UNITED STATES DEPARTMENT OF THE INTERIOR

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

PART 6. SOUTHWESTERN STATES AND TERRITORY OF HAWAII

Prepared in cooperation with the States of
ARIZONA, CALIFORNIA, and NEW MEXICO, the TERRITORY OF HAWAII
and other agencies

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 911

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

GEOLOGICAL SURVEY
W. C. Mendenhall, Director

Water-Supply Paper 911

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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 southwestern section and gives records of water level or artesian pressure in about 1,460 observation wells in Arizona, California, Territory of Hawaii, and New Mexico that were obtained by the Geological Survey and cooperating agencies. About 47 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 16,300 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 and Ermelinda F. Mattera, 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 SOUTHWESTERN PART OF THE UNITED STATES

The precipitation in Arizona, California, and New Mexico was above normal in 1940, but in the Territory of Hawaii it was somewhat 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

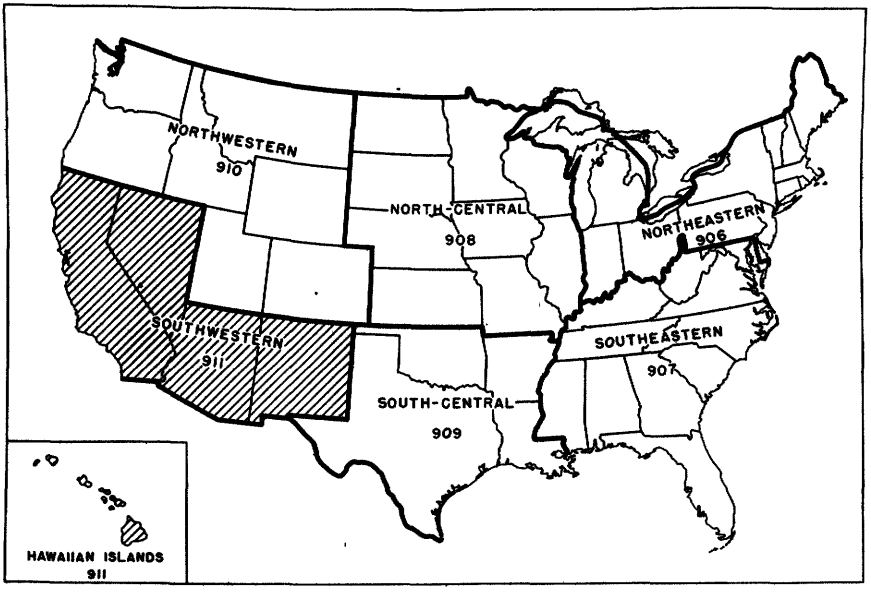

Figure 1.--Outline map of the United States, showing sections of the country covered by the six water-supply papers on water levels and artesian pressure in observation wells in 1940. The shaded section represents the part of the country covered by this volume.

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 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 southwestern States that the observation wells tap.

Arizona.--Small net rises in ground-water levels occurred in 1940 in Safford Valley of the upper Gila River. Recharge to the underground reservoirs occurs in this area chiefly from canal losses, irrigation return flow, rainfall penetration, and percolation from the Gila River.

The precipitation in Duncan Valley of the upper Gila River was about normal during the early part of 1940, but in November and December it was much above normal. As a result there were small net rises in ground-water

levels in the valley in 1940, but net declines probably would have occurred had not the precipitation been high near the end of the year. The normal seasonal lowering of the water levels during the summer in regions of heavy pumping was overcome by the recharge that occurred during the late fall and early winter.

California.--The water level in well 42a at Baldwin Park, a key observation well in the San Gabriel River Basin, declined 4.87 feet in 1940 and the water level in the Williams well, a similar key well in the Santa Ana River Basin, declined 1 foot. Water levels in 9 wells distributed over the San Jacinto Valley had net changes during the year ranging from a rise of a few tenths of a foot to a decline of about 4 feet. The average of the water levels in 5 observation wells in the Tia Juana River Basin declined 2.2 feet in 1940.

In the San Diego River Basin the water levels in 3 wells in the El Monte Park area declined 1.5 to 3.6 feet in 1940 and the water levels in 5 wells in and near Lakeside declined 1 foot. An average net decline of 1.1 feet occurred in 4 wells of the Riverview group and an average net decline of 0.3 foot occurred in 2 wells near Santee. In Mission Valley 3 wells showed an average decline of 0.7 foot in water level, whereas 2 wells showed a small average rise.

The net change of the water levels in 1940 in 6 wells in San Pasqual Valley, San Dieguito River Basin, ranged from a rise of 1.4 feet to a decline of 0.6 foot. No appreciable net changes occurred in wells in the upper part of San Luis Rey River Basin, but the water levels in 4 wells at the lower part of the valley showed an average net gain of 1.5 feet. The water levels in most wells in the Mojave River Basin declined in the year.

Ground-water levels throughout Antelope Valley were mostly lower in 1940 than at corresponding times in 1939. The declines ranged from a few tenths of a foot in the northeastern part of the valley to 4 or 5 feet in the Palmdale-Tierra Bonita area. There was an average decline of about 2 feet.

The average of the water levels in 24 key observation wells in the Mokelumne area, San Joaquin County, rose an average of 1.31 feet in 1940. This rise contrasts with an average net decline of 3.58 feet in 1939. At the end of 1940 the average of the water levels in the wells was 1.02 feet higher than at the end of 1933.

Territory of Hawaii.--In 1940 losses in ground-water storage occurred in 9 of 12 artesian areas on the island of Oahu; only areas on the northeast coast had gains in storage. Withdrawals from the underground reservoirs on Oahu amounted to about 118,500 million gallons in the year.

Water levels in wells on the windward side of the island of Maui declined slightly in 1940; water levels in wells on the leeward side, however, rose from a few hundredths to a few tenths of a foot. The ground-water withdrawal on Maui in the year was about 68,300 million gallons.

The water level in a test boring on the island of Molokai was higher in March and April 1940 than at any time since measurements were begun in June 1938. The water level in a shaft on the island of Lanai on December 2, 1940, reached the highest stage since the shaft was constructed in 1936. The ground-water draft on Molokai in 1940 was about 1 million gallons; on Lanai it was about 144 million gallons.

On the island of Hawaii the water level in Olaa shaft on June 28, 1940, reached the lowest stage since observations were begun in 1936. The water level in Kaiwiki shaft declined only slightly in the year, but on June 14, 1940, it reached the lowest stage since measurements were started in January 1938. The draft on the underground reservoirs on the island of Hawaii was about 2,600 million gallons in 1940.

The artesian head in wells on the island of Kauai rose slightly during 1940. The ground-water withdrawal on Kauai was about 6,200 million gallons in the year.

New Mexico.--The seasonal fluctuations of artesian head in 1940 in 3 key observation wells in the Roswell artesian basin followed the general pattern of previous years. In the Berrendo well, the net decline in artesian head in the year was about the same as in 1939. The mean water level in December 1940 was 0.4 foot below that in December 1939, and the mean annual water level in 1940 was 1.1 feet below that of the previous year. In the Orchard Park well, the mean water level in December 1940 was 0.4 foot higher than in the corresponding month in 1939, but the mean annual water level was 0.7 foot lower. In the Artesia well, the mean monthly water level in December 1940 was 2.2 feet below the mean in December 1939, and the mean annual water level was 2.4 feet lower than in 1939. The water levels in the 3 wells in August 1940 reached the lowest mean monthly stages for the period of record, which extends back to 1926.

The shallow ground-water level declined over most of the Roswell basin in 1940. The decline ranged from a few hundredths of a foot to about 6 feet and over an area of about 60 square miles it ranged from 2 to 4 feet. In the vicinity of Cottonwood Creek, just south of the Chaves-Eddy County line, 3 areas, totaling 20 square miles, showed net rises of water level in 1940. The average rise in the area was about 0.5 foot.

The ground-water level declined over the Mimbres Valley in 1940. The part of the valley in which the decline was more than 1 foot was about 81 square miles--about 25 square miles more than in 1939--and the part in which the decline was more than 1.5 feet was about 46 square miles--about 29 square miles more than in 1939. The parts of the valley in which the decline amounted to more than 1 foot are in general those in which large quantities of water are pumped from wells for irrigation.

The ground-water level declined throughout Portales Valley in 1940, the maximum decline occurring in two heavily pumped areas, northwest and east of Portales. The water level declined more than 1 foot over an area of about 86 square miles, an increase of about 69 square miles over that of the previous year. The declines ranged from 0.02 foot at Floyd to about 3.5 feet northwest of Portales.

ARIZONA

Introduction

By S. F. Turner and L. C. Halpenny

Ground-water investigations were begun in Arizona in August, 1939, by the Federal Geological Survey in cooperation with the State Water Commissioner. The United States Engineer Office, War Department, transferred funds to the Geological Survey to study the probable effects of major flood control structures that are being considered upon ground-water conditions. The following men are now engaged on the ground-water investigations: Samuel F. Turner, in charge, L. C. Halpenny, H. M. Babcock, D. H. Bratton, E. M. Cushing, H. G. Fernandez, Thomas McCauley, Jr., H. R. McDonald, and W. T. Stuart, who are engineers, and R. B. Morrison, who is a geologist.

Detailed studies were started first in several heavily developed areas for which more information was needed. In accordance with this plan, investigations are now in progress in the Queen Creek area, in Pinal and Maricopa Counties, in the Santa Cruz Valley, in Santa Cruz and Pima Counties, and in the Upper Gila area, in Graham and Greenlee Counties.

Reconnaissance investigations have been made of the ground-water resources of the Saint Johns area, on the Little Colorado River; the Big Sandy River Valley; the St. David area, on the San Pedro River; and the San Simon area, near San Simon Creek. A preliminary report on the ground-water resources of the Big Sandy Valley, by R. B. Morrison, was released December 30, 1940, through the office of the State Water Commissioner.

The following water-supply papers of the Geological Survey, United States Department of the Interior, deal with ground water in Arizona:

104. The underground waters of Gila Valley, Arizona, by W. T. Lee, 1904. Refers to Queen Creek and Santa Cruz areas.

136. Underground waters of Salt River Valley, Arizona, by W. T. Lee, 1905. Refers to Queen Creek area.

320. Geology and water resources of Sulphur Spring Valley, Arizona, by O. E. Meinzer and F. C. Kelton, with a section on agriculture by R. H. Forbes, 1913.

375 b. Ground water in Paradise Valley, Arizona, by O. E. Meinzer and A. J. Ellis, 1916.

380. The Navajo country - a geographic and hydrographic reconnaissance of parts of Arizona, New Mexico and Utah, by H. E. Gregory, 1916.

425 a. Ground water in San Simon Valley, Arizona and New Mexico, by A. T. Schwennesen, with a section on agriculture by R. H. Forbes, 1919.

450 a. Geology and water resources of the Gila and San Carlos Valleys in the San Carlos Indian Reservation, Arizona, by A. T. Schwennesen, 1921. Refers to the lower end of Safford Valley.

490 c. Routes to desert watering places in the lower Gila region, Arizona, by C. P. Ross, 1922.

490 d. Routes to desert watering places in the Papago country, Arizona, by Kirk Bryan, 1922.

498. The lower Gila region, Arizona, a geographic, geologic and hydrologic reconnaissance, with a guide to desert watering places, by C. P. Ross, 1923.

499. The Papago country, Arizona, a geographic, geologic and hydrologic reconnaissance, with a guide to desert watering places, by Kirk Bryan, 1925.

796 e. Ground water in Avra-Altar Valley, Arizona, by D. A. Andrews, 1937. Refers to Santa Cruz area.

796 f. Geology and ground-water resources of the valley of Gila River and San Simon Creek, Arizona, by M. M. Knechtel, 1937. Refers to Safford Valley.

836 b. The ground-water resources of the Holbrook region, Arizona, by M. A. Harrell and E. B. Eckel, 1939.

The Agricultural Experiment Station of the University of Arizona has published the following bulletins by G. E. P. Smith on the ground-water resources of the Santa Cruz River Valley:

64. Ground-water supply and irrigation in the Rillito Valley, 1910.

77. The physiography of Arizona valleys and the occurrence of ground-water, 1938.

87. Ground-water supply of the Eloy District in Pinal County, Arizona, 1940.

GRAHAM COUNTY

Safford Valley

By H. R. McDonald and D. H. Bratton

A detailed study is now being made of the ground-water resources of the Safford Valley of the upper Gila River. A field office was established at Safford January 1, 1940. In connection with the investigation measurements of water level have been made once a month in 133 wells and once a week or twice a month in 88 wells. A total of 4,307 individual measure-

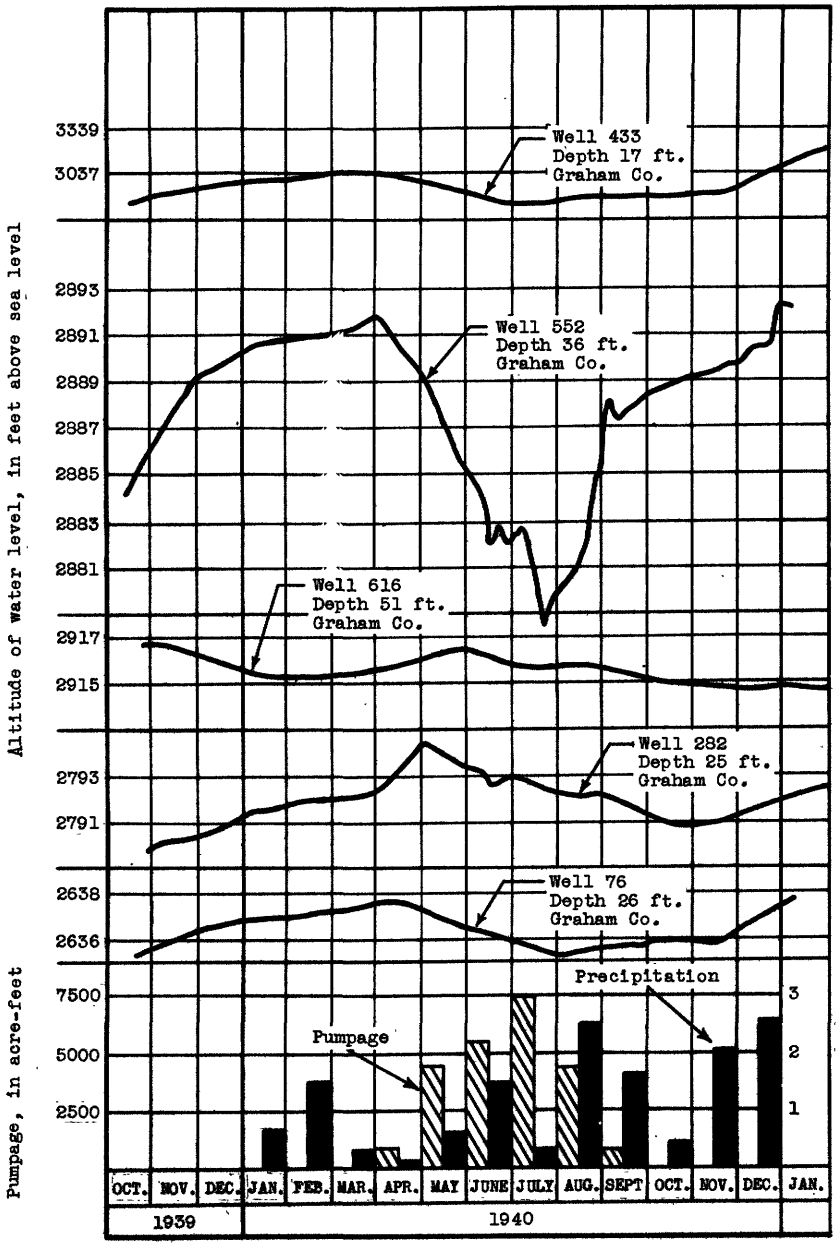

Figure 2.--Graphs showing fluctuations of water level in observation wells in the Safford Valley, Graham County, Ariz.

Graham County--Continued.

ments of water level were made in the observation wells from October 1, 1939 to January 1, 1941. Six automatic water-stage recorders were operated on wells during most of 1940. The quantity of water pumped from wells and the average monthly rainfall is shown in the accompanying table.

Water pumped from wells in acre feet, and average precipitation in inches, in Safford Valley, 1940

	Pumpage	Precipitation		Pumpage	Precipitation
January	-	0.72	July	7,522	0.36
February	-	1.54	August	4,344	2.54
March	-	.29	September	791	1.63
April	980	.15	October	-	.44
May	4,395	.61	November	-	2.08
June	5,541	1.47	December	-	2.59

There were relatively small net gains in the water levels in wells in the area between January 1, 1940 and January 1, 1941. Ground-water recharge occurred from canal losses, irrigation return flow, rainfall penetration, and percolation from the Gila River (see accompanying illustration). Well 433, in the eastern or upper end of the valley, and its hydrograph shows normal fluctuations of water level unaffected by pumping. Well 552 is north of the Gila River near Safford in a region of heavy pumping. Well 616 is south of Safford near an irrigation canal. The hydrograph of the well shows the effect of recharge from the canal during the peak of the irrigation season. It shows also a lowering of water level during the late fall when the depressions in the water table caused by pumping were being filled. The hydrograph of well 282, which is near a canal just west of Pima, also shows the effect of recharge from canals. Well 76 is in the western end of the cultivated part of the valley at a considerable distance from pumped wells and the hydrograph of this well shows normal fluctuations in water level.

In the following tables water levels are expressed in feet below the measuring points. The highest and lowest water levels that are given for some periods were obtained with maximum-minimum strip recorders.

Graham County--Continued.

1. U. S. Indian Service. San Carlos Indian Reservation, 1,790 feet north of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.55 feet above land surface and 101.45 feet above assumed datum.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 21	10.58	July 25	11.43	Aug. 30	11.65	Oct. 11	12.46
24	10.64	Aug. 2	11.64	Sept. 6	11.81	18	12.60
26	10.64	a	11.51	13	11.94	Nov. 1	12.76
28	10.68	9	11.53	20	12.09	15	12.80
July 6	10.90	16	11.62	a	11.87	Dec. 6	12.52
12	11.07	23	11.74	27	12.14	20	11.93
19	11.26	a	11.30	Oct. 4	12.37		

2. U. S. Indian Service. San Carlos Indian Reservation, 1,250 feet north of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.7 feet above land surface and 102.19 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 21	10.15	July 19	10.73	Aug. 30	10.94	Oct. 11	11.97
24	10.09	25	10.85	Sept. 6	11.21	18	12.10
26	10.03	Aug. 2	11.17	13	11.27	Nov. 1	12.34
28	10.11	9	10.78	20	11.56	15	12.27
July 6	10.34	16	10.71	27	11.59	Dec. 6	11.81
12	10.57	23	11.01	Oct. 4	11.77	20	10.50

3. U. S. Indian Service. San Carlos Indian Reservation, 670 feet north of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 18 feet. Measuring point, top of pipe, 1.4 feet above land surface and 99.32 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 21	8.61	July 25	9.23	Aug. 30	9.44		a10.17
24	8.31	Aug. 2	9.59	Sept. 6	9.60	Oct. 11	10.40
26	8.28		a8.93		a9.18	18	10.60
28	8.39	9	9.22	13	9.66	Nov. 1	10.67
July 6	8.65	16	8.76	20	10.05	15	10.51
	a8.93	23	9.35		a10.01	Dec. 6	10.05
12	8.94		a9.08	26	10.11	20	9.04
19	9.15			Oct. 4	10.18		

4. U. S. Indian Service. San Carlos Indian Reservation, 210 feet south of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.55 feet above land surface and 100.24 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 18	12.02	July 25	12.55		a12.76		a13.34
24	11.48	Aug. 2	13.11	Sept. 6	12.95	Oct. 18	13.60
26	11.52		a11.98		a12.53		a13.56
28	11.78	9	12.85	13	12.91	Nov. 1	13.60
July 6	12.00		a11.04	20	13.34		a13.14
	a11.96	16	11.40		a13.13	15	13.21
12	12.58	23	12.74	27	13.33		a12.50
	a12.42		a12.09	Oct. 4	13.10	Dec. 6	12.62
19	12.83	30	13.05		a13.00	20	12.60
	a12.44			11	13.40		

a Highest water level in period between tape measurements.

Graham County--Continued.

5. U. S. Indian Service. San Carlos Indian Reservation, 230 feet south of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west of mouth of San Carlos River. Used bored observation well, diameter 8 inches, depth 17 feet. Measuring point, joint at top of casing, 1.2 feet above land surface and 99.73 feet above assumed datum. Well equipped with water-stage recorder from October 1 to December 13 inclusive.

Daily noon water level, in feet below measuring point, 1940 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 4	b 12.72	Oct. 17	12.36	Nov. 5	12.49	Nov. 25	12.26
6	b 12.48	18	12.37	6	12.50	26	12.25
20	b 12.11	19	12.38	7	12.50	27	12.24
27	b 12.27	20	12.39	8	12.51	28	12.24
Oct. 1	12.33	21	12.40	9	12.51	29	12.23
2	12.32	22	12.41	10	12.52	30	12.23
3	12.32	23	12.42	11	12.52	Dec. 1	12.23
4	12.33	24	12.43	12	12.52	2	12.23
5	12.33	25	12.44	13	12.52	3	12.23
6	12.32	26	12.44	14	12.52	4	12.23
7	12.33	27	12.44	15	12.52	5	12.23
8	12.33	28	12.44	16	12.52	6	12.23
9	12.33	29	12.44	17	12.52	7	12.23
10	12.33	30	12.45	18	12.52	8	12.23
11	12.33	31	12.46	19	12.50	9	12.22
12	12.33	Nov. 1	12.47	20	12.42	10	12.22
13	12.33	2	12.47	21	12.32	11	12.22
14	12.33	3	12.48	22	12.28	12	12.22
15	12.34	4	12.49	23	12.27	13	11.87
16	12.35			24	12.27		

6. U. S. Indian Service. San Carlos Indian Reservation, 790 feet south of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.4 feet above land surface and 100.91 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 18	12.81	Aug. 2	14.01		a 14.03	Oct. 4	14.26
24	12.51		a 13.33	Sept. 6	14.15	11	14.45
26	12.53	9	13.87		a 13.32		a 14.39
28	12.69		a 12.97	12	14.01	18	14.64
July 6	13.00	16	13.09	20	14.38	Nov. 1	14.68
12	13.39	23	13.89		a 14.13	15	14.33
19	13.63		a 13.57	27	14.41	Dec. 6	13.72
25	13.56	30	14.11		a 14.06	20	12.90
	a 13.53			Oct.			

7. U. S. Indian Service. San Carlos Indian Reservation, 1,110 feet south of Gila River, 400 feet west from mouth of Kelly Canyon, 0.5 mile west from mouth of San Carlos River. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.35 feet above land surface and 100.00 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 19	9.61	July 19	12.84	Aug. 30	13.37	Oct. 11	13.76
24	11.74	25	12.93	Sept. 6	13.53	18	13.92
26	11.90	Aug. 2	13.27	13	13.39	Nov. 1	13.99
28	12.02	9	13.18	20	13.65	15	13.70
July 6	12.32	16	12.83	27	13.71	Dec. 6	12.70
12	12.59	23	13.20	Oct. 4	13.63	20	12.47

a Highest water level in period between tape measurements.
b Tape measurements.

Graham County--Continued.

8. U. S. Indian Service. San Carlos Indian Reservation at Calva, 840 feet south of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.1 feet above land surface and 100.00 feet above assumed datum.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 17	8.65	July 12	8.58	Aug. 23	8.35	Oct. 11	8.36
24	8.72	19	8.75	30	8.37	18	8.46
25	8.64	26	8.93	Sept. 6	8.45	Nov. 1	8.43
26	8.58	a	8.91	13	8.26	15	8.32
28	8.52	Aug. 2	8.95	20	8.40	Dec. 6	7.88
July 6	8.46	9	8.73	27	8.40	20	7.42
a	8.41	16	8.52	Oct. 4	8.33		

9. U. S. Indian Service. San Carlos Indian Reservation at Calva, 400 feet south of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well with sand point, diameter 1 inch, depth 15 feet. Measuring point, top of pipe, 1.1 feet above land surface and 99.20 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 17	7.69	July 26	7.93	Aug. 30	7.29	a	7.19
24	7.53	a	7.81	Sept. 6	7.40	Oct. 11	7.29
25	7.39	Aug. 2	7.88	a	7.03	18	7.39
26	7.31	a	7.55	13	7.11	Nov. 1	7.37
28	7.30	9	7.58	20	7.32	a	7.17
July 6	7.35	16	7.12	a	7.24	15	7.18
12	7.52	23	7.17	27	7.30	Dec. 6	6.77
19	7.74	a	7.11	Oct. 4	7.22	20	6.26

10. U. S. Indian Service. San Carlos Indian Reservation at Calva, 250 feet south of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used bored observation well, diameter 8 inches, depth 7 feet. Measuring point, joint at top of casing, 1.65 feet above land surface. Well equipped with water-stage recorder from Sept. 18 to Dec. 13 inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Sept. 3	b 7.30	Oct. 8	7.14	Oct. 31	7.32	Nov. 23	6.82
6	b 7.31	9	7.16	Nov. 1	7.31	24	6.82
13	b 7.01	10	7.18	2	7.30	25	6.80
18	7.22	11	7.22	3	7.29	26	6.78
19	7.23	12	7.24	4	7.27	27	6.76
20	7.24	13	7.26	5	7.25	28	6.76
21	7.27	14	7.28	6	7.24	29	6.75
22	7.24	15	7.30	7	7.22	30	6.74
23	7.19	16	7.30	8	7.20	Dec. 1	6.74
24	7.10	17	7.32	9	7.18	2	6.74
25	7.10	18	7.33	10	7.17	3	6.73
26	7.15	19	7.34	11	7.17	4	6.72
27	7.19	20	7.35	12	7.15	5	6.72
28	7.25	21	7.35	13	7.14	6	6.70
29	7.24	22	7.36	14	7.12	7	6.69
30	7.26	23	7.35	15	7.10	8	6.68
Oct. 1	7.20	24	7.35	16	7.09	9	6.68
2	7.11	25	7.35	17	7.08	10	6.67
3	7.08	26	7.34	18	7.07	11	6.66
4	7.08	27	7.34	19	7.03	12	6.65
5	7.09	28	7.33	20	6.98	13	6.57
6	7.09	29	7.33	21	6.89	20	b 6.12
7	7.12	30	7.32	22	6.83		

a Highest water level in period between tape measurements.
b Tape measurement.

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Graham County--Continued.

11. U. S. Indian Service. San Carlos Indian Reservation at Calva, 160 feet south of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well with sand point, diameter 1 inch, depth 15 feet. Measuring point, top of pipe, 1.2 feet above land surface and 98.44 feet above assumed datum.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 17	6.61	July 26	6.87	Aug. 30	6.05	Oct. 11	6.08
24	6.06	a	6.62	Sept. 6	6.17	18	6.19
25	5.99	Aug. 2	6.68	a	5.50	Nov. 1	6.14
26	5.93	a	6.16	13	5.86	15	5.91
28	6.03	9	6.38	20	6.12	a	5.50
July 6	6.17	16	5.40	a	5.92	Dec. 6	5.52
12	6.39	a	5.36	27	6.06	20	4.94
19	6.65	23	5.86	a	5.91		
a	6.64	a	5.84	Oct. 4	5.92		

12. U. S. Indian Service. San Carlos Indian Reservation at Calva, 155 feet north of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well, with sand point, diameter 1 inch, depth 15 feet. Measuring point, top of pipe, 0.7 foot above land surface and 97.09 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 14	6.14	July 19	6.49	Aug. 23	5.66	Oct. 4	5.67
24	5.77	26	6.68	30	5.88	11	5.80
25	5.63	a	6.36	Sept. 6	5.98	18	5.93
26	5.70	Aug. 2	6.42	a	5.26	Nov. 1	5.88
28	5.84	a	5.92	13	5.62	15	5.67
July 6	5.96	9	6.16	20	5.91	Dec. 6	5.23
12	6.18	a	5.16	a	5.72	a	4.36
a	6.16	17	5.28	27	5.81	20	4.55

13. U. S. Indian Service. San Carlos Indian Reservation at Calva, 665 feet north of Gila River, 0.4 mile east from mouth of Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well with sand point, diameter 1 inch, depth 20 feet. Measuring point, top of pipe, 2.5 feet above land surface and 104.37 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 14	12.36	July 19	12.62	Aug. 30	12.19	Oct. 11	12.07
24	12.38	26	12.78	Sept. 6	12.27	18	12.17
25	12.26	Aug. 2	12.78	13	12.02	Nov. 1	12.13
26	12.18	9	12.49	20	12.19	15	11.95
28	12.15	17	12.04	27	12.13	Dec. 6	11.51
July 6	12.22	23	12.10	Oct. 4	12.03	20	11.02
12	12.39						

14. U. S. Indian Service. San Carlos Indian Reservation at Calva, 1,065 feet north of Gila River, 0.4 mile east from Wild Horse Canyon, 0.6 mile east from railroad bridge. Used driven observation well with sand point, diameter 1 inch, depth 16 feet. Measuring point, top of pipe, 1.35 feet above land surface and 104.02 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 14	11.82	July 19	12.01	Aug. 30	11.77	Oct. 11	11.56
24	11.88	26	12.15	Sept. 6	11.86	18	11.60
25	11.81	Aug. 2	12.22	13	11.64	Nov. 1	11.63
26	11.75	9	12.01	20	11.70	15	11.44
28	11.70	17	11.81	27	11.68	Dec. 6	11.03
July 6	11.70	23	11.74	Oct. 4	11.60	20	10.70
12	11.83						

a Highest water level in period between tape measurements.

Graham County--Continued.

16. U. S. Indian Service. San Carlos Indian Reservation at Bylas, 640 feet north of Gila River, 300 feet east of Indian Rodeo Grounds. Used driven observation well with sand point, diameter 1 inch, depth 16 feet. Measuring point, top of pipe, 2.0 feet above land surface and 101.50 feet above assumed datum.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 13	13.09	July 19	13.21	Aug. 30	12.57	Oct. 11	12.63
24	12.67	26	13.35	Sept. 6	12.65	18	12.79
25	12.62	Aug. 2	13.17	13	12.47	Nov. 1	12.72
26	12.63	9	12.98	20	12.70	15	12.43
28	12.70	17	12.16	27	12.61	Dec. 6	11.88
July 6	12.76	23	12.33	Oct. 4	12.38	20	11.36
12	13.01						

17. U. S. Indian Service. San Carlos Indian Reservation at Bylas, 220 feet north of Gila River, 300 feet east of Indian rodeo grounds. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.8 feet above land surface and 95.61 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 12	7.34		a 7.27	Aug. 23	6.30	Oct. 4	6.56
24	6.74	July 19	7.49	30	6.83		a 6.52
25	6.65		a 7.42	Sept. 6	6.57	11	6.94
26	6.79	26	7.46	13	6.72	18	7.10
28	6.91	Aug. 2	7.15	20	7.10	Nov. 1	6.98
July 6	7.03		a 6.59		a 6.36	15	6.65
	a 7.02	9	7.17	27	6.86	Dec. 6	6.20
12	7.33	17	6.01		a 6.29	20	5.69

18. U. S. Indian Service. San Carlos Indian Reservation at Bylas, 210 feet south of Gila River, 300 feet east of rodeo grounds. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.2 feet above land surface and 96.41 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 11	7.87	July 19	7.96	Aug. 23	6.83		a 6.79
24	7.18		a 7.92	30	7.29	Oct. 4	7.03
25	7.12	26	7.97	Sept. 6	7.16	11	7.37
26	7.27		a 7.67		a 6.30	18	7.57
28	7.41	Aug. 2	7.69	13	7.20	Nov. 1	7.43
July 6	7.54		a 7.18	20	7.56	15	7.12
12	7.81	9	7.61		a 6.86	Dec. 6	6.71
	a 7.79	16	6.25	27	7.30	20	6.26

19. U. S. Indian Service. San Carlos Indian Reservation at Baylas, 485 feet south of Gila River, 300 feet east of rodeo grounds. Used bored observation well, diameter 8 inches, depth 8 feet. Measuring point, joint at top of casing, 0.75 foot above land surface. Well equipped with water level recorder from Sept. 9 to Dec. 16.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Sept. 3	b 6.49	Sept.17	6.56	Sept.27	6.42	Oct. 7	6.34
6	b 6.55	18	6.59	28	6.48	8	6.38
9	6.06	19	6.61	29	6.53	9	6.42
10	6.14	20	6.67	30	6.54	10	6.46
11	6.22	21	6.70	Oct. 1	6.37	11	6.50
12	6.28	22	6.60	2	6.18	12	6.53
13	6.31	23	6.42	3	6.18	13	6.56
14	6.36	24	6.26	4	6.22	14	6.59
15	6.44	25	6.26	5	6.25	15	6.61
16	6.50	26	6.35	6	6.29	16	6.61

a Highest water level in period between tape measurements.
b Tape measurements.

Graham County--Continued.

19. U. S. Indian Service -- Continued

Daily noon water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 17	6.63	Nov. 2	6.61	Nov. 18	6.31	Dec. 3	5.94
18	6.66	3	6.59	19	6.27	4	5.95
19	6.67	4	6.56	20	6.12	5	5.95
20	6.68	5	6.53	21	5.96	6	5.93
21	6.69	6	6.51	22	5.95	7	5.94
22	6.68	7	5.49	23	5.97	8	5.93
23	6.66	8	6.46	24	5.97	9	5.93
24	6.66	9	6.45	25	5.94	10	5.93
25	6.67	10	6.44	26	5.92	11	5.92
26	6.68	11	6.43	27	5.92	12	5.90
27	6.69	12	6.39	28	5.92	13	5.72
28	6.68	13	6.37	29	5.93	14	5.52
29	6.67	14	6.36	30	5.94	15	5.43
30	6.66	15	6.35	Dec. 1	5.95	16	5.43
31	6.65	16	6.34	2	5.95	20 b	5.47
Nov. 1	6.62	17	6.32				

20. U. S. Indian Service. San Carlos Indian Reservation at Bylas, 690 feet south of Gila River, 300 feet east of rodeo grounds. Used driven observation well with sand point, diameter 1 inch, depth 19 feet. Measuring point, top of pipe, 1.4 feet above land surface and 97.14 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 12	8.61	a	8.57	Sept. 6	8.08	Oct. 11	8.05
24	8.36	Aug. 2	8.60	a	7.65	18	8.20
25	8.14	a	8.26	13	7.93	Nov. 1	8.17
26	8.11	9	8.41	20	8.18	a	7.88
28	8.16	a	7.75	a	7.87	15	7.90
July 6	8.26	16	7.77	27	8.05	a	7.52
12	8.52	23	7.79	Oct. 4	7.86	Dec. 6	7.55
19	8.67	30	8.03	a	7.85	20	7.08
26	8.78						

21. U. S. Indian Service. San Carlos Indian Reservation at Bylas, 1,150 feet south of Gila River, 300 feet east of rodeo grounds. Used driven observation well with sand point, diameter 1 inch, depth 20 feet. Measuring point, top of pipe, 1.8 feet above land surface and 100.00 feet above assumed datum.

Water level, in feet below measuring point, 1940

June 12	14.76	a	11.33	Aug. 30	10.83	Oct. 4	10.64
24	11.25	July 19	11.48	Sept. 6	10.93	11	10.79
25	11.14	26	11.60	a	10.64	18	10.93
26	11.07	Aug. 2	11.47	13	10.72	Nov. 1	10.89
28	11.05	a	11.10	20	10.95	15	10.67
July 6	11.11	9	11.24	a	10.74	Dec. 6	10.26
a	10.10	16	10.80	27	10.79	20	9.91
12	11.35	23	10.67				

51. Bert Hinton. SE¼NW¼ sec. 13, T. 4 S., R. 22 E., 300 feet south of well 52, 0.3 mile north from U. S. Highway 70, 0.6 mile west from Geronimo. Used drilled irrigation well, diameter 10 inches, depth 76 feet. Measuring point, bottom of hole in east side of casing, 0.5 foot above land surface and 2,641.45 feet above mean sea level. Bench mark, established Feb. 1, 1940, green cross at the east end of north pump base, 2.5 feet above land surface and 2,643.41 feet above mean sea level. Equipped with turbine pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1939	18.36	July 2, 1940	18.62	Oct. 9, 1940	18.49
Feb. 8, 1940	17.73	31	19.37	31	18.56
Mar. 29	17.52	Aug. 30	18.88	Nov. 28	18.11
May 29	18.52	Sept. 28	18.64		

a Highest water level in period between tape measurements.
b Tape measurement.

Graham County--Continued.

52. Bert Hinton. SE¼NW¼ sec. 13, T. 4 S., R. 22 E., 300 feet north of well 51, 0.35 mile north from U. S. Highway 70, 0.6 mile west from Geronimo. Used drilled domestic well, diameter 4 inches, depth 20.6 feet. Measuring point, top of casing, 1.2 feet above land surface and 2,641.12 feet above mean sea level. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1939	18.04	May 29, 1940	17.95	Sept.28, 1940	18.08
Nov. 29	17.84	July 2	18.10	Oct. 31	18.00
Feb. 8, 1940	17.10	31	18.80	Nov. 28	17.56
May 1 a	17.70	Aug.30	18.29		

53. H. A. McBeath. SE¼SE¼ sec. 13, T. 4 S., R. 22 E., at rear of service station, 100 feet north from U. S. Highway 70 in Geronimo. Unused dug domestic well, diameter 36 inches, depth 53 feet. Measuring point, top of pipe clamp, 2.0 feet above land surface and 2,723.79 feet above mean sea level. Equipped with windmill.

Water level, in feet below measuring point, 1940

Jan. 29	54.02	Mar. 29	53.76	Sept.28	(b)
Feb. 7	53.14	Aug. 30	(b)		

54. Mrs. R. S. Knowles. SE¼SE¼ sec. 13, T. 4 S., R. 22 E., at rear of McBeath Trading Post, in Geronimo. Used dug domestic well, diameter 54 inches, depth 45 feet. Measuring point, red arrow at top of 4 by 8-inch timber across curb, 2.0 feet above land surface and 2,717.45 feet above mean sea level. Equipped with windmill.

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

Oct. 10, 1939	45.91	May 1, 1940	44.87	Sept.28, 1940	46.03
Nov. 29	45.69	29	45.43	Oct. 31	46.26
Feb. 7, 1940	45.34	July 2	45.84	Nov. 28	45.92
Mar. 29	44.77				

55. Paul Higgins. NE¼NE¼ sec. 24, T. 4 S., R. 22 E., in field, 0.4 mile south from Geronimo. Unused dug domestic well, diameter 168 inches, depth 37.8 feet. Measuring point, red arrow at top of 6 by 6-inch timber across curb, 0.6 foot above land surface and 2,731.04 feet above mean sea level. Measurements discontinued July 31, 1940. See well 56 for further measurements.

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

Oct. 19, 1939	37.22	Mar. 20, 1940	36.23	June 3	37.34
Nov. 29	36.93	Apr. 15	36.40	July 2	37.19
Feb. 7, 1940	36.30	May 2	36.79	18	37.55
27	35.87	22	37.05	31	38.30

56. NW¼NE¼ sec. 24, T. 4 S., R. 22 E., 25 feet west from private road, 300 feet west from well 55, 0.4 mile south from Geronimo. Unused dug irrigation well, diameter 55 inches, depth 50 feet. Measuring point, top of concrete curb at land surface. See well 55 for previous measurements.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 14	47.25	May 29	46.90	Aug. 30	46.54	Oct. 31	46.85
Mar. 29	46.92	July 2	46.30	Sept.28	45.96	Nov. 28	47.30
May 1	46.87	31	46.87				

59. Pat Hinton. NW¼SE¼ sec. 35, T. 4 S., R. 22 E., 100 feet northeast from house, one-half mile west from Goodwin Wash Road, 4.2 miles southwest from Geronimo. Used drilled domestic well, diameter 6 inches, depth, 39.8 feet. Measuring point, top of casing, 1.1 feet above land surface and 2,858.57 feet above mean sea level. Bench mark, established

a Well 51 pumping.
b Dry.

Graham County--Continued.

59. Pat Hinton -- Continued.

Feb. 16, 1940, blue mark at upper northeast corner of concrete tank, 5.5 feet above land surface, 300 feet southeast from well and 2,863.74 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 8, 1939	29.05	July 1, 1940	29.76	Oct. 1, 1940	30.86
Feb. 8, 1940	28.12	31	30.24	30	30.67
Mar. 29	27.94	Aug.30	30.60	Nov. 28	30.14
May 1	28.44				

71. U. S. Government. SE¼SW¼ sec. 7, T. 4 S., R. 23 E., 140 feet north of Gila River, one mile north from Geronimo. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.5 feet above land surface and 2,645.79 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 8	18.57		a 18.68	Aug. 23	18.02	Oct. 11	18.20
24	18.39	July 19	18.83	Sept. 6	18.15	18	18.32
25	18.28	26	18.75	13	18.23	Nov. 1	18.27
26	18.35	Aug. 3	18.61	20	18.50	15	18.03
July 6	18.46	9	18.53	27	18.25	Dec. 6	17.70
12	18.72	16	17.56	Oct. 4	17.95	20	17.09

72. Graham County. SE¼SW¼ sec. 7, T. 4 S., R. 23 E., 170 feet south of Gila River, one mile north from Geronimo. Used driven observation well with sand point, diameter 1 inch, depth 11 feet. Measuring point, top of pipe, 1.4 feet above land surface and 2,634.24 feet above mean sea level.

Water level, in feet below measuring point, 1940

June 7	4.50	July 19	4.74	Aug. 31	4.35	Oct. 11	4.17
10	4.54		a 4.43	Sept. 6	3.58	18	4.28
11	4.54	26	4.45		a 3.54	Nov. 1	4.13
24	4.04		a 4.14	13	4.17	15	3.90
25	3.87	Aug. 3	4.25	20	4.47		a 3.06
26	4.09	9	4.19	27	4.18	Dec. 6	3.53
28	4.18	16	2.70		a 3.44		a 2.27
July 6	4.32	23	3.77	Oct. 4	3.82	20	2.88
12	4.60		a 3.72				

73. Graham County. SE¼SW¼ sec. 7, T. 4 S., R. 23 E., 600 feet south of Gila River, on east side of McEuen Ranch Road. Used driven observation well with sand point, diameter 1 inch, depth 20 feet. Measuring point, top of pipe, 1.8 feet above land surface and 2,641.02 feet above mean sea level.

Water level, in feet below measuring point, 1940

June 7	11.01		a 11.07	Aug. 31	10.66		a 10.29
10	11.02	July 19	11.24		a 10.58	Oct. 7	10.57
11	11.04		a 11.14	Sept. 6	10.71		a 10.55
24	10.68	26	11.32		a 10.10	Oct. 18	10.77
25	10.61	Aug. 3	11.11	13	10.62	Nov. 1	10.57
26	10.65		a 10.70	20	10.92	15	10.30
28	10.69	9	10.99		a 10.28		a 9.83
July 6	10.89	16	9.97	27	10.62	Dec. 6	9.89
	a 10.85	23	10.40		a 10.23	20	9.29
12	11.23		a 10.26	Oct. 4	10.36	26	8.38

a Highest water level in period between tape measurements.

Graham County--Continued.

74. Graham County. SE¼SW¼ sec. 7, T. 4 S., R. 23 E., 900 feet south of Gila River on east side of McEuen Ranch Road. Used bored observation well, diameter 8 inches, depth 9 feet. Measuring point, joint at top of casing; 2.2 feet above land surface and 2,637.21 feet above mean sea level. Well equipped with water level recorder from Aug. 24 to Dec. 16.

Daily noon water level, in feet below measuring point, 1940 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 10 a	7.78	Sept.13	6.59	Oct. 14	6.74	Nov. 10	6.61
19 a	7.26	14	6.64	15	6.77	11	6.60
26 a	7.48	15	6.71	16	6.79	12	6.58
Aug. 3 a	7.40	16	6.78	17	6.81	13	6.56
9 a	7.19	17	6.84	18	6.83	14	6.54
16 a	6.36	18	6.87	19	6.84	15	6.51
23 a	6.58	19	6.89	20	6.86	16	6.49
24	6.58	20	6.92	21	6.87	17	6.48
25	6.47	21	6.96	22	6.88	18	6.45
26	6.34	22	6.70	23	6.87	19	6.42
27	6.23	27	6.66	24	6.87	20	6.23
28	6.22	28	6.71	25	6.87	21	6.08
29	6.39	29	6.73	26	6.87	22	6.05
30	6.52	30	6.75	27	6.88	29	5.87
31	6.61	Oct. 1	6.69	28	6.86	Dec. 6	6.06
Sept. 1	6.67	2	6.49	29	6.85	7	6.07
2	6.71	3	6.48	30	6.83	8	6.05
3	6.69	4	6.49	31	6.80	9	6.05
4	6.72	5	6.52	Nov. 1	6.75	10	6.03
5	6.77	6	6.53	2	6.73	11	6.01
6	6.80	7	6.60	3	6.72	12	5.97
7	6.71	8	6.63	4	6.71	13	5.81
8	6.38	9	6.67	5	6.69	14	5.61
9	6.41	10	6.69	6	6.68	15	5.47
10	6.45	11	6.69	7	6.66	16	5.40
11	6.52	12	6.70	8	6.64	20 a	5.42
12	6.56	13	6.72	9	6.62	26 a	4.97

75. Graham County. NE¼NW¼ sec. 18, T. 4 S., R. 23 E., 1,150 feet south of Gila River, on east side of McEuen Ranch Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.75 feet above land surface and 2,634.93 feet above mean sea level.

Water level, in feet below measuring point, 1940

June 7	4.67	a	4.66	Aug. 31	4.26	Oct. 11	4.23
10	4.67	July 19	4.87	Sept. 6	4.47	18	4.42
11	4.70	a	4.78	a	3.92	Nov. 1	4.21
24	4.34	26	5.05	13	4.29	a	3.93
25	4.33	a	4.84	a	4.24	15	3.98
26	4.33	Aug. 3	4.87	20	4.57	a	3.40
28	4.35	9	4.73	27	4.29	Dec. 6	3.55
July 6	4.60	16	3.88	a	3.97	20	2.95
a	4.53	23	4.13	Oct. 4	4.06	26	2.50
12	4.93	a	3.69	a	4.00		

76. E. W. Black. NE¼NW¼ sec. 18, T. 4 S., R. 23 E., 25 feet west of county road, 0.25 mile south from well 75, 1 mile north from Geronimo. Unused dug domestic well, diameter 72 inches, depth 25.7 feet. Measuring point, red arrow on south curb, 0.1 foot above land surface and 2,659.99 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1939	24.46	July 31, 1940	24.86	Oct. 18, 1940	24.13
Dec. 8	23.75	Aug. 30	24.48	31	24.08
Feb. 8, 1940	23.04	Sept.28	24.33	Nov. 1	24.05
27	22.96	Oct. 4	24.26	15	23.85
Mar. 29	22.44	9	24.20	28	23.64
May 1	22.86	11	24.17	Dec. 6	23.43
29	23.61	16	24.16	20	23.13
July 2	24.14				

a Highest water level in period between tape measurements.

Graham County--Continued.

77. E. M. Claridge. NW¼SW¼ sec. 18, T. 4 S., R. 23 E., at Diamond Bar Ranch Corral, 0.5 mile south from Geronimo. Used drilled stock well, diameter 6 inches, depth 47 feet. Measuring point, top of casing, 0.9 foot above land surface and 2,696.03 feet above mean sea level. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1939	40.75	May 1, 1940	39.23	Aug. 30, 1940	41.22
Nov. 29	40.45	29	39.70	Sept.28	41.05
Feb. 8, 1940	39.69	July 2	40.40	Oct. 30	40.90
Mar. 29	39.42	31	40.83	Nov. 28	40.60

79. Fay Rabb. NE¼SE¼ sec. 18 T. 4 S., R. 23 E., 0.6 mile south from Gila River, 1 mile east from Geronimo. Unused dug domestic well, diameter 81 inches, depth 28 feet. Measuring point, red arrow at top of timber across curb, 0.2 foot below land surface and 2,668.76 feet above mean sea level.

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

Oct. 19, 1939	25.55	June 15, 1940	25.53		a 25.33
Nov. 29	25.01	July 2	25.37	Sept.14, 1940	25.48
Feb. 8, 1940	24.30		a 25.31	Oct. 1	25.46
27	24.19	17	26.12		a 25.20
Mar. 20	23.98		a 25.61	16	25.37
	a 23.66	30	26.11	31	25.24
Apr. 15	24.14		a 25.02		a 25.02
May 2	24.44	Aug. 16	25.52	Nov. 15	25.10
22	25.01		a 25.24		a 24.67
	a 24.75	30	25.49	28	24.70
June 3	25.17			Dec. 18	24.23

80. Fay Rabb. NW¼SW¼ sec. 17, T. 4 S., R. 23 E., 300 feet east of house, 0.25 mile west and 0.3 mile south from mouth of Goodwin Wash, 1.5 miles east from Geronimo. Used drilled irrigation well, diameter 16 inches, depth 82 feet. Measuring point, top of casing, 0.8 foot above land surface and 2,656.89 feet above mean sea level. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 29	15.17	May 29	16.70	Aug. 30	18.52	Oct. 31	16.54
Apr. 29	17.47	July 2	16.48	Sept.30	16.53	Nov. 28	15.89

81. Mrs. J. B. Blessing. NW¼NE¼ sec. 19, T. 4 S., R 23 E., at rear of house, 100 feet south from county road, 0.4 mile east from Geronimo. Used dug domestic well, diameter 54 inches, depth 33.8 feet. Measuring point, red arrow on 3 by 4-inch timber over curb, 0.3 foot above land surface and 2,692.15 feet above mean sea level. Equipped with windmill, centrifugal pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1939	31.57	May 1, 1940	30.34	Aug. 30, 1940	32.14
Dec. 8	30.76	29	31.14	Sept.28	32.02
Feb. 7, 1940	30.40	July 2	31.65	Oct. 31	31.50
Mar. 29	30.49	31	32.46	Nov. 28	31.00

88. W. F. Bolinger. NW¼NE¼ sec. 27, T. 4 S., R. 23 E., west of house 0.5 mile west from county road, 1.3 miles north from U. S. Highway 70 at west city limits of Fort Thomas. Used drilled domestic and stock well, diameter 5 inches, depth 28.8 feet. Measuring point, red arrow at top of casing, 1.2 feet above land surface and 2,677.78 feet above mean sea level. Bench mark, established Nov., 1939, nail in northeast corner post of tank tower, 2 feet above land surface and 2,679.10 feet above mean sea level. Equipped with windmill.

a Highest water level in period between tape measurements.

Graham County--Continued.

88. W. F. Bolinger -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 25, 1939	15.72	Apr. 30, 1940	14.27	Aug. 2, 1940	16.37
Dec. 9	15.35	May 29	14.95	30	16.05
Feb. 10, 1940	14.21	July 4	15.59	Oct. 30	15.69
Mar. 27	13.72				

90. Church of Latter Day Saints. NE¼NE¼ sec. 29, T. 4 S., R. 23 E., at rear of building, 300 feet north from U. S. Highway 70, one mile southeast from Geronimo. Unused drilled public well, diameter 6 inches, depth 39.5 feet. Measuring point, top of casing, 0.4 feet above land surface and 2,678.35 feet above mean sea level. Equipped with windmill.

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

Oct. 20, 1939	24.33	Apr. 30, 1940	23.36	Aug. 30, 1940	24.30
Dec. 8	24.10	May 29	23.49	Sept.30	24.20
Feb. 7, 1940	23.59	July 1	23.97	Oct. 30	24.13
Mar. 29	23.24	31	24.54	Nov. 28	23.98

91. Ben Montierth. NW¼SE¼ sec. 29, T. 4 S., R. 23 E., across private road from house, 0.1 mile south and 0.2 mile west from U. S. Highway 70, 1.3 miles southeast from Geronimo. Used drilled irrigation well, diameter 16 inches, depth 83 feet. Measuring point, top of casing at air line, 1.0 foot above land surface and 2,705.56 feet above mean sea level. Equipped with turbine and gasoline engine.

Water level, in feet below measuring point, 1940

Jan. 16	49.25	Sept. 3	49.74	Oct. 31	49.69
Feb. 7	49.10	30	49.67	Nov. 28	49.51

92. Wendell Montierth. SE¼NE¼ sec. 33, T. 5 S., R. 23 E., west side of fence along private road, 0.15 mile south from Fort Thomas Canal, 0.30 mile south from U. S. Highway 70, 1.5 miles northwest from Fort Thomas. Used drilled irrigation well, diameter 16 inches, depth 90.5 feet. Measuring point, bottom of slot in casing, 0.1 foot above land surface and 2,718.54 feet above mean sea level. Equipped with turbine and natural gas engine.

Water level, in feet below measuring point, 1940

Jan. 23	59.23	Oct. 9	59.70	Oct. 30	59.63
Oct. 1	59.77	16	59.78	Nov. 28	59.53

93. Graham County. NE¼SE¼ sec. 27, T. 4 S., R. 23 E., 1,340 feet north of Gila River on west side of Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.25 feet above land surface and 2,679.90 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 7	13.90	July 6	14.34	Aug. 17	14.68	Sept.26	14.38
10	14.17	15	14.61	23	14.43	Oct. 4	14.27
11	14.17	19	14.90	29	14.70	10	14.59
22	14.66		a 14.88	Sept. 5	14.74	17	14.45
25	14.58	27	15.40	13	14.53	31	14.40
26	14.51	Aug. 3	15.16		a 14.44	Nov. 14	14.20
July 1	14.35	9	14.98	19	14.47	Dec. 6	13.69

94. Graham County. NE¼SE¼ sec. 27, T. 4 S., R. 23 E., 700 feet north of Gila River on west side of Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 22 feet. Measuring point, top of pipe, 0.35 foot above land surface and 2,675.81 feet above mean sea level.

a Highest water level in period between tape measurements.

Graham County--Continued.

94. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 30	9.31	July 6	9.67	Aug. 23	9.67	Oct. 10	9.70
June 10	9.63	15	10.12	29	9.87	17	9.87
11	9.68	19	10.29	Sept. 5	9.99	31	9.77
22	10.10	27	10.35	13	9.75	Nov. 14	9.55
25	9.87	Aug. 3	10.34	19	9.84	Dec. 6	9.07
26	9.61	9	10.25	26	9.70	20	8.53
July 1	9.47	17	9.71	Oct. 4	9.56		

95. Graham County. SE¼SE¼ sec. 27, T. 4 S., R. 23 E., 230 feet north of Gila River on west side of Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 19 feet. Measuring point, top of pipe, 0.5 foot above land surface and 2,678.48 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 29	10.94		a 11.67	Aug. 23	10.53		a 10.47
June 10	11.30	July 19	11.77	29	10.81	Oct. 4	10.55
11	11.31	27	11.79	Sept. 5	11.02	10	10.89
22	11.62	Aug. 3	11.48		a 10.13	17	11.05
25	10.86		a 11.13	13	10.66	31	10.99
26	11.04	9	11.40	19	10.99	Nov. 14	10.68
July 1	10.74		a 10.10		a 10.60	Dec. 6	10.20
6	11.22	17	10.25	26	10.80	20	9.37
15	11.69						

96. Graham County. SW¼SW¼ sec. 26, T. 4 S., R. 23 E., 225 feet south of Gila River on east side of Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.6 foot above land surface and 2,673.73 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 29	5.69		a 6.38	Aug. 29	5.41	Oct. 10	5.50
June 10	5.96	July 27	6.42	Sept. 5	5.56	17	5.61
11	5.98	Aug. 3	6.21		a 4.84		a 5.55
22	6.26		a 5.69	13	5.28	31	5.63
25	5.60	9	5.90	19	5.58	Nov. 14	5.32
26	5.76		a 4.87		a 5.28	Dec. 6	4.80
July 1	5.53	16	4.89	26	5.50		a 3.93
6	5.87	23	5.12		a 5.17	20	4.03
15	6.34		a 5.10	Oct. 4	5.24	27	1.71
19	6.41						

97. Graham County. SW¼SW¼ sec. 26, T. 4 S., R. 23 E., 475 feet south of Gila River on east side of Fort Thomas River Crossing Road. Used bored observation well, diameter 8 inches, depth 8 feet. Measuring point, joint at top of casing, 1.0 foot above land surface and 2,674.48 feet above mean sea level. Well equipped with water level recorder from Aug. 7 to Oct. 18, inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

July 10	b6.84	Aug. 10	6.35	Aug. 18	5.76	Aug. 26	5.76
15	b6.86	11	6.35	19	5.79	27	5.77
19	b6.93	12	6.31	20	5.83	28	5.79
27	b6.98	13	6.28	21	5.78	29	5.87
Aug. 3	b6.86	14	6.11	22	5.74	30	5.98
7	6.33	15	5.94	23	5.69	31	6.05
8	6.32	16	5.81	24	5.70	Sept. 1	6.08
9	6.36	17	5.76	25	5.70	2	6.01

a Highest water level in period between tape measurements.
b Tape measurement.

Graham County--Continued.

97. Graham County -- Continued.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 3	5.94	Sept.16	6.01	Sept.29	6.06	Oct. 11	6.04
4	5.92	17	6.05	30	6.04	12	6.03
5	5.98	18	6.05	Oct. 1	5.94	13	6.04
6	6.03	19	6.09	2	5.86	14	6.06
7	5.67	20	6.13	3	5.84	15	6.08
8	5.61	21	6.18	4	5.85	16	6.11
9	5.63	22	6.19	5	5.87	17	6.14
10	5.67	23	6.04	6	5.90	18	6.16
11	5.75	24	5.97	7	5.95	31 b	6.18
12	5.77	25	5.98	8	5.97	Nov. 14 b	5.90
13	5.82	26	6.06	9	6.00	Dec. 6 b	5.39
14	5.89	27	6.08	10	6.04	20 b	4.72
15	5.96	28	6.04				

98. Graham County. NW¼NW¼ sec. 35, T. 4 S., R. 23 E., 700 feet south of Gila River on east side of Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,673.79 feet above mean sea level.

Water level, in feet below measuring point, 1940

June 7	5.88	July 6	5.89	Aug. 23	5.09	a	5.24
10	5.84	15	6.23	29	5.33	Oct. 10	5.38
11	5.87	19	6.29	Sept. 5	5.39	17	5.48
22	6.12	27	6.34	13	5.26	31	5.51
25	5.78	Aug. 3	6.24	19	5.47	Nov. 14	5.23
26	5.79	9	5.75	26	5.53	Dec. 6	4.78
July 1	5.73	16	5.32	Oct. 4	5.27	20	4.18

99. Graham County. NW¼NW¼ sec. 35, T. 4 S., R. 23 E., 1,200 feet south of Gila River on Fort Thomas River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 12 feet. Measuring point, top of pipe, 0.6 foot above land surface and 2,671.96 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 30	3.12	July 15	3.69	Aug. 16	3.07	Oct. 4	2.87
June 10	3.29	a	3.68	23	2.60	10	2.90
11	3.33	19	3.75	29	2.85	17	2.98
22	3.59	a	3.73	Sept. 5	2.83	31	3.07
25	3.37	27	3.84	13	2.83	Nov. 14	2.84
26	3.36	Aug. 3	3.74	19	2.97	Dec. 6	2.38
July 1	3.26	9	3.15	26	3.07	20	1.93
6	3.39						

100. C. N. Higgins. NE¼NE¼ sec. 34, T. 4 S., R. 23 E., behind concrete house, 200 feet west of county road, 0.5 mile north from Southern Pacific Railroad depot in Fort Thomas. Used drilled domestic and stock well, diameter 6 inches, depth 42.3 feet. Measuring point, top of casing, southeast side, 1.2 feet above land surface and 2,682.31 feet above mean sea level. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 25, 1939	13.13	July 31, 1940	13.84	Oct. 30, 1940	13.25
Nov. 29	13.00	Aug. 30	13.06	31	13.20
Feb. 7, 1940	12.24	Sept.26	12.91	Nov. 14	13.11
Mar. 29	11.88	28	12.91	28	12.74
Apr. 30	12.14	Oct. 4	13.03	Dec. 6	12.65
May 29	12.92	10	13.06	20	12.31
July 1	12.88	17	13.08		

a Highest water level in period between tape measurements.
b Tape measurements.

Graham County--Continued.

101. D. C. Kempton. NE¼NW¼ sec. 34, T. 4 S., R. 23 E., at rear of house, 0.35 mile north from U. S. Highway 70, 0.85 mile northwest from Fort Thomas. Unused dug domestic well, diameter 36 inches, depth 19.8 feet. Measuring point, red arrow on north curb, 3.4 feet above land surface and 2,687.62 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1939	21.60	Apr. 30, 1940	21.62	Aug. 30, 1940	21.77
Nov. 29	21.63	May 29	21.48	Sept.30	21.79
Feb. 7, 1940	20.90	July 1	22.02	Oct. 31	21.93
Mar. 29	20.71	31	22.38	Nov. 28	21.50

105. Edward McEuen. SE¼SW¼ sec. 35, T. 4 S., R. 23 E., 200 yards southwest of Fort Thomas Grade School, 0.4 mile southeast from U. S. Highway 70 on first road east from Southern Pacific Railroad depot in Fort Thomas. Used drilled stock well, diameter 5 inches, depth 59 feet. Measuring point, bottom of north side of 2 by 4-inch pipe clamp, 1.5 feet above land surface. Equipped with windmill. Casing covered, Dec., 1940. See well 106 for further measurements in this vicinity.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	49.15	Mar. 29	48.97	May 29	49.39	July 31	49.81
Feb. 7	50.75	Apr. 30	49.48	July 1	49.40	Oct. 30	49.84

106. L. L. Morrison. SW¼SW¼ sec. 35 T. 4 S., R. 23 E., south side of road, 0.25 mile southeast from U. S. Highway 70 on first road east from Southern Pacific Railroad depot in Fort Thomas. Used drilled domestic well, diameter 5 inches, depth 49.3 feet. Measuring point, top of casing north side, 1.1 feet above land surface and 2,721.90 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1939	46.85	Apr. 30, 1940	45.87	Aug. 29, 1940	47.23
Dec. 26	46.14	May 28	46.32	Sept.30	47.48
Feb. 7, 1940	46.66	July 1	47.04	Oct. 30	46.91
Mar. 29	45.79	31	47.49	Nov. 28	46.66

107. Port McEuen. SE¼SW¼ sec. 35, T. 4 S., R. 23 E., at rear of house, 250 feet south from Fort Thomas Canal, 0.5 mile southwest from Fort Thomas. Unused drilled domestic well, diameter 6 inches, depth 61 feet. Measuring point, top of casing, 5.4 feet above land surface and 2,723.98 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	48.88		a 47.86	July 30	49.53	Oct. 30	49.39
Feb. 7	48.69	June 3	48.57		a 49.08		a 49.29
27	48.38	15	48.87	Aug. 16	49.22	Nov. 15	49.37
Mar. 20	47.50		a 48.80		a 48.77		a 49.05
Apr. 15	47.25	July 1	49.03	28	49.36	28	49.16
May 2	47.89		a 48.79	Sept.14	49.44		a 47.29
	a 47.80		b 49.66	Oct. 1	49.47	Dec. 18	48.99
22	48.26	17	49.44	16	49.29		

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Graham County--Continued.

108. W. O. Tyler. SE¼SE¼ sec. 35, T. 4 S., R. 23 E., in field, 500 feet east from well 160, 0.5 mile east from U. S. Highway 70 at Black Rock Wash, near Fort Thomas. Used drilled irrigation well, diameter 16 inches, depth 50.5 feet. Measuring point, top of casing east side, 2.5 feet above land surface and 2,703.13 feet above mean sea level. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	19.97	Apr. 30	19.64	July 1	20.58	Sept.30	20.25
Feb. 7	19.80	May 29	19.93	31	21.24	Oct. 30	20.39
Mar. 29	19.60						

126. YL Ranch. SE¼NE¼ sec. 24, T. 5 S., R. 21 E., at rear of abandoned camp house, 75 feet south from Goodwin Wash Road, 10 miles southwest from Geronimo. Unused drilled stock well, diameter 8 inches, depth 73 feet. Measuring point, top of casing, 1.9 feet above land surface.

Water level, in feet below measuring point, 1940

Mar. 6	67.00	June 25	55.56	Aug. 21	55.85	Nov. 25	66.02
19	65.39	July 24	54.65	Oct. 11	60.60	Dec. 18	66.04
May 31	57.54						

129. YL Ranch. SW¼NE¼ sec. 27, T. 5 S., R. 21 E., at center of east side of garden fence, 35 feet east from burned house, at junction of Blue Bird Mine Road with Goodwin Wash Road, 13 miles southwest from Geronimo. Unused drilled domestic well, diameter 8 inches, depth 86 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet below measuring point, 1940

Mar. 6	7.44	June 25	22.15	Aug. 21	26.72	Nov. 25	23.31
19	8.38	July 24	24.74	Oct. 11	30.20	Dec. 18	9.42
May 31	19.24						

132. Hinton. SE¼SW¼ sec. 35, T. 5 S., R. 21 E., at rear of camp house, 50 feet south from Black Rock Road, 15.7 miles southwest from Fort Thomas. Used dug stock well, diameter 48 inches, depth 17 feet. Measuring point, top of south curb, 1.9 feet above land surface. Equipped with windmill.

Water level, in feet below measuring point, 1940

May 31	13.43	Aug. 6	14.01	Oct. 11	16.30	Dec. 17	9.61
June 25	12.13	20	13.59	Nov. 25	11.29		

143. R. S. Snedigar. NW¼SW¼ sec. 25, T. 5 S., R. 22 E., across fence 50 feet south from Black Rock Road, 8.2 miles southwest from Fort Thomas. Unused drilled stock well, diameter 4 inches, depth 54.2 feet. Measuring point, top of casing, 1.3 feet above land surface. Equipped with windmill.

Water level, in feet below measuring point, 1940

May 31	43.48	Aug. 6	42.00	Oct. 11	43.03	Dec. 17	46.43
June 25	42.80	20	41.87	Nov. 25	46.10		

156. Roy Layton. SW¼SE¼ sec. 1, T. 5 S., R. 23 E., east side of house, 0.9 mile east from U. S. Highway 70, 1.9 miles southeast from Fort Thomas. Used drilled irrigation well, diameter 12 inches, depth 66 feet. Measuring point, bottom of slot in east side of casing, 0.25 foot above land surface and 2,705.78 feet above mean sea level. Equipped with turbine.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1939	12.48	Apr. 30, 1940	11.46	Aug. 28, 1940	12.25
Jan. 29, 1940	12.14	May 28	12.07	Sept.30	12.50
Feb. 7	12.01	July 1	12.39	Oct. 30	12.76
Mar. 29	10.80	31	13.57	Nov. 28	12.54

Graham County--Continued.

158. W. C. Rhodes. NE¼SW¼ sec. 2, T. 5 S., R. 23 E., 130 feet west of house, 0.25 mile west from U. S. Highway 70, one mile southeast from Fort Thomas. Used dug domestic well, diameter 60 inches, depth 52.7 feet. Measuring point, red arrow on concrete curb, 1.5 feet below land surface and 2,736.50 feet above mean sea level. Equipped with cylinder pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1939	48.70	Apr. 30, 1940	48.07	Sept.30, 1940	49.70
Dec. 26	48.61	May 28	48.43	Oct. 30	49.59
Feb. 7, 1940	48.32	July 1	48.94	Nov. 28	49.56
Mar. 29	48.16	Aug. 29	49.59		

160. W. O. Tyler. SW¼SE¼ sec. 1, T. 5 S., R. 23 E., at rear of house, 0.5 mile east from U. S. Highway 70 at Black Rock Wash near Fort Thomas. Unused drilled irrigation well, diameter 16 inches, depth 54 feet. Measuring point, top of casing south side, 1.0 foot above land surface and 2,712.83 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	31.68	May 29	31.40	Aug. 29	32.51	Oct. 16	32.37
Feb. 7	31.35	July 1	32.29	Sept.30	32.44	30	32.38
Mar. 29	31.03	31	32.96	Oct. 9	32.37	Nov. 28	31.94
Apr. 30	31.09						

164. Don Steele. SW¼SW¼ sec. 2, T. 5 S., R. 23 E., 1.7 miles south by road from Southern Pacific Railroad depot in Fort Thomas. Used dug domestic well, diameter 60 inches, depth 66 feet. Measuring point, top of north curb 0.3 foot above land surface, 2,782.72 feet above mean sea level. Equipped with cylinder pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1939	65.49	Apr. 30, 1940	66.47	Aug. 29, 1940	66.57
Dec. 26	65.96	May 28	66.41	Sept.30	66.56
Feb. 9, 1940	66.42	July 1	66.45	Oct. 30	66.60
Mar. 29	66.71	31	66.50	Nov. 28	66.46

166. NW¼SW¼ sec. 12, T. 5 S., R. 23 E., 200 feet east from U. S. Highway 70, 2.6 miles southeast from Fort Thomas. Unused dug domestic well, diameter 30 inches, depth 22.8 feet. Measuring point, top of south curb, 3.2 feet above land surface and 2,723.35 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 25, 1939	22.94	Apr. 30, 1940	21.23	Aug. 29, 1940	21.98
Nov. 29	22.59	May 29	21.38	Oct. 1	22.35
Feb. 7, 1940	21.75	July 1	21.86	30	22.01
Mar. 29	21.33	31	22.49	Nov. 28	21.98

168. Elam Olsen. NE¼SW¼ sec. 24, T. 5 S., R. 23 E., at rear of abandoned house, 0.6 mile by road west from Ashurst Post Office. Unused drilled domestic well, diameter 4 inches, depth 43 feet. Measuring point, top of casing south side, 1.0 foot above land surface and 2,753.96 feet above mean sea level. Equipped with hand pump. Casing plugged, Sept. 1940; measurements discontinued. For further measurements in this vicinity see well 195.

Graham County--Continued.

168. Elam Olsen -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 26, 1939	38.83	Mar. 29, 1940	37.58	July 30, 1940	38.35
Jan. 24, 1940	38.08	Apr. 30	37.57	Aug. 29	38.27
Feb. 7	37.94	May 28	37.73		

194. Virgil McEuen. SE¼NE¼ sec. 18, T. 5 S., R. 24 E., north of house, 10 feet west from county road, 3.5 miles along road north and west from Eden. Used dug stock well, diameter 48 inches, depth 22.4 feet. Measuring point, top of west curb, 2.9 feet above land surface and 2,734.08 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 17, 1939	23.39	Apr. 30, 1940	22.29	Aug. 29, 1940	23.23
Dec. 27	22.98	May 28	22.60	Oct. 1	23.24
Feb. 10, 1940	22.45	July 1	22.99	30	23.32
Mar. 27	22.00	30	23.38	Nov. 28	23.10

195. Fay Rabb. SE¼NW¼ sec. 19, T. 5 S., R. 23 E., on north bank of irrigation ditch, 0.6 mile east from Ashurst Post Office. Used driven observation well, diameter 1 inch, depth 34 feet. Measuring point, top of pipe, 1.7 feet above land surface. See well 168 for previous measurements in this vicinity.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug. 14	18.46	Sept.26	18.20	Oct. 16	18.31	Nov. 28	17.98
29	18.14	Oct. 8	18.20	30	18.26		

200. J. R. Thatcher. SE¼SW¼ sec. 20, T. 5 S., R. 24 E., at west end of house, south side of private road, 0.6 mile west from Indian Hot Springs Road, 1.15 miles north from Eden. Used dug domestic well, diameter 72 inches, depth 21.4 feet. Measuring point, top inner edge of 6 by 6-inch sill at land surface, 2,743.60 feet above mean sea level. Equipped with hand pump and windmill.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1939	20.58	Apr. 30, 1940	19.32	Aug. 28, 1940	19.69
Dec. 26	20.22	May 28	19.43	Oct. 1	19.66
Feb. 10, 1940	19.67	July 1	19.75	30	20.09
Mar. 27	19.50	30	19.90	Nov. 28	dry

202. A. D. Nelson. SW¼SW¼ sec. 21, T. 5 S., R. 24 E., on east bank of Curtis Canal, 0.1 mile east from Indian Hot Springs Road, 1.15 miles north from Eden. Used dug domestic well, diameter 28 inches, depth 39.2 feet. Measuring point, top of casing south side, at land surface, and 2,763.01 feet above mean sea level. Equipped with cylinder pump and walking beam.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1939	38.41	Apr. 30, 1940	38.24	Aug. 28, 1940	38.54
Nov. 25	38.45	May 28	38.13	Oct. 1	38.39
Feb. 10, 1940	38.42	July 1	38.22	30	38.60
Mar. 27	38.40	30	38.51	Nov. 28	38.64

205. W. B. Marshall. NW¼NW¼ sec. 28, T. 5 S., R. 24 E., at rear of frame house, 150 feet east from Indian Hot Springs Road, 0.8 mile north from Eden. Used dug domestic well, diameter 36 inches, depth 29 feet. Measuring point, top of north curb, 0.5 foot above land surface and 2,754.51 feet above mean sea level. Equipped with hand pump.

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

Oct. 16, 1939	29.39	May 28, 1940	29.50	Oct. 8, 1940	29.20
Nov. 25	29.43	July 1	29.05	16	29.23
Feb. 10, 1940	29.49	30	29.25	30	29.20
Mar. 27	29.21	Aug. 28	29.11	Nov. 28	29.28
Apr. 30	28.93	Oct. 1	29.15		

Graham County--Continued.

206. J. D. Colvin. SE¼NE¼ sec. 29, T. 5 S., R. 24 E., 50 feet north of frame house, 200 feet west from Indian Hot Springs Road, 0.6 mile north from Eden. Used dug domestic, stock and irrigation well, diameter 42 inches, depth 32.2 feet. Measuring point, red arrow at center of north side of curb, 2.0 feet above land surface and 2,752.20 feet above mean sea level. Equipped with windmill and centrifugal pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1939	24.80	Apr. 30, 1940	24.25	Aug. 29, 1940	24.15
Nov. 25	24.80	May 28	24.10	Oct. 1	24.38
Feb. 10, 1940	24.91	July 1	24.23	30	24.63
Mar. 27	24.40	30	24.46	Nov. 28	24.76

207. Lamar Kempton. SE¼SW¼ sec. 24 T. 5 S., R. 24 E., in field, 50 feet north from Cork-Eden Road, 0.6 mile west from intersection with Indian Hot Springs Road. Used dug irrigation well, diameter 42 inches, depth 14.5 feet. Measuring point, top of east side of casing, 4.0 feet below land surface and 2,733.33 feet above mean sea level. Equipped with centrifugal pump and gasoline engine.

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

Oct. 17, 1939	2.34	May 28, 1940	1.32	Oct. 1, 1940	1.97
Dec. 26	1.04	July 1	1.76	30	1.93
Feb. 10, 1940	1.39	30	2.70	Nov. 28	1.37
Mar. 27	0.23	Aug. 29	1.73		

208. L. W. Farrington. SW¼SE¼ sec. 30, T. 5 S., R. 24 E., at rear of concrete house, 200 feet east from U. S. Highway 70, 0.3 mile northwest from Cork. Unused drilled domestic well, diameter 8 inches, depth 34.2 feet. Measuring point, top of south side of casing, 1.3 feet above land surface and 2,750.36 feet above mean sea level. Equipped with hand pump.

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

Dec. 8, 1939	24.39	May 28, 1940	24.16	Sept.26, 1940	24.46
Feb. 7, 1940	23.85	June 29	24.40	Oct. 30	24.60
Mar. 29	22.67	July 31	24.71	Nov. 28	24.04
Apr. 30	23.96	Aug. 29	24.27		

210. Boyd Hawkins. SW¼NE¼ sec. 31, T. 5 S., R. 24 E., at rear of frame house, 0.2 mile west from U. S. Highway 70, 0.4 mile southeast from Cork. Unused drilled domestic well, diameter 5 inches, depth 69 feet. Measuring point, bottom of hole at south side of pump base, 2.6 feet above land surface and 2,765.44 feet above mean sea level. Equipped with hand pump.

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

Oct. 26, 1939	35.72	Apr. 30, 1940	35.29	Aug. 29, 1940	35.49
Dec. 9	35.44	May 28	35.21	Sept.26	35.67
Feb. 7, 1940	34.88	June 29	35.40	Oct. 30	35.75
Mar. 29	34.98	July 31	35.76	Nov. 27	35.27

211. Producers Ginning Co. NW¼NE¼ sec. 31, T. 5 S., R. 24 E., 25 feet east of south end of gin, at Cork. Used drilled industrial well, diameter 6 inches, depth 70 feet. Measuring point, top of east side of casing, 2.0 feet above land surface and 2,752.25 feet above mean sea level. Equipped with cylinder pump and diesel engine.

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

July 24, 1939	25.75	June 29, 1940	24.57	Oct. 30, 1940	25.06
Jan. 12, 1940	24.43	July 31	25.03	Oct. 31	25.03
Feb. 7	23.98	Aug. 29	2 4.72	Nov. 14	24.80
Mar. 29	24.03	Sept.26	24.87	Dec. 5	24.44
Apr. 30	24.46	Oct. 3	24.76	19	23.98
May 28	24.52	10	24.88		

212. Graham County. NW¼NE¼ sec. 31, T. 5 S., R. 24 E., 1,160 feet west of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 31 feet. Measuring point, top of pipe, 0.7 foot above land surface. Elevation of measuring point 2,749.92 feet above mean sea level.

Graham County--Continued.

212. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 28	20.39	July 15	21.88	Aug. 22	21.35	Oct. 10	21.73
June 10	21.60		a 21.86	29	21.55	17	21.83
11	21.60	20	21.95	Sept. 5	21.73	31	21.84
22	21.80	27	21.90	12	21.52	Nov. 14	21.59
25	21.54	Aug. 5	21.64	19	21.83	Dec. 5	21.24
26	21.53	9	21.72	26	21.71	19	20.81
July 1	21.43	16	21.17	Oct. 3	21.58	28	20.35
6	21.60						

213. Graham County. NE¼NE¼ sec. 31, T. 5 S., R. 24 E., 680 feet west of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 27 feet. Measuring point, top of pipe, 2.0 feet above land surface and 2,748.57 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 28	20.71	July 20	21.36	Sept. 5	21.12	Oct. 17	21.23
June 10	20.97	27	21.26		a 20.57		a 21.17
11	21.00	Aug. 5	20.93	12	20.89	31	21.21
22	21.21		a 20.90	19	21.25	Nov. 14	20.93
25	20.84	9	21.05		a 20.89	Dec. 5	20.58
26	20.85		a 20.27	26	21.08	19	20.08
July 1	20.73	16	20.33	Oct. 3	20.89		a 19.46
6	20.96	22	20.66	10	21.10	28	19.51
15	21.29	29	20.90				

214. Graham County. NE¼NE¼ sec. 31, T. 5 S., R. 24 E., 200 feet west of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 22 feet. Measuring point, top of pipe, 0.4 foot above land surface and 2,741.92 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	13.80	July 20	14.42		a 13.90	Oct. 10	14.07
June 10	14.10	27	14.20	Sept. 5	14.27	17	14.21
11	14.14	Aug. 5	13.77		a 13.28		a 14.12
22	14.34		a 13.74	12	13.88	31	14.16
25	13.79	9	14.04	19	14.30	Nov. 14	13.82
26	13.91	16	12.98		a 13.82		a 13.34
July 1	13.68	22	13.67	26	14.07	Dec. 5	13.46
6	14.00		a 13.54		a 13.64	19	12.99
15	14.41	29	13.97	Oct. 3	13.79	28	12.12
	a 14.37						

215. Graham County. NE¼NE¼ sec. 31, T. 5 S., R. 24 E., 100 feet west of Gila River on south side of Cork-Eden Road. Used bored observation well, diameter 8 inches, depth 9 feet. Measuring point, joint at top of casing, 1.85 feet above land surface and 2,735.80 feet above mean sea level. Well equipped with water level recorder from Aug. 7 to Sept. 18 inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

July 9	b	8.56	Aug. 18		7.10	Sept. 1		7.95	Sept.15		8.01
20	b	8.25	19		7.22	2		7.77	16		8.07
27	b	8.00	20		7.39	3		7.89	17		8.12
Aug. 5	b	7.50	21		7.32	4		7.96	18		8.14
7		7.77	22		7.47	5		8.02	19	b	8.16
8		7.91	23		7.40	6		7.66	26	b	7.94
9		7.83	24		7.51	7		6.92	Oct. 3	b	7.65
10		7.76	25		7.64	8		7.24	10	b	7.96
11		7.78	26		7.53	9		7.40	17	b	8.09
12		7.51	27		7.58	10		7.53	31	b	8.05
13		7.42	28		7.72	11		7.65	Nov. 14	b	7.68
14		7.00	29		7.85	12		7.74	Dec. 5	b	7.30
15		6.98	30		7.96	13		7.83	19	b	6.78
16		6.57	31		8.03	14		7.94	28	b	5.77
17		6.98									

a Highest water level in period between tape measurements.
b Tape measurements.

Graham County--Continued.

216. Graham County. NW¼NW¼ sec. 32, T. 5 S., R. 24 E., 210 feet east of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 18 feet. Measuring point, top of pipe, 1.0 foot above land surface and 2,736.53 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 28	7.91	a	8.46	Aug. 29	7.99	Oct. 10	8.02
June 10	8.15	July 20	8.51	Sept. 5	8.20	17	8.23
11	8.28	a	8.36	12	7.88	a	8.14
22	8.49	27	8.40	19	8.30	31	8.17
25	7.98	Aug. 3	8.20	a	7.93	Nov. 14	7.83
28	8.03	a	7.87	26	8.12	Dec. 5	7.50
July 1	7.84	9	8.18	a	7.85	19	6.96
6	8.10	17	7.19	Oct. 3	7.88	26	5.38
15	8.59	23	7.71	a	7.81		

217. Graham County. NW¼NW¼ sec. 32, T. 5 S., R. 24 E., 700 feet east of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 13 feet. Measuring point, top of pipe, 1.8 feet above land surface and 2,734.29 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 29	5.09	July 6	5.39	Aug. 23	4.96	Oct. 10	5.17
June 10	5.35	15	5.81	29	5.11	17	5.43
11	5.40	20	5.79	Sept. 5	5.35	31	5.43
22	5.70	27	5.81	12	5.02	Nov. 14	5.14
25	5.37	Aug. 3	5.72	19	5.44	Dec. 5	4.80
26	5.29	9	5.50	26	5.33	19	4.29
July 1	5.19	17	4.63	Oct. 3	5.15	26	3.45

218. Graham County. NE¼NW¼ sec. 32, T. 5 S., R. 24 E., 1,160 feet east of Gila River on south side of Cork-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.6 foot above land surface and 2,736.35 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 29	5.32	July 15	6.02	Aug. 23	5.36	Oct. 3	5.47
June 10	5.62	20	6.07	29	5.26	10	5.32
11	5.65	27	6.13	Sept. 5	5.62	17	5.68
22	5.94	a	6.09	a	4.93	31	5.74
25	5.73	Aug. 3	6.14	12	5.25	Nov. 14	5.51
26	5.41	a	5.74	19	5.68	Dec. 5	5.21
July 1	5.51	9	5.84	a	5.52	19	4.82
6	5.67	17	5.16	26	5.59	26	4.62
a	5.34						

219. H. C. Kempton. NE¼NE¼ sec. 32, T. 5 S., R. 24 E., 50 feet south of yellow frame house, 200 feet south from Cork-Eden Road, 0.15 mile west from intersection with Indian Hot Springs Road. Used drilled domestic well, diameter 6 inches, depth 13.6 feet. Measuring point, top of north side of pump base, 2.0 feet above land surface and 2,746.42 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1939	12.53	May 28, 1940	11.38	Oct. 1, 1940	11.98
Dec. 26	11.59	July 1	11.98	30	11.81
Feb. 10, 1940	11.56	30	12.33	Nov. 28	12.20
Apr. 30	10.77	Aug. 29	11.83		

220. Lionel Hancock. SW¼NW¼ sec. 33, T. 5 S., R. 24 E., at rear of frame house, 150 feet south from east-west street, one block south from church at Eden. Used dug domestic well, diameter 42 inches, depth 17.5 feet. Measuring point, top of north side of curb, 0.4 foot above land surface and 2,752.32 feet above mean sea level. Equipped with hand pump.

a Highest water level in period between tape measurements.

Graham County--Continued.

220. Lionel Hancock -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1939	16.14	Apr. 30, 1940	14.73	Aug. 29, 1940	14.79
Nov. 25	15.71	May 28	15.71	Oct. 1	14.79
Feb. 10, 1940	15.71	July 1	16.19	30	15.59
Mar. 27	13.95	30	16.75	Nov. 28	16.47

222. Dave Hawkins. NE¼NW¼ sec. 33, T. 5 S., R. 24 E., at rear of yellow frame house, 150 feet south from main street in Eden. Used dug domestic well, diameter 36 inches, depth 27 feet. Measuring point, top of east side of curb, 3.1 feet above land surface and 2,759.81 feet above mean sea level. Equipped with rope and bucket.

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

July 24, 1939	29.58	Apr. 30, 1940	29.39	Aug. 29, 1940	29.47
Oct. 16	29.81	May 28	29.22	Oct. 1	29.58
Nov. 25	29.71	July 1	29.33	30	29.39
Feb. 10, 1940	29.98	30	29.46	Nov. 28	29.65
Mar. 27	29.83				

223. E. E. Hancock. NE¼SW¼ sec. 33, T. 5 S., R. 24 E., 50 feet north of frame house, 250 feet west from Indian Hot Springs Road, 0.5 mile east from Eden. Unused dug domestic well, diameter 36 inches, depth 27.3 feet. Measuring point, top of north side of wood curb, 2.3 feet above land surface and 2,767.45 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 16, 1939	28.94	Apr. 30, 1940	28.97	Aug. 28, 1940	28.89
Nov. 25	28.77	May 28	28.89	Oct. 1	28.78
Feb. 10, 1940	28.78	July 1	28.49	30	28.74
Mar. 27	28.87	30	28.90	Nov. 28	28.80

262. J. Hancock. NE¼SW¼ sec. 2, T. 6 S., R. 24 E., near barbed wire fence, 200 feet south from bridge over Curtis Canal, 0.3 mile west from old Eden Road, one-half mile north and two miles west from Bryce. Used driven observation well, diameter 1 inch, depth 27 feet. Measuring point, top of pipe, 2.2 feet above land surface. See well 263 for previous measurements.

Water level, in feet below measuring point, 1940

Aug. 13	19.62	Oct. 1	19.74	Nov. 28	19.05
Sept. 3	19.65	30	19.63		

263. J. Hancock. SE¼NW¼ sec. 3, T. 6 S., R. 24 E., on west bank of Curtis Canal, 0.1 mile west from old Eden Road, one-half mile north and two miles west from Bryce. Used drilled irrigation well, diameter 16 inches, depth 46.1 feet. Measuring point, top of west side of casing at ground level, 2,775.82 feet above mean sea level. Measurements discontinued after May 28, 1940. See well 262 for further measurements.

Water level, in feet below measuring point, 1940

Jan. 22	12.89	Mar. 27	12.19	May 28	13.26
Feb. 19	12.46	Apr. 30	12.83		

264. Jessie Hancock. NE¼NE¼ sec. 3, T. 6 S., R. 24 E., 50 feet east of concrete house, 200 feet south from Indian Hot Springs Road, 2.5 miles southeast from Eden. Used dug domestic and stock well, diameter 36 inches, depth 18 feet. Measuring point to Oct. 30, 1939, 2 by 4-inch wooden curb at center of well, 2.6 feet above land surface and 2,773.77 feet above mean sea level. Measuring point since Oct. 30, 1940, top of wood curb at pump intake, 6 feet below land surface. Equipped with cylinder force pump and electric motor.

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

July 25, 1939	14.50	Apr. 30, 1940	12.94	Aug. 29, 1940	13.39
Oct. 16	13.73	May 28	13.39	Oct. 1	13.72
Nov. 25	13.29	July 1	13.79	30	13.65
Feb. 10, 1940	12.84	30	14.18	Nov. 28	6.93
Mar. 27	12.37				

Graham County--Continued.

267. Wm. Carpenter. NE¼NE¼ sec. 4, T. 6 S., R. 24 E., 15 feet east of Curtis Canal, 0.1 mile south from Indian Hot Springs Road at intersection with Markham Wash, 1.5 miles southeast from Eden. Drilled test well, diameter 5 inches, depth 33.4 feet. Measuring point, top of casing, 2.7 feet above land surface.

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

Date	Water level	Date	Water level	Date	Water level
July 25, 1939	28.58	May 20, 1940	26.07		b 27.87
Oct. 16	25.99	June 3	26.94	Aug. 29, 1940	26.24
Nov. 25	25.12	15	27.39		a 25.51
Feb. 10, 1940	24.58		a 26.95	Sept.14	25.59
Mar. 5	24.15		b 27.65	Oct. 1	25.34
	a 24.02	July 1	27.01		a 25.22
20	24.08		a 26.80	16	25.27
	a 23.98	17	28.34	30	25.33
Apr. 15	24.44	30	29.12	Nov. 15	25.30
May 2	25.04	Aug. 16	27.31	28	25.11
	a 24.99		a 25.21	Dec. 18	24.82

269. Frank Matthews. SW¼SE¼ sec. 4, T. 6 S., R. 24 E., at east side of farmyard, 200 feet north from U. S. Highway 70, 250 feet west from Matthewsville Wash, 2.1 miles northwest from Glenbar. Unused dug irrigation well, diameter 60 inches, depth 34.2 feet. Measuring point, top of 8 by 10-inch timber at land surface, 2,777.34 feet above mean sea level.

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

July 24, 1939	28.66	Apr. 29, 1940	27.30	Aug. 28, 1940	27.02
Oct. 26	27.43	May 28	27.41	Sept.26	27.34
Dec. 4	27.33	June 29	27.70	Oct. 30	27.48
Feb. 7, 1940	26.25	July 30	28.12	Nov. 27	26.35
Mar. 29	26.79				

270. Frank Matthews. SW¼SE¼ sec. 4 T. 6.S., R. 24 E., at rear of house, 250 feet north from U. S. Highway 70, 0.1 mile west from Matthewsville Wash, 2.1 miles northwest from Glenbar. Used drilled stock well, diameter 4 inches, depth 29.8 feet. Measuring point, top of southeast side of casing, 0.6 foot above land surface and 2,775.38 feet above mean sea level. Equipped with windmill.

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

Oct. 26, 1939	25.79	Apr. 29, 1940	25.72	Aug. 29, 1940	25.44
Dec. 9	25.76	May 28	25.85	Sept.26	25.79
Feb. 7, 1940	24.55	June 29	26.18	Oct. 30	25.83
Mar. 29	25.31	July 30	26.58	Nov. 27	24.73

273. M. J. Ferguson. SW¼NE¼ sec. 5, T. 6 S., R. 24 E., on south bank of Dodge-Nevada Canal, 300 feet south from U. S. Highway 70, 3.1 miles northwest from Glenbar. Used drilled irrigation well, diameter 16 inches, depth 64 feet. Measuring point, south side of casing, 1.8 feet above land surface. Equipped with turbine and natural gas engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	42.67	July 31	43.85	Sept.26	43.30	Nov. 27	43.20
June 29	43.08	Aug. 29	43.24	Oct. 30	43.39		

274. Dean. SE¼SW¼ sec. 10, T. 6 S., R. 24 E., south side of Smithville Canal, 0.3 mile south from U. S. Highway 70, 0.95 mile northwest from Glenbar. Unused drilled domestic well, diameter 6 inches, depth 60 feet. Measuring point, bottom of hole at north side of pump base, 1.9 feet above land surface and 2,818.88 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 26, 1939	52.52	Apr. 29, 1940	49.34	Aug. 28, 1940	51.48
Dec. 11	52.06	May 28	49.47	Sept.26	51.55
Feb. 7, 1940	51.63	June 29	50.30	Oct. 30	51.51
Mar. 29	50.06	July 30	51.20	Nov. 27	51.35

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Graham County--Continued.

275. Lamar Bellman. SE¼NE¼ sec. 10, T. 6 S., R. 24 E., 50 feet east of yellow stucco house, 0.25 mile north from U. S. Highway 70, 1.0 mile northwest from Glenbar. Used drilled irrigation well, diameter 16 inches, depth 53 feet. Measuring point, top of west side of casing, 1.0 foot above land surface and 2,792.13 feet above mean sea level. Equipped with turbine and gasoline engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	25.61	May 28	23.95	Aug. 28	25.47	Oct. 16	25.58
Feb. 7	25.42	June 29	24.03	Sept.26	25.65	30	25.50
Mar. 28	24.12	July 30	25.82	Oct. 8	25.63	Nov. 27	25.35
Apr. 29	23.54						

279. Howard McBride. SW¼SW¼ sec. 12, T. 6 S., R. 24 E., on north bank of Smithville Canal, 0.1 mile north from county road, 0.5 mile east from U. S. Highway 70 at Glenbar. Used driven observation well, diameter 1 inch, depth 17 feet. Measuring point, top of pipe, 1.5 feet above land surface.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 14	8.56	Sept.26	8.92	Nov. 27	8.75
Sept. 3	8.85	Oct. 30	9.00		

280. Graham County. SE¼NE¼ sec. 12, T. 6 S., R. 24 E., in corner of right-of-way near end of county road, 0.7 mile west from Bryce School, 2.2 miles north from Pima. Used driven observation well, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 1.1 feet above land surface. See well 281 for previous measurements.

Water level, in feet below measuring point, 1940

Aug. 13	14.97	Sept.24	15.00	Nov. 27	14.28
28	14.87	Oct. 30	14.60		

281. Jack Bryce. SE¼NE¼ sec. 12, T. 6 S., R. 24 E., 100 feet west from county road, 0.1 mile south from south turn in road, 0.7 mile west from Bryce School, 2.2 miles north from Pima. Unused dug domestic well, diameter 48 inches, depth 14.2 feet. Measuring point, top of 6 by 6-inch timber at land surface, 2,796.28 feet above mean sea level. Measurements discontinued after June 28, 1940. See well 280 for further measurements.

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

July 25, 1939	14.75	Feb. 9, 1940	13.11	May 28, 1940	12.19
Oct. 13	14.14	Mar. 27	11.88	June 28	12.76
Nov. 24	13.70	Apr. 29	11.94		

282. Guy Anderson. SW¼NE¼ sec. 13, T. 6 S., R. 24 E., 100 feet south of red brick house, 0.15 mile north from county road, 0.8 mile east from U. S. Highway 70, 0.8 mile southeast from Glenbar. Used dug domestic well, diameter 36 inches, depth 25.4 feet. Measuring point, top of south side of wood curb, 2.7 feet above land surface and 2,814.59 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 26, 1939	24.70	Apr. 29, 1940	20.10	Aug. 28, 1940	22.44
Dec. 11	24.10	May 28	21.17	Sept.26	23.29
Jan. 2, 1940	23.22	June 28	21.70	Oct. 30	23.70
Mar. 28	22.34	July 30	22.50	Nov. 27	23.53

285. Guy Anderson. SE¼SE¼ sec. 13, T. 6 S., R. 24 E., on east bank of Smithville Canal, 250 feet west of two-story red brick house, 0.4 mile north from Cottonwood Dance Hall, 0.4 mile west from Pima. Used drilled irrigation well, diameter 16 inches, depth 59 feet. Measuring point, bottom of north side of pump base at land surface, 2,838.36 feet above mean sea level. Equipped with turbine and gasoline engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 6	32.61	May 28	29.50	Aug. 28	33.54	Oct. 30	32.21
Mar. 28	31.69	June 28	32.43	Sept.24	33.40	Nov. 27	32.13
Apr. 29	29.13	July 30	33.50				

Graham County--Continued.

292. Dick Bryce Estate. SE¼SE¼ sec. 14, T. 6 S., R. 24 E., at rear of frame house, 200 feet west from county road, 0.3 mile south from U. S. Highway 70, 1.6 miles northwest from Pima. Unused drilled domestic well, diameter 8 inches, depth 9.5 feet. Measuring point, top of north side of casing, 0.3 foot above land surface and 2,846.99 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 27, 1939	9.27		a 6.06	June 29, 1940	7.30
Dec. 9	7.35	May 2, 1940	6.83	July 17	7.88
Feb. 6, 1940	7.01	20	6.85	Aug. 16	8.06
26	6.98		a 5.97	28	8.19
Mar. 28	7.11	June 3	7.08	Sept.26	8.43
	a 6.34		a 6.70	Oct. 30	7.99
Apr. 15	6.80	14	7.30	Nov. 27	7.49

298. Joe Rogers. NE¼NW¼ sec. 25, T. 6 S., R. 24 E., 300 feet east of adobe house, 0.65 mile south from Tripp Canyon Road, 2.3 miles southwest from Pima. Used drilled stock well, diameter 6 inches, depth 21.2 feet. Measuring point, top of south side of casing, 0.8 foot above land surface and 2,887.0 feet above mean sea level. Equipped with windmill.

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

Oct. 27, 1939	16.00	May 28, 1940	16.13	Sept.26, 1940	17.38
Nov. 29	16.53	June 29	16.84	Oct. 30	16.67
Feb. 8, 1940	16.91	July 30	17.05	Nov. 27	17.15
Apr. 29	16.08	Aug. 28	17.34		

313. Jack Bryce. NW¼NE¼ sec. 7, T. 6 S., R. 25 E., in corral 20 feet from north fence, 0.35 mile east from Bryce School, 2.2 miles north from Pima. Used drilled irrigation well, diameter 16 inches, depth 103 feet. Measuring point, bottom of slot at south side of casing, 1.3 feet above land surface. Equipped with turbine and gasoline engine. See well 314 for previous measurements. Water levels, in feet below measuring point, 1940: Aug. 28, 61.68; Sept. 24, 61.30; Oct. 30, 61.24; Nov. 27, 61.01.

314. Jack Bryce. NW¼NE¼ sec. 7, T. 6 S., R. 25 E., in corral 20 feet from north fence, 0.35 mile east from Bryce School, 2.2 miles north from Pima. Used drilled stock well, diameter 12 inches, depth 85 feet. Measuring point, top of southeast side of casing, 2.2 feet above land surface and 2,850.27 feet above mean sea level. Equipped with cylinder pump and gasoline engine. Measurements discontinued after June 28, 1940. See well 313 for further measurements.

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

Nov. 24, 1939	62.21	Mar. 22, 1940	60.50	May 28, 1940	59.80
Jan. 8, 1940	61.56	Apr. 29	59.69	June 28	60.43
Feb. 9	61.48				

315. Dick Bryce Estate. NW¼SE¼ sec. 7, T. 6 S., R. 25 E., 100 feet east from Eden Road, 300 feet south from Big Spring Wash, 1.9 miles north from Pima. Used drilled stock well, diameter 6 inches, depth 31 feet. Measuring point, top of north side of casing, 1.1 feet above land surface and 2,819.45 feet above mean sea level. Equipped with windmill.

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

Oct. 13, 1939	31.23	Apr. 29, 1940	28.76	Aug. 28, 1940	30.37
Nov. 24	30.93	May 27	29.03	Sept.24	30.74
Feb. 10, 1940	30.19	June 28	29.58	Oct. 30	30.59
Mar. 22	29.11	July 29	30.44	Nov. 27	30.27

317. Wm. Walmsley. NW¼SW¼ sec. 16, T., 6 S., R. 25 E., 200 feet north of house, 300 feet north from county road, 2.5 miles east from Eden Road, 1.4 miles north from Pima. Used drilled stock well, diameter 6 inches, depth 28 feet. Measuring point, top of south side of casing, 0.5 foot above land surface and 2,829.36 feet above mean sea level. Equipped with hand pump.

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

Oct. 13, 1939	21.63	Apr. 29, 1940	17.98	Aug. 28, 1940	20.84
Nov. 24	21.32	May 27	18.60	Sept.24	20.80
Feb. 9, 1940	20.30	June 28	19.99	Oct. 30	20.68
Mar. 22	17.66	July 29	21.75	Nov. 27	20.84

a Highest water level in period between tape measurements.

Graham County--Continued.

319. Vance Marshall. SE¼NE¼ sec. 17, T. 6 S., R. 25 E., 50 feet west from county road, 0.5 mile south from Graham Canal, 2 miles northeast from Pima. Used drilled irrigation well, diameter 18 inches, depth unknown. Measuring point, top of west side of casing, 2.0 feet above land surface. Equipped with turbine and gasoline engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 20	15.69	Sept.24	20.43	Oct. 16	20.08	Nov. 27	20.35
Aug. 28	20.00	Oct. 8	20.00	30	20.41		

320. Vance Marshall. SE¼SE¼ sec. 17, T. 6 S., R. 25 E., 75 feet west from turn in county road, 200 feet west of frame barn, 2.4 miles east from Eden Road, 1.4 miles north from Pima. Used drilled irrigation well, diameter 16 inches, depth 46.3 feet. Measuring point, bottom of hole in east side of casing, 0.35 foot above land surface and 2,822.29 feet above mean sea level. Bench mark, established Jan. 17, 1940, green cross on concrete headwall, level with land surface, 18 feet east from well and 2,823.62 feet above mean sea level. Equipped with turbine and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 12, 1939	13.82	Mar. 22, 1940	13.01	Sept.24, 1940	13.91
Nov. 24	14.26	Apr. 29	12.62	Oct. 30	14.01
Jan. 8, 1940	13.80	May 27	12.98	Nov. 27	13.66
Feb. 9	13.23	Aug. 28	13.69		

321. Graham County. SW¼SE¼ sec. 7, T. 6 S., R. 25 E., 1,030 feet north of Gila River on east side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,800.82 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	8.99	July 15	9.68	Aug. 22	8.68	Oct. 10	9.49
June 10	8.90	20	9.75	29	9.06	17	9.61
11	9.04	a	9.72	Sept. 5	9.33	31	9.64
22	9.57	27	9.81	a	9.15	Nov. 14	9.34
25	9.41	Aug. 5	9.64	12	9.21	Dec. 5	8.77
26	9.34	a	9.61	19	9.51	19	8.08
July 1	9.29	9	9.71	26	9.43	28	7.27
5	9.20	16	7.31	Oct. 3	9.30		

322. NE¼NW¼ sec. 18, T. 6 S., R. 25 E., 470 feet north of Gila River, inside fence on west side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.45 feet above land surface and 2,800.49 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	8.66	July 5	8.81	Aug. 22	8.36	Oct. 10	8.85
June 10	9.07	15	9.33	29	8.73	17	9.07
11	9.06	20	9.33	Sept. 5	8.96	31	9.06
22	9.35	27	9.09	12	8.77	Nov. 14	8.65
25	8.80	Aug. 5	8.67	19	9.38	Dec. 5	8.09
26	8.84	9	8.87	26	8.76	19	7.30
July 1	8.61	16	7.35	Oct. 3	8.48	28	6.49

323. Graham County. NW¼NE¼ sec. 18, T. 6 S., R. 25 E., 220 feet north of Gila River on east side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.8 feet above land surface and 2,800.96 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 27	8.10	July 1	8.79	a	8.68	a	7.62
June 10	9.45	5	9.13	Aug. 5	8.80	Aug. 29	9.13
11	9.50	15	9.63	a	8.78	a	8.99
22	9.74	a	9.56	9	9.08	Sept. 5	9.36
25	9.05	20	9.65	16	7.53	a	8.04
26	9.20	27	9.30	22	8.73	12	9.15

a Highest water level in period between tape measurements.

Graham County--Continued.

323. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept.19	9.74	Oct. 3	8.72	Oct. 31	9.34	Dec. 5	8.40
a	8.90	10	9.20	Nov. 14	8.94	19	7.58
26	9.07	17	9.36	a	8.26	28	6.83
a	8.69	a	9.31				

324. Graham County. SW¼NE¼ sec. 18, T. 6 S., R. 25 E., 600 feet south of Gila River on east side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.25 feet above land surface and 2,800.26 feet above mean sea level.

Water level, in feet below measuring point, 1940

May	25	5.62		a	6.45	Aug.	29	6.05	Oct.	10	6.03
June	10	6.34	July	20	6.61		a	6.01		17	6.26
	11	6.20		27	6.12	Sept.	5	6.36		a	6.09
	22	6.60		a	5.68		a	5.03		31	6.16
	25	6.19	Aug.	5	5.78		12	5.70	Nov.	14	5.88
	26	6.25		9	6.19		19	6.28		a	5.32
July	1	5.98		16	4.93		26	6.03	Dec.	5	5.61
	5	6.43		22	5.91		a	5.66		19	4.78
	a	6.03		a	5.53	Oct.	3	5.76		28	3.86
	15	6.53									

325. Graham County. SW¼NE¼ sec. 18, T. 6 S., R. 25 E., 1,080 feet south of Gila River on east side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.5 feet above land surface and 2,802.16 feet above mean sea level.

Water level, in feet below measuring point, 1940

May	25	6.30	July	5	7.39	Aug.	22	6.76	Oct.	10	6.64
June	10	7.15		15	7.07		29	6.89		17	6.94
	11	6.73		20	7.42	Sept.	5	7.10		31	6.91
	22	7.47		27	7.34		12	6.42	Nov.	14	6.66
	25	7.25	Aug.	5	6.88		19	6.96	Dec.	5	6.42
	26	7.19		9	7.19		26	6.81		19	5.83
July	1	7.15		16	6.32	Oct.	3	6.54		28	5.10

326. Graham County. SW¼NE¼ sec. 18, T. 6 S., R. 25 E., 1,570 feet south of Gila River on east side of Pima-Eden Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.7 feet above land surface and 2,804.81 feet above mean sea level.

Water level, in feet below measuring point, 1940

May	27	6.96	July	20	7.89	Aug.	29	7.29	Oct.	10	6.59
June	10	7.66		27	8.16	Sept.	5	7.50		17	6.98
	11	7.07		a	7.75		12	6.74		31	7.10
	22	7.97	Aug.	5	7.80		19	7.17	Nov.	14	7.16
	25	8.03		9	7.90		a	7.05		a	6.94
	26	7.93		16	7.50		26	7.08	Dec.	5	6.96
July	1	8.03		a	7.32		a	6.73		19	6.60
	5	8.09		22	7.33	Oct.	3	6.75		a	6.06
	15	7.29		a	7.22		a	6.46		28	6.09

328. Dodge-Nevada Canal Co. SE¼SW¼ sec. 18, T. 6 S., R. 25 E., on east bank of Dodge-Nevada Canal, 200 feet west from Eden Road, 0.8 mile north from Pima. Used drilled irrigation well, diameter 12 inches, depth 66 feet. Measuring point, bottom of slot in east side of casing, 1.2 feet above land surface and 2,808.80 feet above mean sea level. Equipped with turbine and electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 29, 1939	7.02	Mar. 22, 1940	7.19	Oct. 17, 1940	7.97
Feb. 5, 1940	7.91	27	7.07	30	6.87
6	7.61	Aug. 28	7.74	31	7.60
7	7.58	Sept.24	7.29	Nov. 14	7.80
13	7.81	26	6.19	27	8.03
16	7.63	Oct. 3	4.38	Dec. 5	7.82
Mar. 12	7.99	10	5.94	19	7.58

a Highest water level in period between tape measurements.

Graham County--Continued.

329. Art Lines. SW¼SW¼ sec. 18, T. 6 S., R. 25 E., 50 feet north of frame barn, 0.4 mile north from Cottonwood Dance Hall, 0.4 mile west from Pima. Used drilled stock well, diameter 5 inches, depth 34.2 feet. Measuring point, top of casing, southwest side, 1.1 feet above land surface and 2,827.70 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 27, 1939	23.24	Apr. 29, 1940	19.32	Aug. 28, 1940	23.22
Dec. 11	23.04	May 28	19.91	Sept.26	22.74
Feb. 6, 1940	21.80	June 28	21.59	Oct. 30	22.09
Mar. 28	20.64	July 29	23.13	Nov. 27	22.38

330. W. W. Crockett. NE¼NW¼ sec. 19, T. 6 S., R. 25 E., in fence corner, 60 feet east from Eden Road. 0.35 mile north from Pima. Unused drilled domestic well, diameter 3 inches, depth 21.8 feet. Measuring point, bottom of hole in west side of pump, 1.5 feet above land surface and 2,829.82 feet above mean sea level. Equipped with hand pump.

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

Oct. 31, 1939	19.33	Apr. 29, 1940	18.19	Aug. 28, 1940	22.78
Nov. 29	20.73	May 27	18.69	Sept.24	21.30
Feb. 5, 1940	20.02	June 28	20.65	Oct. 29	19.90
Mar. 27	17.63	July 29	22.37	Nov. 27	20.61

335. E. B. McBride. NW¼SW¼ sec. 20, T. 6 S., R. 25 E., 50 feet north of frame house, 100 feet west from county road, 0.75 mile east from fire station in Pima. Used drilled domestic and stock well, diameter 6 inches, depth 15.5 feet. Measuring point, top of inner edge of pump base, 2.5 feet above land surface and 2,831.24 feet above mean sea level. Equipped with hand pump.

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

Oct. 31, 1939	16.35	May 27, 1940	14.32	Oct. 8, 1940	16.10
Nov. 29	16.25	June 28	14.98	16	15.49
Feb. 6, 1940	15.29	July 29	15.86	29	15.70
Mar. 28	14.08	Aug. 28	16.20	Nov. 27	15.43
Apr. 29	14.67	Sept.24	15.95		

342. Ed Howard. SW¼SW¼ sec. 23, T. 6 S., R. 25 E., 150 feet south of Graham Canal, 200 feet east from large frame barn, 2.85 miles northeast of Thatcher. Unused drilled domestic well, diameter 4 inches, depth 41.6 feet. Measuring point, top of casing southeast side, 1.0 foot above land surface and 2,870.49 feet above mean sea level. Bench mark, established Jan. 17, 1940, green cross on east side of concrete pump base, 1.0 foot above land surface and 2,870.49 feet above mean sea level. Equipped with hand pump.

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

Oct. 13, 1939	26.50	June 28, 1940	26.44	Sept.24, 1940	25.74
Nov. 24	25.48	July 29	26.53	Oct. 29	25.77
Apr. 24, 1940	23.44	Aug. 28	26.06	Nov. 27	25.29
May 27	24.35				

344. J. M. Talley. NW¼SW¼ sec. 26, T. 6 S., R. 25 E., in yard in front of small frame house, 100 feet south from Graham Canal, 0.1 mile south from county road, 4.4 miles northwest from Safford. Used drilled domestic well, diameter 6 inches, depth 38 feet. Measuring point, top of west side of casing, 1.0 foot above land surface and 2,881.40 feet above mean sea level. Equipped with hand pump. Irrigation well 250 feet west.

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

Oct. 12, 1939	24.51	Apr. 24, 1940	21.59	Aug. 27, 1940	23.63
Nov. 24	23.69	May 27	22.59	Sept.24	23.77
Feb. 9, 1940	22.92	June 28	23.46	Oct. 29	24.11
Mar. 22	21.12	July 29	a 26.37	Nov. 27	23.80

346. Graham County. SE¼NE¼ sec. 27, T. 6 S., R. 25 E., 1,290 feet north of Gila River on east side of Thatcher River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.0 foot above land surface and 2,841.91 feet above mean sea level.

a Nearby irrigation well pumping.

346. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 25	6.20	a	7.14	Aug. 29	7.15	a	7.11
June 10	6.43	July 20	7.36	a	7.14	Oct. 17	7.19
11	6.45	a	6.59	Sept. 5	7.22	a	7.17
22	6.77	29	7.07	12	6.99	31	7.24
25	6.70	Aug. 3	7.22	a	6.89	a	7.08
26	6.67	a	7.11	19	7.00	Nov. 14	7.11
July 1	6.74	10	7.39	26	7.07	Dec. 5	6.46
5	6.85	15	7.19	a	6.94	a	6.01
a	6.77	22	7.05	Oct. 3	6.95	19	6.03
16	7.15	a	7.03	10	7.13		

347. Graham County. SE¼NE¼ sec. 27, T. 6 S., R. 25 E., 770 feet north of Gila River on east side of Thatcher River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 13 feet. Measuring point, top of pipe, 2.0 feet above land surface and 2,843.69 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 24	7.69	July 5	8.23	Aug. 22	8.45	Oct. 10	8.56
June 10	7.97	16	8.62	29	8.54	17	8.66
11	7.97	20	8.77	Sept. 5	8.69	31	8.66
22	8.26	29	8.69	12	8.28	Nov. 14	8.43
25	7.99	Aug. 3	8.78	19	8.49	Dec. 5	7.82
26	8.00	10	8.84	26	8.49	19	7.21
July 1	7.95	15	8.50	Oct. 3	8.38		

348. Graham County. NE¼SE¼ sec. 27, T. 6 S., R. 25 E., 240 feet north of Gila River on east side of Thatcher River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.4 feet above land surface and 2,844.46 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 24	7.76	a	8.76	Aug. 29	8.72	Oct. 3	8.50
June 10	8.16	July 20	8.97	a	8.71	10	8.72
11	8.19	a	8.61	Sept. 5	8.91	17	8.84
22	8.41	29	9.02	a	8.04	31	8.80
25	7.87	a	8.71	12	8.33	a	8.50
26	8.01	Aug. 3	8.75	19	8.71	Nov. 14	8.53
July 1	7.83	10	8.98	a	8.44	Dec. 5	7.94
5	8.33	15	8.31	26	8.64	19	7.25
16	8.81	22	8.56				

349. Graham County. NE¼SE¼ sec. 27, T. 6 S., R. 25 E., 330 feet south of Gila River on east side of Thatcher River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.10 feet above land surface and 2,843.10 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 24	5.53	July 20	6.74	Aug. 29	6.44	Oct. 3	6.07
June 10	5.97	a	6.67	a	6.37	10	6.32
11	5.93	29	6.86	Sept. 5	6.60	17	6.39
22	6.29	Aug. 5	6.30	a	5.47	a	6.28
25	5.50	10	6.71	12	5.99	31	6.31
26	5.72	15	5.84	19	6.44	Nov. 14	5.98
July 1	5.42	a	5.57	a	5.97	Dec. 5	5.39
5	6.10	22	6.27	26	6.27	a	4.39
16	6.62	a	6.21	a	6.02	19	4.71
a	6.56						

350. Graham County. SE¼SE¼ sec. 27, T. 6 S., R. 25 E., 830 feet south of Gila River on east side of Thatcher River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.25 feet above land surface and 2,844.50 feet above mean sea level.

a Highest water level in period between tape measurements.

Graham County--Continued.

350. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 24	5.98	July 5	6.76	Aug. 22	6.94	Oct. 10	6.65
June 10	6.49	16	7.20	29	6.97	17	6.70
11	6.46	20	7.38	Sept. 5	6.98	31	6.51
22	6.78	29	7.47	12	6.59	Nov. 12	6.16
25	6.36	Aug. 5	7.25	19	6.86	Dec. 5	5.67
26	6.50	10	7.44	26	6.73	19	5.02
July 1	6.35	15	6.93	Oct. 3	6.56		

351. Graham County. NE¼SE¼ sec. 27, T. 6 S., R. 25 E., 1,110 feet south of Gila River on east side of Thatcher River Crossing Road. Used bored observation well, diameter 6 inches, depth 7 feet. Measuring point, joint at top of casing, 2.10 feet above land surface. Well equipped with water level recorder from July 11 to Sept. 7, and from Dec. 14 to 25 inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

July	9	b	7.54	Aug.	2		7.99	Aug.	22		7.46
	11		7.59		3		7.93		23		7.46
	12		7.63		4		7.94		24		7.47
	13		7.67		5		7.90		25		7.47
	14		7.70		6		7.92		26		7.42
	15		7.73		7		8.01		27		7.41
	16		7.76		8		8.08		28		7.44
	17		7.72		9		8.11		29		7.48
	18		7.79		10		8.07		30		7.52
	19		7.82		11		8.06		31		7.55
	20		7.85		12		7.99	Sept.	1		7.52
	21		7.89		13		7.95		2		7.45
	25		7.93		14		7.76		3		7.45
	26		7.91		15		7.59		4		7.46
	27		7.97		16		7.40		5		7.48
	28		8.02		17		7.32		6		7.45
	29		8.06		18		7.35		7		6.73
	30		8.09		19		7.39		12	b	7.13
	31		8.06		20		7.44		19	b	7.38
Aug.	1		8.10		21		7.43				

Sept.	26	b	7.23								
Oct.	3	b	7.04								
	10	b	7.11								
	17	b	7.15								
	31	b	6.99								
Nov.	14	b	6.65								
Dec.	5	b	6.17								
	14		5.62								
	15		5.54								
	16		5.53								
	17		5.55								
	18		5.56								
	19		5.54								
	20		5.53								
	21		5.54								
	22		5.54								
	23		5.55								
	24		5.56								
	25		5.52								

352. Graham County. SE¼SE¼ sec. 27, T. 6 S., R 25 E., 1,360 feet south of Gila River on east side of Thatcher River Crossing Road. Used bored observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.6 foot above land surface and 2,845.54 feet above mean sea level.

Water level, in feet below measuring point, 1940

May	24		6.57			a	7.81			a	7.48
June	10		7.05	July	20		7.98	Aug.	29		7.55
	11		7.04			a	7.93			a	7.46
	22		7.41		29		8.18	Sept.	5		7.53
	25		7.02	Aug.	5		8.03			a	7.05
	26		7.16		10		8.19		12		7.16
July	1		7.03		15		7.61		19		7.41
	5		7.38			a	7.43			a	7.20
	16		7.86		22		7.57		26		7.25

Oct.	3		7.07								
		a	7.05								
	10		7.14								
		a	7.11								
	17		7.16								
	31		6.98								
Nov.	14		6.63								
Dec.	5		6.16								
	19		5.54								

353. Graham County. SE¼SE¼ sec. 27, T. 6 S., R. 25 E., 1,560 feet south of Gila River on east side of Thatcher River Crossing Road. Used bored observation well, diameter 8 inches, depth 6 feet. Measuring point, joint at top of pipe, 0.7 foot above land surface. Equipped with water level recorder.

a Highest water level in period between tape measurements.
b Tape measurements

Graham County--Continued.

353. Graham County--Continued.

Daily noon water levels, in feet below measuring point, 1939-40 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 17	5.08	Dec. 21	4.64	Dec. 25	4.64	Dec. 29	3.87
18	5.09	22	4.64	26	(a)	30	4.22
19	4.65	23	4.65	27	(a)	31	(a)
20	4.64	24	4.65	28	3.76		

354. Ned Daley. SW¼SE¼ sec. 27, T. 6 S., R. 25 E., 50 feet north of county road, 0.2 mile west from Thatcher Crossing Road, 1.9 miles north from U. S. Highway 70 at west city limits of Thatcher. Used drilled irrigation well, diameter 16 inches. Measuring point, bottom of slot in north side of casing, 3.0 feet above land surface. Equipped with turbine. See well 355 for previous measurements.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Apr. 29	9.04	Sept.24	10.72	Nov. 27	8.90
Aug. 28	11.90	Oct. 29	9.74		

355. Ned Daley. SW¼SE¼ sec. 27, T. 6 S., R. 25 E., at rear of house 200 feet north from county road, 0.4 mile west from Thatcher Crossing Road, 1.9 miles north from U. S. Highway 70 at west city limits of Thatcher. Used drilled domestic well, diameter 5 inches, depth 13.1 feet. Measuring point, top of pipe clamp, 1.1 feet above land surface and 2,850.50 feet above mean sea level. Equipped with windmill. See well 354 for further measurements in this vicinity. Measurements discontinued.

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

Oct. 31, 1939	9.22	Mar. 28, 1940	8.42	May 27, 1940	11.90
Dec. 27	8.53	Apr. 29	9.11	June 28	15.84
Feb. 6, 1940	7.85				

356. W. T. Watson. SW¼NW¼ sec. 27, T. 6 S., R. 25 E., 100 feet north of adobe house, 0.5 mile north from county highway, 3.5 miles northwest from Thatcher. Used drilled domestic well, diameter 4 inches, depth 12 feet. Measuring point, top of casing southwest side, 1.2 feet above land surface and 2,843.78 feet above mean sea level. Equipped with hand pump.

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

Oct. 30, 1939	11.65	Apr. 29, 1940	9.81	Aug. 28, 1940	12.53
Dec. 27	11.01	May 27	10.85	Sept.24	11.98
Feb. 6, 1940	10.39	June 28	11.71	Oct. 29	11.53
Mar. 28	10.50	July 29	12.51	Nov. 27	11.18

366. Charles M. Beals. NW¼SE¼ sec. 30, T. 6 S., R. 25 E., at rear of house, 0.08 mile east of county road, 0.6 mile south from Southern Pacific Railroad depot in Pima. Used dug domestic and stock well, diameter 54 inches, depth 22.4 feet. Measuring point, top of south side of curb, 0.3 foot above land surface and 2,884.34 feet above mean sea level. Equipped with hand pump.

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

Oct. 30, 1939	19.33	Apr. 29, 1940	17.97	Aug. 28, 1940	20.63
Nov. 29	19.70	May 27	18.78	Sept.24	19.12
Feb. 8, 1940	19.40	June 28	19.80	Oct. 29	19.68
Mar. 28	19.83	July 29	20.33	Nov. 27	20.22

368. G. Chavez. NW¼NW¼ sec. 30, T. 6 S., R. 25 E., 50 feet north of adobe house, 100 feet east from county road, 0.3 mile south from Southern Pacific Railroad depot in Pima. Used dug domestic well, diameter 36 inches, depth 46.3 feet. Measuring point, top of west side of wood curb, 2.7 feet above land surface and 2,904.09 feet above mean sea level. Equipped with rope and bucket.

a Destroyed by flood.

Graham County--Continued.

368. G. Chavez -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 27, 1939	48.35	Mar. 28, 1940	46.62	Oct. 29, 1940	46.92
Nov. 29	47.37	Aug. 28	47.14	Nov. 27	47.05
Feb. 8, 1940	47.16	Sept.24	47.43		

372. George Layton. NE¼SE¼ sec. 32, T. 6 S., R. 25 E., at rear of frame house, 200 feet south from county road, 0.4 mile west from U. S. Highway at Central. Used dug domestic well, diameter 30 inches, depth 36.6 feet. Measuring point, top of west side of wood curb, 2.9 feet above land surface and 2,890.02 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 30, 1939	38.32	Apr. 29, 1940	35.13	Aug. 28, 1940	39.27
Dec. 27	37.83	May 27	34.52	Sept.24	39.07
Feb. 8, 1940	37.27	June 28	36.38	Oct. 29	38.71
Mar. 28	36.92	July 29	39.09	Nov. 27	38.25

379. Smithville Canal Co. SW¼NE¼ sec. 32, T. 6 S., R. 25 E., on north bank of Smithville Canal, 1.8 miles west from Smithville Diversion Dam. Used drilled irrigation well, diameter 16 inches, depth 82 feet. Measuring point, bottom of hole in east side of casing, 1.3 feet above land surface and 2,853.70 feet above mean sea level. Equipped with turbine and natural gas engine.

Water level, in feet below measuring point, 1940

Jan. 16	7.52	Aug. 28	12.40	Oct. 29	9.12
Feb. 6	7.40	Sept.24	10.90	Nov. 27	8.45
Mar. 28	6.51				

380. Smithville Canal Co. SE¼NE¼ sec. 34, T. 6 S., R. 25 E., on north bank of Smithville Canal, 50 feet west from county road, 1.5 miles south from U. S. Highway 70 at west city limits of Thatcher. Used drilled irrigation well, diameter 16 inches. Measuring point, top of slot in west side of casing at land surface, 2,851.37 feet above mean sea level. Equipped with turbine and natural gas engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 16	5.12	June 28	13.85	Oct. 10	7.35	Nov. 14	6.45
Feb. 6	5.11	Sept.26	8.05	17	7.14	Dec. 2	6.05
Mar. 28	4.34	Oct. 3	7.63	31	6.77	19	5.64

381. Pratt Tenney. SW¼SW¼ sec. 35, T. 6 S., R. 25 E., at rear of house 100 feet east from county road, 0.85 mile north from U. S. Highway 70 at west city limits of Thatcher. Used drilled domestic and stock well, diameter 6 inches, depth 21.1 feet. Measuring point, top of west side of casing, 0.4 foot above land surface and 2,870.93 feet above mean sea level. Equipped with hand pump. Measurements discontinued after June 28, 1940. See well 508 for further measurements.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 30, 1939	13.82	Mar. 28, 1940	11.97	May 27, 1940	13.80
Dec. 27	13.06	Apr. 29	12.09	June 28	15.56
Feb. 6, 1940	12.85				

429. Gramam County. SE¼NE¼ sec. 35, T 6 S., R. 27 E., 1,400 feet north of Gila River on west side of San Jose River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet Measuring point, top of pipe, 1.1 feet above land surface, and 3,045.46 feet above mean sea level.

Graham County--Continued.

429. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 23	8.81	July 15	9.80	Sept. 5	9.50		a 9.34
June 10	9.10	22	10.05	12	9.38	Oct. 10	9.51
11	9.12	29	10.27		a 9.34	17	9.40
22	9.48	Aug. 5	10.04	19	9.44	31	9.59
25	9.64	10	9.92	26	9.39	Nov. 14	9.53
27	9.53	15	9.73		a 9.37	Dec. 5	9.17
29	9.53	22	9.64	Oct. 3	9.38	19	8.98
July 5	9.35	29	9.52				

430. Graham County. SE¼NE¼ sec. 35, T. 6 S., R. 27 E., 950 feet north of Gila River, on west side of San Jose River Crossing Road, 200 feet north from Tidwell canal. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.7 foot above land surface and 3,040.75 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 23	5.68		a 6.28	Aug. 22	5.98		a 5.30
June 10	6.02	July 22	6.48		a 5.53	Oct. 3	5.69
11	6.01	29	6.48	29	5.80	10	5.92
22	6.28	Aug. 5	6.20	Sept. 5	5.96	17	5.85
25	6.17		a 6.12		a 5.69	31	6.07
27	6.18	10	6.19	12	5.74	Nov. 14	6.00
29	6.18	15	6.00	19	5.84	Dec. 5	5.64
July 5	6.11		a 5.93	26	5.33	19	5.28
15	6.44						

431. Graham County. NE¼SE¼ sec. 35, T. 6 S., R. 27 E., 350 feet north of Gila River, 200 feet west from San Jose River Crossing Road, in baccharis thicket. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.0 foot above land surface and 3,040.47 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 23	6.11		a 6.55	Aug. 29	6.06	Oct. 10	6.10
June 10	6.39	July 22	6.64	Sept. 5	6.21	17	6.06
11	6.38	29	6.44		a 5.59	31	6.19
22	6.49	Aug. 5	6.19	12	5.89	Nov. 14	6.10
25	6.22		a 6.15	19	6.03		a 5.70
27	6.23	10	6.26	26	5.92	Dec. 5	5.82
29	6.32	15	5.83		a 5.77		a 5.15
July 5	6.38		a 5.75	Oct. 3	5.90	19	5.28
15	6.65	22	6.05				

432. SE¼SE¼ sec. 35, T. 6 S., R. 27 E., 850 feet south of Gila River, 300 feet west from San Jose River Crossing Road, 50 feet southeast from Mexican shack. Used dug observation well, diameter 36 inches, depth 14 feet. Measuring point, bottom of slot in north side of curb, 1.10 feet above land surface and 3,050.79 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 11, 1939	13.16	July 22, 1940	13.90	Sept. 19, 1940	13.59
Nov. 24	12.66	29	14.00	26	13.64
Feb. 13, 1940	12.73	Aug. 5	13.80	Oct. 3	13.41
Mar. 22	12.65	10	13.72	10	13.40
June 22	13.59	15	13.66	17	13.39
25	13.64	22	13.49	31	13.46
27	13.68	29	13.50	Nov. 14	13.39
29	13.75	Sept. 5	13.63	Dec. 5	13.05
July 15	13.87	12	13.47	19	12.82

a Highest water level in period between tape measurements.

Graham County--Continued.

433. W. H. Baker. SW¼SW¼ sec. 36, T. 6 S., R. 27 E., in front of adobe house, 0.2 mile south from south end of San Jose Diversion Dam, 6 miles northeast from Solomonsville. Used dug domestic well, diameter 24 inches, depth 17.3 feet. Measuring point, top of west side of wood curb, 2.3 feet above land surface and 3,055.12 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 11, 1939	19.39	Apr. 23, 1940	18.38	Aug. 26, 1940	19.19
Nov. 24	18.83	May 25	18.89	Sept.23	19.15
Feb. 13, 1940	18.33	June 26	19.29	Oct. 28	19.14
Mar. 22	18.13	July 25	19.53	Nov. 26	18.87

434. Abel Sanchez. SE¼NE¼ sec. 35, T. 6 S., R. 27 E. South of adobe house on hill and north bank of Brown Canal, 6.1 miles northeast from Solomonsville. Used dug domestic well, diameter 30 inches, depth 23.8 feet. Measuring point, top of west side of wood curb, 2.7 feet above land surface and 3,063.54 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 24, 1939	22.46	Apr. 23, 1940	20.46	Aug. 26, 1940	22.39
Nov. 24	22.32	May 24	21.78	Sept.26	22.58
Feb. 13, 1940	21.54	June 26	22.34	Oct. 28	22.22
Mar. 21	21.35	July 26	22.73	Nov. 29	21.96

451. S. A. Clontz. SW¼SW¼ sec. 31, T. 6 S., R. 28 E., 50 feet south of frame house at upper road fork along Brown Canal, 7 miles northeast from Solomonsville. Unused dug domestic well, diameter 30 inches, depth 24.6 feet. Measuring point, top of south side of concrete curb, 1.9 feet above land surface and 3,079.71 feet above mean sea level.

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

Oct. 24, 1939	25.36	Apr. 23, 1940	24.09	Aug. 26, 1940	25.42
Nov. 24	25.59	May 24	24.83	Sept.26	25.22
Feb. 13, 1940	24.89	June 26	25.24	Oct. 28	25.62
Mar. 21	24.55	July 26	27.13	Nov. 29	25.26

452. S. A. Clontz. SW¼SW¼ sec. 31, T. 6 S., R. 28 E., on bank of Brown Canal, 250 feet south from frame house near road fork, 7 miles northeast from Solomonsville. Used drilled domestic well, diameter 16 inches, depth 46.7 feet. Measuring point, top of casing, west side, 1.4 feet above land surface and 3,077.03 feet above mean sea level. Equipped with hand pump. Bench mark G-19, established 1935 by Soil Erosion Service, brass cap set in concrete, 0.5 foot above land surface, 800 feet southeast from well and 3,076.44 feet above mean sea level.

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

Oct. 24, 1939	22.53	Apr. 23, 1940	21.26	Aug. 26, 1940	22.55
Nov. 24	22.55	May 24	21.99	Sept.26	22.45
Feb. 13, 1940	21.99	June 26	22.46	Oct. 28	22.68
Mar. 21	21.62	July 26	23.29	Nov. 29	22.57

454. Brown Canal Co. NE¼NE¼ sec. 31, T. 6 S., R. 28 E., 100 feet south of burned house, 0.5 mile downstream from Brown Canal Diversion Dam. Used drilled irrigation well, diameter 16 inches, depth 51 feet. Measuring point, bottom of slot on west side of top of casing, at land surface. Equipped with turbine and gasoline engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	21.39	Apr. 23	20.69	July 26	23.65	Oct. 28	21.62
Feb. 13	20.91	May 24	21.38	Aug. 26	21.62	Nov. 29	21.45
Mar. 21	20.78	June 26	21.64	Sept.26	21.33		

Graham County--Continued.

491. Jim Smith. NW¼SW¼ sec. 17, T. 7 S., R. 24 E. At old Lamb Ranch, 250 feet east of Left Hand Creek, 1.2 miles south from junction with Cottonwood Wash, 10 miles southwest from Pima. Unused dug domestic well, diameter 42 inches, depth 30 feet. Measuring point to May 18, 1940, top of recorder base 2.8 feet above land surface. Measuring point since May 18, 1940, top of north curb, 2.5 feet above land surface.

Daily noon water level, in feet below measuring point, 1940 (from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 14	11.07	Apr. 2	10.20	Apr. 19	9.62	May 6	8.50
16	10.58	3	10.20	20	9.51	7	8.48
18	10.65	4	10.16	21	9.40	8	8.45
19	10.57	5	10.15	22	9.33	9	8.45
20	10.49	6	10.14	23	9.26	10	8.44
21	10.42	7	10.12	24	9.15	11	8.45
22	10.38	8	10.10	25	9.08	12	8.50
23	10.33	9	10.11	26	9.00	13	8.58
24	10.30	10	10.07	27	8.94	14	8.62
25	10.26	11	10.05	28	8.87	15	8.75
26	10.22	12	10.06	29	8.80	16	8.82
27	10.20	13	10.02	30	8.75	17	8.90
28	10.23	14	10.01	May 1	8.68	18	8.99
29	10.25	15	9.97	2	8.63	Aug. 2	a 12.40
30	10.24	16	9.91	3	8.58	20	a 14.17
31	10.21	17	9.85	4	8.55	Oct. 15	a 20.16
Apr. 1	10.20	18	9.74	5	8.53	Nov. 29	a 24.36

508. Graham County. NE¼NE¼ sec. 3, T. 7 S., R. 25 E. In fence corner, 25 feet west of county road, 0.8 mile north from U. S. Highway 70 at west city limits of Thatcher. Used driven observation well, diameter 1 inch, depth 24 feet. Measuring point, top of pipe, 2.0 feet above land surface. See well 381 for previous measurements.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 13	19.67	Sept.24	18.25	Nov. 27	15.93
28	18.03	Oct. 29	16.03		

509. Ellis Welker and Eldon Palmer. SE¼SW¼ sec. 3, T. 7 S., R. 25 E. In front of house, 50 feet north from county road, 0.1 mile west from U. S. Highway 70, 0.5 mile west from Thatcher. Used drilled irrigation well, diameter 16 inches. Measuring point, bottom of slot at north side of casing at land surface. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 8	36.45	May 27	34.60	Aug. 28	38.05	Oct. 29	38.37
Mar. 28	35.92	June 28	35.53	Sept.23	38.40	Nov. 27	38.28
Apr. 29	34.82	July 29	37.19				

510. Ted Ferguson. NW¼NW¼ sec. 3, T. 7 S., R. 25 E. About 25 feet north of adobe house, 150 feet east from county road, 0.15 mile north of U. S. Highway 70, 0.8 mile southeast from Central. Used dug domestic well, diameter 30 inches, depth 22 feet. Measuring point, top of west side of curb, 3.0 feet above land surface and 2,879.77 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 30, 1939	23.26	Apr. 29, 1940	20.14	Aug. 28, 1940	24.54
Dec. 27	22.40	May 27	20.34	Sept.24	24.70
Feb. 8, 1940	22.27	June 28	21.78	Oct. 29	24.30
Mar. 28	21.80	July 29	23.70	Nov. 27	23.95

a Tape measurements.

Graham County--Continued.

516. Roy Layton. NE¼NE¼ sec. 10, T. 7 S., R. 25 E., near west side of county road, 0.25 mile south from U. S. Highway 70 at west city limits of Thatcher. Unused drilled irrigation well, diameter 20 inches, depth 90 feet. Measuring point, top of casing, 0.9 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. 2	43.07	July 30	44.17	Sept.24	45.16	Nov. 15	45.05
Apr. 29	41.78	Aug. 16	44.86	Oct. 8	45.17	27	44.99
May 27	41.73		a 43.87	16	45.13		a 44.79
June 28	42.67	28	45.00	29	45.08	Dec. 18	44.84
July 29	44.12	Sept.13	45.11				

552. Graham Canal Co. SW¼SE¼ sec. 5, T. 7 S., R. 26 E. About 100 feet north of Graham Canal, 0.5 mile west from Graham Diversion Dam. Unused drilled irrigation well, diameter 16 inches, depth 36 feet. Measuring point, top of casing, 1.5 feet above land surface and 2,904.56 feet above mean sea level. In heavily pumped region.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 12, 1939	20.49	July 17, 1940	25.61	Oct. 10, 1940	15.84
Nov. 24	15.91	26	26.18		a 15.70
Feb. 9, 1940	13.89	Aug. 16	23.11	15	15.73
	a 13.27		a 19.42	18	15.68
Mar. 19	13.32	27	19.61	28	15.51
	a 13.21		a 17.07		a 15.45
Apr. 11	13.66	Sept.13	17.12		b 15.57
May 1	15.30		a 16.45	Nov. 4	15.49
20	18.82	24	16.49		a 15.33
June 3	19.69	Oct. 3	16.06	15	15.35
14	22.71		a 15.73		a 14.78
	a 21.91		b 16.13	27	14.97
28	22.63	8	15.87		a 14.12
	a 22.13		a 15.80	Dec. 18	14.17

554. Graham Canal Co. SW¼SE¼ sec. 5, T. 7 S., R. 26 E. On south bank of Graham Canal, 0.4 mile west from Graham Diversion Dam. Used drilled irrigation well, diameter 16 inches. Measuring point, bottom of slot at southwest side of casing, at land surface and 2,901.08 feet above mean sea level. Equipped with turbine and diesel engine.

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

Nov. 24, 1939	12.40	Apr. 24, 1940	10.92	Oct. 28, 1940	12.03
Feb. 9, 1940	10.40	Aug. 27	15.71	Nov. 27	11.49
Mar. 22	10.15	Sept.24	12.89		

557. R. A. Smith. NE¼NE¼ sec. 6, T. 7 S., R. 26 E. In shed at east side of stucco house, 300 feet west from county road, 1.8 mile directly north from Graham County Courthouse. Unused drilled domestic well, diameter 4 inches, depth 35 feet. Measuring point, top of south side of casing, 0.5 foot above land surface and 2,905.37 feet above mean sea level. Equipped with hand pump.

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

Oct. 12, 1939	31.33	Apr. 24, 1940	26.85	Aug. 27, 1940	31.57
Nov. 24	29.47	May 27	28.64	Sept.24	30.13
Feb. 9, 1940	27.96	June 28	30.87	Oct. 29	29.26
Mar. 22	26.78	July 29	31.85	Nov. 27	28.90

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Graham County--Continued.

559. J. A. Peterson. NE¼NW¼ sec. 6, T. 7 S., R. 26 E. On north side of Graham Canal, 0.1 mile west from Peterson Wash, 2.0 miles northwest from Safford. Unused drilled irrigation well, diameter 16 inches, depth 44 feet. Measuring point, top of north side of casing, 1.0 foot above land surface and 2,992.59 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	20.40	Mar. 19	18.78	June 28	21.15	Sept.24	21.57
Feb. 9	19.93	May 2	18.88	July 29	22.26	Oct. 28	21.19
27	19.13	27	19.63	Aug. 27	22.16	Nov. 27	20.83
	a 19.08						

562. Bill Morris. SE¼SE¼ sec. 7, T. 7 S., R. 26 E. At corner of block, 0.15 mile south from Roosevelt Park, in Safford. Used drilled irrigation well, diameter 6 inches, depth 36.8 feet. Measuring point, top of concrete curb at land surface, 2,918.53 feet above mean sea level. Equipped with centrifugal pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 1, 1939	25.99	Apr. 24, 1940	24.29	Aug. 28, 1940	27.24
Dec. 27	25.60	May 27	24.71	Sept.24	27.20
Feb. 6, 1940	25.40	June 28	26.04	Oct. 29	27.14
Mar. 26	24.85	July 29	26.88	Nov. 27	26.92

564. Graham County. NW¼SW¼ sec. 8, T. 7 S., R. 26 E. About 3,450 feet south of Gila River on east side of 8th Street at north edge of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 29 feet. Measuring point, top of pipe, 1.0 foot above land surface and 2,903.57 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 17	11.27	June 29	12.49	Aug. 19	13.48	Oct. 3	13.38
June 10 b	11.78	July 5	12.76	22	13.57	10	13.45
10 c	11.85	15	13.10	29	13.67	17	13.37
11 b	11.84	20	13.31	Sept. 5	13.40	31	13.38
11 c	11.90	29	13.56	12	13.42	Nov. 14	13.14
22	12.59	Aug. 5	13.65	19	13.42	Dec. 5	12.71
25	12.34	8	13.69	26	13.47	19	12.49
26	12.40	10	13.81				

565. Graham County. NW¼SW¼ sec. 8, T. 7 S., R. 26 E. About 2,950 feet south of Gila River on east side of 8th Street, 500 feet north of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,900.36 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 16	8.91	June 29	10.12	Aug. 15	11.17	Oct. 3	11.03
June 10 b	9.47	July 5	10.39	19	11.15	10	11.12
10 c	9.50	15	10.68	22	11.23	17	11.09
11 b	9.51	20	10.90	29	11.35	31	11.04
11 c	9.56	29	11.33	Sept. 5	11.08	Nov. 14	10.86
22	10.20	Aug. 5	11.37	12	11.09	Dec. 5	10.41
25	9.91	8	11.42	19	11.13	19	10.17
26	9.98	10	11.55	26	11.15		

566. Graham County. SW¼NW¼ sec. 8, T. 7 S., R. 26 E. About 2,500 feet south of Gila River on east side of 8th Street, 950 feet north of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,898.80 feet above mean sea level.

a Highest water level in period between tape measurements.
b Measured at 10:00 a. m.
c Measured at 10:00 p. m.

Graham County--Continued.

566. Graham County -- Continued.

Water level, in feet below measuring point, 1940

Date		Water level	Date		Water level	Date		Water level	Date		Water level
May 16		7.72	July 5		9.11	Aug. 15		9.67	Sept. 26		9.71
June 10	a	8.26		c	8.82	22		9.82	Oct. 3		9,56
10	b	8.29	15		9.37		c	9.79		c	9.54
11	a	8.28	20		9.60	29		9.95	10		9.71
11	b	8.37	29		9.79	Sept. 5		9.66	17		9.68
22		8.95		c	9.77		c	9.61	31		9.64
25		8.73	Aug. 5		9.92	12		9.66	Nov. 14		9.42
26		8.71	8		9.97		c	9.64	Dec. 5		8.97
29		8.84	10		10.04	19		9.73	19		8.72

567. Graham County. SW¼NW¼ sec. 8, T. 7 S., R. 26 E. About 1,950 feet south of Gila River, 1,500 feet north of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,897.13 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 16		6.85	June 29		7.97	Aug. 15		8.66	Oct. 3		8.32
June 10	a	7.42	July 5		8.23	22		8.85	10		8.70
10	b	7.48	15		8.45	29		9.01	17		8.75
11	a	7.51	20		8.70	Sept. 5		8.72	31		8.71
11	b	7.54	29		8.79	12		8.67	Nov. 14		8.45
22		8.05	Aug. 5		8.75	19		8.49	Dec. 5		7.96
25		7.85	8		8.92	26		8.74	19		7.68
26		7.84	10		9.07						

568. Graham County. SW¼NW¼ sec. 8, T. 7 S., R. 26 E. About 1,550 feet south of Gila River on east side of 8th Street, 1,900 feet north of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.7 foot above land surface and 2,895.51 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 16		6.15	July 15		7.67	Aug. 22		7.96	Oct. 3		7.56
June 10	a	6.71	20		7.90	29		8.22	10		7.84
10	b	6.69		c	7.28	Sept. 5		7.99		c	7.80
11	a	6.76	29		7.93		c	7.71	17		7.87
11	b	6.82	Aug. 5		7.70	12		7.77	31		7.80
22		7.32	8		8.07	19		7.95	Nov. 14		7.50
25		7.09	10		8.23		c	7.83		c	6.96
26		7.05		c	7.57	26		7.86	Dec. 5		7.00
29		7.17	15		7.65		c	7.52	19		6.64
July 5		7.40									

569. Graham County. SW¼NW¼, sec. 8, T. 7 S., R. 26 E. About 1,050 feet south of Gila River on east side of 8th Street, 2,400 feet north of Safford city limits. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 0.7 foot above land surface and 2,894.70 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 15		6.33	June 29		7.20	Aug. 15		7.67	Oct. 3		7.44
June 10	a	6.87	July 5		7.43	22		7.90	10		7.74
10	b	6.89	15		7.75	29		8.31	17		7.87
11	a	6.90	20		7.94	Sept. 5		8.16	31		7.72
11	b	6.90	29		7.91	12		7.69	Nov. 14		7.34
22		7.38	Aug. 5		7.55	19		7.92	Dec. 5		6.80
25		7.15	8		8.10	26		7.83	19		6.44
26		7.12	10		8.24						

a Measurement made at 10:00 a. m.
b Measurement made at 10:00 p. m.
c Highest water level in period between tape measurements.

Graham County--Continued.

570. Z. C. Prina. NW¼NW¼, sec. 8, T. 7 S., R. 26 E. About 550 feet south of Gila River, 50 feet east of bridge, just inside fence. Used driven observation well with sand point, diameter 1 inch, depth 8 feet. Measuring point, top of pipe, 1.5 feet above land surface and 2,890.30 feet above mean sea level. During the period Aug. 25 to Oct. 21, this well was affected by two pumps which ran daily on the bridge construction job 100 feet west.

Water level, in feet below measuring point, 1940

Date		Water level	Date		Water level	Date		Water level	Date	Water level
May 14		4.80	July 5		5.46		c	6.04	Sept.19	6.97
June 10	a	5.24	15		5.89	Aug. 10		6.31	26	7.92
10	b	5.21		c	5.83		c	5.80	Oct. 3	5.71
11	a	5.26	20		6.05	15		5.91	10	6.08
11	b	5.28		c	6.02		c	5.65	17	6.37
22		5.76	29		6.14	22		5.90	31	5.67
25		5.29		c	5.93	29		8.66	Nov. 14	5.22
26		5.29	Aug. 5		6.00	Sept. 5		7.70	Dec. 5	4.64
29		5.36	8		6.23	12		7.04	19	3.96

573. Z. C. Prina. NW¼NW¼ sec. 8, T. 7 S., R. 26 E. About 380 feet south of Gila River, 100 feet east from bridge, just inside fence of U. S. Geological Survey Experiment Station. Used driven observation well with sand point, diameter 1 inch, depth 32 feet. Measuring point, top of pipe, 1.0 foot above land surface and 2,890.91 feet above mean sea level. Water levels in this well were affected by pumps on bridge construction job 100 feet west during period Aug. 25 to Oct. 31.

Water level, in feet below measuring point, 1940

May 13	5.96	July 9	6.69	Oct. 14	7.28	Nov. 25	5.59
29	5.98	15	7.11	15	7.67	26	5.63
30	6.06	16	7.15	16	7.12	27	5.67
31	6.07	18	7.10	17	7.41	28	5.72
June 1	6.11	20	7.20	18	7.57	29	5.77
4	6.16	23	7.30	19	7.46	Dec. 2	5.79
5	6.20	29	7.26	20	7.43	3	5.80
6	6.20	Aug. 5	7.07	21	7.09	4	5.74
7	6.22	8	7.28	22	7.33	5	5.73
8	6.28	10	7.37	23	7.38	6	5.64
9	6.32	15	6.90	24	7.21	9	5.43
10	6.39	22	6.95	25	7.13	10	5.38
11	6.40	26	7.49	26	7.11	11	5.38
12	6.48	27	7.74	27	6.77	12	5.26
13	6.48	29	8.04	28	6.87	13	4.83
14	6.59	Sept. 3	7.82	29	7.11	14	4.65
15	6.64	5	7.90	30	7.04	16	4.75
16	6.70	12	6.94	31	6.85	17	4.86
19	6.85	17	7.72	Nov. 1	6.88	18	4.94
20	6.90	18	7.59	2	6.90	19	4.95
21	6.95	19	7.67	6	6.81	20	4.95
24	6.75	20	7.45	7	6.65	21	5.03
25	6.38	26	7.51	8	6.58	22	5.13
26	6.36	Oct. 3	7.13	9	6.53	23	5.16
27	6.33	5	7.69	12	6.27	24	5.23
28	6.46	7	7.47	13	6.44	25	5.08
29	6.46	8	7.70	14	6.37	27	3.93
30	6.21	9	7.81	16	6.19	28	4.16
July 1	6.16	10	7.87	20	5.70	29	4.37
3	6.25	12	7.74	22	5.60	30	4.51
5	6.55	13	6.85				

574. Z. C. Prina. NW¼NW¼ sec. 8, T. 7 S., R. 26 E. One foot east of well 573. Used bored observation well, diameter 8 inches, depth 8 feet. Measuring point, joint at top of casing, 1.0 foot above land surface and 2,891.15 feet above mean sea level. Well equipped with water level recorder from Dec. 14 to 31, inclusive. During the period Aug. 25 to Oct. 31, 1940 this well was affected by two pumps which ran daily on the bridge construction job 100 feet west. Well was deepened 3 feet July 16, 1940.

a Measurements made at 10:00 a. m.
b Measurements made at 10:00 p. m.
c Highest water level in period between tape measurements.

Graham County--Continued.

574. Z. C. Prina -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 29	6.20	Aug. 26	8.28	Oct. 22	7.43	Dec. 2	6.06
30	6.25	27	8.33	23	7.50	3	6.03
31	6.29	29	8.62	24	7.44	4	5.99
June 1	6.33	Sept. 3	8.32	25	7.34	5	5.94
4	6.40	5	8.12	26	7.32	6	5.91
5	6.43	12	6.98	27	7.16	9	5.71
6	6.42	17	7.65	28	7.02	10	5.65
7	6.47	18	7.49	29	7.27	11	5.64
8	6.50	19	7.68	30	7.19	12	5.54
9	6.52	20	7.49	31	7.11	13	5.14
10	6.52	26	7.53	Nov. 1	7.14	14 a	4.94
11	(b)	Oct. 3	7.16	2	7.18	15 a	4.97
29	6.68	5	7.57	6	7.06	16 a	5.06
30	6.45	7	7.35	7	6.92	17 a	5.16
July 1	6.35	8	7.58	8	7.03	18 a	5.23
3	6.47	9	7.68	9	6.77	19 a	5.23
9	(b)	10	7.77	12	6.50	20 a	5.25
16	8.02	12	7.51	13	6.71	21 a	5.28
17	7.86	13	7.24	14	6.58	22 a	5.38
18	7.91	14	7.17	16	6.45	23 a	5.43
20	7.99	15	7.72	20	6.01	24 a	5.48
23	8.16	16	7.42	22	5.84	25 a	5.37
29	8.06	17	7.34	25	5.85	26 a	3.94
Aug. 5	7.90	18	7.54	26	5.90	27 a	4.16
8	8.11	19	7.55	27	5.93	28 a	4.40
10	8.19	20	7.60	28	5.97	29 a	4.63
15	7.70	21	7.15	29	6.02	30 a	4.78
22	7.80						

575. Z. C. Prina. NW¼NW¼ sec. 8, T. 7 S., R. 26 E. In northeast corner of inner fence at U. S. Geological Survey Experiment Station. Used bored observation well, diameter 8 inches, depth 9 feet. Measuring point, joint at top of casing, 0.7 foot above land surface and 2,891.58 feet above mean sea level. Well equipped with water-level recorder. During the period Aug. 25 to Oct. 31, 1940, this well was affected by two pumps which ran daily on the bridge construction job 150 feet west.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	7.05	7.00	8.20	8.37	.....	7.76	6.70
2	.....	7.07	7.11	8.17	8.12	.....	7.75	6.71
3	.....	7.07	7.20	8.11	8.10	7.32	7.67	6.67
4	.....	7.10	7.26	8.10	8.28	7.50	8.58	6.63
5	.....	7.11	7.32	7.99	8.38	7.64	8.03	6.54
6	.....	7.13	7.37	7.98	8.38	7.51	7.66	6.49
7	.....	7.17	7.43	8.07	7.81	7.52	7.52	6.45
8	.....	7.22	7.48	8.15	7.60	7.84	7.43	6.42
9	.....	7.27	7.52	8.19	7.42	8.02	7.36	6.26
10	.....	7.32	7.58	8.22	7.47	8.04	7.22	6.20
11	.....	7.34	7.64	8.24	7.44	8.11	7.02	6.18
12	.....	7.38	7.73	8.23	7.46	7.98	7.05	6.07
13	.....	7.42	7.82	8.20	7.56	7.87	7.25	5.65
14	.....	7.44	7.93	8.00	7.67	7.60	7.18	5.44
15	.....	7.52	7.99	7.76	7.76	8.08	7.16	5.47
16	.....	7.60	8.06	7.55	7.73	7.92	7.03	5.58
17	.....	7.66	7.94	7.60	7.86	7.68	6.95	5.70
18	.....	7.72	7.92	7.67	7.91	7.97	6.91	5.76
19	.....	7.77	7.98	7.73	7.94	8.03	6.81	5.78
20	.....	7.82	8.03	7.81	7.94	7.86	6.55	5.78
21	.....	7.86	8.08	7.84	7.96	7.72	6.41	5.82
22	.....	....	8.13	7.87	7.79	7.93	6.40	5.87
23	6.84	....	8.18	7.86	7.45	8.02	6.40	5.94

a Noon water level from recorder charts.
b Dry.

Graham County--Continued.

575. Z. C. Prina--Continued.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	6.74	7.63	8.21	8.11	7.54	8.00	6.37	6.05
25	6.74	7.30	8.24	8.10	7.58	7.93	6.39	5.90
26	6.76	7.30	8.11	7.98	7.72	7.90	6.43	....
27	6.77	7.28	8.09	8.09	7.89	7.69	6.49	....
28	6.79	7.33	8.10	8.25	7.90	7.53	6.54	4.94
29	6.87	7.39	8.13	(a)	7.79	7.82	6.60	5.16
30	6.93	7.11	8.17	(a)	7.60	7.83	6.67	5.31
31	7.01	....	8.18	(a)	....	7.75	....	....

576. Z. C. Prina. NW¼NW¼ sec. 8, T. 7 S., R. 26 E. About 80 feet south of Gila River in northwest corner of outer fence of U. S. Geological Survey Experiment Station. Used driven observation well with sand point, diameter 1 inch, depth 23 feet. Measuring point, top of pipe, 0.8 foot above land surface and 2,890.88 feet above mean sea level. During the period Aug. 25 to Oct. 31, 1940, this well was affected by two pumps which ran daily on the bridge construction job 100 feet west.

Water level, in feet below measuring point, 1940

Date		Water level	Date		Water level	Date		Water level	Date		Water level
June 10	b	7.01		d	7.58	Aug. 29		8.00	Oct. 10		7.88
10	c	6.96	July 20		7.77		d	7.61		d	6.96
11	b	6.92		d	7.69	Sept. 5		8.05	Sept.17		7.49
11	c	7.00	29		7.87		d	6.97		d	6.98
22		7.59	Aug. 5		7.68	12		7.04	31		7.53
25		6.88	8		7.86	19		7.50		d	6.65
26		6.85		d	7.62		d	7.21	Nov. 14		6.93
29		6.98	10		7.91	26		7.25		d	6.14
July 5		7.07		d	7.32		d	6.72	Dec. 5		6.31
	d	7.05	15		7.34	Oct. 3		6.88	19		5.39
15		7.78	22		7.55						

578. Graham County. SE¼SE¼ sec. 6, T. 7 S., R. 26 E. About 180 feet north of Gila River on west side of 8th Street. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.5 foot below land surface and 2,889.09 feet above mean sea level.

Water level, in feet below measuring point, 1940

Aug. 24	7.36	Sept.19	6.87	Oct. 10	6.64	Dec. 5	6.18
29	7.41	26	6.55	17	6.57	7	5.81
Sept. 5	6.52	Oct. 3	6.26	Nov. 14	6.30	19	5.22
12	6.60						

579. Graham County. SW¼SW¼ sec. 5, T. 7 S., R. 26 E., 850 feet north of Gila River on east side of 8th Street. Used driven observation well with sand point, diameter 1 inch, depth 21 feet. Measuring point, top of pipe, 0.8 foot above land surface and 2,891.81 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 17	10.20	June 29	11.72	Aug. 10	12.68	Oct. 3	10.58
June 10	b 11.27	July 5	11.64	15	12.48	10	10.63
10	c 11.31	16	12.30	22	12.18	17	10.57
11	b 11.31	17	12.27	29	11.93	31	10.47
11	c 11.35	20	12.35	Sept. 9	11.31	Nov. 14	10.20
22	11.96	29	12.54	12	11.17	Dec. 5	9.76
25	11.81	Aug. 5	12.55	19	11.12	19	9.13
26	11.75	8	12.64	26	10.82		

a Dry.
b Measurements made at 10:00 a. m.
c Measurements made at 10:00 p. m.
d Highest water level in period between tape measurements.

Graham County--Continued.

580. City of Safford. NE¼SW¼ sec. 9, T. 7 S., R. 26 E. At fence corner 60 feet west of street, 0.4 mile north from junction of U. S. Highways 70 and 666 in Safford. Used driven observation well, diameter 1 inch, depth 34 feet. Measuring point, top of pipe, 1.8 feet above land surface. See well 582 for previous measurements.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 12	15.45	Sept.23	14.82	Nov. 26	14.14
27	15.09	Oct. 28	14.75		

582. E. Olsen. NW¼SE¼ sec. 8, T. 7 S., R. 26 E. At rear of house, 150 feet west of street, 0.4 mile north from junction of U. S. Highways 70 and 666 in Safford. Unused drilled domestic well, diameter 6 inches, depth 15.2 feet. Measuring point, bottom of east edge at center of 2 by 8-inch timber pump base, 0.2 foot above land surface and 2,905.17 feet above mean sea level. Equipped with hand pump. Measurements discontinued Apr. 1, 1940; see well 580 for further measurements. Water level, in feet below measuring point: Nov. 8, 1939, 10.14; Dec. 28, 1939, 9.59; Feb. 5, 1940, 9.06; Mar. 27, 1940, 7.10.

585. Graham Canal Co. NE¼NW¼ sec. 9, T. 7 S., R. 26 E. About 25 feet south of Graham Canal, 0.2 mile west from Graham Diversion Dam. Unused drilled test well, diameter 4 inches, depth 21.3 feet. Measuring point, top of 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
Feb. 5	13.52	June 14	16.91	Aug. 16	18.28	Oct. 28	15.70
Mar. 5	13.29	27	17.52	27	17.12	Nov. 15	15.52
20	13.40	a	17.13	a	15.63	a	14.73
Apr. 11	14.19	b	18.24	Sept.13	15.70	27	14.78
May 1	14.19	July 17	19.64	24	15.67	a	13.81
20	15.37	26	20.14	a	15.56	Dec. 18	13.92
June 3	15.45	a	18.13	Oct. 15	15.68		

586. Ted Tidwell. SE¼SE¼ sec. 12, T. 7 S., R. 26 E. About 100 feet east of county road, 0.5 mile north from Solomonsville Crossing, 1.4 miles north from Solomonsville. Used dug domestic and stock well, diameter 36 inches, depth 16.8 feet. Measuring point, west side top of wooden curb, 2.6 feet above land surface and 2,966.79 feet above mean sea level. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
July 20, 1939	18.83	Mar. 21, 1940	16.44	Aug. 26, 1940	17.42
24	18.67	Apr. 23	16.54	Sept.26	17.98
Oct. 28	18.71	May 24	17.28	Oct. 26	17.87
Nov. 29	18.35	June 26	17.84	Nov. 29	17.75
Feb. 13, 1940	17.26	July 26	18.33		

587. Graham County. SE¼SE¼ sec. 12, T. 7 S., R. 26 E. About 1,420 feet north of Gila River on east side of Solomonsville River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.7 foot above land surface and 2,955.72 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 21	7.83	July 15	8.51	a	7.74	Oct. 3	7.90
June 10	8.10	22	8.74	Aug. 22	8.05	10	8.11
11	8.10	a	8.71	29	8.30	17	8.25
22	8.29	29	8.84	Sept. 5	8.46	31	8.27
25	8.09	a	8.30	12	8.05	a	8.26
27	8.10	Aug. 5	8.38	a	8.03	Nov. 14	8.29
29	8.28	10	8.47	19	8.22	a	7.92
July 5	8.12	a	8.12	a	8.12	Dec. 5	7.94
a	8.02	15	8.17	26	8.18	19	7.46

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Graham County--Continued.

588. Graham County. NE¼NE¼ sec. 13, T. 7 S., R. 26 E. About 780 feet north of Gila River on east side of Solomonsville River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.95 foot above land surface and 2,956.29 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date		Water level	Date		Water level	Date		Water level	Date		Water level
May 21		7.47	July 15		8.21		b	7.36		b	7.59
June 10		7.69		b	8.19	Aug. 22		7.84	Oct. 3		7.62
11		7.71	22		8.44	29		8.14	10		7.84
22		7.91		b	8.42	Sept. 5		8.39		b	7.82
25		7.61	29		8.55	12		7.73	17		8.00
27		7.68		b	7.91		b	7.69	31		7.97
29		7.88	Aug. 5		7.98	19		7.96	Nov. 14		8.03
July 5		7.81	10		8.20		b	7.83	Dec. 5		7.67
	b	7.77	15		7.87	26		7.91	19		7.20

589. Graham County. NE¼NE¼ sec. 14, T. 7 S., R. 26 E. About 520 feet north of Gila River on west side of Solomonsville River Crossing Road. Used bored observation well, diameter 8 inches, depth 9 feet. Measuring point at top of casing, 0.95 foot above land surface. Well equipped with water level recorder from July 11 to Sept. 7 inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

July 9	a	7.90	July 28		7.86	Aug. 15		7.23	Sept. 1		7.70
11		7.29	29		7.91	16		7.11	2		7.73
12		7.34	30		7.94	17		7.10	3		7.77
13		7.41	31		7.77	18		7.05	4		7.79
14		7.49	Aug. 1		7.68	19		6.95	5		7.81
15		7.58	2		7.45	20		7.05	6		7.82
16		7.65	3		7.38	21		7.11	7		7.37
17		7.66	4		7.34	22		7.20	12	a	7.10
18		7.67	5		7.33	23		7.25	19	a	7.33
19		7.72	6		7.33	24		7.31	26	a	7.28
20		7.75	7		7.41	25		7.35	Oct. 3	a	6.97
21		7.78	8		7.47	26		7.33	10	a	7.21
22		7.82	9		7.52	27		7.41	17	a	7.37
23		7.85	10		7.55	28		7.45	31	a	7.31
24		7.89	11		7.60	29		7.51	Nov. 14	a	7.43
25		7.91	12		7.63	30		7.57	Dec. 5	a	7.05
26		7.88	13		7.52	31		7.64	19	a	6.57
27		7.83	14		7.44						

590. Graham County. NE¼NE¼ sec. 13, T. 7 S., R. 26 E. About 320 feet north of Gila River on west side of Solomonsville River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.7 foot above land surface and 2,955.71 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 20		6.61		b	6.55	Aug. 29		6.06	Oct. 10		6.86
June 10		6.39	July 22		6.64	Sept. 5		6.21	17		7.01
11		6.38	29		6.44		b	5.59	31		6.93
22		6.49	Aug. 5		6.19	12		5.89	Nov. 14		7.04
25		6.22		b	6.15	19		6.03		b	6.63
27		6.23	10		6.26	26		5.92	Dec. 5		6.69
29		6.32	15		5.83		b	5.77		b	5.99
July 5		6.38		b	5.75	Oct. 3		5.90	19		6.15
15		6.65	22		6.05						

592. E. M. Claridge. SW¼SE¼ sec. 13, T. 7 S., R. 26 E. In field, 50 feet north of U. S. Highway 70, 0.1 mile west from turn at north edge of Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 95 feet. Measuring point, top of east side of casing, 2.0 feet above land surface. Equipped with turbine and natural gas engine.

a Tape measurements.
b Highest water level in period between tape measurements.

Graham County--Continued.

592. E. M. Claridge -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 25	18.23	Aug. 26	22.65	Oct. 8	20.93	Oct. 28	20.43
Apr. 25	19.64	Sept.23	21.30	16	20.72	Nov. 26	20.15
May 25	21.82						

593. E. M. Claridge. SE¼SW¼ sec. 13, T. 7 S., R. 26 E. In field, 50 feet north of U. S. Highway 70, 0.5 mile west from Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 90 feet. Measuring point, top of west side of casing, 2.5 feet above land surface and 2,963.88 feet above mean sea level. Equipped with turbine and natural gas engine.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1939	22.22	May 25, 1940	22.13	Sept.23, 1940	23.22
Feb. 12, 1940	21.05	June 26	24.48	Oct. 28	22.32
Mar. 25	20.27	Aug. 26	24.60	Nov. 26	22.01
Apr. 23	21.57				

594. E. M. Claridge. NE¼SE¼ sec. 14, T. 7 S., R. 26 E. On west bank of San Simon Creek on south side of Union Canal, 1.2 miles west from Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 100 feet. Measuring point, top of north side of casing, 1.2 feet above land surface and 2,949.65 feet above mean sea level. Equipped with turbine and gasoline engine.

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

Dec. 21, 1939	12.90	Apr. 23, 1940	11.42	Oct. 30, 1940	13.27
Feb. 12, 1940	12.27	June 4	12.30	Nov. 26	12.95
Mar. 25	13.94	Aug. 26	13.87		

597. C. M. Pursley. NE¼SE¼ sec. 15, T. 7 S., R. 26 E. About 250 feet west of wood barn, 0.3 mile north from U. S. Highway 70, 2.0 miles west from Solomonsville. Unused drilled domestic well, diameter 4 inches, depth 30 feet. Measuring point, top of south side of casing, 3.6 feet below land surface and 2,938.74 feet above mean sea level. Bench mark, established Jan. 9, 1940, green cross at southwest corner of concrete tank base, 2,942.83 feet above mean sea level. Equipped with windmill.

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

Nov. 2, 1939	16.43	Apr. 24, 1940	17.23	Aug. 26, 1940	19.22
Jan. 9, 1940	14.94	May 25	18.70	Sept.23	17.32
Feb. 12	14.49	June 26	20.99	Oct. 28	16.12
Mar. 25	13.33	July 25	22.94	Nov. 26	15.60

598. Union Canal Co. NE¼SE¼ sec. 15, T. 7 S., R. 26 E. Between two wood barns on north bank of Union Canal, 0.35 mile north from U. S. Highway 70, 2.1 miles west from Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 46.5 feet. Measuring point, top of south side of casing, 0.9 foot above land surface and 2,941.31 feet above mean sea level. Equipped with turbine.

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

Nov. 2, 1939	19.38		a15.20	June 14, 1940	22.04
Jan. 9, 1940	17.80	Apr. 11, 1940	15.73	Aug. 26	21.90
Feb. 12	17.36	May 2	20.59	Sept.23	20.90
26	17.08	20	21.07	Oct. 28	18.66
Mar. 19	16.55	28	21.19	Nov. 26	18.16

603. L. A. Nelson. SE¼SW¼ sec. 16, T. 7 S., R. 26 E. In field, 50 feet north of Lone Star Road, 0.9 mile east from U. S. Highway 666, 1 mile south from Safford. Used drilled irrigation well, diameter 20 inches, depth 89 feet. Measuring point, bottom of slot on north side of casing, 1.8 feet above land surface.

a Highest water level in period between tape measurements.

Graham County--Continued.

603. L. A. Nelson -- Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 12	36.65	May 25	36.69	Aug. 26	38.78	Oct. '29	38.07
Apr. 24	35.69	June 27	37.80	Sept.23	38.83	Nov. 27	37.84

606. Pedro Solas. NE¼NE¼ sec. 16, T.7 S., R. 26 E. At rear of adobe house, at right turn in road 1 mile north from Lone Star. Used dug domestic well, diameter 54 inches, depth 15 feet. Measuring point, top of east side of wood curb, 2.6 feet above land surface and 2,919.02 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 8, 1939	9.82	May 25, 1940	11.11	Oct. 8, 1940	10.12
Dec. 24	8.30	June 27	12.90	16	9.90
Feb. 12, 1940	7.67	July 25	13.82	28	9.64
Mar. 25	6.80	Aug. 27	12.58	Nov. 26	8.89
Apr. 23	8.87	Sept.23	10.93		

607. Mrs. Anna Welker. NW¼NW¼ sec. 16, T. 7 S., R. 26 E. About 100 feet south of gray brick house, 0.1 mile north from U. S. Highway 70, 1 mile east from Safford. Unused drilled domestic well, diameter 4 inches, depth 36.6 feet. Measuring point, top of south side of casing, 1.0 foot above land surface and 2,924.24 feet above mean sea level. Equipped with hand pump.

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

Nov. 8, 1939	18.96	Apr. 24, 1940	16.01	Sept.23, 1940	19.70
Dec. 28	18.07	May 25	19.38	Oct. 28	19.24
Feb. 12, 1940	17.45	Aug. 27	20.67	Nov. 26	18.76

609. Annie Collins. NW¼NE¼ sec. 17, T. 7 S., R. 26 E. About 150 feet south from Union Canal, 175 feet west from U. S. Highway 666, 0.25 mile south from junction with U. S. Highway 70 in Safford. Unused drilled domestic well, diameter 6 inches, depth 34.7 feet. Measuring point, top of casing, 1.0 foot below land surface and 2,928.90 feet above mean sea level.

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

Nov. 8, 1939	24.63		b 24.24	Aug. 26, 1940	24.96
Dec. 28	24.52	June 3, 1940	23.95	Sept.13	24.80
Feb. 5, 1940	24.11	14	24.24	24	24.59
26	24.56	27	24.44	Oct. 16	24.88
	a 22.59		b 25.96	29	24.83
Apr. 11	23.37	July 16	24.79	Nov. 15	24.86
18	23.17	29	24.83	27	24.74
May 2	23.21	Aug. 16	24.67	Dec. 18	24.80
20	23.64		b 25.01		

610. Bert Hatch. SW¼SW¼ sec. 17, T. 7 S., R. 26 E. On north bank of abandoned Montezuma Canal Extension, 800 feet east from 8th Avenue, 0.8 mile south from Graham County Courthouse. Unused drilled irrigation well, diameter 16 inches, depth 63 feet. Measuring point, bottom edge of pump base at gage pipe, 3.0 feet above land surface and 2,963.59 feet above mean sea level. Bench mark, established Jan. 10, 1940, blue cross at northeast corner of concrete foundation, 2.5 feet above land surface and 2,963.43 feet above mean sea level. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	52.21	Apr. 25	51.88	July 25	53.31	Oct. 29	53.28
Feb. 5	52.63	May 27	51.55	Aug. 26	52.59	Nov. 26	53.53
Mar. 25	52.00	June 28	52.72	Sept.24	52.92		

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Graham County--Continued.

612. Montezuma Canal Co. SE¼SW¼ sec. 18, T. 7 S., R. 26 E. On north bank of Montezuma Canal, 50 feet west from county road, 0.4 mile south from Relation Street, 1.0 mile west from intersection with U. S. Highway 666 at south city limits of Safford. Unused drilled irrigation well, diameter 16 inches, depth unknown. Measuring point, bottom of slot in west side of casing, 0.9 foot above land surface and 2,960.30 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 27, 1939	58.45		a58.24		a57.68
Feb. 5, 1940	58.21	Apr. 11, 1940	58.67	June 4, 1940	57.80
26	58.34	May 2	58.05		
Mar. 19	58.43	20	57.85		

613. Montezuma Canal Co. SW¼SW¼ sec. 18, T. 7 S., R. 26 E. On north bank of Montezuma Canal, 0.2 mile east from county road, 0.3 mile south from Relation Street, 1.0 mile west from U. S. Highway 666 at south city limits of Safford. Unused drilled irrigation well, diameter 20 inches, depth 85 feet. Measuring point, top of casing, 0.5 foot above land surface and 2,961.15 feet above mean sea level. Bench mark, established Jan. 10, 1940, green cross at southeast corner of concrete pump base 1.1 feet above land surface and 2,960.92 feet above mean sea level.

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

Dec. 28, 1939	62.04	July 17, 1940	62.66	Sept.24, 1940	62.98
Feb. 5, 1940	62.13		a 62.53	Oct. 17	63.10
26	62.25	27	62.82		a 63.02
Mar. 19	62.28		a 62.74	29	63.13
	a 61.77	Aug. 15	62.83	Nov. 15	63.20
Apr. 11	62.01	27	62.85	29	63.26
	a 61.71		a 62.75	Dec. 18	63.27
19	61.89	Sept.14	62.93		

614. Charles Gates. SE¼NE¼ sec. 19, T. 7 S., R. 26 E. In field 300 feet west of 8th Avenue, 0.2 mile south from last house on road, 1.2 miles south from Graham County Courthouse. Used drilled stock well, diameter 6 inches, depth 71.5 feet. Measuring point, top of north side of casing, 1.0 foot above land surface and 2,975.82 feet above mean sea level. Equipped with windmill.

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

Nov. 2, 1939	63.38	Apr. 24, 1940	64.43	Aug. 27, 1940	64.14
Dec. 28	63.79	May 27	63.52	Sept.24	64.44
Feb. 2, 1940	64.24	June 28	63.72	Oct. 28	64.73
Mar. 26	64.35	July 29	64.93	Nov. 26	64.91

615. Charles Gates. SE¼NE¼ sec. 19, T. 7 S., R. 26 E. In field 200 feet west of 8th Avenue, 0.2 mile south from last house on road, 1.2 miles south from Graham County Courthouse. Used drilled irrigation well, diameter 16 inches, depth 89.2 feet. Measuring point, top of south side of casing, 1.0 foot above land surface and 2,976.37 feet above mean sea level. Equipped with turbine.

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

Nov. 2, 1939	63.29	Apr. 24, 1940	63.50	Sept.24, 1940	64.49
Dec. 28	64.08	June 28	63.46	Oct. 28	64.76
Feb. 5, 1940	64.08	July 29	63.86	Nov. 26	64.93
Mar. 25	64.36	Aug. 27	64.15		

616. Kimball and Greenhalgh. NE¼SW¼ sec.20, T. 7 S., R. 26 E. At rear of yellow frame house, 100 feet east from U. S. Highway 666, 1.6 miles south from Safford. Used drilled domestic well, diameter 6 inches, depth 51 feet. Measuring point, top of south side of casing, 0.5 foot above land surface and 2,964.62 feet above mean sea level. Bench mark, established Jan. 10, 1940, blue cross on top of rock set in concrete, 0.4 foot above land surface, 2 feet southwest from well and 2,964.35 feet above mean sea level. Equipped with hand pump.

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

Oct. 28, 1939	48.01	Apr. 24, 1940	48.68	Aug. 27, 1940	48.98
Nov. 29	48.71	May 27	48.20	Sept.23	49.45
Jan. 10, 1940	49.18	June 27	49.02	Oct. 29	49.73
Feb. 5	49.49	July 25	48.92	Nov. 26	49.90
Mar. 25	49.26				

a Highest water level in period between tape measurements.

Graham County--Continued.

619. Willard Welker. NE¼SW¼ sec. 21, T. 7 S., R. 26 E. South side of San Jose Canal at west side of Stockton Wash, 0.5 mile east from county road, 0.7 mile south from Lone Star Road, 3 miles southeast from Safford. Unused drilled irrigation well, diameter 16 inches, depth 80 feet. Measuring point, top of casing, 1.0 foot above land surface and 2,971.13 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 19	47.17	June 4	45.27	Aug. 15	48.50	Oct. 16	47.94
Feb. 12	46.89	14	49.56		b 48.69		a 47.89
26	44.39		a 45.91	27	48.24	29	47.93
	a 43.95	27	46.30		a 48.14	Nov. 15	47.82
Mar. 19	44.05	29	48.03	Sept.14	48.16		a 47.49
Apr. 11	44.09	July 17	49.64		a 48.09	27	47.78
May 2	44.85		a 47.92	23	48.73		a 47.60
	a 44.35	25	52.84		a 47.72	Dec. 18	47.67
20	44.94		a 47.88		b 49.60		

623. Lee Johns. NE¼NW¼ sec. 22, T. 7 S., R. 26 E. About 200 feet east of filling station at Lone Star. Used drilled irrigation well, diameter 16 inches, depth 90 feet. Measuring point, bottom of hole in west side of casing, 2.0 feet above land surface and 2,951.17 feet above mean sea level. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	29.83	Apr. 24	29.69	Aug. 27	33.18	Oct. 16	31.15
Feb. 12	29.41	May 25	31.11	Sept.23	32.77	28	30.95
Mar. 25	28.49	June 27	32.72	Oct. 8	31.32	Nov. 26	30.44

625. Willard Welker. NE¼SE¼ sec. 22, T. 7 S., R. 26 E. On bank of Montezuma Canal, 0.7 mile south from U. S. Highway 70, 0.7 mile east from Lone Star. Used drilled irrigation well, diameter 16 inches. Measuring point, bottom of slot at northwest side of casing, 0.5 foot above land surface and 2,962.46 feet above mean sea level. Equipped with turbine and diesel engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 19	34.80	May 25	32.53	Aug. 26	36.60	Oct. 28	35.62
Feb. 12	34.43	June 27	33.86	Sept.23	36.20	Nov. 26	35.27
Apr. 24	31.97						

627. Mrs. Nannie Wilson. SW¼NW¼ sec. 24, T. 7 S., R. 26 E. About 100 feet from Montezuma Canal, 0.3 mile south from U. S. Highway 70, 0.8 mile west from Solomonsville. Unused drilled domestic well, diameter 6 inches, depth 29.2 feet. Measuring point, top of north side of casing, 1.8 feet above land surface and 2,966.83 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1939	26.84	May 25, 1940	25.99	Sept.23, 1940	27.51
Feb. 12, 1940	25.29	June 26	28.16	Oct. 28	26.40
Mar. 25	24.39	July 25	c dry	Nov. 26	26.17
Apr. 23	25.56	Aug. 26	28.95		

628. Kempton and Larson. SW¼NW¼ sec. 24, T. 7 S., R. 26 E. On north bank of Montezuma Canal, 0.25 mile south from U. S. Highway 70, 0.7 mile west from Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 98 feet. Measuring point, top of east side of casing, at land surface and 2,966.32 feet above mean sea level. Equipped with turbine and natural gas engine.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 21, 1939	23.46	Apr. 23, 1940	23.57	Sept.23, 1940	24.84
Feb. 12, 1940	22.65	May 25	24.39	Oct. 28	23.94
Mar. 25	21.75	Aug. 26	26.64	Nov. 26	23.61

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.
c Nearby irrigation well pumping.

Graham County--Continued.

630. E. L. Claridge. NE¼NE¼ sec. 24, T. 7 S., R. 26 E. On south bank of Montezuma Canal, 50 feet west from U. S. Highway 70 at north city limits of Solomonsville. Used drilled irrigation well, diameter 20 inches, depth 76 feet. Measuring point, top of west side of casing, 3.0 feet above land surface and 2,967.41 feet above mean sea level. Equipped with turbine and natural gas engine.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 21, 1939	21.14	Oct. 10, 1940	20.71	Nov. 14, 1940	20.12
Feb. 12, 1940	20.73	17	20.55	Dec. 5	19.90
Oct. 3	20.88	31	20.23	19	19.71

632. E. S. Ellsworth. NE¼NE¼ sec. 27, T. 7 S., R. 26 E. About 75 feet west of frame barn, 200 yards west of county road, 1 mile south from U. S. Highway 70, 0.8 mile east from Lone Star. Unused drilled domestic well, diameter 6 inches, depth 56.5 feet. Measuring point, top of south side of casing, 2.2 feet above land surface and 2,984.39 feet above mean sea level. Equipped with windmill. Well caved and measurements discontinued Oct. 1, 1940.

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

Nov. 2, 1939	56.23	Apr. 24, 1940	51.95	July 25	55.83
Jan. 9, 1940	55.18	May 25	52.43	Aug. 27	56.55
Feb. 12	55.14	June 27	53.38	Sept.23	56.33
Mar. 25	53.43				

639. Amos Cook. NW¼SE¼ sec. 31, T. 7 S., R. 26 E. At rear of frame house, end of private road, 0.4 mile west from U. S. Highway 666, 3.5 miles south from Safford. Used drilled domestic and stock well, diameter 4 inches, depth 150 feet. Measuring point, top of wood cover 1 foot south of 2 by 4-inch upright post, at land surface. Equipped with windmill.

Water level, in feet below measuring point, 1940

Feb. 12	35.97	Apr. 25	37.32	Sept.23	38.86
Mar. 25	37.28	Aug. 27	39.48	Oct. 29	36.87

661. Louis Mitchellena. SW¼NW¼ sec. 1, T. 7 S., R. 27 E. About 100 feet south of adobe house, 0.25 mile east from road, 0.25 mile south from south end of San Jose Diversion Dam, 6 miles northeast from Solomonsville. Unused dug domestic well, diameter 48 inches, depth 32.5 feet. Measuring point, top of north side of wood curb, 2.85 feet above land surface and 3,077.98 feet above mean sea level. Broken windmill.

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

Oct. 11, 1939	32.57	Apr. 23, 1940	33.00	Aug. 26, 1940	32.84
Nov. 24	33.01	May 25	33.14	Sept.23	32.83
Feb. 13, 1940	32.56	June 26	33.25	Oct. 28	33.01
Mar. 22	32.05	July 25	33.32	Nov. 26	32.80

662. L. Mitchellena. NE¼NE¼ sec. 2, T. 7 S., R. 27 E. About 1,250 feet south of Gila River, 75 feet west from San Jose River Crossing Road. Used dug observation well, diameter 48 inches, depth 19 feet. Measuring point, bored hole in cover, 1.5 feet above land surface and 3,053.93 feet above mean sea level. Water level recorder used on well from June 29 to Aug. 24 and from Dec. 16 to 31, inclusive.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 6	a 17.94	July 2	18.23	July 13	18.35	July 22	18.46
10	a 18.03	3	18.23	14	18.36	23	18.46
11	a 18.14	4	18.23	15	18.38	24	18.47
22	a 18.23	5	18.25	16	18.39	25	18.48
25	a 18.27	6	18.26	17	18.40	26	18.49
27	a 18.25	9	18.30	18	18.41	27	18.50
29	18.24	10	18.31	19	18.42	28	18.51
30	18.23	11	18.32	20	18.43	29	18.51
July 1	18.22	12	18.33	21	18.44	30	18.52

a Tape measurements.

Graham County--Continued.

662. L. Mitchellena -- Continued.

Daily noon water level, in feet below measuring point, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
July 31	18.52	Aug. 13	18.31	Sept. 5	a 18.22	Dec. 19	17.37
Aug. 1	18.53	14	18.29	12	a 18.09	20	17.35
2	18.52	15	18.26	19	a 18.11	21	17.33
3	18.49	16	18.24	26	a 18.08	22	17.31
4	18.46	17	18.21	Oct. 3	a 18.01	23	17.30
5	18.42	18	18.19	10	a 17.98	24	17.29
6	18.40	19	18.18	17	a 17.98	25	17.27
7	18.39	20	18.16	31	a 18.04	26	17.26
8	18.38	21	18.16	Nov. 14	a 17.94	27	17.23
9	18.37	22	18.16	Dec. 5	a 17.58	28	17.21
10	18.35	23	18.15	16	17.42	29	17.17
11	18.34	24	18.14	17	17.41	30	17.14
12	18.33	29	a 18.16	18	17.38	31	17.09

664. San Jose Canal Co. SW¼NE¼ sec. 2, T. 7 S., R. 27 E. On south bank of San Jose Canal, 0.3 mile north from county road, 0.8 mile west from San Jose Diversion Dam, 6 miles northeast from Solomonsville. Unused drilled irrigation well, diameter 16 inches, depth 35.5 feet. Measuring point, top of casing, 2.0 feet above land surface.

Water level, in feet below measuring point, 1940

Jan. 11	19.91	May 20	18.94	July 25	21.13	Oct. 19	19.90
Feb. 13	18.72	June 1	19.03	Aug. 15	20.46	28	19.84
Mar. 6	18.39	14	19.27		b 19.86		b 19.68
	b 18.26	26	20.00	26	19.89	Nov. 15	19.74
19	18.29		b 19.57	Sept.13	19.67	26	19.61
Apr. 11	17.87	July 17	20.70	23	19.74	Dec. 18	19.23
May 1	18.20		b 20.03	Oct. 17	19.89		

669. S. Molino. SE¼SW¼ sec. 2, T. 7 S., R. 27 E. Behind wood shed 200 feet northwest of county road to San Jose Diversion Dam, 1.0 mile north from U. S. Highway 666, 4.7 miles northeast from Solomonsville. Used dug stock and irrigation well, diameter 48 inches, depth 63 feet. Measuring point, top of south side of concrete curb, 0.3 foot above land surface, and 3,035.98 feet above mean sea level. Equipped with centrifugal pump, gasoline motor. Flowing well 5 feet west.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 11, 1939	17.43	July 25, 1940	17.79	Oct. 28, 1940	16.87
Nov. 24	17.15	Aug. 26	17.38	Nov. 26	16.82
Feb. 13, 1940	16.73	Sept.23	17.03		

674. Louis Mitchellena. NE¼SW¼ sec. 4, T. 7 S., R. 27 E. About 50 feet south of Brown Canal, 200 feet west from pecan orchard, 3.9 miles northeast from Solomonsville. Used drilled irrigation well, diameter 16 inches, depth 81 feet. Measuring point, top of south side of casing, 1.0 foot above land surface. Equipped with turbine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	15.77	May 24	14.38	Aug. 26	15.73	Oct. 16	15.35
Feb. 13	14.63	June 26	15.58	Sept.28	15.46	28	15.46
Mar. 21	13.84	July 26	16.01	Oct. 7	15.43	Nov. 29	15.20
Apr. 23	13.78						

676. Louis Mitchellena. SW¼SE¼ sec. 4, T. 7 S., R. 27 E. Near adobe house and corrals, 200 feet south from county road, 3.7 miles northeast from Solomonsville. Used drilled domestic and stock well, diameter 6 inches, depth 39.7 feet. Measuring point, top of northwest side of casing, 2.3 feet above land surface and 3,007.66 feet above mean sea level. Equipped with windmill.

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a Tape measurements.
b Highest water level in period between tape measurements.

Graham County--Continued.

676. Louis Mitchellena -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 28, 1939	16.84	Apr. 23, 1940	15.04	Aug. 26, 1940	16.55
Nov. 29	16.83	May 24	15.46	Sept.26	16.54
Feb. 13, 1940	15.74	June 26	16.39	Oct. 28	16.52
Mar. 21	15.64	July 26	16.75	Nov. 29	16.17

683. NE¼NW¼ sec. 10, T. 7 S., R. 27 E. About 25 feet south of adobe house, 0.15 mile north from bridge over San Jose Canal wasteway, 4.2 miles northeast from Solomonsville. Used dug domestic well, diameter 36 inches, depth 26 feet. Measuring point, top of north side of wood curb, 2.7 feet above land surface and 3,025.38 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 11, 1939	25.80	May 25, 1940	25.31	Oct. 7, 1940	25.86
Nov. 24	26.04	June 26	25.78	16	26.04
Feb. 13, 1940	24.88	July 25	26.38	28	26.00
Mar. 21	24.52	Aug. 26	26.02	Nov. 26	25.78
May 1	24.67	Sept.23	25.88		

685. Brijido Carrasco. SW¼NW¼ sec. 11, T. 7 S., R. 27 E. In wash near adobe house, 325 feet east of first northeast turn in county road to San Jose Diversion Dam, 4.6 miles northeast from Solomonsville. Used dug domestic well, diameter 48 inches, depth 29.2 feet. Measuring point, top of north side of wood curb, 2.2 feet above land surface and 3,042.62 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 11, 1939	30.03	Apr. 23, 1940	26.98	Aug. 26, 1940	28.40
Nov. 24	28.83	May 25	27.58	Sept.23	28.46
Feb. 13, 1940	26.99	June 26	28.43	Oct. 28	28.28
Mar. 22	27.02	July 25	29.22	Nov. 26	28.51

689. San Jose Canal Co. SW¼SW¼ sec. 16, T. 7 S., R. 27 E. At west end of canal siphon beneath San Jose Wash, 2.2 miles east from Solomonsville. Used drilled irrigation well, diameter 16 inches, depth 115 feet. Measuring point, top of east side of casing, 1.0 foot above land surface. Equipped with turbine and natural gas engine.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	45.15	Apr. 23	47.05	Oct. 7	54.85	Oct. 28	50.50
Feb. 13	44.39	June 26	56.13	16	52.37	Nov. 26	48.14
Mar. 21	42.75						

696. Louis Carrasco. NE¼NE¼ sec. 19, T. 7 S., R. 27 E. About 150 feet west of adobe house, 0.1 mile north from U. S. Highway 70, 1.1 miles east from Solomonsville. Used dug domestic well, diameter 36 inches, depth 24 feet. Measuring point, top of north side of wood curb, 2.7 feet above land surface and 2,979.17 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1939	21.64	Apr. 23, 1940	17.09	Aug. 26, 1940	25.78
Dec. 11	20.05	May 24	19.30	Sept.23	24.84
Feb. 12, 1940	18.47	June 26	22.92	Oct. 28	23.19
Mar. 21	16.45	July 25	(a)	Nov. 26	21.70

a Dry, nearby irrigation well pumping.

Graham County--Continued.

698. Peciano Pena. SE¼NW¼ sec. 18, T. 7 S., R. 27 E. South side of Gila River, 20 feet east of adobe house, 0.2 mile east from Solomonsville Crossing, 0.9 mile north from Solomonsville. Used dug domestic well, diameter 36 inches, depth 12 feet. Measuring point, top of east side of wood curb, 2.5 feet above land surface and 2,963.51 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 14, 1939	13.08	May 24, 1940	(a)	Oct. 7, 1940	13.16
Nov. 24	12.84	June 26	12.02	16	13.25
Feb. 12, 1940	11.43	July 25	12.86	28	12.97
Mar. 21	10.87	Aug. 26	13.59	Nov. 26	12.88
Apr. 23	10.92	Sept.23	13.15		

699. Graham County. SW¼NW¼ sec. 18, T. 7 S., R. 27 E. About 340 feet south of Gila River, 25 feet west of Solomonsville River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 13 feet. Measuring point, top of pipe, 0.9 foot above land surface and 2,956.48 feet above mean sea level.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 18	7.26	b	7.98	Aug. 29	8.73	Oct. 17	8.15
June 10	7.45	July 20	8.27	Sept. 5	9.00	b	7.63
11	7.45	29	8.67	b	6.86	31	7.64
22	7.75	b	8.23	12	6.93	Nov. 14	8.11
25	7.51	Aug. 5	8.30	19	8.89	Dec. 5	7.82
27	7.65	b	8.22	26	8.17	b	7.33
29	7.82	10	8.58	b	7.58	19	7.36
July 5	7.91	15	8.37	Oct. 3	7.70	26	5.70
15	8.40	22	8.52	10	7.99		

700. Graham County. SW¼NW¼ sec. 18, T. 7 S., R. 27 E. About 1,280 feet south of Gila River on east side of Solomonsville River Crossing Road. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 1.25 feet above land surface and 2,957.40 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 20	8.17	July 5	9.39	Aug. 22	11.20	Oct. 10	9.88
June 10	8.38	15	9.84	27	11.58	17	10.12
11	8.39	22	10.07	Sept. 5	12.12	31	8.82
22	8.90	29	10.79	12	8.52	Nov. 14	9.80
25	8.90	Aug. 5	10.83	19	10.05	Dec. 5	9.48
27	9.00	10	11.25	26	10.25	19	8.99
29	9.16	15	11.43	Oct. 3	9.54		

701. Graham County. NW¼SW¼ sec. 18, T. 7 S., R. 27 E. About 1,760 feet south of Gila River on east side of Solomonsville River Crossing Road, inside fence and 75 feet north from Mexican shack. Used driven observation well with sand point, diameter 1 inch, depth 14 feet. Measuring point, top of pipe, 0.55 foot above land surface and 2,957.96 feet above mean sea level.

Water level, in feet below measuring point, 1940

May 20	8.53	July 5	9.50	Aug. 22	11.56	Oct. 10	10.48
June 10	8.77	15	10.07	29	11.49	17	10.45
11	8.77	22	10.62	Sept. 5	11.49	31	10.90
22	8.97	29	11.04	12	10.81	Nov. 14	10.18
25	9.37	Aug. 5	11.55	19	10.65	Dec. 5	9.94
27	9.53	10	11.59	26	10.69	19	9.68
29	9.69	15	11.69	Oct. 3	10.48		

a Dry.
b Highest water level in period between tape measurements.

Graham County--Continued.

702. William Waldrom. SW¼SW¼ sec. 18, T. 7 S., R. 27 E. Behind white house on east side of turn in U. S. Highway 70 at north edge of Solomonsville. Used drilled domestic well, diameter 6 inches, depth 23.7 feet. Measuring point, top of north side of casing, 0.2 foot above land surface and 2,963.09 feet above mean sea level. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1939	16.92	Apr. 23, 1940	15.50	Aug. 26, 1940	18.79
Dec. 11	16.38	May 24	16.36	Sept.23	17.66
Feb. 12, 1940	15.40	June 26	17.79	Oct. 28	16.93
Mar. 21	15.83	July 25	20.82	Nov. 26	16.60

703. William Waldrom. NW¼NW¼ sec. 19, T. 7 S., R. 27 E. On bank of Union Canal, 250 feet east of turn in U. S. Highway 70 at north edge of Solomonsville. Used drilled irrigation well, diameter 16 inches. Measuring point, bottom of north side of pump base, 0.1 foot above land surface and 2,964.21 feet above mean sea level. Equipped with turbine and natural gas engine.

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

Nov. 24, 1939	16.59	May 24, 1940	15.75	Sept.23, 1940	17.70
Feb. 12, 1940	15.37	June 26	17.14	Oct. 28	17.02
Mar. 21	14.40	Aug. 26	18.70	Nov. 26	16.68
Apr. 23	14.85				

705. J. M. Hatfield. NW¼NE¼ sec. 19, T. 7 S., R. 27 E. At rear of burned concrete house, 50 feet north from U. S. Highway 70, 0.7 mile east from Solomonsville. Unused drilled domestic well, diameter 4 inches, depth 22.5 feet. Measuring point, top of southwest side of casing, 0.5 foot above land surface and 2,983.07 feet above mean sea level. Equipped with hand pump.

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

Oct. 14, 1939	21.30	Apr. 23, 1940	20.18	Aug. 26, 1940	20.73
Nov. 24	21.74	May 24	20.40	Sept.23	21.22
Feb. 12, 1940	22.17	June 26	20.43	Oct. 28	21.31
Mar. 21	21.08	July 25	20.15	Nov. 26	21.71

708. Pete Bertaldo. NE¼NE¼ sec. 20, T. 7 S., R. 27 E. About 75 feet east of adobe house, 250 feet south and 0.1 mile west from junction of U. S. Highways 70 and 666, 1.9 miles east from Solomonsville. Unused drilled domestic well, diameter 4 inches, depth 58 feet. Measuring point, top of east side of casing, 0.8 foot above land surface and 3,013.16 feet above mean sea level.

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

Oct. 14, 1939	39.80	May 24, 1940	39.54	Oct. 7, 1940	39.97
Nov. 24	37.52	June 26	39.82	16	39.90
Feb. 13, 1940	39.09	July 25	40.01	28	39.78
Mar. 22	38.75	Aug. 26	39.89	Nov. 26	39.49
Apr. 23	38.99	Sept.23	39.97		

709. E. E. Taylor. NW¼NW¼ sec. 30, T. 7 S., R. 27 E. In pit behind garage, 150 feet south of county road, 250 feet east from road intersection, 0.75 mile south from Solomonsville. Used drilled domestic and stock well, diameter 4 inches, depth 38.5 feet. Measuring point, top of east side of casing, 3.7 feet below land surface and 2,979.24 feet above mean sea level. Equipped with force pump.

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

Oct. 21, 1939	19.18	Apr. 23, 1940	16.66	Aug. 26, 1940	18.60
Jan. 9, 1940	18.19	May 25	17.14	Sept.23	18.75
Feb. 12	18.83	June 26	17.56	Oct. 28	18.92
Mar. 22	18.72	July 25	18.02	Nov. 26	19.02

758. Mrs. E. Harris. NE¼NW¼ sec. 9, T. 8 S., R. 26 E. About 200 feet south of adobe house at end of private road, 1.4 miles east from U. S. Highway 666, 5.2 miles south from Safford. Unused dug domestic well, diameter 48 inches, depth 22.6 feet. Measuring point, top of north side of wood curb, 0.1 foot below land surface.

Graham County--Continued.

758. Mrs. E. Harris -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 12, 1939	21.10	Apr. 25, 1940	19.97	Aug. 27, 1940	21.26
Dec. 28	20.84	May 27	20.19	Sept.23	21.41
Feb. 12, 1940	20.50	June 27	20.55	Oct. 29	21.02
Mar. 26	20.09	July 25	20.85	Nov. 27	21.53

766. Cluff and Montierth. NE¼NE¼ sec. 21, T. 8 S., R. 26 E. About 100 feet north of Swift Trail, 0.25 mile west from Swift Trail Junction. Used dug domestic and stock well, diameter 48 inches, depth 53 feet. Measuring point, top of wood cover at center of well, 2.3 feet above land surface. Equipped with windmill. See well 767 for previous measurements. Water level, in feet below measuring point, 1940: May 27, 49.44; Sept. 23, 48.70; Oct. 29, 48.30; Nov. 27, 52.17.

767. J. W. Bell. NW¼NW¼ sec. 20, T. 8 S., R. 26 E. At rear of store at Swift Trail Junction. Used dug domestic well, diameter 42 inches, depth 46.5 feet. Measuring point, top of pipe tee, 2.5 feet above land surface. Equipped with windmill. Measurements discontinued. See well 766 for further measurements.

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

Oct. 28, 1939	46.83	Feb. 12, 1940	44.40	Apr. 25, 1940	44.59
Dec. 15	44.47	Mar. 26	45.59	May 27	44.79

791. Howard Olsen. SW¼SE¼ sec. 16, T. 8 S., R. 27 E. On Olsen Ranch 3 miles north of Southern Pacific Railroad depot at Haeckel, 4.9 miles southeast from Solomonsville. Used dug stock well, diameter 40 inches, depth 40.8 feet. Measuring point, top of pipe clamp at center of well, 0.5 foot above land surface. Equipped with windmill.

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

Nov. 21, 1939	30.27	Apr. 25, 1940	31.71	Sept.10, 1940	31.00
Dec. 15	30.35	July 3	32.12	Dec. 6	30.59
Feb. 14, 1940	30.93				

792. Howard Olsen. NW¼SW¼ sec. 21, T. 8 S., R. 27 E. On Olsen Ranch 1.75 miles northwest of Southern Pacific Railroad depot at Haeckel, 6.2 miles southeast from Solomonsville. Used dug stock well, diameter 48 inches, depth 39 feet. Measuring point, top of south side of concrete curb, 0.25 feet above land surface. Equipped with windmill.

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

Oct. 21, 1939	33.90	Apr. 25, 1940	33.45	Sept.10, 1940	33.50
Dec. 15	33.68	July 3	32.96	Dec. 6	32.63
Feb. 14, 1940	33.55				

793. Howard Olsen. SW¼NE¼ sec. 20, T. 8 S., R. 27 E. On Olsen Ranch, 2.35 miles northeast of Southern Pacific Railroad depot at Haeckel, 5.6 miles southeast from Solomonsville. Unused drilled stock well, diameter 5 inches, depth 67 feet. Measuring point, top of west side 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
Feb. 14	47.24	July 3	47.80		b 48.97		a 47.58
Apr. 25	47.07		a 47.75	Sept.10	48.20	Dec. 6	47.64
	a 47.13						

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

GREENLEE COUNTY

Duncan Valley

By H. M. Babcock

An investigation of the ground-water resources of the Duncan-Virden Valley of the upper Gila River was begun in October 1939, at which time observation on the water levels in wells were begun. Records of water levels in Virden Valley, which is in Hidalgo County, New Mexico, are given in the New Mexico section of this volume. Measurements of water level have been made about one a month in 39 wells from October 1, 1939 to January 1, 1941. A total of 482 individual measurements, including those wells in Hidalgo County, New Mexico, were made in this period.

The quantity of water pumped from wells and the average monthly rainfall in the valley are given in the accompanying table:

Water pumped from wells in acre feet in Queen Creek and adjacent areas, 1939-40

	Pumpage	Precipitation		Pumpage	Precipitation
January	29.9	0.49	July	499.2	0.92
February	32.0	1.85	August	749.2	1.05
March	48.8	.36	September	271.3	1.90
April	74.8	.50	October	168.4	.10
May	150.3	.42	November	99.6	2.78
June	313.0	.99	December	.....	2.53

The precipitation was about normal during the early part of 1940, but in November and December it was much above normal. There were small net gains in water levels in wells from January 1, 1940 to January 1, 1941 (see accompanying illustration), but net declines probably would have occurred had not the precipitation near the end of 1940 been high. That the seasonal lowering of water levels during the summer in the regions of heavy pumping was overcome by the recharge during the late fall and early winter is shown by the hydrographs of wells 61 and 133. The hydrographs of well 232 in Hidalgo County and well 6 in Greenlee County are typical of fluctuations in shallow wells along the river bottom that are unaffected by pumping. The hydrograph of well 171, Greenlee County, shows a seasonal lowering of water level during the summer followed by a recovery of the water level caused by recharge from the flow of a nearby wash. Well 201, Hidalgo County, is near the Gila River just above the heavily pumped area. Well 104, Greenlee County, is near the middle of the valley and its hydrograph shows summer depletion and subsequent recharge from lateral percolation; the well is not near heavily pumped areas.

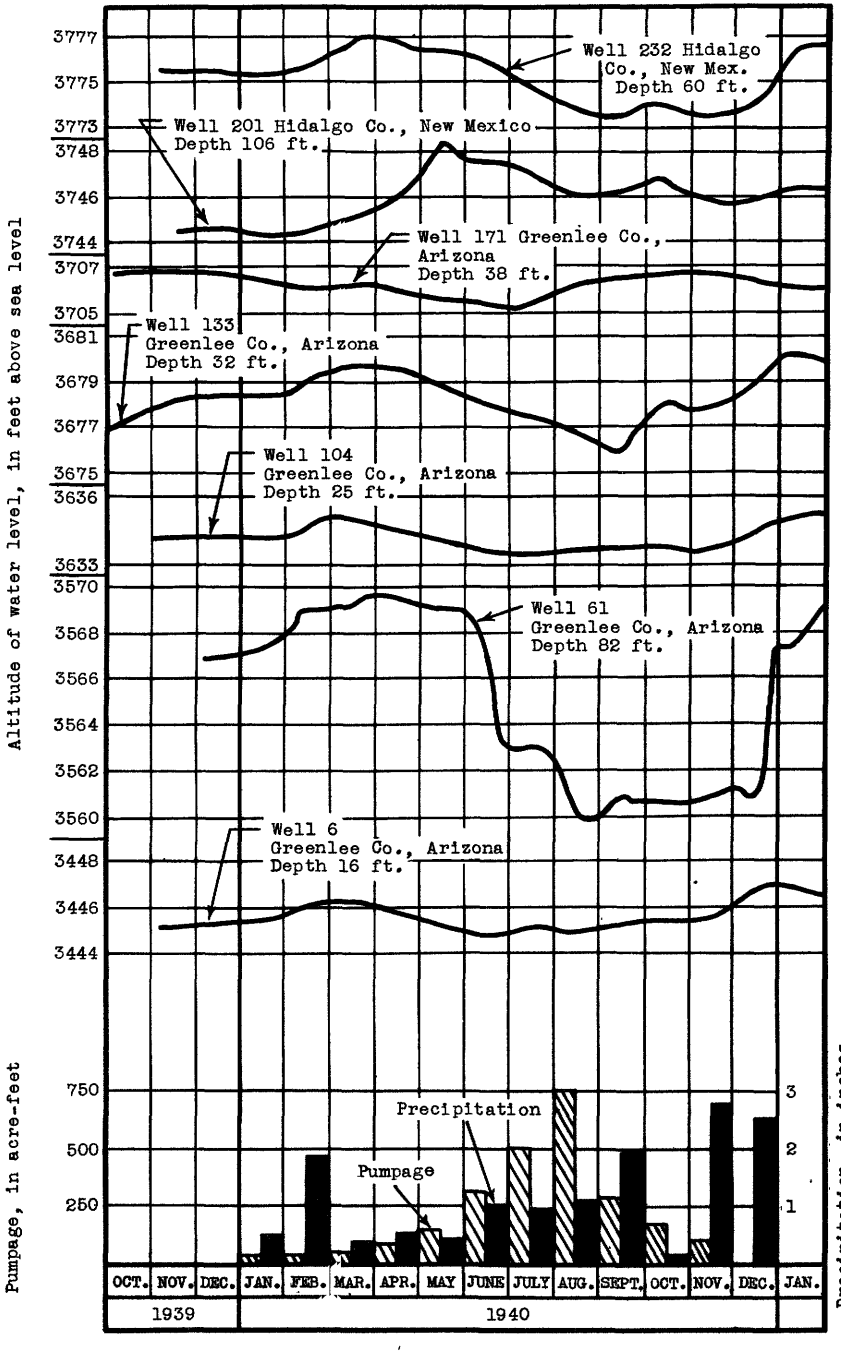

Figure 3.--Graphs showing fluctuations of water level in observation wells in the Duncan-Virden Valley, Greenlee County, Ariz., and Hidalgo County, N. Mex.

Greenlee County--Continued.

In the following tables water levels are expressed in feet below the measuring points. The highest and lowest water levels that are given for some periods were obtained with maximum-minimum strip recorders.

6. Warner Foote. SE¼NW¼ sec. 7, T. 6 S., R. 31 E. 20 feet north of small mound, 700 feet south of CCC camp, 0.5 mile west from State Highway 75, 3.5 miles north from York. Unused dug domestic well, diameter 36 inches, depth 16.1 feet. Measuring point, blue arrow near post, top of south curb, 2.5 feet above land surface and 3,460.44 feet above mean sea level. Bench mark, established Dec. 6, 1939, screw in horizontal root of large mesquite tree, 146 feet north from well 6, 3,460.06 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 7, 1939	15.15	June 4, 1940	15.58	Sept.30, 1940	15.10
Dec. 7	15.09	July 1	15.59	Oct. 17	14.95
Jan. 31, 1940	14.98		a 15.19	29	14.98
Mar. 1	14.25	Aug. 8	15.56		a 14.31
26	14.32	Sept. 5	15.37	Dec. 2	14.36
May 1	14.93				

12. Wilton. NW¼NW¼ sec. 20, T. 6 S., R. 31 E. 20 feet north of house, 500 feet west from State Highway 75, 1.3 miles north from York. Used dug domestic well, diameter 48 inches, depth 26 feet. Measuring point, south side top of pipe clamp, 0.5 foot above land surface. Equipped with windmill. Water levels, in feet below measuring point, 1940: Sept. 30, 23.45; Oct. 29, 23.95; Dec. 2, 23.06.

13. Arizona State Highway Department. SE¼NW¼ sec. 20, T. 6 S., R. 31 E. 60 feet east of State Highway 75, 1.3 miles north from York and 1.4 miles south from Cottonwood Wash. Unused dug domestic well, diameter 30 inches, depth 36.7 feet. Measuring point, blue arrowmark at center top of east wood curb, 2.7 feet above land surface and 3,502.12 feet above mean sea level. Well filled up by State Highway Department, Aug., 1940. For further measurements see well 12.

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

Nov. 7, 1939	36.18		a 34.76	June 4, 1940	35.86
Dec. 6	35.92	Mar. 1, 1940	34.85	July 1	36.13
Jan. 31, 1940	35.66	26	34.73	Aug. 8	36.68
Feb. 6	35.20	May 1	35.20		

14. Victor Rowden. SW¼NW¼ sec. 29, T. 6 S., R. 31 E. 10 feet west of tin shed, 200 feet west of State Highway 75, 0.2 mile south from York. Used drilled irrigation well, diameter 12 inches, depth 70 feet. Measuring point, east side top of casing, 0.3 foot above land surface and 3,508.81 feet above mean sea level. Equipped with turbine pump and 30 horsepower gasoline engine, capacity 400 gallons a minute.

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

Dec. 6, 1939	34.22	July 1, 1940	33.70	Sept.30, 1940	34.87
Jan. 31, 1940	33.92	Aug. 8	34.50	Oct. 29	34.48
Mar. 1	32.90	Sept. 5	35.19	Dec. 2	34.63
June 4	33.51				

31. Jack Merritt. SW¼NW¼ sec. 4, T. 7 S., R. 31 E. 10 feet south of tin barn, 75 feet west from State Highway 75, 0.9 mile south from Apache Creek and 2.0 miles south from York. Used drilled irrigation well, diameter 20 inches. Measuring point, ⅛-inch hole in east side of base, 0.6 foot above land surface and 3,544.99 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Measured discharge, 2,250 gallons a minute, June 15, 1940.

/ a Highest water level in period between tape measurements.

Greenlee County--Continued.

31. Jack Merritt -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 6, 1939	26.87	Apr. 30, 1940	29.00	Sept.30, 1940	28.22
Jan. 31, 1940	27.17	July 1	28.08	Oct. 17	28.71
Mar. 1	26.45	Aug. 8	28.50	29	28.03
26	27.13	Sept. 5	28.80	Dec. 2	27.65

36. Mussett Cosper. NE¼NW¼ sec. 16, T. 7 S., R. 31 E. 20 feet east of irrigation canal, 250 feet west from State Highway 75, 1.65 miles north from Sheldon. Used drilled domestic well, diameter 12 inches, depth 26.6 feet. Measuring point, east side top of casing, 1.6 feet above land surface and 3,550.36 feet above mean sea level. Equipped with hand pump.

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

Nov. 7, 1939	13.87	June 4, 1940	14.60	Oct. 10, 1940	18.80
Dec. 5	13.44	July 1	17.02	17	18.75
Jan. 31, 1940	13.20	Aug. 8	17.95	24	18.87
Mar. 1	11.75	Sept. 5	19.43	29	18.86
26	12.56	Oct. 1	18.75	Dec. 2	19.16
Apr. 30	12.57				

43. Ernest Campbell. NE¼SW¼ sec. 21, T. 7 S., R. 31 E. 30 feet west of house, 500 feet southwest from Sheldon Railroad Station, 800 feet west from Sheldon suspension bridge, 0.5 mile west from State Highway 75. Used dug domestic well, diameter 54 inches, depth 38.2 feet. Measuring point, top of wood curb by south post, 2.1 feet above land surface and 3,572.56 feet above mean sea level. U. S. Coast and Geodetic Survey bench mark P-73, established 1934, brass cap set in concrete block 100 feet east of Sheldon station house and 3,565.58 feet above mean sea level. Equipped with rope and bucket.

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

Nov. 6, 1939	36.11	Apr. 30, 1940	26.60	Oct. 1, 1940	34.34
Dec. 4	34.90	June 4	26.63	17	34.46
Jan. 31, 1940	33.55	July 1	30.02	29	34.60
Mar. 1	30.40	Aug. 8	32.70	Dec. 2	35.06
26	28.13	Sept. 5	34.02		

49. W. M. Zumwalt. NE¼NW¼ sec. 34, T. 7 S., R. 31 E. 100 feet north of house, 150 feet west from irrigation canal, 0.15 mile west from State Highway 75, 1.9 miles southeast from Sheldon. Used drilled domestic well, diameter 8 inches, depth 59.5 feet. Measuring point, green arrow painted on east side top of casing, 0.6 feet above land surface and 3,593.68 feet above mean sea level. Equipped with hand pump.

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

Nov. 6, 1939	54.08	Apr. 30, 1940	45.24	Oct. 1, 1940	50.95
Dec. 5	52.19	June 4	44.84	17	51.10
Jan. 31, 1940	49.84	July 1	47.73	29	51.17
Mar. 1	48.10	Aug. 8	50.10	Dec. 2	51.20
26	49.27	Sept. 5	50.58		

61. Franklin Irrigation District Test Well 2. M. W. McKelvey. SW¼NE¼ sec. 3, T. 8 S., R. 31 E. 600 feet north of house, 0.6 mile northwest from junction of old highway with new State Highway 75, 3.1 miles southeast from Sheldon. Unused drilled test well, diameter 6 inches, depth 82.5 feet. Measuring point, green arrow painted on east side top of casing, 0.8 foot above land surface and 3,599.15 feet above mean sea level.

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

Dec. 4, 1939	32.35	Apr. 30, 1940	29.94	Sept. 5, 1940	39.21
Jan. 31, 1940	31.20	June 4	30.35		a 38.16
Feb. 6	30.23	July 1	36.36	Oct. 1	38.60
	a 30.14		a 36.29	17	38.50
Mar. 1	30.19	Aug. 8	37.60	29	38.57
26	29.54		b 39.33	Dec. 2	37.83
	a 29.49				

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Greenlee County--Continued.

63. Franklin Irrigation District Test Well 1. M. W. McKelvey. NE¼SE¼ sec. 3, T. 8 S., R. 31 E. 20 feet east of Colmenero Canal, 600 feet south from house, 0.4 mile northwest from junction of old highway with new State Highway 75, 3.1 miles southeast from Sheldon. Unused drilled test well, diameter 6 inches, depth 105 feet. Measuring point, east side of top of casing, 2.9 feet above land surface and 3,608.51 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 6, 1939	66.93	Mar. 26, 1940	52.63	Sept. 5, 1940	62.08
Dec. 4	60.58	Apr. 30	51.20	Oct. 1	63.68
Jan. 1, 1940	55.90		a 50.80	17	64.21
Feb. 6	55.36	June 4	50.90	29	64.39
Mar. 1	54.25	July 1	56.46	Dec. 2	64.23
	a 52.49	Aug. 8	60.44		

66. Franklin Irrigation District Well 4. SW¼NE¼ sec. 11, T. 8 S., R. 31 E. 20 feet east of Colmenero canal, 300 feet east of Gila River, 0.3 mile west from State Highway 75, 4.0 miles northwest from Duncan. Used drilled irrigation well, diameter 20 inches, depth 71 feet. Measuring point, air-line hole in east side of pump base, 4.0 feet above land surface, and 3,622.07 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Measured discharge 1,980 gallons a minute, Aug., 1940. Drawdown, 35 feet after pumping 2,800 gallons a minute for 12 hours. Water levels, in feet below measuring point, 1940: Jan. 31, 12.30; Apr. 30, 8.69; July 1, 14.95; Sept. 11, 19.48.

68. Franklin Irrigation District Test Well 10. SW¼NE¼ sec. 11, T. 8 S., R. 31 E. 600 feet northeast of head of Colmenero Canal, 0.1 mile southwest from State Highway 75, 4.0 miles northwest from Duncan. Unused drilled test well, diameter 6 inches, depth 60 feet. Measuring point, top of casing, 8.1 feet above land surface and 3,627.58 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Dec. 12, 1939	13.42	Mar. 26, 1940	11.64	Oct. 1, 1940	20.10
Jan. 31, 1940	15.65	Apr. 30	12.95		a 18.54
Feb. 6	12.94	June 4	14.08	17	18.78
	a 11.08	July 1	18.27	29	20.50
Mar. 1	11.13	Aug. 8	22.16	Dec. 2	19.60

69. Franklin Irrigation District Well 3. NW¼SE¼ sec. 11, T. 8 S., R. 31 E. At head of Colmenero Canal, 100 feet east from Gila River, 0.3 mile southwest from State Highway 75, 4.0 miles northwest from Duncan. Used drilled irrigation well, diameter 20 inches, depth 75 feet. Measuring point, air-line hole in pump base on east side, 4.0 feet above land surface and 3,624.30 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Measured discharge 1,250 gallons a minute, Aug., 1940. Drawdown, 33 feet after pumping 2,020 gallons a minute for 12 hours. Water levels in feet below measuring point, 1940: Jan. 31, 9.68; Apr. 30, 7.87; Sept. 11, 16.04.

72. J. C. Campbell. SE¼SE¼ sec. 12, T. 8 S., R. 31 E. 30 feet northwest of house, 300 feet south from State Highway 75, 2.7 miles northwest from Duncan. Used dug domestic well, diameter 40 inches, depth 60 feet. Measuring point, top of west wood curb beside post, 2.7 feet above land surface and 3,663.0 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1939	49.65	Apr. 30, 1940	45.85	Nov. 1, 1940	49.90
Dec. 2	49.33	June 4	47.80	17	48.43
Jan. 31, 1940	46.64	July 1	47.45	29	48.84
Mar. 1	46.30	Aug. 8	49.06	Dec. 2	48.26
26	45.68	Sept. 11	49.38		

a Highest water level in period between tape measurements.

Greenlee County--Continued.

92. Raymond Davis. SW¼SE¼ sec. 17, T. 8 S., R. 32 E. 20 feet east of house, 0.25 mile east from East Camp Road, 0.6 mile northeast from State Highway 75, 1.3 miles north from Duncan. Used dug domestic well, diameter 50 inches, depth 70.9 feet. Measuring point, top of 6 by 6-inch timber across top of well on north side, 0.6 foot above land surface and 3,704.73 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1939	67.36	Apr. 30, 1940	69.00	Oct. 1, 1940	67.20
Dec. 1	68.39	June 4	69.09	17	68.86
Jan. 31, 1940	67.76	July 1	67.65	29	67.68
Mar. 1	67.97	Aug. 8	68.30	Dec. 2	67.84
26	67.75	Sept.11	67.40		

96. L. Deane. NW¼NW¼ sec. 19, T. 8 S., R. 32 E. 15 feet south of house, 0.2 mile west from State Highway 75, 0.7 mile northwest from Duncan. Used dug domestic well, diameter 50 inches, depth 30.5 feet. Measuring point, red arrow painted on bottom edge of concrete curb on northwest side, 0.6 foot below land surface and 3,653.98 feet above mean sea level. Equipped with windmill.

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

Oct. 23, 1939	27.66	Apr. 29, 1940	27.16	Oct. 1, 1940	28.27
Nov. 28	27.71	June 3	28.00	17	28.14
Jan. 30, 1940	27.52	July 2	28.72	28	28.45
Feb. 29	27.05	Aug. 7	29.01	Dec. 3	27.92
Mar. 26	26.70	Sept.10	28.60		

100. W. M. Zumwalt. SW¼SE¼ sec. 19, T. 8 S., R. 32 E. 10 feet west of house, on slope at edge of lower terrace, 200 feet northwest from junction of old and new U. S. Highway 70, at southeast city limits of Duncan. Used dug domestic well, diameter 48 inches, depth 36.5 feet. Measuring point, top center of wood curb on east side, 0.5 foot above land surface, and 3,668.78 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 10, 1939	31.18	Apr. 29, 1940	31.18	Oct. 1, 1940	32.40
Nov. 27	31.44	June 3	31.56	17	32.30
Jan. 30, 1940	31.57	July 2	32.52	28	32.30
Feb. 29	30.50	Aug. 7	33.46	Dec. 3	31.81
Mar. 26	30.18	Sept.10	32.71		

104. Bill Cosper. NE¼NE¼ sec. 19, T. 8 S., R. 32 E. 20 feet west of house, 150 feet west from State Highway 75, 0.6 mile north from Duncan. Used dug domestic well, diameter 48 inches, depth 24.8 feet. Measuring point, top of wood curb at northwest corner post, 2.7 feet above land surface and 3,659.44 feet above mean sea level. Equipped with rope and bucket.

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

Nov. 3, 1939	25.34	Apr. 30, 1940	25.18	Oct. 1, 1940	25.74
Dec. 1	25.24	June 4	25.76	17	25.68
Jan. 31, 1940	25.23	July 1	26.05	29	25.93
Mar. 1	24.28	Aug. 8	26.05	Dec. 2	25.55
26	24.77	Sept.11	25.80		

111. Franklin Irrigation District Well 8. SE¼SW¼ sec. 28, T. 8 S., R. 32 E. 10 feet south of canal, 2.5 miles east from gate, 1.3 miles east from U. S. Highway 70, 3.0 miles southeast from Duncan. Used drilled irrigation well, diameter 20 inches, depth 77 feet. Measuring point, air-line hole in base of pump, 4.2 feet above land surface and 3,671.67 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Measured discharge, 1,350 gallons a minute, Aug., 1940. Drawdown, 30 feet after pumping 1,580 gallons a minute for 12 hours.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 29	8.55	June 3	10.50	Oct. 1	9.84	Oct. 28	10.07
Mar. 26	8.07	July 2	10.66	17	9.91	Dec. 3	9.45
Apr. 29	9.80	Sept.10	10.05				

Greenlee County--Continued.

115. J. D. Wilkins. SE¼NW¼ sec. 29, T. 8 S., R. 32 E. 50 feet north of small wash, 50 feet northeast from U. S. Highway 70, 1.2 miles southeast from Duncan. Used dug and drilled domestic well, diameter 50 inches to depth of 12 feet, diameter 6 inches, total depth 26.9 feet. Measuring point, top of wood curb west side, 1.4 feet above land surface and 3,666.08 feet above mean sea level. Equipped with pump.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 6, 1939	12.08	Mar. 26, 1940	12.87	Aug. 7, 1940	16.79
27	15.38	Apr. 29	12.70	Sept.10	14.64
Jan. 30, 1940	15.26	June 3	13.50	Oct. 28	13.48
Feb. 29	14.28	July 2	14.63		

120. D. E. Wilkins. NE¼NW¼ sec. 32, T. 8 S., R. 32 E. 200 feet west of house, 700 feet west from U. S. Highway 70, 0.85 mile southeast from intersection of Arizona & New Mexico Railroad with U. S. Highway 70, 1.85 miles southeast from Duncan. Unused dug domestic well, diameter 40 inches, depth 17.6 feet. Measuring point, top of north curb, 1.2 feet above land surface and 3,691.72 feet above mean sea level. Bench mark, established Nov. 27, 1939, green cross on rock in curb on west side of well, 3,691.37 feet above mean sea level.

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

Oct. 23, 1939	13.38	Apr. 29, 1940	12.45	Nov. 1, 1940	14.63
Nov. 27	13.12	June 3	12.80	17	14.69
Jan. 30, 1940	11.98	July 2	14.85	28	14.27
Feb. 29	11.76	Aug. 7	15.14	Dec. 3	14.30
Mar. 27	11.60	Sept.10	14.75		

122. Delbert Moyers. SE¼SW¼ sec. 32, T. 8 S., R. 32 E. 50 feet south of house, 100 feet south from dirt road, 0.3 mile west from U. S. Highway 70, 2.5 miles southeast from Duncan. Used drilled domestic well, diameter 4 inches, depth 110 feet. Measuring point, top of casing on north side, 1.25 feet above land surface and 3,717.0 feet above mean sea level. Equipped with hand pump.

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

Oct. 6, 1939	32.16	June 3, 1940	a 35.20	Oct. 1, 1940	32.27
Nov. 27	32.17	July 2	32.14	17	32.89
Jan. 30, 1940	32.18	Aug. 7	31.82	28	32.60
Feb. 29	32.66	Sept.10	33.70	Dec. 3	31.80
Apr. 29	a 33.18				

125. V. L. Crotts. SE¼SW¼ sec. 33, T. 8 S., R. 32 E. 15 feet south of house, 600 feet north from county road, 0.4 mile east from U. S. Highway 70, 3.2 miles southeast from Duncan. Unused dug domestic well, diameter 30 inches, depth 30 feet. Measuring point, mark on plank at northeast corner of curb, 0.8 foot above land surface and 3,712.22 feet above mean sea level. Bench mark, established Nov. 25, 1939, green cross at west end of culvert, 600 feet south from well, 3,714.29 feet above mean sea level. Equipped with rope and bucket.

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

Oct. 6, 1939	26.50	Apr. 29, 1940	22.77	Oct. 1, 1940	21.73
Nov. 27	23.08	June 3	23.55	10	24.02
Jan. 30, 1940	23.44	July 2	27.65	28	23.72
Feb. 29	23.59	Aug. 7	28.09	Dec. 3	23.95
Mar. 27	23.57	Sept.10	24.70		

131. Franklin Irrigation District Well 2. SW¼NE¼ sec. 34, T. 8 S., R. 32 E. 30 feet east of canal, 40 feet north from Duncan-Virden Road, 0.5 mile west from Arizona-New Mexico line. Used drilled irrigation well, diameter 20 inches, depth 92 feet. Measuring point, airline hole in pump base, at land surface and 3,698.01 feet above mean sea level. Bench mark, established July 11, 1940, top of pipe over canal, 100 feet south of well 131, 3,697.46 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Measured discharge, 1,370 gallons a minute, Aug., 1940. Drawdown 28 feet after pumping 1,740 gallons a minute for 12 hours.

a Pump recently used.

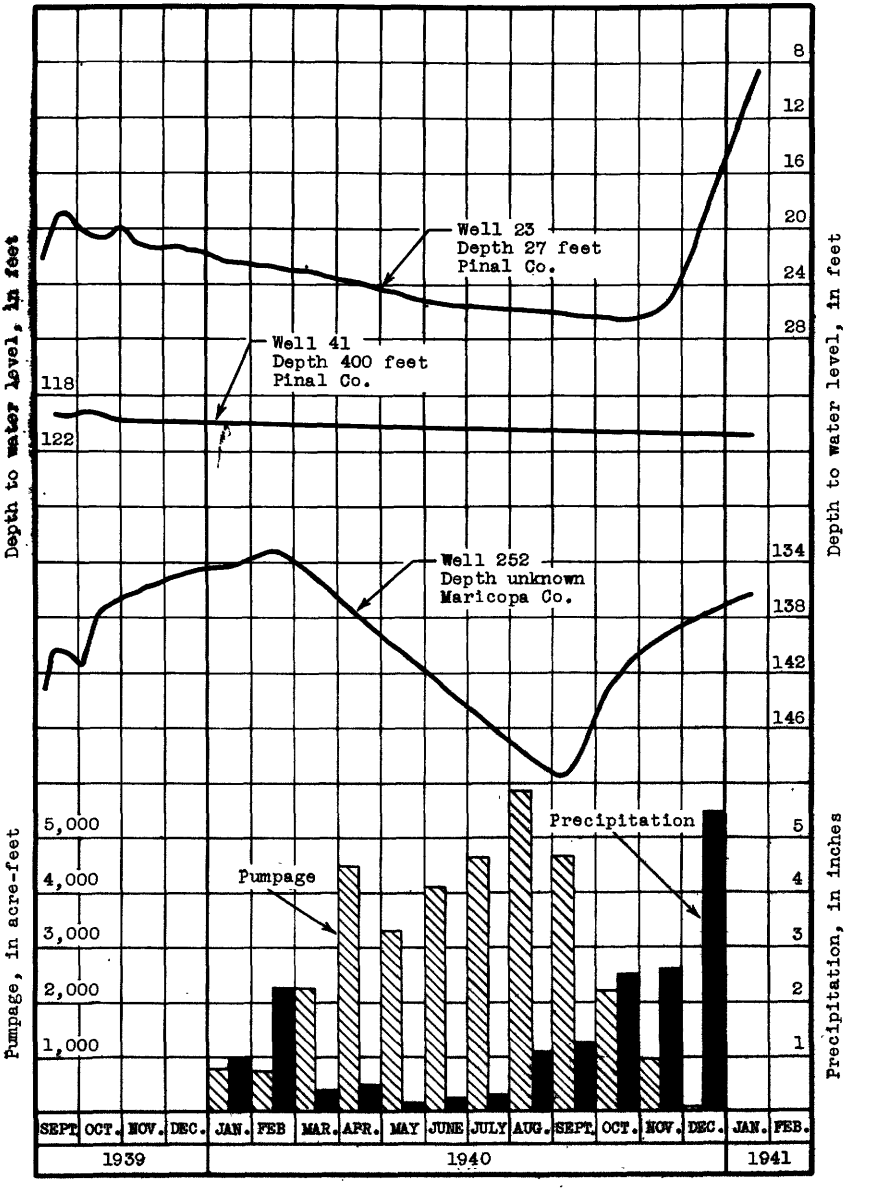

Figure 4.--Graphs showing fluctuations of water level in observation wells in the Queen Creek area, Maricopa and Pinal Counties, Ariz.

Greenlee County--Continued.

131. Franklin Irrigation District Well 2. -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 22, 1939	20.24	Apr. 30, 1940	18.90	Oct. 2, 1940	21.00
Jan. 30, 1940	20.12	June 4	22.60	28	20.67
Feb. 29	19.10	July 3	24.27	Dec. 2	20.35
Mar. 26	18.26	Sept.11	22.60		

133. Floyd McDaniels. SE¼SW¼ sec. 34, T. 8 S., R. 32 E. 80 feet west of house, 100 feet north from county road, 1.8 miles east from U. S. Highway 70, 4.2 miles southeast from Duncan. Used dug and drilled irrigation well, diameter 60 inches to depth of 10 feet diameter 12 inches, total depth 32 feet. Measuring point, top of steel bar east side, in pit, 3.5 feet below land surface, and 3,684.65 feet above mean sea level. Equipped with centrifugal pump.

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

Oct. 6, 1939	7.53	Apr. 29, 1940	4.36	Oct. 1, 1940	7.48
Nov. 27	6.39	June 3	6.37	17	6.47
Jan. 30, 1940	6.26	July 2	7.03	28	6.85
Feb. 29	5.06	Aug. 7	7.65	Dec. 3	6.35
Mar. 27	4.90	Sept.10	8.82		

136. Franklin Irrigation District Well 1. SE¼NE¼ sec. 34, T. 8 S., R. 32 E. 10 feet north of canal, 50 feet west from Carlyle Wash, 200 feet north from Virden Road. 5.2 miles southeast from Duncan. Used drilled irrigation well, diameter 20 inches, depth 89 feet. Measuring point, air-line hole in pump base, 0.5 foot above land surface and 3,726.64 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Drawdown, 20.5 feet after pumping 1,500 gallons a minute for 12 hours.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	41.98	July 3	42.74	Oct. 10	43.03	Oct. 28	43.03
Feb. 29	40.79	Aug. 9	44.00	18	43.40	Nov. 5	42.70
Apr. 30	40.18	Sept.11	44.40	25	43.34	Dec. 2	42.82
June 3	41.32	Oct. 2	42.92				

160. Franklin Irrigation District Well 7. NE¼NE¼ sec. 3, T. 9 S., R. 32 E. 300 feet south of Gila River, 500 feet west of Arizona-New Mexico State Line, 2.2 miles east from Franklin. Used drilled irrigation well, diameter 20 inches, depth 77 feet. Measuring point, air-line hole in pump base, 4.0 feet above land surface and 3,693.96 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Drawdown, 39 feet after pumping 2,920 gallons a minute for 12 hours. Water levels, in feet below measuring point, 1940: Feb. 29, 7.41; Sept. 10, 13.40.

161. Franklin Irrigation District Well 6. NE¼NE¼ sec. 3, T. 9 S., R. 32 E. 200 feet south of Gila River, 200 feet west of Arizona-New Mexico State line, 2.2 miles east from Franklin. Used drilled irrigation well, diameter 20 inches, depth 80 feet. Measuring point, air-line hole in pump base, 4.5 feet above land surface and 3,693.97 feet above mean sea level. Equipped with turbine pump and 150 horsepower diesel engine. Drawdown, 49 feet after pumping 1,780 gallons a minute for 12 hours.

Water level, in feet below measuring point, 1940

Feb. 29	7.41	June 3	8.72	Oct. 1	10.20	Oct. 28	9.55
Mar. 27	7.45	July 2	9.20	17	9.65	Dec. 3	10.19
Apr. 29	7.95	Sept.10	12.74				

Greenlee County--Continued.

162. Franklin Irrigation District Well 5. NE¼NE¼ sec. 3, T. 9 S., R. 32 E. 50 feet west of Arizona-New Mexico State line, 600 feet south of Gila River, 2.2 miles east from Franklin. Used drilled irrigation well, diameter 20 inches, depth 89 feet. Measuring point, air-line hole in pump base, 0.5 foot above land surface and 3,703.60 feet above mean sea level. Equipped with turbine pump, and 150 horsepower diesel engine. Drawdown, 40 feet after pumping 1,500 gallons a minute for 12 hours. Water levels, in feet below measuring point, 1940: June 3, 17.82; Sept. 10, 21.85.

171. NE¼NW¼ sec. 9, T. 9 S., R. 32 E. 200 feet southwest of U. S. Highway 70, 0.5 mile southeast from Franklin. Unused dug domestic well, diameter 36 inches, depth 37.8 feet. Measuring point, top of wood curb at southeast side, 1.9 feet above land surface and 3,744.81 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 6, 1939	38.02	Apr. 29, 1940	39.15	Oct. 1, 1940	38.26
Nov. 25	38.08	June 3	39.36	17	38.20
Jan. 30, 1940	38.55	July 2	39.69	28	38.10
Feb. 29	38.78	Aug. 7	38.81	Dec. 3	38.35
Mar. 27	38.62	Sept.10	38.40		

PINAL AND MARICOPA COUNTIES

Queen Creek Area

By E. M. Cushing and H. M. Babcock

The Queen Creek area is delineated on the east by the Pinal Mountains, on the south by the Santan Mountains, on the west by the Roosevelt Water Conservation District and on the north by the Superstition Mountains. Ground water is withdrawn from the area for irrigation and is replenished chiefly from the intermittent flows of Queen Creek and smaller streams. The water levels in 46 wells have been measured about once a month since the investigation was begun. A total of 500 individual measurements of water level were made to January 1, 1941. A continuous water-stage recorder was installed on a well in the Queen Creek area in 1940. The highest water levels for several periods in well 3 and lowest water levels for several periods in wells 89 and 100 were obtained with maximum-minimum strip recorders.

The quantity of water pumped for irrigation in the Queen Creek and adjacent areas is given in the accompanying table:

Water pumped from wells in acre-feet in Queen Creek and adjacent areas, 1939-40

	Bulldog Superstition Area	Queen Creek Irrigation District		Roosevelt Water Conservation District		Chandler Heights Citrus District	
	1940	1939	1940	1939	1940	1939	1940
Jan.	336.2	328.4	701.9	648.2	2,420.6	20.5	111.2
Feb.	118.2	480.8	707.1	1,369.3	1,877.6	52.5	83.3
Mar.	456.7	1,591.4	2,149.1	5,736.7	8,067.7	131.3	312.6
Apr.	692.6	2,905.0	4,240.8	7,388.7	8,576.6	169.3	360.6
May	724.3	2,156.3	3,101.1	7,947.7	9,368.6	323.2	426.5
June	888.9	2,752.2	3,914.7	8,328.7	8,839.7	417.7	536.5
July	806.6	4,225.3	4,422.2	9,551.8	4,921.4	398.4	506.7
Aug.	1,006.5	4,162.6	5,529.1	9,156.9	7,759.8	378.3	441.7
Sept.	941.8	1,921.6	3,983.0	1,986.4	9,084.1	248.7	502.9
Oct.	574.5	1,224.3	1,632.6	4,959.6	7,133.6	192.8	198.4
Nov.	264.4	800.0	772.4	4,083.8	1,803.7	195.9	128.4
Dec.	171.2	400.0	85.0	3,021.3	970.2	100.3	5.2

Water is apparently being withdrawn in excess of the rate of replenishment, as is indicated by a progressive decline of water levels in outlying wells. There is a seasonal lowering of the water table in the western end of the district occasioned by heavy pumping. (See hydrograph of well 252 in accompanying illustration.) When pumping stops, however, water levels in this part of the district rise as a result of recharge from underground percolation from outlying areas. The decline caused by the pumping is thus spread over the entire area. (See hydrograph of well 41.) The winter of 1940 was much wetter than the winters of previous years and pumping requirements have been reduced and the recharge has been increased. Water levels in relatively shallow wells in the valley of Queen Creek near the base of the base of the Pinal Mountains rose sharply during the latter part of 1940. (See hydrograph of well 23.)

In the following tables water levels are given in feet below the measuring points.

Maricopa County

3. Elias Habeeb. NE¼SE¼ sec. 3, T. 1 N., R. 6 E. About 75 feet west of county road, 3.0 miles north of U. S. Highway 80, 9.7 miles west of Apache Junction. Unused drilled irrigation well, diameter 20 inches, depth 492 feet. Measuring point, top of casing, 1.5 feet above land surface and 1,402.11 feet above mean sea level. Bench mark, established Jan. 19, 1940, chisel mark on southwest side concrete base of metal power line pole across road from well, 1,402.21 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 10, 1939	230.30	Apr. 1, 1940	229.88		a 233.13
Dec. 21	230.64		a 229.71	July 27	235.01
Jan. 15, 1940	229.65	May 10	231.69	Sept. 6	235.82
Feb. 23	228.79		a 231.10	Oct. 21	235.71
	a 228.43	June 13	234.00		

a Highest water level in period between tape measurements.

Maricopa County--Continued.

6. Roosevelt Water Conservation District. NE¼NE¼ sec. 9, T. 1 N., R. 6 E. On east bank of canal, 2.7 miles northwest of intersection of canal with U. S. Highway 80, 6.0 miles east of Mesa city limits. Used drilled irrigation well, diameter unknown, depth 255 feet. Measuring point, bottom of flange on pump base, at land surface and 1,348.43 feet above mean sea level. Bench mark, established Jan. 17, 1940, chisel mark on southwest corner of weir box 10 feet south of well and 1,349.77 feet above mean sea level. Equipped with turbine and electric motor. Water levels, in feet below measuring point: Nov. 6, 1939, 182.09, Jan. 15, 1940, 181.50; Feb. 23, 1940, 177.90.

10. Win Wylie. NW¼NE¼ sec. 15, T. 1 N., R. 6 E. About 100 feet west of lumber shack on county road, 0.3 mile east of Roosevelt Water Conservation District Canal, 1.5 miles northwest of intersection of canal with U. S. Highway 80, 6.0 miles east of Mesa city limits. Used drilled irrigation well, diameter 18 inches. Measuring point ½-inch hole on west side of casing, at land surface and 1,358.11 feet above mean sea level. Bench mark, established Jan. 19, 1940, chisel mark on northwest corner concrete base of pump house, 1,357.37 feet above mean sea level. Equipped with turbine and 75 horsepower electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 10, 1939	193.00	Feb. 23, 1940	188.96	June 13, 1940	198.32
Dec. 21	190.98	Apr. 1	192.29	Sept. 6	199.08
Jan. 15, 1940	189.99	May 10	196.16	Oct. 21	201.68

18. J. Assyd. SE¼NE¼ sec. 21, T. 1 N., R. 6 E. About 200 feet north of U. S. Highway 80, 5.0 miles east of Mesa city limits. Used drilled domestic well, diameter 6 inches. Measuring point, top of casing, 0.8 foot above land surface and 1,302.58 feet above mean sea level. Bench mark, established Jan. 18, 1940, top of concrete base at well casing, 0.8 foot above land surface and 1,302.58 feet above mean sea level. Equipped with cylinder pump and electric motor.

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

Oct. 24, 1939	136.53	Feb. 23, 1940	135.45	July 27, 1940	143.00
Nov. 7	137.43	Apr. 1	137.79	Sept. 6	144.46
Dec. 21	136.98	May 9	140.60	Oct. 21	146.75
Jan. 15, 1940	135.86	June 13	142.54		

19. E. D. Edwards. NE¼NE¼ sec. 28, T. 1 N., R. 6 E. About 0.75 mile south of U. S. Highway 80, 5.0 miles east of Mesa city limits. Unused drilled domestic well, diameter 6 inches, depth 135.1 feet. Measuring point, top of casing at land surface and 1,294.48 feet above mean sea level. Bench mark, established Jan. 18, 1940, top of bolt holding cross bracing to bottom of water tank support, at southeast corner, 7 feet from well and 1,294.23 feet above mean sea level. Equipped with cylinder pump.

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

Oct. 24, 1939	128.75	Feb. 23, 1940	128.20	July 27	(a)
Nov. 7	129.60	Apr. 1	129.71	Sept. 6	(a)
Dec. 21	128.71	May 9	132.71	Oct. 21	(a)
Jan. 15, 1940	128.84	June 12	134.52		

62. Evans Blewett. SW¼SW¼ sec. 21, T. 1 N., R. 7 E. At the "Knolls", 0.3 mile south of U. S. Highway 80, 10.5 miles east of Mesa city limits. Used drilled domestic well, diameter 6 inches, depth 406 feet. Measuring point, top of concrete pump base southeast side, 0.4 foot above land surface. Equipped with cylinder pump and gasoline engine.

Water level, in feet below measuring point, 1940

Apr. 4	289.07	June 13	291.26	Sept. 7	291.48
May 10	289.80	July 27	290.72	Oct. 22	292.29

a Well dry.

Maricopa County--Continued.

68. Schmitt. NW¼SE¼ sec. 23, T. 1 N., R. 7 S. About 0.3 mile south of U. S. Highway 80, 3.2 miles west of Apache Junction. Used drilled domestic well, diameter 8 inches. Measuring point, bottom of flange on pump base, 1.5 feet above land surface and 1,584.94 feet above mean sea level. Bench mark, established Dec. 27, 1939, top of concrete base at southwest corner, 1.5 feet above land surface and 1,584.94 feet above mean sea level. Equipped with cylinder pump and gas engine.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 4, 1939	301.75	May 10, 1940	302.07	Sept. 7, 1940	302.44
Dec. 27	301.86	June 13	302.07	Oct. 22	302.58
Apr. 4, 1940	301.88				

84. W. A. Anderson. SW¼SE¼ sec. 11, T. 1 S., R. 7 E. About 1.8 miles northeast from county road, 6.5 miles north from Rittenhouse siding. Used dug domestic well, diameter 60 inches, depth 212 feet. Measuring point, top of wood plank on concrete curb, 0.5 foot above land surface and 1,447.59 feet above mean sea level. Equipped with cylinder pump and gasoline engine.

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

Aug. 29, 1939	175.01	Oct. 31, 1939	175.02	May 8, 1940	175.26
Sept. 5	174.95	Nov. 14	175.10	June 11	175.33
19	175.22	Jan. 15, 1940	175.17	July 26	175.34
27	175.13	Feb. 20	175.26	Sept. 5	175.44
Oct. 2	174.98	Apr. 2	175.44	Oct. 26	175.50
17	175.10				

87. Mrs. Gardner. NW¼NW¼ sec. 18, T. 1 S., R. 7 E. About 0.4 mile west of Roosevelt Water Conservation District Canal, 6.0 miles east from Gilbert. Used drilled domestic well, diameter 6 inches, depth unknown. Measuring point, top of 2 by 6-inch plank at top of casing, at land surface and 1,326.67 feet above mean sea level. Bench mark, established Jan. 13, 1940, nail driven in power line pole 150 feet north of well, 2.0 feet above land surface and 1,328.33 feet above mean sea level.

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

Oct. 24, 1939	114.60	Apr. 1, 1940	115.39	July 27, 1940	115.88
Jan. 15, 1940	114.75	May 9	115.49	Sept. 6	116.14
Feb. 22	115.10	June 12	115.69	Oct. 21	116.47

89. NE¼SE¼ sec. 18, T. 1 S., R. 7 E. About 10 feet west of county road, 0.5 mile east from Roosevelt Water Conservation District Canal, 7 miles east from Gilbert. Unused drilled irrigation well, diameter 16 inches, depth 211 feet. Measuring point, top of casing, northwest side, 0.3 foot above land surface and 1,348.23 feet above mean sea level.

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

Aug. 29, 1939	112.10	Nov. 14, 1939	112.33	May 9, 1940	112.82
Sept. 5	112.12	Dec. 18	112.46		a 113.03
19	112.15	Jan. 15, 1940	112.50	June 12	112.97
27	112.18	Feb. 20	112.50	July 26	113.19
Oct. 2	112.20	21	112.49	Sept. 5	113.39
17	112.24	Apr. 3	112.63	Oct. 26	113.60
31	112.29		a 112.86		

94. "Old Clifford Place". NE¼NE¼ sec. 21, T. 1 S., R. 7 E. In pit 200 feet west from county road, 5.5 miles north from Rittenhouse siding. Unused drilled irrigation well, diameter 16 inches, depth 176 feet. Measuring point, top of wood cover, south side casing, 5.7 feet below land surface and 1,387.38 feet above mean sea level. Bench mark, established Dec. 12, 1939, top of 1½-inch pipe in southeast corner of concrete block, 30 feet south of well and 1,394.12 feet above mean sea level.

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

Aug. 30, 1939	125.16	Oct. 31, 1939	125.36	Apr. 9, 1940	129.87
Sept. 5	125.21	Nov. 14	125.37	June 12	125.96
19	125.20	Jan. 12, 1940	125.60	July 25	126.05
27	125.22	Feb. 20	125.66	Sept. 4	126.17
Oct. 2	125.30	Apr. 2	125.79	Oct. 25	126.28
17	125.32				

a Lowest water level in period between tape measurements.

Maricopa County--Continued.

100. A. W. Kelly. SW¼SE¼ sec. 25, T. 1 S., R. 7 E. Near old house, 100 feet north of desert road, 7.5 miles east from Higley. Unused dug and drilled stock well, diameter 48 inches to depth of 77 feet, from 77 feet to 160 feet diameter 8 inches. Measuring point, top of board over center of well, 0.5 foot above land surface and 1,442.30 feet above mean sea level. Bench mark, established Dec. 7, 1939, staple set in concrete on south side 10 by 15-foot water tank, 1.5 feet above land surface and 1,443.91 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Aug. 29, 1939	146.70	Oct. 31, 1939	146.73	June 11, 1940	147.47
Sept. 6	146.73	Nov. 14	146.80		a 147.70
19	146.75	Dec. 18	146.98	July 26	147.60
27	146.64	Apr. 2, 1940	147.24	Sept. 5	147.74
Oct. 2	146.66	May 8	147.38	Oct. 26	147.91
18	146.69				

101. Gardiner. NE¼SE¼ sec. 25, T. 1 S., R. 7 E. About 25 feet east of water tank, 100 feet west of Pinal-Maricopa County line, 8 miles east and 0.5 mile north from Higley. Used drilled stock well, diameter 6 inches, depth 170 feet. Measuring point, top of casing south side, 0.3 foot above land surface and 1,460.17 feet above mean sea level. Bench mark, established Dec. 9, 1939, chisel mark 3 feet west of southeast corner of concrete tank, 15 feet west of well and 1,460.97 feet above mean sea level. Equipped with cylinder pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Aug. 29, 1939	161.26	Oct. 31, 1939	161.36	May 8, 1940	161.29
Sept. 6	161.28	Nov. 14	161.46	June 11	161.43
19	161.30	Dec. 18	161.58	July 26	161.48
27	161.30	Jan. 15, 1940	161.64	Sept. 5	161.59
Oct. 2	161.33	Feb. 20	161.11	Oct. 26	161.80
17	161.33	Apr. 2	161.19		

102. Florence McEntire. NE¼NE¼ sec. 33, T. 1 S., R. 7 E. About 20 feet south of three large tanks, 150 feet west from graded county road, 3.5 miles north from Rittenhouse siding. Used drilled stock well, diameter 8 inches, depth 135 feet. Measuring point, top of casing collar west side, 1.5 feet above land surface and 1,384.78 feet above mean sea level. Bench mark, established Dec. 7, 1939, brass cap at top of iron pipe marking corner common to sections 27, 28, 33, 34, T. 1 S., R. 7 E., about 1 foot above land surface and 1,383.70 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Aug. 29, 1939	113.15	Oct. 31, 1939	113.46	May 8, 1940	114.22
Sept. 5	113.20	Nov. 14	113.58	June 11	114.39
19	113.25	Dec. 18	113.68	July 26	114.60
27	113.27	Jan. 15, 1940	113.76	Sept. 5	114.83
Oct. 2	113.34	Feb. 20	113.85	Oct. 25	115.09
17	113.39	Apr. 2	114.07		

122. Roosevelt Water Conservation District. NW¼NE¼ sec. 2, T. 1 S., R. 6 E. About 50 feet south of Base Line Road, 1 mile west from Roosevelt Water Conservation District Canal, 2 miles north and 4.5 miles east from Gilbert. Used drilled irrigation well, depth 285 feet. Measuring point, top of casing at land surface and 1,308.06 feet above mean sea level. Bench mark, established Jan. 17, 1940, chisel mark top of culvert headwall 40 feet northwest of well and 1,309.07 feet above mean sea level. Pump installed in Mar., 1940, and measurements discontinued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 23, 1939	144.07	Dec. 21, 1939	143.70	Feb. 22, 1940	142.09
Nov. 7	144.17	Jan. 15, 1940	142.72		

a Lowest water level in period between tape measurements.

Maricopa County--Continued.

125. J. C. Jenkins. NW¼NW¼ sec. 12, T. 1 S., R. 6 E. About 25 feet northeast of house, 75 feet east from county road, 4 miles north and 1 mile east from Higley. Used drilled domestic well, diameter 6 inches. Measuring point, east side top of casing, at land surface and 1,307.27 feet above mean sea level. Bench mark, established Jan. 16, 1940, chisel mark in southeast corner of concrete motor and tank base, about 1 foot above land surface and 1,306.72 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 24, 1939	143.12	Feb. 22, 1940	141.53	July 27, 1940	149.09
Nov. 7	143.02	Apr. 1	144.88	Sept. 6	151.82
Dec. 21	143.37	May 9	148.29	Oct. 21	152.73
Jan. 15, 1940	141.65	June 12	149.95		

128. Roosevelt Water Conservation District. SE¼SW¼ sec. 14, T. 1 S., R. 6 E. About 25 feet north of county road, 2.2 miles northeast from Higley. Used drilled irrigation well, depth 350 feet. Measuring point, bottom of flange at south side of pump base, at land surface and 1,293.42 feet above mean sea level. Bench mark, established Jan. 16, 1940, chisel mark in south wing wall of valve box, 75 feet west of well and 1,294.30 feet above mean sea level. Equipped with turbine and 50 horsepower electric motor.

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

Oct. 24, 1939	109.78	Feb. 22, 1940	109.20	July 26, 1940	112.50
Nov. 7	109.39	Apr. 1	110.49	Sept. 6	115.63
Dec. 21	108.95	May 9	111.76	Oct. 21	115.10
Jan. 15, 1940	110.30	June 12	115.00		

130. F. Lockhart. SE¼SW¼ sec. 23, T. 1 S., R. 6 E. About 70 feet north of house, 125 feet north from county road, 1.0 miles northeast from Higley. Used drilled domestic well, diameter 6 inches, depth 200 feet. Measuring point ½-inch round hole, north side casing, 1.0 foot above land surface and 1,299.85 feet above mean sea level. Bench mark, established Jan. 11, 1940, chisel mark on south side of concrete motor base, 3 feet east of well and 1,299.04 feet above mean sea level.

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

Oct. 24, 1939	87.20	Feb. 22, 1940	88.53	July 26, 1940	89.61
Nov. 7	87.48	Apr. 1	88.98	Sept. 6	89.91
Dec. 21	88.15	May 9	89.27	Oct. 21	90.26
Jan. 15, 1940	88.40	June 12	89.50		

136. Roosevelt Water Conservation District. NE¼NE¼ sec. 25, T. 1 S., R. 6 E. About 0.3 mile west of Roosevelt Water Conservation District Canal, 2 miles northeast from Higley. Used drilled irrigation well. Measuring point, bottom of flange at north side of pump base, 2.0 feet above land surface and 1,326.13 feet above mean sea level. Bench mark, established Jan. 11, 1940, spike in power line pole, 150 feet east of well, 2.0 feet above land surface and 1,327.91 feet above mean sea level. Equipped with turbine and electric motor.

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

Oct. 24, 1939	99.11	Dec. 21, 1939	105.35	Feb. 22, 1940	98.24
Nov. 7	101.07	Jan. 15, 1940	98.32		

151. Roosevelt Water Conservation District. SW¼SE¼ sec. 13, T. 2 S., R. 5 E. About 50 feet north of county road, 0.5 mile west from paved county road, 7 miles south from Gilbert. Used drilled irrigation well, diameter 20 inches, depth 250 feet. Measuring point, bottom of flange on south side of pump base, at land surface and 1,248.55 feet above mean sea level. Bench mark, established Jan. 2, 1940, chisel mark on southeast corner of concrete weir box, 15 feet east of well and 1,250.86 feet above mean sea level. Equipped with turbine and 75 horsepower electric motor.

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

Oct. 16, 1939	55.15	Dec. 20, 1939	54.50	Feb. 22, 1940	54.51
Nov. 2	54.92	Jan. 15, 1940	54.19	Oct. 25	59.54

Maricopa County--Continued.

155. Harris. SW¼NE¼ sec. 25, T. 2 S., R. 5 E. About 10 feet east of house, 40 feet east from private road, 0.5 mile northeast of county road, 9 miles south from Gilbert. Unused dug domestic well, diameter 48 inches. Measuring point, top of plank cover west side, 1,251.28 feet above mean sea level. Bench mark, established Dec. 29, 1939, nail in south side of tamarisk tree, 30 feet east of well, 1 foot above land surface and 1,251.68 feet above mean sea level.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 10, 1939	34.10	Feb. 22, 1940	36.96	July 25, 1940	33.84
Nov. 2	34.61	Apr. 3	36.64	Sept. 6	34.08
Dec. 20	35.94	May 9	36.15	Oct. 25	35.53
Jan. 15, 1940	36.35	June 12	34.78		

164. Roosevelt Water Conservation District. SE¼NW¼ sec. 5, T. 2 S., R. 6 E. About 50 feet north from private road, 0.5 mile west from county road, 2.7 miles southwest from Higley. Used drilled irrigation well, diameter 20 inches, depth 356 feet. Measuring point, 3/4-inch hole in south side of casing, at land surface and 1,273.05 feet above mean sea level. Bench mark, established Jan. 10, 1940, chisel mark on southwest corner concrete weir box 10 feet north of well and 1,274.62 feet above mean sea level. Equipped with turbine and 75 horsepower electric motor.

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

Oct. 16, 1939	83.87	Jan. 15, 1940	78.2	Sept. 6, 1940	90.56
Dec. 21	78.8	July 25	84.82		

170. A. Sanford. SE¼SW¼ sec. 3, T. 2 S., R. 6 E. In shed, 15 feet north of house, 100 feet north from county road, 2 miles south and 0.5 mile west from Higley. Used drilled domestic well, diameter 4 inches. Measuring point, top of casing at west side of land surface and 1,302.46 feet above mean sea level. Bench mark, established Jan. 9, 1940, top of southeast corner of lower step, 20 feet south of well and 1,302.82 feet above mean sea level.

Water level, in feet below measuring point, 1927-1939-40

June 24, 1927 a	88.0	Jan. 15, 1940	87.66	June 12, 1940	89.36
Oct. 6, 1939	87.48	Feb. 22	88.23	July 25	89.41
Nov. 2	86.72	Apr. 1	88.73	Sept. 6	89.94
Dec. 21	87.62	May 9	88.82	Oct. 21	90.67

177. J. O. Power. SE¼NW¼ sec. 12, T. 2 S., R. 6 E. About 10 feet south of used irrigation well, 50 feet south from house, 0.5 mile west from county road, 3 miles southeast from Higley. Unused drilled irrigation well, diameter 20 inches. Measuring point, top of casing north side of well at land surface.

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

Sept. 14, 1939	112.51	Jan. 15, 1940	110.80	July 25, 1940	114.59
Oct. 3	112.63	Feb. 23	111.10	Oct. 24	115.67
18	112.25				

185. Gephart. SE¼SE¼ sec. 8, T. 2 S., R. 6 E. In shed, 50 feet west of house, 150 feet west from county road, 5 miles southeast from Chandler. Used drilled domestic well, diameter 20 inches, depth 100 feet. Measuring point, top of pump base board on north side, at land surface and 1,283.39 feet above mean sea level.

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

Oct. 7, 1939	91.47	Feb. 22, 1940	88.05	July 25, 1940	95.56
Nov. 2	91.48	Apr. 3	90.86	Sept. 6	97.16
Dec. 21	89.41	May 9	93.10	Oct. 25	98.63
Jan. 15, 1940	87.95	June 12	94.72		

a Measurement reported by owner.

Maricopa County--Continued.

205. A. J. Schlesinger. SE¼SW¼ sec. 24, T. 2 S., R. 6 E. In field, 0.5 mile west from Chandler Heights Road, 5 miles southeast from Higley. Used drilled irrigation well, diameter 18 inches. Measuring point, top of casing at northeast side, 0.5 foot above land surface and 1,350.44 feet above mean sea level. Bench mark, established Dec. 15, 1939, nail in north post of transformer platform on power line pole and 1,351.34 feet above mean sea level. Equipped with turbine and 100 horsepower electric motor.

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

Oct. 4, 1939	108.24	Jan. 15, 1940	103.67	June 12, 1940	120.63
18	107.40	Feb. 21	104.81	July 25	120.41
Nov. 18	105.36	May 9	114.46	Oct. 24	114.84
Dec. 20	104.50				

208. H. O. Backer. SE¼NE¼ sec. 20, T. 2 S., R. 6 E. About 10 feet north of shed, 75 feet west from house, 150 feet west from county road, 4.7 miles southwest of Higley. Unused drilled domestic well, diameter 4 inches. Measuring point, top of casing, south side, at land surface and 1,288.23 feet above mean sea level.

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

Oct. 7, 1939	77.77	Feb. 22, 1940	76.68	July 25, 1940	a 82.40
Nov. 2	76.96	Apr. 3	a 81.48	Sept. 6	a 84.14
Dec. 21	76.60	May 9	a 81.51	Oct. 25	a 84.48
Jan. 15, 1940	76.61				

217. Chandler Heights Citrus Irrigation District. SW¼SE¼ sec. 36, T. 2 S., R. 6 E. About 100 feet north of county highway, 0.9 mile west of Chandler Heights. Used drilled irrigation well, diameter 20 inches, depth 310 feet. Measuring point, bottom of 2-inch pipe on northeast side of pump, 0.5 foot above land surface and 1,448.70 feet above mean sea level. Bench mark, established Dec. 28, 1939, chisel mark on west corner of valve box, 1,451.77 feet above mean sea level. Equipped with turbine and 125 horsepower electric motor.

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

Sept. 2, 1939	186.75	Nov. 18, 1939	185.80	May 9, 1940	186.56
15	185.80	Dec. 20	184.98	June 12	187.59
Oct. 3	186.30	Jan. 15, 1940	184.65	July 25	188.86
10	186.68	Feb. 21	184.17	Sept. 5	190.03
Nov. 1	185.76	Apr. 3	185.36	Oct. 25	189.24

218. Fitzgerald. SE¼NW¼ sec. 34, T. 2 S., R. 6 E. About 0.5 mile north of county road, 3.0 miles west from Chandler Heights. Used drilled irrigation well, diameter 18 inches. Measuring point, 1-inch round hole north side pump base, 0.4 foot above land surface. Equipped with turbine and gasoline engine.

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

Oct. 18, 1939	92.82	Dec. 18, 1939	91.40	June 12, 1940	97.46
Nov. 1	92.07	Feb. 23, 1940	92.12	July 25	98.38
18	93.16	Apr. 3	95.62		

221. Roosevelt Water Conservation District. NE¼NE¼ sec. 31, T. 2 S., R. 6 E. About 0.95 mile north of Pinal-Maricopa County line, 3.9 miles east from State Highway 87, 6.5 miles southeast from Chandler. Used drilled irrigation well, diameter 20 inches. Measuring point, bottom of pump flange south side, 1 foot above land surface and 1,268.54 feet above mean sea level. Bench mark, established Dec. 30, 1939, chisel mark on northwest corner of weir box 15 feet north of well and 1,269.78 feet above mean sea level. Equipped with turbine and 50 horsepower electric motor.

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

Oct. 16, 1939	52.34	Jan. 15, 1940	50.01	July 25, 1940	54.53
Nov. 2	52.70	Feb. 21	50.29	Oct. 25	58.98
Dec. 20	50.84				

a Well 300 feet distant pumping.

Maricopa County--Continued.

252. Barnes. SE¼SE¼ sec. 9, T. 2 S., R. 7 E. About 0.5 mile north of Magma Arizona Railroad, 0.5 mile north from Rittenhouse siding. Used drilled irrigation well, diameter 20 inches. Measuring point, bottom of pump flange, south side, 0.5 foot above land surface and 1,402.06 feet above mean sea level. Bench mark, established Dec. 7, 1939, chisel mark on south side pump base near air gage and 1,402.06 feet above mean sea level. Equipped with turbine and 100 horsepower electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Sept. 6, 1939	143.2	Oct. 31, 1939	136.77	Feb. 20, 1940	133.41
14	140.45	Nov. 16	135.95	May 8	139.98
Oct. 2	141.74	Dec. 20	134.75	Sept. 5	a 149.50
17	137.55	Jan. 15, 1940	134.30	Oct. 24	141.16

254. W. J. Germann. SE¼NE¼ sec. 7, T. 2 S., R. 7 E. About 0.3 mile southwest of Magma Arizona Rialroad, 2.1 miles northwest of Rittenhouse siding. Unused dug and drilled irrigation well, depth 210 feet. Measuring point, edge of angle iron, east side, at land surface and 1,361.20 feet above mean sea level. Bench mark, established Dec. 14, 1939, chisel mark on west of corner concrete box, 20 feet southeast of well and 1,364.17 feet above mean sea level.

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

Aug. 30, 1939	b 131.70	Oct. 3, 1939	118.32	Dec. 18, 1939	116.55
Sept.14	121.60	17	119.28	Jan. 15, 1940	116.27
19	117.80	Nov. 1	118.41	June 12	125.98
27	117.84	18	117.52	Oct. 16	124.15

260. Lawrence Ellsworth. SE¼SE¼ sec. 16, T. 2 S., R. 7 E. About 300 feet north of Ellsworth store, 0.5 mile south of Rittenhouse siding. Used drilled irrigation well, diameter 24 inches. Measuring point, bottom of tin can opening on east side, 0.3 foot above land surface and 1,406.51 feet above mean sea level. Equipped with turbine and 100 horsepower electric motor.

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

Aug. 31, 1939	145.45	Oct. 17, 1939	139.05	Jan. 15, 1940	137.75
Sept.14	139.47	Nov. 16	137.82	Feb. 20	137.49
Oct. 3	139.52	Dec. 18	136.68	Oct. 24	142.39

261. Higley Ward School. NW¼NW¼ sec. 15, T. 2 S., R. 7 E. About 0.45 mile north of Magma and Arizona Railroad siding at Rittenhouse. Used drilled public service well, diameter 6 inches, depth 220 feet. Measuring point, top of wood pump base south side, 1,400.97 feet above mean sea level. Bench mark, established Dec. 7, 1939, nail driven in power line pole with transformer, near school, 0.5 mile north of Rittenhouse and 1,403.95 feet above mean sea level.

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

Aug. 30, 1939	139.93	Feb. 20, 1940	132.41	July 26, 1940	b 140.55
Sept. 5	139.82	Apr. 2	b 135.40	Sept. 5	142.82
14	138.9	June 11	b 137.54	Oct. 24	140.17
19	138.47				

271. Sossaman Bros. NE¼NE¼ sec. 19, T. 2 S., R. 7 E. About 100 feet south of frame house, 250 feet south of county road, 2.0 miles west of Ellsworth store at Rittenhouse. Used drilled irrigation well, diameter 24 inches, depth 500 feet. Measuring point, top of metal base, west side, 1 foot above land surface and 1,373.76 feet above mean sea level. Bench mark, established Dec. 13, 1939, chisel mark on southwest corner of pump base, 1,373.63 feet above mean sea level. Equipped with turbine and 100 horsepower electric motor.

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

Sept.15, 1939	133.34	Dec. 18, 1939	128.35	May 9, 1940	136.50
Oct. 3	134.15	Feb. 21, 1940	128.19	Oct. 24	136.39
Nov. 1	132.35				

a Pump shut down 5 hours.
b Nearby well pumping.

Maricopa County--Continued.

273. Leo Ellsworth. SE¼NE¼ sec. 28, T. 2 S., R. 7 E. About 200 feet west of county road, 1.5 miles south of Ellsworth store at Rittenhouse. Used drilled irrigation well, diameter 24 inches. Measuring point, bottom of flange on pump base at land surface and 1,409.05 feet above mean sea level. Bench mark, established Oct. 11, 1939, chisel mark on northwest corner of concrete pump base, 1,409.76 feet above mean sea level. Equipped with turbine and 125 horsepower electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Sept.14, 1939	145.05	Feb. 23, 1940	131.37	Sept. 4, 1940	148.54
Dec. 18	140.26	Apr. 2	134.11	Oct. 24	139.27
Jan. 15, 1940	131.35	May 8	136.23		

279. Southern Pacific Railroad. SE¼SE¼ sec. 25, T. 2 S., R. 7 E. About 50 feet west of railroad at Queen Creek siding. Used drilled railroad well. Measuring point, bottom of hole in east side of casing, 3.3 feet below land surface and 1,453.38 feet above mean sea level.

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

Aug. 21, 1939	145.07	Oct. 19, 1939	145.65	Apr. 2, 1940	144.73
Sept.13	145.20	30	145.13	May 8	145.56
20	145.33	Nov. 14	145.95	June 11	145.65
28	145.51	Jan. 14, 1940	145.85	Oct. 23	147.28
Oct. 3	145.62				

Pinal County

1. Rose. SE¼SE¼ sec. 31, T. 1 N., R. 8 E. On Rose Ranch, 2.6 miles southwest of Apache Junction. Used drilled stock well, diameter 6 inches. Measuring point, bottom of hole in south side of casing at land surface.

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

Oct. 25, 1939	269.65	Jan. 16, 1940	270.08	May 10, 1940	270.18
Nov. 16	269.94	Feb. 21	270.52	Oct. 22	270.43
Dec. 27	269.99	Apr. 4	270.02		

22. Hart Mullins. NW¼SE¼ sec. 35, T. 1 S., R. 10 E. On Mullins Ranch, 0.1 mile from north bank of Queen Creek, 3.8 miles northeast of Florence Junction. Unused dug domestic well, diameter 48 inches, depth 33 feet. Measuring point, top east side wood curb, 0.3 foot above land surface.

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

Aug. 28, 1939	20.51	Oct. 19, 1939	19.20	Apr. 1, 1940	24.46
Sept. 5	20.91	30	19.02	May 8	25.94
15	18.00	Nov. 14	19.59	June 11	27.42
21	17.90	Dec. 27	20.80	July 27	28.28
26	18.34	Jan. 13, 1940	21.45	Sept. 7	28.79
Oct. 2	19.05	Feb. 20	22.82	Oct. 22	29.15

23. Hart Mullins. NW¼SE¼ sec. 35, T. 1 S., R. 10 E. On Mullins Ranch, 0.1 mile from north bank of Queen Creek, 3.8 miles northeast of Florence Junction. Used dug stock well, diameter 48 inches, depth 27 feet. Measuring point, top inner edge of angle iron, east side, at land surface. Equipped with centrifugal pump and gasoline engine.

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

Aug. 28, 1939	21.54	Oct. 19, 1939	20.65	Apr. 1, 1940	23.79
Sept. 5	22.03	30	19.77	May 8	24.60
15	19.19	Nov. 14	21.38	June 11	25.35
21	18.97	Dec. 27	21.75	July 27	25.87
26	19.30	Jan. 13, 1940	22.29	Sept. 7	26.20
Oct. 2	19.92	Feb. 20	22.65	Oct. 22	26.41

Pinal County--Continued.

24. Jack Gray. NW¼SW¼ sec. 35, T. 1 S., R. 10 E. About 0.15 mile north of north bank of Queen Creek and 3.5 miles northeast of Florence Junction. Used drilled domestic and stock well, diameter 8 inches, depth 102 feet. Measuring point, notch in top of casing, east side, 2.0 feet above land surface. Equipped with cylinder pump and windmill.

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

Date	Water level	Date	Water level	Date	Water level
Aug. 28, 1939	44.65	Oct. 19, 1939	44.55	May 8, 1940	47.43
Sept. 5	44.75	30	43.97	June 11	48.39
15	43.73	Dec. 27	44.69	July 27	49.55
21	43.33	Jan. 13, 1940	45.08	Sept. 7	50.15
26	43.20	Feb. 20	45.45	Oct. 22	51.12
Oct. 2	44.34	Apr. 1	46.36		

32. L. C. Baldwin. SE¼SW¼ sec. 34, T. 1 S., R. 10 E. About 0.1 mile north of north bank of Queen Creek, 3.0 miles northeast of Florence Junction. Unused dug domestic well, depth 68 feet. Measuring point, top north side wood curb, 1 foot above land surface.

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

Aug. 8, 1939	58.30	Oct. 2, 1939	56.50	Apr. 1, 1940	63.36
19	57.87	19	57.15	May 8	66.46
28	58.20	30	57.57	June 11	66.88
Sept. 5	58.47	Nov. 14	58.10	July 27	(a)
15	57.77	Dec. 27	59.72	Sept. 7	(a)
21	56.97	Jan. 13, 1940	60.40	Oct. 22	(a)
26	56.60	Feb. 20	61.26		

35. E. M. Little. SW¼SW¼ sec. 8, T. 2 S., R. 10 E. About 100 feet southwest of U. S. Highway 80, 1.0 mile northwest of Florence Junction. Unused drilled well, diameter 6 inches. Measuring point, top of casing, west side, 0.2 foot above land surface.

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

Sept. 22, 1939	410.80	Nov. 14, 1939	411.08	May 8, 1940	411.40
26	410.87	Dec. 27	411.21	June 11	411.25
Oct. 2	410.90	Jan. 13, 1940	411.24	July 27	411.18
19	410.95	Feb. 20	411.28	Sept. 7	411.70
30	411.05	Apr. 1	411.31	Oct. 22	411.75

36. L. C. Baldwin. SE¼SW¼ sec. 34, T. 1 S., R. 10 E. About 0.1 mile north of north bank of Queen Creek, 3.0 miles northeast of Florence Junction. Used dug domestic and stock well, diameter 60 inches, depth 81 feet. Measuring point, northwest corner of wood sill for trap door. Water levels, in feet below measuring point, 1940: July 27, 69.10; Sept. 7, 70.75; Oct. 22, 72.56.

41. Barkley. NW¼SE¼ sec. 27, T. 2 S., R. 8 E. On Bowen's Ranch, at ranch headquarters, 0.3 mile south of south bank of Queen Creek, 4.0 miles east of Queen Creek railroad siding. Used drilled domestic and stock well, depth 400 feet. Measuring point, plug on south side casing at land surface. Elevation of measuring point 1,558.19 feet above mean sea level.

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

Sept. 15, 1939	219.54	Oct. 30, 1939	219.68	May 8, 1940	220.10
21	219.56	Nov. 14	219.77	June 11	220.18
26	219.61	Dec. 18	219.89	July 26	220.33
Oct. 3	219.30	Feb. 20, 1940	219.95	Sept. 5	220.50
19	219.50	Apr. 2	220.09	Oct. 22	220.57

71. Magma Arizona Railroad. NE¼NE¼ sec. 35, T. 3 S., R. 8 E. About 100 feet east of railroad track at Magma station. Unused drilled industrial well, diameter 6 inches, depth 450 feet. Measuring point, top of metal cover, west side, 0.8 foot above land surface and 1,518.33 feet above mean sea level. Bench mark, established Dec. 5, 1939, end of tie rod at southwest corner of base of well derrick, Magma junction, elevation 1,518.21 feet above mean sea level.

a Well dry.

Pinal County--Continued.

71. Magma Arizona Railroad -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Aug. 20, 1939	147.91	Oct. 19, 1939	148.02	Apr. 2, 1940	148.40
28	147.87	30	148.08	May 8	148.43
Sept. 5	147.91	Nov. 14	148.15	June 11	148.53
13	147.90	Dec. 18	148.20	July 26	148.70
20	147.94	Jan. 14, 1940	148.23	Sept. 4	148.88
26	148.00	Feb. 20	148.24	Oct. 23	149.26
Oct. 3	148.03				

PIMA AND SANTA CRUZ COUNTIES

Santa Cruz River Valley

By E. M. Cushing, H. G. Fernandez, and D. H. Bratton

Work in the valley of the Santa Cruz River in Pima and Santa Cruz Counties was begun September 1, 1939. The region under investigation extends along the river between its entrance to the United States east of Nogales and its junction with the Gila River northwest of Casa Grande. Intensive work in this area has just begun. Water-level measurements have been made in 41 wells in Santa Cruz County, 63 wells in Pima County, and have recently been started in the portion of the valley lying in Pinal County. A total of 1,085 individual measurements of water level were made in the wells from September 1, 1939 and January 1, 1941.

The accompanying figure shows hydrographs of typical observation wells in the area. All are in Pima County with the exception of Well 142 which is in Santa Cruz County. Well 199 is relatively shallow and is situated near Rillito Creek at a point about three miles east of the Santa Cruz River. The fluctuations of water level in the well show the normal seasonal depletion of the ground-water overcome during the summer and the increase in storage caused by recharge from floods in Rillito Creek. Well 256 is east of the city of Tucson and is comparatively deep. The hydrograph shows a progressive lowering of water level and no effects of recharge.

Well 96 is near both the Santa Cruz River and the area of heavy pumping in the vicinity of Cortaro. Well 296 is also near the river but is in the region of heavy pumping north of San Xavier del Bac Mission.

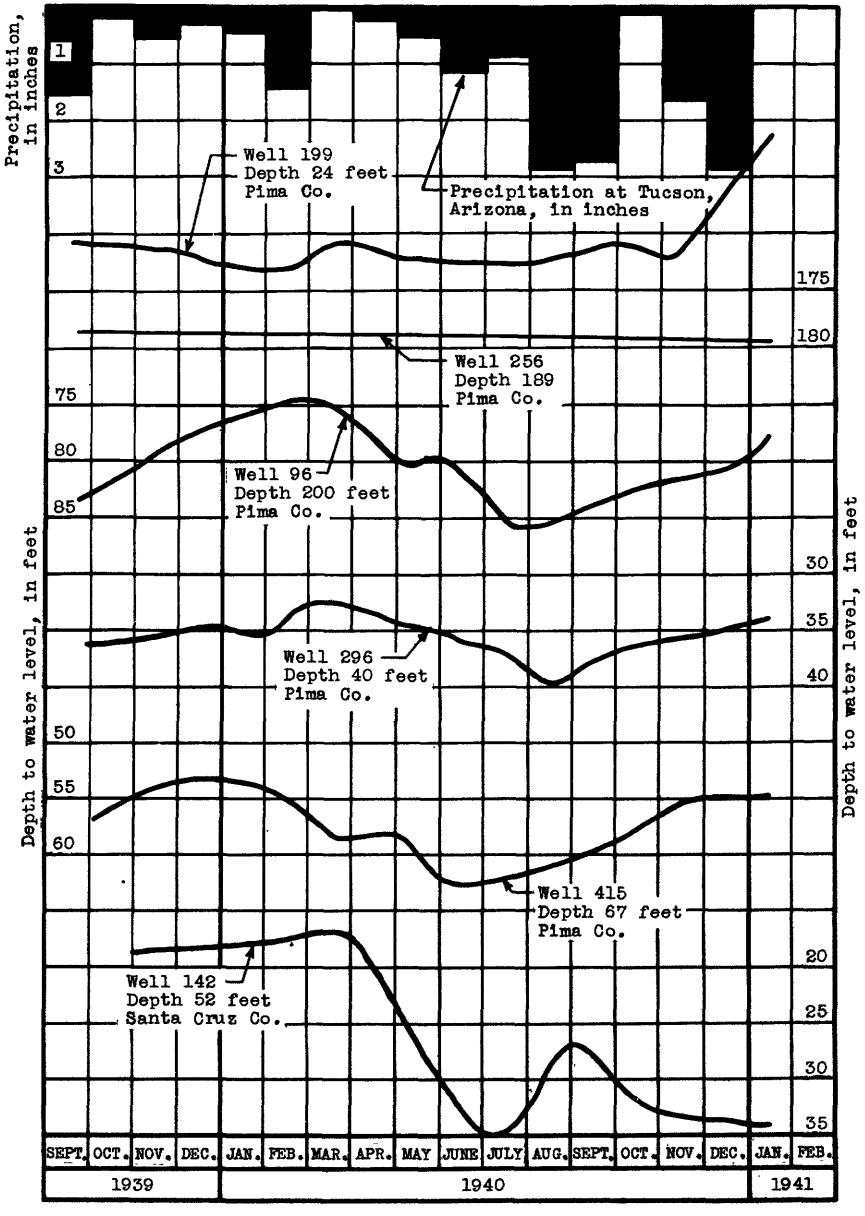

Figure 5.--Graphs showing fluctuations of water level in observation wells in the Santa Cruz Valley, Pima and Santa Cruz Counties, Ariz.

The water level in the well is influenced to some extent by the pumpage of the city of Tucson. Well 415 is near the river in the pumped region at Sahuarita. The water levels in all three wells are affected by pumping during the summer months.

Floods late in the summer of 1940 lessened pumping requirements and raised the water levels in many of the wells in the Santa Cruz Valley. The hydrograph of well 142, which is slightly downstream from the Nogales infiltration gallery pumping station, shows that the flood of August 13, 1940 produced sufficient recharge to offset temporarily the heavy withdrawal of water from the gallery.

In the following tables the water levels are expressed in feet below measuring points. The highest and lowest water levels which are given for many of the wells were obtained with maximum-minimum strip recorders.

Pima County

25. Cortaro Farms. NE¼NE¼ sec. 30, T. 11 S., R. 11.E. About 2 miles west and 0.5 mile south from Cortaro Farm offices, 2.6 miles west from Marana Station. Used drilled domestic well, diameter 6 inches, depth 200 feet. Measuring point, top of casing, east side, 0.75 foot above land surface. Equipped with electric cylinder pump.

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

Date	Water level	Date	Water level	Date	Water level
Sept.16, 1939	172.70	Feb. 20, 1940	173.05	July 19, 1940	173.87
27	172.62	Mar. 19	173.18	Oct. 1	173.93
Nov. 14	172.92	May 2	173.45	Nov. 7	174.12
Dec. 30	173.17	31	173.62		

81. Guake. SE¼SW¼ sec. 31, T. 12 S., R. 13 E. About 0.6 mile east from junction State Highway 84 and Ina Road, and 0.25 mile north from Ina Road, 2.1 miles southeast from Cortaro. Unused drilled well, diameter 12 inches, depth 118 feet. Measuring point, red mark on northwest side of top of casing at land surface.

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

Sept.13, 1939	89.91	Feb. 20, 1940	89.26	July 19, 1940	92.24
26	89.91	Mar. 18	89.70	Oct. 1	91.36
Nov. 13	89.59	May 2	91.20	Nov. 7	91.83
Dec. 30	89.31	31	91.50	Dec. 26	91.63

96. Cortaro Farms. NE¼NW¼ sec. 16, T. 12 S., R. 12 E. About 0.15 mile southwest from State Highway 84, 2 miles southeast from Rillito. Unused drilled irrigation well, diameter 18 to 24 inches, depth over 200 feet. Measuring point, seam at top of casing, south side, at land surface.

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

Sept.15, 1939	83.62	Feb. 20, 1940	74.71	July 19, 1940	85.93
27	83.22	Mar. 19	75.19	Oct. 10	82.43
Nov. 13	79.69	May 2	80.19	Nov. 7	81.91
Dec. 30	76.58	31	79.86	Dec. 26	79.20

Pima County--Continued.

97. Cortaro Farms. NW¼NW¼ sec. 21, T. 12 S., R. 12 E. About 2.7 miles northwest from Cortaro Station and 2.9 miles south southeast of Rillito Station. Windmill and tank painted orange. Unused drilled well, diameter 12 inches, depth 115 feet. Measuring point, seam at top of casing, at land surface.

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

Date	Water level	Date	Water level	Date	Water level
Sept.14, 1939	81.50	Feb. 20, 1940	72.22		a 77.12
27	80.94	Mar. 19	73.30	May 31, 1940	78.31
Nov. 14	76.24	May 2	77.36	Oct. 10	80.53
Dec. 30	74.06				

98. Cortaro Farms. NE¼SW¼ sec. 21, T. 12 S., R. 12 E. About 2.4 miles west northwest from Cortaro and 3.2 miles south southeast from Rillito Station. Unused drilled irrigation well, diameter 24 inches, depth more than 200 feet. Measuring point, seam at top of casing, at land surface.

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

Sept.27, 1939	78.37	Mar. 19, 1940	70.89	Oct. 10, 1940	77.70
Nov. 14	74.83	May 2	74.19	Nov. 7	76.64
Dec. 30	72.70	31	74.74	Dec. 30	73.84
Feb. 20, 1940	70.75	July 19	78.54		

99. Tucson Light & Power Co. NE¼SE¼ sec. 26, T. 12 S., R. 12 E. About 75 feet southwest of State Highway 84, inside Cortaro Power House, southwest corner. Unused drilled irrigation well, diameter 18 inches, depth 143 feet. Measuring point, top of casing west side, at land surface.

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

Sept.13, 1939	70.14	Mar. 19, 1940	68.58	July 19, 1940	73.76
Nov. 13	69.46	May 2	71.86	Oct. 1	71.42
Jan. 2, 1940	67.72	31	b 72.80	Dec. 26	71.29

101. Adams. NE¼NE¼ sec. 33, T. 12 S., R. 12 E. About 0.5 mile south southwest of junction of Wade, Silver Bell, and Cortaro Farm roads, 1.8 miles west southwest from Cortaro Station. Unused drilled irrigation well, diameter 24 inches, depth 153 feet. Measuring point, joint at top of casing, 0.3 foot above land surface.

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

Sept.14, 1939	113.30	Feb. 20, 1940	114.22	July 19, 1940	119.43
26	118.78	Mar. 19	113.56	Oct. 1	120.60
Nov. 14	117.59	May 2	115.60	Nov. 7	121.60
Dec. 30	116.04	31	116.67	Dec. 20	119.42

121. Cortaro Farms. SW¼NE¼ sec. 1, T. 12 S., R. 11 E. About 1.0 mile west from road junction 0.34 mile northwest from Rillito. Unused drilled well, diameter 6 inches, depth 176 feet. Measuring point, 1/2-inch hole in top of casing cap, 0.4 foot above land surface.

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

Sept.14, 1939	163.72	Feb. 20, 1940	164.24	July 19, 1940	165.44
27	163.65	Mar. 19	164.29	Oct. 10	166.55
Nov. 14	164.09	May 2	164.53	Nov. 7	166.10
Dec. 30	164.18	31	164.83	Dec. 30	166.45

131. Nourse. SE¼SW¼ sec. 2, T. 13 S., R. 12 E. At junction of Silver Bell and Picture Rocks roads, 1.7 miles south-southwest of Cortaro Station. Dug and drilled domestic well, diameter 6 inches, depth 79 feet. Measuring point, top of casing, east side, 1.25 feet above land surface. Equipped with cylinder pump and gasoline engine.

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

Sept.13, 1939	67.28	Mar. 19, 1940	68.43	Oct. 1, 1940	70.85
27	67.84	May 2	70.95	Nov. 7	71.12
Nov. 14	68.69	31	71.40	Dec. 30	69.40
Jan. 2, 1940	68.32				

a Highest water level in period between tape measurements.
b Well 15 feet southwest just shut down after pumping 12 hours.

Pima County--Continued.

132. W. A. Knapp. SW¼SW¼ sec. 8, T. 13 S., R. 12 E. About 0.20 mile west from junction of State Highway 84 and Sunset Road, 1.0 mile northwest from Jaynes Station. Unused drilled well, diameter 8 inches, depth 85 feet. Measuring point, seam at top of casing, 0.75 foot above land surface.

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

Date	Water level	Date	Water level	Date	Water level
Sept. 13, 1939	42.08	Feb. 19, 1940	43.53	Aug. 6, 1940	45.70
26	42.32	Mar. 18	43.88	Oct. 1	44.53
Nov. 13	43.13	May 2	44.66	Nov. 7	45.52
Jan. 2, 1940	43.69	31	44.78	Dec. 21	45.47

133. W. A. Hansen. NE¼NW¼ sec. 12, T. 13 S., R. 12 E. About 1.5 miles southeast from junction of Picture Rocks and Silver Bell roads, and 2.8 miles south-southeast from Cortaro Station. Used drilled domestic well, diameter 6 inches, depth 80 feet. Measuring point, bottom of pump, south side, 0.75 foot above land surface. Equipped with windmill.

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

Sept. 13, 1939	71.97	Dec. 27, 1939	73.93	May 31, 1940	76.87
27	72.65	Mar. 17, 1940	74.72	July 19	77.79
Nov. 14	73.60	May 2	76.62	Nov. 7	76.84

141. Cortaro Farms. NW¼NW¼ sec. 6, T. 13 S., R. 13 E. About 0.3 mile east of junction of State Highway 84 and Ina Road, about 10 yards south of road, 2.2 miles southeast from Cortaro Station. Unused drilled irrigation well, diameter 24 inches, depth 82 feet. Measuring point, seam at top of casing, at land surface.

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

Sept. 13, 1939	73.74	Mar. 18, 1940	74.46	Aug. 6, 1940	77.92
26	74.25		a 74.27	Oct. 1	76.77
Nov. 13	73.79	May 2	76.30	Nov. 7	76.92
Dec. 30	73.66		a 75.91	Dec. 26	76.05
Feb. 20, 1940	73.26	31	76.58		

142. Cortaro Farms. SE¼SE¼ sec. 7, T. 13 S., R. 13 E. About 0.45 mile west of junction of State Highway 84 and Sunset Road, which is 1.0 mile northwest from Jaynes Station. Unused drilled well, diameter 24 inches, depth 44 feet. Measuring point, red mark on southeast side of top of casing, at land surface.

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

Sept. 14, 1939	30.24		a 31.89	Aug. 6, 1940	33.99
26	30.65	Mar. 18, 1940	32.15	Oct. 1	34.02
Nov. 13	31.46	May 2	33.11	Nov. 7	34.18
Dec. 30	31.95		a 32.99	Dec. 23	33.70
Feb. 19, 1940	32.00	31	33.26		

146. Jaynes Station Irrigation District. NE¼SE¼ sec. 17, T. 13 S., R. 13 E. At northeast corner of Jaynes Station school, 0.6 mile northeast of junction State Highway 84 and Ruthrauff Road. Bored irrigation well, diameter 16 inches, depth 96 feet. Measuring point, top of 1½-inch pipe welded on casing, 1.0 foot above land surface. Equipped with turbine and electric motor.

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

Sept. 12, 1939	41.15	Feb. 19, 1940	41.29	Nov. 7, 1940	42.22
Nov. 15	41.49	Oct. 1	42.74	Dec. 23	41.53
Dec. 27	41.32				

147. Hans Been. SW¼SE¼ sec. 17, T. 13 S., R. 13 E. About 0.25 mile west of junction of State Highway 84 and Ruthrauff Road, 10 feet north of road, 0.2 mile southeast of Jaynes Station. Unused drilled irrigation well, diameter 16 inches, depth 58 feet. Measuring point, seam at top of casing, at land surface.

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

Sept. 12, 1939	32.89	Feb. 19, 1940	36.76	May 31, 1940	39.14
26	33.52	Mar. 18	38.53	Aug. 6	39.40
Nov. 13	34.05	May 2	38.74	Dec. 23	32.20
Dec. 27	35.04				

a Highest water level in period between tape measurements.

Pima County--Continued.

154. Ralph Wetmore. NE¼SE¼ sec. 24, T. 13 S., R. 13 E., 0.8 mile east of U. S. Highway 80, 2.7 miles north of Tucson city limits. Dug and drilled domestic well, diameter 84 to 12 inches, depth 86 feet. Measuring point, blue arrow at east side of concrete casing 1 foot below top and 1 foot above land surface. Equipped with centrifugal pump and electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Sept.18, 1939	31.46	Mar. 19, 1940	31.97	Oct. 3, 1940	33.62
Nov. 6	31.52	May 3	32.17	Nov. 7	33.75
Dec. 29	31.83	June 3	33.23	Dec. 23	31.87
Feb. 21, 1940	32.00	July 20	33.66		

158. Bruce Knapp. SE¼NE¼ sec. 28, T. 13 S., R. 13 E. About 0.1 mile southwest of State Highway 84, 0.1 mile northwest of junction with Prince Road, 2.0 miles southeast of Jaynes Station. Dug and bored domestic well, diameter 12 inches, depth 168.5 feet. Measuring point, ¼-inch hole, northwest side of pump base, 0.8 foot above land surface. Equipped with small pressure pump and electric motor.

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

Sept.12, 1939	32.11	Feb. 19, 1940	32.94	Oct. 10, 1940	33.68
27	32.27	Mar. 18	33.36	Nov. 7	34.75
Nov. 13	32.88	May 31	33.65	Dec. 23	34.00
Jan. 2, 1940	33.28	July 19	34.75		

185. J. M. Guss. SE¼SW¼ sec. 21, T. 13 S., R. 14 E. On River Road, 1.4 miles east of North Campbell Avenue, 0.5 mile northwest of junction of River and Dodge roads, Tucson. Unused dug well, diameter 90 to 72 inches, depth 28 feet. Measuring point, red mark on flange at top of pump, 6.62 feet below land surface.

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

Sept.19, 1939	17.90	Feb. 21, 1940	19.01	June 3, 1940	18.94
Nov. 6	18.49	Mar. 19	18.67	Aug. 6	19.59
Dec. 29	18.97	May 3	18.84	Oct. 3	(a)

187. Courtright Stables. SE¼SE¼ sec. 25, T. 13 S., R. 14 E. About 0.4 mile south from River Road, 1.1 miles west of junction of River Road and Sabino Canyon Road. Unused dug well, 36 by 48 inches, depth 16 feet. Measuring point, red mark at hole in well cover, 1.25 feet above land surface.

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

Sept.20, 1939	12.14	Mar. 19, 1940	11.30	Oct. 3, 1940	13.80
Nov. 6	13.53	May 3	13.54	Nov. 7	14.19
Dec. 29	14.11	June 3	14.30	Dec. 23	6.41
Feb. 21, 1940	13.60	July 20	15.13		

190. Bayliss. SW¼SE¼ sec. 26, T. 13 S., R. 14 E. About 0.3 mile north of Fort Lowell Road and 0.4 mile northwest of Fort Lowell Ruins. Used dug irrigation well, diameter 72 inches, depth 19 feet. Measuring point, red mark top of casing, east side, 7.5 feet below land surface.

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

Sept.21, 1939	8.00		b 8.74	July 20, 1940	11.37
Nov. 6	8.67	Mar. 20, 1940	8.83	Oct. 3	9.99
Dec. 29	9.25	May 4	9.34	Nov. 8	10.03
Feb. 23, 1940	9.59	June 3	10.23	Dec. 23	8.77

192. Glenn Bingham. SE¼SW¼ sec. 27, T. 13 S., R. 14 E. About 100 feet north of Fort Lowell Road, 0.4 mile east from Maple Blvd., Tucson. Unused drilled domestic well, diameter 6 inches, depth 44 feet. Measuring point, red mark on block, top of casing, 0.7 foot above land surface.

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

Sept.21, 1939	32.00	Mar. 19, 1940	31.89	Aug. 20, 1940	34.50
Nov. 14	33.20	May 4	31.60	Nov. 8	35.60
Dec. 29	33.56	June 3	32.70	Dec. 23	34.12
Feb. 23, 1940	33.36				

a Dry.
b Highest water level in period between tape measurements.

Pima County--Continued.

196. Southern Arizona Polo Association. SE¼NW¼ sec. 28, T. 13 S., R. 14 E. About 0.15 mile south of River Road, 1.4 miles east of Campbell Avenue, Tucson. Unused dug and drilled stock well, diameter 48 to 10 inches, depth 26 feet. Measuring point, top of concrete casing, west side, 0.5 foot above land surface.

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

Date	Water level	Date	Water level	Date	Water level
Sept.19, 1939	19.91	Mar. 19, 1940	20.19	Oct. 3, 1940	(c)
Nov. 6	22.55	May 3	23.11	Nov. 7	(c)
Dec. 29	23.47	June 3	23.96	Dec. 23	14.20
Feb. 21, 1940	23.54	July 20	24.52		

197. NE¼SE¼ sec. 28, T. 13 S., R. 14 E. About 0.12 mile south Rillito Creek on Maple Blvd., 0.3 mile north of Fort Lowell Road, Tucson. Unused dug irrigation well, diameter 96 inches, depth 23 feet. Measuring point, red mark top of 10 by 10-inch timber, east side, 2.8 feet above land surface. Equipped with centrifugal pump and electric motor.

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

Sept.21, 1939	17.93	Mar. 19, 1940	17.90	Oct. 3, 1940	20.54
Nov. 14	18.74		b 17.74		b 19.11
Dec. 29	19.32	May 4	17.95	Nov. 8	23.48
Feb. 23, 1940	18.90	June 3	18.86	Dec. 23	13.38
	b 17.76	Aug. 6	19.11		

199. Southern Arizona Polo Association. NE¼SW¼ sec. 28, T. 13 S., R. 14 E. About 540 yards south of bend in River Road, 0.35 mile east from Dodge Boulevard, 50 feet south of well 196, Tucson. Unused dug stock well, diameter 42 inches, depth 24 feet. Measuring point, blue mark on top of casing, south side, 3.5 feet above land surface.

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

Sept.19, 1939	20.59	Mar. 19, 1940	20.79	Oct. 3, 1940	20.90
Nov. 6	21.17	May 3	22.18	Nov. 7	22.06
Dec. 29	22.62	June 3	22.39	Dec. 23	15.12
Feb. 21, 1940	22.99	July 20	22.70		

201. Urquidas. SE¼SE¼ sec. 30, T. 13 S., R. 14 E. About 100 yards north of Rillito Creek, 100 yards east of Sabino Canyon Road, Tucson. Unused dug well, diameter 96 inches, depth 17 feet. Measuring point, red mark on center board of well cover, 1.08 feet above land surface.

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

Sept.20, 1939	14.83	Mar. 19, 1940	14.28	Oct. 3, 1940	15.80
Nov. 6	15.20	May 3	14.30	Nov. 7	16.21
Dec. 29	15.31	June 3	14.76	Dec. 23	14.90
Feb. 21, 1940	14.92	July 20	15.59		

207. F. W. Jordan. NW¼NW¼ sec. 36, T. 13 S., R. 14 E. About 0.25 mile north northeast of junction of Flrt Lowell and Craycroft Roads, 0.2 mile north of Fort Lowell Ruins, Tucson. Unused dug well, diameter 96 inches, depth 30 feet. Measuring point, red mark west side top of casing, 2.0 feet above land surface.

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

Sept.21, 1939	25.77		a 27.10	July 20, 1940	(c)
Nov. 6	26.92		b 27.95	Oct. 3	28.31
Dec. 29	28.50	May 3, 1940	27.56	Nov. 8	29.43
Feb. 21, 1940	29.10	June 3	29.31	Dec. 23	27.94
Mar. 20	27.18				

221. W. G. Boyd. SE¼SE¼ sec. 29, T. 13 S., R. 15 E. About 0.4 mile north of Rillito Creek, 0.1 mile south from county road, 0.8 mile west from junction of River Road and Sabino Canyon Road. Unused drilled well, diameter 8 inches, depth 130 feet. Measuring point, top of casing, 2.5 feet below land surface.

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

Sept.22, 1939	22.19	Mar. 19, 1940	21.92	Aug. 5, 1940	22.71
Nov. 6	22.59		b 22.65	Oct. 3	23.21
Dec. 29	22.15	May 3	21.97	Nov. 7	23.40
Feb. 21, 1940	23.30	June 3	22.19	Dec. 23	22.43

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.
c Dry.

Pima County--Continued.

222. E. T. Wright. NW¼SW¼ sec. 33, T. 13 S., R. 15 E. About 50 feet northwest of nsw Tanque Verde Road, 0.1 mile southwest of Rillito Creek. Used dug stock well, diameter 42 inches, depth 18 feet. Measuring point, red mark on south side of pump base, 1.5 feet above land surface. Equipped with hand-operated cylinder pump.

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

Date	Water level	Date	Water level	Date	Water level
Sept.22, 1939	15.92	Mar. 30, 1940	15.23	Oct. 3, 1940	17.31
Nov. 14	16.31	May 3	15.65	Nov. 7	17.50
Dec. 29	16.29	June 3	16.46	Dec. 23	14.05
Feb. 21, 1940	16.24	July 20	17.18		

223. Crouch. SW¼SE¼ sec. 36, T. 13 S., R. 15 E. About 0.15 mile north of Tanque Verde Road, 0.4 mile west northwest of junction of Tanque Verde Road and Tanque Verde Loop Road. Used dug domestic well, diameter 60 inches, depth 33 feet. Measuring point, red mark south edge of hole in well cover, 1.6 feet above land surface.

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

Sept.22, 1939	29.93	Mar. 20, 1940	31.95	Oct. 3, 1940	32.70
Nov. 14	30.81	May 3	29.59	Nov. 7	32.79
Dec. 29	31.76	June 3	30.70	Dec. 23	24.89
Feb. 21, 1940	32.27	July 20	31.56		

253. NW¼SE¼ sec. 3, T. 14 S., R. 15 E. About 0.3 mile north from Speedway, 0.34 mile west from Harrison Road. Unused dug well, diameter 48 inches, depth 66 feet. Measuring point, red mark on board, at land surface.

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

Sept.22, 1939	62.30	Mar. 20, 1940	63.05	Oct. 3, 1940	63.85
Nov. 14	62.61	May 3	63.20	Nov. 8	64.01
Dec. 29	62.89	June 3	63.40	Dec. 23	63.78
Feb. 21, 1940	63.02	July 20	63.63		

255. J. S. Sayres. NW¼SW¼ sec. 6, T. 14 S., R. 15 E. About 100 yards east from Tanque Verde Loop Road, 0.6 mile south from Tanque Verde Road. Unused drilled well, diameter 16 inches, depth 24 feet. Measuring point, red mark on top of casing, east side, 0.9 foot above land surface.

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

Sept.22, 1939	20.23	Mar. 20, 1940	19.72	Oct. 3, 1940	21.98
Nov. 14	20.99	May 3	20.60	Nov. 7	22.62
Dec. 29	21.15	June 3	21.11	Dec. 23	15.94
Feb. 21, 1940	20.61	July 20	21.87		

256. Charles Raynard. SW¼SE¼ sec. 7, T. 14 S., R. 15 E. About 0.25 mile north from Broadway, 0.6 mile east from Wilmot Road, Tucson. Unused drilled well, diameter 7 inches, depth 189 feet. Measuring point, red mark top of casing, at land surface.

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

Sept.22, 1939	178.64	Mar. 20, 1940	178.79	Oct. 3, 1940	179.19
Nov. 14	178.58	May 3	178.80	Nov. 8	179.31
Dec. 29	178.62	June 3	178.93	Dec. 23	179.30
Feb. 21, 1940	178.69	July 20	179.00		

284. Petrie. NE¼NW¼ sec. 3, T. 14 S., R. 13 E. About 1.6 miles west of U. S. Highway 80 and 0.25 mile south of DeMoss-Petrie Road. Unused dug and drilled irrigation well, diameter 16 to 9 inches, depth 235 feet. Measuring point, red mark on east side top of casing, at land surface.

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

Sept. 9, 1939	27.80		a 27.37	Aug. 6, 1940	29.56
25	27.80	Mar. 18, 1940	27.46		b 30.53
Nov. 13	27.82		a 27.36	Oct. 10	28.91
Dec. 29	27.79	May 2	28.04	Nov. 7	28.64
Feb. 19, 1940	27.55	31	28.60	Dec. 23	28.18

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Pima County--Continued.

288. A. J. Larm. NE¼SW¼ sec. 14, T. 14 S., R. 13 E. About 0.5 mile south of Congress Street on S. Grand Avenue, northeast side at base of Sentinel Peak, Tucson. Used dug and driven domestic well, diameter 2 inches, depth 34 feet. Measuring point, top of 1¼-inch pipe, 13.2 feet below land surface. Equipped with cylinder pump and electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Sept.11, 1939	14.30	Feb. 19, 1940	13.64	July 20, 1940	15.56
25	14.45	Mar. 18	13.62	Aug. 13	15.61
Nov. 13	15.11	May 4	14.22	Oct. 4	15.63
Dec. 30	14.36	May 28	14.60	Nov. 5	15.62

294. Hal Manning. SW¼SE¼ sec. 34, T. 14 S., R. 13 E. In field 100 feet west of road, 0.9 mile southwest of junction of Indian School and Valley roads, and 0.4 mile west of Valley Road. Dug and drilled irrigation well, diameter 144 to 16 inches. Measuring point, top of casing, east side, at land surface. Equipped with centrifugal pump and tractor. Water levels, in feet below measuring point: Sept. 28, 1939, 33.44; Oct. 4, 1940, 36.44; Nov. 5, 1940, 36.60.

295. Hal Manning. SW¼SE¼ sec. 34, T. 14 S., R. 13 E. About 1.0 mile southwest of junction of Indian School Road with Valley Road, in field 0.5 mile west of Valley Road, farthest west of three wells 275 yards apart. Unused dug and drilled irrigation well, diameter 96 to 16 inches. Measuring point, red mark at top of casing, southwest side, 0.6 foot above land surface. Measurements discontinued Nov. 5, 1940. For further measurements in this vicinity, see well 294.

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

Sept.28, 1939	33.96	Feb. 19, 1940	32.08		a 31.38
Nov. 6	33.57		a 31.76	May 1, 1940	32.83
Dec. 26	32.82	Mar. 18	32.23	28	33.32

296. Hal Manning. SE¼NW¼ sec. 35, T. 14 S., R. 13 E. About 0.3 mile east from Valley Road, 0.5 mile southeast from junction of Valley Road and Indian School Road. Unused dug well, diameter 150 to 132 inches, depth 40 feet. Measuring point, red mark at southwest side of top of casing, 2.0 feet above land surface.

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

Sept.29, 1939	36.37	Mar. 18, 1940	32.70	Aug. 13, 1940	39.63
Nov. 6	35.87	May 1	34.29	Oct. 4	36.68
Dec. 26	34.49	28	35.08	Nov. 5	35.95
Feb. 19, 1940	33.21	July 20	37.32	Dec. 30	34.14

311. H. C. Barker. NE¼SW¼ sec. 1, T. 15 S., R. 13 E. About 0.7 mile southwest from junction of Irvington Road and U. S. Highway 89, 100 feet west of Mission Dale Road. Dug domestic well, diameter 44 inches, depth 59.1 feet. Measuring point, blue mark at hole in tin top cover, 0.55 foot above land surface.

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

Sept.16, 1939	52.23	Mar. 18, 1940	53.27	Aug. 13, 1940	54.84
Nov. 13	53.70	May 1	53.50	Oct. 4	53.76
Dec. 26	53.51	28	53.69	Nov. 5	53.95
Feb. 19, 1940	53.36	July 20	53.88	Dec. 30	52.77

314. San Xavier School. NE¼NE¼ sec. 15, T. 15 S., R. 13 E. About 2.0 miles north northeast of San Xavier del Bac Mission, and 0.2 mile west of Santa Cruz River. Used drilled domestic and public well, diameter 8 inches. Measuring point, top of casing, west side, 2.0 feet above land surface. Equipped with windmill.

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

Sept. 1, 1939	37.87	Mar. 18, 1940	37.49	Aug. 13, 1940	38.82
23	37.93	May 1	38.01	Oct. 4	39.60
Nov. 13	38.04	28	b 38.42	Dec. 30	b 40.42
Dec. 26	37.93				

a Highest water level in period between tape measurements.
b Pumping.

Pima County--Continued.

315. SE¼SE¼ sec. 15, T. 15 S., R. 13 E. About 1.25 miles northeast of San Xavier del Bac Mission and 0.25 mile west of Santa Cruz River. Unused drilled well, diameter 18 inches, depth 133 feet. Measuring point, top of casing, west side, at land surface.

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

Date	Water level	Date	Water level	Date	Water level
Sept. 5, 1939	48.28	Mar. 18, 1940	48.00	Aug. 31, 1940	49.16
23	48.26		a 47.93	Oct. 4	48.72
Nov. 13	48.51	May 1	48.36		a 48.45
Dec. 26	48.47		a 48.28	Nov. 4	48.84
Feb. 19, 1940	48.16	28	48.74	Dec. 30	48.44
	a 47.91				

319. U. S. Indian Service, San Xavier Reservation. SE¼NE¼ sec. 22, T. 15 S., R. 13 E. About 0.8 mile east northeast of San Xavier del Bac Mission and 0.5 mile north northwest of road crossing Santa Cruz River. Dug domestic well, diameter 96 inches, depth 44 feet. Measuring point, red mark at northeast side of casing, 1.6 feet above land surface.

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

Sept. 8, 1939	31.34	Feb. 19, 1940	33.62	Aug. 13, 1940	34.30
25	32.75	Mar. 18	33.16	Oct. 4	33.30
Nov. 13	34.44	May 1	33.87	Nov. 5	33.73
Dec. 26	33.81	28	34.12	Dec. 30	33.32

322. U. S. Indian Service, San Xavier Reservation. SW¼SE¼ sec. 22, T. 15 S., R. 13 E. At headquarters of U. S. Indian Service 100 feet north of Santa Cruz River Crossing Road at a point 0.4 mile west of ford. Unused drilled well, diameter 6 inches, depth 45 feet. Measuring point, blue mark at top of casing, west side, 0.75 foot above land surface.

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

Sept. 5, 1939	30.41	Feb. 19, 1940	29.29	Aug. 13, 1940	30.16
23	30.34	Mar. 18	28.65	Oct. 4	29.57
Nov. 13	29.81	May 1	28.93	Nov. 5	29.63
Dec. 26	29.23	28	29.27	Dec. 30	29.15

327. U. S. Indian Service, San Xavier Reservation. SW¼SW¼ sec. 23, T. 15 S., R. 13 E. About 1.0 mile east of San Xavier Mission and 0.1 mile north from east end of Santa Cruz River Crossing. Dug domestic well, diameter 48 inches, depth 38 feet. Measuring point, red arrow at top of curb, southwest corner, 2.3 feet above land surface.

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

Sept. 5, 1939	31.03	Feb. 19, 1940	32.50	Aug. 13, 1940	36.38
25	33.32	Mar. 18	33.52	Oct. 4	34.35
Nov. 13	37.00	May 1	35.89	Nov. 5	34.55
Jan. 2, 1940	32.64	June 1	36.08	Dec. 30	31.30

328. U. S. Indian Service, San Xavier Reservation. SW¼NE¼ sec. 26, T. 15 S., R. 13 E. About 0.64 mile south southwest of U. S. Indian Service Sanatorium. Dug domestic and stock well, diameter 50 inches, depth 26 feet. Measuring point, red arrow at top of curb on south side, 1.9 feet above land surface.

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

Sept. 8, 1939	24.33	Feb. 19, 1940	24.97	Oct. 4, 1940	25.21
25	25.30	Mar. 18	24.40	Nov. 5	25.53
Nov. 13	25.60	June 1	22.61	Dec. 30	24.36
Dec. 26	24.99	Aug. 13	23.94		

329. Papago Indian Tribe. NW¼NE¼ sec. 27, T. 15 S., R. 13 E. About 0.4 mile west southwest of Santa Cruz River ford, 0.6 mile east southeast of San Xavier del Bac Mission. Unused dug well, diameter 108 inches, depth 40 feet. Measuring point, red arrow at top of curb, southwest side, 1.9 feet above land surface. Equipped with centrifugal pump and electric motor.

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a Highest water level in period between tape measurements.

Pima County--Continued.

329. Papago Indian Tribe -- Continued.

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

Date	Water level	Date	Water level	Date	Water level
Sept. 5, 1939	26.79	Mar. 18, 1940	25.85	Aug. 13, 1940	27.53
23	26.70		a 25.78	Oct. 4	27.00
Nov. 13	27.04	May 1	26.07	Nov. 5	26.95
Dec. 26	26.55	28	26.53		a 26.28
Feb. 19, 1940	26.44		a 26.41	Dec. 30	26.47
	a 25.64				

330. U. S. Indian Service, San Xavier Indian Reservation. SE¼SE¼ sec. 27, T. 15 S., R. 13 E. About 1.3 mile southeast from San Xavier del Bac Mission, 1.6 miles southwest of U. S. Indian Sanatorium, 0.1 mile west of Santa Cruz River. Drilled domestic and stock well, diameter 16 inches, depth 59 feet. Measuring point, top of casing, south side, 1.3 feet above land surface. Equipped with rope and bucket.

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

Sept. 2, 1939	24.89	Feb. 19, 1940	23.93	Aug. 13, 1940	25.56
23	24.87	Mar. 18	23.64	Oct. 4	25.04
Nov. 13	24.79	May 1	23.84	Nov. 5	24.95
Dec. 26	24.29	28	24.57	Dec. 30	24.30

363. NW¼NE¼ sec. 7, T. 16 S., R. 14 E. About 200 feet east of Southern Pacific Railroad, 2.3 miles south of Xavier siding. Unused dug domestic well, diameter 48 to 6 inches, depth 48 feet. Measuring point, red arrow on 1 by 6-inch board, west side of curb, at land surface.

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

Oct. 5, 1939	41.79	Feb. 24, 1940	41.46	June 4, 1940	42.10
Nov. 15	41.93	Mar. 20	41.80	Aug. 29	41.94
Jan. 2, 1940	41.76	May 4	41.98	Oct. 7	42.20

373. Lane Farms. SE¼SW¼ sec. 31, T. 16 S., R. 14 E. About 100 feet west of U. S. Highway 89, 2.2 miles north from road junction at Sahuarita. Unused drilled well, diameter 24 inches, depth more than 200 feet. Measuring point, top of casing, east side, at land surface.

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

Oct. 1, 1939	50.43	Mar. 20, 1940	b 57.57	Oct. 7, 1940	49.10
Nov. 15	48.82	May 4	52.95	Nov. 5	48.31
Jan. 2, 1940	48.95	June 4	53.66	Dec. 24	47.74
Feb. 23	51.25	Aug. 28	56.96		

393. Lane Farms. SE¼NW¼ sec. 13, T. 17 S., R. 13 E. About 0.3 mile south of county Twin Buttes Road, and 0.75 mile west-southwest of road junction at Sahuarita. Unused drilled well, diameter 16 inches, depth 125 feet. Measuring point, seam at top of casing, at land surface.

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

Oct. 1, 1939	60.98	Mar. 20, 1940	60.06	Oct. 7, 1940	63.24
Nov. 15	60.07	May 4	61.46	Nov. 5	62.84
Jan. 2, 1940	59.24	June 4	61.78	Dec. 24	61.54
Feb. 23	58.79	Aug. 28	63.24		

395. Lane Farms. NW¼NE¼ sec. 25, T. 17 S., R. 13 E. About 2.4 miles south-southwest of junction of U. S. Highway 89 and Twin Buttes Road, and 0.5 mile west of U. S. Highway 89. Unused drilled well, diameter 16 inches, depth 109 feet. Measuring point, seam in top of casing, at land surface.

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

Oct. 1, 1939	47.72	Mar. 20, 1940	46.38	Oct. 7, 1940	51.38
Nov. 15	46.16	May 6	48.89	Nov. 6	50.17
Jan. 2, 1940	44.44	June 4	49.23	Dec. 24	46.81
Feb. 23	44.86	Aug. 28	51.83		

a Highest water level in period between tape measurements.
b Intensive pumping from nearby wells in this area.

Pima County--Continued.

411. Lane Farms. SE¼NW¼ sec. 6, T. 17 S., R. 14 E. About 100 feet west of U. S. Highway 89, 1.6 miles north from road junction at Sahuarita. Unused drilled stock well, diameter 16 inches, depth over 200 feet. Measuring point, seam at top of casing, at land surface.

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

Date	Water level	Date	Water level	Date	Water level
Sept.30, 1939	48.72		a 50.00	Aug. 28, 1940	50.67
Nov. 15	47.82	Apr. 27, 1940	50.22		a 47.51
Jan. 2, 1940	48.15	May 4	51.05	Oct. 7	48.73
Feb. 23	48.80		a 50.00	Nov. 6	48.67
	a 48.69	June 4	50.24	Dec. 24	48.30
Mar. 20	51.84				

412. Lane Farms. NW¼NW¼ sec. 7, T. 17 S., R. 14 E. On west bank of Santa Cruz River, 1.1 miles north northeast of road junction at Sahuarita, and 0.4 mile west from U. S. Highway 89. Used drilled irrigation well, diameter 16 inches, depth over 200 feet. Measuring point, seam in top of casing, at land surface. Equipped with turbine and tractor.

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

Date	Water level	Date	Water level	Date	Water level
Sept.30, 1939	51.48	Feb. 23, 1940	51.39	Oct. 7, 1940	53.09
Nov. 15	50.80	May 4	53.49	Nov. 5	52.88
Jan. 2, 1940	50.55	June 4	53.22	Dec. 24	51.94

414. H. B. Minelo. SE¼SW¼ sec. 7, T. 17 S., R. 14 E. About 100 feet north of Twin Buttes Road, 100 feet west of U. S. Highway 89. Used dug domestic well, diameter 48 inches, depth 63 feet. Measuring point, red arrow on pump base 1 inch below discharge pipe, 3.0 feet above land surface. Equipped with automatic pump and electric motor.

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

Sept.30, 1939	55.76	Mar. 20, 1940	57.44	Oct. 7, 1940	57.89
Nov. 15	54.35	May 4	58.39	Nov. 5	56.08
Jan. 2, 1940	53.84	June 4	58.74	Dec. 24	55.70
Feb. 23	53.88	Aug. 28	60.17		

415. Highway Department. NE¼SW¼ sec. 18, T. 17 S., R. 14 E. About 0.6 mile south of junction of Twin Buttes Road with U. S. Highway 89, 50 feet east of U. S. Highway 89 in State Highway Department yard, 50 feet south of house. Used dug domestic well, diameter 36 inches, depth 67 feet. Measuring point, red mark on board west side pump base, 1.3 feet above land surface.

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

Oct. 3, 1939	56.79	Mar. 20, 1940	58.55	Oct. 7, 1940	58.18
Nov. 15	54.09	May 6	58.38	Nov. 6	55.98
Jan. 2, 1940	53.46	June 4	b 62.60	Dec. 24	54.74
Feb. 23	55.40	Aug. 28	60.43		

416. NW¼SW¼ sec. 30, T. 17 S., R. 14 E. About 200 feet west of U. S. Highway 89, 2.75 miles south of junction of Twin Buttes Road with U. S. Highway 89. Unused dug well, diameter 39 inches, depth 56 feet. Measuring point, red arrow on top of casing, south side, 0.25 feet above land surface.

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

Oct. 1, 1939	51.98	Mar. 20, 1940	55.92	Oct. 7, 1940	c 56.57
Nov. 15	54.30	May 6	(d)	Nov. 6	58.54
Jan. 2, 1940	54.73	June 4	(d)	Dec. 24	57.53
Feb. 23	55.50	Aug. 29	(d)		

a Highest water level in period between tape measurements.
b Pumping.
c Well deepened.
d Dry.

Pima County--Continued.

444. J. B. Bull: NW¼SW¼ sec. 1, T. 18 S., R. 13 E. About 0.25 mile west of U. S. Highway 89, 2.5 miles north of Continental. Used drilled irrigation well, diameter 16 inches, depth 250 feet. Measuring point, bottom edge of hole, west side of pump, 1.25 feet above land surface. Equipped with turbine and electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 9, 1939	45.23	Feb. 23, 1940	45.23	Oct. 7, 1940	47.21
Nov. 15	44.95	May 6	48.80	Nov. 6	47.02
Jan. 2, 1940	44.65	June 4	49.54	Dec. 24	46.14

447. Intercontinental Ranch Co. SE¼NW¼ sec. 13, T. 18 S., R. 13 E. In adobe, wood and tin shed, 15 feet west of U. S. Highway 89, 1.0 mile north of Continental. Dug and drilled irrigation well, diameter 96 to 18 inches. Measuring point, edge of hole in floor of pump base, northeast side, 0.75 foot above land surface. Equipped with centrifugal pump and electric motor.

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

Oct. 9, 1939	42.51	Feb. 23, 1940	43.05	Nov. 6, 1940	44.28
Nov. 15	42.74	May 6	45.16	Dec. 24	44.18
Jan. 2, 1940	35.54	Oct. 7	44.25		

451. Owner's No. E2. Intercontinental Ranch Co. SE¼NE¼ sec. 26, T. 18 S., R. 13 E. South of 8-foot concrete stand pipe, north of power line, 150 feet east of private road, 1.15 miles south of Continental. Unused dug and drilled irrigation well, diameter 16 inches, depth more than 200 feet. Measuring point, red arrow on top of casing, south side, 0.75 foot above land surface.

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

Oct. 2, 1939	38.80	Mar. 30, 1940	42.92	Aug. 29, 1940	44.37
Nov. 15	38.61	May 6	40.00	Oct. 7	40.59
Jan. 2, 1940	38.59	June 4	43.67	Nov. 6	40.34
Feb. 23	38.63				

473. Owner's No. W1. Intercontinental Ranch Co. SW¼NW¼ sec. 3, T. 19 S., R. 13 E. Covered by shed, near 8-foot concrete stand pipe, 500 feet east of U. S. Highway 89, 3.6 miles southwest of Continental. Unused dug and drilled irrigation well, diameter 96 to 16 inches. Measuring point, bottom of west corner of pump base, 0.83 foot above land surface.

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

Oct. 3, 1939	48.27	Feb. 24, 1940	48.81	June 4, 1940	49.79
Nov. 15	48.47	Mar. 21	50.28	Aug. 28	50.46
Jan. 2, 1940	48.70	May 6	49.40	Oct. 7	49.52

474. Hal Manning. NE¼SW¼ sec. 9, T. 19 S., R. 13 E. Covered by house supporting large storage tank, near Canoa Ranch headquarters, 0.25 mile east of U. S. Highway 89, 5.0 miles southwest of Continental. Dug domestic and stock well, diameter 48 inches, depth 30 feet. Measuring point, red mark top of well cover, east side, 0.9 foot above land surface. Equipped with centrifugal pump and electric motor.

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

Oct. 11, 1939	27.16	Feb. 24, 1940	28.24	Nov. 6, 1940	a 29.92
Nov. 15	28.31	Mar. 21	28.67	Dec. 24	28.98
Jan. 2, 1940	28.40	Oct. 7	a 28.84		

475. Hal Manning. NW¼SW¼ sec. 16, T. 19 S., R. 13 E. Center well of three wells in the same pit, covered by galvanized iron shed, east of side road in old canal bed, 0.3 mile southeast of U. S. Highway 89, and 4.0 miles northeast of Arivaca Junction. Unused dug and drilled domestic and stock well, diameter 10 inches, depth 82 feet. Measuring point, red arrow on 2 by 8-inch timber over pit, 1.0 foot below land surface. Equipped with centrifugal pump and 15 horsepower electric motor.

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a Pumping.

Pima County--Continued.

475. Hal Manning - Continued.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 10, 1939	2.54	May 6, 1940	4.72	Oct. 7, 1940	4.32
Nov. 15	4.22		b 4.48	Nov. 6	a 7.68
Jan. 2, 1940	3.88	June 4	a 6.22		b 3.65
Feb. 24	3.83		b 4.39	Dec. 24	4.88
Mar. 21	a 7.99	Aug. 28	6.10		

477. Gustavo Amado. NW¼SW¼ sec. 29, T. 19 S., R. 13 E. Behind shed, 100 feet south of side road, 0.2 mile southeast of U. S. Highway 89, 1.8 miles northeast of Arivaca Junction. Dug domestic and stock well, diameter 48 inches, depth 32 feet. Measuring point, red arrow on top pipe clamp, 2.5 feet above land surface. Equipped with windmill.

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

Oct. 10, 1939	27.34	Mar. 21, 1940	30.45	Aug. 28, 1940	28.76
Nov. 15	28.56	May 6	c 30.96	Oct. 7	c 30.33
Jan. 2, 1940	28.55	June 4	31.44	Nov. 6	30.10
Feb. 24	28.99	July 11	c 31.63	Dec. 24	30.08

479. O. Kinsley. SW¼SW¼ sec. 31, T. 19 S., R. 13 E. About 0.15 mile east of Kinsley's Filling Station on U. S. Highway 89, at Arivaca Junction. Unused drilled well, diameter 8 inches, depth 56 feet. Measuring point, bottom of 8 by 8-inch timber, at land surface.

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

Oct. 10, 1939	47.92	Mar. 21, 1940	49.25	Aug. 28, 1940	50.40
Nov. 15	48.70	May 6	49.89	Oct. 7	49.74
Jan. 2, 1940	48.83	June 4	50.14	Nov. 6	50.62
Feb. 24	49.10	July 11	50.60	Dec. 24	50.31

Santa Cruz County

3. R. W. Littlejohn. SE¼NE¼ sec. 13, T. 20 S., R. 12 E. About 200 feet west of U. S. Highway 89, 0.85 mile south of Amado Post Office. Unused dug domestic well, diameter 36 inches, depth 62 feet. Measuring point, red mark on bottom 2 by 8-inch plank at top of north side of casing, at land surface.

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

Oct. 12, 1939	58.63	Apr. 25, 1940	59.35	Aug. 29, 1940	59.16
Jan. 3, 1940	58.75	June 6	59.52	Oct. 8	59.42
Feb. 27	58.87	July 11	59.73	Nov. 6	59.60
Mar. 21	58.92				

12. Steinfeld. NE¼NE¼ sec. 7, T. 20 S., R. 13 E. About 0.5 mile northeast of Southern Pacific Railroad siding at Amado, and 1.1 miles east of U. S. Highway 89. Used dug domestic and irrigation well, diameter 96 by 114 inches, depth 32 feet. Measuring point, red mark on bottom of elbow of 6-inch pipe, 1.75 feet above land surface.

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

Oct. 11, 1939	27.92	Apr. 25, 1940	29.33	Aug. 28, 1940	29.16
Jan. 3, 1940	28.64	June 6	30.07	Oct. 7	29.48
Feb. 26	28.94	July 11	30.51	Nov. 6	30.80
Mar. 21	28.95				

13. Gene England. SW¼NW¼ sec. 7, T. 20 S., R. 13 E. About 0.3 mile northeast of Amado Post Office, and 0.6 mile west northwest of Amado Railroad Station. Dug irrigation well, diameter 96 to 60 inches, depth 46 feet. Measuring point, red mark on top of steel rail at northwest corner pump base, at land surface. Equipped with centrifugal pump and diesel engine. Water levels, in feet below measuring point: Oct. 11, 1939, 34.34; Jan. 3, 1940, 34.41; Feb. 26, 1940, 34.60; Nov. 6, 1940, 36.06.

a Nearby well pumping.
b Highest water level in period between tape measurements.
c Pumping.

Santa Cruz County--Continued.

21. Otero. SW¼SW¼ sec. 19, T. 20 S., R. 13 E. About 0.3 mile east of U. S. Highway 89, and 2.4 miles south southeast of Amado Post Office. Used drilled irrigation well, depth 140 feet. Measuring point, top of casing, west side, 0.8 foot below land surface. Equipped with turbine and diesel engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1939	39.15	Feb. 27, 1940	39.49	Oct. 8, 1940	39.80
Jan. 3, 1940	39.44	Apr. 25	40.17	Nov. 6	39.98

28. Mrs. Schenkel. NW¼SE¼ sec. 31, T. 20 S., R. 13 E. At rear of abandoned adobe house, 0.4 mile east of U. S. Highway 89, and 0.5 mile west southwest of Chavez siding. Unused dug domestic well, diameter 72 inches, depth 42 feet. Measuring point, red mark on top 6 by 6-inch timber, south side, 1.08 feet above land surface.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 12, 1939	39.67	Apr. 25, 1940	40.13	Aug. 29, 1940	40.23
Jan. 3, 1940	39.76		a 39.99		a 39.48
Feb. 27	39.73	June 6	40.45	Oct. 8	39.60
	a 39.58	July 11	40.76		a 39.45
Mar. 21	39.85		a 40.08	Nov. 6	40.22

29. NW¼SW¼ sec. 31, T. 20 S., R. 13 E. About 200 feet west of U. S. Highway 89, 0.2 mile north of cross road to Southern Pacific Railroad siding at Chavez. Used drilled stock well, diameter 6 inches. Measuring point, bottom 3-inch "Tee" at top of casing, east side, 1.3 feet above land surface. Equipped with windmill.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1939	70.52	Apr. 25, 1940	70.88	Aug. 29, 1940	71.69
Jan. 3, 1940	70.56	June 6	71.48	Oct. 8	72.14
Feb. 27	70.57	July 11	71.69	Nov. 6	72.23
Mar. 21	70.67				

30. Mrs. Schenkel. SW¼NW¼ sec. 32, T. 20 S., R. 13 E. About 100 feet northeast of county road crossing Southern Pacific Railroad at Chavez siding. Used drilled irrigation well, diameter 20 inches, depth 84 feet. Measuring point, top of casing, north side, 0.5 foot above land surface. Equipped with turbine and tractor.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 12, 1939	25.93	Apr. 25, 1940	26.79	Oct. 8, 1940	26.72
Jan. 3, 1940	26.08	June 6	27.48	Nov. 6	26.96
Feb. 27	26.03				

46. Sinohui. NW¼NW¼ sec. 17, T. 21 S., R. 13 E. Near abandoned adobe house, 100 feet south of county road leading to Tubac, 0.5 mile east of U. S. Highway 89. Unused dug domestic well, diameter 84 inches, depth 36 feet. Measuring point, blue arrow on bottom 1 by 12-inch plank at curb, west side, 0.8 foot above land surface.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 13, 1939	34.86	Apr. 25, 1940	34.85	Aug. 30, 1940	34.95
Jan. 3, 1940	34.34	June 6	35.52	Oct. 8	35.48
Feb. 27	34.54	July 11	35.83	Nov. 4	35.50
Mar. 21	34.61				

48. Mrs. Mary Ellen Cotter. NW¼NE¼ sec. 19, T. 21 S., R. 13 E. About 0.25 mile south of Carmen store at Carmen, and 200 feet east of U. S. Highway 89. Used dug stock and domestic well, diameter 72 inches, depth 30 feet. Measuring point, blue mark on top 6 by 8-inch timber, 0.30 foot above land surface. Equipped with centrifugal pump and electric motor.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1939	26.16	Apr. 25, 1940	26.04	Aug. 30, 1940	25.57
Jan. 3, 1940	24.71	June 6	26.47	Oct. 8	26.66
Feb. 27	25.05	July 9	26.97	Nov. 4	26.81
Mar. 21	24.88				

a Highest water level in period between tape measurements.

Santa Cruz County--Continued.

53. Favronio. NE¼SW¼ sec. 30, T. 21 S., R. 13 E. About 200 feet east of U. S. Highway 89, 0.2 mile north of Tumacacori National Monument. Unused dug domestic well, 48 by 60 inches, depth 23 feet. Measuring point, blue arrow on southwest corner of lower curb, 1.0 foot below land surface. Equipped with cylinder pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 13, 1939	20.69	Apr. 25, 1940	20.70	Aug. 30, 1940	21.29
Jan. 3, 1940	20.60	June 6	21.24	Oct. 8	21.43
Feb. 27	20.44	July 9	21.49	Nov. 4	21.44
Mar. 21	20.34				

73. SW¼SE¼ sec. 18, T. 21 S., R. 12 E. About 100 feet west of U. S. Highway 89, 0.6 mile north of Carmen store. Unused dug domestic well, diameter 33 inches, depth 30 feet. Measuring point, blue mark at middle of curb, east side, 2.0 feet above land surface.

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

Oct. 16, 1939	27.03	Apr. 25, 1940	27.71	Aug. 30, 1940	27.66
Jan. 3, 1940	27.50	June 6	28.49	Oct. 8	28.70
Feb. 27	27.41	July 9	29.06	Nov. 4	28.97
Mar. 21	27.36				

81. T. T. Pendleton. SE¼SE¼ sec. 5, T. 22 S., R. 13 E. About 0.3 mile northeast of U. S. Highway 89, 0.25 mile southwest of Southern Pacific Railroad at a point 0.7 mile northwest of Otero siding. Used drilled irrigation well, diameter 20 inches. Measuring point, southwest side of pump base, 0.5 foot above land surface. Equipped with turbine and 25 horsepower electric motor.

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

Oct. 24, 1939	18.39	Mar. 21, 1940	18.35	Aug. 30, 1940	19.14
Jan. 4, 1940	18.53	Apr. 25	18.70	Oct. 8	19.82
Feb. 27	18.31	June 6	20.65	Nov. 4	19.36

82. T. T. Pendleton. SW¼SE¼ sec. 5, T. 22 S., R. 13 E. About 0.1 mile northeast of U. S. Highway 89, and 2.3 miles south southeast of Tumacacori National Monument. Dug domestic well, diameter 34 inches, depth 20 feet. Measuring point, blue mark on top 6 by 6-inch timber south side of curb, 0.5 foot above land surface. Equipped with rope and bucket.

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

Oct. 24, 1939	16.22	Apr. 27, 1940	17.65	Aug. 30, 1940	17.79
Jan. 4, 1940	17.41	June 6	18.86	Oct. 8	18.61
Feb. 27	17.27	July 9	19.07	Nov. 4	19.03
Mar. 21	17.28				

85. T. T. Pendleton. SW¼NW¼ sec. 9, T. 22 S., R. 13 E. About 0.1 mile northeast of U. S. Highway, and 0.6 mile west of Otero siding. Used dug and drilled domestic well, diameter 52 to 12 inches, depth 88 feet. Measuring point, blue arrow on top of 2 by 4-inch board west side of curb, 0.75 foot above land surface. Equipped with centrifugal pump and electric motor.

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

Oct. 24, 1939	32.02	Mar. 21, 1940	32.06	July 9, 1940	33.70
Jan. 4, 1940	32.20	June 6	33.47	Aug. 30	32.94
Feb. 27	32.11				

91. T. T. Pendleton. SW¼SE¼ sec. 16, T. 22 S., R. 13 E. About 0.1 mile north of Calabasas school house, 0.1 mile west of U. S. Highway 89, and 1.6 miles south of Otero siding. Used drilled stock well, diameter 8 inches, depth 45 feet. Measuring point, top of casing, south side, 0.9 foot above land surface. Equipped with windmill.

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

Oct. 25, 1939	13.84	June 6, 1940	19.31	Aug. 31, 1940	a 11.13
Mar. 21, 1940	18.11	July 9	19.97	Nov. 4	14.40

a Nearby wash running several hours.

Santa Cruz County--Continued.

98. T. T. Pendleton. SE¼SE¼ sec. 35, T. 22 S., R. 13 E. About 200 feet southwest of Southern Pacific Railroad, 0.8 mile northwest of Calabasas siding. Drilled irrigation well, diameter 20 inches, depth 100 feet. Measuring point, top of wood platform for pump, 0.5 foot above land surface. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 25, 1939	16.51	Apr. 27, 1940	19.38	Aug. 31	22.74
Jan. 4, 1940	18.86	June 6	21.54	Oct. 8	24.07
Mar. 21	18.47	July 9	23.50	Nov. 4	24.32

99. T. T. Pendleton. SW¼SW¼ sec. 36, T. 22 S., R. 13 E. About 0.15 mile northeast of Southern Pacific Railroad and 0.6 mile northeast of Calabasas siding. Used drilled domestic and stock well, diameter 8 inches, depth 76 feet. Measuring point, top of casing, west side, 0.66 foot above land surface. Equipped with automatic cylinder pump and electric motor.

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

Oct. 25, 1939	42.04	June 6, 1940	46.37	Oct. 8, 1940	48.86
Jan. 4, 1940	43.88	July 9	48.09	Nov. 4	48.93
Mar. 21	43.59	Aug. 31	47.80		

101. T. T. Pendleton. SW¼NE¼ sec. 2, T. 23 S., R. 13 E. Near abandoned house, 0.1 mile northeast of U. S. Highway 89, 0.7 mile west of Southern Pacific Railroad siding at Calabasas. Unused dug domestic well, diameter 33 inches, depth 28 feet. Measuring point, blue arrow on bottom 6 by 8-inch timber at center of well on west side at land surface.

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

Oct. 26, 1939	24.91	Mar. 22, 1940	24.58	Aug. 31, 1940	(b)
Jan. 4, 1940	25.31	June 6	25.53	Oct. 8	28.25
Feb. 27	25.19	July 9	(a)	Nov. 4	28.78

102. T. T. Pendleton. NE¼NE¼ sec. 12, T. 23 S., R. 13 E. About 50 feet southwest of Santa Cruz River, 0.15 mile east of Southern Pacific Railroad, 0.75 mile southeast of Calabasas siding. Unused drilled irrigation well, diameter 20 inches, depth 83 feet. Measuring point, bottom hole, southeast side of casing, 0.75 foot above land surface.

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

Oct. 26, 1939	13.48	Mar. 22, 1940	12.90	Aug. 31, 1940	20.07
Jan. 4, 1940	14.75	June 6	22.32	Oct. 8	24.25
Feb. 27	11.39	July 9	26.03	Nov. 4	26.10

103. T. T. Pendleton. NW¼NE¼ sec. 12, T. 23 S., R. 13 E. About 300 feet west of Southern Pacific Railroad, 300 feet east of U. S. Highway 89, 0.75 mile south southeast of Calabasas siding. Used dug domestic well, diameter 36 inches, depth 29 feet. Measuring point, blue arrow on top of center 2 by 10-inch plank south side of casing, 1.6 feet above land surface.

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

Oct. 26, 1939	22.08	June 6, 1940	24.60	Oct. 8, 1940	26.71
Jan. 4, 1940	22.43	July 9	26.19	Nov. 4	27.01
Mar. 22	21.31	Aug. 31	26.31		

105. Mrs. Ellen Underwood. SE¼SE¼ sec. 13, T. 23 S., R. 13 E. About 0.1 mile south of Ruby Road, and 0.1 mile southwest of junction of Ruby Road with U. S. Highway 89. Used dug domestic and irrigation well, 57 by 54 inches, depth 27 feet. Measuring point, blue arrow at bottom 2 by 4-inch board, northwest edge of opening, 1.0 foot above land surface. Equipped with centrifugal pump and gasoline engine.

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

Oct. 26, 1939	4.25	Mar. 22, 1940	13.16	Aug. 31, 1940	10.92
Jan. 4, 1940	6.28	June 6	10.90	Oct. 8	6.90
Feb. 27	11.17	July 9	14.49	Nov. 4	4.36

a Dry.
b Well being deepened.

Santa Cruz County--Continued.

125. J. F. Dalton. SW¼NW¼ sec. 19, T. 23 S., R. 14 E. About 200 feet west of U. S. Highway 89, 0.8 mile south of junction with Ruby Road. Used dug irrigation well, diameter 55 inches, depth 21 feet. Measuring point, top of 6-inch discharge pipe, 2.4 feet below land surface. Equipped with centrifugal pump and gasoline engine.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1939	10.13	Apr. 27, 1940	8.02	Aug. 31, 1940	8.77
Jan. 4, 1940	9.44	June 6	10.02	Oct. 8	9.02
Feb. 27	8.26	July 9	9.70	Nov. 4	9.00
Mar. 22	7.71				

126. Carl Peterson. NW¼NE¼ sec. 21, T. 23 S., R. 14 E. In tin shed, 150 feet northeast of Santa Cruz River Road, 3.2 miles northwest of Nogales pumping station. Used dug and drilled domestic and stock well, diameter 72 inches to depth of 19 feet, 10 inches to depth of 26 feet. Measuring point, bottom coupling on 1-inch pipe, west side, 0.75 foot above land surface.

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

Oct. 31, 1939	20.63	Mar. 22, 1940	20.47	July 10, 1940	21.14
Jan. 4, 1940	21.38	June 7	20.62	Oct. 9	20.96

132. Dines Nelson. NE¼NW¼ sec. 27, T. 23 S., R. 14 E. About 20 feet northeast of River Road, 2.0 miles northwest of Nogales pumping station. Unused dug well, diameter 62 inches, depth 36 feet. Measuring point, blue arrow at bottom 8 by 8-inch timber, west side of curb, 0.3 foot above land surface.

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

Oct. 31, 1939	18.37		a 17.40		a 18.29
Jan. 4, 1940	18.05	Apr. 27, 1940	17.59	Aug. 30, 1940	18.80
Feb. 26	17.72	June 7	18.83	Oct. 9	18.80
	a 17.49	July 10	19.29	Nov. 6	19.80
Mar. 22	17.57				

138. Bill Chenoweth. NE¼NW¼ sec. 31, T. 23 S., R. 14 E. About 0.1 mile west of U. S. Highway 89, 2.1 miles northwest of Nogales Ranger Station. Unused drilled irrigation well, diameter 10 inches, depth 50 feet. Measuring point, top of casing, east side, at land surface.

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

Oct. 27, 1939	9.94	Mar. 22, 1940	8.27	June 6, 1940	9.08
Jan. 4, 1940	8.37		a 8.18	July 10	9.66
Feb. 27	8.35	Apr. 27	8.37		

139. Tom Bayze. SE¼SE¼ sec. 31, T. 23 S., R. 14 E. About 0.1 mile southwest of U. S. Highway 89, 0.9 mile northwest of Nogales Ranger Station. Used dug and drilled irrigation well, diameter 72 inches to depth of 8 feet, 10 inches to depth of 48 feet. Measuring point, bottom of pump base, east side, 2.0 feet above land surface. Equipped with turbine and gasoline engine.

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

Oct. 18, 1939	22.61	Mar. 22, 1940	15.27	Oct. 9, 1940	19.67
Jan. 4, 1940	20.79	June 7	16.01	Nov. 4	19.88
Feb. 27	15.92	July 9	18.73		

142. Camberos Brothers. NW¼NW¼ sec. 36, T. 23 S., R. 14 E. About 200 yards east of Santa Cruz River, 200 feet west of State Highway 82, 0.4 mile northeast of Nogales pumping station. Used dug domestic and irrigation well, diameter 51 inches, depth 52 feet. Measuring point, blue arrow on bottom of steel rail north side pump, at land surface.

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

Nov. 1, 1939	18.52	Mar. 22, 1940	16.80	Aug. 30, 1940	26.72
Jan. 4, 1940	18.03	June 7	31.39	Oct. 9	31.63
Feb. 26	17.08	July 10	35.18	Nov. 6	33.12

a Highest water level in period between tape measurements.

Santa Cruz County--Continued.

144. George Griffith. SW¼SW¼ sec. 26, T. 23 S., R. 14 E. About 200 feet southwest of Santa Cruz River, 150 feet northeast of River Road, 1.0 mile northwest of Nogales pumping station. Unused dug domestic and stock well, diameter 60 inches, depth 16 feet. Measuring point, blue arrow on south side of flange at top of pump, 2.0 feet below land surface.

Water level, in feet below measuring poi.., 1939-40

Date	Water level	Date	Water level	Date	Water level
Oct. 31, 1939	3.73	Apr. 27, 1940	3.24	Aug. 30, 1940	5.65
Jan. 4, 1940	3.73	June 7	7.20	Oct. 9	8.51
Feb. 26	2.32	July 9	9.06	Nov. 6	9.72
Mar. 22	3.00				

174. D. Peterson. SE¼NE¼ sec. 7, T. 24 S., R. 15 E. About 300 yards east of Santa Cruz River, 1.5 miles south southwest of Nogales-Washington Camp Road, 2.9 miles southeast of Nogales pumping station. Unused dug well, diameter 48 to 36 inches, depth 15 feet. Measuring point, bottom coupling on 2-inch pipe on hand pump, 1.5 feet above land surface.

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

Nov. 2, 1939	12.06	Mar. 22, 1940	11.92	July 10, 1940	14.49
Jan. 4, 1940	12.03	Apr. 26	12.14	Oct. 9	12.40
Feb. 26	11.70	June 7	13.00	Nov. 6	12.50

176. Neilson Brown. Buena Vista Grant, 100 yards west of ranch headquarters, 200 feet east of Santa Cruz River, 2.0 miles south southwest of Nogales-Washington Camp Road, 3.1 miles southeast of Nogales pumping station. Used drilled irrigation well, diameter 16 inches, depth 43 feet. Measuring point, bottom of hole in north side of pump base, 2.5 feet above land surface. Equipped with turbine and 18 horsepower gasoline engine.

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

Nov. 2, 1939	9.67	Mar. 22, 1940	10.49	June 7, 1940	11.64
Jan. 4, 1940	10.57	Apr. 26	11.26	July 10	12.85
Feb. 26	10.30				

177. Neilson Brown. Buena Vista Grant, 50 yards east of Santa Cruz River, 2.1 miles south southwest of Nogales-Washington Camp Road, 3.2 miles southeast of Nogales pumping station. Unused dug and drilled irrigation well, diameter 60 to 12 inches, depth 22 feet. Measuring point, blue arrow at top of casing, southeast side, 0.3 foot above land surface.

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

Nov. 2, 1939	10.36	Mar. 22, 1940	10.19	Apr. 26, 1940	10.24
Jan. 4, 1940	10.21		a 10.05	June 7	11.19
Feb. 26	10.01		b 10.51	July 10	12.39

199. Benito Morales. SE¼SE¼ sec. 5, T. 24 S., R. 14 E. About 0.2 mile east of U. S. Highway 89, 0.7 mile southeast of Nogales Ranger Station. Unused dug irrigation well, 72 by 96 inches, depth 37 feet. Measuring point, blue arrow on top center 2 by 12-inch timber, east side curb, 1.0 foot below land surface.

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

Oct. 30, 1939	29.07	Mar. 22, 1940	25.79	Aug. 31, 1940	31.10
Jan. 4, 1940	26.34	Apr. 27	27.23	Oct. 9	30.71
Feb. 27	25.58	June 7	29.85	Nov. 4	31.04
	a 25.33	July 9	32.27		

202. Simon Mastick. SW¼NE¼ sec. 8, T. 24 S., R. 14 E. About 50 feet west of U. S. Highway 89, and 1.0 mile north of junction of U. S. Highway 89 with State Highway 82. Unused dug irrigation well, diameter 70 inches, depth 35 feet. Measuring point, blue arrow at top of casing, east side, 1.8 feet above land surface.

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

Oct. 30, 1939	19.48	Apr. 27, 1940	23.17	Aug. 31, 1940	26.09
Jan. 4, 1940	20.91	June 7	25.27		a 25.73
Feb. 27	20.77	July 10	26.72	Oct. 9	26.68
Mar. 22	21.09		a 25.91	Nov. 4	27.00

a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Santa Cruz County--Continued.

204. P. C. Gallegos. SE¼SE¼ sec. 8, T. 24 S., R. 14 E. About 300 feet west of U. S. Highway 89, and 0.65 mile north northeast of junction of U. S. Highway 89 with State Highway 82. Unused dug well, 36 by 48 inches, depth 20 feet. Measuring point, blue arrow at top of wood cover, west side, 1.8 feet above land surface.

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

Date	Water level	Date	Water level	Date	Water level
Oct. 30, 1939	13.73		a 15.87		b 16.97
Jan. 4, 1940	14.97	June 7, 1940	16.75	Aug. 31, 1940	16.51
Feb. 27	15.86		a 16.34		a 16.24
	a 15.53	July 10	16.92	Oct. 9	16.52
Mar. 22	15.67		a 16.27	Nov. 4	17.11
Apr. 27	16.20				

208. O. D. Bartlett. SW¼SW¼ sec. 9, T. 24 S., R. 14 E. About 50 feet northwest of State Highway 82, and 0.9 mile northeast of junction with U. S. Highway 89. Unused dug well, 72 by 45 inches, depth 33 feet. Measuring point, blue arrow on flat side of washer under pump, 1.0 foot above land surface.

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

Nov. 1, 1939	26.44	Apr. 26, 1940	29.42	Aug. 30, 1940	31.97
Jan. 4, 1940	27.75	June 7	30.42	Oct. 9	31.71
Feb. 26	28.44	July 9	31.12	Nov. 6	31.84
Mar. 22	28.78				

232. Caulishaw. SW¼NE¼ sec. 33, T. 22 S., R. 15 E. About 200 feet east of State Highway 82, 1.3 miles south of Circle Z Ranch, and 4.7 miles northeast of Nogales Airport. Unused drilled well, diameter 8 inches, depth 25 feet. Measuring point, blue arrow at top of casing, north side, 0.9 foot above land surface.

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

Nov. 3, 1939	18.98	Apr. 26, 1940	20.70	Aug. 31, 1940	21.73
Jan. 5, 1940	19.91	June 7	21.19	Oct. 9	21.24
Feb. 26	20.37	July 10	21.48		b 21.81
Mar. 22	20.48		a 19.23	Nov. 6	21.65

233. L. G. Zinsmeister. NW¼NE¼ sec. 28, T. 22 S., R. 15 E. About 0.2 mile south of Sonoita Creek, 0.15 mile west northwest of State Highway 82 at Circle Z Ranch headquarters. Unused dug well, diameter 60 inches, depth 48 feet. Measuring point, blue arrow on top 6 by 8-inch timber, east side of cover, at land surface.

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

Nov. 3, 1939	41.27		a 39.04		a 40.82
Jan. 5, 1940	39.07	Apr. 26, 1940	40.00	Aug. 31, 1940	41.95
Feb. 26	36.93	June 7	42.23	Oct. 9	43.07
Mar. 22	39.27	July 10	43.10	Nov. 6	44.73

234. L. G. Zinsmeister. SW¼SE¼ sec. 21, T. 22 S., R. 15 E. In shed just southeast of corral, 10 yards south of Sonoita Creek, at Cricle Z Ranch, and 0.15 mile west northwest of State Highway 82. Used dug domestic and stock well, 72 by 96 inches, depth 14 feet. Measuring point, blue arrow on 2 by 8-inch timber west side of square hole in cover, 0.8 foot above land surface. Equipped with cylinder pump and gasoline engine.

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

Nov. 3, 1939	8.29	June 7, 1940	8.60	Aug. 31, 1940	8.40
Jan. 5, 1940	8.29	July 10	8.72	Nov. 6	8.38
Mar. 22	8.32				

235. U. S. Civilian Conservation Corps Camp. San Jose de Sonoita Grant. 50 feet south of Sonoita Creek, 0.1 mile west of junction of State Highway 82 and county road to Hardshel. Used dug well, diameter 36 inches, depth 13 feet. Measuring point, blue arrow on top of casing, northeast side, 4.5 feet above land surface. Equipped with cylinder pump and gasoline engine.

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a Highest water level in period between tape measurements.
b Lowest water level in period between tape measurements.

Santa Cruz County--Continued.

235. U. S. Civilian Conservation Corps Camp--Continued.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1939	8.84	Mar. 22, 1940	a 9.62	Oct. 9, 1940	8.08
Jan. 5, 1940	7.51	July 10	a10.10	Nov. 6	a 9.50
Feb. 26	7.76	Aug. 31	a 8.65		

236. Caulishaw. San Jose de Sonoita Grant, 200 yards northwest of Sonoita Creek, 0.15 mile northwest of State Highway 82, 0.9 mile southwest of Patagonia. Used dug domestic well, depth 25 feet. Measuring point, blue arrow on west side curb, at land surface.

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

Nov. 3, 1939	23.67	Apr. 26, 1940	22.82	Aug. 31, 1940	23.46
Jan. 5, 1940	23.03	June 7	23.79	Oct. 9	23.64
Feb. 26	22.67	July 10	24.24	Nov. 6	23.40
Mar. 22	22.67				

237. Albert Gatlin. SE¼SE¼ sec. 11, T. 22 S., R. 15 E. About 0.4 mile northwest of Sonoita Creek, 0.25 mile northwest of county road, 1.6 miles west-southwest of Patagonia. Used dug domestic and stock well, diameter 30 inches, depth 32 feet. Measuring point, blue arrow on bottom of upper pipe clamp, south side, 1.43 feet above land surface. Equipped with windmill.

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

Nov. 3, 1939	24.12	Apr. 26, 1940	a 25.82	Aug. 31, 1940	20.36
Jan. 5, 1940	a 28.86	June 7	a 28.73	Oct. 9	a 23.84
Feb. 26	22.54	July 10	a 29.91	Nov. 6	a 23.61
Mar. 22	24.09				

a Pumping.

CALIFORNIA

GENERAL SUMMARY

By F. C. Ebert

The Geological Survey continued during 1940 its program of measuring the depth to water level in selected wells in southern California.[1] A water-stage recorder was maintained on well 42a at Baldwin Park, in the upper San Gabriel Valley. Systematic measurements by other agencies of the depth to water level in wells in several areas in California were also continued during 1940. The State of California, Department of Public Works, Division of Water Resources, assembled the records of water level that were collected during 1939 by the agencies interested in the south coastal basins and published them in Bulletin 39-H, Records of ground-water levels at wells for the year 1939.

CLIMATOLOGICAL DATA

The following general summary of climatological data for the calendar year 1940 is taken from a report[2] of the Weather Bureau:

"The total precipitation for the State was 150 percent of the 44-year average and was with two exceptions the greatest of record during this period, the years 1906 and 1909 being somewhat wetter. January, February, and December were abnormally wet, December being the wettest month of that name on record. March and October were somewhat wetter than usual, while the other seven months were dry. The annual excess was general, least in the desert regions and southwestern portion of the State and greatest along the middle coast and over the Sacramento River Drainage Basin where a number of stations had over double the normal amount.

"The total snowfall was 79 percent of the 44-year average. Annual totals were generally subnormal at low and intermediate levels, but well above normal at high altitudes. February and December were the only months with excesses. At the end of December the ground was bare generally below the 4,500-foot level in northern, below the 5,000-foot level in central, and below the 6,000-foot level in southern California. At high elevations, however, the snow cover was unusually great, and more than double the normal amount at stations having an elevation of 9,000 feet or more."

FLUCTUATIONS OF WATER LEVEL

San Gabriel River Basin

The water level in well 42a[3] at Baldwin Park rose from a seasonal minimum mean daily altitude of 291.36 feet on January 8 and 9 to a mean daily altitude of 293.87 feet, the highest stage of the year, on May 18 and 20. The water level then declined during the pumping season to a low mean daily altitude of 286.35 feet on December 18 and 19. On December

1/ See Water-Supply Papers 817, 840, 845, and 886.
2/ U. S. Department of Commerce, Weather Bureau, Climatological Data, vol. XLIV, No. 13, 1940.
3/ Ebert, F. C., Am. Geophys. Union Trans. 1936, p. 372.

31, 1940, the mean daily altitude of the water level was 286.53 feet--7.34 feet below the high stage of the year and 4.87 feet below that of December 31, 1939.

The general trend of the water level in this area was upward from the beginning of the record in 1904 to 1907, then slowly downward until 1913. From 1914 to 1916, the precipitation was considerably above average and the discharge of the San Gabriel River was high. As a result the water level in the well rose to a record high altitude of 329.1 feet on May 19, 1916. From that date until 1921 the water level receded steadily except for seasonal fluctuations. The lowest altitude of the water level observed during that period was 292.4 feet on October 21, 1921. The precipitation in 1921-22 was 4.6 inches above normal and the San Gabriel River had a record discharge of 410,000 acre-feet. The water level in the well reached a stage of 321.3 feet on May 25, 1922. From 1922 to 1931, a period of subnormal precipitation, the trend of the water level was down except during 1927, when it was reversed and the water level rose from an altitude of 275.6 feet in November 1926 to 295.7 feet in May 1927. A record low stage of 257.0 feet was observed December 5, 1931. During 1931-32 the water level rose 19.7 feet and in 1934-35 it rose 25.8 feet. During 1932-33, 1933-34, and 1935-36, all years of subnormal rainfall, the water level declined about 5 feet each year. The seasonal low mean daily altitude recorded on December 13-14, 1936, was 266.98 feet. In 1936-37, the precipitation at Los Angeles was 7.29 inches above the 60-year average and the water level rose 35.46 feet. In 1937-38, the precipitation at Los Angeles was 8.20 inches above the 61-year average, the discharge of the San Gabriel River was high, and the water level rose 22.81 feet to reach a mean daily altitude of 309.99 feet on May 5, 1938. This stage was 19.1 feet below the record high stage in 1916, 53.0 feet above the lowest stage on record, and 43.0 feet above the seasonal low stage in December 1936. Since the high stage of 1938 the trend has been generally downward except for small seasonal fluctuations. The precipitation for 1938-39 and 1939-40 was about average. The seasonal low altitude of the water level in December 1940 was 286.35 feet--19.4 feet higher than the corresponding stage in December 1936, but 14.0 feet lower than the seasonal low stage recorded in February 1939.

The natural fluctuations of the water levels in the basin may have been affected somewhat by regulation of the San Gabriel River at the 3 dams: the City of Pasadena Morris Dam, which was placed in operation in 1936; the Los Angeles County Flood Control District San Gabriel Dam 1, which was placed in operation in 1938, and San Gabriel Dam 2 on the West Fork, which was placed in operation in 1934.

Santa Ana River Basin

San Bernardino Area

The water level in the Williams well[4/] rose to a stage 15.5 feet below the measuring point on April 20, 1940. The lowest stage observed in the year occurred on October 19 when the water level was 30.2 feet below the measuring point--3.4 feet below the corresponding low stage in 1939. On December 28, 1940, the water level was 26.92 feet below the measuring point--1.0 foot lower than on December 30, 1939.

The first general public interest in ground-water levels in San Bernardino Valley developed when water levels declined following a period of deficient precipitation in the late eighteen nineties. Of wells in which measurements of water level are still being made, the record on one begins in 1892; the record on the others begins about 1900.

The general pattern of the fluctuations of water level in the valley may be described as follows: from the bottom of a deep depression, which occurred about 1904, the water levels rose persistently until 1917; from 1917 the water levels declined continuously until 1936, except for small rises in 1922 and 1927, and in 1936 they were lower than in 1904. The fluctuations of the water level in the Williams well are shown in the accompanying illustration.

The average of the fluctuations of water level in well 125, which is near the south edge of the valley, in the Williams well, which is at the edge of Santa Ana River, and in well 94, which is near the north edge of the valley, shows that the decline from 1917 to 1936 was 156 percent of the 1904-1917 rise and that the rise from the low of 1936 to the maximum stage reached since 1936 was 74 percent of the 1904-1917 rise. The decline in the Williams well from 1892 to 1904 was 102 percent of the 1904-1917 rise.

4/ Ebert, F. C., Am. Geophys. Union Trans. 1936, p. 373.

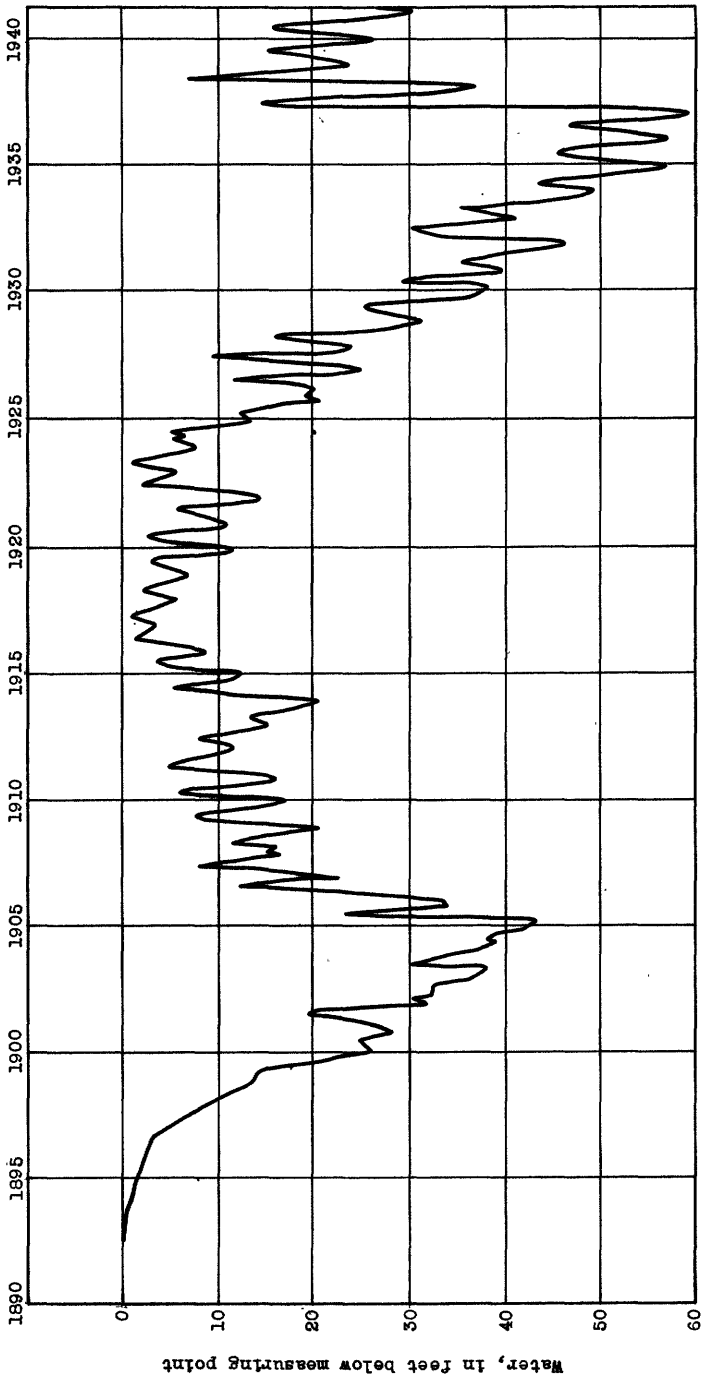

Figure 6.--Graph showing fluctuations of water level in the Williams well, San Bernardino area, Santa Ana River Basin, Calif., 1892-1940.

Records of all wells in the valley follow the same general pattern, but there are wide differences in detail between the records of individual wells. In general the water levels in wells close to stream channels rise quickly and have large annual fluctuations, whereas the water levels in wells farther from stream channels have relatively small annual fluctuations and considerable time is required for them to reach both their maximum and minimum stages.

South Coastal Plain

The water level in well 41b throughout 1940 was 1 to 2 feet lower than it was at corresponding times in 1939. The highest stage observed in the year occurred on May 2, when the altitude of the water level was 22.9 feet above sea level. The lowest observed stage unaffected by pumping occurred on September 12, when the altitude of the water level was 11.8 feet. The water level on December 10 was 15.7 feet--1.5 feet lower than it was at the corresponding time in 1939.

The altitude of the water level in well 41 was approximately 113 feet in 1898. The trend was generally downward to the end of 1905 at which time the altitude of the water level was 84 feet. The water level rose to 99 feet in 1908 but then receded to 65 feet by 1913. A slight rise in water level occurred in 1914 and comparatively large rises occurred in 1915 and 1916 in response to high precipitation and run-off during those years. The altitude of the water level was about 100 feet in March 1917. Except for a small recovery in 1922-23 the trend was downward from 1917 to the end of 1936. The altitude of the water level in well 41b, which replaced well 41, was 8.1 feet in October 1936--the lowest stage on record.

Although precipitation and run-off were excessive in 1937 and 1938 the resulting recovery of the water level from 1936 to 1939 amounted to only about 7 feet. The water level at the end of 1940 was 97 feet lower than in 1898.

San Jacinto Valley

The water levels in 9 wells distributed over the valley had net changes during the year ranging from a rise of a few tenths of a foot to a decline of about 4 feet. The water level in well 72c, at Perris, declined 0.5 foot; other wells in the Perris-March Field area also had very

small changes in water level. The declines in water levels in wells in the vicinity of Winchester and in the Hemet-San Jacinto area ranged from 1 to 2 feet; the water level in a well near Lakeview declined about 4 feet during the year.

The water level in well 72[5/] stood about 31 feet below the land surface in 1904. Except for a rise of 2 feet in 1905, a few tenths of a foot in 1937, and a temporary interruption in the recession during the period 1917-19, the trend has been steadily downward. The water level in well 72c, which replaced well 72, was 69 feet below the land surface in 1940--a net decline of 38 feet during the period of record. In the same period the water levels in wells 69 and 69a, between Perris and March Field, have had a net decline of 1.5 feet. Although water levels in the vicinity of Winchester have risen temporarily during periods of excessive precipitation, they have declined from stages about 19 feet below the land surface in 1905 to 30 feet in 1940. The water level in a well between San Jacinto and Hemet declined 16 feet from 1904 to 1940.

Tia Juana River Basin

The water levels in all five observation wells in this basin declined during the year. The net declines from November 1939 to December 1940 ranged from 0.9 foot in well 0140b to 4.3 feet in well 0130b and averaged 2.2 feet in the 5 wells.

The first measurements of water level available in the basin are those made in the fall of 1914. The precipitation in 1914-16 was above normal and the discharge of the Tia Juana River was high. As a result the water levels in wells rose to the highest stages on record. The water level in well 0118, which penetrates river fill, rose from an altitude of 9.6 feet above sea level in October 1914 to 20.6 feet in June 1916. The water level in well 0104, on the mesa north of the river, rose from an altitude of 3.6 feet in November 1914 to 8.5 feet in May 1917. Except for seasonal fluctuations the trend of the water level was downward until 1922, when considerable recharge occurred in the basin. The water level in well 0118a, which replaced well 0118, had a net gain of 4.0 feet during 1922. Water levels declined from 1923 to 1926 but rose in 1927. From 1928 to 1931 water levels lowered progressively, reaching record low stages in November 1931. During 1932, when the discharge of the Tia Juana River was comparatively high, the water levels rose about 2 feet. The water levels

5/ Ebert, F. C., Am. Geophys. Trans. 1936, p. 377.

changed very little except for seasonal fluctuations in 1933, declined without interruption in 1934, rose during 1935 and declined in 1936. The discharge of the Tia Juana River was high in 1936-37 and in 1937-38 and the water levels rose in most of the observation wells. The rises in 1937 ranged from 1 to 4 feet. In 1938 the water levels rose in some of the wells but declined in others. The average of the water levels in 5 wells rose 0.3 foot in 1939 and declined 2.2 feet in 1940. The altitude of the water level in well 0118b was 10.28 feet above sea level in December 1940.

The natural fluctuations of the water levels in this basin may have been affected by the regulation of the Tia Juana River and tributaries by storage in Morena, Barrett and Rodriguez reservoirs.

Otay and Sweetwater River Basins

The trend of the water levels in the Otay and Sweetwater River basins has been similar to that of the other river basins in San Diego County. Comparatively large rises in water level occurred in response to the excessive precipitation and high run-off in 1914-15 and 1915-16. Rises also occurred in 1921-22, 1926-27 and 1936-37. The water levels in most wells declined during the intervening periods. The water level in well 089a, in the Otay River Basin, was 18.4 feet below the land surface in December 1916--the highest stage on record--and 25.5 feet below the land surface in December 1940. The lowest stage of the water level in the well is not definitely known, but the water level in the fall of 1932 was approximately 29 feet below the land surface. The water level in well 018b, at Sunnyside in the Sweetwater River Basin, in September 1927 was about 6 feet higher than in 1921. The water level in well 018c, which in 1927 replaced well 018b, was 16.4 feet below the land surface in August 1940--6.8 feet below the stage in September 1927.

San Diego River Basin

The water levels in 3 wells in the El Monte Park area declined 1.5 to 3.6 feet in 1940 and the water levels in 5 wells in and near Lakeside declined 1.0 foot. An average net decline in water level of 1.1 feet occurred in 4 wells of the Riverview group and an average net decline of 0.3 foot occurred in 2 wells near Santee. In Mission Valley 3 wells

showed an average net decline of 0.7 foot in water level, whereas 2 wells showed small net rises.

The water level in well L5, near Lakeside, was 10.9 feet below the land surface and 402.40 feet above sea level in December 1912. The water level declined during 1913 but rose during 1914, 1915 and 1916. The highest fall stage on record--405.23 feet above sea level--was reached in December 1916. Gains in water level occurred in 1922, 1927, 1932, and 1937 following high discharges of the San Diego River during those years. Except for seasonal fluctuations, the water level declined during intervening years. The lowest stage on record--393.37 feet above sea level--was reached in December 1935. The altitude of the water level in December 1940 was 400.68 feet, which is 1.72 feet lower than it was in December 1912, 4.55 feet lower than the highest stage on record, and 7.31 feet above the lowest stage on record. The fluctuations of water level in wells in the Riverview and Santee areas are in general similar to those in well L5. The record low stages in most of the wells in these areas occurred in 1931.

Water levels in Mission Valley followed trends similar to those in the upper valley except that record low stages occurred in most of the observation wells in 1929. Water levels were low also in 1925, the water levels in some wells reaching their lowest stages in that year. The water level in well K63 declined from a stage 13.3 feet below the land surface in November 1922 to a record low stage of 16.8 feet below the land surface in October 1925. The lowest stage observed in this well since 1925 occurred in December 1929 when the water level was 15.5 feet below the land surface. The water level in December 1940 was 12.6 feet below the land surface--0.7 foot below the stage of November 1922 and 4.2 feet higher than that of October 1925.

Regulation of the San Diego River at El Capitan Dam, which was placed in operation in 1936, may have had some effect on the natural fluctuations of the water levels in the basin.

San Dieguito River Basin

The net change of the water levels in 6 wells in San Pasqual Valley in 1940 ranged from a gain of 1.4 feet to a loss of 0.6 foot.

Fluctuations of water levels in this basin during the period 1912-1940 have in general been similar in pattern to those in the other river

basins in San Diego County. Available records indicate peak water levels following floods in 1916. Record low stages were reached in 1926 in several of the wells and in 1929, 1931 or 1934 in other wells. Water levels in 2 wells near Fenton ford were about 2.5 feet lower in the fall of 1940 than they were at the corresponding time in 1927 and about 1.5 feet higher than at the low stages in 1934.

San Luis Rey River Basin

The water levels in wells in the upper part of the valley underwent usual seasonal fluctuation in 1940 but there were no appreciable net changes in water level in the year. The water level in well F17, at San Luis Rey, declined 0.35 foot from December 1939 to December 1940; the water levels in other wells in the vicinity also declined slightly. Water levels in 4 wells at the lower end of the valley showed an average net gain of 1.5 feet during the year.

The fluctuations of water level in well F17 are indicative of the general behavior of the ground-water levels in the basin. The first observation on the well was made in December 1912 when the water level was 7.0 feet below the land surface. The water level declined slightly in 1913 then rose during the period 1914-16 in response to high precipitation and run-off to a record high stage 3.6 feet below the land surface in February 1916. The trend of the water level was then generally downward until the underground reservoirs of the basin were recharged in 1922; the water level rose to a stage 5.2 feet below the land surface in March 1922. Except for a rise in 1927, the water level declined from 1923 to 1929 and in December 1929 reached the lowest stage on record--10.9 feet below the land surface. The water level remained low during 1930 and 1931, but rose during 1932 and 1933. The trend was downward again until considerable recharge occurred from the high river discharges in 1937 and 1938. The water level declined 1.0 foot from December 1938 to December 1940, at which time it was 8.9 feet below the land surface.

Mojave River Basin

Observations on the water levels in about 90 wells were made during spring and fall of 1940. The flow of the Mojave River during the winter of 1939-40 was below normal. Only comparatively small surface flow from the Forks reached Victorville during storms and such flow continued only

for a few days; no surface flow reached Barstow during the year. Generally, water levels in wells in the basin declined during 1940.

Except for the usual seasonal rises in areas adjacent to the river upstream from the Verde Crossing, water levels throughout the area south of Victorville declined in 1940. The declines ranged from 3.3 feet in a well near the river at the extreme upper end of the basin to a few tenths of a foot in the vicinity of Victorville. Water levels in the area between Victorville and Hodge showed net declines of a few tenths of a foot. Water levels in wells in the bottom lands north of the Mojave River and downstream from Hodge Crossing declined 3 to 4 feet; the water level in well M53 between the bottom lands and Barstow-Mojave highway declined 1.0 foot. Water levels in wells in Hinckley Valley north of the Barstow-Mojave highway showed declines ranging from 0.5 foot to 0.8 foot. Water levels in wells southeast of Harper Lake showed small but persistent declines. The water level in a well near Lenwood declined 0.6 foot; wells in and near Barstow declined about 1 foot.

In the area between Barstow and the intake of the Van Dyke Ditch water levels declined 1 to 2 feet during the year. The water level in well L1 just downstream from the ditch intake showed a decline of 3.8 feet. Water levels throughout the sub-basin from Daggett to the Kouns-Newberry sand-dune belt[6/] declined during the year; the declines ranged from about 3 feet at Daggett to a foot or less in the sand-dune belt. The pattern of the water-level decline was similar on both the north and south sides of the Mojave Valley. Water levels in wells east of the sand-dune belt declined a few tenths of a foot; those in Newberry-Troy Lake area had no appreciable change or declined slightly.

The observation-well program, which was started in this basin in 1929 by the State of California, Department of Public Works, Division of Water Resources, has been continued since 1931 by the Federal Geological Survey in conjunction with the operation of stream-gaging stations on the Mojave River. Records have been kept of the water levels in about 90 wells, most of which have been measured twice a year. A number of observations of water levels in wells[7/] were made prior to 1929 by the Federal Geological Survey, the California State Department of Engineering and by private

6/ Thompson, D. G., The Mohave Desert region, Calif.: U. S. Geol. Survey Water-Supply Paper 578, p. 481, 1929.

7/ Thompson, D. G., The Mohave Desert region: U. S. Geol. Survey Water-Supply Paper 578, pp. 371-547, 1929. Bulletin 5, California State Department of Engineering, 1918.

organizations or individuals, but no continuing program was begun until 1929. Records of discharge of the Mojave River were kept from 1905 to 1922 by the Arrowhead Reservoir and Power Company[8/] and from 1899 to 1905 and from 1930 to 1940 by the Federal Geological Survey. The available records of water levels together with the records of discharge indicate in general the behavior of the ground-water levels in this basin throughout a series of precipitation cycles. Ground-water recharge is furnished mainly by the Mojave River, which receives almost its entire flow from precipitation in the San Bernardino Mountains. Although a nominal amount of pumping for irrigation has been carried on in the area between Victorville and Barstow and in Hinckley Valley, such withdrawals of water from the basin have in the aggregate been small from 1930 to 1940. Consumptive use of water by native vegetation in the flood plains of the Mojave River has been high, particularly in the reach from Verde Crossing to Hodge Crossing.

During the period 1905-1920, the highest observed stage of the water level in well U13, near Hesperia Crossing, occurred in the spring of 1907, whereas the highest stage observed in well U26 occurred in the spring of 1916. The records of wells U26 and U27 indicate high water levels also in 1911 and 1922. The highest water levels observed in wells U13 and U26 during the period 1930-40 occurred in June 1938--these levels are believed to be nearly the maximum for that year. The stages of 1907 and 1916 in the wells were 2.5 feet to 4.5 feet higher than the stages of June 1938. Although river discharges were high for 2 consecutive years preceding the high stage of the water levels in June 1938 the total discharge for the preceding 7-year period was considerably less than that of the corresponding period preceding the maximum stage of 1907. The high water levels in 1916 followed high river discharges for 3 consecutive years; those of 1922 occurred during a year of high annual discharge. High water levels in 1911 followed moderately high river discharges in 1908-09 and excessive discharges in 1909-10 and 1910-11. The water level in well U17, which is on the mesa and about 3 miles east from Hesperia Crossing, was 5.6 feet lower in 1923 than in 1917 and 8.1 feet lower in 1930 than in 1923. The highest stage observed in well U17 since 1930 occurred in June 1938 and was 8.2 feet lower than that of 1917. The water levels in well U43, about a mile east of the Verde Crossing, and in well U57, about 3

8/ Bulletin 47, State of California, Department of Public Works, Division of Water Resources, pp. 114-115, 1934.

miles east from the Upper Narrows, were 1.5 feet and 7.0 feet higher, respectively, in 1917 than in 1938. The water level in well U57 was 6.2 feet lower in 1923 than in 1917. During the period 1930-40 the water levels in wells throughout the area south of Victorville registered net rises in 1932, 1935, 1937, and 1938 and net declines in the intervening years. Discharges in the Mojave River were moderately high in 1931-32 and excessive in 1936-37 and 1937-38. Although the discharge in 1934-35 was not high, the river flowed at Hesperia Crossing for several days. Discharges were appreciably below normal during the rest of the period. Water levels reached their lowest stages in most of the wells in this area in January 1935 just before the winter run-off of that year, but the levels were nearly as low in 1931 and 1936. The lowest water level in well U13 was observed January 7, 1935; it was 41.6 feet below the land surface and 31.3 feet below the record high stage of 1907. This low stage was probably the lowest since 1905. The range of fluctuation of the water levels near Daggett and in the basin south of Victorville decreases with distance from the river and also decreases with distance downstream. They become smallest at the Upper Narrows in Victorville. The water levels in some wells on the east mesa may be influenced by ground water from sources other than the Mojave River, but the extent of this influence is not definitely known. During the period 1930-40, water levels in wells north of the road from Victorville to Deadman Point changed very little and did not differ appreciably from those observed in 1917.

Only very few observations of water levels in the valley from Victorville to Barstow and Hinckley Valley were made prior to 1930. However, the record for well M40, near Hodge, includes measurements made in 1919 and 1923. Except for seasonal fluctuations of 3 or 4 feet, the water level in this well has changed very little. The highest stage--11.9 feet below the land surface--was observed in April 1932 and again in June 1938; this stage was 5.4 feet higher than the lowest recorded stage, which occurred in November 1931. Water levels in other observation wells in this locality showed similar changes. During the period 1930-40 the flow of the river reached Hodge Crossing every winter after the vegetation became dormant. This fact furnished further evidence that the water table between Victorville and Hodge had not greatly lowered during the years of subnormal precipitation and runoff.

Water levels in wells on the lowlands north of the Mojave River and downstream from Hodge Crossing have fluctuated according to the amount of river flow that reached this part of the basin. During the period 1930-40, considerable flow passed the gaging station at Barstow in 1931-32, 1936-37 and 1937-38; small flows passed the station for only a few days in 1934-35 and 1938-39. The lowlands were flooded in March 1938. Water levels in the area reached the lowest stages on record in the winters of 1932 and 1937 just before the storm run-off of those years; they reached the highest stages on record in the spring of 1938. The water level in well M56a, about 0.5 mile from the river, was 25.4 feet below the land surface in January 1937 and 8.2 feet below the land surface in June 1938 - a range in stage of 17.2 feet. The water level in this well was 18.4 feet below the land surface at the end of 1940. Well M53, on the mesa about midway between the river and the Barstow-Mojave highway, showed a maximum gain of 6.9 feet in water level during 1937 and 1938, but wells in Hinckley Valley north of the highway showed no definite gains in water level following high discharges of the river. The water levels in the latter area were mostly lower in 1940 than they were in 1930. Water levels in the area southeast of Harper Lake declined progressively and were 1 to 2 feet lower in 1940 than they were in 1930.

During the period 1930-40, the water level in well M82, near the bridge on U. S. Highway 91 in Barstow, fluctuated from a low stage of about 10 feet below the land surface in the fall of 1931 to a high stage of 5.4 feet below the land surface in May 1938. The pumping of a nearby well may have affected the water levels a few tenths of a foot. An observation on the water level in a neighboring well in 1919 indicates a stage between the high and low of the later period. The fluctuations of the water levels in this locality have followed a general pattern similar to that observed in other parts of the Mojave River Basin.

Water levels in the area between Barstow and Daggett were generally higher in 1940 than they were in 1925. The water level in well L1, just below the intake of the Van Dyke Ditch, rose from 35.3 feet below the land surface to 7.4 feet below the land surface from January 1937 to May 1938. These stages were the lowest and highest, respectively, that were observed from 1925 to 1940. The high stage in 1938 was 2.9 feet higher than the previous highest stage, which was observed in 1927. The well showed comparatively large rises in water level in 1927, 1932, 1937, and 1938. The water level declined steadily during the intervening periods.

The fluctuations of water levels in wells in the sub-basin between Daggett and the Kouns-Newberry sand-dune belt water levels have been greatest near the river at Daggett and the least in the sand-dune belt. The fluctuations decrease with increased distance from the river. The water level in well L42, about a mile northeast of Daggett, in January 1937 was at the lowest stage on record--83.0 feet below the land surface. Following a period of recharge from the river in 1937 the water level rose in May to a stage 50.6 feet below the land surface, then receded to a stage of 64.6 feet in December, rose again following high river flow to a record high stage of 47.0 feet below the land surface in May 1938. Observations have been made on this well since 1925. The water level in well L13, on the south border of the plain near Minneola, registered a record low stage in January 1937, showed a slight rise by June 1937, and progressive rises through 1938 and 1939. The water level in November 1939 and May 1940 was about 3.9 feet above the low stage in 1937, but was 5.5 feet below the stage observed in 1917. The water level in well L49, north of the Mojave River and about 1½ miles east of Yermo, was 23.0 feet below the land surface in November 1919. The highest observed stage of this well was 18.3 feet below the land surface in December 1922. During the period 1930-36 the water level in the well declined steadily except for a net rise of 1.0 foot in 1932. The lowest observed stage was 34.6 feet below the land surface in January 1937. The water level rose 5.7 feet in 1937 and 3.7 feet in 1938. The stage observed in November 1938 was 6.8 feet lower than the record high in 1922 and also lower than the stages observed in 1919 and 1924. The water level in the well at the end of 1940 was 28.8 feet below the land surface, 3.7 feet lower than that at the end of 1938. The records of other observation wells in this area also indicate that considerably higher water levels resulted from the recharge by the river in 1922 than those that resulted from the recharge of 1937 and 1938. The records of wells in the vicinity of Daggett indicate that the water levels in 1938 were higher than those in 1927; records of wells further east show the opposite. The fluctuation of water levels in wells in the sand-dune belt have about the same general pattern, but with a much smaller range in stage. The water level in well L67 registered a record high stage 2.0 feet below the land surface in 1924 and a record low stage 9.7 feet below the land surface in January 1937; the water level rose 4.7 feet during 1937 and 1938, changed very little during 1939 and declined about 1 foot in 1940.

Records of wells eastward or downstream from the sand-dune belt show that there has been only very little change in water level. The greatest change is that shown by well L76 in which the water level trended generally downward, except for rises of a few tenths of a foot in 1938 and 1939. The water levels in other wells in the area showed no definite trends from 1930 to 1940 and stages during this period were about the same as those in 1919 and 1922. Water levels in wells between Newberry and Troy Lake have indicated no definite general trend although a few wells have shown small declines.

Antelope Valley

Observations on the water levels in 25 wells were made during spring and fall in 1940. Water levels throughout the valley were mostly lower in 1940 than at corresponding times in 1939. The declines ranged from a few tenths of a foot in the northeastern part of the valley to 4 or 5 feet in the Palmdale-Tierra Bonita area. There was an average decline of about 2 feet.

Available records[9/] indicate a gradual lowering of the water levels in Antelope Valley prior to 1925. The flow of several wells in the lower part of the valley had ceased by 1925 and the water levels in other parts of the valley had declined a few feet since they were drilled. Except for seasonal fluctuations, which have corresponded closely to the irrigation cycle, the trend of the water levels in the arable parts of the valley since 1925 has been persistently downward. The declines in general have been the least in the northeastern or lowest part of the valley and the most in the southern part. During the period 1921-1940 the water level in a well northeast of Redman school, in the outermost part of the irrigated area, had a decline of 10 feet, and the water level in a well in the northwestern part of the valley had a decline of 21 feet. During the same period the water levels in 2 wells southwest of Lancaster declined an average of 40 feet and the water level in a well south of Roosevelt declined 31 feet. The greatest decline of the water level occurred in a well west of Lovejoy Buttes. The decline in this well between 1921 and 1940 was 67 feet. During the period 1932-40 the water level in a well northwest of Wilsona school declined about 20 feet. Water levels in wells for which records were started in recent years have shown declines comparable to wells with older records.

9/ Johnson, H. R., Water resources of Antelope Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 278, 1911. Thompson, D. G., The Mojave Desert region: U. S. Geol. Survey Water-Supply Paper 578, pp. 314-371, 1929.

WELL DESCRIPTIONS AND WATER-LEVEL MEASUREMENTS

On the following pages are given the records for 1940, arranged by basins, of all wells that were published in Water-Supply Paper 886. A complete description and datum are given also for an additional well in San Luis Rey River Basin.

For descriptions of the wells not given in this report, see Water-Supply Papers 817, 840, 845, and 886.

San Gabriel River Basin

42a. Baldwin Park, Calif.

Water level, in feet above mean sea level minus 200, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	91.37	91.63	91.88	92.85	93.69	93.69	93.19	92.04	90.08	88.29	87.01	86.76
2	91.37	91.54	91.96	92.86	93.72	93.72	93.23	91.95	90.03	88.21	87.02	86.76
3	91.38	91.55	91.99	92.94	93.73	93.74	93.26	91.92	89.95	88.17	87.02	86.76
4	91.42	91.55	91.99	92.99	93.76	93.68	93.22	91.91	89.90	88.12	87.02	86.71
5	91.42	91.57	92.03	93.02	93.78	93.63	93.29	91.84	89.89	87.99	87.02	86.67
6	91.40	91.61	92.06	93.04	93.80	93.62	93.32	91.77	89.84	87.94	87.03	86.66
7	91.39	91.65	92.09	93.09	93.82	93.67	93.34	91.70	89.75	87.92	87.01	86.64
8	91.38	91.61	92.14	93.13	93.86	93.68	93.34	91.59	89.70	87.88	87.03	86.62
9	91.36	91.59	92.18	93.19	93.86	93.66	93.29	91.53	89.69	87.82	87.03	86.59
10	91.36	91.66	92.20	93.21	93.78	93.63	93.20	91.46	89.68	87.74	86.97	86.56
11	91.41	91.71	92.19	93.22	93.79	93.61	93.16	91.39	89.64	87.66	86.98	86.53
12	91.46	91.66	92.18	93.25	93.80	93.57	93.13	91.32	89.59	87.61	86.98	86.48
13	91.42	91.68	92.22	93.29	93.85	93.55	93.09	91.22	89.54	87.54	86.99	86.43
14	91.45	91.73	92.27	93.31	93.86	93.54	93.00	91.16	89.49	87.46	86.95	86.39
15	91.47	91.69	92.31	93.37	93.85	93.49	92.99	91.15	89.44	87.45	86.94	86.40
16	91.49	91.68	92.34	93.35	93.84	93.41	92.97	91.11	89.33	87.42	86.93	86.42
17	91.55	91.67	92.36	93.33	93.86	93.34	92.89	91.04	89.23	87.37	86.93	86.37
18	91.55	91.69	92.39	93.38	93.87	93.32	92.85	90.99	89.18	87.33	86.95	86.35
19	91.53	91.74	92.43	93.40	93.86	93.33	92.74	90.92	89.15	87.24	86.90	86.35
20	91.53	91.77	92.47	93.41	93.87	93.30	92.69	90.85	89.09	87.19	86.88	86.39
21	91.55	91.80	92.50	93.44	93.81	93.26	92.70	90.80	89.05	87.13	86.93	86.43
22	91.54	91.81	92.54	93.47	93.74	93.21	92.60	90.72	88.99	87.03	86.89	86.45
23	91.56	91.76	92.56	93.49	93.74	93.22	92.52	90.65	88.94	86.98	86.85	86.49
24	91.53	91.79	92.59	93.47	93.80	93.17	92.46	90.53	88.84	86.94	86.86	86.51
25	91.51	91.85	92.63	93.51	93.82	93.16	92.41	90.48	88.77	86.94	86.90	86.40
26	91.53	91.81	92.66	93.54	93.80	93.17	92.37	90.45	88.67	86.93	86.86	86.44
27	91.57	91.84	92.68	93.54	93.76	93.19	92.32	90.36	88.59	86.92	86.84	86.50
28	91.57	91.87	92.71	93.57	93.71	93.14	92.27	90.31	88.48	86.93	86.83	86.56
29	91.59	91.89	92.74	93.62	93.73	93.15	92.22	90.24	88.38	86.96	86.82	86.60
30	91.59	.....	92.80	93.65	93.73	93.18	92.18	90.16	88.33	86.96	86.80	86.58
31	91.62	.....	92.88	.....	93.70	.....	92.13	90.10	.....	86.98	.....	86.53

San Bernardino Basin

Williams Well. Record furnished by Gage Canal Co.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	25.75	Feb. 17	19.58	Mar. 30	16.75	May 11	16.58
13	25.00	24	19.16	Apr. 6	16.50	18	17.42
20	22.58	Mar. 2	18.92	13	15.69	25	18.25
26	21.66	9	16.58	20	15.50	June 1	19.08
Feb. 3	21.08	16	16.33	27	15.67	8	19.67
10	20.75	23	16.33	May 4	16.00	15	20.33

San Bernardino Basin--Continued.

Williams Well.--Continued.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 22	21.08	Aug. 10	25.50	Sept.28	28.83	Nov. 16	29.75
29	21.66	17	26.03	Oct. 5	29.25	23	29.75
July 6	22.33	24	26.58	12	29.50	30	29.58
13	23.08	31	27.00	19	30.16	Dec. 7	29.29
20	23.75	Sept. 7	27.50	26	29.92	14	29.08
27	24.33	14	27.92	Nov. 2	29.92	21	28.83
Aug. 3	24.92	21	28.50	9	29.75	28	26.92

Santa Ana River Basin

41b. C-1129m-N-16 in Bulletin 39, California Division of Water Resources. South of Anaheim, Orange County. Record furnished by Orange County Flood Control District.

Water level, in feet below measuring point, 1940

Jan. 11	116.59	Mar. 21	114.67	June 13	118.00	Sept.12	124.35
18	116.16	Apr. 11	113.67	July 5	119.25	Oct. 8	135.96
Feb. 8	114.60	May 2	113.20	11	120.06	Nov. 7	122.18
13	114.64	13	113.26	Aug. 6	122.12	28	120.62
29	114.22	23	115.55	15	123.10	Dec. 10	120.38
Mar. 11	114.32	June 10	116.45				

72c. San Jacinto Valley at Perris, Riverside County. Water levels, in feet below measuring point, 1940: Feb. 15, 72.88; May 10, 76.00; Aug. 23, 73.17.

Tia Juana River Basin

0118b. Owens ranch.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Mar. 5	11.36	Aug. 22	17.05	Dec. 7	17.93
May 11	12.67	Oct. 5	17.33		

0120. Hewitt Bros. hog ranch.

Water level, in feet below measuring point, 1940

Mar. 5	12.77	Aug. 22	14.50	Dec. 7	16.17
May 11	12.17	Oct. 5	15.33		

0125. Evans ranch. Water levels, in feet below measuring point, 1940: Mar. 5, 10.75; May 11, 11.99; Aug. 22, 14.22; Oct. 5, 14.48.

0130b. Nestor Bridge.

Water level, in feet below measuring point, 1940

Mar. 5	10.42	Aug. 22	16.75	Dec. 7	18.31
May 11	12.51	Oct. 5	18.09		

0140b. Mrs. A. W. Jackson.

Water level, in feet below measuring point, 1940

Mar. 5	7.58	Aug. 22	9.91	Dec. 7	9.05
May 11	8.23	Oct. 5	10.31		

Otay River Basin

039a. N. Bard. Dry Mar. 5 and May 11, 1940.

089a. G. W. St. Clair.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level
Mar. 5	25.03	Aug. 22	27.74	Dec. 7	27.54
May 11	26.29	Oct. 5	28.82		

Sweetwater River Basin

018c. L. C. Kincaid.

Water level, in feet below measuring point, 1940

Mar. 5	13.06	Aug. 22	18.59	Dec. 7	(a)
May 11	13.13	Oct. 5	(a)		

San Diego River Basin

L28. San Diego County, El Monte Park.

Water level, in feet below measuring point, 1940

Jan. 25	20.83	July 17	23.75	Sept.30	27.14
Mar. 15	(b)	Aug. 30	(b)	Nov. 19	28.47
May 4	18.12				

L29. Pratt test well.

Water level, in feet below measuring point, 1940

Jan. 25	6.68	July 17	9.27	Sept.30	10.45
Mar. 15	6.92	Aug. 30	10.05	Nov. 19	10.68
May 4	7.13				

L30. Irrigation District well 6.

Water level, in feet below measuring point, 1940

Jan. 25	3.71	July 17	6.30	Sept.30	7.43
Mar. 15	3.66	Aug. 30	7.06	Nov. 19	7.77
May 4	4.24				

L31. Truttman ranch.

Water level, in feet below measuring point, 1940

Jan. 25	4.03	July 17	5.65	Sept.30	6.59
Mar. 15	3.85	Aug. 30	6.27	Nov. 19	6.91
May 4	4.27				

L32. Dr. Irey ranch.

Water level, in feet below measuring point, 1940

Jan. 25	9.52	July 17	10.10	Sept.30	10.97
Mar. 15	8.75	Aug. 30	10.67	Nov. 19	11.15
May 4	8.92				

L33. County yard.

Water level, in feet below measuring point, 1940

Jan. 25	8.95	July 17	9.27	Sept.30	10.16
Mar. 15	7.76	Aug. 30	9.88	Nov. 19	10.33
May 4	8.00				

a Well dry.
b Pump operating in well.

San Diego River Basin--Continued.

L5a. J. F. Rickerts.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	11.90	May 4	11.08	Aug. 30	12.92	Nov. 19	12.93
Mar. 15	10.76	July 17	12.32	Sept.30	12.96		

L35. Langdon.

Water level, in feet below measuring point, 1940

Jan. 25	9.85	May 4	8.12	Aug. 30	10.80	Nov. 19	11.52
Mar. 15	8.58	July 17	9.70	Sept.30	11.35		

L37. Levi.

Water level, in feet below measuring point, 1940

Jan. 25	11.38	May 4	9.36	Aug. 30	13.45	Nov. 19	13.51
Mar. 15	9.18	July 17	12.21	Sept.30	13.74		

L39. Burch.

Water level, in feet below measuring point, 1940

Jan. 25	8.71	May 4	8.53	Aug. 30	10.79	Nov. 19	11.14
Mar. 15	8.44	July 17	9.80	Sept.30	11.31		

L2. Riverview well 2.

Water level, in feet below measuring point, 1940

Jan. 29	2.62	May 4	2.81	Aug. 30	5.52	Nov. 19	4.97
Mar. 15	2.51	July 17	5.26	Sept.30	5.99		

L44a. Riverview well 3.

Water level, in feet below measuring point, 1940

Jan. 29	4.74	May 4	4.57	Aug. 30	6.14	Nov. 19	6.59
Mar. 15	4.21	July 17	5.54	Sept.30	6.54		

L83c. Riverview well 1.

Water level, in feet below measuring point, 1940

Jan. 29	0.67	May 4	1.06	Aug. 30	2.21	Nov. 19	2.52
Mar. 15	.79	July 17	1.86	Sept.30	2.52		

L46. County Farm.

Water level, in feet below measuring point, 1940

Jan. 29	8.46	May 4	6.92	Aug. 30	8.84	Nov. 19	9.24
Mar. 15	6.74	July 17	8.22	Sept.30	9.12		

L85. William Thum.

Water level, in feet below measuring point, 1940

Jan. 29	11.27	May 4	9.48	Aug. 30	13.39	Nov. 19	12.45
Mar. 15	9.46	July 17	12.73	Sept.30	13.30		

K51a. Jaussaud.

Water level, in feet below measuring point, 1940

Jan. 29	17.51	May 2	a 22.94	Aug. 30	24.90	Nov. 20	18.82
Mar. 16	15.64	July 17	19.23	Sept.30	19.31		

K51b. Jaussaud.

Water level, in feet below measuring point, 1940

Jan. 29	16.10	May 2	b 18.46	Aug. 30	23.12	Nov. 20	17.38
Mar. 16	14.23	July 17	17.85	Sept.30	17.90		

a Pump operating in nearby well.
b Pump operating in well.

San Diego River Basin--Continued.

K60. Bridges.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	2.36	May 2	3.14	Aug. 30	4.65	Nov. 20	3.80
Mar. 16	2.72	July 17	(a)	Sept.30	4.18		

K62. T. J. Goset, formerly Madruga.

Water level, in feet below measuring point, 1940

Jan. 29	10.50	May 2	9.23	Aug. 30	10.71	Nov. 20	11.01
Mar. 16	9.08	July 17	10.12	Sept.30	11.00		

K63. Confar.

Water level, in feet below measuring point, 1940

Jan. 29	12.64	May 2	11.86	Aug. 30	13.73	Nov. 20	13.87
Mar. 16	11.36	July 17	13.19	Sept.30	14.15		

K33a. Chapman.

Water level, in feet below measuring point, 1940

Jan. 29	8.76	May 2	8.80	Aug. 30	8.98	Nov. 20	8.89
Mar. 16	8.58	July 17	8.83	Sept.30	8.91		

San Dieguito River Basin

G17a. Pratt ranch. Water levels, in feet below measuring point, 1940: Mar. 1, 0.62; June 6, 2.17; Aug. 27, 3.80; Nov. 6, 4.01.

G17b. Pratt ranch. Water levels, in feet below measuring point, 1940: Mar. 1, 4.89; June 6, 6.33; Aug. 27, 7.98; Nov. 6, 8.16.

H31b. Old San Pasqual Creamery. Water levels, in feet below measuring point, 1940: Mar. 1, 10.62; June 6, 10.54; Aug. 27, 12.75; Nov. 6, 13.49.

H1a. Fenton ford. Water levels, in feet below measuring point, 1940: Mar. 1, 4.11; June 6, 4.72; Aug. 27, 6.31; Nov. 6, 7.50.

H1b. Fenton ford. Water levels, in feet below measuring point, 1940: Mar. 1, 2.42; June 6, 3.16; Aug. 27, 4.87; Nov. 6, 5.68.

H34b. Peet ranch. Water levels, in feet below measuring point, 1940: Mar. 1, 4.78; June 6, 4.95; Aug. 27, 5.25; Nov. 6, 5.48.

San Luis Rey River Basin

C9a. San Luis Rey ranch.

Water level, in feet below measuring point, 1940

Jan. 15	11.82	Apr. 15	12.09	July 15	13.28	Oct. 14	b 12.46
Feb. 12	11.98	May 13	12.88	Aug. 12	13.49	Nov. 18	12.17
Mar. 18	12.06	June 17	12.89	Sept.16	13.51	Dec. 16	12.13

C9b. San Luis Rey ranch.

Water level, in feet below measuring point, 1940

Jan. 15	8.94	Apr. 15	9.07	July 15	9.36	Oct. 14	b 9.38
Feb. 12	8.95	May 13	9.28	Aug. 12	9.33	Nov. 18	9.27
Mar. 18	9.09	June 17	9.29	Sept.16	9.33	Dec. 16	9.26

a Pump operating in well.
b Measurement by D. C. Muckel, Soil Conservation Service.

San Luis Rey River Basin--Continued.

C9c. San Luis Rey ranch.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	5.96	Apr. 15	6.13	July 15	6.33	Oct. 14	a 6.48
Feb. 12	6.01	May 13	6.28	Aug. 12	6.36	Nov. 18	6.20
Mar. 18	6.10	June 17	6.31	Sept.16	6.33	Dec. 16	6.26

C8. Fallbrook Public Utility District observation well on San Luis Rey ranch.

Water level, in feet below measuring point, 1940

Jan. 15	7.87	Apr. 15	8.33	July 15	9.06	Oct. 14	a 9.55
Feb. 12	7.95	May 13	8.53	Aug. 12	9.37	Nov. 18	8.41
Mar. 18	8.23	June 17	8.65	Sept.16	9.51	Dec. 16	8.29

C3a. Gird ranch.

Water level, in feet below measuring point, 1940

Jan. 15	7.88	Apr. 15	8.64	July 15	9.78	Oct. 14	a 10.68
Feb. 12	7.88	May 13	8.93	Aug. 12	10.10	Nov. 18	9.84
Mar. 18	8.43	June 17	9.23	Sept.16	10.43	Dec. 16	9.18

C5. Hart Incorporated.

Water level, in feet below measuring point, 1940

Jan. 15	6.14	Apr. 15	b 6.39	July 15	b 7.38	Oct. 14	ab 8.52
Feb. 12	6.11	May 13	b 6.57	Aug. 12	b 8.15	Nov. 18	6.24
Mar. 18	b 6.44	June 17	6.50	Sept.16	b 8.61	Dec. 16	6.15

C7b. Bonsall School well.

Water level, in feet below measuring point, 1940

Jan. 15	9.35	Apr. 15	9.30	July 15	10.57	Oct. 14	a 11.43
Feb. 12	8.76	May 13	9.80	Aug. 12	11.14	Nov. 18	10.94
Mar. 18	9.28	June 17	10.17	Sept.16	11.52	Dec. 16	10.59

C4. Fallbrook Public Utility District observation well on San Diego County Water Company property.

Water level, in feet below measuring point, 1940

Jan. 15	10.74	Apr. 15	11.08	July 15	13.04	Oct. 14	a 14.95
Feb. 12	10.56	May 13	11.41	Aug. 12	13.52	Nov. 18	13.75
Mar. 18	11.01	June 17	11.66	Sept.16	13.77	Dec. 16	11.32

F36. City of Oceanside observation well on Stokes property. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	10.61	Apr. 15	9.44	July 15	12.19	Oct. 14	15.17
Feb. 12	9.45	May 13	9.79	Aug. 12	13.29	Nov. 18	15.38
Mar. 18	9.54	June 17	9.87	Sept.16	14.55	Dec. 16	15.51

F22. Santa Fe well. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	11.19	Apr. 15	10.80	Aug. 12	13.75	Nov. 18	14.10
Feb. 12	10.22	May 13	(c)	Sept.16	14.58	Dec. 16	14.45
Mar. 18	10.48	July 15	(c)	Oct. 14	(c)		

F30. Carlsbad Mutual Water Company observation well near north abutment of County road bridge at San Luis Rey. Measurements made by D.C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	8.16	Apr. 15	7.79	July 15	9.50	Oct. 14	12.13
Feb. 12	7.66	May 13	8.22	Aug. 12	10.59	Nov. 18	12.14
Mar. 18	7.84	June 17	8.81	Sept.16	11.61	Dec. 16	12.13

a Measurement by D. C. Muckel, Soil Conservation Service.
b Pump operating in nearby well. c Pump operating in well.

San Luis Rey River Basin--Continued.

F17. Old San Luis Rey store. Measurements have been referred to the measuring point used prior to Dec. 30, 1929, by adding 3.1 feet. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	12.76	Apr. 15	11.29	July 15	10.26	Oct. 14	12.00
Feb. 12	11.31	May 13	11.14	Aug. 12	11.32	Nov. 18	12.54
Mar. 18	11.39	June 17	11.04	Sept.16	11.49	Dec. 16	12.90

F32. Carlsbad Mutual Water Company observation well, 0.25 mile east of pumping plant. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	19.60	Apr. 15	9.87	July 15	15.97	Oct. 14	18.50
Feb. 12	9.87	May 13	23.67	Aug. 12	17.67	Nov. 18	16.51
Mar. 18	a 19.37	June 17	15.02	Sept.16	17.46	Dec. 16	14.20

F13b. City of Oceanside. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	12.39	Apr. 15	11.71	July 15	15.17	Oct. 14	17.91
Feb. 12	8.94	May 13	13.78	Aug. 12	16.36	Nov. 18	13.03
Mar. 18	11.62	June 17	14.86	Sept.16	16.94	Dec. 16	12.45

F13c. City of Oceanside. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	11.55	Apr. 15	8.98	July 15	12.57	Oct. 14	14.79
Feb. 12	9.10	May 13	8.81	Aug. 12	13.57	Nov. 18	13.18
Mar. 18	8.85	June 17	11.58	Sept.16	14.15	Dec. 16	12.79

F13d. City of Oceanside. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	11.36	Apr. 15	10.76	July 15	13.24	Oct. 14	14.86
Feb. 12	9.56	May 13	12.06	Aug. 12	14.13	Nov. 18	10.12
Mar. 18	10.74	June 17	12.56	Sept.16	14.31	Dec. 16	12.39

F13e. City of Oceanside. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

Jan. 15	8.69	Apr. 15	8.13	July 15	10.35	Oct. 14	11.66
Feb. 12	7.18	May 13	9.14	Aug. 12	11.10	Nov. 18	10.12
Mar. 18	8.10	June 17	9.75	Sept.16	11.36	Dec. 16	9.78

F37. City of Oceanside observation well on Williams ranch. SE¼NW¼ sec. 9, T. 11 S., R. 4 W. Diameter 4 inches, depth 199 feet. Measuring point, top of casing, 3 feet above land surface. Measurements made by D. C. Muckel, Soil Conservation Service.

Water level, in feet below measuring point, 1940

June 17	10.47	Aug. 12	15.00	Oct. 14	14.57	Dec. 16	15.05
July 15	13.78	Sept.16	16.16	Nov. 18	14.58		

Mojave River Basin

U1. Olive. SE cor. NW¼NE¼ sec. 13, T. 3 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 68.40; Nov. 19, 73.24.

U4. Near cen. SE¼ sec. 12, T. 3 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 7.29; Nov. 19, dry.

U6. Mike Spranger. Near center of east line SW¼NW¼ sec. 6, T. 3 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 2.00; Nov. 19, dry.

a Pump operating in nearby well.

Mojave River Basin--Continued.

U9. A. W. Cole. Near NE cor. SW¼NW¼ sec. 30, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 32.53; Nov. 19, 40.74.

U13. Arrowhead Reservoir and Power Co. Near west line SE¼SE¼ sec. 19, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 20.00; Nov. 19, 32.66.

U14. O. A. Minister. Near SW cor. sec. 20, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 22.40; Nov. 19, 31.36.

U15. J. M. Allison. Near center of south line NE¼SW¼ sec. 20, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 27.12; Nov. 19, 33.12.

U16. N. F. Marsh. Near center of south line NW¼SE¼ sec. 20,T. 4 N., R. 3 W. Water level, in feet below measuring point, 1940: Nov. 19, 123.50.

U17. W. O. Wade. SW cor. NE¼NE¼ sec. 21, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 251.4; Nov. 19, 252.5.

U18a. W. E. Tussing. NE cor. SE¼SE¼ sec. 10, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 236.50; Nov. 19, 236.71.

U19. E. D. S. Pope. Near SW cor. NW¼SW¼ sec. 1, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 199.90; Nov. 19, 200.70.

U21. A. B. Sheridan. SW cor. sec. 5, T. 4 N., R. 2 W. Water levels, in feet below measuring point, 1940: May 8, 236.10; Nov. 19, 236.03.

U23. G. W. McLister. Near center south line NE¼ sec. 19, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 21.79; Nov. 20, 31.15.

U26. Arrowhead Reservoir and Power Co. Near NW cor. SW¼ sec. 17, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 18.36; Nov. 20, 21.33.

U28. C. O. Evans. Near SE cor. SW¼NW¼ sec. 18, T. 4 N., R. 3 W. Water level, in feet below measuring point, 1940: Nov. 20, 26.46.

U31. Center of east line of SE¼SW¼ sec. 5, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 166.20; Nov. 20, 165.89.

U43. A. W. Phillips. Near NE cor. NW¼NW¼ sec. 6, T. 4 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 55.41; Nov. 20, 56.14.

U44. A. J. Lintner. Near NE cor. NW¼NE¼ sec. 6, T. 4 N., R. 3 W. Water level, in feet below measuring point, 1940: May 8, 53.09.

U55. F. A. Fletcher. Near center of west line SE¼ sec. 9, T. 5 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 89.82; Nov. 20, 89.92.

U57. J. D. Humiston. SE¼NW¼ sec. 18, T. 5 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 8, 104.60; Nov. 20, 104.78.

U59. Lee Saul. SE¼SW¼ sec. 11, T. 5 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 56.84; Nov. 20, 56.88.

U59a. Lee Saul. SE¼SW¼ sec. 11, T. 5 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 48.41; Nov. 20, 49.68.

U61. SW¼ sec. 10, T. 5 N., R. 4 W., in Victorville. Water levels, in feet below measuring point, 1940: May 7, 45.70; Nov. 20, 46.03.

U68. A. Sorenson, Verde ranch. Near NW cor. NE¼NE¼ sec. 35, T. 5 N., R. 4 W. Flowing Mar. 6, no measurement made.

Mojave River Basin--Continued.

U72. Verde ranch. Near SW cor. sec. 36, T. 5 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 4.11; Nov. 20, 4.41.

M3. John Bennette. SW¼NE¼ sec. 19, T. 6 N., R. 4 W. Water level, in feet below measuring point, 1940: Dec. 5, 17.47.

M7. NE cor. NW¼ sec. 30, T. 7 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 8, 57.40; Nov. 26, 57.87.

M15. SE cor. sec. 31, T. 8 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 24, 15.92; Nov. 26, 16.35.

M19. F. H. Merrell. In center and near west line of NW¼NW¼ sec. 31, T. 8 N., R. 4 W. Water level, in feet below measuring point, 1940: May 24, 44.40.

M22. Lord. In center and near south line SW¼SW¼ sec. 20, T. 8 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 24, 3.82; Nov. 26, 5.81.

M26. Near SW cor. SE¼ sec. 2, T. 8 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 24, 24.63; Nov. 26, 26.00.

M30. Holcomb Brothers. SW cor. SE¼ sec. 12, T. 8 N., R. 4 W. Water levels, in feet below measuring point, 1940: May 24, 10.92; Nov. 26, 11.25.

M38. Everett Swing. SE cor. NW¼SW¼ sec. 4, T. 8 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 14.03; Dec. 5, 15.79.

M40. L. S. Emerson. SW¼SW¼ sec. 34, T. 9 N., R. 3 W. Well caved; no measurements made in 1940.

M41a. Nellie Storey. SE¼SE¼ sec. 34, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 125.70; Nov. 26, 126.04.

M43. Shobel. Near NE cor. NW¼NE¼ sec. 19, T. 9 N., R. 2 W. Water levels, in feet below measuring point, 1940: May 24, 66.01; Nov. 26, 66.28.

M51. J. Slagill. NE¼NE¼ sec. 28, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 4.74; Dec. 5, 19.91.

M52. SE¼SW¼ sec. 10, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 91.16; Dec. 5, 93.88.

M52b. Near center of north line NW¼ sec. 32, T. 10 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 57.23: Dec. 5, 57.46.

M53. NE cor. sec. 10, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 75.46; Dec. 5, 77.37.

M56. Osborn. SE cor. sec. 10, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 14.56; Dec. 5, 16.36.

M56a. Bullock. SW cor. NW¼NW¼ sec. 14, T. 9 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, a/18.54; Dec. 5, 18.45.

M64. NE cor. SE¼ sec. 28, T. 11 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 44.30; Dec. 5, 43.55.

M64a. Near NE cor. SE¼ sec. 28, T. 11 N., R. 3 W. Water level, in feet below measuring point, 1940: May 24, 42.95; Dec. 5, caved, measurements discontinued.

M65. S. F. Edwards. About 600 feet north of SE cor. sec. 28, T. 11 N., R. 3 W. Water level, in feet below measuring point, 1940: May 24, 24.0; Dec. 5, caved, measurements discontinued.

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a Pump operating in well.

Mojave River Basin--Continued.

M66. Near center of south line SE¼NW¼ sec. 34, T. 11 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 30.86; Dec. 5, 31.17.

M71. A. H. Harris. Near SW cor. sec. 23, T. 10 N., R. 3 W. Water levels, in feet below measuring point, 1940: May 24, 35.05; Dec. 5, 35.47.

M74. J. D. Rich. SE cor. SW¼SW¼ sec. 30, T. 10 N., R. 2 W. Water levels, in feet below measuring point, 1940: May 24, 23.17; Dec. 5, 22.30.

M75. Loftus. NE cor. SE¼SW¼ sec. 19, T. 10 N., R. 2 W. Water levels, in feet below measuring point, 1940: May 24, 66.57; Dec. 5, 67.13.

M82. Water Company of Barstow. Near center of west line NW¼NE¼ sec. 6, T. 9 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 9, 6.71; Nov. 26, 8.18.

M84. Nelson. SE cor. NE¼NW¼ sec. 31, T. 10 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 9, 47.27; Dec. 6, 49.26.

M88. Sandoz. NW¼NW¼ sec. 33, T. 10 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 24, 29.02; Nov. 26, 28.25.

M91. Harlow. NW¼NW¼ sec. 10, T. 9 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 24, 9.50; Nov. 26, 10.38.

M92. Gibbs. NE¼NE¼ sec. 10, T. 9 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 24, 4.60; Nov. 26, 5.55.

M97. Greystone Auto Camp. NW¼SW¼ sec. 10, T. 9 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 9, 53.99; Nov. 26, 54.50.

M100. F. Ryerse. NW¼NE¼ sec. 13, T. 9 N., R. 1 W. Water levels, in feet below measuring point, 1940: May 9, 14.46; Nov. 26, 16.46.

L1. B. A. Funk. SW cor. NW¼ sec. 18, T. 9 N., R. 1 E. Water levels, in feet below measuring point, 1940: May 9, 20.64; Nov. 26, 22.85.

L8. Center of west line NW¼ sec. 24, T. 9 N., R. 1 E. Water levels, in feet below measuring point, 1940: May 9, 70.40; Nov. 27, dry at 72.

L10. E. D. Barry. Near NW cor. SW¼ sec. 20, T. 9 N., R. 2 E. Water level, in feet below measuring point, 1940: May 9, 50.64; Nov. 27, caved.

L10a. E. D. Barry. Near NW cor. SW¼ sec. 20, T. 9 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 52.55; Nov. 27, 54.15.

L13. D. E. Thompson. NW cor. SE¼ sec. 27, T. 9 N., R. 2 E. Water level, in feet below measuring point, 1940: May 9, 35.37; Nov. 27, caved, measurements discontinued.

L19. Clinkenbeard. NW cor. NW¼ sec. 34, T. 9 N., R. 3 E. Water level, in feet below measuring point, 1940: Nov. 27, 30.53.

L21. Lyle Graham. NW cor. NE¼ sec. 4, T. 8 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 3.33; Nov. 28, 4.41.

L22. Lyle Graham. NW cor. NE¼ sec. 4, T. 8 N., R. 3 E., in pump house near ranch house. Water level, in feet below measuring point, 1940: Nov. 28, 5.61.

L23. C. W. Beaverstock. SW cor. NW¼ sec. 3, T. 8 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 5.56; Nov. 28, 7.21.

L24. SE cor. NW¼ sec. 3, T. 8 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 23.91; Nov. 28, 24.86.

Mojave River Basin--Continued.

L28. C. E. Burckhartt. Near SW cor. SW¼ sec. 7, T. 8 N., R. 4 E. Water levels, in feet below measuring point, 1940: May 9, 38.12; Nov. 28, 38.37.

L31. A. M. Monroe. Near NW cor. SE¼ sec. 31, T. 9 N., R. 4 E. Water levels, in feet below measuring point, 1940: May 9, 15.90; Nov. 28, 16.32.

L32. Near SW cor. SW¼ sec. 4, T. 8 N., R. 4 E. Dry at 7.0 feet below measuring point, Nov. 28, 1940.

L37. Mojave Camp Service station. Near center SW¼ sec. 12, T. 8 N., R. 4 E. Water levels, in feet below measuring point, 1940: May 9, 33.14; Nov. 28, 33.11.

L42. G. Linguenfelder. Near center SW¼ sec. 15, T. 9 N., R. 1 E. Well caved, no measurements made in 1940.

L43. Near SW cor. NW¼ sec. 13, T. 9 N., R. 1 E. Water levels, in feet below measuring point, 1940: May 9, 66.30; Nov. 27, 68.12.

L43a. Near SW cor. NW¼ sec. 13, T. 9 N., R. 1 E., about 300 feet south of well 43. Water levels, in feet below measuring point, 1940: May 9, 66.75; Nov. 27, 68.57.

L47. Near NW cor. NW¼ sec. 12, T. 9 N., R. 1 E. Water levels, in feet below measuring point, 1940: May 9, 45.78; Dec. 6, 46.38.

L49. Yermo Mutual Water Co. SE cor. SW¼ sec. 32, T. 10 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 28.00; Dec. 6, 29.04.

L50. Near NW cor. NW¼ sec. 4, T. 9 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 20.10; Dec. 6, 21.37.

L51. Bruce McCormick. Near center NE¼ sec. 3, T. 9 N., R. 2 E., near corral. Water levels, in feet below measuring point, 1940: May 9, 17.30; Dec. 6, 20.12.

L51a. Bruce McCormick. Near center NE¼ sec. 3, T. 9 N., R. 2 E., at east end of ranch house. Water levels, in feet below measuring point, 1940: May 9, 20.95; Dec. 6, 23.78.

L54. Near center SW¼ sec. 34, T. 10 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 59.20; Dec. 6, 59.41.

L63. Near center sec. 18, T. 9 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 55.80; Nov. 27, 57.20.

L64. Annie Escholtz. Near center SE¼ sec. 8, T. 9 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, a/42.15; Nov. 27, 41.74.

L67. Hunter. Near SW cor. SW¼ sec. 12, T. 9 N., R. 2 E. Water levels, in feet below measuring point, 1940: May 9, 5.44; Nov. 27, 6.03.

L68. Scobel and Haimut. Near SW cor. SW¼ sec. 14, T. 9 N., R. 2 E., north of ranch house. Water levels, in feet below measuring point, 1940: May 9, a/b/25.00; Nov. 27, a/25.05.

L68a. Scobel and Haimut. Near SW cor. SW¼ sec. 14, T. 9 N., R. 2 E., about 200 feet northeast of well L68. Water levels, in feet below measuring point, 1940: May 9, 21.75; Nov. 27, 19.52.

L68c. Scobel and Haimut. Near SW cor. SW¼ sec. 14, T. 9 N., R. 2 E., southeast of well L68. Water levels, in feet below measuring point, 1940: May 9, b/18.85; Nov. 27, 19.52.

L76. Bozarth. Near center west line NW¼ sec. 10, T. 9 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 34.35; Nov. 27, 34.66.

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a Pump in observation well stopped shortly before measurement.
b Pump operating in nearby irrigation well.

Mojave River Basin--Continued.

L77. NW cor. sec. 3, T. 9 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 42.95; Nov. 27, 43.24.

L78. Henderson. South of center NW¼ sec. 34, T. 10 N., R. 3 E. Water levels, in feet below measuring point, 1940: May 9, 8.61; Nov. 27, 9.64.

L83. H. G. Tienken. Near SW cor. NW¼ sec. 18, T. 9 N., R. 4 E. Water level, in feet below measuring point, 1940: Nov. 27, 25.61.

L93. B. Nicholas. SW¼NE¼ sec. 12, T. 9 N., R. 3 E. Water level, in feet below measuring point, 1940: May 9, 25.10.

L97. G. F. Getty. Near NE cor. sec. 21, T. 10 N., R. 3 E. Water level, in feet below measuring point, 1940: Dec. 6, 81.25.

SAN JOAQUIN COUNTY

MOKELUMNE AREA

By John W. Robinson

During 1940, the East Bay Municipal Utility District continued water-level measurements in selected observation wells in the Mokelumne area, in the central part of the Great Valley. From these wells, 24 have been selected to serve as an approximate index to ground-water storage. Water levels were measured once a month in each of the 24 wells; 254 measurements were made during the year. No water-level recorders or float gages were operated.

The following table gives average year-end water levels in the selected wells from 1933 through 1940. The table shows that ground-water storage was replenished appreciably in 1940.

Average ground-water levels, in feet above mean sea level, in 24 observation wells of the Mokelumne area, on or about December 31, 1933-1940

Year	Water level (feet)	Rise (+) or decline (-) during the year (feet)	Accumulative rise (+) or decline (-) since 1933 (feet)
1933	30.38	.....	.....
1934	29.66	-0.72	-0.72
1935	29.73	+ .07	- .65
1936	31.26	+1.53	+ .88
1937	32.43	+1.17	+2.05
1938	33.67	+1.24	+3.29
1939	30.09	-3.58	- .29
1940	31.40	+1.31	+1.02

A second table, compares net water-level changes during the periods of increasing withdrawal for irrigation (January to May, inclusive) and of diminishing withdrawal respectively (June to December) in 1940.

Summary of net water-level changes, in feet, at 24 observation wells in the Mokelumne area, 1940

Period	Greatest rise or least recession	Greatest recession	Average
1940			
Jan. 1 to May 31 (period of increasing withdrawal)	+8.58	-6.84	+1.92
June 1 to Dec. 31 (period of diminishing withdrawal)	+8.16	-7.06	a/ - .62
The year	+2.56	- .31	+1.31

The accompanying figure shows the relation between average ground-water levels and the accumulated deviation of mean rainfall on the drainage basin of the Mokelumne River. For this diagram yearly mean rainfall on the basin has been taken as the average of rainfall at Electra, West Point, and Twin Lakes (Tamarack, until 1923); the weighted mean water levels for 1927-1933 were taken from the recent report[10/], and average water levels for 1933-1940, were taken from the preceding table. The similarity of the fluctuations and water level and in rainfall since 1927 is obvious. There are no records of ground-water levels to compare with the large excess of rainfall that accumulated from 1906 through 1922.

a In Water-Supply Paper 886 the corresponding average for 1937 should read 0.10 foot rather than 1.03 foot.

10/ Piper, A. M., Gale, H. S., Thomas, H. E., and Robinson, T. W., Geology and ground-water hydrology of the Mokelumne area, California: U. S. Geol. Survey Water-Supply Paper 780, p. 206, 1939.

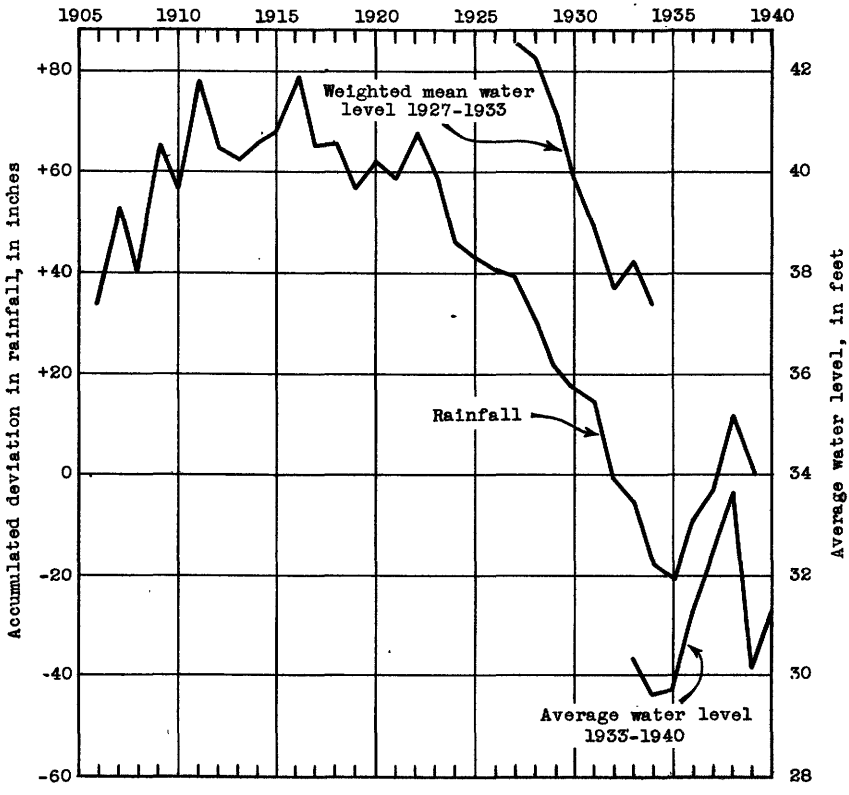

Figure 7.--Average water levels in wells and accumulated deviation from average rainfall in the Mokelumne area, Calif.

San Joaquin County

363L3. F. B. Mills.

Water level, in feet above mean sea level, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 4	25.59	Apr. 1	27.84	July 1	27.28	Nov. 1	27.17
Feb. 1	25.98	May 1	28.15	Aug. 1	26.88	Dec. 2	26.46
Mar. 1	26.37	June 3	27.77	Oct. 3	26.84		

3617A1. Otto Helmie.

Water level, in feet above mean sea level, 1940

Jan. 4	10.38	Apr. 1	16.00	July 1	10.75	Oct. 3	9.23
Feb. 1	11.81	May 1	16.63	Aug. 1	9.85	Nov. 1	10.34
Mar. 1	13.73	June 3	15.45	Sept.2	8.47	Dec. 2	10.81

San Joaquin County--Continued.

3636R2. Leland W. Bunch.

Water level, in feet above mean sea level, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 8	18.63	Apr. 1	24.79	July 1	20.07	Nov. 1	19.81
Feb. 1	19.64	May 1	23.66	Oct. 1	18.79	Dec. 2	a 19.62
Mar. 1	24.39	June 3	22.09				

373B1. Jacob Knoll.

Water level, in feet above mean sea level, 1940

Jan. 9	43.55	Apr. 1	45.81	July 1	49.42	Oct. 1	45.46
Feb. 1	43.75	May 1	48.26	Aug. 1	47.20	Nov. 1	45.12
Mar. 1	44.03	June 3	52.13	Sept.2	46.01	Dec. 2	45.00

376J8. R. E. and Ruth F. Coker.

Water level, in feet above mean sea level, 1940

Jan. 5	29.05	Apr. 1	29.04	July 1	30.89	Oct. 8	29.78
Feb. 1	29.22	May 1	30.78	Aug. 1	29.96	Nov. 1	29.72
Mar. 1	29.31	June 3	31.20	Sept.2	29.65	Dec. 2	29.44

377J1. J. and Rachel Goetken.

Water level, in feet above mean sea level, 1940

Jan. 5	21.50	Apr. 1	23.91	July 1	21.28	Oct. 8	21.21
Feb. 1	22.30	May 1	21.92	Aug. 1	20.46	Nov. 1	21.59
Mar. 1	23.12	June 3	21.50	Sept.2	20.61	Dec. 1	22.58

3710K3. Edward Preszler.

Water level, in feet above mean sea level, 1940

Jan. 9	31.93	Apr. 1	26.34	July 1	b 26.63	Oct. 1	31.81
Feb. 1	32.11	May 1	25.55	Aug. 1	27.82	Nov. 1	32.91
Mar. 1	31.12	June 3	28.00	Sept.2	29.72	Dec. 1	33.34

3710K4. Edward Preszler.

Water level, in feet above mean sea level, 1940

Jan. 9	32.10	Apr. 1	27.66	Aug. 1	28.35	Nov. 1	32.99
Feb. 1	32.85	May 1	26.39	Sept.2	29.88	Dec. 2	33.35
Mar. 1	31.63	June 3	27.24	Oct. 1	31.86		

3715P2. Eugene R. Hieb.

Water level, in feet above mean sea level, 1940

Jan. 9	27.53	Apr. 1	28.31	July 1	24.25	Oct. 1	25.88
Feb. 1	28.01	May 1	b 22.21	Aug. 1	23.75	Nov. 1	26.83
Mar. 1	28.44	June 3	26.42	Sept.2	24.66	Dec. 2	27.58

3719A2. C. M. Ferdun.

Water level, in feet above mean sea level, 1940

Jan. 5	19.02	Apr. 1	19.77	July 1	19.36	Oct. 7	17.56
Feb. 1	19.17	May 1	21.14	Aug. 1	16.66	Nov. 1	18.08
Mar. 1	19.85	June 3	19.49	Sept.2	16.25	Dec. 2	18.69

3727F3. John F. Heitzmann.

Water level, in feet above mean sea level, 1940

Jan. 9	25.01	Apr. 1	26.04	July 1	23.51	Oct. 1	22.96
Feb. 1	25.28	May 1	26.38	Aug. 1	23.89	Dec. 2	24.16
Mar. 1	25.44	June 3	26.00	Sept.2	22.34		

3730E2. W. L. Flanigan.

Water level, in feet above mean sea level, 1940

Jan. 8	18.38	May 1	22.48	July 1	16.23	Oct. 7	16.52
Feb. 1	19.37	June 3	19.84	Sept.2	15.02	Nov. 1	17.84
Mar. 1	21.28						

a Pump in observation well stopped a few minutes before measurement.
b Pump operating in nearby well.

San Joaquin County--Continued.

4612R1. G. A. Jahant.

Water level, in feet above mean sea level, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	25.05	Apr. 1	27.45	July 1	24.71	Oct. 7	23.43
Feb. 1	26.27	May 1	28.31	Aug. 1	23.39	Nov. 1	23.94
Mar. 1	26.38	June 3	27.37	Sept.2	22.89	Dec. 2	24.53

4634R1. E. M. Smith.

Water level, in feet above mean sea level, 1940

Jan. 4	30.20	Apr. 1	29.41	July 1	31.26	Oct. 3	a 30.83
Feb. 1	29.89	May 1	29.89	Aug. 1	31.09	Nov. 1	31.44
Mar. 1	29.40	June 3	31.16	Sept.2	30.39	Dec. 2	30.91

4636A1. D. D. Smith and S. H. and I. Zimmerman.

Water level, in feet above mean sea level, 1940

Jan. 5	27.08	Apr. 1	28.11	July 1	27.73	Oct. 7	29.79
Feb. 1	26.82	May 1	30.56	Aug. 1	27.25	Nov. 1	30.26
Mar. 1	27.52	June 1	30.92	Sept.2	29.06	Dec. 2	28.87

4715C3. Robert L. Carter.

Water level, in feet above mean sea level, 1940

Jan. 3	42.27	Apr. 1	43.59	July 1	41.25	Oct. 2	40.15
Feb. 1	42.84	May 1	43.96	Aug. 1	40.00	Nov. 1	40.88
Mar. 1	42.84	June 3	43.16	Sept.2	39.66	Dec. 2	41.62

4718N3. Martha Eddlemon.

Water level, in feet above mean sea level, 1940

Jan. 5	24.33	Apr. 1	26.52	July 1	19.84	Oct. 7	22.06
Feb. 1	24.88	May 1	27.31	Aug. 1	18.28	Nov. 1	23.24
Mar. 1	25.35	June 3	23.73	Sept.2	18.82	Dec. 2	24.25

4722Q4. Adolphus Eddlemon.

Water level, in feet above mean sea level, 1940

Jan. 2	42.87	Apr. 1	44.03	July 1	41.94	Oct. 2	42.52
Feb. 1	43.29	May 1	44.02	Aug. 1	41.59	Nov. 1	43.11
Mar. 1	43.57	June 3	43.01	Sept.2	41.45	Dec. 2	43.66

4722Q5. Adolphus Eddlemon.

Water level, in feet above mean sea level, 1940

Jan. 2	42.79	May 1	43.13	Aug. 1	37.62	Oct. 2	41.51
Feb. 1	43.45	June 3	35.95	1	37.72	Nov. 1	42.80
Mar. 1	43.79	July 1	34.94	Sept.2	33.64	Dec. 2	43.43
Apr. 1	44.07						

4727P1. Frank H. and Leonard W. Buck.

Water level, in feet above mean sea level, 1940

Jan. 3	46.54	Apr. 1	50.10	July 1	51.57	Oct. 2	47.69
Feb. 1	47.35	May 1	52.78	Aug. 1	48.70	Nov. 1	47.83
Mar. 1	48.22	June 3	53.95	Sept.2	47.77	Dec. 2	47.91

4730J2. Clara A. Barton.

Water level, in feet above mean sea level, 1940

Jan. 5	26.78	Apr. 1	b 29.1	Aug. 1	25.51	Nov. 1	27.48
Feb. 1	27.03	May 1	25.90	Sept.2	25.17	Dec. 2	27.94
Mar. 1	27.45	July 1	c 24.34	Oct. 7	26.73		

a Water in adjacent intermittent pond.
b Water leaking into well.
c Pump in observation well stopped a short time before measurement.

San Joaquin County--Continued.

4731J3. Charles H. Woest.

Water level, in feet above mean sea level, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	a 31.40	Apr. 1	34.19	July 1	34.25	Oct. 8	a 34.36
Feb. 1	31.59	May 1	35.28	Aug. 1	33.70	Nov. 1	34.38
Mar. 1	32.72	June 3	37.52	Sept.2	34.15	Dec. 2	33.27

4731N5. Jacob Goehring.

Water level, in feet above mean sea level, 1940

Jan. 5	a 32.64	May 1	40.04	Aug. 1	36.84	Nov. 1	36.03
Feb. 1	33.02	June 3	40.34	Sept.2	36.52	Dec. 2	34.34
Mar. 1	33.85	July 1	37.78	Oct. 8	a 36.24		

4734G1. John J. Schmiedt.

Water level, in feet above mean sea level, 1940

Jan. 9	47.46	May 1	54.24	Aug. 1	49.89	Nov. 1	48.66
Feb. 1	48.03	June 3	55.24	Sept.2	48.62	Dec. 2	48.70
Mar. 1	50.07	July 1	51.12	Oct. 1	48.65		

a Adjacent land flooded by streams.

TERRITORY OF HAWAII

By H. T. Stearns

INTRODUCTION

Measurements of artesian head or water levels in wells were made in 1940 by the Geological Survey and cooperating agencies on the islands of Oahu, Maui, Molokai, Lanai, Hawaii, and Kauai. Records of about 850 measurements of head or water level made in about 65 wells on the islands are given on the following pages. The pumpage in 1940 from wells on the islands was about 196,000 million gallons. Of this draft nearly 119,000 million gallons was withdrawn from wells on the island of Oahu.

ISLAND OF OAHU

During 1940 the Geological Survey made 308 monthly measurements of artesian head and 262 chloride determinations on 29 wells on the island of Oahu. The Board of Water Supply, city and county of Honolulu, made 362 measurements of artesian head in 115 wells, of which 107 wells were measured more than once. The Board maintained automatic water-stage recorders on 11 wells and pumped 7,487,000,000 gallons of water in 1940. Private artesian wells in Honolulu yielded 4,924,000,000 gallons.

The average rainfall for the Territory was 73.8 inches in 1940, which is 10.6 inches below normal, and is the lowest since 1933, when the rainfall was 64.01 inches. Losses in ground-water storage occurred in 1940 in 9 of the 12 artesian areas on Oahu. Only areas 8, 9, and 10, on the northeast coast, had gains in storage. The losses were largest in the Honolulu and Pearl Harbor areas. The artesian heads have not yet declined to those of 1935-36, which followed the dry years of 1931-35, but much of the gain following the wet years from 1936 to 1939 has been lost. A graph showing the fluctuation of artesian head in the 12 isopiestic areas since records were begun is shown in an accompanying illustration. Another illustration shows the location of the artesian areas and the wells.

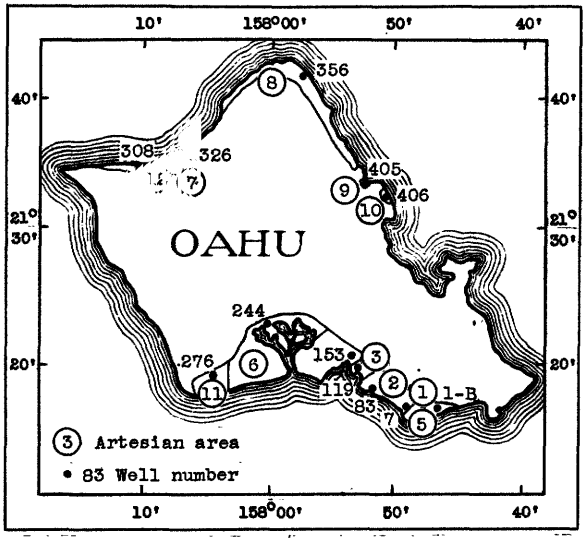

Figure 8.--Map of island of Oahu showing location of artesian areas and observation wells.

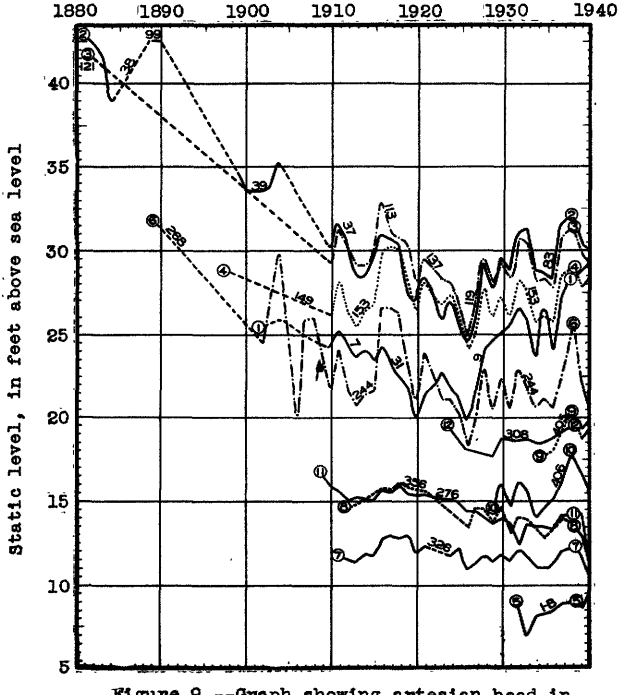

Figure 9.--Graph showing artesian head in typical wells in artesian areas 1 to 12, on the island of Oahu, 1880-1940.

Oahu--Continued.

Time of high and low heads in artesian areas and net gain or loss in static head, in feet, for 1940, as shown by typical wells on the island of Oahu

Area	Name	Well	High	Low	Gain 1/
1	St. Louis Heights	2	January	October	-2.50
2	Makiki-Pacific Heights	83	February	August	-2.03
3	Kapalama	132	January and February	August	-2.05
4	Moanalua	144	January	October	-1.82
5	Wilhelmina Rise	1A	January	May, August, and December	- .28
6	Pearl Harbor	201	January	October	-2.35
		244	February	August	-1.53
		266	January	August	-1.74
7	Waialua	326	January	July	- .72
8	Kahuku	356	December	September	+1.16
		396	May	July	- .07
9	Kahana	405	June	March	+ .14
10	Kaaawa	406	June	April	+ .18
11	Gilbert	T5 2/	November	May	- .17
12	Mokuleia	286	November	July	+ .06
		308	November	June	- .23

In the following records the head of the water in the wells is expressed in feet with reference to mean sea level. In some of the wells this is the measured water level in the well; in others, it is the height to which the water would rise in a casing or tube, as indicated by the shut-in pressure.

Schofield Barracks shaft 4.

Water level, in feet above mean sea level, 1940
(from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	281.57	Apr. 6	281.60	July 6	280.96	Oct. 5	280.15
13	281.69	13	281.57	13	280.88	12	280.15
20	281.81	20	281.52	20	280.82	19	280.01
27	281.78	27	281.42	27	280.75	26	279.99
Feb. 3	281.78	May 4	281.40	Aug. 3	280.67	Nov. 2	279.88
10	281.72	11	281.39	10	280.59	9	279.85
17	281.68	18	281.30	17	280.55	16	279.75
24	281.72	25	281.29	24	280.45	23	279.68
Mar. 2	281.65	June 1	281.18	31	280.37	30	279.64
9	281.71	8	281.18	Sept. 7	280.34	Dec. 7	279.51
16	281.72	15	281.15	14	280.29	14	279.61
23	281.68	22	281.08	21	280.28	21	279.44
30	281.66	29	281.03	28	280.23	28	279.40

1/ Gain was determined for wells 201 to 308 by subtracting first measurements in January from last measurements in December.
2/ Nonartesian, but indicative of nearby artesian conditions.

Oahu--Continued.

Artesian head, in feet, in five wells in the Honolulu District, 1940
(Mean daily measurements furnished by Board of Water Supply, City and County of Honolulu, from recorder charts.)

Area well		1 2	2 83	3 132	4 144	5 1A	Area well		1 2	2 83	3 132	4 144	5 1A
Jan.	3	30.97	31.61	31.11	28.69	....	July	10	27.89	29.68	28.75	26.42	8.74
	10	31.12	31.65	31.08	28.76	9.00		17	27.64	29.38	28.44	26.20	8.77
	17	31.24	31.72	31.19	28.93	9.03		24	27.46	29.13	28.17	26.02	8.81
	24	31.44	31.76	31.22	.....	9.07		31	27.54	28.92	27.97	.....	8.76
	31	31.45	31.86	31.33	29.02	9.08	Aug.	7	27.61	28.76	27.90	25.84	8.71
Feb.	7	31.43	31.89	31.33	28.94	9.02		14	27.48	28.59	27.81	25.82	8.70
	14	31.30	31.92	31.30	28.83	8.97		21	27.51	28.56	27.88	25.77	8.69
	21	31.11	31.88	31.24	28.71	8.90		28	27.46	28.55	27.86	25.68	8.68
	28	30.93	31.76	31.11	28.60	8.87	Sept.	4	27.76	28.67	27.99	.....	8.77
Mar.	6	30.67	31.59	31.03	28.42	8.86		11	27.53	28.72	28.01	25.85	8.72
	13	.....	31.53	30.88	28.19	8.94		18	27.25	28.80	28.06	25.74	....
	20	30.73	31.50	30.89	28.30	8.98		25	27.28	.....	28.05	25.66	8.69
	27	30.54	31.46	30.84	28.34	8.96	Oct.	2	27.17	28.85	28.05	25.67	8.72
Apr.	3	30.29	31.36	30.70	28.06	8.84		9	27.18	.....	28.05	25.76	8.74
	10	30.22	31.29	30.57	27.90	8.86		16	26.91	28.86	28.07	25.69	8.73
	17	30.03	31.12	30.40	27.70	8.83		23	26.87	28.80	28.00	25.60	8.74
	24	29.92	31.04	30.31	27.50	8.77		30	26.82	28.79	27.98	25.59	8.74
May	1	29.80	30.85	30.20	27.40	8.71	Nov.	6	26.93	28.77	27.98	25.71	8.73
	8	29.66	30.85	30.10	27.37	8.68		13	26.89	28.72	27.97	25.66	8.74
	15	29.85	30.81	30.03	27.29	8.78		20	27.36	28.78	28.05	25.69	....
	22	29.66	.....	29.93	27.26	8.74		27	.....	28.95	28.20	26.16	....
	29	29.64	30.63	29.83	27.17	8.71	Dec.	4	27.88	29.06	28.42	26.50	....
June	5	29.43	30.61	29.75	27.06	8.72		11	28.02	29.22	28.63	26.70	8.74
	12	29.25	.....	29.63	26.96	8.71		18	.....	29.40	28.76	26.75	8.68
	19	28.74	.....	29.46	26.80	8.73		25	28.39	29.48	28.88	26.81	....
	26	28.50	30.15	29.28	26.66	....		31	28.47	29.58	28.96	26.82	8.73
July	3	28.22	29.97	29.02	26.47	8.70							

Artesian head, in feet, and chloride, in parts per million, in typical wells in Oahu, 1940

Well 1B (area 5).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 6	8.85	165	May 23	8.62	203	Sept.23	8.72	220
Feb. 16	8.84	199	June 25	8.64	223	Oct. 24	8.80	206
Mar. 27	8.92	197	July 26	8.75	233	Nov. 27	8.82	188
Apr. 25	8.67	206	Aug. 30	8.69	232	Dec. 28	8.85	198

Well 9 (area 1).

Jan. 6	30.82	53	May 23	29.50	50	Sept.23	26.90	51
Feb. 16	30.92	54	June 25	28.32	54	Oct. 24	26.65	50
Mar. 27	30.46	53	July 26	27.15	53	Nov. 27	27.44	53
Apr. 25	29.77	52	Aug. 30	27.50	50	Dec. 28	28.00	51

Well 81 (area 2).

Jan. 6	31.52	35	May 23	30.45	37	Sept.23	28.85	36
Feb. 16	31.67	36	June 25	30.17	38	Oct. 24	28.78	36
Mar. 27	31.16	37	July 26	28.87	37	Nov. 27	28.89	38
Apr. 25	30.97	37	Aug. 30	28.45	35	Dec. 28	29.36	37

Well 119 (area 3).

Jan. 5	30.44	323	May 23	29.14	315	Sept.23	27.42	310
Feb. 16	30.54	334	June 25	28.94	338	Oct. 24	27.42	315
Mar. 28	30.21	320	July 26	27.54	331	Nov. 27	27.41	326
Apr. 25	29.34	320	Aug. 30	27.10	318	Dec. 28	28.31	333

Oahu--Continued.

Well 153 (area 4).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 5	28.36	56	May 24	26.99	55	Sept.24	25.43	56
Feb. 15	28.62	56	June 24	26.48	58	Oct. 24	25.33	56
Mar. 25	28.28	56	July 26	25.70	57	Nov. 25	25.89	56
Apr. 25	27.24	57	Aug. 28	25.50	55	Dec. 23	26.59	57

Well 187B (area 6).

Apr. 23	22.95	87	Aug. 24	21.10	82	Oct. 19	21.05	82
May 23	22.95	79	30	21.05	...	25	21.05	..
June 21	21.95	93	Sept. 9	21.80	100	Nov. 1	21.70	86
28	21.80	..	13	21.40	...	8	22.30	..
July 6	22.00	..	19	20.80	85	16	22.21	..
13	21.51	..	28	20.98	...	22	23.30	..
20	21.40	..	Oct. 4	21.02	...	30	24.02	92
26	21.10	86	8	21.40	...	Dec. 7	24.25	..
Aug. 3	21.44	84	9	21.30	...	14	24.08	..
9	21.29	..	10	21.20	...	21	24.01	..
16	21.40	83	12	21.00	83	27	23.95	80

Well 190 (area 6).

Jan. 5	23.98	58	May 23	21.81	56	Sept.23	20.04	53
Feb. 15	23.60	61	June 24	21.03	58	Oct. 24	.....	54
Mar. 26	23.24	59	July 22	20.28	57	Nov. 25	21.57	52
Apr. 23	21.99	57	Aug. 28	.....	53	Dec. 23	21.91	52

Well 193 (area 6).

Jan. 5	23.33	114	May 23	21.27	108	Sept.23	19.38	112
Feb. 15	23.05	115	June 24	20.36	112	Oct. 24	19.09	116
Mar. 26	22.59	111	July 22	19.66	113	Nov. 25	20.87	114
Apr. 23	21.27	107	Aug. 28	19.36	105	Dec. 23	21.15	113

Well 201 (area 6).

Jan. 5	21.73	638	May 23	19.40	565	Sept.23	17.74	485
Feb. 15	21.66	693	June 24	18.84	580	Oct. 23	17.69	460
Mar. 26	21.54	635	July 22	18.48	558	Nov. 25	19.28	579
Apr. 23	19.76	610	Aug. 28	18.02	496	Dec. 23	19.38	646

Well 244 (area 6).

Jan. 5	23.71	136	Mar. 26	23.54	130	Aug. 28	18.78	125
Feb. 15	24.01	131	Apr. 23	21.41	129	Sept.23	19.19	126
20	23.80	...	May 22	20.81	127	Oct. 22	18.99	129
Mar. 1	22.82	...	June 24	20.11	136	Nov. 25	21.73	128
21	23.93	...	July 22	19.18	128	Dec. 23	22.18	129

Well 266 (area 6).

Jan. 5	22.80	168	May 22	19.17	161	Sept.23	17.08	173
Feb. 15	22.45	179	June 24	18.17	173	Oct. 22	17.24	167
Mar. 26	22.59	167	July 22	17.36	172	Nov. 25	21.77	176
Apr. 23	19.71	167	Aug. 28	16.91	177	Dec. 23	21.06	173

Well 276 (area 11). Records furnished by Ewa Plantation Co. Figures are monthly averages.

Jan.	14.56	567	May	12.76	608	Sept.	12.86	611
Feb.	14.31	601	June	12.93	606	Oct.	12.70	615
Mar.	14.16	601	July	.....	616	Nov.	13.75	531
Apr.	13.68	617	Aug.	.....	612	Dec.	14.18	523

Oahu--Continued.

Well 286 (area 12).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	18.32	129	May 25	17.86	115	Sept.24	18.11	114
Feb. 14	18.09	131	June 26	17.70	113	Oct. 21	18.06	116
Mar. 25	18.34	126	July 25	17.54	115	Nov. 26	18.42	110
Apr. 24	18.32	115	Aug. 30	18.20	111	Dec. 26	18.38	103

Well 308 (area 12).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	19.80	94	May 25	18.85	96	Sept.24	19.73	98
Feb. 14	19.80	93	June 26	18.70	101	Oct. 21	19.68	108
Mar. 25	19.95	97	July 25	18.81	98	Nov. 26	20.37	108
Apr. 24	19.80	95	Aug. 30	19.93	91	Dec. 26	19.57	90

Well 326 (area 7).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	12.63	76	May 25	11.35	73	Sept.24	11.29	71
Feb. 14	11.98	77	June 26	11.04	74	Oct. 21	11.79	70
Mar. 25	11.95	74	July 25	11.03	73	Nov. 26	12.36	75
Apr. 24	11.48	72	Aug. 30	11.52	71	Dec. 26	11.91	71

Well 337 (area 8).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	14.22	160	May 25	14.01	156	Sept.24	14.35	170
Feb. 14	14.21	164	June 26	14.20	163	Oct. 22	14.37	173
Mar. 25	14.14	161	July 25	14.52	172	Nov. 26	14.17	164
Apr. 24	13.84	156	Aug. 29	14.49	167	Dec. 26	14.27	162

Well 356 (area 8).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	13.71	144	May 25	13.45	134	Sept.24	11.92	132
Feb. 14	13.79	184	June 26	11.95	135	Oct. 22	12.93	137
Mar. 25	13.41	137	July 25	12.41	134	Nov. 26	14.48	134
Apr. 24	13.35	135	Aug. 29	12.34	129	Dec. 26	14.87	131

Well 396 (area 8).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	20.83	49	May 25	20.93	47	Sept.24	20.14	51
Feb. 14	20.59	49	June 26	19.84	53	Oct. 22	20.60	50
Mar. 25	20.64	48	July 25	19.52	54	Nov. 26	20.78	54
Apr. 24	20.52	48	Aug. 29	19.64	50	Dec. 26	20.76	48

Well 405 (area 9).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	18.15	40	May 25	18.80	39	Sept.24	18.33	40
Feb. 14	18.00	41	June 26	19.12	43	Oct. 22	18.48	39
Mar. 25	17.63	40	July 25	19.01	42	Nov. 26	18.47	42
Apr. 24	17.90	41	Aug. 29	18.72	39	Dec. 26	18.29	42

Well 406 (area 10).

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 4	16.07	197	May 25	16.15	188	Sept.24	16.25	200
Feb. 14	15.94	202	June 26	16.46	185	Oct. 22	16.24	218
Mar. 25	15.72	190	July 25	16.30	177	Nov. 26	16.31	191
Apr. 24	15.65	192	Aug. 29	16.30	187	Dec. 26	16.25	190

Water level, in feet, and chloride, in parts per million, in test borings in Oahu, 1940

Test boring Oahu T1 (tributary to area 12).

Date	Water level	Chloride	Date	Water level	Chloride	Date	Water level	Chloride
Jan. 2	18.87	43	Apr. 30	19.04	43	Sept. 3	18.87	52
Feb. 1	18.83	35	May 31	19.31	42	Oct. 2	18.50	42
Mar. 2	19.08	35	July 1	19.26	42	Nov. 1	19.06	42
Apr. 2	19.28	47	Aug. 1	18.67	52	Dec. 2	19.65	42

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Oahu--Continued.

Test boring Oahu T2 (tributary to area 7).

Date	Water level	Chloride	Date	Water level	Chloride	Date	Water level	Chloride
Jan. 2	6.83	127	Apr. 30	5.99	127	Sept. 3	6.49	114
31	6.41	133	May 31	5.69	145	Oct. 2	6.33	125
Mar. 1	5.37	134	July 1	6.08	127	Nov. 1	6.28	125
Apr. 1	5.41	130	Aug. 1	7.49	156	Dec. 2	6.66	125

Test boring Oahu T5 (tributary to area 11).

Jan. 5	5.23	15	May 22	4.51	142	Sept.25	4.61	135
Feb. 15	5.08	264	June 24	4.69	139	Oct. 25	4.84	178
Mar. 26	5.03	292	July 24	4.87	168	Nov. 28	5.27	48
Apr. 23	4.93	262	Aug. 28	4.89	139	Dec. 27	5.06	62

Test boring Oahu T15. Rural Water Works of Honolulu. On east side and about 1.8 miles above mouth of Nanakuli Gulch. Drilled in June 1940 by J. M. Heizer. Diameter 1.5 inches, depth 488.8 feet. Penetrated only Lower Waianae basalt. For description see page 37 of Bulletin 5 of Hawaii Division of Hydrography series. Bench mark,top of 3/4-inch casing, altitude 479.64 feet.

Aug. 1	2.74	...	Sept.25	2.60	107	Nov. 28	2.88	95
23	2.69	119	Oct. 25	2.76	108	Dec. 27	2.64	90

ISLAND OF MAUI

The water levels in the wells owned by the Hawaiian Commercial and Sugar Co. and the Maui Agricultural Co. on the windward side of the island declined slightly in 1940. Wells on the leeward side, including all the wells of the Pioneer Mill Co., showed slight gains during the year. Rainfall at Lahaina, on the leeward side, was 7.08 inches above normal because of the prevalence of "kona" or anti-trade wind weather. This condition accounts for higher water levels on leeward Maui when levels in most areas were declining.

The East Maui Irrigation Co. ditch delivered 58,281.53 million gallons of water during 1940. All pumps of the Hawaiian Commercial and Sugar Co. were started early in January and were shut down near the end of December. The pumping season of the Maui Agricultural Co. began in January but not all the pumps were running until March. The pumps, except pump 2, which was shut down in April, were operated until November or December. The Pioneer Mill Co.'s pumping season began in January, February, and early March, and closed in November and December.

The data in the following table were furnished by R. E. Hughes, H. J. Eby, and C. A. Brown.

Oahu--Continued.

Chloride, in parts per million, water levels, in feet above mean sea level, and net change in static level, in feet, on the island of Maui, 1940

Location	Chloride	Water level	
		Dec. 31, 1940	Gain or loss 1940
Hawaiian Commercial and Sugar Co.			
1 (Kihei)	62	4.55	.....
2	42	5.20	+0.14
3	32	4.08	- .37
4	47	3.32	- .15
5	46	4.53	- .04
6	36	5.37	+ .07
7	31	5.54	- .39
8	47	5.08	.....
3 (Kihei)	42	6.67	- .28
Maui Agricultural Co.			
Lower Paia (pumps 1, 2, 5, and 6) a/	405	4.42	- .04
Kaheka (pumps 3 and 4) b/	189	4.96	- .42
7 Paia School	191	3.83	- .34
12 Kuau	207	4.25	- .42
Pioneer Mill Co.			
Kaanapali	719	2.26	+ .06
Kahoma	349	2.90	- .05
Lahaina	852	2.68	+ .14
Mill	1,014	3.63	+ .03
Olowalu	308	3.90	+ .15
Ukumehame	470	6.40	+ .45

Test boring Maui T2. Wailuku Sugar Co. About 0.7 mile northwest of Puu Hele on west side of Wailuku Sugar Co. reservoir. Longitude 156° 31' 1" W. Latitude 20° 49' 20" N. Drilled Dec. 1933 by J. M. Heizer. Diameter 1½ inches, depth 325.1 feet. Cased with 313 feet of 3/4-inch iron pipe, exclusive of 3-inch steel bit; 4 sets of 1/8-inch holes drilled through the pipe at 1-foot intervals beginning at 5 inches above bit. Altitude of top of casing 312.7 feet. Boring penetrated West Maui basalt. Water level, when finished, was 6.55 feet, and chloride test showed 301 parts per million. No continuous measurements made until Sept. 1939. Measurements furnished by owner.

Water level, in feet, and chloride, in parts per million, 1939-40

Date	Water level	Chloride	Date	Water level	Chloride
Sept.13, 1939	6.67	....	May 16, 1940	6.68	309
Oct. 18	6.60	....	June 20	6.65	305
Nov. 17	6.60	310	July 15	6.66	310
Dec. 15	6.84	....	Aug. 16	7.22	308
Jan. 19, 1940	6.93	295	Sept.17	7.60	308
Feb. 15	6.79	311	Oct. 17	7.54	308
Mar. 18	6.57	306	Nov. 18	7.81	305
Apr. 15	6.52	315	Dec. 17	7.84	301

a Pump 2 was permanently abandoned in July 1940. Pump 5 was formerly pump 4.

b Pump 4 was formerly pump 5.

Maui--Continued.

Test boring Maui T102. Geological Survey. About 3/4 mile west of Wailuku in Iao Valley, Maui, and 50 feet south of the road. Longituds 156° 31' 27" W., latitude 20° 53' 9" N. Drilled Aug. 1940 by J. V. Crews. Diameter 6½ inches, depth 475 feet. Cased with 20 feet of 6-inch pipe at top of hole, in which was inserted 465 feet of 3/4-inch pipe. Altitude of top of casing 453.9 feet. Well penetrated 40 feet of gravel, 110 feet of rock (probably talus) and 290 feet of West Maui basalt. Chloride samples showed 18.7 parts per million every month.

Water level, in feet, 1940

Date	Water level	Date	Water level	Date	Water level
Aug. 16	31.90	Sept.17	31.91	Nov. 18	31.98
29	32.05	Oct. 17	32.04	Dec. 17	32.08

ISLAND OF MOLOKAI

The water level in test boring T1 was higher in March and April 1940 than at any time since measurements began in June 1938.

The water level in the Kamalo well ranged from 1.83 feet to 2.17 feet. The water level in the Ualapue well was about 4.4 feet throughout 1940. Monthly measurements are omitted for the Kamalo and Ualapue wells because the data received are inconsistent. Those published for 1939 are questionable.

Test boring Molokai T1.

Water level, in feet, and chloride, in parts per million, 1940
(Measurements made by Mitchell Pauole, Hawaiian Homes Commission.)

Date	Water level	Chloride	Date	Water level	Chloride	Date	Water level	Chloride
Jan. 16	5.27	530	May 29	5.69	510	Sept.19	5.61	545
Feb. 20	5.36	536	June 20	5.61	510	Oct. 21	5.44	535
Mar. 18	5.77	516	July 15	5.61	530	Nov. 19	5.36	538
Apr. 20	5.77	522	Aug. 16	5.69	530	Dec. 23	5.27	544

Connant well.

Water level, in feet, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	1.67	Apr. 15	1.58	July 15	1.50	Oct. 15	1.58
Feb. 15	1.75	May 15	1.42	Aug. 15	1.42	Nov. 15	1.67
Mar. 15	1.50	June 15	1.67	Sept.15	1.33	Dec. 15	1.50

ISLAND OF LANAI

The water level in shaft 1 was 2.78 feet above sea level on December 2, 1940, which is the highest since the shaft was constructed in 1936. This is due to continued periods of "kona" weather, which benefits the leeward islands.

Water level, in feet, in the Maunalei shaft 1, Lanai, 1940
(Records furnished by the Hawaiian Pineapple Co.)

Jan. 5	2.64	Apr. 1	2.59	July 1	2.46	Oct. 1	2.70
Feb. 1	2.62	May 1	2.55	Aug. 1	2.73	Nov. 1	2.75
Mar. 2	2.61	June 1	2.49	Sept. 3	2.77	Dec. 2	2.78

ISLAND OF HAWAII

The water level in Olaa shaft fell to 12.88 feet on June 28, 1940, the lowest since records began in 1936 and 2.19 feet lower than the lowest level in 1939. The water level in Kaiwiki shaft declined only slightly, but reached 4.08 feet on June 14, 1940, the lowest stage since measurements were begun in January 1938. The chloride content of the water in the Kaiwiki shaft in 1940 ranged from 125 to 166 parts per million.

Olaa shaft.

Water level, in feet above sea level, 1940
(Records furnished by Olaa Sugar Co.)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	15.25	Apr. 12	14.00	July 12	12.92	Oct. 4	16.12
12	14.00	19	13.45	19	13.00	11	15.96
19	14.00	26	13.53	26	13.04	18	15.96
Feb. 2	14.67	May 3	13.53	Aug. 2	12.96	25	16.38
9	14.00	10	13.33	9	13.00	Nov. 1	16.27
16	14.50	17	13.12	16	13.69	8	16.06
23	14.17	24	13.19	23	13.83	15	16.10
Mar. 1	14.00	31	13.42	30	14.25	22	16.02
8	13.92	June 7	13.12	Sept. 6	15.42	29	16.02
15	14.00	14	13.00	13	15.88	Dec. 6	15.92
22	13.88	21	13.08	20	16.17	20	15.33
29	13.75	28	12.88	27	16.12	27	14.92
Apr. 5	13.88	July 5	12.92				

Kaiwiki shaft.

Water level, in feet, 1940
(Records furnished by Kaiwiki Sugar Co. Unless otherwise indicated, measurements were made while one pump was operating.)

Jan. 3	5.58	Mar. 21	5.42	June 14	a 4.08	Sept. 16	a 5.17
11	5.58	28	a 5.17	20	4.92	24	5.25
19	5.50	Apr. 10	a 5.21	July 14	4.83	Oct. 4	5.29
24	a 5.42	16	5.25	22	a 5.17	14	a 5.17
31	b 5.62	25	a 5.08	29	b 5.42	18	5.50
Feb. 6	a 5.21	29	a 4.75	Aug. 5	5.42	26	a 5.42
13	6.42	May 6	4.92	12	a 5.33	Nov. 5	5.50
21	a 5.25	17	a 4.67	19	a 5.17	25	a 5.42
28	5.29	24	5.00	26	5.42	Dec. 10	5.25
Mar. 7	a 4.83	30	4.88	Sept. 2	a 5.42	16	a 5.42
19	5.17	June 7	4.75	10	a 5.25	23	a 5.35

ISLAND OF KAUAI

In November 1940, artesian heads at Kealia and Wailua reached their highest stages since measurements were first reported in 1937. The head in well 14N has not changed appreciably since 1937. Heads in Kekaha wells 37 and 56 were higher on January 15, 1940, than at any time since 1937. Heads in all Kauai artesian wells included in this report rose slightly during 1940.

a Two pumps operating.
b No pumps operating.

Kauai--Continued.

Head, in feet, and chloride content, in parts per million, in typical artesian wells in Kauai, 1940

Well 2F. Kealia, Kauai.

Date	Head	Chloride	Date	Head	Chloride	Date	Head	Chloride
Jan. 20	10.38	42	June 19	10.07	43	Oct. 3	11.15	...
Feb. 22	10.01	42	July 20	10.01	42	21	10.88	40
Mar. 26	10.24	41	Aug. 19	10.32	42	Nov. 20	11.17	44
Apr. 23	9.86	40	Sept.23	10.59	41	Dec. 20	11.01	44
May 23	9.76	41						

Well 7. Wailua, Kauai.

Jan. 16	.....	132	June 17	.....	124	Oct. 17	.....	128
Mar. 19	.....	131	July 17	.....	133	Nov. 18	.....	129
Apr. 15	.....	123	Aug. 15	.....	127	Dec. 16	.....	130
May 16	.....	127	Sept.17	.....	124			

Well 8. Wailua, Kauai.

Jan. 16	12.60	102	June 17	12.36	100	Oct. 17	12.77	103
Feb. 19	12.49	...	July 17	12.30	113	Nov. 18	12.95	108
Apr. 15	12.47	96	Aug. 15	12.45	113	Dec. 16	12.81	104
May 16	12.45	95	Sept.17	12.70	108			

Well 14N. Koloa, Kauai. Records furnished by Koloa Sugar Co.

Jan. 30	31.27	41.6	May 25	29.94	41.6	Sept.26	a10.27	41.6
Feb. 27	a12.02	41.6	June 25	a11.94	42.6	Oct. 29	30.52	41.6
Mar. 29	a10.94	41.6	July 25	a11.02	42.6	Nov. 26	a12.20	43.6
Apr. 29	a11.69	41.6	Aug. 28	a11.52	41.6	Dec. 24	30.44	41.6

Head, in feet, and chloride, in parts per million, in the Kekaha Sugar Co.'s artesian wells, Kauai, 1940
(Records furnished by the Kekaha Sugar Co.)

Well 35.

Jan. 15	11.28	48	June 16	10.25	170	Oct. 16	10.42	182
Feb. 16	10.03	364	July 15	10.07	249	Nov. 16	10.07	152
Apr. 15	10.51	48	Aug. 15	10.12	261	Dec. 15	10.12	170
May 19	10.74	121	Sept.15	10.77	146			

Well 37.

Jan. 15	10.94	67	June 16	9.90	97	Oct. 16	9.98	91
Feb. 16	10.23	85	July 15	10.06	79	Nov. 16	9.92	115
Apr. 15	9.86	85	Aug. 15	9.98	76	Dec. 15	9.98	109
May 19	9.78	85	Sept.15	10.03	85			

Well 43. Leaking since December 1939 and can not be measured.

Well 56.

Jan. 15	9.96	243	June 16	9.58	237	Oct. 16	9.52	224
Feb. 16	9.96	b437	July 15	9.42	212	Nov. 16	9.94	218
Apr. 15	9.71	212	Aug. 15	9.52	267	Dec. 15	9.82	224
May 19	9.52	224	Sept.15	9.72	194			

a Pumps operating.
b Re-test made; high chloride content unexplainable.

PUMPAGE OF GROUND WATER

The following table gives the draft from all important ground-water pumping plants in the Hawaiian Islands. The draft from individual wells on Oahu, which is not included, is estimated to be about 25 million gallons a day. Pumpage records for Oahu prior to 1940 are published in Bulletins 1, 4, and 5 of the Hawaii Division of Hydrography. Numbers in parentheses for the Oahu pumpage records are the Federal Geological Survey well numbers. Total pumpage in the Hawaiian Islands in 1940 was almost one and a half times the pumpage in 1920.

Ground-water draft, in millions of gallons, from wells in the Hawaiian Islands, 1940
(Data furnished by the owners.)

Island of Hawaii		
Kaiwiki Sugar Co.		a 73.00
Kohala Sugar Co.		
Hoea Pump	463.50	
Kohala Pump	1,573.69	
Waikane Pump	176.75	2,213.94
Olaa Sugar Co.		a 318.00
Total		2,604.94
Island of Kauai b/		
County of Kauai		123.18
Kekaha Sugar Co.		
Wells 3-6, 12-14 16, and 19	311.00	
Well 9	519.00	
Wells K-1 to K-5	1,018.25	
Wells M-1 to M-12	1,357.00	
Kekaha Pump	730.00	
Mana Pump	91.25	
Waiawa Pump	887.75	4,914.25
Koloa Sugar Co. (3 pumps)		494.21
Lihue Plantation Co.		
Shaft	487.94	
Kealia wells	a210.00	697.94
Total		6,229.58
Island of Lanai		
Hawaiian Pineapple Co.		
Tunnels 1 and 2	123.87	
Shaft 2	20.05	143.92

Island of Maui		
Hawaiian Commercial & Sugar Co.		
Pump 1 (Kihei)	1,959.07	
Pump 2	3,607.15	
Pump 3	3,003.60	
Pump 4	2,203.88	
Pump 5	1,902.44	
Pump 6	6,013.60	
Pump 7	6,623.84	
Pump 8	3,135.43	
Pump 3 (Kihei)	5,958.48	
Power plant	2,191.37	
		36,598.86
Maui Agricultural Co. c/		
Lower Paia (pumps 1, 2, 5, and 6)	3,482.00	
Kaheka (pumps 3 and 4	2,899.00	
Pump 7	2,508.00	
Maliko (pumps 10 and 11)	1,264.00	
Kuau (pump 12)	1,096.00	
Mill (pumps 8 and 13)	4,264.00	
		15,513.00
Pioneer Mill Co.		
Pump A Lahaina	2,552.18	
Pump B Lahaina	2,160.86	
Pump C Mill	2,410.42	
Pump D Kaanapali	1,877.19	
Pump E	372.81	
Pump F Honohowai	850.86	
Pump G Hahakea	933.12	
Pump H	1,865.65	
Pump L Wahikuli	261.61	
Pump M Kahoma	1,597.11	
Pump N Olowalu	640.57	
Pump O old Olowalu	165.31	
Pump P Ukumehame	510.73	
		16,198.42
Total		68,310.28

a Estimated.

b McBryde Sugar Co. not included. Three pumps in Hanapepe Valley and one pump at Lawai Valley discharge both ground and surface water.

c Pump 2 was permanently abandoned in July 1940. Pump 5 was formerly pump 4. Pump 4 was formerly pump 5. Pumpage of pump 9 was erroneously listed in 1939 report; the pumpage should read 11,174 million gallons.

Ground-water draft, in millions of gallons, from wells in the Hawaiian Islands, 1940
(Data furnished by the owners.)

Island of Molokai		
Estimate		1.00
Island of Oahu		
Ewa Plantation Co.		
Pump 1 (268)	2,504.88	
Pump 2 (257)	951.97	
Pump 3 (264)	3,171.72	
Pump 4 (264)	3,266.57	
Pump 5 (259)	2,462.03	
Pump 6 (259)	85.53	
Pump 7 (263)	2,793.43	
Pump 8 (270)	687.55	
Pump 9A a/(273)	556.97	
Pump 9C (273)	871.35	
Pump 9D (273)	13.30	
Pump 9E (273)	398.52	
Pump 10 (276)	2,686.24	
Pump 11 (276)	1,776.68	
Pump 12 (276)	1,583.44	
Pump 13 (276)	1.96	
Pump 15 (shaft 3)	2,463.38	
Pump 16 (dug well 16)	4,806.11	
Pump 20 (dug well 20)	774.28	
Pump 21 (dug well 21)	503.23	
Pump 22 (dug well 22)	220.09	
Pump 23 (dug well 23)	2,913.74	
Pump 24 (dug well 24)	817.18	
Pump 25 (254)	369.47	
		36,679.62
Hawaiian Electric Co.		
Wells & tunnel (199-1 & shaft 8)	5,691.19	
Kaluaoopu Spring	1,606.36	
		7,297.55
Honolulu Board of Water Supply		
Kalihi Station (shaft 6)	612.00	
Waialae Station (shaft 7)	242.00	
Kaimuki Station (7)	1,860.00	
Beretania Station (88)	2,580.00	
Kalihi Station (128)	2,193.00	
		7,487.00
Honolulu Plantation Co.		
Pump 1 (185)	2,727.71	
Pump 2 (196)	1,110.14	
Pump 3 (186)	3,557.50	
Pump 4 (197)	2,438.85	
Pump 5 (189)	1,836.92	
Pump 6 (Kalawao Spring)	548.76	
Pump 16 b/(199-1)	3,468.40	
		15,688.28
Island of Oahu--Continued.		
Honolulu Rural Water Works		
Lualualei shaft 2		62.92
Kahuku Plantation Co.		
Pump 1 (353)	682.93	
Pump 2 (341)	2,130.82	
Pump 3 (362)	1,647.94	
Pump 5 (352)	1,399.13	
Pump 6 (362-1)	263.17	
Pump 7 (363)	170.95	
Pump 8 (357)	315.90	
Pump 12(361)	90.92	
Pump 14(338)	237.00	
Pump 15(348)	37.05	
Pump 17(362)	110.49	
Pump 20(377)	595.04	
Pump 23(387)	91.62	
Pump 25(373)	104.64	
Pump 26(392)	123.46	
Pump 27(398)	54.57	8,055.63
Oahu Sugar Co.		
Pump 1 (247)	2,271.46	
Pump 2 (249)	2,340.39	
Pump 3 (249)	1,728.88	
Pump 4 (248)	1,195.31	
Pump 4B (tunnel)	986.56	
Pumps 5 & 5B (274)	2,147.19	
Pump 6 (239)	2,174.21	
Pump 6B(239)	497.33	
Pump 7 (246)	3,291.75	
Pumps 8 & 8A (Waikele Spring)	1,243.01	
Pump 9 (Waiawa Spring)	314.60	
		18,190.69
Private wells in Honolulu		4,924.00
U. S. Army		
Schofield shaft 4		1,230.27
U. S. Navy		
Aiea shaft 5	2,199.58	
Aiea wells (187)	139.98	2,339.56
Waialua Agricultural Co.		
Pump 1 (321)	993.92	
Pump 2 (322)	3,916.11	
Pump 3 (331)	2,842.77	
Pump 4 (334)	1,580.66	
Pump 5 (285)	1,027.80	
Pump 6 (298, 299, and 301)	326.56	
Pump 7 (324)	1,059.94	
Pump 8 (329)	440.90	
Pump 9 (327)	100.58	
Pump 10(323)	1,973.50	
Pump 11(296)	111.06	
Pump 12(332)	137.38	
Mill (319)	2,964.39	
Pump 13 (328)	147.42	
Pump 15 (317)	37.16	
Pump 16 (316)	117.04	
		17,777.19

a Pump 9B not operated in 1940.
b Includes an inseparable amount from Kaluaoopu Spring, obtained from Hawaiian Electric Co.

Ground-water draft, in millions of gallons, from wells in the Hawaiian Islands, 1940
(Data furnished by the owners.)

Island of Oahu--Continued.			
Waianae Co.			
Puko (dug well 1)	114.80		
Makaha (dug well 1B)	60.37		
Makaha (dug well 2)	67.66		
Lehano (dug well 3)	90.21		
Kuaiwa (dug well 4)	26.25		
Paheehee (dug well 5)	34.09		
Keekee (dug well 6)	32.56		
Pahoa (dug well 7)	117.33		
Kahoolanakio (dug well 10)	60.45		
Waianae Co.--Continued.			
Kamaile (277)	901.11		
Shaft 17 (shaft 1)	240.30		
Makaha wells (277)	110.37		
Mill dug well	a400.00	2,255.50	
Total		b118,519.81	
Grand total		195,809.53	

a Estimated quantity of brackish water used for cooling purposes only; salt content ranges from 400 to 500 grains per gallon.

b Pump 16, Honolulu Plantation Co., not included in Oahu total because it boosts water already listed under Hawaiian Electric Co. well.

NEW MEXICO

INTRODUCTION

By C. V. Theis

In the following sections on New Mexico, the land surface datum referred to in the descriptions and tables corresponds to the actual land surface in the vicinity of the well as closely as the surface can be determined and is defined accurately by reference to the measuring point and reference point.

The system of numbering wells in New Mexico used herewith, except for Sierra and Hidalgo Counties, is based upon the common land subdivisions and serves the dual purpose of designating and locating the well. The number of the well is separated into segments by decimal points. The first segment denotes the township, the second the range, the third the section, and the fourth the 10-acre tract in the section. The section is divided into quarters, numbered respectively 1, 2, 3, and 4 for the northwest, northeast, southwest, and southeast quarters, and each quarter section is divided into 40-acre tracts on the same basis. The first and second digits of the last segment denote, respectively, the quarter of the section and the quarter of the quarter section. Similarly, each 40-acre tract is divided into 10-acre tracts, which are denoted by the digit in the last segment. Thus a well in NE¼NW¼SE¼ sec. 29, T. 14 S., R. 26 E., is designated as 14.26.29.412. If two or more wells are in the same 10-acre tract, a letter a, b, c, or d is arbitrarily added to the number designating the tract. For townships north of the base line, an N is added after the township digit. No letter is added to the number to denote whether the range is east or west of the New Mexico principal meridian since in no single area are there wells on both sides of the meridian.

CHAVES AND EDDY COUNTIES

ROSWELL BASIN

By O. J. Loeltz

Most of the water used for irrigation in the Roswell artesian basin is derived directly or indirectly from underground sources. The most important sources are artesian water[1] in the San Andres limestone and shallow water[2] in the valley fill. Minor sources include the spring-fed perennial flows of the lower courses of the larger tributaries of the Pecos River, the flow of drains, and the flow of the Pecos River. Return water from irrigation and natural ground-water seepage supply most of the normal flow of the minor sources. The releases of water from storage in Alamogordo Reservoir above Fort Summer, used to irrigate land having Pecos River water rights, constitute the major contributions of water from outside the artesian basin.

Of the 102,700 acres under irrigation in 1940, 72,900 acres were in Chaves County and 29,800 acres in Eddy County. About 59,600 acres received water directly from artesian wells, 30,200 acres from shallow wells, and 12,900 acres from surface sources. The principal source of surface water was the Pecos River, which supplied water for irrigating 5,900 acres in Chaves County and 1,300 acres in Eddy County.

In order to obtain additional information regarding the fluctuations of artesian head three additional recorder wells were put into operation during the summer of 1940. The wells were drilled by the Pecos Valley Artesian Conservancy District, and were equipped with continuous water-stage recorders which were serviced as a part of the cooperative program between the United States Geological Survey and the State engineer. One of the wells, the Berrendo-Smith well, was drilled to replace eventually the Berrendo well which is badly affected by a nearby shallow irrigation well that penetrates the first flow.

1/ Fiedler, A. G., and Nye, S. S., Geology and ground-water resources of the Roswell artesian basin, N. Mex.: U. S. Geol. Survey Water-Supply Paper 639, pp. 134-155, 194-260, 1933.

2/ Idem., pp. 120-128, 260-263. Morgan, A. M., Geology and shallow water resources of the Roswell artesian basin: N. Mex. State engineer 12th and 13th Bienn. Rept., pp. 155-249, 1939.

Artesian wells

All the artesian water levels used in this report were obtained by recomputing the water levels for all the artesian recorder wells for their entire period of record by the maximum-minimum method described below.

The daily maximum and the daily minimum artesian head for each well were obtained by inspection of the recorder graphs. From these figures a mean monthly maximum and a mean monthly minimum head for each well were obtained. The average of the mean monthly maximum and the mean monthly minimum head was then considered to be the mean monthly artesian head. The average monthly head obtained by this method was found to be strictly comparable to the monthly mean obtained by averaging the daily means determined in previous years by inspection of the daily hydrographs. The average annual artesian head, as in previous reports, was computed as the average of the mean monthly artesian heads.

The seasonal fluctuations of artesian head in 1940 in the 3 wells equipped with continuous water-stage recorders since 1926 followed the general pattern of previous years. In each well the maximum mean monthly head occurred in January. A small decline of head in February was followed by a much larger decline of head in March and April. May, a month of above-normal precipitation, showed an increase of head over the mean monthly head for April, the increase being 0.72 foot for the Berrendo well, 4.82 feet for the Orchard Park well, and 1.6 feet for the Artesia well. June, July and August were months of declining head and the heads in all three wells reached their lowest mean monthly stages on record in August. A slight increase of head in September was followed by a large increase of head in October, the month of greatest recovery for all three wells. In November and December the head continued to increase, although the rate of recovery in November was only about a half that in October and the increase in December was roughly a half that in November.

The fluctuations of water level in the new recorder wells, Berrendo-Smith, Mountain View, and Greenfield, followed the same general pattern as that of the 3 older wells. The mean monthly fluctuations of head in the Berrendo-Smith well correspond very closely to those of the Berrendo well, although it appears that the range of seasonal fluctuations is somewhat larger. The Mountain View well shows a still larger range of fluctuations, and the Greenfield well indicates a range of fluctuations comparable with those of the Orchard Park and the Artesia recorder wells.

In the Berrendo well, the decline in artesian head was about the same as in 1939. The mean water level in December 1940 was 0.4 foot below that in December 1939, and the mean annual water level in 1940 was 1.1 feet below that in 1939. In the Orchard Park well, the mean water level for December 1940 was 0.4 foot higher than for the corresponding month in 1939, but the mean annual water level was 0.7 foot lower than in 1939. Although the lowest mean monthly water level on record was reached in August, when the water level was 3.5 feet below the former lowest mean monthly stage which was reached in August 1939, the mean annual water level declined less in 1940 than in 1939 or 1938. In the Artesia well, the mean monthly head in December 1940 was 2.2 feet below the mean in December 1939, and the annual mean in 1940 was 2.4 feet lower than the mean in 1939. The lowest stage on record for this well was reached in August, when the mean head was 4.8 feet below the mean head for July 1939--the lowest mean monthly head observed previously.

Records of artesian head in 1940 for the 6 wells equipped with continuous water-stage recorders are given in the following tables.

Berrendo well. SW¼SW¼ sec. 9, T. 10 S., R. 24 E. Beginning of record: June 1926. Extremes: Highest mean annual water level, 3,571.7 feet (1927). Lowest mean annual water level, 3,563.0 feet (1940). Highest mean monthly water level, 3,574.8 feet (December 1926). Lowest mean monthly water level, 3,560.0 feet (August 1940).

Mean monthly and annual artesian head, in feet above sea level, 1940

Month	Water level	Month	Water level	Month	Water level
Jan.	3,566.0	June	3,561.5	Oct.	3,562.7
Feb.	3,566.1	July	3,561.3	Nov.	3,564.0
Mar.	3,564.2	Aug.	3,560.0	Dec.	3,565.0
Apr.	3,562.1	Sept.	3,560.5	Annual	3,563.0
May	3,562.8				

Berrendo-Smith well. NE¼NW¼NE¼ sec. 21, T. 10 S., R. 24 E. Depth 324 feet, diameter 10 inches, depths to artesian aquifers 269 feet and 310 feet. Measuring point, chisel-cut cross on top of casing, 3,582.4 feet above mean sea level. Beginning of record: June 1940. Extremes: Highest mean monthly water level, 3,564.6 feet (December 1940). Lowest mean monthly water level, 3,557.9 feet (August 1940).

Mean monthly artesian head, in feet above sea level, 1940

June	3,559.7	Sept.	3,558.4	Nov.	3,563.6
July	3,559.4	Oct.	3,561.8	Dec.	3,564.6
Aug.	3,557.9				

Mountain View well. NE¼SE¼NE¼ sec. 29, T. 11 S., R. 24 E. Depth 553 feet, diameter 10 3/4 inches, depths to artesian aquifers 290, 410, 460, 505, and 545 feet. Measuring point, chisel-cut cross on top of casing, 3,631.1 feet above mean sea level. Beginning of record: July 1940. Extremes: Highest mean monthly water level, 3,562.5 feet (December 1940). Lowest mean monthly water level, 3,553.4 feet (August 1940).

Mean monthly artesian head, in feet above sea level, 1940

July	3,556.2	Sept.	3,553.5	Nov.	3,560.8
Aug.	3,553.4	Oct.	3,558.2	Dec.	3,562.5

Orchard Park well. NW¼NW¼ sec. 23, T. 12 S., R. 25 E. Beginning of record: August 1925. Extremes: Highest mean annual water level, 3,526.1 feet (1932). Lowest mean annual water level, 3,516.1 feet (1940). Highest mean monthly water level, 3,536.6 feet (December 1937). Lowest mean monthly water level, 3,501.7 feet (August 1940).

Mean monthly and annual artesian head, in feet above sea level, 1940

Month	Water level	Month	Water level	Month	Water level
Jan.	a 3,531	June	a 3,507	Oct.	3,520.4
Feb.	3,528.1	July	a 3,506	Nov.	3,529.1
Mar.	3,516.7	Aug.	3,501.7	Dec.	3,529.4
Apr.	3,508.2	Sept.	3,502.6	Annual	3,516.1
May	3,513.0				

Greenfield well. NW¼NW¼NE¼ sec. 27, T. 13 S., R. 25 E. Depth 880 feet, diameter 10 inches, depths to artesian aquifers 740 feet and 795 feet. Measuring point, chisel-cut cross on top of casing, 3,524.7 feet above mean sea level. Beginning of record: May 1940. Extremes: Highest mean monthly water level, 3,510.5 feet (December 1940). Lowest mean monthly water level, 3,485 feet (August 1940).

Mean monthly artesian head, in feet above sea level, 1940

June	3,496.0	Sept.	3,487.4	Nov.	3,510.3
July	3,493.1	Oct.	3,508.8	Dec.	3,510.5
Aug.	a 3,485				

Artesia well. SW¼SW¼ sec. 5, T. 18 S., R. 26 E. Beginning of record: April 1931. Extremes: Highest mean annual water level, 3,384.1 feet (1932). Lowest mean annual water level, 3,376.0 feet (1940). Highest mean monthly water level, 3,392.8 feet (January 1932). Lowest mean monthly water level, 3,365.0 feet (August 1940).

Mean monthly and annual artesian head, in feet above sea level, 1940

Jan.	3,387.9	June	3,371.1	Oct.	3,378.4
Feb.	a 3,382.3	July	3,368.9	Nov.	3,383.9
Mar.	a 3,376.7	Aug.	3,365.0	Dec.	3,385.7
Apr.	3,371.0	Sept.	3,367.9	Annual	3,376.0
May	3,372.6				

Shallow wells

The investigation of the shallow ground-water resources of the Roswell basin, in Chaves and Eddy Counties, N. Mex., begun in 1937, was continued through 1940 by the United States Geological Survey in financial cooperation with the State engineer.

The observation-well program was continued in 1940 and an average of 8 measurements of water level were made in each of 39 wells, 28 of which were in Chaves County and 11 in Eddy County. Observations on two of the wells in Chaves County and two in Eddy County were discontinued during the year because of changes in well installations. Seven wells were equipped with water-stage recorders at the beginning of the year, two of which were abandoned in March because the heavy draft for spring irrigation caused them to go dry. Both of the abandoned recorder wells were in Chaves County. Two recorder wells in Chaves County and three in Eddy County were in operation at the end of 1940.

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a Estimated.

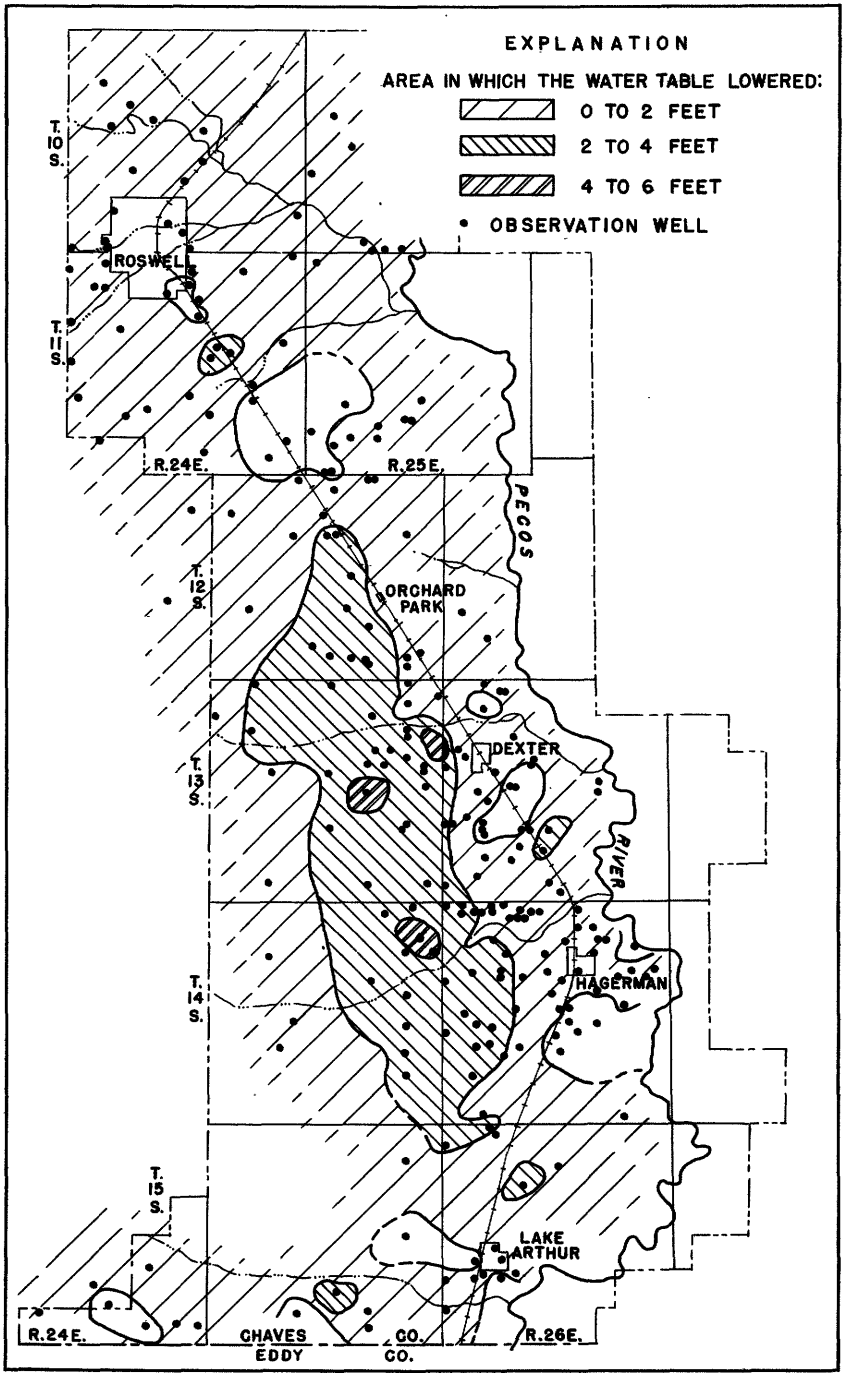

Figure 10.--Map of Chaves County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1940 to January 1941.

The water levels reached maximum stages in late January and early February and minimum stages in late September and early October. With the exception of well 10.24.31.444, all the wells showed seasonal declines in water level that ranged from less than 1 foot to as much as 21.5 feet. The water levels in most of the wells, however, had a seasonal decline in water level of less than 10 feet. The decline of 21.5 feet, which occurred in well 13.25.11.433, was probably caused largely by a deepening of the cone of depression created by 9 nearby pumped wells inasmuch as well 13.25.11.433 was not used.

The fluctuations of water level in well 10.24.31.444 followed the usual pattern (see Water-Supply Paper 845), the lowest stage being reached at the beginning of the irrigation season and the highest stage being reached near the end of the season.

For the most part the water levels during 1940 were lower than they were for corresponding times during 1939. The departures from 1939 stages increased rapidly in late summer.

During the latter part of January and the early part of February of 1941, measurements of water level were again made in 348 wells and 14 auger holes whose water levels had been observed during January and early February of 1940. Each of the water-level measurements made in 1941 was then compared with the measurement in the corresponding well in January and February 1940 to determine the change in water level. In order to show more clearly the areal distribution and the amount of the changes, a change-in-water-level map was drawn. (See accompanying illustration.) The areas in which the water levels rose are unhatchured, whereas the areas in which the water levels declined are hatchured, the areas of greater decline being the more densely hatchured.

The water levels, as shown by the accompanying illustration, declined over the greater part of the basin, the decline ranging from a few hundredths of a foot to about 6 feet. A decline of more than 6 feet was observed in only 1 well, recorder-well 13.26.7.333. This decline is at least 3 feet in excess of the estimated regional decline based upon the decline of water levels in 8 wells within 1.25 miles of the recorder well. The excessive decline undoubtedly was brought about by the plugging of a badly leaking artesian well a quarter of a mile north of the recorder well, which thus shut off an important local source of recharge to the shallow-water supply. The plugging of this well, begun January 8, 1940 and

completed March 26, 1940, by the Pecos Valley Artesian Conservancy District was extremely difficult. According to the superintendent's report, 3,450 tons of clay, 7 tons of roughage, one-half ton of aquagel, and 40 sacks of cement were used in plugging the well.

Except for the single decline of about 6 feet in the shallow well mentioned above, the decline in water levels exceeded 4 feet in only 3 localities, representing a total area of about 3 square miles. The deepest parts of the ground-water trough roughly coincide with the area of heavy shallow-water development. The part of the trough in which the water levels declined from 2 to 4 feet has an average width of about 4 miles, extends from the middle of T. 12 S., R. 25 E. to the northwest corner of T. 15 S., R. 26 E., and has an area of about 60 square miles. Other regions in which the decline amounted to more than 2 feet are four small areas in Chaves County totaling 2.5 square miles and six areas in Eddy County totaling 8.5 square miles. The largest of these regions, which is southwest of Lakewood has an area of 6.5 square miles.

In the vicinity of Cottonwood Creek just south of the Chaves-Eddy County line, 3 areas, totaling 20 square miles, again showed a rise in water level. In 3 wells the rise exceeded 2 feet, but the average rise for the entire group was about 0.5 foot. The largest area of rise of ground-water level, which covers about 15 square miles, is mostly in the northern half of T. 16 S., R. 26 E. A strip 1 mile wide along the west side of the Pecos River and extending to Lake Arthur, and another strip about 1 mile wide and 3 miles long extending northwestward from the western boundary of sec. 6, T. 16 S., R. 26 E., comprise the rest of the area. Other rises in the Cottonwood Creek area occurred in the northwestern part of T. 16 S., R. 25 E. and in the southern part of T. 15 S., R. 24 E. The persistent rise of water levels in this area is probably due to leakage from artesian wells that has recently developed.

Other areas having significant rises of water level include: 6 square miles in the southeastern part of T. 11 S., R. 24 E., and the southwestern part of T. 11 S., R. 25 E.; 2 square miles southeast of Dexter; 6 square miles south of Hagerman; and 2.5 square miles west of Lake Arthur. The average rise of the water levels in the above areas was about 1 foot.

In comparing the change-in-water-level map for the year 1939 (see Water-Supply Paper 886) with that for 1940 it is apparent that in Chaves County in 1940 both the areal extent and the magnitude of the decline of water levels were significantly reduced. In 1939 the ground-water level

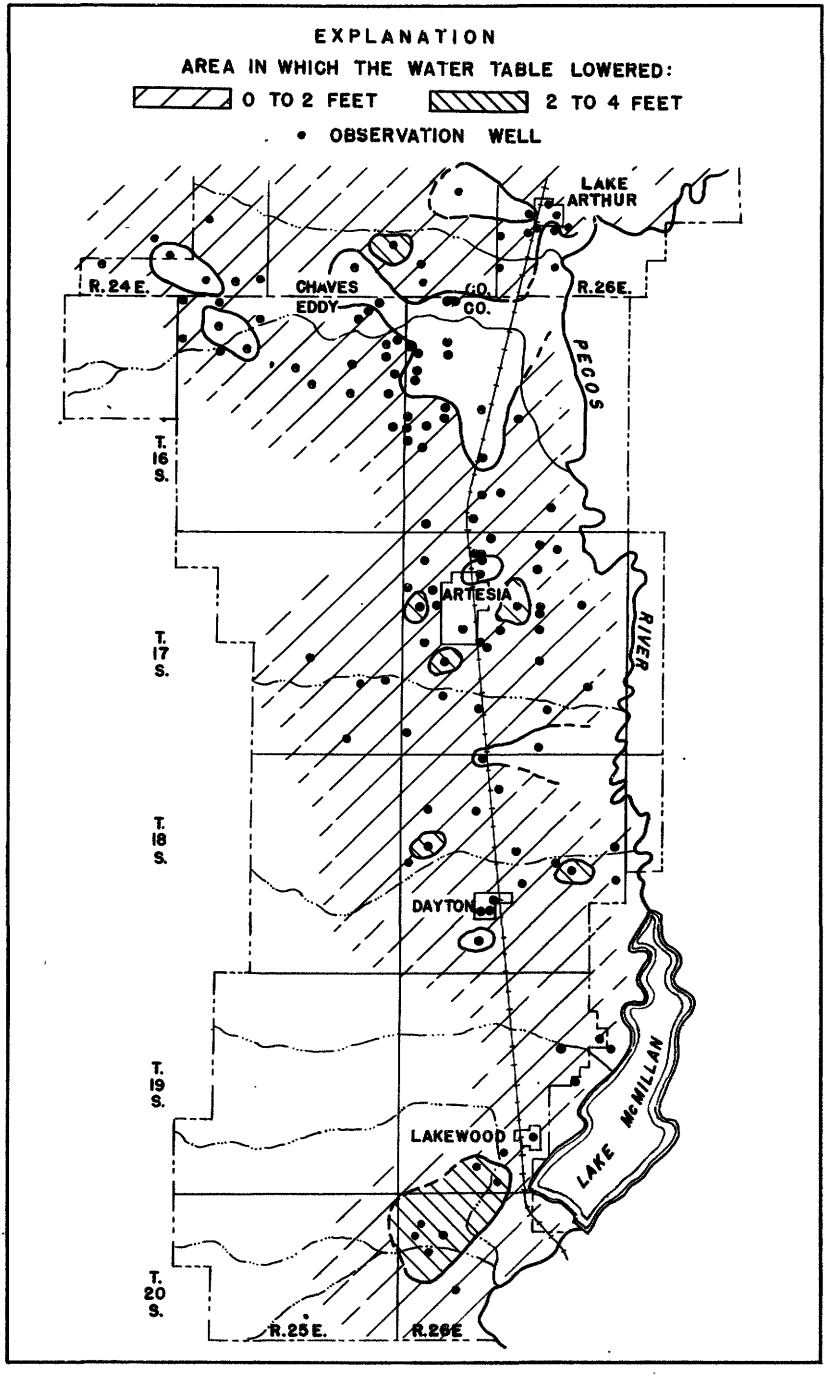

Figure 11.--Map of Eddy County portion of the Roswell Basin, New Mexico, showing change in the ground-water level from January 1940 to January 1941.

in the vicinity of Orchard Park and Lake Arthur declined an average of 3.5 feet over an area of about 100 square miles, whereas in 1940 the additional lowering averaged 3 feet over an area of only 60 square miles.

A similar comparison of water levels in Eddy County shows a diminishing rate of decline in Tps. 16 and 17 S., but there appears to be little if any change in the rate of decline of water levels in Tps. 18, 19, and 20 S.

The precipitation in the Roswell area in 1940 was 0.85 inch below the 14.94-inch normal and in 1939, 2.13 inches below normal. Corresponding departures below the 12.52 inches normal of the Artesia area were 1.73 and 3.41 inches. As there was no significant change in the acreage being irrigated from shallow wells in 1940 from that being irrigated in 1939, it is highly probable that the diminishing rate of decline in water levels over the basin is principally due to both the increased amount and slightly more favorable distribution of rainfall in 1940 as compared with 1939.

Chaves County

10.24.17.122. Howard.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	32.57	May 27	34.67	Aug. 1	38.25	Oct. 9	36.16
30	32.30	July 2	35.14	Sept.5	38.23	Nov. 13	34.49
Apr. 17	35.80						

10.24.22.432. P. R. Fuller. Measurements discontinued after March 26, 1940.

Highest water level, in feet below land-surface datum, 1940 (from recorder charts)

Jan. 1	18.72	Jan. 28	19.34	Mar. 3	19.99	Mar. 14	20.10
2	18.74	29	19.37	4	20.00	15	20.11
9	18.92	30	19.39	5	20.02	16	20.13
10	18.94	31	19.41	6	20.03	17	20.14
11	18.95	Feb. 1	19.43	8	20.05	18	20.15
12	18.97	2	19.45	9	20.06	19	20.16
13	18.98	3	19.47	10	20.07	20	20.17
14	19.00	28	19.94	11	20.07	21	20.18
15	19.03	29	19.96	12	20.08	22	20.20
16	19.05	Mar. 1	19.96	13	20.09	26	a 20.27
27	19.31	2	19.98				

10.24.31.444. Star Tourist Camp.

Water level, in feet below land-surface datum, 1940

Jan. 11	25.45	May 27	25.10	Aug. 1	23.30	Oct. 9	23.74
Apr. 17	25.45	July 2	24.64	Sept.5	23.22	Nov. 13	24.67

11.24.10.224. C. E. Smith.

Water level, in feet below land-surface datum, 1940

Jan. 30	19.39	May 27	b 24.04	Aug. 1	31.94	Oct. 9	b 25.78
Apr. 17	b 29.52	July 2	23.54	Sept.5	b 32.87	Nov. 13	c 21.32

a Tape measurement. b Windmill pumping.
c Windmill pumping intermittently.

Chaves County--Continued.

11.24.14.313b. Fairbanks Filling Station.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 11	37.41	May 27	44.58	Aug. 1	55.46	Oct. 9	45.04
29	36.75	July 2	43.13	Sept.5	55.80	Nov. 13	39.92
Apr. 17	52.19						

11.24.28.113. Rocky Arroyo School House.

Water level, in feet below land surface datum, 1940

Jan. 11	68.52	May 27	a 71.85	Aug. 1	73.58	Nov. 13	72.63
Apr. 17	72.02	July 2	72.65	Oct. 9	b 80.63		

11.25.29.422. Neil Wheeler. No equipment after July 2, 1940.

Water level, in feet below land-surface datum, 1940

Jan. 11	7.54	May 27	6.63	Aug. 1	6.93	Oct. 9	8.66
29	7.07	July 2	5.09	Sept.5	7.58	Nov. 13	7.80
Apr. 17	4.91						

11.25.29.444. Glen Wheeler.

Water level, in feet below land-surface datum, 1940

Jan. 11	7.58	May 27	c 10.94	Aug. 1	10.83	Oct. 9	c 13.77
29	7.07	July 2	7.68	Sept.5	c 13.14	Nov. 13	9.24
Apr. 17	8.37						

12.25.4. Lot 4. Cross Roads Filling Station. Equipped with pressure pump.

Water level, in feet below land-surface datum, 1940

Jan. 11	35.50	Apr. 17	37.84	July 2	36.97	Oct. 9	36.97
27	35.28	May 27	d 38.33	Sept.5	d 40.96	Nov. 13	35.84

12.25.9.422. Cumberland townsite (Welty).

Water level, in feet below land-surface datum, 1940

Jan. 11	44.48	May 27	45.20	Aug. 1	46.53	Oct. 9	47.37
27	44.25	July 2	45.75	Sept.5	47.33	Nov. 13	46.90
Apr. 17	44.47						

12.25.22.231. W. T. Clardy. Water levels, in feet below land-surface datum, 1940: Jan. 11, 58.81; Jan. 26, 58.43. Measurements discontinued.

12.25.34.311a. W. T. Clardy. Measurements discontinued after March 8, 1940.

Highest water level, in feet below land-surface datum, 1940 (from recorder charts)

Jan. 1	52.95	Jan. 20	52.56	Feb. 3	52.04	Feb. 24	52.47
2	52.91	21	52.51	4	52.00	25	52.37
9	52.71	22	52.50	5	52.02	26	52.37
10	52.70	23	52.50	6	51.95	29	52.87
11	52.70	24	52.50	19	52.57	Mar. 1	53.00
12	52.68	25	52.40	20	52.48	2	55.33
13	52.56	26	52.34	21	52.46	3	e 59.10
14	52.82	31	52.07	22	52.37	4	e 60.34
15	52.78	Feb. 1	52.11	23	52.38	5	e 60.92
16	52.69	2	52.08				

12.25.35.311a. A. C. Stone.

Water level, in feet below land-surface datum, 1940

Jan. 12	44.08	May 27	f 63.73	Aug. 1	57.01	Oct. 9	57.42
25	43.90	July 2	51.61	Sept.5	g 60.38	Nov. 13	48.26
Apr. 17	51.07						

a Windmill pumping intermittently. b Windmill pumping.
c Irrigation well 600 feet distant pumping.
d Pressure pump operating.
e Irrigation well 100 feet south pumping.
f Irrigation well 300 feet east pumping.
g Irrigation well 300 feet east pumped shortly before measurement.

Chaves County--Continued.

13.25.1.422. O. B. Berry.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	9.06	May 27	7.79	Aug. 1	9.08	Oct. 9	10.95
24	8.61	July 2	9.13	Sept.5	9.75	Nov. 13	10.17
Apr. 17	8.37						

13.25.11.433. Beck.

Water level, in feet below land-surface datum, 1940

Jan. 12	43.16	May 27	59.49	Aug. 1	61.63	Oct. 9	62.47
24	43.43	July 2	59.12	Sept.5	64.66	Nov. 13	56.08
Apr. 17	57.44						

13.26.7.333. Howard Amason. Nearest pumped well 0.7 mile southwest.

Highest water level, in feet below land-surface datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	7.61	.....	.....	14.40	13.68	13.45	15.98	16.71	16.93	15.82	15.11
2	....	7.75	.....	.....	14.70	13.90	13.33	16.00	16.73	16.85	15.80	15.11
3	....	7.92	.....	.....	14.98	13.70	13.28	16.02	16.75	16.79	15.78	15.10
4	....	7.94	.....	.....	15.18	13.65	13.20	16.23	16.80	16.73	15.75	15.07
5	....	....	.....	.....	.....	13.65	13.13	16.54	16.85	16.65	15.74	15.07
6	....	....	.....	.....	.....	13.65	13.10	16.80	16.90	16.59	15.72	15.04
7	....	....	.....	.....	.....	13.66	13.07	16.94	17.17	16.55	15.69	15.04
8	....	....	9.82	.....	.....	13.65	13.06	17.02	17.40	16.50	15.66	15.01
9	8.01	....	9.98	.....	.....	.....	13.05	17.18	17.63	16.47	15.63	14.98
10	8.04	....	10.60	.....	.....	.....	13.05	17.35	17.82	16.44	15.62	14.95
11	8.14	....	11.03	.....	.....	14.17	13.14	17.15	18.00	16.43	15.60	14.93
12	8.27	....	11.35	.....	.....	14.13	13.27	16.80	18.17	16.38	15.56	14.90
13	8.22	....	11.38	.....	.....	14.07	13.48	16.57	18.28	16.31	15.56	14.88
14	8.07	....	11.47	.....	.....	14.02	13.67	16.38	18.43	16.25	15.53	14.85
15	....	....	11.54	.....	13.52	13.98	13.82	16.25	18.50	16.24	15.50	14.82
16	....	....	11.75	.....	13.56	13.95	14.20	16.18	18.53	16.22	15.44	14.80
17	....	....	12.15	.....	13.60	13.95	14.55	16.17	18.53	16.20	15.39	14.76
18	....	....	12.50	.....	13.68	13.97	15.05	16.20	18.53	16.19	15.33	14.73
19	7.94	8.30	12.80	.....	13.77	14.25	15.31	16.21	18.57	16.18	15.31	14.70
20	7.87	8.41	12.92	.....	13.84	14.54	.....	16.22	18.62	16.14	15.30	14.67
21	7.82	8.71	.....	.....	13.85	14.57	.....	16.48	18.62	16.09	15.27	14.64
22	7.74	9.12	.....	.....	13.85	14.63	15.75	16.78	18.59	16.07	15.25	14.61
23	7.70	9.15	.....	.....	13.86	14.80	15.87	17.03	18.55	16.05	15.25	14.57
24	....	9.16	.....	.....	13.83	14.68	15.91	16.95	18.43	16.02	15.24	14.54
25	....	9.02	.....	.....	13.80	.....	16.00	16.82	18.20	15.97	15.18	14.51
26	....	....	.....	.....	13.80	.....	15.87	16.77	17.87	15.90	15.20	14.51
27	....	....	.....	14.43	13.78	14.08	15.82	16.76	17.62	15.85	15.20	14.54
28	....	....	.....	14.40	13.77	14.02	15.83	16.65	17.39	15.83	15.17	14.52
29	....	....	.....	14.37	13.68	13.93	16.05	16.61	17.20	15.82	15.15	14.51
30	....	....	.....	14.37	13.64	13.68	16.07	16.62	17.05	15.80	15.12	14.50
31	7.57	....	.....	.....	.....	.....	15.99	16.67	.....	15.80	.....	.....

13.26.8.422. Jake Mills.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	a 17.61	May 27	14.43	Aug. 1	14.80	Oct. 9	a 15.91
Apr. 17	13.77	July 2	14.98	Sept.5	a 18.21	Nov. 13	14.11

13.26.17.133. Judge Melhop.

Water level, in feet with reference to land-surface datum, 1940

Jan. 12	(b)	May 27	+0.16	Aug. 1	-5.77	Oct. 9	-3.09
Apr. 17	-0.98	July 2	-.95	Sept.5	-5.92	Nov. 13	-.21

a Pumping. b Flowing.

Chaves County--Continued.

13.26.17.321. Leo Nowak.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 13	11.47	May 27	a 20.22	Aug. 1	12.16
24	11.13	July 2	10.20	Oct. 9	12.30

13.26.28.121. George Grassie.

Water level, in feet below land-surface datum, 1940

Jan. 13	16.15	May 27	18.14	Sept. 5	a 23.04
23	17.67	July 2	17.31	Oct. 9	16.86
Apr. 17	15.22	Aug. 1	20.26	Nov. 13	16.83

14.25.1.112. Gentry.

Water level, in feet below land-surface datum, 1940

Jan. 13	38.49	Apr. 17	b 42.53	July 2	46.05
23	41.48	May 27	43.46	Nov. 13	45.28

14.25.1.344. Wm. Langnegger.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	50.28	Apr. 17	53.12	July 2	d 61.06	Nov. 13	e 56.37
26	48.92	May 27	c 57.76	Aug. 1	57.47		

14.25.21.131.

Water level, in feet below land-surface datum, 1940

Jan. 12	88.51	May 27	88.25	Aug. 1	88.46	Oct. 9	88.71
20	88.52	June 5	88.19	Sept.5	88.59	Nov. 13	88.75
Apr. 17	89.72	July 2	88.32				

14.25.25.221. John M. Norris.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46.77	46.18	45.69	46.18	.....	48.68	.....	49.54	50.29	50.71	50.60	50.16
2	46.75	46.15	45.70	.....	47.53	48.70	.....	49.58	50.31	50.72	50.58	50.14
3	.....	46.13	45.68	.....	47.56	48.72	.....	49.61	50.32	50.73	50.56	50.11
4	.....	46.10	45.70	.....	47.60	48.74	.....	49.65	50.35	50.74	50.56	50.09
5	.....	46.09	45.68	.....	47.63	48.77	49.09	49.70	50.35	50.74	50.56	50.07
6	.....	45.92	45.65	.....	47.66	48.78	49.10	49.73	50.40	50.75	50.54	50.06
7	.....	.....	.....	.....	47.70	48.79	49.11	49.75	50.41	50.74	50.53	50.04
8	.....	.....	45.67	.....	47.76	48.81	49.13	49.80	50.42	.....	50.51	50.03
9	46.62	.....	45.68	46.50	.....	.....	49.14	49.85	50.43	50.75	50.49	50.01
10	46.59	.....	45.68	46.52	.....	48.84	49.15	49.88	50.45	50.77	50.50	50.00
11	46.58	.....	45.68	46.58	.....	48.86	49.18	49.93	50.46	50.77	50.47	49.98
12	46.55	.....	45.70	46.62	.....	48.90	49.19	49.96	50.48	50.77	50.43	49.99
13	46.55	.....	45.75	46.63	.....	48.90	49.20	50.00	50.47	50.77	50.42	49.99
14	46.53	.....	45.77	.....	.....	48.92	49.21	50.00	50.50	.....	50.41	49.96
15	46.52	.....	45.80	.....	48.10	48.95	49.22	50.04	50.52	.....	50.40	49.96
16	46.49	.....	45.80	.....	48.15	48.95	49.23	.....	50.54	50.74	50.39	49.95
17	.....	.....	45.82	46.83	48.18	48.95	49.24	50.08	50.56	50.76	50.37	49.93
18	.....	.....	45.86	46.86	48.23	48.94	49.26	50.12	50.57	50.74	50.34	.....
19	46.44	45.88	45.87	46.90	48.26	48.94	49.25	50.13	50.60	50.74	50.35	.....
20	46.41	45.86	45.87	46.94	48.30	48.95	49.29	50.15	50.60	50.73	50.33	.....

a Pumping.
b Irrigation well 300 feet northeast pumping.
c Irrigation well one quarter mile west pumping.
d Irrigation well one quarter mile west pumping and windmill pumping intermittently.
e Windmill pumping intermittently.

Chaves County--Continued.

14.25.25.221.--Continued.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	46.39	45.84	45.90	46.99	48.34	48.97	49.30	50.18	50.60	50.73	50.30	.....
22	46.36	45.81	.....	47.05	48.37	48.98	49.32	50.21	50.61	50.72	50.30	.....
23	46.36	45.81	.....	47.11	.....	49.00	49.33	50.25	50.62	50.70	50.30	.....
24	46.34	45.81	.....	47.15	.....	49.01	49.35	50.24	50.64	50.68	50.26	49.77
25	46.31	45.77	.....	.....	48.49	.....	49.36	50.25	50.65	50.68	50.24	49.75
26	46.29	45.75	45.99	.....	48.51	.....	49.40	50.25	50.65	50.66	50.24	49.76
27	.....	.....	46.01	.....	48.54	49.05	49.43	50.25	50.66	50.65	50.22	49.71
28	.....	45.70	46.04	.....	48.56	49.06	49.45	50.25	50.68	50.65	50.19	49.72
29	.....	45.68	46.10	.....	48.58	.....	49.47	50.26	.....	50.63	50.17	49.68
30	46.22	.....	46.12	.....	48.61	.....	49.49	50.27	50.68	50.61	50.18	49.68
31	46.18	.....	46.15	.....	48.63	.....	49.51	50.28	.....	50.62	.....	.....

14.26.7.443. W. W. Adams.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	43.46	May 27	49.42	Aug. 1	49.75	Oct. 9	a 55.47
Apr. 17	47.35	July 2	49.18	Sept.5	51.54	Nov. 13	48.90

14.26.8.433a. Tom Ferguson. Water levels, in feet below land-surface datum, 1940: Jan. 12, 46.33, well 300 feet southeast pumping; Apr. 17, 44.04, irrigation well 400 feet southeast pumping; Sept. 5, pit dry at 48 feet.

14.26.8.433b. No measurements made in 1940.

14.26.8.433c. No measurements made in 1940.

14.26.12.131. W. E. Utterback. Owner designated as W. E. Udderback in Water-Supply Paper 845.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	21.88	May 27	b 29.58	Aug. 1	b 25.18	Oct. 9	21.45
22	21.95	July 2	20.60	Sept.5	b 25.92	Nov. 13	21.78
Apr. 17	21.54						

14.26.15.333. E. D. Menoud.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	23.07	May 27	c 20.72	Aug. 1	c 24.47	Oct. 9	24.21
20	22.26	July 2	20.11	Sept.5	21.87	Nov. 13	23.73
Apr. 17	23.03						

14.26.32.332. B. E. Spencer.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	39.27	May 27	39.31	Sept.5	38.27	Nov. 13	39.00
Apr. 17	38.06	Aug. 1	37.98	Oct. 9	38.60		

15.25.35.111. Moss Spence.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	23.90	May 27	24.23	Aug. 1	28.92	Oct. 9	d 30.24
Apr. 17	d 25.73	July 2	d 27.06	Sept.5	30.32	Nov. 13	25.04

15.26.9.222. Harry Cowan.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	37.85	May 27	37.42	Sept.5	39.12	Nov. 13	38.15
Apr. 17	37.58	Aug. 1	37.27	Oct. 9	37.86		

15.26.18.242. A. R. Davis. Water levels, in feet below land-surface datum, 1940: Jan. 12, 24.32; Apr. 17, 24.33; May 27, 24.80. Measurements discontinued.

a Pumping.
b Windmill pumping slowly.
c Water flowing in irrigation ditch 50 feet south of well.
d Windmill pumping.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
10.24.8.111		31	41.34
10.24.15.342	Mr. Tow	31	12.62
10.24.16.133	George D. Perrine	30	28.09
10.24.18.424		3	43.25
10.24.20.344		30	45.12
a/10.24.22.322	H. Crile	30	19.45
10.24.27.111		30	22.77
10.24.29.333		30	40.35
10.24.30.344		31	48.94
10.24.31.333	Mr. Williams		(b)
10.24.31.423		30	24.44
10.25.32.431	Henry Russell Estate	30	5.52
10.25.32.444	Henry Russell Estate	30	c +0.74
11.23.12.221		30	61.14
11.24.2.322			(b)
11.24.3.114		30	15.05
11.24.3.312		30	14.17
11.24.3.333		30	26.47
11.24.6.224		29	27.17
11.24.6.311			(b)
11.24.6.433		30	40.30
11.24.6.444	Morrie Huff	29	40.71
11.24.7.333	d/Mrs. Pearl Baker	30	70.00
11.24.7.444			(b)
11.24.8.122		30	34.32
11.24.9.133	P. Caman		(b)
11.24.9.211		29	34.83
11.24.10.114	e/Claude Hobbs	29	25.03
11.24.10.321		30	28.64
11.24.11.214	H. D. Jeffcoat	30	11.59
11.24.13.144	Frank Peters	29	13.35
11.24.14.313a	f/Mr. Fairbanks	29	36.60
11.24.15.421	Mrs. M. L. Barnett	29	39.38
11.24.15.431	M. L. and S. Barnett	29	40.60
11.24.16.111		29	54.96
11.24.17.121	D. H. Johnson	29	59.40
11.24.18.333	G. V. Coker	29	89.56
11.24.19.222		30	75.54
11.24.19.343		30	98.63
11.24.22.333	John Tweedy	27	50.43
11.24.23.411a	Cornell Ranch	29	16.57
11.24.23.433	Tweedy Gin	27	19.80
11.24.24.144			(b)
11.24.27.231	Mr. Copeland	27	47.07
11.24.29.411	Mrs. J. S. Singleton	27	85.00
11.24.31.221		30	97.60
11.24.34.411b		27	51.18
11.24.36.211	Russell Smith	29	24.88
11.24.36.133	Wiley Grizzle	29	36.02

a Erroneously designated as well 10.24.20.322 in Water-Supply Paper 886.

b No measurements made in 1940.

c Above land surface datum.

d 11.24.7.333. Mrs. Pearl Baker. Used drilled irrigation well, diameter 12⅛ inches, depth 140 feet. Measuring point, top edge of well casing, 0.30 foot above land surface datum. Equipped with turbine pump in 1940.

e 11.24.10.114. Claude Hobbs. Used drilled irrigation well, diameter 12⅛ inches. Measuring point, top of basal flange of pump head, 0.85 foot above land surface datum. Equipped with turbine pump.

f 11.24.14.313a. Fairbanks. Used drilled irrigation well. Measuring point, lower edge of basal flange of pump head at oil line opening in concrete foundation, 0.80 foot above land surface datum. Equipped with turbine pump.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
11.24.36.333	Wiley Grizzle		(a)
11.25.4.111	J. P. White		(a)
11.25.6.114	Henry Russell Estate		(a)
11.25.6.123	Henry Russell Estate	30	16.79
11.25.6.421		30	7.60
11.25.22.333	Mrs. Whitney	27	7.15
11.25.28.234	E. Whitney	29	6.22
11.25.28.244	R. Whitney	29	6.85
11.25.29.111	Oasis Gin	27	8.67
11.25.29.343	Albert Hobson	29	4.38
11.25.30.333	J. P. White Co.	29	17.07
11.25.31.223		29	14.24
11.25.31.433a	Albert Watson	27	30.98
11.25.31.433b	Albert Watson	27	30.68
11.25.32.333	George Bogart	27	26.27
12.24.12.411	Mr. Little	27	60.05
12.24.23.441a	Monte Goodin	27	83.95
12.24.23.441b	Monte Goodin	27	84.11
12.25.2.Lot 3	B. F. Heine	27	14.56
12.25.2.Lot 4	E. R. Duval	27	13.15
12.25.3.334	J. W. Young	27	28.58
12.25.7.144a		27	b 44.46
12.25.7.144b		27	44.26
12.25.13.111		27	14.02
12.25.15.112		27	43.64
12.25.15.333	G. M. Sterrett	26	54.77
12.25.16.111	Ernest Nelson	27	35.05
12.25.16.222		27	47.25
12.25.20.422		26	71.75
12.25.25.413	Omar Leach		(a)
12.25.26.311	C. E. Smith	28	48.58
12.25.27.211	W. T. Clardy	26	55.28
12.25.30.222		26	80.58
12.25.31.311			(a)
12.25.32.222		26	76.31
12.25.33.112	W. A. McLeod	26	70.40
12.25.33.211		26	59.50
12.25.34.311b	W. T. Clardy	25	53.15
12.25.34.411		25	46.68
12.25.35.111	(c)	25	39.72
12.25.35.311b	A. C. Stone	25	44.33
12.25.35.411	A. C. Stone	25	42.08
12.25.36.121	O. B. Berry	25	23.56
12.25.36.133	H. Kuykendall	25	30.07
12.25.36.142	O. B. Berry	25	19.65
12.25.36.313	M. L. Kuykendall	25	26.25
12.26.7.421	Cecil Johnson	27	(d)
12.26.29.333		25	14.20
12.26.30.213	S. O. Wilburn	25	17.00
13.25.1.111	M. L. Kuykendall		(e)
13.25.1.331	Will Schaaphok	24	16.49
13.25.5.111	Mr. Stanley	26	51.99
13.25.5.111		26	63.04
13.25.6.333		26	80.14
13.25.8.133		26	67.94
13.25.10.344	Mr. Heinecke	24	62.88
13.25.11.111	Mrs. Belle Hurst	24	44.48
13.25.11.343	J. E. Brockman	24	51.69
13.25.12.133	M. E. Colclazier	24	24.55
13.25.12.311	M. E. Colclazier	24	24.79

a Measurements discontinued. b Windmill removed.
c 12.25.35.111. Used irrigation well. Measuring point, top of basal flange of pump head, 0.30 foot above land surface datum.
d Flowing. e No measurements made in 1940.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
13.25.13.113	W. F. Kerr	25	40.88
13.25.13.131		24	a 49.50
13.25.13.233a	W. F. Kerr	24	30.41
13.25.13.233b	W. F. Kerr	24	33.04
13.25.13.311	b/Learue Martin	24	45.43
13.25.13.433	Mrs. J. W. Wier	24	34.80
13.25.14.131	Durand and McNiel	24	57.80
13.25.14.231	c/William Zappe	25	51.37
13.25.15.311	Roswell Insurance and Surety Company	24	74.07
13.25.15.422		24	(d)
13.25.17.411			(d)
13.25.23.111	I. F. Wortman	24	60.27
13.25.24.333	Hal Bogle	25	50.93
13.25.26.211	Mrs. B. Hurst		(e)
13.25.26.222		23	51.15
13.25.27.111	Hal Bogle	23	76.22
13.25.27.211b	Hal Bogle		(d)
13.25.32.411		26	77.20
13.25.34.433a	O. B. Berry		(d)
13.25.35.311	W. F. Kerr	26	66.54
13.25.36.421a	R. M. Ware	23	47.25
13.25.36.421b	R. M. Ware	23	50.56
13.25.36.421c	R. M. Ware	23	48.62
13.26.5.111	Robert H. Aston	24	13.12
13.26.5.231a	Mr. Sterrett	24	(d)
13.26.5.231b	Mr. Sterrett	24	13.66
13.26.5.331	W. W. Harris	24	16.51
13.26.7.433		24	10.71
13.26.8.332			(d)
13.26.16.114a	Fish Hatchery	27	10.90
13.26.16.114b	Fish Hatchery	24	7.77
13.26.16.114c	Fish Hatchery	24	(d)
13.26.17.213		24	(e)
13.26.17.443	H. Vandenbout	24	13.14
13.26.17.444	H. Vandenbout	24	13.06
13.26.18.211	(f)	25	10.48
13.26.18.311	W. F. Kerr	24	18.81
13.26.19.222	A. T. Stone	23	20.21
13.26.19.333	Hal Bogle	23	28.08
13.26.19.343		23	23.20
13.26.19.432	George Weaver	23	10.81
13.26.20.113		23	19.78
13.26.20.333	Mrs. Lockhead	23	13.80
13.26.23.111	Zuber Hollow Corporation	24	5.54
13.26.28.111		23	17.89
13.26.28.221	Hal Bogle	23	8.77
13.26.28.233		23	9.17
13.26.28.311	Mrs. C. L. Appleby	23	15.15
13.26.29.111	g/J. H. Reid	23	15.72
13.26.29.113	J. H. Reid	23	16.64
13.26.29.211		23	10.38

a Well 13.25.13.113 pumping.

b 13.25.13.311. Learue Martin. Used drilled irrigation well, diameter 15½ inches, depth 167 feet. Measuring point, top of concrete foundation, 0.20 foot above land surface datum. Equipped with turbine pump.

c 13.25.14.231. William Zappe. Used drilled irrigation well, diameter 12 inches, depth 152 feet. Measuring point, top of basal flange of pump head, 0.30 foot above land surface datum. Equipped with turbine pump.

d No measurements made in 1940. e Measurements discontinued.

f 13.26.18.211. Used domestic well. Measuring point, top of casing, 0.20 foot above land surface datum. Equipped with windmill.

g 13.26.29.111. J. H. Reid. Used domestic well. Measuring point, top of concrete base, 1.10 feet above land surface datum. Equipped with windmill. Water level, in feet below land surface datum, 1939: Jan. 25, 9.67.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
13.26.29.333	M. Y. Monicle	23	14.46
13.26.29.424	a/M. Y. Monicle	23	11.78
13.26.31.241		23	13.07
13.26.31.311	E. O. Moore	23	43.22
13.26.33.421	E. P. Malone	25	17.80
13.26.33.433		23	(b)
13.26.34.313	Mrs. West	23	9.59
14.25.1.111	c/Mr. Gentry	19	42.91
14.25.1.343	Wm. Langnegger	13	(d)
14.25.2.233a	e/L. T. Lewis	26	60.50
14.25.2.444	J. V. Thomas	19	56.90
14.25.8.411		26	94.48
14.25.12.133b	C. Whitman	19	66.45
14.25.12.234		26	50.65
14.25.12.313	L. T. Lewis	19	69.27
14.25.13.311	E. O. Moore	20	71.52
14.25.14.131	O. B. Berry	19	88.21
14.25.15.431	H. E. Blackwelder	20	97.95
14.25.20.443		20	74.30
14.25.24.133	E. O. Moore	18	63.85
14.25.25.111	John M. Norris	18	63.55
14.25.25.313	S. C. Bybee	18	59.30
14.25.29.233			(b)
14.26.3.111			(b)
14.26.3.213		22	8.67
14.26.3.313			(b)
14.26.3.413		22	9.76
14.26.3.433		22	14.13
14.26.3.442		22	17.63
14.26.4.113		23	20.0
14.26.4.133a		23	19.47
14.26.4.133b		23	19.08
14.26.4.141	Roy Lockhead	23	19.84
14.26.4.231	George Wade	23	17.24
14.26.5.111	H. L. McKinistry	23	27.87
14.26.5.131	Mrs. L. Harter	22	25.22
14.26.5.211	Mr. McKinistry	22	23.70
14.26.5.243	J. D. S. McKinistry	23	21.00
14.26.5.443		22	28.10
14.26.6.111	f/Wiley Grizzle	19	24.66
14.26.6.142	g/W. L. Heitmann	22	24.87
14.26.6.211	Wiley Grizzle	22	25.04
14.26.6.232	h/Tom Andrews	22	31.13
14.26.6.241		23	27.83
14.26.6.422		22	25.38
14.26.7.344	i/W. W. Adams	19	48.77
14.26.8.112	G. L. Truitt	22	26.75

a 13.26.29.424. M. Y. Monicle. Used domestic well, diameter 6 inches, depth 110 feet. Measuring point, top of casing, 0.95 foot above land surface datum. Equipped with automatic pressure pump.

b Measurements discontinued.

c 14.25.1.111. Mr. Gentry. Used drilled irrigation well, diameter 10 inches, depth 150 feet. Measuring point, top of casing, 0.20 foot below land surface datum. Equipped with turbine pump.

d No measurements made in 1940.

e 14.25.2.233a. L. T. Lewis. Used drilled irrigation well, diameter 12⅛ inches, depth 200 feet. Measuring point, mouth of discharge pipe, 4.0-foot correction to concrete foundation, 5.0-foot correction to land surface datum. Equipped with turbine pump.

f Measuring point is 0.10 foot below land surface datum and not level with the datum, as reported in Water-Supply Paper 886.

g 14.26.6.142. W. L. Heitmann. Used drilled irrigation well, diameter 12⅛ inches, depth 150 feet. Measuring point, lower edge of mouth of discharge pipe, 2.40-foot correction to land surface datum. Equipped with turbine pump

h 14.26.6.232. Tom Andrews. Used drilled irrigation well, depth 110 feet. Measuring point, lower edge of mouth of discharge pipe, 6.3-foot correction to land surface datum. Equipped with turbine pump.

i 14.26.7.344. W. W. Adams. Used drilled irrigation well. Measuring point, lower edge of mouth of discharge pipe, 3.8-foot correction to land surface datum. Equipped with turbine pump.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
14.26.8.243		22	24.99
14.26.9.143		22	30.18
14.26.9.234		23	11.67
14.26.9.434	Cave Brothers	20	12.95
14.26.9.442		20	14.85
14.26.10.121		22	13.33
14.26.10.244		22	12.85
14.26.10.433	Mark Boyce	22	7.25
14.26.11.111	J. Langnegger	22	16.23
14.26.11.121		22	16.38
14.26.11.322		22	11.89
14.26.11.444		22	11.14
14.26.12.433b	a/W. N. Olive	22	16.37
14.26.13.121	L. M. Lang	22	17.43
14.26.14.111	Wiley Grizzle		(b)
14.26.14.133	Wiley Grizzle	22	7.51
14.26.14.212	c/George Harris	22	12.91
14.26.14.343	F. H. Evans	22	11.97
14.26.14.441	M. C. Brown	22	13.58
14.26.15.113		20	16.75
14.26.15.343	(d)	20	19.58
14.26.16.111	Marie O'Dell	19	28.87
14.26.16.422	O'Dell	20	19.45
14.26.17.211	Wm. Saloman	19	48.34
14.26.17.334	Clarence Pearson	19	(e)
14.26.17.444	Pearson Brothers	19	44.54
14.26.18.113	O. C. Yarbrough	19	55.48
14.26.18.433	Albert Hobson	18	48.13
14.26.19.211	Joseph Hooten	18	48.23
14.26.19.242	Oscar A. Pearson	18	56.00
14.26.19.311	W. C. West	18	44.23
14.26.19.444	E. E. Lane	18	57.02
14.26.20.143	Pearson Brothers	19	55.69
14.26.20.334	E. Langnegger	19	68.32
14.26.20.343	E. Langnegger	18	63.92
14.26.21.333	G. E. Wade	18	39.61
14.26.21.422		20	20.15
14.26.22.141		22	28.24
14.26.22.213	J. L. King	22	27.02
14.26.22.411		22	19.43
14.26.23.131	E. A. White	22	11.77
14.26.27.111		20	17.21
14.26.28.114	Phillip Stoes	18	36.09
14.26.28.211	L. T. Lewis	18	30.51
14.26.29.112	Phillip Stoes	18	(e)
14.26.29.213	Phillip Stoes	18	57.80
14.26.29.441a	J. W. Wiggins	18	38.61
14.26.29.441b		19	37.51
14.26.30.441		17	57.07
14.26.31.244			(b)
14.26.35.344			(b)

a 14.26.12.433b. W. N. Olive. Newly drilled well at northeast corner of reservoir. Measuring point, top of casing, level with land surface datum. No equipment.

b Measurements discontinued.

c 14.26.14.212. George Harris. Used irrigation well. Measuring point, top of concrete casing, level with land surface datum.

d 14.26.15.343. Used domestic and stock well. Measuring point, top of pipe clamp, 0.28 foot above top of casing, 0.30 foot above land surface datum. Equipped with windmill. Water levels, in feet below land surface datum: Jan. 27, 1938, 15.89; Jan. 20, 1939, 17.20.

e No measurements made in 1940.

Chaves County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
15.24.23.344		15	66.52
15.24.27.344		15	61.17
15.24.28.244		15	88.73
15.24.32.211	(a)	15	49.48
15.24.34.341	S. Lanning	15	49.79
15.24.35.143	E. P. Malone	15	24.63
15.24.36.243		15	b 40.40
15.24.36.321		15	24.03
15.25.11.411			(c)
15.25.12.111a	F. U. Gooding	17	40.77
15.25.12.111b		17	(c)
15.25.12.231	Ben Truman	17	37.37
15.25.24.111		17	13.29
15.25.24.211		17	10.72
15.25.27.321	Chas. W. Nelson	16	28.49
15.25.28.331	Carroll Jackson		(d)
15.25.33.112	Carroll Jackson	17	22.28
15.25.35.311	R. E. Coleman		(c)
15.25.36.333	John M. Norris	17	(c)
15.26.5.121	B. E. Spencer	17	39.99
15.26.5.142	H. S. Russell	17	32.22
15.26.6.311	Calvin Graham	19	33.62
15.26.9.133	e/E. M. George	25	19.94
15.26.19.111			(d)
15.26.19.224	Mrs. Ivy H. Beasley	16	31.43
15.26.19.442		16	9.71
15.26.20.144		17	23.45
15.26.20.431		17	14.58
15.26.29.111	E. E. Jackson	16	6.81
15.26.29.222		17	14.40
15.26.29.231		17	10.60
15.26.30.131	Paul Robinson	16	2.10
15.26.30.224		16	9.35
15.26.31.111	E. J. Gromo	16	12.98
15.26.32.231		17	9.64

Eddy County

16.25.6. Lot 4. Fred Nellson.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	14.04	May 27	b 14.29	Aug. 1	b 14.37	Oct. 9	b 14.58
Apr. 17	15.69	July 2	13.48	Sept.5	b 12.93	Nov. 13	15.52

16.25.6.313. Childress.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.57	29.55	29.52	29.47	.....	.....	.....	30.06	30.12	30.05	30.11	30.13
2	°29.60	29.70	29.70	29.52	29.57	29.67	.....	30.06	30.10	.....	30.11	30.21
3	.....	29.67	29.58	.....	29.48	29.68	.....	30.08	30.09	.....	30.02	30.17
4	.....	29.53	29.63	.....	29.50	29.70	.....	30.06	30.10	.....	29.99	30.08
5	.....	29.50	29.61	.....	29.52	29.74	30.00	30.07	30.13	.....	30.06	30.12

a 15.24.32.211. Used stock well. Measuring point, top of casing, 0.85 foot above land surface datum. Equipped with windmill.

b Windmill pumping. c No measurements made in 1940.

d Measurements discontinued.

e 15.26.9.133. E. M. George. Used drilled irrigation well, diameter 15½ inches, depth 125 feet. Measuring point, top of casing, 0.1 foot below land surface datum. Equipped with turbine pump.

Eddy County--Continued.

16.25.6.313.--Continued.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
6	.....	29.60	29.57	.....	29.57	29.76	29.97	30.17	30.15	.....	30.13	30.04
7	.....	.....	.....	.....	29.60	29.77	29.95	30.04	30.20	.....	30.12	30.10
8	.....	.....	.....	.....	29.65	29.75	29.96	30.04	30.18	.....	29.98	30.11
9	.....	.....	29.49	29.55	29.83	.....	29.95	30.06	30.04	30.00	29.89	30.00
10	29.64	.....	29.51	29.55	.....	.....	29.96	30.00	30.04	30.03	29.83	30.02
11	29.62	.....	29.54	29.65	.....	29.95	29.95	30.02	30.19	.....	30.00	30.00
12	29.41	.....	29.55	29.85	.....	29.90	30.05	30.10	30.12	.....	30.05	30.00
13	29.37	.....	29.82	29.66	.....	29.88	30.07	30.06	30.08	.....	30.23	30.09
14	29.68	.....	29.84	29.46	.....	29.83	30.00	29.94	30.08	30.24	30.23	30.15
15	29.83	.....	29.73	29.39	29.67	29.87	30.00	29.88	.....	30.22	30.09	30.12
16	29.65	.....	29.62	29.34	29.60	29.88	30.03	29.98	.....	30.13	30.05	30.15
17	.....	.....	29.58	29.45	29.55	29.87	30.02	30.00	.....	30.15	29.97	30.16
18	.....	.....	29.63	29.67	29.69	29.89	30.04	30.11	.....	30.16	29.88	.....
19	.....	.....	29.65	29.64	29.66	29.95	30.00	30.17	.....	30.10	29.88	.....
20	29.72	29.82	29.59	29.57	29.59	29.93	29.98	.....	.....	30.05	30.01	.....
21	29.75	29.77	.....	29.50	29.67	29.92	29.93	30.03	30.21	29.98	29.90	.....
22	29.67	29.67	.....	29.52	29.83	29.85	30.04	30.03	30.16	29.98	29.90	.....
23	29.68	29.61	.....	29.62	.....	29.84	30.03	30.06	30.11	30.01	30.00	29.92
24	29.77	29.68	.....	29.58	.....	29.97	29.98	30.07	30.11	29.99	30.09	29.84
25	29.77	29.68	.....	.....	29.58	.....	29.93	30.04	30.15	29.99	29.93	29.73
26	29.75	29.55	29.53	.....	29.60	.....	29.91	30.05	30.10	29.95	30.09	29.90
27	.....	.....	29.43	.....	29.60	.....	29.93	30.08	30.03	29.88	30.18	29.99
28	.....	.....	29.47	.....	29.65	.....	30.01	30.06	30.03	29.90	30.05	29.96
29	.....	29.53	29.60	.....	29.75	.....	30.06	30.06	.....	30.04	29.98	29.99
30	29.64	.....	29.63	.....	29.73	.....	30.07	30.20	30.12	29.95	29.97	29.95
31	29.55	.....	29.56	.....	.....	.....	30.05	30.23	.....	29.99	.....	.....

16.26.5. NW lot 4. H. V. Parker. Water levels, in feet below land-surface datum, 1940: Jan. 12, 32.00; Apr. 17, 36.08. Measurements discontinued.

16.26.8.222. I. P. Johnson. Depth 119 feet. Water levels, in feet below land-surface datum, 1940: Jan. 15, 14.54; Apr. 17, 18.56, pumping. Measurements discontinued.

16.26.19.411. F. M. Privett. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	35.05	May 27	38.88	Aug. 1	46.44	Oct. 9	39.03
Apr. 17	40.72	July 2	39.64	Sept.5	42.97	Nov. 13	37.04

16.26.28.333. Ina C. Harral. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Jan. 10	14.69	May 27	16.17	Aug. 1	19.30	Oct. 9	18.44
Apr. 17	16.24	July 2	16.29	Sept.5	18.70	Nov. 13	16.44

17.26.7.344. Everest Scoggins. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Jan. 8	38.36	May 27	41.13	Aug. 1	45.72	Oct. 9	42.66
Apr. 17	42.14	July 2	42.43	Sept.5	44.64	Nov. 13	40.47

17.26.10.333. V. L. Gates. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 8	8.48	May 27	9.96	Nov. 13	11.60
Apr. 17	6.51	July 2	10.10		

Eddy County--Continued.

17.26.16.333. Artesia Cemetery. Erroneously placed in Chaves County in Water-Supply Paper 886. Measuring point, U. S. G. S. washer in top of pipe clamp, 1.00 foot above land-surface datum.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 9	13.00	May 27	19.52	Aug. 1	b 37.22	Oct. 9	a 21.39
Apr. 17	22.76	July 2	a 28.19	Sept.5	a 35.55	Nov. 13	14.82

18.26.4.111b. Frank Watkins. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Jan. 9	27.10	May 27	28.82	Aug. 1	b 30.80	Nov. 13	28.20
Apr. 17	a 29.90	July 2	b 29.70	Oct. 9	30.44		

18.26.7.234a. C. H. Hutsonpillar. Erroneously placed in Chaves County in Water-Supply Paper 886.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	52.13	53.05	53.64	54.65	55.00	55.64	56.51	56.92	.....	54.50
2	.....	.....	52.15	53.08	53.66	54.64	55.01	55.68	56.54	56.90	.....	54.45
3	.....	.....	52.15	.....	53.68	54.62	55.02	55.70	56.56	56.89	.....	54.41
4	.....	.....	52.15	.....	53.72	54.61	55.04	55.73	56.60	56.88	55.49	54.38
5	.....	.....	52.17	.....	53.77	54.60	55.05	55.75	56.64	56.86	55.46	54.34
6	.....	.....	52.17	.....	53.81	54.59	55.06	55.77	56.67	56.84	55.41	54.31
7	.....	.....	.....	.....	.....	54.59	55.07	55.80	56.70	56.82	55.37	54.29
8	.....	.....	52.16	.....	.....	54.59	55.07	55.83	56.72	.....	55.33	54.25
9	52.53	.....	52.17	53.32	.....	.....	55.08	55.87	56.74	56.75	55.28	54.21
10	52.53	.....	52.18	53.37	.....	54.59	55.10	55.90	56.76	56.71	55.24	54.18
11	52.52	.....	52.19	53.39	.....	54.61	55.12	55.95	56.79	56.69	55.20	54.15
12	52.50	.....	52.20	53.42	.....	54.62	55.15	55.95	56.81	56.61	55.16	54.13
13	52.49	.....	52.24	53.43	.....	54.64	55.15	55.97	56.82	56.56	55.13	54.12
14	52.51	.....	52.26	53.43	.....	54.67	55.17	56.00	56.84	56.56	55.09	54.10
15	52.52	.....	52.27	53.44	54.20	54.71	55.19	56.03	56.86	56.49	55.04	54.07
16	52.49	.....	52.27	53.43	54.25	54.73	55.20	56.06	56.86	56.45	55.01	54.06
17	.....	.....	52.29	53.45	54.30	54.75	55.23	56.09	56.89	56.41	54.96	54.03
18	.....	.....	52.31	53.46	54.35	54.75	55.25	56.10	56.91	56.37	54.90	.....
19	52.48	52.10	52.35	53.47	54.45	54.78	55.27	56.13	56.92	56.32	54.88	.....
20	52.47	52.11	52.40	53.47	54.47	54.81	55.31	.....	56.92	56.27	54.84	.....
21	52.47	52.11	.....	53.48	54.50	54.84	55.33	56.16	56.93	56.20	54.81	.....
22	52.46	52.11	.....	53.49	54.52	54.87	55.36	56.21	56.92	56.16	54.78	.....
23	52.45	52.10	.....	53.50	.....	54.90	55.37	56.25	56.92	56.11	54.75	.....
24	52.45	52.10	.....	53.51	.....	54.91	55.41	56.27	56.91	56.05	54.73	53.80
25	.....	52.11	.....	.....	.....	.....	55.43	56.30	56.90	56.00	54.70	53.76
26	.....	52.09	52.70	.....	54.60	.....	55.47	56.33	56.91	55.95	54.66	53.78
27	.....	.....	52.76	.....	54.62	54.95	55.51	56.35	56.91	55.89	54.62	53.75
28	.....	52.13	52.82	.....	54.63	54.97	55.54	56.39	56.93	55.85	54.58	53.74
29	.....	52.13	52.88	53.60	54.63	55.00	55.64	56.41	.....	.....	54.53	53.72
30	.....	.....	52.95	53.61	54.64	55.00	55.64	56.45	56.93	.....	54.52	53.69
31	.....	.....	53.00	.....	54.64	.....	55.64	56.48	.....	.....	.....	53.69

18.26.21.344. Town of Dayton. Erroneously placed in Chaves County in Water-Supply Paper 886.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	42.33	42.24	42.78	43.21	43.58	43.89	44.20	44.64	44.87	.....	44.14
2	.....	42.32	42.26	42.80	43.23	43.58	43.90	44.22	45.65	44.88	.....	44.11
3	.....	42.40	42.25	.....	43.25	43.59	43.90	44.24	44.65	44.88	.....	44.08
4	.....	42.30	42.28	.....	43.27	43.60	43.89	44.24	44.67	44.88	.....	44.08
5	42.41	42.30	.....	.....	43.31	43.59	.....	44.25	44.68	44.88	44.46	44.05
6	42.41	42.27	.....	.....	43.33	43.59	43.87	44.27	44.70	44.90	44.46	44.05
7	42.42	.....	.....	.....	43.33	43.60	43.87	44.27	44.72	44.89	44.44	44.04
8	42.42	.....	42.28	.....	43.35	43.61	43.87	44.29	44.72	44.88	44.43	44.02

a Pumping. b Pumping intermittently.

Eddy County--Continued.

18.26.21.344.--Continued.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
9	42.41	.....	42.30	.....	43.37	.....	43.89	44.30	44.72	44.89	44.42	44.02
10	42.41	.....	42.31	.....	43.39	43.68	43.90	44.32	44.73	44.89	44.39	44.03
11	42.42	.....	42.32	.....	43.40	43.68	43.91	44.33	44.76	44.88	44.38	44.01
12	42.40	.....	42.33	.....	43.41	43.71	43.91	44.34	44.76	44.87	44.34	44.00
13	42.41	.....	42.33	.....	43.42	43.73	43.93	44.34	44.75	44.83	44.34	44.01
14	42.44	.....	42.36	.....	43.44	43.75	43.95	44.35	44.77	44.81	44.32	44.00
15	42.44	.....	42.37	.....	.....	43.77	43.95	44.37	44.78	44.79	44.30	43.99
16	42.42	.....	42.37	.....	.....	43.78	43.97	44.37	44.78	44.78	44.29	43.98
17	.....	.....	42.39	42.98	.....	43.78	44.00	44.39	44.79	44.77	44.28	43.95
18	.....	.....	42.41	43.00	.....	43.80	44.02	44.42	44.80	44.75	44.25	.....
19	42.38	42.19	.....	43.00	.....	43.83	44.03	44.42	44.82	44.73	.....	.....
20	42.38	42.19	.....	43.00	.....	43.84	44.04	44.42	44.81	44.72	.....	.....
21	42.38	42.20	.....	43.01	.....	43.84	44.05	44.44	44.83	44.67	.....	.....
22	42.37	42.17	.....	43.04	.....	43.87	44.06	44.45	44.83	44.65	.....	.....
23	42.38	42.17	.....	43.06	.....	43.88	44.08	44.47	44.84	44.63	.....	43.89
24	42.38	42.19	.....	43.05	.....	43.89	44.10	44.49	44.85	44.61	.....	43.88
25	42.36	42.20	.....	.....	.....	.....	44.11	44.50	44.84	44.60	.....	43.87
26	42.35	42.20	.....	.....	43.59	.....	44.12	44.53	44.83	44.57	44.22	43.88
27	.....	.....	.....	.....	43.60	.....	44.15	44.54	44.84	44.55	44.19	43.85
28	.....	42.23	42.70	.....	43.60	43.84	44.16	44.56	44.85	44.55	44.16	43.86
29	.....	42.23	42.72	43.13	43.60	43.85	44.17	44.59	.....	.....	44.16	43.84
30	42.33	.....	42.75	43.17	43.60	43.84	44.18	44.60	44.87	.....	44.15	43.83
31	42.33	.....	42.77	.....	43.62	.....	44.20	44.63	.....	.....	.....	.....

19.26.27.233. Lakewood School. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 17	50.90	July 2	b 59.93	Sept.5	b 58.71	Nov. 13	53.62
May 27	a 55.19	Aug. 1	51.61	Oct. 9	b 57.22		

20.26.7.122. Coats Filling Station. Erroneously placed in Chaves County in Water-Supply Paper 886.

Water level, in feet below land-surface datum, 1940

Jan. 5	43.13	May 27	a 48.62	Aug. 1	52.53	Oct. 9	b 51.03
Apr. 17	a 48.70	July 2	a 48.05	Sept.5	52.76	Nov. 13	48.76

Supplemental list of observation wells in which water level was measured in late winter

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
16.25.1.Lot 3		17	14.25
16.25.1.Lot 12			(c)
16.25.1.Lot 13			(c)
16.25.1.344		16	10.90
16.25.1.423	O'Bannon and Meyer	13	12.24
16.25.2.Lot 9		16	17.10
16.25.2.Lot 15	d/Ralph Pearson	16	18.26
16.25.3.Lot 9			(c)
16.25.3.343			(c)
16.25.4.Lot 12		16	12.99
16.25.5.Lot 4		15	10.29
16.25.5.Lot 13		16	13.93

a Pumping slowly. b Pumping.
c Measurements discontinued.
d 16.25.2.Lot 15, Ralph Pearson. Used drilled irrigation well, diameter 15½ inches, depth 177 feet. Measuring points, (a) edge of slot in basal flange of pump head level with land surface datum, (b) lower edge of mouth of discharge pipe, 5.43 foot correction to land surface datum. Equipped with turbine pump.

Eddy County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
16.25.5.443	Winton Ault	16	13.60
16.25.6.Lot 8	E. P. Malone		(a)
16.25.8.111		16	b 31.39
16.25.10.311		15	35.70
16.25.10.334	Clayton Gray		(c)
16.25.10.344		15	54.77
16.25.11.233	Noah Buck	15	31.76
16.25.12.124	Buck Brothers	15	17.86
16.25.12.412	Terry Reser	13	13.74
16.25.13.211	T. J. Terry	13	24.93
16.25.14.213	Chas. Buck	13	34.09
16.25.15.233	J. H. Everest		(c)
16.25.15.331	J. W. Everest		(c)
16.25.24.212	H. C. Powell	13	34.16
16.26.5.Lot 3	Mr. Taylor	16	27.89
16.26.5.331	Mrs. Nancy Eippers	13	18.83
16.26.6.Lot 2	H. V. Parker	13	29.48
16.26.6.Lot 4			(a)
16.26.6.333	O'Bannon and Meyer	13	13.56
16.26.7.121	L. Keith	13	15.63
16.26.7.321	C. Buck	13	7.87
16.26.7.332		13	15.16
16.26.8.111	Reser and Johnson	13	17.00
16.26.16.313	V. L. Gates	10	8.60
16.26.17.311	J. L. Muncy	13	25.75
16.26.17.331	Mr. Green	13	14.48
16.26.18.331	Monroe Howard	13	20.55
16.26.18.411	G. G. Golder	13	23.69
16.26.19.113	Henry E. Hall	13	21.90
16.26.19.133	F. M. Privett	13	23.70
16.26.19.211	H. V. Parker	13	16.74
16.26.21.333	J. H. Everest	10	8.31
16.26.28.431	R. E. Coleman	10	14.22
16.26.31.413	T. F. Wilson	10	39.90
16.26.32.311	K. A. Bivens		(c)
16.26.32.411	O. V. Moore	10	20.64
16.26.32.421	W. W. Parker	10	17.42
17.25.13.131	L. G. Mousehke	8	90.46
17.25.14.132	Artesia Country Club	10	126.80
17.25.22.223		9	(a)
17.25.24.433		9	91.52
17.25.26.222		9	101.10
17.25.35.411		9	115.38
17.26.2.133	A. L. Jackson	10	9.40
17.26.3.231	H. R. Rogers	10	9.73
17.26.3.433	Mr. Box	10	9.35
17.26.4.121		10	16.64
17.26.4.331a	Howard Stroup	10	7.17
17.26.4.331b	Howard Stroup	10	8.33
17.26.4.413	F. Crawford		(c)
17.26.5.422		10	15.60
17.26.5.433		10	32.02
17.26.6.413	Fred Savoie	10	40.02
17.26.7.131	J. W. Collins	8	(a)
17.26.7.433	Everest Scoggins	8	33.85
17.26.7.421	J. W. Jackson	8	25.59
17.26.7.423	(d)	8	24.81
17.26.7.444	Albert Blake	8	29.08
17.26.8.212			(c)
17.26.9.111		10	10.61

a No measurements made in 1940. b Windmill pumping.
c Measurements discontinued.
d 17.26.7.423. Abandoned well. Measuring point, top of north 8 by 8-inch stringer, level with land-surface datum. No equipment.

Eddy County--Continued.

Supplemental list of observation wells in which water level was measured in late winter--Continued

Water level, in feet below land-surface datum, January 1940

Location number	Owner or tenant	Date	Water level
17.26.9.333		9	14.71
17.26.10.433	D. D. Sullivan	6	18.33
17.26.15.113	C. L. Allison	6	5.95
17.26.15.121		9	9.47
17.26.15.211	J. M. Vogel	6	15.72
17.26.15.313	J. H. Holloman		(a)
17.26.15.411	Mrs. A. J. Hardendorf	6	16.39
17.26.16.411		8	17.30
17.26.17.423	H. A. Denton		(b)
17.26.18.224		8	34.35
17.26.18.433	Lowery and Baca	8	46.20
17.26.18.442		10	33.97
17.26.20.133	W. E. Ragsdale	8	34.05
17.26.21.112	Roger Durand	6	14.57
17.26.21.341	W. T. Amstutz	6	5.72
17.26.22.233	R. L. Paris	6	21.85
17.26.27.413	W. E. Simmons		(a)
17.26.27.423	Leslie Martin	6	14.98
17.26.28.331	Carl Martin	8	18.11
17.26.29.131a	Carl Martin	8	34.84
17.26.29.131b	Carl Martin	8	34.10
17.26.31.133	W. Clendenen	9	64.95
18.26.2.333	S. O. Higgins	6	14.35
18.26.4.111a	Frank Watkins	9	29.14
18.26.4.433	W. M. Schneider	6	21.66
18.26.7.234c	C. H. Hutsonpiller	9	55.83
18.26.9.311	B. E. Spencer		(b)
18.26.10.233	Muncie	9	14.82
18.26.15.133	J. D. Terry	6	23.95
18.26.15.311	J. H. Everest	6	22.02
18.26.15.444		5	18.34
18.26.17.112	Mr. Yates	6	42.75
18.26.18.241	L. McCrory		(a)
18.26.18.323	W. D. McCrory		(b)
18.26.22.314			(b)
18.26.23.213	Smith and Horner	5	24.20
18.26.24.223		9	5.41
18.26.28.132	Dayton School	9	58.46
18.26.28.142		9	43.65
18.26.33.111	Harvey Yates	5	67.97
19.26.12.323	E. W. Dimock	5	21.32
19.26.13.211	R. L. House	5	14.08
19.26.14.431	Albert Lee		(b)
19.26.28.334			(c)
19.26.28.441	D. D. Sullivan	5	60.53
19.26.33.412	E. G. Kimmel (?)	5	47.85
20.26.6.431	J. G. Moutry	6	42.50
20.26.7.421	E. Mantei	5	36.99
20.26.8.112	J. G. Moutry	6	31.74
20.26.17.411	Cecil E. Holeman and Roy D. Angell	5	47.15
20.26.21.111		5	19.80

a Measurements discontinued.
b No measurements made in 1940.
c Windmill pumping.

HIDALGO COUNTY

VIRDEN VALLEY

By H. M. Babcock

The Virden Valley lies along the upper Gila River. It is the eastern portion of the area commonly known as the "Duncan-Virden Valley". The wells listed here are in the upper end of the valley in New Mexico. The water resources of the valley are being investigated by the Federal Geological Survey in cooperation with the United States Engineer Office, War Department. Water levels in the wells are expressed in feet below the measuring points. Hydrographs of a few of the wells and a table giving the quantity of water pumped for irrigation and the rainfall in 1940 are included in the Arizona section under Greenlee County.

181. P. Lunt. SW¼NW¼ sec. 32, T. 18 S., R. 21 W. Five hundred feet northeast of house, 0.4 mile north from Duncan-Virden Road, 0.3 mile east from Arizona-New Mexico State Line. Used drilled stock well, diameter 8 inches, depth 114 feet. Measuring point, top of casing, 0.3 foot above land surface and 3,756.72 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1939	48.70	Mar. 26, 1940	48.90	Aug. 9, 1940	40.07
Dec. 12	47.27	Apr. 30	41.03	Sept.11	42.86
Jan. 30, 1940	46.80	June 3	35.60	Oct. 2	40.10
Feb. 29	48.30	July 3	37.90	28	42.19

185. J. Pierce. SE¼SE¼ sec. 32, T. 18 S., R. 21 W. One hundred feet east of house, 150 feet south of Duncan-Virden Road, 1.5 miles west from Virden. Unused dug domestic well, diameter 36 inches, depth 30 feet. Measuring point, top of 2 by 4-inch wood curb at southeast corner, 1.7 feet above land surface and 3,735.72 feet above mean sea level.

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

Nov. 20, 1939	32.13	June 3, 1940	30.98	Oct. 2, 1940	32.45
Dec. 12	32.30	July 3	31.81	18	32.36
Feb. 29, 1940	32.05	Aug. 9	32.65	28	32.50
Mar. 26	31.59	Sept.11	32.42	Dec. 4	32.28
Apr. 30	30.82				

201. Payne. NW¼SE¼ sec. 2, T. 19 S., R. 21 W. Ten feet south of Sunset Canal, 20 feet east from small wash, 0.15 mile south from county road, 1.45 miles southeast from Virden. Unused drilled irrigation well, diameter 18 inches, depth 106 feet. Measuring point, top of casing, 0.92 foot above land surface, and 3,788.59 feet above mean sea level.

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

Nov. 20, 1939	44.02	June 3, 1940	41.94	Oct. 10, 1940	41.67
Dec. 12	43.89	July 3	42.05	18	41.94
Jan. 31, 1940	44.22	Aug. 9	42.46	24	42.10
Feb. 29	43.76	Sept.11	42.52	28	42.30
Mar. 26	43.30	Oct. 2	42.06	Dec. 4	42.85
Apr. 30	41.84				

Hidalgo County--Continued.

204. State of New Mexico. SE¼NW¼ sec. 2, T. 19 S., R. 21 W. Fifty feet north of Sunset Canal, 0.1 mile south from county road, 1.2 miles east from Virden. Used dug domestic well, diameter 36 inches, depth 52 feet. Measuring point, top of east wooden curb, 2.5 feet above land surface and 3,792.71 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1939	53.66	June 3, 1940	51.30	Oct. 10, 1940	52.80
Dec. 12	53.19	July 3	52.70	17	52.10
Jan. 30, 1940	53.70	Aug. 8	53.50	24	53.19
Feb. 29	53.27	Sept.11	53.32	28	52.95
Mar. 26	53.09	Oct. 2	52.95	Dec. 4	53.70
Apr. 30	51.37				

211. SW¼NW¼ sec. 5, T. 19 S., R. 21 W. Twenty feet east of house, 0.2 mile south of Gila River, 600 feet north from county road, 0.6 mile east from Arizona-New Mexico State Line. Used dug domestic well, diameter 30 inches, depth 38 feet. Measuring point, top of north wooden curb, 3.2 feet above land surface and 3,721.09 feet above mean sea level. Equipped with rope and bucket.

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

Nov. 10, 1939	37.72	Apr. 29, 1940	34.05	Oct. 1, 1940	38.16
Dec. 2	37.79	June 3	33.15	17	36.03
Jan. 30, 1940	38.22	July 2	35.75	24	36.04
Feb. 29	37.50	Aug. 7	37.76	28	35.82
Mar. 27	36.22	Sept.10	38.45		

215. John B. Jones. SE¼NW¼ sec. 12, T. 19 S., R. 21 W. Fifty feet south of barn, 75 feet west from dirt road, 0.25 mile south from county road, 2.45 miles southeast from Virden. Unused dug, drilled domestic well, diameter 144 inches to depth of 12 feet, diameter 12 inches, total depth 67 feet. Measuring point, top of casing, 0.6 foot above land surface and 3,766.80 feet above mean sea level. Bench mark, established November 21, 1939, green square painted on top of concrete curb at northwest side, 3,766.26 feet above mean sea level.

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

Nov. 10, 1939	16.25	Apr. 29, 1940	13.95	Oct. 2, 1940	14.91
Dec. 12	16.23	June 3	14.05	17	15.20
Jan. 30, 1940	16.47	July 3	14.25	28	15.60
Feb. 29	15.98	Aug. 9	15.94	Dec. 4	16.11
Mar. 26	15.32	Sept.11	15.62		

217. Skaggs. NE¼SE¼ sec. 12, T. 19 S., R. 21 W. Twenty feet south of house, 150 feet west from county road, 0.75 mile north from bridge over Gila River, 3.2 miles southeast from Virden. Used dug domestic well, diameter 48 inches, depth 26 feet. Measuring point, top of west wood curb, 3.0 feet above land surface and 3,791.51 feet above mean sea level. Equipped with rope and bucket.

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

Nov. 10, 1939	19.80	June 3, 1940	a 14.95	Oct. 10, 1940	22.69
Dec. 12	18.70	July 3	18.96	17	22.79
Jan. 30, 1940	19.98	Aug. 8	22.14	24	22.22
Feb. 29	20.68	Sept.11	22.82	28	22.41
Mar. 26	a 14.85	Oct. 1	22.52	Dec. 4	23.41
Apr. 29	a 11.25				

a Water probably seeped in from nearby canal.

Hidalgo County--Continued.

219. Ruth Skaggs. NE¼NE¼ sec. 13, T. 19 S., R. 21 W. Thirty feet south of house, 50 feet west from county road, 300 feet north from bridge over Gila River, 4.0 miles southeast from Virden. Used dug domestic well, diameter 48 inches, depth 17 feet. Measuring point, top of west curb, 3.25 feet above land surface and 3,780.94 feet above mean sea level. Bench mark, established November 17, 1939, green cross painted on concrete well base, south of southeast corner of wooden curb, 0.3 foot above land surface and 3,778.01 feet above mean sea level. Equipped with rope and bucket.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 10, 1939	16.74	Apr. 29, 1940	16.12	Oct. 1, 1940	17.45
Dec. 12	16.78	June 3	16.42	17	17.64
Jan. 30, 1940	16.60	July 3	17.38	28	17.74
Feb. 29	15.58	Aug. 9	17.72	Dec. 4	17.65
Mar. 26	15.69	Sept.11	17.53		

232. Floyd Johns. NE¼NW¼ sec. 18, T. 19 S., R. 20 W. Seventy-five feet south of house, 0.5 mile east from county road, one mile northeast from bridge over Gila River, 4.0 miles southeast from Virden. Used drilled domestic well, diameter 8 inches, depth 60 feet. Measuring point, top of casing, 0.6 foot above land surface and 3,803.47 feet above mean sea level. Equipped with hand pump.

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

Date	Water level	Date	Water level	Date	Water level
Nov. 10, 1939	27.96	Apr. 29, 1940	26.93	Oct. 1, 1940	29.41
Dec. 12	27.97	June 3	27.23	17	29.58
Jan. 30, 1940	28.15	July 3	28.08	28	29.80
Feb. 29	27.25	Aug. 9	29.50	Dec. 24	29.71
Mar. 26	26.41	Sept.11	30.05		

LEA COUNTY

NORTHERN PART

By Clyde S. Conover

Lea County is in the southeastern corner of New Mexico. The northern part of Lea County, for which water levels are herein reported, is a typical part of the Llano Estacado or Staked Plain. This plain, which extends eastward for over 100 miles into western Texas, in northern Lea County slopes east-southeastward 10 to 15 feet to the mile. It is bounded on the west by an escarpment several hundred feet high, which overlooks the Pecos Valley to the west and closely follows the west line of Lea County. The escarpment decreases in height southward and in the southern part of Lea County becomes indistinct. The surface of the plain is dotted with numerous sinks, most of which are near the western edge, that probably serve as loci of recharge. There is no surface drainage from the area.

Although most of the precipitation occurs during the growing season, the area is semi-arid and in normal years irrigation is necessary for the production of crops. The precipitation is disposed of chiefly by evapotranspiration and by seepage to the zone of saturation.

The surface rock materials of most of Lea County consist of unconsolidated sand, gravel, and silt of Tertiary and Quaternary age, which in places are a few hundred feet thick. The upper part of the deposits is cemented by calcium carbonate, which forms dense hard caliche and thus inhibits recharge. The deposits are underlain by nearly impervious shales of Triassic and Cretaceous age. The Tertiary deposits north and east of Tatum are thin.

The main ground-water supplies are found in the Tertiary deposits. From the latitude of Tatum south to the escarpment of the plain in the vicinity of Pearl, the deposits contain much water. South of the escarpment, the Tertiary and Quaternary deposits are thin and the water supplies, which are found chiefly in shallow buried valleys in the underlying Triassic rocks, are scanty.

Recharge to the zone of saturation occurs by the seepage of rain water. The natural discharge of ground water in the county is negligible. There are a few small springs along the western escarpment and in the vicinity of Monument. Some discharge by transpiration by mesquite and other vegetation occurs south of the escarpment.

The industries of the area consist mainly of cattle raising and oil production with some farming. The two largest towns are Hobbs, with a population 10,641, and Lovington, the county seat, with a population 1,904.

Ground-water furnishes practically all the needs for water in the county, the only exception being the watering of stock from surface water that collects in the numerous sinks. Most of the irrigation wells are in the eastern part of the county where the water table is shallow. In 1940 there were approximately 54 irrigation wells in use, each of which irrigated from about 2 to 200 acres of land. In additon to use for irrigation, large quantities of ground water are pumped for use for rotary drilling operations in the oil fields.

The investigation of the ground-water supply was begun in 1929 by S. S. Nye of the Geological Survey, the results of which were published in the 9th and 10th Biennial Reports of the State engineer of New Mexico. Subsequent progress reports by C. V. Theis from 1932 to 1938 have been published in the 11th, 12th and 13th Biennial Reports. The preceding description of the general features of the area has been taken chiefly from these publfshed reports. It is expected that a progress report covering

work carried on from 1938 through 1939 will be published in the forthcoming 14th Biennial Report of the State Engineer. All work has been carried on in financial cooperation with the State engineer.

Measurements of water levels in observation wells in northern Lea County in 1940 were made once a month in 27 wells. Seventeen of the wells have been measured at monthly intervals since 1929. The monthly observation wells are in general unused wells distant from pumped wells and thus show closely the change in water level due to natural causes. In January of 1939 and 1940 water level measurements were made also in about 51 other wells, chiefly used irrigation wells. Two water-stage recorders were in operation in 1940.

The fluctuations of water level in wells in Lea County depend primarily on the distance from pumped wells. Since the area over which the observation wells are distributed is very large, the fluctuation of water level in each observation well has characteristics peculiar to that well and to that locality. The unused observation wells that are distant from pumped wells and which are measured once a month show periods of small rises in water level that can in general be correlated with the recorded precipitation, but inasmuch as the area is large and is subject to heavy and very localized showers some fluctuations occur that cannot be correlated with the precipitation where it is measured. The yearly fluctuation of water levels in the observation wells is, in general, only a few tenths of a foot, and varies with the location of the well and the amount of nearby pumpage.

The following tables give the measurements of water level in observation wells from the beginning of record. The former well number referred to in the tables is the number given to the wells in the 9th, 10th, 11th, 12th and 13th Biennial Reports of the State engineer of New Mexico. Records for a few observation wells that have been abandoned are not given in this report.

12.36.19.223. O. V. Fisher. East of caliche rock house. Used dug and drilled domestic well. Measuring point, lower east edge of first 1 by 12-inch board east of windmill pipe, 0.5 foot above land surface datum. Reference point, surface of small ledge in concrete curb, south side of well, upon which well cover rests, level with measuring point. Well is equipped with windmill. Water levels, in feet below land surface datum: Feb. 9, 1939, 31.44; Jan. 31, 1940, 31.18.

Lea County--Continued.

12.36.25.222. Formerly MC-1. State land. Unused drilled well, diameter 6 inches, depth 38.4 feet. Measuring point, bottom edge of nick in top of 4-inch clay sewer tile, at west side of well, 0.10 foot above land surface datum. Reference point, top of 2 by 2-inch wooden hub, flush with ground, 1 foot S. 45° W. of northeast corner fence post of section, about 20 feet northeast of well, 0.20 foot above measuring point. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1935-40

Date	Water level	Date	Water level	Date	Water level
Dec. 16, 1935	24.09	Sept.16, 1937	24.54	May 18, 1939	24.65
Jan. 20, 1936	24.05	Oct. 20	24.54	June 17	24.57
Feb. 14	24.41	Nov. 19	24.52	July 22	24.58
Mar. 16	24.49	Dec. 17	24.52	Aug. 25	24.59
Apr. 19	24.51	Jan. 11, 1938	24.49	Sept.14	24.52
May 18	24.54	Feb. 16	24.46	Oct. 18	24.55
June 16	24.54	Mar. 20	24.49	Nov. 21	24.48
July 15	24.46	Apr. 19	24.76	Jan. 15, 1940	24.49
Aug. 14	24.53	May 15	24.45	31	24.47
Sept.18	24.51	June 17	24.47	Mar. 10	24.50
Oct. 16	24.54	July 22	24.49	Apr. 15	24.54
Nov. 13	24.50	Aug. 15	24.46	May 16	24.57
Dec. 15	24.53	Sept.23	24.50	June 14	24.70
Jan. 13, 1937	24.54	Oct. 21	24.47	July 14	24.60
Feb. 18	24.55	Nov. 15	24.44	Aug. 18	24.68
Mar. 13	24.60	Dec. 12	24.46	Sept.15	24.61
Apr. 17	24.70	Jan. 13, 1939	24.46	25	24.61
May 17	a 25.40	Feb. 3	24.45	Oct. 19	24.62
June 16	24.70	Mar. 21	24.48	Nov. 7	24.60
July 5	24.70	Apr. 20	24.50	Dec. 21	24.62
Aug. 17	a 24.07				

12.36.27.212. Formerly MC-2. State land. Unused drilled well, diameter 6 inches, depth 40.5 feet. Measuring point, top edge of 4-inch clay sewer tile, at north side of well, 0.10 foot above land surface datum. Reference point, top of 2 by 2-inch wooden hub driven in ground, 1 foot south of fence post painted orange, 11 feet northwest of well, 0.09 foot below measuring point. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1935-40

Dec. 16, 1935	b 33.62	Sept.16, 1937	35.42	May 18, 1939	36.32
Jan. 20, 1936	b 33.62	Oct. 20	35.23	June 17	36.56
Feb. 14	34.95	Nov. 19	35.25	July 22	36.87
Mar. 16	35.18	Dec. 17	35.32	Aug. 25	36.86
Apr. 19	35.25	Jan. 11, 1938	35.35	Sept.14	36.08
May 18	35.24	Feb. 16	35.47	Oct. 16	35.85
June 16	35.44	Mar. 20	35.53	Nov. 21	35.88
July 15	35.20	Apr. 19	35.59	Jan. 15, 1940	36.22
Aug. 14	35.50	May 15	35.59	31	36.60
Sept.18	35.58	June 17	35.63	Mar. 10	36.94
Oct. 16	35.56	July 22	35.71	Apr. 15	37.35
Nov. 13	35.60	Aug. 15	35.70	May 16	37.50
Dec. 15	35.66	Sept.23	35.71	June 14	37.34
Jan. 13, 1937	35.65	Oct. 21	35.60	July 14	37.32
Feb. 18	35.62	Nov. 15	35.86	Aug. 18	37.49
Mar. 13	b 36.60	Dec. 12	35.85	Sept.15	37.43
Apr. 17	b 36.66	Jan. 13, 1939	35.91	25	37.41
May 17	b 36.56	Feb. 3	35.89	Oct. 19	37.34
June 14	b 36.44	Mar. 21	36.09	Nov. 7	37.30
July 5	b 36.45	Apr. 20	36.19	Dec. 21	37.24
Aug. 17	35.56				

a Measurement probably inaccurate.
b Apparently a 1-foot mistake on field notes.

Lea County--Continued.

12.36.29.11. Formerly B-11. E. D. Holt. Unused drilled well, diameter 14 inches, depth 174 feet. Measuring point, top edge of horizontal notch in well curb, marked with orange paint, north side of well, by "x" mark on surface, of curb, 0.10 foot below surface of curb, 0.5 foot above land surface datum, 4,006.03 feet above sea level. Water level recorder installed May 27, 1930 and removed January 1940. New recorder installed August 2, 1940.

Water level, in feet below land-surface datum 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 14, 1929	32.70	Oct. 21, 1933	33.34	June 16, 1937	34.09
Feb. 19, 1930	32.72	Nov. 17	33.31	July 5	33.93
May 14	32.83	Dec. 18	33.31	Aug. 17	33.96
29	32.85	Jan. 15, 1934	33.39	Sept.16	34.02
July 30	32.92	Feb. 22	33.31	Oct. 20	33.94
Sept.26	32.93	Mar. 19	33.30	Nov. 19	33.94
Oct. 30	32.95	Apr. 16	33.32	Dec. 17	33.84
Nov. 14	32.91	May 15	33.31	Jan. 11, 1938	33.80
Dec. 26	32.94	June 18	33.36	Feb. 16	33.79
Jan. 20, 1931	32.95	July 16	33.41	Mar. 20	33.78
Mar. 18	33.00	Aug. 17	33.48	Apr. 18	33.83
Apr. 30	33.05	Sept.20	33.48	May 15	33.86
June 2	33.08	Oct. 24	33.53	June 17	33.95
14	33.14	Nov. 15	33.52	July 22	33.99
July 2	33.15	Dec. 17	33.54	Aug. 15	34.01
31	33.20	Jan. 16, 1935	33.56	Sept.25	34.02
Aug. 31	33.16	Feb. 15	33.57	Oct. 21	34.08
Oct. 1	33.22	Mar. 19	33.60	Nov. 15	34.07
Nov. 2	33.21	Apr. 2	33.63	Dec. 12	a 34.26
Dec. 11	33.22	May 16	33.66	Jan. 13, 1939	34.07
Jan. 18, 1932	33.21	June 14	33.72	Feb. 4	34.05
Feb. 5	33.20	July 17	33.73	Mar. 21	34.06
Mar. 19	33.21	Aug. 14	33.75	Apr. 20	34.09
Apr. 20	33.24	Sept.17	33.71	May 18	34.15
May 17	33.23	Oct. 18	33.69	June 17	a 34.62
June 5	33.30	Nov. 20	33.65	July 22	34.10
July 1	33.32	Dec. 16	33.59	Aug. 25	34.10
Aug. 7	33.36	Jan. 20, 1936	33.72	Sept.14	34.13
Sept.12	33.41	Feb. 14	33.63	Oct. 18	34.13
Oct. 2	33.36	Mar. 15	33.61	Nov. 21	34.11
6	33.36	Apr. 19	33.72	Jan. 15, 1940	34.09
15	33.37	May 18	33.78	31	34.08
Nov. 8	33.38	June 16	33.78	Mar. 10	34.10
13	33.37	July 15	33.61	Apr. 15	34.10
Dec. 16	33.37	Aug. 14	33.85	May 16	34.16
Jan. 19, 1933	33.36	Sept.18	33.83	June 14	34.29
Feb. 16	33.34	Oct. 15	33.89	July 14	34.20
Mar. 17	33.35	Nov. 13	33.94	Aug. 2	34.19
Apr. 18	33.38	Dec. 15	33.96	18	34.23
May 13	33.40	Jan. 13, 1937	34.01	Sept.15	34.25
June 6	33.42	Feb. 18	34.02	25	34.24
July 29	33.44	Mar. 13	34.05	Nov. 19	34.26
Aug. 24	33.47	Apr. 17	34.06	24	34.25
Sept.18	33.37	May 17	a 34.23	Dec. 21	34.26
Oct. 18	33.30				

13.35.11.222. Formerly B-12. Ashley G. Green. Unused dug and drilled well, 6 by 6-feet (pit), depth 80 feet. Measuring point, top edge of USGS washer in top south edge of north 6 by 6-inch timber, near center of well, 0.50 foot above land surface datum. Reference point, top edge of USGS washer on southeast side of cottonwood tree, 15 feet west of well, 1.14 feet above measuring point. Equipped with irrigation pump until 1940.

Water level, in feet below land-surface datum, 1929-31, 1939-40

Nov. 14, 1929	32.71	Oct. 30, 1930	c 42.79	July 1, 1931	35.56
Feb. 19, 1930	32.67	Dec. 26	32.94	31	35.03
May 14	33.57	Jan. 20, 1931	32.89	Feb. 9, 1939	b 33.22
Aug. 2	b 33.60	Apr. 30	33.98	Jan. 31, 1940	32.86
Sept.26	33.44	June 2	35.13		

a Measurement probably inaccurate.
b Measuring point changed. New measuring point could not be accurately referenced to old, possible discrepancy of a few tenths of a foot between preceding and succeeding records.
c Pumping approximately 200 gallons a minute.

Lea County--Continued.

13.35.19.211. Seth Alston. Used drilled irrigation well, diameter 14½ inches, depth 144 feet. Measuring point, top edge of hole in east side of base flange of pump, 1.50 feet above land surface datum. Reference point, surface of concrete pump base, 0.64 foot below measuring point. Water levels, in feet below land surface datum: Aug. 26, 1939, 50.50; Feb. 1, 1940, a/79.48.

13.36.6.221. R. W. Duncan. Unused dug well, diameter 5 feet, depth 37.0 feet. Measuring point, top edge of USGS washer on top north edge of south 2 by 6-inch cross brace, near center of well, level with land surface datum. Reference point, top of 2 by 2-inch hub, flush with ground, 1 foot south of fifth fence post east from a north-south fence, 15 feet northeast of well, 0.05 foot below measuring point. Water levels, in feet below land surface datum: Feb. 4, 1939, 36.14; Jan. 31, 1940, 36.17; Sept. 25, 1940, 36.25.

13.36.33.341. Lewis Beaman. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer on top east side of west 6 by 6-inch pump support, north side of pump, level with land surface datum. Reference point, top edge of USGS washer on south side of fence post 20 feet north of well, 1.54 feet above measuring point. Water levels, in feet below land surface datum: Feb. 10, 1939, 42.20; Jan. 31, 1940, 41.87.

13.36.35.323. J. C. McClish. Used drilled irrigation well, diameter 15 inches, depth 102 feet. Measuring point, bottom edge of pump base flange, northeast corner of pump, level with concrete pump base and land surface datum. Water levels, in feet below land surface datum: Feb. 4, 1939, 38.09; Jan. 31, 1940, 38.65.

13.37.3.131. Jim H. Simpson. Located at southwest corner of earthen reservoir, 20 feet west of house. Unused drilled well, diameter 12 (?) inches. Measuring point, top edge of casing, south side of well, level with concrete curb, 0.50 foot above land surface datum. A windmill is located on each of the other corners of reservoir. Water levels, in feet below land surface datum: Feb. 9, 1939, 39.31; Jan. 31, 1940, 38.59.

13.37.3.133. Jim H. Simpson. Used drilled irrigation well, diameter 14 inches, depth 227 feet. Measuring point, lower inside edge of hole in north side of pump case shell, 1.80 feet above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 31, 34.65.

13.37.7.121. Formerly B-10. Tom Parsley. About 500 feet southwest of a windmill well. Unused dug and drilled well, pit 6 by 6-feet, depth 114 feet. Measuring point, top edge of USGS washer near middle of log across east side of pit, level with land surface datum, 3,925.9 feet above sea level. Reference point, top of 14 by 5/8-inch bolt, set in concrete in ground, 16.5 feet north of north corner of well, 14.7 feet northwest of north corner post of fence around well, 21 feet northeast from southwest corner fence post, 0.08 foot below measuring point. During early part of record, well was equipped with irrigation pump, in use, removed in April 1935.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 14, 1929	34.10	Nov. 2, 1931	34.16	Mar. 17, 1933	34.09
Feb. 19, 1930	34.00	Dec. 12	34.14	Apr. 18	34.04
June 1	34.16	Jan. 18, 1932	34.11	May 13	34.08
Aug. 2	34.61	Feb. 5	34.12	June 6	34.08
Sept.26	34.12	Mar. 19	34.07	July 29	34.11
Oct. 30	34.04	Apr. 20	34.06	Aug. 24	34.08
Dec. 26	34.01	May 19	34.07	Sept.18	34.10
Jan. 20, 1931	34.01	July 1	34.03	Oct. 18	34.10
Mar. 18	34.03	Aug. 7	34.04	Nov. 17	34.10
Apr. 30	34.02	Sept.12	34.16	Dec. 18	34.14
June 2	34.01	Oct. 15	34.13	Jan. 15, 1934	34.12
July 2	34.27	Nov. 8	34.01	Feb. 22	34.11
31	34.64	Dec. 16	34.08	Mar. 19	34.12
Aug. 31	34.23	Jan. 19, 1933	34.04	Apr. 16	34.16
Oct. 1	34.18	Feb. 16	34.08	May 15	34.14

a Pumping.

Lea County--Continued.

13.37.7.121.--Continued.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
June 18, 1934	34.19	Aug. 14, 1936	34.30	Oct. 21, 1938	33.72
July 20	34.20	Sept.18	34.26	Nov. 15	33.81
Aug. 18	34.20	Oct. 16	34.30	Dec. 12	33.96
Sept.20	34.20	Nov. 13	34.15	Jan. 13, 1939	33.94
Oct. 24	34.20	Dec. 15	34.24	Feb. 3	33.80
Nov. 15	34.20	Jan. 13, 1937	34.24	Mar. 21	33.74
Dec. 19	34.19	Feb. 18	34.22	May 18	a 33.58
Jan. 17, 1935	34.18	Mar. 13	34.20	June 17	33.76
Feb. 15	34.18	Apr. 17	34.26	July 22	33.74
Mar. 19	34.27	May 17	34.12	Aug. 25	33.74
Apr. 13	34.22	June 16	34.22	Sept.14	33.69
May 17	34.33	July 5	34.15	Oct. 18	33.65
June 14	34.30	Aug. 17	34.02	Nov. 21	33.61
July 17	34.35	Sept.16	34.02	Jan. 15, 1940	33.69
Aug. 14	34.35	Oct. 20	34.09	31	33.70
Sept.17	34.35	Nov. 19	34.02	Mar. 10	33.68
Oct. 18	34.30	Dec. 17	34.02	Apr. 15	33.69
Nov. 20	34.27	Jan. 11, 1938	33.99	May 16	33.68
Dec. 16	34.26	Feb. 16	34.00	June 14	33.60
Jan. 20, 1936	34.28	Mar. 20	33.91	July 14	33.65
Feb. 14	34.24	Apr. 19	33.87	Aug. 18	33.69
Mar. 16	34.24	May 15	33.79	Sept.15	33.63
Apr. 19	34.22	June 17	33.84	25	33.68
May 18	34.06	July 22	33.72	Oct. 19	33.69
June 16	34.07	Aug. 15	33.80	Nov. 7	33.75
July 15	34.10	Sept.23	33.82	Dec. 21	33.67

13.37.13.132. Formerly B-7. A. M. Brownfield. Most westerly well of four on south side of earthen tank. Unused drilled well, diameter 8 inches, depth 41 feet. Measuring point, top edge of USGS washer on top of wooden well curbing, south side of well, 1 foot above land surface datum. Reference point, top of 14 by 5/8-inch bolt set in concrete in ground, 19.2 feet east of well in line with three other wells, 22.3 feet west of first well east of observation well, 0.58 foot below measuring point. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1930-40

Feb. 19, 1930	28.73	Jan. 19, 1933	29.45	Apr. 2, 1935	29.76
Aug. 2	28.97	Feb. 16	29.44	May 17	29.77
Sept.26	29.03	Mar. 17	29.45	June 15	29.75
Oct. 30	29.08	Apr. 18	29.45	July 17	29.83
Dec. 26	29.10	May 13	29.45	Aug. 14	29.82
Jan. 20, 1931	29.12	June 6	29.54	Sept.17	29.84
Mar. 18	29.12	July 28	29.55	Oct. 18	29.86
Apr. 30	29.18	Aug. 23	29.58	Nov. 20	29.86
June 2	29.18	Sept.18	29.50	Dec. 16	29.88
July 2	29.22	Oct. 18	29.53	Jan. 20, 1936	29.89
31	29.25	Nov. 17	29.57	Feb. 14	29.86
Aug. 31	29.23	Dec. 18	29.57	Mar. 16	29.91
Oct. 1	29.30	Jan. 15, 1934	29.58	Apr. 19	29.98
Nov. 2	29.32	Feb. 22	29.60	May 18	29.92
Dec. 12	29.32	Mar. 19	29.59	June 16	29.94
Jan. 18, 1932	29.35	Apr. 16	29.61	July 15	29.96
Feb. 5	29.34	May 15	29.67	Aug. 14	29.96
Mar. 19	29.34	June 18	29.68	Sept.18	29.96
Apr. 21	29.37	July 19	29.70	Oct. 16	29.99
May 19	29.41	Aug. 18	29.71	Nov. 13	29.97
June 5	29.39	Sept.20	29.70	Dec. 15	30.02
July 1	29.35	Oct. 24	29.71	Jan. 13, 1937	29.96
Aug. 7	29.40	Nov. 15	29.71	Feb. 18	29.98
Sept. 9	29.45	Dec. 19	29.71	Mar. 13	30.00
Oct. 16	29.40	Jan. 16, 1935	29.75	Apr. 17	29.97
Nov. 8	29.44	Feb. 15	29.74	May 17	a 30.32
Dec. 16	29.45	Mar. 19	29.75	June 16	29.59

a Measurement probably inaccurate.

Lea County--Continued.

13.37.13.132.--Continued.

Water level, in feet below land-surface datum, 1930-40

Date	Water level	Date	Water level	Date	Water level
July 5, 1937	29.60	Sept.23, 1938	29.68	Nov. 21, 1939	29.99
Aug. 17	29.46	Oct. 21	29.68	Jan. 16, 1940	29.95
Sept.16	29.51	Nov. 15	29.80	Feb. 1	30.00
Oct. 20	29.44	Dec. 12	29.80	Mar. 10	30.00
Nov. 19	29.47	Jan. 13, 1939	29.80	Apr. 15	29.97
Dec. 17	29.52	Feb. 3	29.82	May 16	29.97
Jan. 11, 1938	29.51	Mar. 21	29.82	June 14	30.04
Feb. 16	29.55	Apr. 20	29.85	July 14	30.06
Mar. 20	29.54	May 18	29.89	Aug. 18	30.09
Apr. 19	29.59	June 17	29.91	Sept.15	30.09
May 15, 1938	29.61	July 22	29.90	Oct. 19	30.09
June 17	29.66	Aug. 25	29.88	Nov. 7	30.10
July 22	29.70	Sept.14	29.89	Dec. 21	30.12
Aug. 15	29.69	Oct. 18	29.90		

13.38.6.341. Opal Fulton. Used drilled irrigation well, diameter 12 inches, depth 120 feet. Measuring point, bottom edge of pump base, center of north side, 0.14 foot above concrete pump base, 1.00 foot above land surface datum. Tape does not hang vertical from measuring point. Water level, in feet below land surface datum, 1940: Feb. 1, 45.37.

14.35.30.3. W. A. Anderson, State land. Used drilled irrigation well, diameter 12 (?) inches, depth 100 feet. Measuring point, top edge of hole in west side of pump base flange, 0.07 foot above surface of concrete pump base, level with land surface datum. Water levels, in feet below land surface datum: Feb. 4, 1939, 48.46; Feb. 1, 1940, 48.54.

14.35.33.433. Formerly A-15. W. A. Anderson. Unused drilled well, diameter 6 inches, depth 62 feet. Measuring point, top of concrete well collar, west side of well, painted orange, one foot above land surface datum, 4,014.59 feet above sea level. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1929-40

Nov. 15, 1929	42.39	May 13, 1933	42.24	Apr. 19, 1936	41.99
Feb. 20, 1930	42.37	June 6	42.22	May 18	a 42.31
June 5	42.35	July 29	42.22	June 16	41.99
Aug. 1	42.32	Aug. 24	42.22	July 15	41.98
Sept.27	42.32	Sept.18	42.21	Aug. 14	41.98
Oct. 31	42.33	Oct. 18	42.23	Sept.17	41.99
Dec. 26	42.37	Nov. 17	42.17	Oct. 16	41.99
Jan. 20, 1931	42.32	Dec. 18	42.13	Nov. 13	41.96
Mar. 26	42.31	Jan. 15, 1934	42.25	Dec. 16	41.96
May 1	42.30	Feb. 22	42.14	Jan. 13, 1937	41.97
June 1	42.28	Mar. 19	42.14	Feb. 18	42.02
July 1	42.29	Apr. 16	42.11	Mar. 13	41.95
31	42.30	May 15	42.10	Apr. 17	41.98
Sept. 1	42.30	June 19	42.11	May 17	42.02
Oct. 2	42.30	July 16	42.10	June 16	41.98
Nov. 3	42.29	Aug. 18	42.11	July 5	41.88
Dec. 12	42.29	Sept.21	42.10	Aug. 17	a 41.02
Jan. 19, 1932	42.29	Oct. 24	42.09	Sept.16	41.89
Feb. 6	42.30	Nov. 15	42.10	Oct. 20	41.87
Mar. 19	42.28	Dec. 17	42.06	Nov. 19	41.88
Apr. 20	42.27	Jan. 18, 1935	42.07	Dec. 17	41.97
May 18	42.28	Feb. 15	42.06	Jan. 11, 1938	42.00
June 5	42.28	Mar. 19	42.08	Feb. 15	41.97
July 1	42.27	Apr. 13	42.04	Apr. 27	41.98
Aug. 7	42.28	June 14	42.01	May 15	41.99
Sept.12	42.31	July 17	42.02	June 17	41.95
Oct. 15	42.26	Aug. 14	42.01	July 22	41.92
Nov. 8	42.26	Sept.17	42.02	Aug. 15	41.94
Dec. 15	42.25	Oct. 18	42.00	Sept.23	41.93
Jan. 19, 1933	42.19	Nov. 20	42.00	Oct. 21	41.88
Feb. 16	42.22	Jan. 20, 1936	41.99	Nov. 15	41.99
Mar. 17	42.24	Feb. 14	41.98	Dec. 12	42.00
Apr. 18	42.23	Mar. 15	41.98	Feb. 4, 1939	41.94

a Measurement probably inaccurate.

Lea County--Continued.

14.35.33.433.--Continued.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Mar. 21, 1939	41.91	Nov. 21, 1939	41.96	Aug. 18, 1940	41.98
Apr. 20	41.92	Jan. 16, 1940	41.96	Sept.15	41.99
May 18	41.91	Feb. 1	41.94	25	41.97
June 17	41.93	Mar. 11	41.98	Oct. 19	41.97
July 22	41.94	Apr. 15	41.99	Nov. 19	41.96
Aug. 25	41.92	May 16	41.95	Dec. 23	41.97
Oct. 18	41.89	July 14	41.97		

14.36.2.41. Clarence M. King. Used drilled irrigation well, diameter 14 inches, depth 98 feet. Measuring point, bottom edge of pump base flange, center of south side, 0.13 foot above surface of concrete curb, 1.13 feet above land surface datum. Water levels, in feet below land surface datum: Feb. 9, 1939, 39.99; Jan. 31, 1940, 40.40.

14.36.6.42. S. A. and W. B. Richardson. Used drilled irrigation well, diameter 16 inches, depth 92 feet. Measuring point, bottom inside edge of hole in east side of pump case shell, 0.63 foot above surface of concrete pump base, 1.25 feet above land surface datum. Water levels, in feet below land surface datum: Aug. 22, 1939, 41.19; Jan. 31, 1940, 40.68; Aug. 5, 1940, a/65.76.

14.36.9.111. L. C. Bivins. Used drilled irrigation well, diameter 15 inches, depth 100 feet. Measuring point, top edge of ½-inch hole in north side of pump base flange, 0.10 foot above surface of concrete pump base, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 4, 1939, 39.96; Jan. 31, 1940, 40.65; Aug. 2, 1940, b/58.51.

14.36.9.21. Buford Rankins. Used drilled irrigation well, diameter 14 inches, depth 102 feet. Measuring point, top edge of ½-inch hole in north side of pump base flange, 0.10 foot above surface of concrete pump base, level with land surface datum. Water levels, in feet below land surface datum: Feb. 4, 1939, 41.85; Jan. 31, 1940, 42.12.

14.36.13.211. Formerly B-3. Noble L. Hibbits, 300 feet east of adobe house. Unused drilled well, diameter 12 inches, depth 87 feet. Measuring point, horizontal notch in concrete well curb, north side of well, near cross and arrow, 0.10 foot below surface of well curb, level with land surface datum, 3,904.59 feet above sea level. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1929-40

Nov. 13, 1929	37.06	Aug. 7, 1932	37.05	Aug. 17, 1934	37.03
Feb. 20, 1930	37.10	Sept.10	37.09	Sept.20	37.02
June 2	37.01	Oct. 15	37.01	Oct. 24	37.04
Aug. 2	37.03	Nov. 8	37.00	Nov. 15	37.00
Sept.27	37.06	Dec. 15	37.01	Dec. 19	37.02
Oct. 31	37.04	Jan. 19, 1933	37.00	Jan. 17, 1935	37.01
Dec. 26	37.02	Feb. 16	37.02	Feb. 15	37.00
Jan. 20, 1931	37.02	Mar. 17	37.00	Mar. 19	36.96
Mar. 18	37.01	Apr. 18	37.01	Apr. 2	37.02
Apr. 30	37.05	May 13	37.02	May 17	37.06
June 1	37.04	June 6	36.98	June 14	37.04
July 2	37.03	July 29	36.99	July 17	37.04
31	37.04	Aug. 24	37.02	Aug. 14	37.04
Aug. 31	37.04	Sept.18	37.02	Sept.17	37.07
Oct. 1	37.07	Oct. 18	37.02	Oct. 18	37.07
Nov. 2	37.02	Nov. 18	37.01	Nov. 20	37.04
Dec. 12	37.00	Dec. 18	37.05	Dec. 16	37.03
Jan. 18, 1932	37.00	Jan. 15, 1934	36.99	Jan. 20, 1936	37.06
Feb. 5	37.00	Feb. 22	36.99	Feb. 14	37.03
Mar. 19	37.02	Mar. 19	37.00	Mar. 16	37.11
Apr. 21	37.00	Apr. 16	37.02	Apr. 19	37.12
May 19	37.05	May 15	37.01	May 18	37.00
June 5	37.10	June 19	37.02	June 16	36.98
July 1	37.05	July 16	37.03	July 15	36.92

a Pumping 655 gallons a minute.
b Pumping 650 gallons a minute.

Lea County--Continued.

14.36.13.211.--Continued.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Aug. 14, 1936	37.15	Feb. 16, 1938	37.10	July 22, 1939	37.12
Sept.18	37.30	Mar. 20	37.09	Aug. 25	37.11
Oct. 16	37.22	Apr. 19	37.10	Sept.14	37.12
Nov. 13	37.17	May 15	37.12	Oct. 18	37.06
Dec. 15	37.19	June 17	37.19	Nov. 21	37.07
Jan. 13, 1937	37.18	July 22	37.17	Jan. 15, 1940	37.05
Feb. 18	37.19	Aug. 15	37.11	Feb. 2	37.08
Mar. 13	37.20	Sept.23	37.11	Mar. 11	37.11
Apr. 17	37.20	Oct. 21	37.09	Apr. 15	37.12
May 17	37.24	Nov. 15	37.13	May 16	37.13
June 16	37.18	Dec. 12	37.16	June 14	37.09
July 5	37.16	Jan. 13, 1939	37.13	July 14	37.15
Aug. 17	37.11	Feb. 4	37.05	Aug. 18	37.15
Sept.16	37.14	Mar. 21	37.14	Sept.15	37.16
Oct. 20	37.14	Apr. 20	37.14	Oct. 19	37.15
Nov. 19	37.09	May 18	37.15	Nov. 19	37.18
Dec. 17	37.11	June 17	37.13	Dec. 21	37.17
Jan. 12, 1938	37.12				

14.36.14.121. V. M. Chamber. Unused drilled well, diameter 12 inches, depth 98 feet. Measuring point, horizontal notch in concrete curb, north side of well, opposite "x" mark, 0.02 foot below surface of concrete curb, 0.78 foot above land surface datum. Water levels, in feet below land surface datum: Nov. 13, 1929, 42.06; Feb. 7, 1939, 41.99; Feb. 2, 1940, 41.98.

14.37.3.113. Lois C. Hobbs. Used drilled irrigation well, diameter 12 inches, depth 128 feet. Measuring point, top edge of hole in west side of pump case shell, 0.80 foot above surface of concrete pump base, 1.50 feet above land surface datum. Water levels, in feet below land surface datum: Feb. 9, 1939, 34.30; Jan. 31, 1940, 34.72.

14.37.14.112. R. W. Smith. Unused drilled well, diameter 11 inches, depth 88 feet. Measuring point, top edge of concrete curb, west side of well, painted orange, 1.00 foot above land surface datum.

Water level, in feet below land-surface datum, 1939-40

Feb. 7, 1939	36.46	Nov. 21, 1939	36.56	July 14, 1940	36.67
May 18	36.48	Jan. 15, 1940	36.55	Aug. 18	36.67
June 17	36.56	Feb. 4	36.57	Sept.15	36.69
July 22	36.53	Mar. 10	36.53	25	36.68
Aug. 25	36.52	Apr. 15	36.54	Oct. 19	36.68
Sept.14	36.52	May 16	36.56	Nov. 7	36.68
Oct. 18	36.48	June 14	36.56	Dec. 21	36.68

14.37.16.421. Claude Fort, School land. Used drilled irrigation well, diameter 9 inches, depth 117 feet. Measuring point, top edge of 3/4-inch hole in west side of pump base flange, 0.07 foot above surface of concrete pump base, 0.80 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 7, 1939, 31.42; Feb. 4, 1940, 31.40; Aug. 5, 1940, a/55.39.

14.37.19.211. A. B. Hennington. Southwest of house, about 300 feet west of irrigation well. Unused drilled well. Measuring point, top edge of USGS washer in board on east side of well, 1.00 foot below land surface datum. Water levels, in feet below land surface datum: Jan. 8, 1938, 38.81; Feb. 7, 1939, 38.96; Feb. 4, 1940, 38.95.

14.37.20.41. Doyle Hudgens. Used drilled irrigation well, diameter 14 inches, depth 114 feet. Measuring point, surface of concrete curb, south side of well, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Aug. 24, 1939, 36.78; Feb. 4, 1940, 35.81.

a Pumping 880 gallons a minute.

Lea County--Continued.

14.37.27.13. Formerly B-4. J. R. Fort. Unused drilled well, diameter about 7 inches, depth 58.5 feet. Measuring point, horizontal notch in caliche on north side of well, opposite arrow, level with land surface datum, 3,838.21 feet above sea level. Reference point, top of 14 by 5/8-inch bolt, set in concrete, 22.4 feet northwest of well in line with well and old windmill anchor post, 16.6 feet northwest of anchor post, 16.0 feet southeast of southeast corner of old house foundation, 0.09 foot below measuring point. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 12, 1929	37.52	Jan. 15, 1934	37.52	June 16, 1937	37.66
Feb. 19, 1930	37.53	Feb. 22	37.52	July 5	37.67
June 4	37.50	Mar. 19	37.53	Aug. 17	37.71
Aug. 2	37.52	Apr. 16	37.50	Sept.16	37.70
Sept.26	37.63	May 15	37.51	Oct. 20	37.65
Oct. 30	37.54	June 18	37.56	Nov. 19	37.71
Dec. 26	37.52	July 20	37.58	Dec. 17	37.75
Mar. 18, 1931	37.56	Aug. 18	37.60	Jan. 8, 1938	37.72
Apr. 30	37.55	Sept.20	37.60	Feb. 16	37.71
June 1	37.56	Oct. 24	37.60	Mar. 20	37.71
July 2	37.57	Nov. 15	37.60	Apr. 19	37.71
31	37.57	Dec. 19	37.59	May 15	37.61
Aug. 31	37.58	Jan. 17, 1935	37.59	June 17	37.63
Oct. 1	37.51	Feb. 15	37.59	July 22	37.78
Nov. 3	37.55	Mar. 19	a 37.86	Aug. 15	37.78
Dec. 12	37.58	Apr. 13	37.57	Sept.23	37.79
Jan. 18, 1932	37.53	May 17	37.58	Oct. 21	37.77
Feb. 5	37.58	June 15	37.58	Nov. 15	37.77
Mar. 19	37.58	July 17	37.60	Dec. 12	37.78
Apr. 21	37.60	Aug. 14	37.59	Feb. 7, 1939	37.78
May 17	37.61	Sept.17	37.61	Mar. 21	37.77
June 5	37.59	Oct. 17	37.62	Apr. 20	37.77
July 1	37.57	Nov. 20	37.61	May 18	37.76
Aug. 7	37.59	Dec. 16	37.57	June 17	37.78
Sept.10	37.51	Feb. 14, 1936	37.61	July 22	37.76
Oct. 15	37.54	Mar. 16	37.62	Aug. 25	37.75
Nov. 8	37.51	Apr. 19	37.63	Sept.14	37.83
Dec. 16	37.51	May 18	37.64	Oct. 18	37.81
Jan. 19, 1933	37.50	June 16	37.66	Jan. 16, 1940	37.81
Feb. 16	37.50	July 15	37.69	Feb. 4	37.81
Mar. 17	37.49	Aug. 14	37.62	Mar. 10	37.81
Apr. 18	37.51	Sept.18	37.63	Apr. 15	37.85
May 13	37.52	Oct. 16	37.71	May 16	37.86
June 6	37.52	Nov. 13	37.65	June 14	37.86
July 29	37.56	Dec. 15	37.70	July 14	37.88
Aug. 24	37.57	Jan. 13, 1937	37.68	Aug. 18	37.91
Sept.18	37.54	Feb. 18	a 37.93	Sept.15	37.92
Oct. 18	37.54	Mar. 13	a 37.88	Oct. 19	37.93
Nov. 17	37.55	Apr. 17	37.65	Nov. 7	37.90
Dec. 18	37.53	May 17	37.64	Dec. 21	37.90

14.38.27.24. Mal. Morrison Gaines. Used drilled irrigation well, depth 156 feet. Measuring point, lower edge of 2 by 4-inch board pump support, north side of pump, level with surface of concrete curb, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 7, 1939, 39.22; Feb. 4, 1940, 40.07.

14.38.28.12. Formerly B-5. Ila M. Cox. Unused dug and drilled irrigation well, diameter 4 by 6-feet (pit), depth 110 feet. Measuring point, top edge of USGS washer on top north edge of 2 by 6-inch plank across well to north of vertical frame posts, south of discharge pipe, 1.00 foot above land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete in fence line running north and south, 90 feet northeast of well, 8.3 feet north of south corner fence post, 1.30 feet below measuring point. Well is pumped in some years.

a Measurement probably inaccurate.

. Lea County--Continued.

14.38.28.12.--Continued.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 12, 1929	26.15	Feb. 22, 1934	26.13	July 5, 1937	25.97
Feb. 19, 1930	26.18	Mar. 19	26.15	Aug. 17	26.02
June 4	26.37	Apr. 16	26.16	Sept.16	26.01
Aug. 2	26.77	May 15	26.25	Oct. 20	25.99
Sept.26	26.07	June 18	26.26	Nov. 19	25.96
Dec. 26	26.27	July 20	26.26	Dec. 17	25.96
Oct. 30	26.27	Aug. 18	26.27	Jan. 8, 1938	26.42
Jan. 20, 1931	26.27	Sept.20	26.26	Feb. 16	26.00
Feb. 18	26.29	Oct. 24	26.26	Mar. 20	25.98
Apr. 30	26.27	Nov. 15	26.29	Apr. 19	26.41
June 1	26.60	Dec. 19	26.28	May 15	26.39
July 2	27.36	Jan. 17, 1935	26.32	June 17	26.54
31	27.59	Feb. 15	26.31	July 22	26.50
Aug. 31	26.75	Mar. 19	26.36	Aug. 15	26.70
Oct. 1	26.84	Apr. 13	26.36	Sept.23	26.68
Nov. 2	26.79	May 17	26.36	Oct. 21	26.47
Dec. 12	26.53	June 15	26.33	Nov. 15	26.60
Jan. 18, 1932	26.90	July 17	26.27	Dec. 12	26.58
Feb. 5	26.47	Aug. 14	26.24	Jan. 13, 1939	26.53
Mar. 19	26.50	Sept.17	26.25	Feb. 3	26.56
Apr. 21	26.53	Oct. 18	26.25	Mar. 21	26.56
May 19	26.51	Nov. 20	26.24	Apr. 20	26.61
June 6	26.34	Dec. 16	26.23	May 18	26.64
July 1	26.33	Jan. 20, 1936	26.22	June 17	26.73
Aug. 7	26.69	Feb. 14	26.27	July 22	26.72
Sept.10	26.38	Mar. 16	26.29	Aug. 25	26.68
Oct. 15	26.12	Apr. 19	26.37	Sept.14	26.66
Nov. 8	26.09	May 18	26.35	Oct. 18	26.72
Dec. 16	26.08	June 16	26.34	Nov. 21	26.83
Jan. 19, 1933	26.08	July 15	26.36	Jan. 16, 1940	26.85
Feb. 16	26.08	Aug. 14	26.37	Feb. 4	26.84
Mar. 17	26.08	Sept.18	26.27	Mar. 10	27.03
Apr. 18	26.11	Oct. 16	25.74	Apr. 15	27.01
May 13	26.11	Nov. 13	25.91	May 16	27.01
June 6	26.34	Dec. 15	26.15	June 14	26.78
July 29	26.30	Jan. 13, 1937	26.01	July 14	26.86
Aug. 24	26.20	Feb. 18	25.92	Aug. 18	26.89
Sept.18	26.10	Mar. 13	26.05	Sept.15	26.86
Oct. 18	26.05	Apr. 17	26.15	Oct. 19	26.80
Nov. 17	26.16	May 17	26.10	Nov. 7	26.88
Dec. 18	26.09	June 16	26.04	Dec. 21	27.13
Jan. 15, 1934	26.07				

15.35.13.11. Coalsen Bros. Used drilled irrigation well, diameter 10 inches, depth 90 feet. Measuring point, top edge of 3/4-inch hole in west side of pump base flange, 1.50 feet above land surface datum. Reference point, top edge of USGS washer on west 10 by 15-inch engine support, north of engine base, 15 feet south of well, 0.06 foot above measuring point. Water levels, in feet below land surface datum: Feb. 4, 1939, 40.61; Feb. 1, 1940, 41.48.

15.36.8.131. Formerly Au-3. Orren Beatty. Unused dug well, diameter 4 feet, depth 46.2 feet. Measuring point, top edge of USGS washer on top edge of recorder shelter floor, east side of well, 0.75 foot above land surface datum, 3,935.37 feet above sea level. Reference point, top of 14 by 5/8-inch bolt, set in concrete, 11 feet due north of northeast corner of recorder shelter, 0.69 foot below measuring point. Water stage recorder installed Jan. 18, 1930. Removed September 25, 1940. Well is distant from pumped wells.

Water level, in feet below land-surface datum, 1930-40

Jan. 18, 1930	40.97	Oct. 31, 1930	41.03	June 2, 1931	41.05
Feb. 20	40.97	Nov. 14	41.00	14	41.07
May 14	40.98	Dec. 26	41.04	July 1	41.05
June 6	40.99	Jan. 20, 1931	41.03	31	41.05
7	40.99	Mar. 19	41.02	Sept. 1	41.05
July 30	41.02	26	41.02	Oct. 2	41.06
Sept.27	41.01	May 1	41.04	Nov. 3	41.08

Lea County--Continued.

15.36.8.131.--Continued.

Water level, in feet below land-surface datum, 1930-40

Date	Water level	Date	Water level	Date	Water level
Dec. 12, 1931	41.08	Dec. 17, 1934	41.18	Jan. 12, 1938	41.42
Jan. 19, 1932	41.08	Jan. 16, 1935	41.20	Feb. 16	41.40
Feb. 6	41.08	Feb. 15	41.20	Mar. 20	41.41
Mar. 19	41.08	Mar. 19	41.20	Apr. 19	41.41
Apr. 20	41.08	Apr. 2	41.21	May 15	41.40
May 18	41.11	May 17	41.20	June 17	41.43
June 5	41.09	June 14	41.23	July 22	41.45
July 1	41.10	July 17	41.24	Aug. 15	41.47
Aug. 7	41.11	Aug. 14	41.26	Sept.23	41.49
Sept.10	41.12	Sept.17	41.27	Oct. 21	41.48
Oct. 5	41.08	Oct. 18	41.25	Nov. 15	41.50
15	41.08	Nov. 20	41.23	Dec. 12	41.50
Nov. 8	41.07	Dec. 16	41.20	Jan. 13, 1939	41.51
Dec. 17	41.04	Jan. 20, 1936	41.21	Feb. 4	41.48
Jan. 20, 1933	41.03	Feb. 14	41.19	Mar. 21	41.51
Feb. 16	41.02	Mar. 15	41.21	Apr. 20	41.49
Mar. 17	41.02	Apr. 19	41.21	May 18	41.49
Apr. 18	41.02	May 18	41.11	June 17	41.51
May 13	41.01	June 16	41.21	July 22	41.53
June 6	41.02	July 14	41.23	Aug. 25	41.53
July 29	41.04	Aug. 14	41.24	Sept.14	41.53
Aug. 24	41.05	Sept.18	41.25	Oct. 18	41.53
Sept.18	41.06	Oct. 16	41.28	Nov. 21	41.53
Oct. 18	41.12	Nov. 13	41.27	Jan. 15, 1940	41.56
Nov. 17	41.07	Dec. 15	41.27	Feb. 2	41.55
Dec. 18	41.07	Jan. 13, 1937	41.24	Mar. 11	41.57
Jan. 15, 1934	41.07	Feb. 18	41.27	Apr. 15	41.58
Feb. 22	41.07	Mar. 13	41.29	May 16	41.59
Mar. 19	41.09	Apr. 17	41.30	June 14	41.59
Apr. 16	41.09	May 17	41.33	July 14	41.62
May 5	41.11	June 16	41.28	Aug. 4	41.60
June 18	41.13	July 5	41.34	18	41.62
July 16	41.14	Aug. 17	41.36	Sept.15	41.56
Aug. 17	41.17	Sept.16	41.39	25	41.62
Sept.20	41.16	Oct. 20	41.36	Oct. 19	41.63
Oct. 24	41.17	Nov. 19	41.39	Nov. 19	41.65
Nov. 15	41.16	Dec. 17	41.40	Dec. 21	41.65

15.36.29.41. D. A. Hudgens. Used drilled irrigation well, diameter 12 inches, depth 93 feet. Measuring point, bottom edge of base flange of pump, east side, level with surface of concrete pump base and land surface datum. Water levels, in feet below land surface datum: Feb. 9, 1939, 42.80; Feb. 2, 1940, 43.11.

15.37.10.113. W. Arthur Simpson. Used drilled irrigation well, diameter 14 inches, depth 100-110 feet. Measuring point, top edge of 3/4-inch hole in northeast side of pump base flange, 0.07 foot above surface of concrete pump base, 2.00 feet above land surface datum. Water levels, in feet below land surface datum: Jan. 8, 1938, 36.56; Feb. 3, 1939, 36.63.

15.37.21.33. Formerly A-11a. Robert W. Dean. Located about 20 feet north of small house. Used drilled stock well, diameter 6 (?) inches, depth 39 feet. Measuring point, top edge of USGS washer on top of east pipe clamp, 0.33 foot above concrete curb, 0.50 foot above land surface datum. Well not used previous to July 1933 at which time windmill was installed.

Water level, in feet below land-surface datum, 1930-40

Aug. 1, 1930	31.27	May 1, 1931	31.33	Nov. 2, 1931	31.40
Sept.26	31.35	June 1	31.34	Dec. 12	31.40
Oct. 31	31.23	July 1	31.18	Jan. 18, 1932	31.41
Dec. 26	31.31	31	31.38	Feb. 6	31.41
Jan. 20, 1931	31.42	Aug. 31	31.38	Mar. 20	31.41
Mar. 18	31.32	Oct. 1	31.40	Apr. 21	31.41

Lea County--Continued.

15.37.21.33.--Continued.

Water level, in feet below land-surface datum, 1930-40

Date	Water level	Date	Water level	Date	Water level
May 18, 1932	31.44	Feb. 15, 1935	32.80	Feb. 15, 1938	31.34
June 5	31.42	Mar. 19	33.15	Mar. 20	31.35
July 1	31.40	Apr. 13	33.19	Apr. 17	31.51
Aug. 7	31.38	May 17	33.22	May 15	(b)
Sept.10	31.39	June 15	31.76	July 22	31.32
Oct. 15	31.29	July 16	31.82	Aug. 15	30.94
Nov. 8	31.26	Aug. 14	31.77	Sept.23	30.95
Dec. 16	31.22	Sept.17	b 34.10	Oct. 21	31.18
Jan. 19, 1933	31.20	Oct. 17	b 33.78	Nov. 15	b 34.55
Feb. 16	31.21	Nov. 20	b 32.54	Jan. 13, 1939	31.33
Mar. 17	31.19	Dec. 16	31.75	Feb. 3	b 38.72
Apr. 18	31.20	Jan. 12, 1936	32.62	Mar. 21	31.96
May 13	31.23	Feb. 14	b 31.86	Apr. 20	32.04
June 6	31.23	Mar. 16	32.60	May 18	31.96
July 29	a 36.51	Apr. 19	32.56	June 17	b 33.31
Aug. 24	33.38	May 18	b 34.03	July 22	33.19
Sept.18	31.94	June 16	34.12	Aug. 25	33.09
Oct. 18	31.77	Sept.18	32.32	Sept.14	33.08
Nov. 17	31.84	Oct. 16	31.58	Oct. 18	33.11
Dec. 18	31.74	Nov. 13	31.56	Nov. 21	b 33.11
Jan. 15, 1934	31.93	Dec. 15	31.60	Jan. 16, 1940	31.24
Feb. 22	32.52	Jan. 13, 1937	31.68	Feb. 4	31.15
Mar. 19	31.72	Feb. 18	b 39.54	Mar. 10	b 35.74
Apr. 16	32.13	Mar. 13	31.90	Apr. 15	b 40.33
May 15	31.85	Apr. 17	b 34.30	May 16	b 35.59
June 18	31.86	May 17	b 38.03	June 14	31.59
July 20	b 36.49	June 16	b 38.12	July 14	b 34.95
Aug. 17	b 39.87	July 5	b 38.09	Aug. 18	31.31
Sept.20	b 36.39	Sept.16	31.67	Sept.15	b 32.74
Oct. 24	b 35.78	Oct. 20	b 35.20	26	b 37.70
Nov. 15	31.66	Nov. 19	31.36	Oct. 19	b 31.83
Dec. 19	b 34.38	Dec. 17	31.39	Nov. 7	b 32.11
Jan. 16, 1935	b 33.14	Jan. 12, 1938	31.39	Dec. 21	31.21

15.38.22.2. Etta Arnett. Used drilled irrigation well, diameter 14 inches, depth 144 feet. Measuring point, surface of concrete curb, north side of well, level with land surface datum. Water levels, in feet below land surface datum: Aug. 26, 1939, 31.39; Feb. 4, 1940, 31.92.

16.36.1.4. Lorene Easley. Used drilled irrigation well, diameter 18 inches, depth 108 feet. Measuring point, lower edge, east end of horizontal discharge pipe. Measure down discharge pipe, subtract 3.5 feet to reduce measurement to land surface datum. Water levels, in feet below land surface datum: Feb. 7, 1939, 42.25; Feb. 2, 1940, 42.63.

16.36.4.433. City of Lovington (?). Drilled well, used for filling swimming pool, diameter 12 inches, depth 74 feet. Measuring point, top edge of 3/4-inch hole in northwest side of pump base flange, 0.08 foot above surface of concrete pump base, level with land surface datum. Water levels, in feet below land surface datum: Aug. 26, 1939, 53.35; Feb. 1, 1940, 52.66.

16.36.4. Lot 12. Formerly Byers. E. H. Byers. About 800 feet northeast of pumped well, in center of field north of house. Unused drilled well, diameter 8 inches, depth 63 feet. Measuring point, top edge of recorder shelter shelf, 2.03 feet above land surface datum. Reference point, bottom edge of nick in top of concrete curb, east side of well, 1.23 feet below measuring point. Water stage recorder installed Aug. 3, 1940.

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a Measuring point changed. New measuring point not accurately referenced to old. Possible discrepancy of several tenths of a foot between preceding and succeeding records.

b Windmill pumping.

Lea County--Continued.

16.36.4. Lot 12.--Continued.

Water level, in feet below land surface datum, 1934-39

Date	Water level	Date	Water level	Date	Water level
July 20, 1934	44.14	May 18, 1936	43.78	Mar. 20, 1938	44.17
Aug. 18	44.40	June 16	43.75	Apr. 27	44.21
Sept.16	44.44	July 14	43.80	May 16	45.32
Oct. 26	43.89	Aug. 20	45.45	June 17	45.88
Nov. 17	43.73	Sept.18	45.47	July 22	45.84
Dec. 17	43.68	Oct. 17	45.44	Aug. 15	45.88
Jan. 18, 1935	43.66	Nov. 12	44.31	Sept.23	45.89
Feb. 15	43.68	Dec. 14	44.15	Oct. 21	45.85
Mar. 19	43.64	Jan. 13, 1937	44.23	Nov. 15	45.91
Apr. 13	43.72	Feb. 16	45.02	Dec. 15	45.89
May 17	44.32	Mar. 13	44.60	Jan. 13, 1939	44.60
June 15	44.72	Apr. 19	44.41	Feb. 4	44.51
July 16	44.68	May 19	45.12	Mar. 21	45.12
Aug. 14	44.49	June 15	45.00	Apr. 20	45.14
Sept.17	44.20	July 4	47.74	May 18	45.35
Oct. 17	44.07	Aug. 16	a 46.17	June 17	45.57
Nov. 19	44.50	Sept.16	44.98	July 22	45.46
Dec. 16	44.48	Oct. 20	44.56	Aug. 25	44.85
Jan. 20, 1936	44.50	Nov. 19	44.39	Sept.19	45.29
Feb. 14	43.98	Dec. 17	44.38	Oct. 18	45.17
Mar. 15	43.76	Jan. 12, 1938	44.26	Nov. 21	a 44.94
Apr. 19	a 43.82	Feb. 15	44.20		

16.36.4. Lot 12. E. H. Byers.--Continued.

Highest daily water level, in feet below land surface datum, 1940

(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	b44.88	.....	.....	.....	.....	.....	45.76	46.10	45.18	44.89
2	.....	.....	.....	.....	.....	.....	.....	45.73	46.07	45.16	44.88
3	.....	.....	.....	.....	.....	.....	46.30	45.69	46.01	45.15	44.87
4	.....	.....	.....	.....	.....	.....	46.31	45.64	45.96	45.14	44.87
5	.....	.....	.....	.....	.....	.....	46.34	45.61	45.91	45.13	44.87
6	.....	.....	.....	.....	.....	.....	46.39	45.57	45.86	45.11	44.86
7	.....	.....	.....	.....	.....	.....	46.32	a45.55	45.81	45.10	44.86
8	.....	.....	.....	.....	.....	.....	46.26	a45.70	45.75	45.09	44.86
9	.....	.....	.....	.....	.....	.....	46.20	45.74	45.71	45.08	44.86
10	.....	.....	b44.67	.....	.....	.....	46.14	45.71	45.67	45.07	44.85
11	.....	.....	.....	.....	.....	.....	46.10	45.67	45.63	45.06	44.84
12	.....	.....	.....	.....	.....	.....	46.04	45.64	45.59	45.05	44.83
13	.....	.....	.....	.....	.....	b45.88	46.00	a45.72	45.55	45.04	44.83
14	.....	.....	.....	.....	.....	.....	45.94	45.79	45.53	45.03	44.83
15	b45.02	.....	.....	b45.27	.....	.....	45.90	45.89	45.49	45.02	44.83
16	.....	.....	.....	.....	b45.64	.....	45.86	45.91	45.47	45.01	44.82
17	.....	.....	.....	.....	.....	.....	45.80	46.01	45.43	45.00	44.81
18	.....	.....	.....	.....	.....	.....	45.76	45.97	45.41	44.99	44.81
19	.....	.....	.....	.....	.....	.....	45.71	45.93	45.39	44.98	44.80
20	.....	.....	.....	.....	.....	.....	45.68	45.88	45.37	44.97	44.79
21	.....	.....	.....	.....	.....	.....	45.65	a45.85	45.35	44.97	44.79
22	.....	.....	.....	.....	.....	.....	45.61	45.88	45.33	44.96	44.79
23	.....	.....	.....	.....	.....	.....	45.59	45.87	45.31	44.96	44.79
24	.....	.....	.....	.....	.....	.....	45.55	45.90	45.29	44.95	44.78
25	.....	.....	.....	.....	.....	.....	45.52	45.84	45.27	44.94	44.77
26	.....	.....	.....	.....	.....	.....	45.49	45.84	45.25	44.94	44.79
27	.....	.....	.....	.....	.....	.....	45.47	45.87	45.23	44.93	44.77
28	.....	.....	.....	.....	.....	.....	45.46	45.91	45.23	44.91	44.85
29	.....	.....	.....	.....	.....	.....	a45.57	46.05	45.21	44.91	44.90
30	.....	.....	.....	.....	.....	.....	45.75	46.07	45.20	44.90	44.91
31	.....	.....	.....	.....	.....	.....	45.81	.....	45.19	.....	45.01

a Irrigation well, about 800 feet southwest, pumping.

b Tape measurement at odd hours.

Lea County--Continued.

16.36.5.Lot 10. Mrs. Mary A. Coxey. Unused drilled well, diameter 10 inches, depth 80 feet. Measuring point, top edge of casing, opposite northwest pump-base bolt in concrete curb, 1.00 foot above land surface datum. Reference point, top of weir box, 1.5 feet south of well, at point on top of north wall, 0.80 foot west of center of discharge pipe semicircle, 0.41 foot above measuring point. Water level, in feet below land surface datum, 1940: Feb. 1, 46.16.

16.36.5.Lot 14. Aubry Bush. Used drilled irrigation well, diameter 6-7/8 inches, depth 74 feet. Measuring point, top edge of 3/4-inch hole in north side of pump base flange, 0.07 foot above surface of concrete pump base and land surface datum. Water levels, in feet below land surface datum: Feb. 5, 1939, 47.80; Feb. 1, 1940, 47.04.

16.36.5.321. J. T. Phillips. Used dug and drilled irrigation well, depth 75 feet. Measuring point, top north edge of south 6-inch steel channel pump support, just east of pump flange, 0.80 foot above land surface datum. Reference point, surface of concrete curb, 0.51 foot below measuring point. Water levels, in feet below land surface datum: Feb. 5, 1939, 47.28; Feb. 1, 1940, 46.39.

16.36.5.411. Mrs. Emma J. Robinson. Unused drilled well, diameter 14 inches, depth 77 feet. Measuring point, top edge of hole in steel barrel-top well cover, north side of well, near northeast pump base bolt, 0.03 foot above surface of concrete curb and land surface datum. Water levels, in feet below land surface datum: Feb. 5, 1939, 48.19; Feb. 1, 1940, 47.52.

16.36.8.424. Seth Alston and J. S. Eaves. Unused dug and drilled irrigation well, diameter 8 inches, depth 88 feet. Measuring point, top south edge of 2 by 6-inch stringer that is on north side of south vertical frame post, 0.50 foot east of frame post, 0.44 foot above top of concrete curb, center of west side of pit, 0.44 foot above land surface datum. Water levels, in feet below land surface datum: Nov. 18, 1929, 51.57; Jan. 10, 1938, 51.84; Feb. 5, 1939, 52.21; Feb. 1, 1940, 52.26.

16.36.10.233. J. E. Simmons. Used drilled irrigation well, diameter 8 inches, depth 87 feet. Measuring point, surface of concrete curb, east side of well, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Aug. 24, 1939, 52.84; Feb. 2, 1940, 51.99; Aug. 3, 1940, a/76.20.

16.36.15.24. J. C. Griffin (?). Located on east side of Lovington-Hobbs Highway, 0.50 mile south from railroad crossing at Magnolia Petroleum Company offices. Unused drilled irrigation well, diameter 6 inches, depth 82 feet. Measuring point, bottom edge of base flange of pump, west side of well, level with surface of concrete pump base and land surface datum. Water levels, in feet below land surface datum: Feb. 8, 1939, 48.37; Feb. 5, 1940, 48.35.

16.36.27.133. State land. Located 40 feet east and 29 feet north of corner fence post, east of fence post painted orange. Unused drilled well, diameter 6 inches, depth 65 feet. Measuring point, inside top edge of sewer tile casing, northwest side of well, level with land surface datum. Reference point, top of 2 by 2-inch hub, driven flush with ground, 1.5 feet northeast of corner fence post, 49 feet southwest from well, 0.06 foot above measuring point.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Feb. 8, 1939	50.55	Sept.18, 1939	50.63	May 22, 1940	50.69
Mar. 15	50.62	Oct. 16	50.68	June 15	50.91
Apr. 20	50.62	Nov. 11	50.61	Aug. 3	50.73
May 20	50.69	Dec. 17	50.61	25	50.75
June 18	50.67	Jan. 16, 1940	50.64	Sept.26	50.76
July 23	50.66	Feb. 4	50.63	Oct. 18	50.99
Aug. 17	50.42	Mar. 10	50.66	Nov. 17	50.98

a Pumping 830 gallons a minute.

Lea County--Continued.

16.37.19.2. H. Taylor Montieth. Unused dug and drilled irrigation well, diameter 12 inches, depth 90 feet. Measuring point, top edge of USGS washer on top south side of north 4 by 4-inch stringer, 6 inches west of vertical frame post, 0.30 foot below land surface datum. Water levels, in feet below land surface datum: Nov. 18, 1929, 30.92; Jan. 7, 1938, 30.04; Feb. 7, 1939, 30.56; Feb. 2, 1940, 30.65.

16.37.33.11. Elbert Shipp. Unused dug and drilled well, diameter 3 by 6-feet (pit), depth 95 feet. Measuring point, top edge of USGS washer on west top edge of 2 by 4-inch board on east side of pit, 1.9 feet north of southeast corner of pit, flush with land surface datum. Water levels, in feet below land surface datum: Feb. 7, 1939, 29.90; Feb. 2, 1940, 30.28.

16.38.28.444. Formerly A-10a. J. L. Williams. Located 197 feet west of fence line. Unused drilled well, diameter 6 inches, depth 52 feet. Measuring point, top of USGS washer on top of wooden casing, east side of well, level with land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete in fence line, 197 feet east of well, 11.2 feet south of south 10 by 10-inch gate post, level with measuring point.

Water level, in feet below land-surface datum, 1930-40

Date	Water level	Date	Water level	Date	Water level
Aug. 1, 1930	33.20	Sept.16, 1934	33.65	Jan. 8, 1938	33.41
Sept.26	33.21	Oct. 26	33.66	Feb. 15	33.42
Oct. 31	33.26	Dec. 20	33.62	Mar. 20	33.40
Dec. 27	33.30	Jan. 16, 1935	33.63	Apr. 17	33.40
Jan. 20, 1931	33.28	Mar. 20	33.67	May 14	a 33.89
Mar. 17	33.30	May 16	33.71	June 18	33.46
May 1	33.33	June 14	33.68	July 23	33.51
June 2	33.33	July 16	33.58	Aug. 14	33.37
July 2	33.37	Aug. 12	33.57	Sept.23	33.38
31	33.38	Sept.17	33.38	Oct. 16	33.40
Sept. 1	33.40	Oct. 17	33.39	Nov. 14	33.37
Oct. 2	33.42	Nov. 19	33.40	Dec. 15	33.40
Nov. 3	33.41	Jan. 12, 1936	33.38	Jan. 12, 1939	33.38
Sept. - 1932	33.44	Feb. 14	33.46	Feb. 3	33.32
Oct. -	33.38	Mar. 15	33.46	Mar. 15	33.33
Nov. -	33.39	Apr. 19	33.45	Apr. 21	33.38
Dec. 16	33.33	May 18	33.55	May 20	33.41
Jan. 19, 1933	33.37	June 16	33.58	June 18	33.42
Feb. 17	33.39	July 14	33.61	July 23	33.44
Mar. -	33.37	Aug. 14	33.64	Aug. 17	32.91
Apr. 18	33.40	Sept.18	33.64	Sept.19	32.68
May 15	33.43	Oct. 17	33.60	Oct. 16	32.54
June 6	33.47	Nov. 12	33.61	Nov. 11	32.47
July -	33.52	Dec. 14	33.60	Dec. 17	32.67
Aug. 31	33.51	Jan. 14, 1937	33.62	Jan. 16, 1940	32.69
Sept.19	33.45	Feb. 16	33.62	Feb. 4	32.69
Oct. 19	33.54	Mar. 15	33.64	Mar. 10	32.73
Nov. 18	33.55	Apr. 19	33.65	Apr. 14	32.74
Dec. 19	33.55	May 19	33.66	May 12	32.80
Jan. 19, 1934	33.57	June 15	33.65	June 15	32.81
Feb. 23	33.55	July 4	33.65	July 13	32.79
Nov. 20	33.57	Aug. 16	33.65	Aug. 25	32.90
Apr. 17	33.60	Sept.17	33.59	Sept.26	32.92
May 13	33.59	Oct. 20	33.58	Oct. 18	32.91
June 17	33.60	Nov. 23	33.58	Nov. 17	32.90
July 19	33.64	Dec. 18	33.57	Dec. 21	32.99
Aug. 19	33.64				

17.37.13.31. John Catchings. Unused drilled well, diameter 14 inches, depth 100 feet. Measuring point, surface of concrete curb, north side of well, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 6, 1939, 28.40; Feb. 4, 1940, 28.56.

a Measurement probably inaccurate.

Lea County--Continued.

17.37.26.33. Mrs. Dave B. Wilhoit. Used dug and drilled irrigation well, diameter 3 by 5-feet (pit), depth 117 feet. Measuring point, Jan. 7, 1938, top inside edge of concrete well curb, south side of well, 0.30 foot below land surface datum, not accurately referenced to old measuring point, possible discrepancy of a few tenths of a foot between preceding and succeeding records. Water levels, in feet below land surface datum: Nov. 19, 1929, 25.94; Jan. 7, 1938, 28.35; Feb. 6, 1939, 28.59; Feb. 5, 1940, 28.99.

17.37.36.141. M. J. Waltman, State school land. Used dug and drilled irrigation well, diameter 15½ inches, depth 120 feet. Measuring point, top edge of casing, surrounded by concrete, east side of well, 0.15 foot below lower edge of pump base, 1.00 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 6, 1939, 25.88; Feb. 5, 1940, 26.15.

17.38.30.113. W. H. Martin. Used dug and drilled irrigation well. Measuring point, top inside edge of concrete curb, center of west side of well, level with land surface datum. Water levels, in feet below land surface datum: Jan. 7, 1938, 27.37; Feb. 6, 1939, 27.64; Feb. 4, 1940, 27.74.

17.38.30.312. Formerly A-9. Colan M. Hawkins. Used dug and drilled irrigation well, diameter 7 inches, depth 66 feet. Measuring point, top edge of USGS washer on north top side of south crossbeam, east of vertical frame post, 0.50 foot above land surface datum.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1929	28.69	Jan. 19, 1934	29.19	July 4, 1937	30.33
Feb. 20, 1930	28.82	Feb. 23	29.20	Aug. 16	(a)
June 11	29.54	Mar. 20	29.20	Sept.17	30.30
Aug. 1	29.41	Apr. 17	29.16	Oct. 19	30.03
Sept.26	29.39	May 13	29.65	Nov. 23	30.04
Oct. 31	29.12	June 17	31.21	Jan. 7, 1938	29.81
Dec. 26	28.99	July 19	(a)	Feb. 15	29.82
Jan. 21, 1931	29.02	Aug. 19	30.78	Mar. 20	29.88
Mar. 26	29.48	Sept.16	30.74	Apr. 17	(a)
May 1	29.21	Oct. 26	30.66	May 14	31.02
June 2	29.57	Nov. 16	29.67	June 18	30.55
July 2	30.47	Dec. 20	29.56	July 23	30.46
31	29.97	Jan. 16, 1935	29.57	Aug. 14	31.96
Sept. 1	29.71	Mar. 20	29.69	Sept.19	b 36.48
Oct. 2	(a)	Apr. 14	30.82	Nov. 14	30.42
Nov. 3	29.40	May 16	30.98	Dec. 15	30.36
Dec. 12	29.30	June 14	(a)	Jan. 12, 1939	30.11
Jan. 19, 1932	29.38	July 16	(a)	Feb. 13	30.09
Feb. 6	29.34	Aug. 12	(a)	Mar. 15	30.11
Mar. 20	29.43	Sept.17	30.63	Apr. 21	(a)
Apr. 21	29.58	Oct. 17	30.14	May 20	(a)
May 18	29.83	Nov. 19	29.93	June 18	(c)
June 5	29.61	Dec. 16	29.91	July 23	30.96
July 1	29.84	Jan. 12, 1936	30.35	Aug. 17	30.38
Aug. 7	b 30.85	Feb. 14	(a)	Sept.19	30.76
Sept. -	29.61	Mar. 15	28.82	Oct. 16	30.47
Oct. -	29.21	Apr. 18	c 31.27	Nov. 11	30.33
Nov. -	29.13	May 18	31.26	Dec. 17	30.19
Dec. 16	29.01	June 16	31.47	Jan. 16, 1940	30.13
Jan. 19, 1933	28.99	July 14	d 32.10	Feb. 4	30.15
Feb. 17	29.00	Aug. 14	31.49	Mar. 10	30.33
Mar. -	28.87	Sept.18	30.70	Apr. 14	30.42
Apr. 18	29.45	Oct. 17	29.81	May 12	(a)
May 15	29.56	Nov. 12	29.70	June 15	30.99
June 6	(a)	Dec. 14	29.60	July 13	b 30.84
July -	31.23	Jan. 14, 1937	29.59	Aug. 25	(a)
Aug. 31	31.86	Feb. 16	29.58	Sept.26	31.05
Sept.19	29.64	Mar. 15	29.54	Oct. 18	30.74
Oct. 19	29.51	Apr. 19	29.70	Nov. 17	30.99
Nov. 18	29.25	May 19	30.74	Dec. 22	30.38
Dec. 19	29.20	June 15	30.30		

a Pumping. b Pumped lately. c Pumped day before.
d Measuring point changed. New measuring point could not be accurately referenced to old; possible discrepancy of a few tenths of a foot between preceding and succeeding records.

Lea County--Continued.

18.36.27.111. State land. Located 40 feet south and 20 feet east of corner fence post, east of fence post painted orange. Unused drilled well, diameter 6 inches. Measuring point, inside top edge of sewer tile casing, north side of well, 0.20 foot below land surface datum.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Feb. 8, 1939	41.25	Oct. 16, 1939	41.43	June 15, 1940	41.41
Mar. 15	41.30	Nov. 11	41.42	July 13	41.55
Apr. 20	41.29	Dec. 17	41.42	Aug. 25	41.58
May 20	41.34	Jan. 16, 1940	41.44	Sept.26	41.61
June 18	41.35	Feb. 3	41.44	Oct. 18	41.64
July 23	41.56	Mar. 10	41.47	Nov. 17	41.61
Aug. 17	40.95	Apr. 14	41.48	Dec. 18	41.65
Sept.19	41.39	May 12	41.47		

18.38.2.131. Sam Dalmont. Used dug and drilled irrigation well. Measuring point, top east edge of east 2 by 6-inch steel channel, 6 inches south of east vertical frame post, 0.20 foot below surface of concrete curb, 0.50 foot above land surface datum. Water levels, in feet below land surface datum: Feb. 7, 1939, 30.28; Feb. 3, 1940, 30.64.

18.38.4.232. Formerly A-8. J. R. Isaacs. Used dug and drilled irrigation well, diameter 9 inches, depth 82 feet. Measuring point, top edge of USGS washer on west edge of 4 by 4-inch board, 6 inches west and 1 foot north of vertical pump shaft, 0.30 foot above land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete, 42.3 feet south of measuring point, 1.3 feet east of locust tree, 0.28 foot below measuring point. Well is used to fill swimming pool and irrigate small acreage.

Water level, in feet below land-surface datum, 1929-40

Nov. 19, 1929	23.69	Feb. 23, 1934	24.49	Sept.17, 1937	24.14
Feb. 20, 1930	23.84	Mar. 20	24.40	Oct. 19	24.42
Aug. 1	24.01	Apr. 17	24.40	Nov. 23	24.52
Sept.26	24.01	May 13	24.72	Dec. 18	24.58
Oct. 31	23.97	June 17	24.48	Jan. 17, 1938	24.60
Dec. 26	24.05	July 19	24.46	Feb. 15	24.67
Jan. 21, 1931	24.08	Aug. 19	24.51	Mar. 20	24.36
Mar. 26	24.00	Sept.16	24.52	Apr. 17	24.71
May 1	23.55	Oct. 26	24.52	May 14	24.78
June 2	a 25.14	Nov. 16	24.54	June 18	25.45
July 1	24.25	Dec. 20	24.53	July 23	25.40
31	24.19	Jan. 16, 1935	24.58	Aug. 14	25.08
Sept. 1	24.15	Mar. 20	24.57	Sept.19	(c)
Oct. 2	24.17	Apr. 14	24.64	Nov. 14	24.92
Nov. 3	24.17	May 16	24.67	Dec. 15	24.91
Dec. 12	24.21	June 14	24.82	Jan. 12, 1939	25.02
Jan. 19, 1932	24.24	July 16	(c)	Feb. 3	25.02
Feb. 6	24.26	Aug. 12	(c)	Mar. 15	25.00
Mar. 20	24.26	Sept.17	24.77	Apr. 21	25.04
Apr. 21	b 25.08	Oct. 17	24.69	May 20	24.65
May 18	24.34	Nov. 19	24.76	June 18	24.59
Jan. 5, 1932	24.27	Dec. 16	24.80	July 23	b 25.53
July 1	24.26	Jan. 12, 1936	24.86	Aug. 17	b 25.54
Aug. 7	24.56	Feb. 14	24.82	Sept.19	25.00
Sept. -	25.22	Mar. 16	24.93	Oct. 16	25.13
Oct. -	24.18	Apr. 19	24.91	Nov. 11	25.52
Nov. -	24.17	May 18	25.06	Dec. 17	25.16
Dec. 16	24.20	June 16	24.96	Jan. 16, 1940	25.59
Jan. 19, 1933	24.22	July 14	24.97	Feb. 3	25.20
Feb. 17	24.24	Aug. 14	25.06	Mar. 10	25.23
Mar. -	24.29	Sept.17	25.00	Apr. 14	25.22
Apr. 18	24.27	Oct. 16	24.92	May 12	25.34
May 15	24.36	Nov. 12	24.80	June 15	b 25.80
June 6	24.42	Dec. 14	24.80	July 13	(c)
July -	24.55	Jan. 14, 1937	24.80	Aug. 25	24.42
Aug. 31	24.32	Feb. 16	24.77	Sept.26	25.19
Sept.19	24.35	Mar. 15	24.86	Oct. 18	25.47
Oct. 19	24.36	Apr. 19	24.59	Nov. 17	25.49
Nov. 18	24.35	June 15	25.09	Dec. 21	25.38
Dec. 19	24.37	July 4	25.08		
Jan. 19, 1934	24.37	Aug. 16	25.00		

a Pumped the day before. b Pumped lately. c Pumping.

Lea County--Continued.

18.38.15.4. W. L. Greebon. Unused drilled well, diameter 12 inches, depth 107 feet. Measuring point, top edge of casing, east side of well, 0.23 foot above concrete curb around well, 0.23 foot above land surface datum. A used irrigation well, depth 102 feet, is located 6 feet southwest of observation well. Water level, in feet below land surface datum, 1940: Feb. 3, 28.62.

18.38.22.321. Earl C. Scott. Used drilled irrigation well, diameter 12 inches, depth 118 feet. Measuring point, top edge of casing, west side of well, 0.32 foot below base of pump, level with land surface datum. Water levels, in feet below land surface datum: Aug. 25, 1939, 38.04; Feb. 3, 1940, 35.32.

18.38.22.412. R. V. Holman. Used drilled irrigation well, diameter 12 (?) inches, depth 95 feet. Measuring point, top edge of east ½-inch hole in north side of pump base, 0.08 foot above concrete curb, and land surface datum. Water level, in feet below land surface datum, 1940: Feb. 3, 38.27.

18.38.26.343. Mr. Morrison. Used drilled irrigation well, diameter 12 inches, depth 135 feet. Measuring point, lower inside edge of hole in north side of pump case shell, 0.92 foot above surface of concrete pump base, 10.00 feet above land surface datum. Water levels, in feet below land surface datum: Aug. 25, 1939, 41.57; Feb. 3, 1940, 40.66.

18.38.30.2. Formerly Getty. Mrs. Sadie Davis. Located in east end of shed that is northeast of oil storage tank and south of a few oil company houses. Unused drilled well, diameter 6 inches, depth 50.4 feet. Measuring point, top edge of casing, south side of well, 0.30 foot above land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete, 34 feet south of well, in line with and 70 feet north of another water well, 24 feet east of base of large storage tank, 0.36 foot below measuring point.

Water level, in feet below land-surface datum, 1931-40

Date	Water level	Date	Water level	Date	Water level
Jan. 21, 1931	27.56	Aug. 19, 1934	27.24	Nov. 23, 1937	26.94
June 2	27.41	Sept.16	27.26	Dec. 18	26.95
July 31	27.40	Oct. 26	27.22	Jan. 7, 1938	26.96
Sept. 1	27.44	Nov. 16	27.19	Feb. 15	26.98
Oct. 2	27.41	Dec. 20	27.17	Mar. 20	26.97
Nov. 3	27.68	Jan. 16, 1935	27.20	Apr. 17	27.04
Dec. 12	27.38	Mar. 20	a 26.97	May 14	27.00
Jan. 19, 1932	27.37	Apr. 14	27.39	June 18	27.14
Feb. 6	27.35	May 16	27.38	July 21	27.16
Mar. 20	27.38	June 14	a 26.81	Aug. 14	26.70
Apr. 21	27.45	July 16	27.47	Sept.19	26.96
May 18	27.43	Aug. 12	27.48	Oct. 16	26.92
June 5	27.43	Sept.17	27.43	Nov. 14	27.17
July 2	27.36	Oct. 17	27.36	Dec. 12	27.07
Aug. 7	27.29	Nov. 19	27.34	Jan. 12, 1939	27.10
Sept. -	27.26	Dec. 16	27.29	Feb. 3	27.10
Oct. -	28.87	Jan. 12, 1936	27.31	Mar. 15	27.09
Nov. -	29.82	Feb. 14	27.33	Apr. 21	27.12
Dec. 16	28.11	Mar. 15	27.38	May 20	27.27
Jan. 19, 1933	27.37	Apr. 19	27.40	June 18	27.24
Feb. 17	27.28	May 18	27.39	July 23	27.33
Mar. 17	27.22	June 16	27.63	Aug. 17	27.36
Apr. 18	27.22	July 14	27.60	Sept.19	27.52
May 15	27.27	Aug. 14	27.61	Oct. 16	27.46
June 6	27.33	Sept.18	27.57	Nov. 11	27.33
July -	a 28.53	Oct. 17	27.31	Dec. 17	27.23
Aug. 31	27.55	Nov. 12	27.25	Jan. 16, 1940	27.31
Sept.19	27.16	Dec. 14	27.60	Feb. 3	27.24
Oct. 19	27.02	Jan. 13, 1937	27.38	Mar. 10	27.22
Nov. 18	26.93	Feb. 16	27.44	Apr. 14	27.26
Dec. 19	26.90	Mar. 15	27.19	May 12	27.31
Jan. 19, 1934	26.94	Apr. 19	27.38	June 15	27.39
Feb. 23	26.87	May 19	27.27	July 13	27.40
Mar. 20	26.91	June 15	a 28.63	Aug. 25	27.35
Apr. 17	26.93	July 4	a 28.61	Sept.26	27.29
May 13	27.06	Aug. 16	27.09	Oct. 18	27.32
June 17	27.10	Sept.17	27.03	Nov. 17	27.32
July 19	27.13	Oct. 19	26.99	Dec. 24	27.15

a Measurement probably inaccurate.

Lea County--Continued.

19.35.13.211. Formerly A-2. Clara Fowler. Located on west side of earthen reservoir, about 600 feet west of orchard and two windmills. Unused dug and drilled well, diameter 3 by 5-feet (pit), depth 59 feet. Measuring point, top edge of USGS washer on top south edge of 4 by 4-inch board across north side of pit, 0.40 foot west of east side of pit, 0.33 foot above land surface datum. Reference point 1, top of concrete curb, near middle of west side of pit, at "x" mark, 0.33 foot below measuring point. Reference point 2, top of 14 by 5/8-inch bolt set in concrete, 47 feet northwest of well, 25 feet west of corner fence post, 2.5 feet east of third post west from corner post, 1.0 foot south of fence line, 0.14 foot above measuring point. Well was equipped with windmill during early part of record.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Sept.19, 1929	23.76	Dec. 19, 1933	22.16	Aug. 16, 1937	22.62
Nov. 25	23.69	Jan. 19, 1934	22.17	Sept.17	22.42
Feb. 20, 1930	a 26.67	Feb. 23	22.32	Oct. 19	22.39
June 13	24.11	Mar. 20	a 24.38	Nov. 23	22.40
July 31	b 30.06	Apr. 17	22.41	Dec. 18	22.42
Oct. 31	23.77	May 13	a 25.13	Jan. 13, 1938	22.40
Dec. 27	a 26.34	June 17	22.85	Feb. 15	22.45
Jan. 21, 1931	24.59	July 19	22.56	Mar. 20	22.49
Mar. 19	23.87	Aug. 19	22.79	Apr. 17	22.08
May 2	c 23.21	Sept.16	22.85	May 14	22.08
June 2	a 22.33	Oct. 26	22.83	June 18	22.60
July 1	a 25.33	Nov. 16	22.51	July 21	22.59
31	a 28.69	Dec. 20	22.57	Aug. 14	22.57
Sept. 1	a 24.40	Jan. 15, 1935	22.59	Sept.19	22.51
Oct. 2	23.68	Mar. 20	22.70	Oct. 16	22.52
Nov. 3	24.15	Apr. 14	22.70	Nov. 14	22.53
Dec. 12	24.08	May 17	22.70	Dec. 12	22.52
Jan. 19, 1932	23.78	July 16	22.60	Feb. 3, 1939	22.56
Feb. 6	b 25.97	Aug. 12	22.61	Mar. 15	22.58
Mar. 20	23.80	Sept.17	22.57	Apr. 21	22.53
Apr. 21	a 27.41	Oct. 17	22.52	May 20	22.66
May 18	24.65	Nov. 19	22.50	June 18	22.67
June 5	23.56	Dec. 16	22.51	July 23	22.69
July 2	23.71	Jan. 12, 1936	22.46	Aug. 17	22.70
Aug. 7	a 26.71	Feb. 14	22.45	Sept.19	22.68
Sept. -	23.72	Mar. 15	22.52	Oct. 16	22.67
Oct. -	23.07	Apr. 19	22.56	Nov. 11	22.84
Nov. -	23.04	May 18	22.64	Dec. 17	22.84
Dec. 16	23.03	June 16	22.56	Jan. 16, 1940	22.91
Jan. 19, 1933	22.85	July 14	22.61	Feb. 3	22.95
Feb. 17	a 24.17	Sept.18	22.74	Mar. 10	22.94
Mar. -	22.89	Oct. 16	22.62	Apr. 14	23.03
Apr. 18	a 24.17	Nov. 12	22.55	May 12	23.08
May 15	23.08	Dec. 14	22.65	June 15	23.31
June 6	a 28.55	Jan. 14, 1937	22.39	July 13	23.28
July -	22.88	Feb. 14	22.45	Aug. 25	23.33
Aug. 31	22.87	Apr. 19	22.59	Sept.26	23.35
Sept.19	22.10	May 19	22.56	Oct. 18	23.37
Oct. 19	22.10	June 15	22.61	Nov. 17	23.37
Nov. 18	22.11	July 4	22.55	Dec. 22	23.40

19.35.24.222. A. R. Brashears. Unused dug and drilled irrigation well, depth 50 feet. Measuring point, top edge of USGS washer on top inside east edge of west 6 by 6-inch timber across west side of pit, 2.00 feet south of northwest corner of pit, 0.40 foot below land surface datum. Water levels, in feet below land surface datum: Feb. 8, 1939, 19.84; Feb. 3, 1940, 20.07.

19.36.19.131. Louis S. Evans Estate. Unused dug and drilled well. Measuring point, top edge of USGS washer on east top edge of wooden well curb, west side of pit, 2.2 feet north of southwest corner of pit, level with land surface datum. Water levels, in feet below land surface datum: Feb. 3, 1939, 17.02; Feb. 3, 1940, 17.15; Sept. 26, 1940, 17.37.

a Windmill pumping. b Windmill pumped lately.
c Measuring point changed. New measuring point could not be accurately referenced to old, possible discrepancy of a few tenths of a foot between preceding and succeeding records.

Lea County--Continued.

19.36.32.111. S. P. Jordan. Used dug and drilled irrigation well, depth 71 feet. Measuring point, top edge of concrete well curb, west side of pit, 6 inches north of west vertical frame post, 2.00 feet above land surface datum. Water levels, in feet below land surface datum: Feb. 6, 1939, 16.77; Feb. 3, 1940, 18.60.

19.37.32.131. Formerly A-4. Mrs. E. A. Anderson. Located 50 feet north of a windmill. Unused dug well, diameter 8 feet, depth 28 feet. Measuring point, top edge of USGS washer on west side of opening into well, 0.50 foot below land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete in old fence line, 44.5 feet west of measuring point, 7.6 feet north of fence post, in line with measuring point and old windmill at house 300 feet east of well, 0.34 foot above measuring point. Equipped with centrifugal pump until May 1933.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 20, 1929	11.90	Feb. 23, 1934	11.71	Aug. 16, 1937	12.10
Feb. 20, 1930	11.93	Mar. 20	11.94	Sept.17	12.07
June 12	11.92	Apr. 17	11.88	Oct. 19	11.97
July 31	11.89	May 5	13.00	Nov. 23	12.13
Sept.26	11.89	June 17	13.89	Dec. 18	12.16
Oct. 31	11.67	July 19	11.94	Jan. 7, 1938	12.18
Dec. 27	11.69	Aug. 19	11.77	Feb. 15	12.18
Jan. 21, 1931	12.25	Sept.16	11.82	Mar. 20	12.13
Mar. 19	12.02	Oct. 26	11.69	Apr. 17	12.19
May 2	12.18	Nov. 16	11.82	May 14	12.24
June 2	a 14.68	Dec. 20	11.74	June 18	11.96
July 1	b 19.76	Jan. 15, 1935	11.98	July 21	11.77
31	c 25.51	Mar. 20	12.02	Aug. 14	11.88
Sept. 1	d 15.37	Apr. 14	12.03	Sept.19	12.31
Oct. 2	12.03	May 17	12.77	Oct. 16	12.03
Nov. 3	11.78	June 15	12.23	Nov. 14	12.08
Dec. 12	11.62	July 16	12.07	Dec. 12	12.33
Jan. 19, 1932	11.74	Aug. 12	12.20	Jan. 12, 1939	11.98
Feb. 6	11.74	Sept.17	12.00	Feb. 3	12.12
Mar. 20	11.72	Oct. 17	e 12.23	Mar. 15	12.16
Apr. 21	e 13.11	Nov. 19	e 12.02	Apr. 21	12.17
May 18	11.52	Dec. 16	12.00	May 20	12.19
June 5	e 12.04	Jan. 12, 1936	12.03	June 18	12.18
July 2	11.79	Feb. 14	12.15	July 23	11.95
Aug. 7	12.05	Mar. 15	12.17	Aug. 17	11.82
Sept. -	11.54	Apr. 19	12.10	Sept.19	11.92
Oct. -	10.89	May 18	12.09	Oct. 16	11.93
Nov. -	11.18	June 16	12.07	Nov. 11	11.98
Dec. 16	11.36	July 14	12.06	Dec. 17	12.06
Jan. 19, 1933	11.50	Aug. 14	12.11	Jan. 16, 1940	12.12
Feb. 17	11.88	Sept.17	12.28	Feb. 3	12.15
Mar. -	11.71	Oct. 17	12.16	Mar. 10	12.17
Apr. 18	12.38	Nov. 12	12.34	Apr. 14	11.95
May 15	12.02	Dec. 14	12.47	May 12	12.18
June 6	12.47	Jan. 13, 1937	12.31	June 15	12.30
July -	12.13	Feb. 14	12.45	July 13	11.79
Aug. 31	11.68	Mar. 15	12.30	Aug. 25	11.98
Sept. 9	11.56	Apr. 17	12.27	Sept.26	12.04
Oct. 19	11.74	May 19	12.26	Oct. 18	11.73
Nov. 18	11.77	June 15	11.96	Nov. 17	12.02
Dec. 19	11.67	July 4	11.95	Dec. 22	12.00
Jan. 19, 1934	11.66				

20.35.1.222. Formerly A-3. J. L. Wood. Unused dug and drilled well, diameter 4 by 4-feet (pit), depth 27.5 feet (pit). Measuring point, top edge of USGS washer in middle of 1 by 6-inch board across east side of well, 2.00 feet above land surface datum. Reference point, top of 14 by 5/8-inch bolt, set in concrete in east-west fence line, about 100 feet north of measuring point, in line with old water ditch running north from well to fence, 3.2 feet west from large fence post, 14.5 feet east from small fence post, 2.43 feet below measuring point. Water stage recorder installed Aug. 16, 1937, removed Oct. 16, 1938.

a Pumped lately. b Pump stopped for 15 minutes.
c Pumping approximately 25 gallons a minute.
d Pump stopped for 2½ hours. e Windmill to south pumping.

Lea County--Continued.

20.35.1.222. Formerly A-3.--Continued.

Water level, in feet below land-surface datum, 1929-40

Date	Water level	Date	Water level	Date	Water level
Nov. 20, 1929	25.07	Feb. 23, 1934	25.30	Sept.17, 1937	24.57
Feb. 20, 1930	25.14	Mar. 20	25.29	Oct. 19	24.67
July 31	25.27	Apr. 17	25.33	Nov. 23	24.78
Sept.26	25.33	May 13	25.36	Dec. 18	24.81
Oct. 31	24.96	June 17	25.35	Jan. 13, 1938	24.91
Dec. 27	24.80	July 19	25.35	Feb. 15	24.99
Jan. 21, 1931	25.03	Sept.16	a 24.99	Mar. 20	24.99
Mar. 19	25.10	Oct. 26	24.98	Apr. 16	25.05
May 2	24.81	Nov. 16	25.05	May 14	25.07
June 2	25.05	Dec. 20	25.12	June 18	25.04
July 1	24.95	Jan. 15, 1935	25.13	July 21	25.12
31	24.84	Mar. 20	25.21	Aug. 14	25.05
Sept. 1	24.79	Apr. 13	25.24	Sept.19	25.06
Oct. 2	24.81	May 17	25.25	Oct. 16	25.08
Nov. 3	24.89	June 15	25.28	Nov. 14	25.13
Dec. 12	24.88	July 16	25.33	Dec. 12	25.10
Jan. 19, 1932	25.03	Aug. 12	25.32	Jan. 12, 1939	25.17
Feb. 6	25.21	Sept.17	25.32	Feb. 3	25.21
Mar. 20	25.27	Oct. 17	25.30	Mar. 15	25.24
Apr. 21	25.36	Nov. 19	25.24	Apr. 21	25.19
May 18	25.12	Dec. 16	25.28	May 20	25.23
June 5	25.00	Jan. 12, 1936	b 24.77	June 18	25.25
July 2	24.94	Feb. 14	b 24.74	July 23	25.23
Aug. 7	24.83	Mar. 15	25.35	Aug. 17	25.24
Sept. -	24.81	Apr. 19	25.36	Sept.19	25.19
Oct. -	24.82	May 18	25.35	Oct. 16	25.22
Nov. -	24.64	June 16	25.28	Nov. 11	25.33
Dec. 16	24.58	July 14	b 26.12	Dec. 17	25.36
Jan. 19, 1933	24.68	Aug. 14	25.30	Jan. 16, 1940	25.39
Feb. 17	24.71	Sept.18	25.68	Feb. 3	25.42
Mar. -	24.80	Oct. 17	25.25	Mar. 10	25.44
Apr. 18	24.82	Nov. 12	25.33	Apr. 14	25.46
May 15	24.91	Dec. 14	25.25	May 12	25.48
June 6	24.93	Jan. 14, 1937	25.46	June 15	25.46
July -	24.99	Feb. 14	25.46	July 13	25.49
Aug. 31	25.03	Mar. 15	25.67	Aug. 25	25.50
Sept.19	25.06	Apr. 19	25.52	Sept.26	25.54
Oct. 19	25.07	May 19	25.57	Oct. 18	25.67
Nov. 18	25.08	June 15	25.47	Nov. 17	25.58
Dec. 19	25.20	July 4	25.45	Dec. 22	25.60
Jan. 19, 1934	25.24	Aug. 12	24.89		

20.37.9.11. Formerly A-5. W. H. Van Laughlin. Located at southwest corner of earthen reservoir. Unused dug and drilled well, diameter 4 by 6-feet (pit), depth 53 feet. Measuring point, top edge of USGS washer on top east edge, near middle, of second 2 by 10-inch board from east side of well, level with land surface datum. Reference point, top of 14 by 5/8-inch bolt set in concrete, 22.5 feet east of well on south side of earth tank, 8 feet east of first clump of salt cedar, 1 foot south of second, and 6 feet west of third clump, 0.56 foot below measuring point. This well and nearby wells were equipped with pumps from June 1934 until about the end of 1937 and furnished water for rotary drilling.

Water level, in feet below land-surface datum, 1929-36, 1938-40

Nov. 20, 1929	31.29	June 2, 1931	31.45	Apr. 21, 1932	32.90
Feb. 20, 1930	31.18	July 1	32.11	May 18	32.96
June 12	31.54	31	32.75	June 5	32.96
July 31	32.04	Sept. 1	32.92	July 2	33.25
Sept.26	32.60	Oct. 2	33.25	Aug. 7	33.62
Oct. 31	32.09	Nov. 3	33.09	Sept. -	33.72
Dec. 27	31.86	Dec. 12	33.14	Oct. -	33.29
Jan. 21, 1931	31.69	Jan. 19, 1932	33.14	Nov. -	33.03
Mar. 19	31.82	Feb. 6	33.11	Dec. 16	32.68
May 1	31.39	Mar. 20	33.00	Jan. 19, 1933	32.41

a Measuring point changed. New measuring point not accurately referenced to old, possible discrepancy of a few tenths of a foot between preceding and succeeding records.

b Measurement probably inaccurate.

Lea County--Continued.

20.37.9.11. Formerly A-5.--Continued.

Water level, in feet below land-surface datum, 1929-36, 1938-40

Date	Water level	Date	Water level	Date	Water level
Feb. 17, 1933	32.39	Mar. 20, 1935	a 42.92	Jan. 12, 1939	38.06
Mar. -	32.23	Apr. 13	a 42.09	Feb. 3	38.10
Apr. 18	32.25	May 17	43.60	Mar. 15	37.84
May 15	31.86	June 15	40.27	Apr. 21	37.64
June 6	32.39	Aug. 12	47.54	May 20	37.50
July -	32.96	Sept.17	a 50.98	June 18	37.47
Aug. 31	33.48	Oct. 17	(a)	July 23	37.62
Sept.19	33.17	Nov. 19	a 51.09	Aug. 17	37.58
Oct. 19	33.13	Dec. 16	(a)	Sept.19	37.87
Nov. 18	33.16	Jan. 12, 1936	(a)	Oct. 16	37.85
Dec. 19	33.05	Feb. 14	a 49.10	Nov. 11	37.66
Jan. 19, 1934	33.03	Nov. 15	(a)	Dec. 17	37.46
Feb. 23	32.94	Jan. 7, 1938	42.40	Jan. 16, 1940	37.42
Mar. 20	32.89	Feb. 15	41.80	Feb. 3	37.36
Apr. 17	32.86	Mar. 20	41.33	Mar. 10	37.25
May 13	32.84	Apr. 17	41.06	Apr. 14	37.14
June 17	a 39.87	May 14	40.28	May 12	37.16
July 19	a 37.92	June 18	40.54	June 15	37.43
Aug. 19	a 47.07	July 21	40.32	July 13	37.50
Sept.16	a 44.73	Aug. 14	b 38.97	Aug. 25	37.83
Oct. 26	a 41.95	Sept.19	39.23	Sept.26	37.94
Nov. 16	a 44.12	Oct. 16	39.16	Oct. 18	37.92
Dec. 20	a 39.14	Nov. 14	38.78	Nov. 17	37.65
Jan. 15, 1935	a 43.41	Dec. 12	38.40	Dec. 22	37.69

LUNA COUNTY

MIMBRES VALLEY

By Clyde S. Conover

The program of measuring water levels in observation wells in the Mimbres Valley and of gathering information on the amount of water pumped, along with other pertinent data, was continued during 1940 in financial cooperation with the State engineer of New Mexico, T. M. McClure.

No reports on the water levels in the Mimbres Valley were published during 1940. The complete record of water-level measurements from the beginning of record through 1939 have been published in Water-Supply Paper 886.

There was a slight increase in 1940 in the acreage irrigated by ground-water in the Mimbres Valley, which caused an increase in the amount of pumpage of ground-water. A slight increase of pumpage also may have been caused by the deficient amount of rainfall, which at Deming in 1940 was 3.27 inches less than the normal of 9.00 inches, according to the United States Weather Bureau. The precipitation for the growing season, April through September, was 2.81 inches below normal.

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a Pumping. b Measurement probably inaccurate.

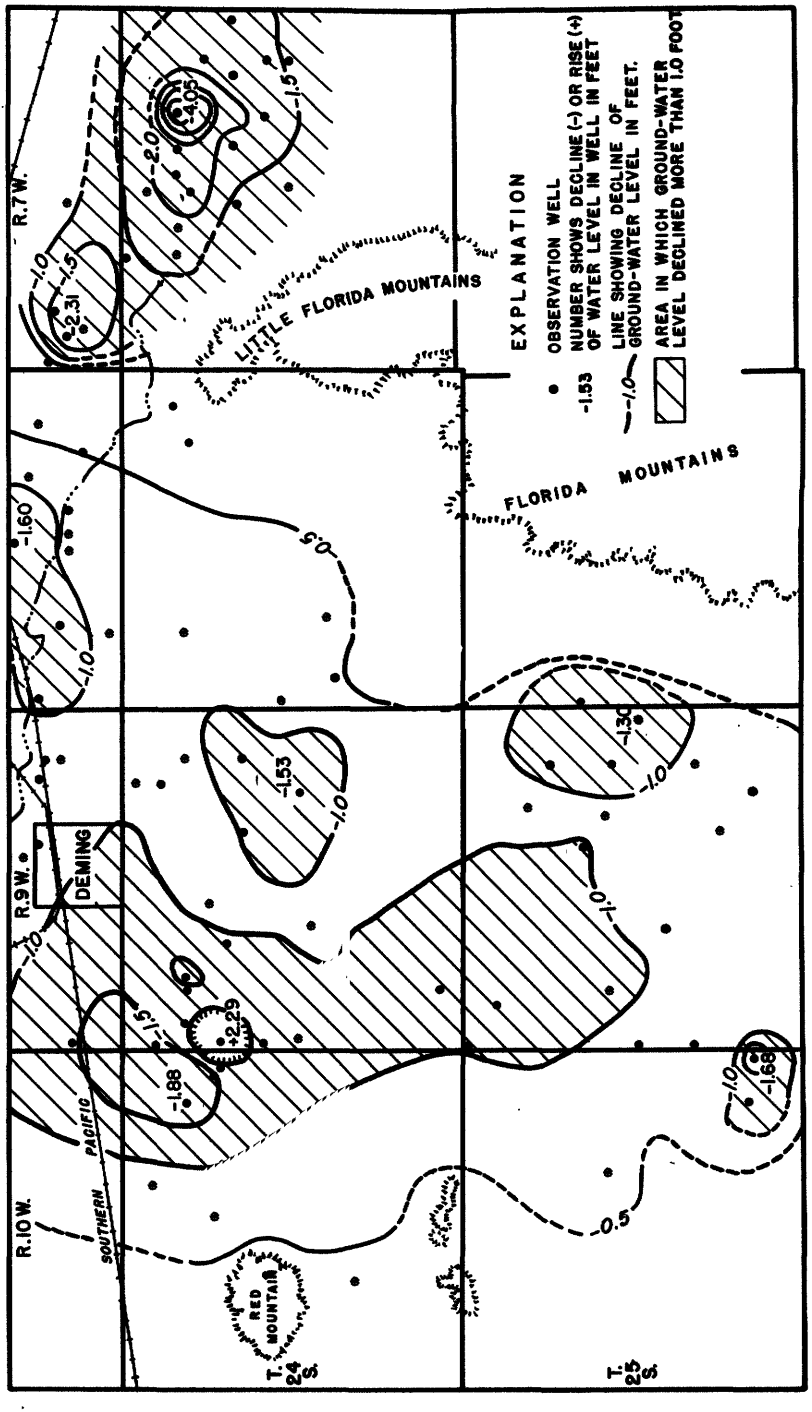

Figure 12.-- Map of a part of the Mimbres Valley, N. Mex., showing change in ground-water level from January 1940 to January 1941.

About 127 wells were under observation at the end of 1940. Of these wells, about 63 are measured at 2-month intervals and the rest are measured once a year, usually in January. The observation wells consist of both used and unused wells distributed over the valley. The measurements obtained on the observation wells measured once a year are used in preparing maps showing the change in ground-water levels in the Mimbres Valley for various periods of record. The bi-monthly well readings show the trend and change in ground-water levels throughout the year. During 1940, 5 water-stage recorders were in operation.

The change in ground-water levels in the Mimbres Valley from January 1940 to January 1941 is shown in an accompanying illustration. In this period the ground-water levels declined over the whole area, and in the area of pumping they declined more than 0.50 foot except in 10 observation wells. The area over which the ground-water level declined more than 1 foot in 1940 was about 81 square miles--about 25 square miles more than in 1939--and the area over which it declined more than 1.5 feet was about 46 square miles---about 29 square miles more than in 1939. The areas in which the decline amounted to more than 1 foot are in general those in which large amounts of ground-water are pumped for irrigation.

In the heavily pumped area, east of the Little Florida Mountains, the ground-water level declined a maximum of 4.05 feet in well 24.7.11.111, and declined more than 1.5 feet in all except 4 observation wells.

The maximum decline of ground-water level observed in the small area of heavy pumping, west of the ground-water dam extending north from the Little Florida Mountains, was 1.60 feet while most of the water levels in the observation wells declined more than 1 foot. In this area the water levels in 5 observation wells declined less than 0.5 foot.

The ground-water levels in the area of heavy pumping west of Deming, declined a maximum of 1.88 feet in well 24 10.12.111, and more than 1 foot over the whole pumped area except in observation well 24.9.7.331, which showed a rise of 2.29 feet during the year. The rise of water level in this well was caused by the deepening in March 1940 of an irrigation well, about 60 feet distant, to a depth of about 245 feet with a consequent rise in water level.

In the lightly pumped area, from about 7 to 12 miles south of Deming, the ground-water level declined a maximum of 1.30 feet, and more than 0.7 foot in all the wells measured.

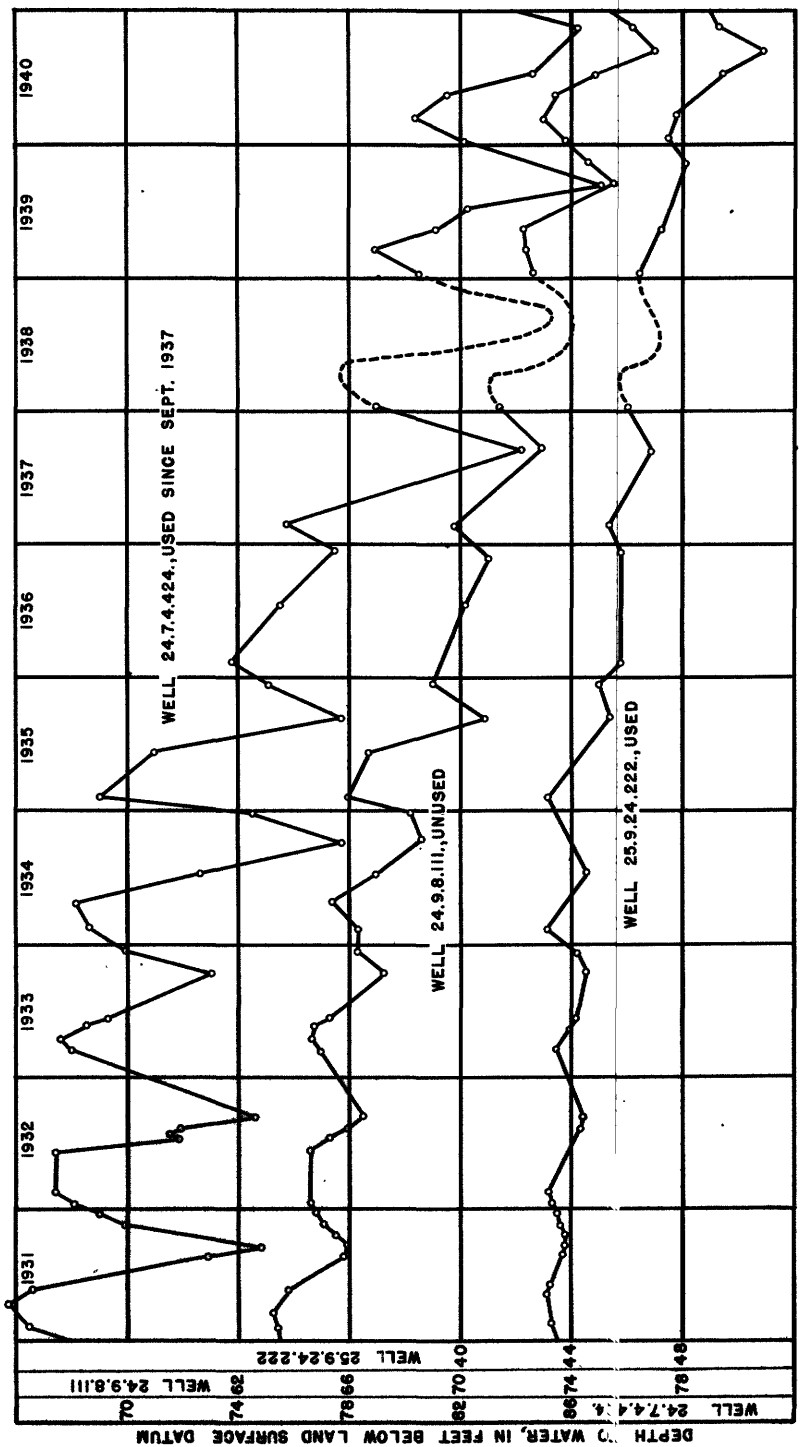

Figure 13.--Change in water level in three wells in the Mimbres Valley, N. Mex., 1931-40.

The ground-water levels declined throughout the valley in the 11-year period from January 1930 to January 1941. The decline in the lightly pumped area south of Deming and in the heavily pumped area northwest of the Little Florida Mountains, west of the ground-water dam extending north from these mountains, was 4 to 5 feet. In the heavily pumped area west of Deming the maximum decline was more than 13 feet, and the decline over the whole area more than 9 feet. In the heavily pumped area east of the Little Florida Mountains the maximum decline of ground-water level in this period was more than 18 feet.

The accompanying illustration shows the change in water levels in 3 observation wells in the Mimbres Valley from 1931 through 1940. Well 24.7.4.424, which is equipped with a windmill, is in the heavily pumped area east of the Little Florida Mountains; well 24.9.8.111 is unused and is near the center of the heavily pumped area west of Deming; and well 25.9.24.222, which is pumped for irrigation, is in the lightly pumped area south of Deming. The water levels in the wells show a progressive decline from year to year and a greater rate of decline in the last few years. The three hydrographs also show characteristic seasonal fluctuations due to pumping for irrigation.

21.10.6. Tom Tigner. Recorder well. Measuring point, top edge of USGS washer on top north edge of 2 by 4-inch board just inside of recorder shelter, 0.36 foot above land surface datum. Highest and lowest water levels, in feet below land surface datum, 1940: Mar. 28, 7.45; Oct. 3, 9.76.

Highest daily water level, in feet below land-surface datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.74	8.55	7.78	7.53	8.50	....	....	9.17	8.73	9.75	9.65	9.44
2	8.74	8.54	7.76	7.58	8.51	....	....	9.17	8.78	9.75	9.66	9.42
3	8.73	8.47	7.74	7.63	8.53	....	9.04	9.11	8.82	9.75	9.68	9.41
4	8.72	8.41	7.72	7.69	8.56	....	9.04	9.06	8.86	9.75	9.69	9.39
5	8.69	8.36	7.71	7.74	8.60	....	9.03	9.01	8.91	9.74	9.70	9.38
6	8.67	8.31	7.70	7.80	8.64	....	8.99	8.97	8.96	9.73	9.70	9.37
7	8.63	8.27	7.69	7.84	8.68	....	8.96	8.93	9.00	9.72	9.71	9.36
8	8.57	8.25	7.68	7.89	8.72	....	8.94	8.89	9.02	9.70	9.71	9.34
9	8.53	8.22	7.67	7.94	8.77	....	8.92	8.89	9.02	9.70	9.70	9.32
10	8.49	8.20	7.66	7.98	8.81	....	8.92	8.86	9.04	9.70	9.70	9.31
11	8.47	8.17	7.65	8.02	8.84	....	8.93	8.83	9.08	9.70	9.69	9.30
12	8.45	8.15	7.65	8.06	8.88	....	8.95	8.77	9.12	9.70	9.68	9.29
13	8.44	8.13	7.64	8.10	8.92	....	8.97	8.68	9.16	9.70	9.66	9.28
14	8.44	8.11	7.62	8.13	8.95	....	8.98	8.38	9.21	9.70	9.65	9.26
15	8.44	8.09	7.60	8.17	8.98	....	9.00	8.14	9.26	9.70	9.64	9.23
16	8.45	8.08	7.58	8.20	9.01	....	9.02	8.06	9.31	9.70	9.63	9.19
17	8.46	8.07	7.57	8.23	9.04	....	9.05	8.06	9.36	9.71	9.62	9.13
18	8.47	8.05	7.57	8.27	9.06	....	9.07	8.10	9.40	9.71	9.61	9.07
19	8.49	8.04	7.56	8.30	9.09	....	9.07	8.17	9.45	9.71	9.60	9.01
20	8.51	8.03	7.55	8.32	9.11	....	9.10	8.22	9.49	9.71	9.59	8.96
21	8.52	8.02	7.55	8.34	9.13	9.58	9.06	8.28	9.55	9.71	9.58	8.91
22	8.53	8.01	7.54	8.36	9.14	9.61	9.04	8.34	9.57	9.71	9.56	8.87
23	8.54	8.00	7.53	8.38	9.15	....	9.02	8.41	9.60	9.70	9.55	8.82

Luna County--Continued.

21.10.6.--Continued.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	8.54	7.98	7.51	8.41	....	....	9.01	8.47	9.64	9.68	9.55	8.78
25	8.55	7.95	7.49	8.42	....	....	9.00	8.51	9.67	9.67	9.53	8.75
26	8.56	7.92	7.47	8.44	....	....	9.02	8.54	9.69	9.66	9.52	8.72
27	8.56	7.88	7.45	8.45	....	....	9.04	8.56	9.71	9.64	9.51	8.68
28	8.56	7.84	7.45	8.46	....	....	9.07	8.57	9.72	9.63	9.49	8.64
29	8.56	7.81	7.46	8.47	....	....	9.09	8.60	9.73	9.62	9.47	8.60
30	8.56	....	7.47	8.49	....	....	9.12	8.64	9.74	9.62	9.45	8.56
31	8.56	....	7.50	....	....	....	9.15	8.69	....	9.63	....	8.53

21.11.13. Fred Roth.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 4	44.30	May 7	42.22	Sept. 5	42.86
Mar. 16	43.68	July 4	42.69	Nov. 13	43.17

21.11.35.31. State land, Tigner lease.

Water level, in feet below land-surface datum, 1940

Jan. 4	30.22	May 7	22.79	Sept. 5	22.89
Mar. 16	20.53	July 4	24.76	Nov. 13	29.04

22.10.18.121. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	74.45	May 7	74.42	Sept. 5	74.35
Mar. 16	74.49	July 4	74.65	Nov. 13	74.31

22.10.20.21. State land. On north side of railroad. Unused drilled well, diameter 21 inches. Measuring point, surface of concrete well curb, at north side, 1.98 feet above 21-inch casing in well, level with land surface datum. Water level, in feet below land surface datum, 1940: Jan. 4, 88.72.

22.11.2.21. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	31.54	May 7	28.75	Sept. 5	28.41
Mar. 16	28.44	July 4	29.76	Nov. 13	30.67

22.11.13.122. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	66.55	May 7	66.24	Sept. 5	66.02
Mar. 16	66.40	July 4	66.52	Nov. 13	66.32

22.11.13.221. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	73.40	May 7	73.18	Sept. 5	73.00
Mar. 16	73.30	July 4	73.41	Nov. 13	73.24

22.11.14.222. Well 22.11.14.22 in Water-Supply Paper 886. State land.

Water level, in feet below land-surface datum, 1940

Jan. 14	58.94	May 7	58.36	Sept. 5	57.87
Mar. 16	58.45	July 4	58.66	Nov. 13	58.39

22.11.23.222. Well 22.11.23.22 in Water-Supply Paper 886. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	53.12	May 7	52.79	Sept. 5	52.45
Mar. 16	53.00	July 4	53.08	Nov. 13	52.70

Luna County--Continued.

23.7.25.331. Frank Veslay. About 200 feet southwest of two metal storage tanks. Unused drilled well, diameter 10 inches, depth 82 feet. Measuring point, top edge of 3-inch pipe column in well, 0.75 foot above land surface datum. Reference point, surface of concrete well curb, 0.04 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 10, 70.20.

23.7.30.Lot 16. H. T. Foster.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 5	25.30	May 8	25.46	Sept. 5	a 26.80
Mar. 14	25.09	July 4	26.08	Nov. 14	26.03

23.7.30.4. John Kelly. Unused dug and drilled well. Measuring point, top edge of USGS washer on west top edge of west 8 by 8-inch timber pump support, 1.10 feet above land surface datum. Reference point, surface of concrete well curb at northwest side, 1.10 feet below measuring point. Water level, in feet below land surface datum, 1940: Jan. 5, 58.42.

23.7.31.12. William Haas. About 100 feet southeast of house that is beside south side of road. Used drilled irrigation well, diameter 8 inches. Measuring point, top edge of casing, west side of well, 0.41 foot below base of pump, 0.70 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 5, 39.49.

23.7.31.14. William Haas. Used dug and drilled irrigation well, depth 180 feet. Measuring point, lower edge of pump base flange, east side of well, 0.60 foot above land surface datum. Reference point, surface of concrete well curb, east side of well, 0.60 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 5, 40.60.

23.7.33.211. Lewis and R. S. Smyer. Used drilled stock well. Measuring point, top edge of USGS washer on north top edge of south 6 by 10-inch wooden pipe clamp, to east of pipe column, 2.50 feet above land surface datum. Reference point, surface of upper ledge of concrete well curb, south side of well, 1.00 foot below measuring point. Equipped with windmill. Water level, in feet below land surface datum, 1940: Jan. 8, 59.99.

23.8.13.4. Bart and John H. Childs.

Water level, in feet below land-surface datum, 1940

Jan. 7	37.02	May 9	b 38.78	Sept. 5	c 38.00
Mar. 17	b 38.18	July 4	b 38.62	Nov. 14	37.64

23.8.25.311. Ed. Remondini. Used dug and drilled irrigation well, diameter 16 inches, depth 90 feet. Measuring point, surface of concrete well curb, east side of well, 0.50 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 5, 20.75.

23.8.26.131. Geo. Snyder.

Water level, in feet below land-surface datum, 1940

Jan. 5	32.23	May 8	b 38.55	Nov. 14	34.39
Mar. 14	31.88	July 4	36.70		

23.8.28.222. C. R. Lewis, Jr. Used dug and drilled irrigation well. Measuring point, top edge of metal base over top of well, east side of well, 0.65 foot below lower surface of pump base, level with land surface datum. Water level, in feet below land surface datum, 1940: Jan. 5, 40.23.

23.8.29.433. B. N. Ruebush. Water level, in feet below land surface datum, 1940: Jan. 4, 43.67.

23.8.30.133. Lee Wilkerson. Water level, in feet below land surface datum, 1940: Jan. 4, 45.68.

a Irrigation well 1,000 feet south pumping.
b Pumping.
c Windmill stopped for 20 minutes prior to measurement.

Luna County--Continued.

23.8.32.323. Jess T. Gosnell.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 4	39.33	May 8	38.82	Sept. 5	40.40
Mar. 13	38.92	July 4	39.51	Nov. 14	40.65

23.8.33.221. A. J. Inderrieden. In small adobe shed by road. Used drilled irrigation well. Measuring point, top edge of hole in west side of pump base flange, level with top of concrete pump base, 1.00 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 5, 35.66.

23.8.34.111. A. J. Inderrieden. Used drilled irrigation well. Measuring point, top edge of ⅜-inch hole in northwest side of pump base flange, 2.00 feet above land surface datum. Reference point, top of concrete pump base, at northwest corner, 0.36 foot below measuring point. Water levels, in feet below land surface datum, 1940: Jan. 5, 33.52; Sept. 5, a/42.2.

23.8.34.211. H. T. Foster. Water levels, in feet below land surface datum, 1940: Jan. 5, 33.49; Mar. 14, 32.85; Nov. 14, 35.55.

23.8.35.21. Joe Remondini. Water level, in feet below land surface datum, 1940: Jan. 16, 29.41.

23.9.7.24. R. M. Wilson ranch. On north side of house and east side of concrete-lined storage tank. Used drilled stock and domestic well, diameter 8 inches, depth 130 feet. Measuring point, top edge of casing, east side of well, 1.00 foot above land surface datum. Equipped with tower painted green and windmill. Water level, in feet below land surface datum, 1940: Jan. 4, 97.06.

23.9.19.131. Peru Mining Company.

Water level, in feet below land-surface datum, 1940

Jan. 4	72.14	May 7	72.17	Sept. 5	72.75
Mar. 16	72.21	July 4	72.58	Nov. 13	72.65

23.9.22.2. Roy Perkins. Cleaned out to 149.5 feet. Irrigation pump installed June 1940.

Water level, in feet below land-surface datum, 1940

Jan. 4	62.06	May 7	62.15	Sept. 5	62.43
Mar. 13	62.12	July 4	62.35	Nov. 13	62.48

23.9.25.311. Albert Ernst.

Water level, in feet below land-surface datum, 1940

Jan. 4	55.13	May 7	55.60	Sept. 5	57.31
Mar. 13	b 57.02	July 4	57.10	Nov. 14	56.18

23.9.25.33. John C. Thompson. Correction of Water-Supply Paper 886, measuring point is 0.50 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 4, 58.90.

23.9.26.41. Hubert Ruebush. Water level, in feet below land surface datum, 1940: Jan. 4, 54.17.

23.9.27.142. Mr. Gray. New measuring point, September 1940, top edge of windmill pipe clamp, to west of pipe column, 0.47 foot above surface of southeast corner of concrete well curb, 0.82 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Jan. 4	59.14	May 7	59.38	Sept. 5	60.91
Mar. 13	59.16	July 4	c 59.84	Nov. 13	60.03

a Pumping 200 gallons a minute.
b Pump stopped 10 minutes prior to measurement.
c Windmill pumping.

Luna County--Continued.

23.9.27.221. R. E. Hardaway.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 4	56.74	May 7	56.88	Sept. 5	56.95
Mar. 13	56.87	July 4	a 57.57	Nov. 13	57.25

23.9.27.411. Thelma Austin.

Water level, in feet below land-surface datum, 1940

Jan. 4	53.14	May 7	53.39	Sept. 5	54.15
Mar. 13	53.10	July 4	a 53.78	Nov. 13	54.07

23.9.27.412. Pedro Hernandez. After May 7, 1940, well filled, measurements discontinued. Water levels, in feet below land surface datum, 1940: Jan. 4, 53.32; Mar. 13, 53.27; May 7, 53.39.

23.9.31.11. Schauer and Lindauer. Used dug and drilled irrigation well. Measuring point, top edge of ⅛-inch hole in southwest side of pump base flange, 2.00 feet above land surface datum. Reference point, surface of concrete well curb, southwest side of well, 0.72 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 13, 75.38.

23.10.15. State land.

Water level, in feet below land-surface datum, 1940

Jan. 4	93.02	May 7	93.17	Sept. 5	93.39
Mar. 16	93.08	July 4	93.26	Nov. 13	93.50

24.7.4.424. G. D. Hatfield.

Water level, in feet below land-surface datum, 1940

Jan. 6	82.04	May 8	81.57	Sept. 5	a 90.32
Mar. 14	80.40	July 4	84.58	Nov. 14	86.22

24.7.5.2. R. M. Williamson. Diameter 12 inches, depth 123 feet.

Water level, in feet below land-surface datum, 1940

Jan. 7	77.58	May 8	77.88	Sept. 5	a 78.93
Mar. 14	77.65	July 4	a 78.66	Nov. 14	78.89

24.7.8.221. J. M. McDougall. Used dug and drilled irrigation well. Measuring point, lower edge of pump base, east side of pump, 0.45 foot above land surface datum. Reference point, surface of concrete well curb, east side of well, 0.45 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 5, 78.47.

24.7.9.111. Smyer Bros.

Water level, in feet below land-surface datum, 1940

Jan. 5	78.12	May 8	c 79.20	Nov. 14	80.78
Mar. 14	bc 78.63	July 4	c 81.33		

24.7.10.111. G. D. Hatfield. Used drilled irrigation well, depth about 130 feet. Measuring point, top edge of metal base over top of well, at south side of pump column, 0.50 foot above land surface datum. Water levels, in feet below land surface datum, 1940: Jan. 6, 84.90; Sept. 5, d/115.78.

24.7.10.211. Fred Hassman. Used drilled irrigation well. Measuring point, top edge of ⅛-inch hole in northeast side of pump base flange, level with land surface datum. Reference point, surface of old concrete engine base, 25 feet east of well, 0.64 foot above measuring point. Water level, in feet below land surface datum, 1940: Jan. 6, 82.47.

24.7.11.111. Edith E. Pollard. Used dug and drilled irrigation well. Measuring point, top edge of first pump support above base, west side of well, 1.03 feet above land surface datum. Reference point, surface of concrete well curb, 0.53 foot below measuring point. Water levels, in feet below land surface datum: Jan. 14, 1939, 74.69; Jan. 5, 1940, 78.95.

a Windmill pumping. b Pump stopped Mar. 13.
c Well ¼ mile west pumping.
d Pumping about 350 gallons a minute.

Luna County--Continued.

24.7.12.311. E. N. Odenbaugh.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 5	71.35	May 8	71.40	Sept. 5	72.75
Mar. 14	71.11	July 4	71.85	Nov. 14	73.53

24.7.13.212. Percival and Dwyer. Used drilled irrigation well. Measuring point, top of concrete well curb, north side of well, level with land surface datum. Water level, in feet below land surface datum, 1940: Jan. 5, 66.53.

24.7.13.311. Jennie Weeks. Water level, in feet below land surface datum, 1940: Jan. 5, 70.90.

24.7.14.221. Well 24.7.14.12 in Water-Supply Paper 886. J. H. Winslow. Depth 118 feet. Equipped with water-stage recorder. Highest and lowest water levels, in feet below land surface datum, 1940: Apr. 9, 73.45; Oct. 24, 76.54.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	74.34	74.00	73.67	73.48	73.87	73.89	74.59	75.34	75.80	76.30	76.51	76.40
2	74.33	73.99	73.67	73.48	73.87	73.87	74.61	75.35	75.83	76.32	76.51	76.40
3	74.32	73.98	73.66	73.47	73.87	73.87	74.63	75.38	75.84	.....	76.50	76.39
4	74.30	73.97	73.66	73.47	73.88	73.86	74.68	75.39	.....	.....	76.50	76.39
5	74.29	73.96	73.64	73.46	73.88	73.87	74.70	75.40	75.90	.....	76.50	76.37
6	74.29	73.95	73.63	73.45	73.88	73.89	74.71	75.43	75.91	.....	76.50	76.37
7	74.28	73.93	73.62	73.46	73.89	73.91	74.74	75.44	75.92	.....	76.50	76.36
8	74.27	73.92	73.62	73.45	73.89	73.94	74.77	75.45	75.93	.....	76.50	76.35
9	74.25	73.91	73.62	73.45	73.90	73.96	74.79	75.47	75.95	.....	76.49	76.34
10	74.25	73.90	73.60	73.45	73.89	73.99	74.81	75.49	75.97	.....	76.50	76.32
11	74.23	73.88	73.60	73.47	73.89	74.00	74.84	75.50	75.99	.....	76.49	76.31
12	74.21	73.87	73.60	73.50	73.88	74.03	74.87	75.52	.....	.....	76.49	76.31
13	74.22	73.86	73.60	73.51	73.87	74.06	74.90	75.53	76.01	.....	76.48	76.30
14	74.20	73.84	73.59	73.53	73.88	74.08	74.92	75.55	76.02	.....	76.48	76.29
15	74.19	73.84	73.59	73.54	73.88	74.11	74.95	75.57	76.04	.....	76.48	76.30
16	74.17	73.83	73.58	73.57	73.88	74.14	74.98	75.58	76.06	.....	76.48	76.28
17	74.16	73.82	73.58	73.62	73.88	74.16	74.99	75.60	76.08	.....	76.47	76.28
18	74.15	73.80	73.57	73.66	73.88	74.20	75.02	75.61	76.09	.....	76.47	76.28
19	74.15	73.80	73.56	73.68	73.88	74.23	75.05	75.63	76.11	.....	76.47	76.28
20	74.14	73.79	73.55	73.69	73.88	74.26	75.07	75.64	76.12	.....	76.47	76.28
21	74.13	73.78	73.55	73.71	73.91	74.29	75.10	75.65	76.14	.....	76.46	76.27
22	74.11	73.76	73.54	73.73	73.92	74.32	75.13	75.67	76.15	.....	76.46	76.26
23	74.10	73.76	73.54	73.75	73.92	74.35	75.15	75.69	76.16	76.52	76.46	76.25
24	74.09	73.75	73.53	73.76	73.91	74.39	75.17	75.70	76.17	76.52	76.46	76.23
25	74.08	73.73	73.52	73.76	73.91	74.42	75.20	75.71	76.20	76.52	76.44	76.22
26	74.07	73.72	73.51	73.77	73.91	74.44	75.22	75.72	76.21	76.52	76.44	76.23
27	74.06	73.72	73.50	73.79	73.91	74.48	75.24	75.73	76.22	76.52	76.43	76.22
28	74.05	73.70	73.50	73.81	73.91	74.50	75.26	75.74	76.25	76.52	76.42	76.21
29	74.04	73.68	73.50	73.84	73.91	74.54	75.28	.....	76.27	76.52	76.41	76.19
30	74.02	.....	73.50	73.85	73.90	74.56	75.30	.....	76.29	76.52	76.41	76.18
31	74.01	.....	73.48	.....	73.90	.....	75.32	.....	.....	76.52	.....	76.18

24.7.14.331. Catherine Nordhaus. Used drilled irrigation well. Measuring point, top edge of concrete well curb, northwest side of well, 1.00 foot above land surface datum. Reference point, surface of concrete slab upon which well curb sits, 0.94 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 5, 76.38.

24.7.15.122. Well 24.7.15.211 in Water-Supply Paper 886. J. N. McDougall. Water level, in feet below land surface datum, 1940: Jan. 5, 81.27.

24.7.16.211. George Snyder. Depth 84 feet.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 5	77.93	May 8	78.36	Sept. 5	78.82
Mar. 14	78.20	July 4	78.56	Nov. 14	79.11

Luna County--Continued.

24.7.21.222. Hirram Jeter. Used drilled irrigation well, diameter 14 inches, depth 90 feet. Measuring point, lower edge of hole in south side of pump case shell, 1.00 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 8, 70.19.

24.7.24.111. Jasper Wilson. Depth 97 feet.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 5	69.79	May 8	70.00	Sept. 5	70.40
Mar. 14	69.94	July 4	70.12	Nov. 14	70.85

24.7.24.211. J. S. Hack. Unused drilled well, depth 92 feet. Measuring point, top edge of most western of two ½-inch holes in north side of pump base, 0.37 foot above land surface datum. Reference point, surface of concrete pump base, at northwest corner, 0.37 foot below measuring point. Water level, in feet below land surface datum, 1940: Mar. 14, 68.37.

24.7.24.312. H. E. Emory (?). Unused drilled well, diameter 30 inches, depth 89 feet. Measuring point, top of concrete well curb, northeast side of well, 2.00 feet above land surface datum. Reference point, surface of lower slab of concrete curb, 1.90 feet below measuring point. Water level, in feet below land surface datum, 1940: Mar. 14, 65.83.

24.8.1.333. F. K. Kretek.

Water level, in feet below land-surface datum, 1940

Jan. 6	16.43	May 8	a 21.66	Sept. 5	19.50
Mar. 14	15.91	July 4	a 23.00	Nov. 14	17.46

24.8.5.11. R. A. Hackebeil. New measuring point, top edge of concrete filling around top of casing, south side of well, 0.69 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Jan. 4	40.91	May 8	40.96	Sept. 5	b 46.69
Mar. 13	41.03	July 4	b 46.54	Nov. 14	42.36

24.8.8.12. J. F. Holiday. Water level, in feet below land surface datum, 1940: Jan. 6, 40.98.

24.8.11.2. F. K. Kretek.

Water level, in feet below land-surface datum, 1940

Jan. 6	16.62	May 8	16.68	Sept. 5	17.70
Mar. 14	16.23	July 4	17.29	Nov. 4	17.50

24.8.18.331. Chas. Peters. Water level, in feet below land surface datum, 1940: Jan. 6, 51.33.

24.8.19.433. A. G. Rudd.

Water level, in feet below land-surface datum, 1940

Jan. 6	54.19	May 7	54.13	Sept. 7	54.57
Mar. 12	54.09	July 4	54.31	Nov. 14	54.75

24.8.20.411. J. W. Jones.

Water level, in feet below land-surface datum, 1940

Jan. 6	40.46	May 7	40.69	Sept. 7	41.03
Mar. 12	40.56	July 4	40.79	Nov. 14	41.27

24.9.2.221. R. G. Folk. Sounded depth 60 feet, March 1940.

Water level, in feet below land-surface datum, 1940

Jan. 7	52.88	May 7	52.93	Sept. 5	53.67
Mar. 12	52.82	July 4	53.23	Nov. 14	53.79

24.9.2.412. J. H. Winslow. Sounded depth 74 feet, March 1940. Windmill out of order, 1940.

Water level, in feet below land-surface datum, 1940

Jan. 7	52.03	May 7	52.09	Sept. 5	52.46
Mar. 12	52.08	July 4	52.20	Nov. 14	52.72

a Irrigation well 50 feet west pumping.
b Irrigation well 100 feet south pumping.

Luna County--Continued.

24.9.6.311. J. B. Wells. New measuring point May 1940, lower edge of pump base flange, north side of pump, 0.98 foot above land surface datum. Water levels, in feet below land surface datum, 1940: Jan. 13, 75.58; Mar. 12, 74.78; May 8, 77.24; Nov. 13, 79.65.

24.9.7.211. Emanuel Vocale. Water level, in feet below land surface datum, 1940: Jan. 13, 77.63.

24.9.7.331. Smitty R. Moir. Irrigation well, about 60 feet northeast, deepened to about 245 feet in March 1940, causing a rise in static water level in observation well. Irrigation well a few hundred feet northeast not used in 1940.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 12	76.62	May 8	74.47	Sept. 6	b 81.67
Mar. 13	76.15	July 5	a 106.3±	Nov. 13	75.38

24.9.8.111. Ben F. Jonas.

Water level, in feet below land-surface datum, 1940

Jan. 13	73.72	May 8	73.51	Sept. 6	76.98
Mar. 12	72.97	July 5	74.82	Nov. 13	76.12

24.9.8.112. Ben F. Jonas.

Water level, in feet below land-surface datum, 1940

Jan. 13	72.57	May 8	71.58	Sept. 6	75.03
Mar. 12	71.87	July 5	72.72	Nov. 13	74.92

24.9.8.121. B. F. Jonas. Not measured in 1940.

24.9.8.44. Frank A. Bredecko. Used dug and drilled irrigation well. Measuring point, top edge of ½-inch hole in southeast side of pump base flange, 1.90 feet above land surface datum. Reference point, top of concrete well curb, east side of well, 1.90 feet below measuring point. Water level, in feet below land surface datum, 1940: Jan. 8, 68.60.

24.9.9.411. Joe Clary. Not used in 1940, pump removed and installed on new well drilled about 100 feet west of observation well, on west side of storage tank. Water levels, in feet below land surface datum, 1940: Jan. 8, 66.00; Sept. 7, c/82.44; Nov. 13, 67.29.

24.9.12.111. Ed. H. Hatcher. Water level, in feet below land surface datum, 1940: Jan. 6, 51.99.

24.9.13.111. Mary E. Barrett.

Water level, in feet below land-surface datum, 1940

Jan. 6	20.76	May 7	20.71	Sept. 7	22.66
Mar. 12	20.67	July 5	21.28	Nov. 14	22.63

24.9.13.112. Dorothy M. Dines. Depth 70 feet. After July 5, pump on well, measurements discontinued. Water levels, in feet below land surface datum, 1940: Jan. 6, 50.18; Mar. 12, 50.18; May 8, 50.21.

24.9.18.311. Chas. Peter. Used dug and drilled irrigation well. Drilled to 165 feet in March 1940. Measuring point, top edge of concrete well curb, south side of well, 1.00 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 12, 72.38.

24.9.19.121. Francis Ligocky. On north side of earthen reservoir, beside road. Unused dug and drilled irrigation well. Measuring point, top edge of concrete well curb, north side of well, level with land surface datum. A pumped irrigation well is located about 0.25 mile east.

Water level, in feet below land-surface datum, 1940

Jan. 12	72.82	May 7	72.64	Sept. 6	78.22
Mar. 15	72.53	July 5	75.82	Nov. 13	74.85

a Irrigation well 60 feet northeast pumping.
b Irrigation well 60 feet northeast stopped September 4.
c Pump operating on well 100 feet west.

Luna County--Continued.

24.9.21.131. L. L. Gaskill. New measuring point, top edge of well cover, inside of recorder shelter, 0.94 foot above land surface datum. Water stage recorder installed Nov. 8, 1939.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	July	Aug.	Sept.	Oct.	Nov.
1	.....	69.37	68.99	68.74	.....	.....	.....	71.16	70.57
2	.....	69.31	68.98	68.73	.....	.....	.....	71.06	71.88
3	.....	69.26	69.12	68.73	.....	.....	.....	71.01	71.01
4	.....	69.23	69.11	69.15	.....	75.05	.....	70.91	70.96
5	.....	69.19	69.52	69.18	78.39	.....	.....	70.94	71.06
6	.....	69.16	69.45	68.97	76.56	74.26	.....	71.34	70.95
7	.....	69.13	69.31	68.91	.....	.....	.....	70.96	70.98
8	.....	.....	69.35	68.84	.....	.....	.....	70.81	70.76
9	69.19	.....	69.31	68.80	77.10	.....	.....	70.76	71.14
10	69.19	.....	69.37	68.77	77.01	.....	79.41	70.76	71.41
11	69.16	.....	69.29	68.77	77.53	.....	.....	70.71	71.29
12	69.12	.....	69.28	68.74	76.64	.....	.....	70.78	72.45
13	69.17	69.04	69.29	68.71	77.23	.....	78.66	70.66	.....
14	69.16	68.99	69.06	68.69	77.37	.....	78.41	70.66	.....
15	69.15	69.03	69.00	68.65	78.03	.....	77.01	70.54	.....
16	69.12	69.05	69.03	68.66	77.50	.....	78.27	70.49	.....
17	69.10	69.03	68.96	68.70	87.29	.....	76.71	70.49	.....
18	69.13	68.98	68.91	68.70	79.06	.....	74.59	70.43	.....
19	69.15	69.05	68.86	.....	.....	.....	73.61	70.39	.....
20	69.11	69.02	68.84	.....	.....	.....	73.11	70.40	.....
21	69.12	68.99	68.84	.....	.....	.....	73.41	70.33	.....
22	69.11	68.99	68.78	.....	.....	.....	72.89	70.31	.....
23	69.09	69.01	68.78	.....	.....	.....	72.71	71.01	.....
24	69.09	68.99	68.77	.....	.....	.....	73.16	70.56	.....
25	69.09	68.99	68.75	.....	.....	.....	72.33	70.43	.....
26	69.11	69.09	68.72	.....	.....	.....	71.91	70.59	.....
27	69.27	69.05	68.71	.....	.....	.....	71.69	70.44	.....
28	69.21	69.00	68.71	.....	.....	.....	71.54	70.40	.....
29	69.17	68.97	68.71	.....	.....	.....	71.41	70.30	.....
30	69.17	.....	68.89	.....	.....	.....	71.24	71.30	.....
31	69.57	.....	68.80	.....	.....	.....	.....	71.35	.....

24.9.23.211. J. H. Winslow. New measuring point, May 1940, lower edge of pump base, at southeast corner of pump, 0.69 foot above previous measuring point, 0.69 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 8	65.20	May 7	65.29	Sept. 7	b 68.58
Mar. 12	65.20	July 4	a 77.9	Nov. 14	66.95

24.9.32.311. H. C. Wheeler. Used dug and drilled irrigation well. Measuring point, top edge of USGS washer on top west side of east 6 by 8-inch pump support, northeast side of pump, 2.00 feet above land surface datum. Reference point, top of concrete well curb under and 0.50 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 12, 69.00.

24.10.3.411. Josh Bryan. New measuring point, top edge of USGS washer on top of well cover, to north of windmill pipe column, 0.16 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Jan. 13	86.51	May 8	86.72	Sept. 6	87.14
Mar. 12	86.57	July 5	c 87.18	Nov. 15	c 87.58

a Pumping. b Pumped recently.
c Irrigation well 94 feet northeast pumping.

Luna County--Continued.

24.10.10.311. G. F. Ackerman. New measuring point, top edge of USGS washer on top south side of north pump support, level with land surface datum. Reference point, surface of southeast corner of large concrete slab, 15 feet north of well, 0.82 foot above measuring point.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 13	81.60	May 8	82.17	Sept. 6	82.96
Mar. 12	a 81.69	July 5	b 89.72	Nov. 13	82.35

24.10.12.111. Morgan Garrett. Water level, in feet below land surface datum, 1940: Jan. 13, 81.82.

24.10.12.431. Steve Hrna. Equipped with water-stage recorder. Highest and lowest water levels, in feet below land-surface datum, 1940: May 12, 77.61; Sept. 8, 83.11.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.46	78.06	77.77	77.67	77.69	77.98	80.31	81.94	82.98	82.02	81.00	80.46
2	78.46	78.05	77.81	77.68	77.66	78.06	80.29	81.96	82.94	81.96	80.96	80.44
3	78.43	78.05	77.83	77.66	77.64	78.11	80.27	81.97	82.91	81.91	80.93	80.41
4	78.40	78.02	77.88	77.66	77.63	78.18	80.29	81.99	82.91	81.86	80.91	80.39
5	78.38	78.01	77.94	77.65	77.62	78.26	80.34	81.99	82.96	81.82	80.89	80.37
6	78.39	78.01	77.96	77.65	77.61	78.36	80.41	82.03	83.02	81.79	80.87	80.35
7	78.39	77.98	77.95	77.69	77.61	78.45	80.47	82.07	83.06	81.74	80.85	80.34
8	78.37	77.97	77.92	77.70	77.61	78.55	80.52	82.11	83.10	81.69	80.82	80.32
9	78.35	77.97	77.90	77.74	77.61	78.65	80.57	82.16	83.07	.....	80.79	80.29
10	78.34	77.96	77.87	77.81	77.61	78.78	80.64	82.20	83.04	.....	80.78	80.27
11	78.32	77.93	77.84	77.87	77.61	78.89	80.70	82.26	83.01	.....	80.77	80.24
12	78.30	77.93	77.93	77.89	77.61	78.98	80.76	82.31	82.96	.....	80.78	80.23
13	78.29	77.93	77.94	77.87	77.61	79.09	80.86	82.35	82.93	.....	80.79	80.22
14	78.30	77.90	77.94	77.85	77.62	79.20	80.93	82.41	82.89	.....	80.78	80.21
15	78.29	77.90	77.92	77.84	77.63	79.31	80.99	82.46	82.83	.....	80.76	80.20
16	78.27	77.91	77.89	77.84	77.64	79.40	81.07	82.51	82.76	.....	80.74	80.17
17	78.24	77.89	77.87	77.88	77.66	79.47	81.15	82.56	82.74	.....	80.71	80.15
18	78.23	77.85	77.85	77.86	77.70	79.51	81.24	82.60	82.69	.....	80.68	80.14
19	78.24	77.88	77.82	77.85	77.75	79.58	81.32	82.62	82.64	.....	80.67	80.13
20	78.21	77.86	77.82	77.84	77.79	79.67	81.37	82.66	82.59	.....	80.65	80.12
21	78.20	77.85	77.81	77.81	77.83	79.76	81.43	82.70	82.54	.....	80.63	80.10
22	78.19	77.84	77.79	77.80	77.84	79.86	81.46	82.74	82.48	.....	80.61	80.08
23	78.18	77.85	77.78	77.80	77.86	79.97	81.51	82.79	82.43	81.21	80.60	80.07
24	78.16	77.84	77.78	77.80	77.82	80.06	81.55	82.83	82.37	81.19	80.59	80.04
25	78.15	77.82	77.76	77.77	77.81	80.15	81.60	82.88	82.32	81.15	80.56	80.03
26	78.14	77.81	77.74	77.75	77.80	80.21	81.65	82.90	82.25	81.13	80.55	80.04
27	78.13	77.81	77.73	77.75	77.80	80.30	81.70	82.95	82.19	81.11	80.54	80.01
28	78.12	77.79	77.73	77.74	77.79	80.35	81.75	82.99	82.15	81.10	80.52	79.99
29	78.11	77.76	77.73	77.72	77.81	80.35	81.80	83.03	82.10	81.06	80.49	79.96
30	78.09	.....	77.71	77.71	77.84	80.33	81.84	83.03	82.05	81.04	80.47	79.94
31	78.08	.....	77.69	.....	77.90	.....	81.90	83.00	.....	81.02	.....	79.93

24.10.12.432a. Steve Hrna. Six feet north of well 24.10.12.432b. Used drilled irrigation well, diameter 12 inches, depth 191 feet. Measuring point, top edge of ½-inch hole in southwest side of pump base flange, 0.94 foot above land surface datum. Reference point, top of concrete well curb, south side of well, 0.94 foot below measuring point.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Sept.10, 1939	82.78	Jan. 12, 1940	77.29	May 8, 1940	78.16
Nov. 8	78.22	Mar. 12	76.88	Nov. 13	79.79

a Windmill pumping.
b Pumping about 350 gallons a minute.

Luna County--Continued.

24.10.12.432b. Steve Hrna. Six feet south of well 24.10.12.431a. Unused drilled well, diameter about 30 inches, depth about 145 feet. Measuring point, top of concrete well curb, east side of well, level with land surface datum.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 4, 1939	a 81.30	Jan. 12, 1940	78.05	July 5, 1940	a 81.64
Sept.10	81.33	Mar. 12	77.57	Sept. 6	a 82.55
Nov. 8	78.84	May 8	78.25	Nov. 13	80.27

24.10.29.222. State land. Unused drilled well, diameter 24 inches, depth 113 feet. Measuring point, top edge of USGS washer on bottom north edge of south 4 by 6-inch board over well, near center of well, 0.39 foot below top of board, level with land surface datum. Reference point, top of 2 by 2-inch wooden hub with USGS washer on top, driven flush with ground, 47 feet N. 38° E. from center of well, 1 foot southwest from base of large mesquite bush, 0.01 foot below measuring point. Water level, in feet below land surface datum, 1940: Mar. 18, 63.49.

25.8.18.111. Geo. McCann. Unused dug and drilled well, diameter 18 inches, depth 63 feet. Measuring point, top edge of well cover, inside of recorder shelter, 0.24 foot above land surface datum. Reference point, top edge of brick well curb, north side of well, 0.24 foot below measuring point. A pumped irrigation well is located about 25 feet northeast and a used domestic well equipped with a pumpjack about 100 feet west. Water stage recorder installed on observation well Mar. 16, 1940. Highest and lowest water levels, in feet below land surface datum, 1940: Mar. 31, 49.99; Sept. 4, 58.51.

Highest daily water level, in feet below land-surface datum, 1940
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	.....	50.43	51.85	52.92	56.81	54.50	55.31	53.78	52.12
2	.....	50.42	51.83	53.14	57.01	55.61	58.28	53.53	52.08
3	.....	50.55	52.03	53.11	57.14	54.73	58.45	53.46	52.05
4	.....	50.43	52.41	53.26	54.69	53.76	55.43	53.61	52.03
5	.....	50.34	52.40	53.45	54.97	53.66	54.51	53.71	52.01
6	.....	50.24	56.28	53.29	54.42	54.26	54.56	53.72	51.98
7	.....	50.21	52.91	53.26	53.66	55.01	54.68	53.68	51.98
8	.....	50.16	56.31	52.85	53.33	54.76	54.61	53.78	51.93
9	.....	50.13	52.09	52.71	53.29	54.23	54.50	53.44	51.91
10	.....	50.12	51.96	52.58	53.21	54.01	54.49	53.26	51.90
11	.....	50.14	52.49	52.55	57.09	53.71	54.54	53.14	51.88
12	.....	50.34	52.65	52.55	54.91	53.61	57.63	53.04	51.86
13	.....	50.67	52.59	52.79	55.26	53.91	54.77	52.97	51.89
14	.....	50.81	52.37	52.83	54.77	53.57	55.44	52.91	51.87
15	.....	50.59	53.50	52.84	54.58	53.91	55.11	52.81	51.84
16	50.14	51.04	53.45	52.91	55.21	57.55	54.18	52.76	51.81
17	50.14	51.18	53.86	52.80	57.63	55.49	54.03	52.69	51.79
18	50.07	51.14	53.51	52.81	54.51	54.46	54.81	52.62	51.78
19	50.03	51.08	53.48	52.71	54.51	57.71	54.03	52.57	51.78
20	50.02	55.31	53.46	52.46	55.20	56.45	53.81	52.52	51.77
21	50.25	52.21	53.36	52.33	55.49	55.78	53.67	52.49	51.76
22	50.43	51.81	56.96	52.29	54.11	58.04	53.56	52.43	51.76
23	50.29	52.74	53.53	53.61	53.91	55.91	53.70	52.39	51.76
24	50.21	51.46	53.66	52.99	53.76	54.76	53.78	52.35	51.78
25	50.11	52.79	53.60	52.76	53.60	55.83	53.83	52.31	51.74
26	50.06	55.76	53.46	52.61	53.31	58.14	53.86	52.28	51.74
27	50.05	56.02	53.36	52.46	53.23	58.21	53.79	52.24	51.89
28	50.06	56.13	53.24	52.56	57.06	56.28	53.71	52.24	51.89
29	50.03	52.26	53.08	52.67	55.28	58.28	53.76	52.20	51.83
30	50.00	52.24	52.99	56.13	54.26	55.74	53.76	52.17	(b)
31	49.99	.....	52.96	.....	53.91	56.41	.....	52.16	.....

a Well 24.10.12.432a, 6 feet north, pumping.
b Clock stopped.

Luna County--Continued.

25.9.4.211. Val Miler. Unused dug and drilled well, diameter about 24 inches, depth 89.5 feet. Measuring point, lower edge of USGS washer on lower east edge of east 8 by 8-inch timber over well, level with land surface datum. Reference point, top of concrete well curb, east side of well, level with measuring point. Water levels, in feet below land surface datum, 1940: Sept. 6, 63.28; Nov. 14, 63.60.

25.9.6.421. Roderick and Wheeler. New measuring point, top south edge of north 8 by 8-inch pump support, east of pump, 0.59 foot above concrete curb, 0.59 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 12	67.14	May 7	67.60	Nov. 14	70.70
Mar. 16	66.73	July 5	69.67		

25.9.11.114. J. B. Anderson. Redrilled to 220 feet January 1940, before measurement. Water levels, in feet below land surface datum, 1940: Jan. 13, 61.07; Mar. 16, 60.62; May 7, 61.45; Nov. 15, 62.49.

25.9.12.311. Joella Cheek. Used dug and drilled irrigation well, depth 120 feet. Measuring point, top edge of concrete well curb, southeast side of well, 0.50 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 12, 56.69.

25.9.13.311. C. Wilbur Gaines.

Water level, in feet below land-surface datum, 1940

Jan. 12	51.90	May 7	52.05	Sept. 7	53.60
Mar. 16	51.75	July 5	52.78	Nov. 14	53.55

25.9.14.311. Geo. W. McCann. Used dug and drilled irrigation well, diameter 16 inches, depth 175 feet. Measuring point, lower edge of pump base, south side of pump, 1.00 foot above land surface datum. Reference point, uppermost surface of southeast corner of concrete weir box, to south of discharge pipe, 0.71 foot above measuring point. Water levels, in feet below land surface datum, 1940: Jan. 12, 57.10; Sept. 7, a/74.26.

25.9.15.211. C. H. Paulk. Water level, in feet below land surface datum, 1940: Jan. 12, 60.65.

25.9.17.311. Tom Tigner. Used dug and drilled irrigation well. Measuring point, lower edge of pump base flange, east side of pump, 0.60 foot above land surface datum. Reference point, surface of concrete well curb, east side of well, 0.60 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 12, 64.38.

25.9.19.111. Tom Marcak. Used drilled irrigation well. Measuring point, east top edge of second set of west 6 by 8-inch pump supports below pump, 1.5 feet above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 13, 62.41.

25.9.21.311. A. W. Speir. Water levels, in feet below land surface datum, 1940: Jan. 10, 64.25; Mar. 16, 64.60; May 7, b/78.00; Nov. 14, 66.58.

25.9.24.222. George P. Watkins.

Water level, in feet below land-surface datum, 1940

Jan. 12	47.53	July 5	49.43	Nov. 14	49.36
Mar. 16	47.74	Sept. 7	50.88		

25.9.25.111. Alan Crotchett. Used dug and drilled irrigation well. Measuring point, upper edge of USGS washer on east side of west 8 by 10-inch pump support, 1.01 feet below base of pump, 0.75 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 12, 47.54.

a Pumping 370 gallons a minute. b Pumping.

Luna County--Continued.

25.9.27.422. H. A. Gray. Used dug and drilled irrigation well. Measuring point, top edge of steel plate over well, south of pump, level with land surface datum. Reference point, top edge of most northerly concrete ledge of engine base north of engine, about 15 feet south of well, 0.67 foot above measuring point. Water level, in feet below land surface datum, 1940: Jan. 12, 53.42.

25.9.30.111. Frank Chvojka. Used dug and drilled irrigation well. Measuring point, upper edge of USGS washer on east top side of west 6 by 6-inch pump support, third pump support below pump, 1.10 feet above land surface datum. Reference point, surface of concrete well curb, north side of well, 1.10 feet below measuring point. Water level, in feet below land surface datum, 1940: Jan. 10, 55.78.

25.9.35.21. Sigman Lindauer Estate. Depth 108 feet. New measuring point, surface of concrete well curb, east side of well, level with land surface datum.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 10	47.97	May 7	48.04	Sept. 6	a 58.00
Mar. 17	47.86	July 5	(a)	Nov. 15	48.92

25.10.36.111. State land. Used dug and drilled irrigation well. Measuring point, surface of concrete well curb, south side of well, 0.50 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 10, 58.84.

25.10.36.222. State land. New measuring point, surface of concrete well curb, west side of well, level with land surface datum.

Water level, in feet below land-surface datum, 1940

Jan. 10	58.19	May 7	57.72	Sept. 6	64.66
Mar. 16	57.91	July 5	b 78.4	Nov. 14	61.69

26.9.11.211. State land. Depth 80.5 feet.

Water level, in feet below land-surface datum, 1940

Jan. 10	37.30	May 7	37.31	Sept. 6	37.54
Mar. 17	37.31	July 5	37.40	Nov. 15	37.69

26.10.1.1. W. F. Kerr. Windmill removed. Measuring point changed Jan. 11, 1940, new point could not be accurately referenced to old, possible discrepancy of several tenths of a foot between preceding and succeeding records. Water level, in feet below land surface datum, 1940: Jan. 11, 58.02.

27.8.8.211. Well 27.8.7.211 in Water-Supply Paper 886. J. S. Pearce. Depth 28 feet. Measurements discontinued after Nov. 15, 1940.

Water level, in feet below land-surface datum, 1940

Jan. 10	24.02	May 7	c 23.13	Sept. 7	24.10
Mar. 17	23.98	July 5	24.12	Nov. 15	24.10

27.8.8.411. Pearl Verdick. At southwest corner of earthen storage tank. Used dug and drilled stock well, diameter about 18 inches, depth 38 feet. Measuring point, surface of concrete well curb, east side of well, one foot north of southeast corner of pit, level with land surface datum.

Water level, in feet below land-surface datum, 1939-40

Sept. 9, 1939	23.45	Mar. 17, 1940	23.40	Sept. 7, 1940	23.54
Nov. 9	23.36	May 7	25.13	Nov. 15	23.57
Jan. 10, 1940	24.29	July 5	23.64		

a Pumping about 400 gallons a minute.
b Pumping about 500 gallons a minute.
c Measurement probably inaccurate.

Luna County--Continued.

27.9.2.211. State land. About 60 feet south of road. Unused dug well, diameter 4 feet, depth 23.5 feet. Measuring point, surface of concrete well curb, northeast side of well, 0.50 foot above land surface datum. Reference point, surface of old engine base, 13 feet north of well, 0.39 foot above measuring point.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
July 1, 1939	21.82	May 7, 1940	18.40	Sept. 7, 1940	14.88
Jan. 10, 1940	15.51	July 5	a 4.76	Nov. 15	16.72
Mar. 17	17.38				

27.7.4.111. Francis S. Connatt. Unused drilled well, diameter 8 inches, depth about 185 feet. Measuring point, top edge of well casing, north side of well, level with land surface datum. Water levels, in feet below land surface datum, 1940: Mar. 17, 2.77; Sept. 8, 3.65.

29.7.18.211. R. M. Marshall. About 15 feet east of another well. Unused drilled well, diameter 12 inches, depth about 180 feet. Measuring point, top edge of well casing, north side of well, 1.3 feet above land surface datum. Water levels, in feet below land surface datum, 1940: Mar. 12, 1.79; Sept. 8, 1.54.

29.8.12.244. A. G. Anderson. Unused drilled well, diameter 12 inches, depth 180 feet. Measuring point, top edge of well casing, east side of well, 2.3 feet above land surface datum. Water levels, in feet below land surface datum, 1940: Mar. 17, 7.07; Sept. 8, 7.68.

29.8.13.111. L. L. Burkhead. Used drilled stock and domestic well, diameter 6 inches, depth 195 (?) feet. Measuring point, top edge of 6-inch sewer tile surface casing, 0.55 foot above top of metal casing, 1.05 feet above land surface datum. A pumped irrigation well is located about 15 feet north. Water levels, in feet below land surface datum, 1940: Mar. 17, 6.44; Sept. 8, b/7.77.

ROOSEVELT COUNTY

PORTALES VALLEY

By Clyde S. Conover

The program of measuring water levels in observation wells and of gathering other pertinent data in the Portales Valley was continued during 1940. All work was done in financial cooperation with the State engineer of New Mexico, T. M. McClure.

A general statement of the geology and water resources of Portales Valley and also water-level measurements are given in Water-Supply Paper 845, pages 245-278. Water-level measurements for 1939 are included in Water-Supply Paper 886. The investigation of the ground water resources of the Portales Valley was begun in 1931 by C. V. Theis and the results have been published in the 10th, 11th, 12th and 13th Biennial Reports of the

a Floodwater in well.
b Irrigation well 15 feet north pumping about 1,000 gallons a minute.

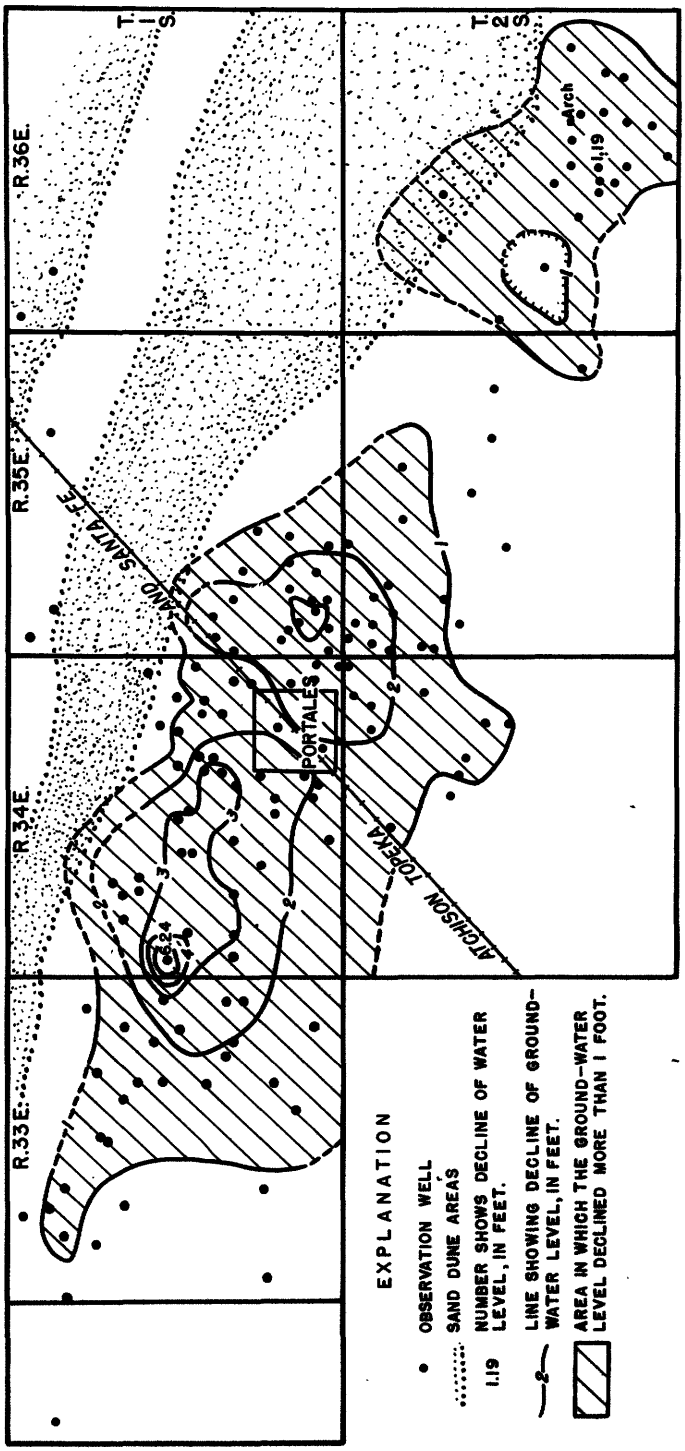

Figure 14.-- Map of the Portales Valley, N. Mex., showing change in ground-water level from January 1940 to January 1941.

State engineer. It is expected that a progress report covering work carried on from 1938 to 1940 will be published in the forthcoming 14th Biennial Report of the State engineer.

At the end of 1940 the program included about 190 observation-wells in which water levels are measured once a year, usually in January. These measurements are used in preparing maps that show the yearly changes in ground-water level in the Valley. Water levels in 53 of the wells are also measured bimonthly in order that the trend and change in ground-water levels during the year can be observed. The observation wells consist of both used and unused wells scattered throught the Valley, and thus the changes in water level in them are representative of the changes that occur throughout the area. Five water-stage recorders were operated during the year on representative wells in different sections of the Valley.

The amount of pumping of ground-water for irrigation varies from year to year and is influenced by the amount and distribution of rainfall and the kind and amount of crops grown. The precipitation at Portales for 1940, as reported by the United States Weather Bureau, was 11.33 inches, or 6.74 inches below normal, whereas for the growing season, April through September, the deficiency was 5.86 inches. Due to the deficiency of precipitation in 1940, there was an increase in the amount of water pumped. According to a rough survey by the writer, approximately 13,600 acres of land were irrigated and about 340 pumps were in use in 1940.

The accompanying map shows the change in ground-water level in Portales Valley between January 1940 and January 1941. In this period, the ground-water levels declined throughout the valley with the maximum decline occurring in the two heavily pumped areas, northwest and east of Portales. The water levels declined more than 1 foot over an area of about 86 square miles, an increase of about 69 square miles over that of the previous year, while the water levels declined more than 2 feet over an area of about 24 square miles. The magnitude of the decline ranged from about 0.02 foot at Floyd, New Mexico to about 3.5 feet about 4 miles northwest of Portales. The maximum decline observed in the year was 6.24 feet in well 1.34.18.343, which is about 5 miles northwest of Portales. The abnormal decline of the water level in this one well was probably caused by heavy pumping.

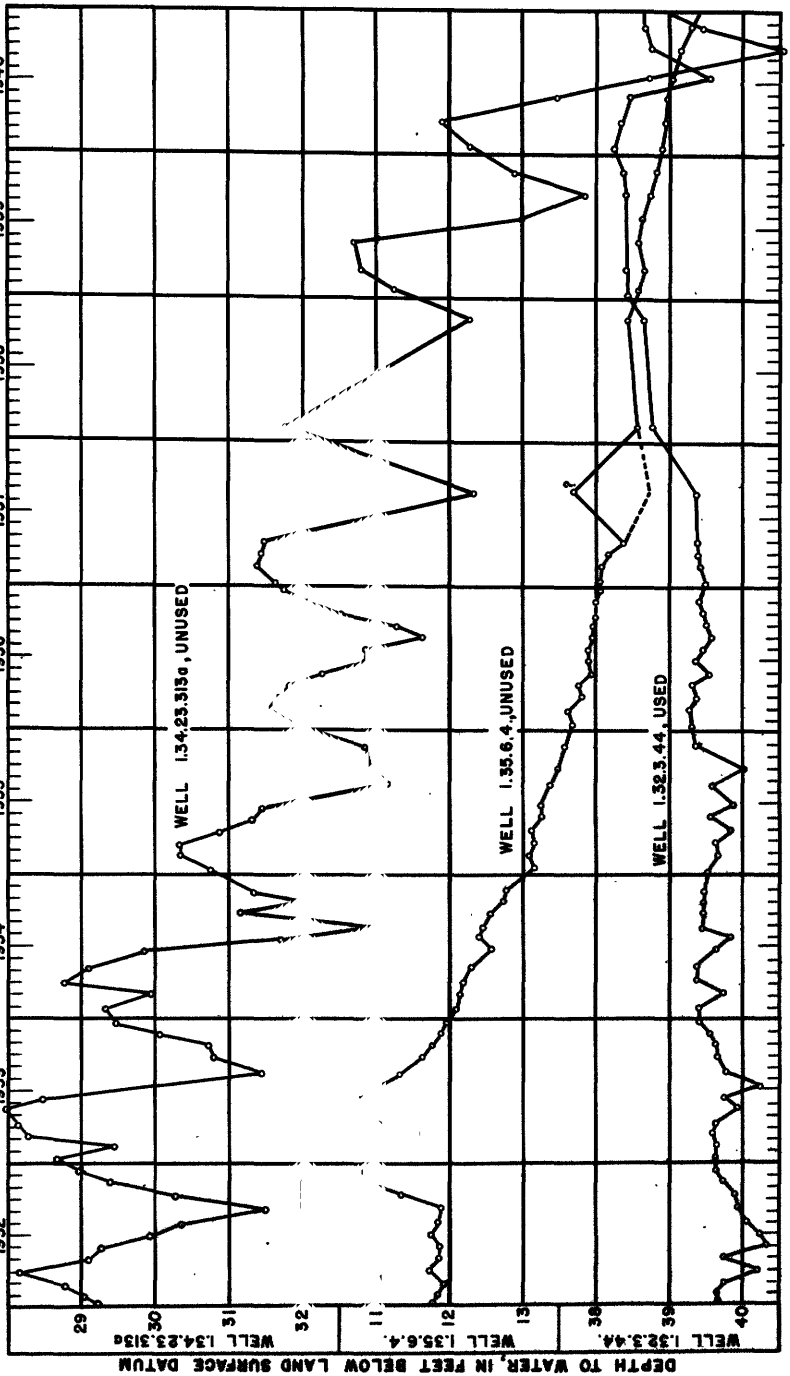

Figure 15.-- Change in water level in three wells in the Portales Valley, N. Mex., 1932-40.

In the heavily pumped area east of Portales the maximum decline observed in 1940 was 3.12 feet, which occurred in well 1.35.31.421.

In the neighborhood of Arch the ground-water level declined more than 1 foot over the area with the maximum observed decline, 1.22 feet, occurring in well 2.36.26.311, a half mile south of Arch.

In the period from January 1932, when the program of well measurements was begun, to January 1941, the ground-water level declined a maximum of more than 12 feet over a small area of heavy pumping about 5 miles northwest of Portales, while in the other area of heavy pumping just east of Portales, the maximum decline amounted to more than 8 feet. The ground-water level in this period has declined more than 5 feet over the entire area of heavy pumping having a maximum length of 9 miles and a maximum width of 6 miles northwest and east of Portales.

In the neighborhood of Arch, in the lower part of the valley, the water levels have declined only slightly since January 1932, the maximum decline being a little more than a half foot.

The accompanying illustration shows the change in water level in 3 wells in the Portales Valley from the beginning of record in 1932 to the end of 1940. Well 1.34.23.313a, which is near the center of heavy pumping just northwest of Portales and which was not used during the period of record, shows characteristic fluctuations due to pumping--that is, a lowering of water level during the summer and a rise during the winter. This graph shows the gradual increased rate of decline in water level that has occurred in the heavily pumped area. The high water level in 1933 was probably due to the reduced amount of pumping as a result of the economic depression (See 12th and 13th Biennial Reports of the State engineer of New Mexico).

The hydrograph for well 1.35.6.4, which was not used during period of record, shows a gradual decline in water level except during 1933. The well is in Blackwater Draw about 4 miles northeast of Portales and about 3 miles from the nearest well that is heavily pumped. The decline in water level is probably due partly to the effects of pumping, as is suggested by the rise in water level in 1933 coincident with the rise shown in the hydrograph of well 1.34.23.313a.

Well 1.32.3.44 is a pumped well on the western edge of the irrigated area in the valley, about 13 miles northwest of Portales, where only very little water is pumped for irrigation.

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Roosevelt County--Continued.

IN.32.7.3. W. J. Crenshaw. Windmill installed September 1940.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	18.17	May 20	18.32	Sept.20	a 19.38
Mar. 26	18.01	July 11	18.89	Nov. 20	a 19.46

IN.33.26.12. Mary E. Miller. Water level, in feet below land surface datum, 1939: Jan. 24, 11.09.

IN.33.36.4a. A. C. Woodburn. Recorder well. Measuring point raised July 16, 1940 to 0.18 foot above land surface datum. New reference point, July 16, 1940, top of 2 by 2-inch wooden hub driven in ground 0.30 foot south of southwest corner fence post of fence around well, 0.31 foot below measuring point. Highest and lowest water level in feet below land surface datum, 1940: Apr. 6, 7.07; Oct. 9, 8.64.

Highest daily water level, in feet below land-surface datum, 1940

(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.27	7.24	7.23	7.21	7.23	7.61	7.57	8.14	8.34	8.54	8.49	8.25
2	7.28	7.24	7.23	7.21	7.25	7.63	7.55	8.15	8.35	8.56	8.48	8.26
3	7.28	7.21	7.23	7.22	7.27	7.65	7.55	8.16	8.32	8.56	8.48	8.26
4	7.28	7.21	7.23	7.22	....	7.66	7.55	8.18	8.38	8.58	8.50	8.26
5	7.29	7.21	7.23	7.15	7.37	7.67	....	8.20	8.41	8.58	8.49	8.26
6	7.25	7.23	7.23	7.07	7.41	7.69	7.17	8.18	8.42	8.60	8.45	8.26
7	7.25	7.24	7.23	7.07	7.43	7.71	7.17	8.13	8.42	8.55	8.44	8.26
8	7.27	7.25	7.23	7.14	7.45	7.74	7.45	8.14	8.44	8.56	8.45	8.26
9	7.27	7.25	7.23	7.17	7.46	7.75	7.63	8.11	8.45	8.58	8.44	8.26
10	7.27	7.24	7.23	7.18	7.49	7.76	7.68	8.12	8.50	8.62	8.42	8.26
11	7.27	7.24	7.23	7.19	7.52	7.77	7.75	8.14	8.47	8.54	8.44	8.25
12	7.27	7.24	7.23	7.19	7.55	7.76	7.76	8.08	8.46	8.52	8.42	8.24
13	7.26	7.24	7.24	7.18	7.58	7.79	7.77	8.06	8.47	8.52	8.40	8.24
14	7.27	7.24	7.24	7.18	7.59	7.81	....	8.05	8.49	8.54	8.40	8.24
15	7.27	7.23	7.23	7.18	7.59	7.83	....	8.08	8.50	8.52	8.39	8.24
16	7.27	7.23	7.23	7.18	7.61	....	....	8.13	8.51	8.52	8.38	8.24
17	7.26	7.24	7.21	7.18	7.63	7.77	7.84	8.14	8.53	8.52	8.36	8.24
18	7.27	7.24	7.22	7.17	7.64	7.73	7.80	8.17	8.56	8.53	8.35	8.26
19	7.27	7.24	7.22	7.18	7.57	7.68	7.86	8.22	8.54	8.54	8.35	8.28
20	7.28	7.25	7.22	7.18	7.57	7.75	7.92	8.23	8.52	8.54	8.34	8.26
21	7.28	7.25	7.22	7.19	7.63	7.73	7.96	8.21	8.52	8.55	8.34	8.24
22	7.29	7.25	7.22	7.19	7.42	7.65	7.94	8.22	8.52	8.56	8.30	8.24
23	7.29	7.25	7.21	7.20	7.43	7.64	7.96	8.24	8.54	8.56	8.34	8.24
24	7.27	7.25	7.22	7.21	7.51	7.71	8.00	8.25	8.59	8.56	8.28	8.25
25	7.27	7.25	7.21	7.20	7.55	7.66	8.02	8.25	8.54	8.56	8.26	8.24
26	7.27	7.24	7.21	7.21	7.58	7.63	8.04	8.27	8.54	8.57	8.27	8.25
27	7.29	7.24	7.21	7.21	7.59	7.63	8.06	8.29	8.54	8.56	8.24	8.22
28	7.19	7.24	7.21	7.23	7.61	7.62	8.08	8.30	8.56	8.55	8.24	8.21
29	7.25	7.23	7.21	7.23	7.56	7.61	8.08	8.32	8.54	8.52	8.24	8.21
30	7.24	....	7.21	7.23	7.57	7.60	8.12	8.34	8.54	8.48	8.24	8.21
31	7.24	....	7.21	....	7.59	....	8.12	8.34	....	8.56	....	8.21

IN.33.36.4b. A. C. Woodburn. Windmill installed on well July 17, 1940.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 23	10.71	May 21	11.03	Sept.20	a 19.37
Mar. 26	10.67	July 11	11.04	Nov. 20	a 12.83

IN.34.29.444. Water level, in feet below land surface datum, 1940: Jan. 28, 19.88.

IN.34.33.224. Mrs. Lee. Water level, in feet below land surface datum, 1940: Jan. 28, 22.38.

IN.34.35.432. Earl McCollum. Water level, in feet below land surface datum, 1940: Jan. 28, 21.85.

a Windmill pumping.

Roosevelt County--Continued.

1.32.3.44. M. Nall.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	38.28	May 20	38.48	Sept.20	38.75
Mar. 26	38.35	July 11	39.53	Nov. 20	38.69

1.32.15.111. Mrs. J. P. Nash. Well is on the east side of an old earthen storage tank, about 20 feet north of a fence line, four windmill anchor posts around well. Unused drilled well, diameter 6 inches, depth 61 feet. Measuring point, top edge of casing on west side, level with land surface datum. Reference point, top edge of USGS washer nailed on northeast side of southwest anchor post, about 3 feet from well, 0.82 foot above measuring point.

Water level, in feet below land-surface datum, 1940

Jan. 17	48.40	May 20	48.39	Sept.20	48.46
Mar. 26	48.42	July 11	48.43	Nov. 20	48.46

1.33.5.231. Ina L. Hoover. Water level, in feet below land surface datum, 1940: Jan. 23, 24.15.

1.33.5.432. Clay Jones. Water level, in feet below land surface datum, 1940: Jan. 17, 21.79.

1.33.5.442. George Thedford. Water level, in feet below land surface datum, 1940: Jan. 17, 22.68.

1.33.7.111. I. G. Hall. Used drilled irrigation well, depth 90 feet. Measuring point, top edge of west ½-inch hole in south side of pump base, 0.06 foot above concrete pump base, 0.56 foot above land surface datum. Water level, in feet below land surface datum, 1940: Jan. 17, 21.16.

1.33.8.112. Andrew Q. Smith. Water level, in feet below land surface datum, 1940: Jan. 17, 20.83.

1.33.8.311. W. F. Marcus. Water level, in feet below land surface datum, 1940: Jan. 17, 22.15.

1.33.9.111. G. C. Kennedy. New measuring point, top edge of USGS washer on west side of west 6-inch crossbeam, west of north upright, 0.70 foot above land surface datum, 0.58 foot below reference point.

Water level, in feet below land-surface datum, 1940

Jan. 17	21.69	May 21	23.74	Sept.20	23.66
Mar. 26	21.71	July 11	23.28		

1.33.9.442. B. J. Perkins. Water level, in feet below land surface datum, 1940: Jan. 17, 20.76.

1.33.10.211. O. B. Sherman. Water level, in feet below land surface datum, 1940: Jan. 23, 25.69.

1.33.10.313. W. A. Bullock. Water level, in feet below land surface datum, 1940: Jan. 17, 22.86.

1.33.11.312. C. F. Williams. Water level, in feet below land surface datum, 1940: Jan. 22, 24.69.

1.33.12.144. A. C. Woodburn. New pump installed May 1940. Measuring point, top edge of east ½-inch hole in south side of pump base, level with land surface datum.

Water level, in feet below land-surface datum, 1939-40

Jan. 12, 1939	33.38	Sept.20, 1939	33.60	May 21, 1940	a 35.17
Mar. 12	33.44	Nov. 17	33.59	July 11	34.13
May 18	33.44	Jan. 23, 1940	33.70	Sept.20	a 38.37
July 18	34.06	Mar. 26	33.76	Nov. 20	34.37

a Pumped recently.

Roosevelt County--Continued.

1.33.13.111. E. Elkins. Water level, in feet below land surface datum, 1940: Jan. 22, 24.29.

1.33.13.431. Mr. Spires. Water level, in feet below land surface datum, 1940: Jan. 24, 26.96.

1.33.14.111. R. D. Loy. Water level, in feet below land surface datum, 1940: Jan. 22, 22.04.

1.33.14.131. J. V. Miller. Water level, in feet below land surface datum, 1940: Jan. 22, 22.16.

1.33.14.311. J. T. Elder Estate. Jan. 22, 1940, pit dry.

1.33.14.331. J. T. Elder Estate.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 22	22.27	May 21	23.22	Sept.20	24.51
Mar. 26	22.15	July 11	23.67	Nov. 20	24.23

1.33.14.421. Leon Jones. Water level, in feet below land surface datum, 1940: Jan. 24, 24.88.

1.33.15.212. Mrs. Ollie Minick. Water level, in feet below land surface datum, 1940: Jan. 24, 21.80.

1.33.17.221. R. F. Campbell. Reference point 2, top of 2 by 2-inch wooden hub, driven flush with land surface, 2.9 feet south of fence post painted orange, 29 feet N. 19° E. of well, 5.16 feet above measuring point.

Water level, in feet below land-surface datum, 1940

Jan. 17	20.29	May 21	20.44	Sept.20	20.80
Mar. 26	20.33	July 11	20.52	Nov. 20	21.02

1.33.23.311. Dan. H. Smith. Water level, in feet below land surface datum, 1940: Jan. 22, 24.78.

1.33.23.433. Dr. H. A. Miller. Water level, in feet below land surface datum, 1940: Jan. 22, 25.17.

1.33.24.111. J. E. Dictson. Water level, in feet below land surface datum, 1940: Jan. 24, 30.04.

1.33.24.433. J. E. Jones. Water level, in feet below land surface datum, 1940: Jan. 22, 26.64.

1.33.25.213. Drew West. Water level, in feet below land surface datum, 1940: Jan. 22, 36.16.

1.33.26.221. D. E. Thomas. Water level, in feet below land surface datum, 1940: Jan. 24, 25.16.

1.33.26.331. Luther Thomas. Water level, in feet below land surface datum, 1940: Jan. 17, 30.64.

1.33.27.322. Joseph A. Henley. Water level, in feet below land surface datum, 1940: Jan. 17, 34.66.

1.33.28.311. R. L. Jolly.

Water level, in feet below land-surface datum, 1940

Jan. 17	46.41	May 21	a 69.5	Sept.20	a 71.5
Mar. 26	46.41	July 11	49.72	Nov. 20	47.60

a Pumping approximately 1150 gallons a minute.

Roosevelt County--Continued.

1.33.29.333. Unused drilled well, diameter 7 inches, depth 50.5 feet. Measuring point, top edge of casing on south side, 0.25 foot above land surface datum. Reference point, top of 2 by 2-inch wooden hub, driven flush with land surface, in fence line on north side of road, 45 feet S. 44° W. from well, in line with power line pole on south side of road, 16.25 feet west from tall fence post, 7.8 feet east from short fence post, 0.45 foot above measuring point. Water levels, in feet below land surface datum, 1940: July 11, 36.77; Sept. 20, 36.99; Nov. 20, 37.09.

1.33.30. Joe S. Lewis.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	1.87	May 20	2.46	Sept.20	3.99
Mar. 26	1.93	July 11	3.70	Nov. 20	2.62

1.33.34.211. John E. Plummer. Diameter 12 inches, depth 99.5 feet. Pump installed on well July 1940.

Water level, in feet below land-surface datum, 1940

Jan. 17	27.58	May 21	a 29.18	Nov. 20	29.72
Mar. 26	27.39	Sept.20	a 31.29		

1.33.36.112. Edwin Johnson. Measurements discontinued after May 21, 1940. Water levels, in feet below land surface datum, 1940: Jan. 17, 32.50; Mar. 26, 32.18; May 21, 34.88.

1.33.36.133. Edwin Johnson. Water level, in feet below land surface datum, 1940: Jan. 17, 39.58.

1.34.8.434. W. H. Marsh. Water level, in feet below land surface datum, 1940: Jan. 23, 34.04.

1.34.13.412. Ben Donathan.

Water level, in feet below land-surface datum, 1940

Jan. 23	56.30	May 21	56.26	Sept.22	56.44
Mar. 26	56.10	July 11	56.30	Nov. 20	56.46

1.34.14.432. Lucille Blackman. Water levels, in feet below land surface datum, 1940: Jan. 23, 46.82; Mar. 26, 46.56.

1.34.16.422. Ed. White. Approximately 60 feet south of a fence line. Unused drilled well, diameter 18 inches, depth 96.5 feet. Measuring point, top edge of concrete well curb at north side of well, level with land surface datum. Water levels, in feet below land surface datum, 1940: Aug. 10, 46.87; Sept. 20, 47.50; Nov. 20, 47.90.

1.34.17.111. L. E. Eyler. Water level, in feet below land surface datum, 1940: Jan. 23, 34.09.

1.34.17.122. Geo. O. Donnell. Water level, in feet below land surface datum, 1940: Jan. 23, 33.67.

1.34.17.233. D. L. Ray. Water levels, in feet below land surface datum, 1940: Jan. 23, 32.44; Mar. 26, 33.04; Nov. 20, 39.65.

1.34.17.241. B. F. Ray. Water level, in feet below land surface datum, 1940: Jan. 23, 29.04.

1.34.18.312. J. E. Tucker. Measurements discontinued.

1.34.18.343. J. W. Terry. Water level, in feet below land surface datum, 1940: Jan. 24, 29.28.

1.34.19.223. Lewis P. King. Water level, in feet below land surface datum, 1940: Jan. 24, 27.57.

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a Well ½ mile west pumping.

Roosevelt County--Continued.

1.34.20.331. A. G. Ross. New well drilled in March 1940 about 10 feet north of old well which was filled. Measuring point, edge of pump case shell, top of rectangular slot on south side of pump, 2.32 feet above land surface datum. Reference point, surface of concrete pump base, 1.13 feet below measuring point. Water levels, in feet below land surface datum, 1940: Jan. 20, 29.50; Mar. 29, 30.14.

1.34.21.121. L. H. Lee. Water level, in feet below land surface datum, 1940: Jan. 20, 34.98.

1.34.21.141. Douglas Owens. Water level, in feet below land surface datum, 1940: Jan. 23, 34.90.

1.34.21.222. Elizabeth Tipton. Water level, in feet below land surface datum, 1940: Jan. 23, 40.95.

1.34.22.131. Mrs. W. E. Jèrgins. Water level, in feet below land surface datum, 1940: Jan. 23, 36.27.

1.34.22.211. Mrs. A. J. Goodwin. Water level, in feet below land surface datum, 1940: Jan. 23, 38.81.

1.34.22.222. Mrs. A. J. Goodwin.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 23	42.35	May 21	42.48	Sept.20	43.58
Mar. 26	42.38	July 11	42.84	Nov. 20	43.45

1.34.22.413. Joe A. Ray. Pump removed to new well approximately 300 feet northeast of observation well. Water level, in feet below land surface datum, 1940: Jan. 22, 34.66.

1.34.22.421. Bob C. Grunig. Water level, in feet below land surface datum, 1940: Jan. 22, 36.22.

1.34.22.443. R. M. Cox. Water level, in feet below land surface datum, 1940: Jan. 22, 33.56.

1.34.23.211. Hazel Hall. Water level, in feet below land surface datum, 1940: Jan. 23, 40.88.

1.34.23.311. J. R. Mahaffey. Water level, in feet below land surface datum, 1940: Jan. 22, 34.80.

1.34.23.313a. F. A. Buchanan.

Water level, in feet below land-surface datum, 1940

Jan. 22	34.25	May 21	35.45	Sept.20	38.57
Mar. 26	33.88	July 11	36.69	Nov. 20	37.46

1.34.23.422. E. L. Yandell. Water level, in feet below land surface datum, 1940: Jan. 23, 32.95.

1.34.23.442. J. C. Hicks. Water level, in feet below land surface datum, 1940: Jan. 23, 33.91.

1.34.24.112. J. A. Penson.

Water level, in feet below land-surface datum, 1940

Jan. 23	39.40	May 21	39.44	Sept.22	40.33
Mar. 26	39.25	July 11	39.82	Nov. 20	40.46

1.34.24.243. J. T. Gorrell. Water level, in feet below land surface datum, 1940: Jan. 23, 46.94.

1.34.24.312. W. A. Cummings. Water level, in feet below land surface datum, 1940: Jan. 23, 33.64.

Roosevelt County--Continued.

1.34.25.211. J. B. H. Young. Recorder well. New recorder shelter installed July 1940. Measuring point, surface of concrete well curb, east side of well, level with land surface datum. Highest and lowest water level, in feet below land surface datum, 1940: Mar. 15, 37.57; Oct. 27, 39.52.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37.91	37.77	37.63	37.68	37.67	38.10	38.33	.....	38.97	39.36	39.49	39.32
2	37.91	37.77	37.62	37.68	37.70	38.11	38.34	38.62	38.98	39.37	39.49	39.31
3	37.91	37.77	37.62	37.68	37.72	38.11	38.34	38.63	38.99	39.38	39.49	39.31
4	37.91	37.76	37.62	37.68	37.75	38.12	38.34	38.65	39.01	39.39	39.49	39.31
5	37.91	37.76	37.62	37.68	37.77	38.14	38.35	38.66	39.03	39.41	39.49	39.30
6	37.91	37.76	37.61	37.69	37.78	38.15	38.36	38.67	39.04	39.41	39.47	39.30
7	37.91	37.75	37.61	37.70	37.80	38.16	38.36	38.68	39.05	39.42	39.46	39.29
8	37.91	37.74	37.60	37.70	37.82	38.17	38.36	38.69	39.06	39.42	39.45	39.29
9	37.90	37.74	37.59	37.70	37.84	38.18	38.37	38.71	39.07	39.43	39.45	39.28
10	37.90	37.74	37.59	37.70	37.85	38.21	38.39	38.72	39.08	39.44	39.44	39.28
11	37.90	37.74	37.58	37.69	37.85	38.22	38.40	38.73	39.10	39.46	39.43	39.27
12	37.89	37.73	37.58	37.68	37.86	38.22	38.41	38.74	39.11	39.46	39.43	39.27
13	37.88	37.73	37.58	37.67	37.86	38.23	38.42	38.75	39.13	39.47	39.42	39.28
14	37.88	37.72	37.58	37.66	37.89	38.24	38.43	38.76	39.16	39.48	39.41	39.27
15	37.88	37.72	37.57	37.65	37.89	38.25	38.43	38.77	39.17	39.49	39.40	39.27
16	37.88	37.70	37.58	37.64	37.90	38.25	38.44	38.78	39.19	39.49	39.40	39.26
17	37.87	37.69	37.58	37.63	37.91	38.25	38.45	38.79	39.20	39.49	39.39	39.25
18	37.86	37.69	37.58	37.63	37.94	38.25	38.46	38.80	39.22	39.50	39.39	39.25
19	37.83	37.68	37.58	37.62	37.95	38.26	38.47	38.81	.....	39.50	39.39	39.25
20	37.83	37.68	37.58	37.60	37.96	38.27	38.48	38.82	.....	39.49	39.37	39.23
21	37.83	37.68	37.58	37.61	37.98	38.28	38.49	38.83	39.24	39.49	39.37	39.22
22	37.83	37.67	37.60	37.60	38.00	38.29	38.50	38.84	39.25	39.49	39.36	39.22
23	37.82	37.66	37.61	37.59	38.01	38.29	38.51	38.85	39.26	39.48	39.37	39.21
24	37.82	37.66	37.62	37.59	38.02	38.29	38.52	38.87	39.28	39.48	39.37	39.21
25	37.81	37.66	37.64	37.58	38.04	38.30	38.53	38.88	39.29	39.49	39.36	39.21
26	37.80	37.65	37.66	37.58	38.06	38.30	.....	38.89	39.30	39.50	39.35	39.22
27	37.80	37.65	37.66	37.59	38.07	38.30	.....	38.90	39.31	39.50	39.34	39.21
28	37.80	37.65	37.66	37.60	38.08	38.31	.....	38.91	39.32	39.51	39.33	39.21
29	37.79	37.64	37.67	37.63	38.08	38.32	.....	38.92	39.34	39.50	39.33	39.20
30	37.79	.....	37.68	37.65	38.09	38.33	.....	38.94	39.35	39.49	39.33	39.20
31	37.78	.....	37.68	.....	38.09	.....	.....	38.96	.....	39.50	.....	39.20

1.34.25. J. B. H. Young and Smith feed pens. Water level, in feet below land surface datum, 1940: Jan. 26, a/35.66.

1.34.26.4. Unused dug and drilled well. Located at southeast corner of north Locust Street and W. Dallas. Measuring point, upper edge of USGS washer on north top edge of south cross beam, to west of south vertical frame post, 0.71 foot above land surface datum. Reference point, surface of concrete well curb at southwest corner of pit, 0.71 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 18, 32.46.

1.34.27.211. J. F. Bowman. Water level, in feet below land surface datum, 1940: Jan. 22, 31.54.

1.34.27.331. Lewis Kirby. Water level, in feet below land surface datum, 1940: Jan. 20, 29.39.

1.34.27.341. B. F. Smith. Water level, in feet below land surface datum, 1940: Jan. 20, 29.52.

1.34.27.412. J. D. Cyphers. Water level, in feet below land surface datum, 1940: Jan. 18, 30.69.

1.34.27.431. T. E. Willman. Water level, in feet below land surface datum, 1940: Jan. 24, 29.82.

a Small pressure pump operating.

Roosevelt County--Continued.

1.34.28.211. H. M. Livingston. Measuring point, upper edge of USGS washer on top southeast edge of southeast 2 by 8-inch stringer, 1 foot southwest of vertical frame post, 1.00 foot above land surface datum. Reference point, surface of concrete weir box at east corner at cross mark, 5 feet southwest of well, 0.91 foot above measuring point. Well redrilled in 1939. Water level, in feet below land surface datum, 1940: Jan. 22, a/30.61.

1.34.28.311. Mrs. Nora Teague. Water level, in feet below land surface datum, 1940: Jan. 20, 30.99.

1.34.29.211. George and King. Water level, in feet below land surface datum, 1940: Jan. 20, 27.75.

1.34.30.121. R. M. Pember. Water level, in feet below land surface datum, 1940: Jan. 23, 26.79.

1.34.30.221. John Davidson. Water level, in feet below land surface datum, 1940: Jan. 20, 26.05.

1.34.33.223. C. P. Yadon. Water level, in feet below land surface datum, 1940: Jan. 20, 27.47.

1.34.33.431. F. E. DeQuire.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	16.84	May 21	17.13	Sept.20	18.26
Mar. 26	16.74	July 11	17.57	Nov. 20	18.37

1.34.34.143. J. A. Sanders. Water level, in feet below land surface datum, 1940: Jan. 24, 32.04.

1.34.34.232. J. W. Owens. Water level, in feet below land surface datum, 1940: Jan. 24, 29.43.

1.34.34.321. A. L. Hartzell. Measurements discontinued.

1.34.34.411. W. L. Patton. Water level, in feet below land surface datum, 1940: Jan. 24, 30.15.

1.34.35.3. Eastern New Mexico College. Water level, in feet below land surface datum, 1940: Jan. 24, 28.08.

1.34.36.212. R. R. Laird. New well drilled in 1938 near old well which was filled. Used drilled irrigation well, diameter 12 inches, depth 107 feet. Measuring point, bottom edge of pump base flange at west side, 0.60 foot above land surface datum. Reference point, top of concrete weir box at cross mark on southeast corner, 15 feet north of well, 1.54 feet above measuring point and 2.0 feet above bottom inside surface of weir box. Water level, in feet below land surface datum, 1940: Jan. 26, a/32.33.

1.34.36.233. Mr. Disney. Water level, in feet below land surface datum, 1940: Jan. 26, 31.54.

1.34.36.332. T. R. Chambers. Water level, in feet below land surface datum, 1940: Jan. 26, 27.75.

1.34.36.421. Earl McCollum. Water level, in feet below land surface datum, 1940: Jan. 26, 30.20.

1.34.36.443. Foy Williams. Water level, in feet below land surface datum, 1940: Jan. 26, 29.50.

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a Measuring point changed. New measuring point could not be accurately referenced to old, possible discrepancy of several tenths of a foot between preceding and succeeding records.

Roosevelt County--Continued.

1.35.2.3. Eastern New Mexico State Park. Measuring point, lower inside edge of hole in west side of pump case shell, 0.80 foot above land surface datum. Reference point, surface of concrete floor that pump sits on, 0.76 foot below measuring point. Measurements in Water-Supply Paper 845, previous to Nov. 1938, should be reduced by 0.10 foot to compare with succeeding record.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 48.07	May 21	48.13	Sept.22	47.90
Mar. 27	b 61.7+	July 11	48.37	Nov. 20	47.86

1.35.6.141. Aubrey and Ellis.

Water level, in feet below land-surface datum, 1940

Jan. 18	10.10	May 21	10.18	Sept.22	10.86
Mar. 26	10.02	July 11	10.48	Nov. 20	10.82

1.35.6.4. Dr. W. M. Brown.

Water level, in feet below land-surface datum, 1940

Jan. 18	14.90	May 21	14.97	Sept.22	15.19
Mar. 26	14.92	July 11	15.04	Nov. 20	15.35

1.35.19.332. S. D. Foreman. Water level, in feet below land surface datum, 1940: Jan. 26, 41.93.

1.35.19.432. D. A. Carroll. Water level, in feet below land surface datum, 1940: Jan. 26, 45.60.

1.35.28.143. J. C. Dick.

Water level, in feet below land-surface datum, 1940

Jan. 26	50.48	May 22	50.79	Sept.21	52.68
Mar. 26	50.42	July 11	c 52.26	Nov. 21	51.56

1.35.29.111. Clara Nullmeyer. Used drilled irrigation well. Measuring point, top edge of 3/4-inch hole in south side of pump base flange, 0.50 foot above land surface datum. Reference point, surface of concrete pump base, 0.08 foot below measuring point. Water levels, in feet below land surface datum: Nov. 12, 1938, 41.90; Jan. 26, 1940, 39.47.

1.35.29.231. R. E. Lee. Water level, in feet below land surface datum, 1940: Jan. 26, 39.05.

1.35.30.111. E. F. Foreman. Water level, in feet below land surface datum, 1940: Jan. 26, 37.64.

1.35.30.343. B. E. Fickling. Water level, in feet below land surface datum, 1940: Jan. 26, 29.87.

1.35.31.122. Mary M. Kenyon. Water level, in feet below land surface datum, 1940: Jan. 26, 29.92.

1.35.31.231. W. L. Rogers. Water level, in feet below land surface datum, 1940: Jan. 26, 28.50.

1.35.31.331. R. A. Young. Water level, in feet below land surface datum, 1940: Jan. 26, 28.48.

1.35.31.341. W. M. Drinkard. Measurements discontinued.

1.35.31.342. E. F. Moore. Water level, in feet below land surface datum, 1940: Jan. 26, 28.23.

1.35.31.421. Henry Beebe. Water level, in feet below land surface datum, 1940: Jan. 27, 27.48.

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a Pump stopped 14½ hours previous to measurement.
b Pumping.
c Stopped pumping 10 minutes previous to measurement.

Roosevelt County--Continued.

1.35.32.112. George and King. Water level, in feet below land surface datum, 1940: Jan. 26, 27.55.

1.35.32.212. H. M. Livingston. Used drilled irrigation well, diameter 14 inches, depth 115 feet. Measuring point, upper edge of USGS washer on east top edge of west 4 by 10-inch timber pump support, 0.67 foot above top of casing, level with land surface datum. Water level, in feet below land surface datum, 1940: Jan. 26, 25.92.

1.35.32.311. Lee and Nelle Carter. Water level, in feet below land surface datum, 1940: Jan. 27, 24.96.

1.35.32.332. Lee and Nelle Carter. Water level, in feet below land surface datum, 1940: Jan. 26, 25.75.

1.35.32.411. Quincy Haynes. Water level, in feet below land surface datum, 1940: Jan. 27, 23.30.

1.35.33.112. Roy Newberry. Water level, in feet below land surface datum, 1940: Jan. 26, 29.89.

1.35.33.331. Lowell C. Green. Water level, in feet below land surface datum, 1940: Jan. 27, 22.20.

1.36.5.3. H. Pieper.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 29	35.84	May 21	a 36.68	Sept.22	35.99
Mar. 27	a 36.72	July 11	a 36.59	Nov. 20	36.00

1.36.6.1. Julian L. Bivins. Water level, in feet below land surface datum, 1940: Jan. 29, 40.66.

1.36.16.1. State land.

Water level, in feet below land-surface datum, 1940

Jan. 29	a 30.20	May 21	a 23.63	Sept.22	24.17
Mar. 27	a 32.03	July 11	a 30.15	Nov. 20	21.63

2.34.1.114. E. C. Murrill. Water level, in feet below land surface datum, 1940: Jan. 30, 27.73.

2.34.1.133. Hugh Knox. Water level, in feet below land surface datum, 1940: Jan. 30, 27.20.

2.34.1.221. Foy Williams. Water level, in feet below land surface datum, 1940: Jan. 26, 29.16.

2.34.2.233. A. G. Troutt. Recorder well. Highest and lowest water level, in feet below land surface datum, 1940: Mar. 8, 41.92; Sept. 28, 46.28.

Highest daily water level, in feet below land-surface datum, 1940
(from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.17	42.05	41.94	42.14	42.72	43.20	43.88	45.38	45.40	45.87	45.08	44.63
2	42.16	42.05	41.97	42.16	42.71	43.19	.....	45.48	45.35	45.82	45.05	44.62
3	42.16	42.02	41.94	42.18	42.70	43.18	.....	45.52	45.32	45.80	45.01	.....
4	42.15	42.03	41.96	42.22	42.73	43.28	.....	45.47	45.32	45.76	44.99	.....
5	42.18	42.02	41.93	42.22	42.76	43.51	.....	45.44	45.33	45.72	44.99	44.57
6	42.17	42.02	41.93	42.21	42.76	43.73	.....	45.49	45.49	45.68	44.99	.....
7	42.15	42.00	41.94	43.23	42.89	43.83	44.42	45.43	45.59	45.63	44.99	.....
8	42.15	42.01	41.92	42.22	42.93	43.86	44.38	45.35	45.65	45.59	44.99	44.51
9	42.15	42.03	41.92	42.21	43.01	43.84	44.58	45.33	45.65	45.61	44.94	44.49
10	42.14	42.01	41.93	42.21	43.10	.....	44.65	45.30	45.77	45.62	44.93	.....
11	42.14	42.00	41.93	42.25	43.20	43.80	44.75	45.20	45.86	45.58	44.91	.....
12	42.12	42.00	41.95	42.23	43.22	43.76	44.78	45.14	45.92	45.53	44.91	.....

a Windmill pumping.

Roosevelt County--Continued.

2.34.2.233.--Continued.

Highest daily watsr level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
13	42.10	42.01	41.98	42.21	43.19	43.74	44.75	45.04	45.95	45.46	44.89	44.49
14	42.16	41.98	41.97	42.17	43.31	43.74	44.66	44.96	45.91	45.45	44.87	44.46
15	42.16	41.98	41.96	42.17	43.36	43.93	44.63	44.89	45.92	45.45	44.84	44.45
16	42.12	42.00	41.96	42.15	43.46	43.92	44.79	44.80	45.87	45.37	44.84	44.45
17	42.10	42.00	41.96	42.17	43.48	43.92	44.93	44.76	45.95	45.34	44.85	44.44
18	42.15	41.97	41.99	42.18	43.57	43.99	45.00	44.74	45.98	45.29	44.84	44.44
19	42.13	41.98	41.97	42.18	43.50	44.07	45.00	44.73	46.01	45.25	44.84	44.44
20	42.11	41.99	41.95	42.23	43.48	44.12	44.98	44.82	46.03	45.19	44.83	44.44
21	42.10	41.98	41.97	42.26	43.54	44.11	45.00	44.96	46.10	45.19	44.78	44.42
22	42.08	41.96	42.00	42.26	43.53	44.15	45.00	45.05	46.05	45.22	44.77	44.40
23	42.10	41.96	42.04	42.39	43.46	44.05	45.00	45.17	45.96	45.26	44.76	44.38
24	42.08	41.99	42.14	42.44	43.40	44.01	45.18	45.33	45.94	45.32	44.74	44.37
25	42.08	41.96	42.12	42.55	43.37	43.95	45.19	45.31	45.96	45.25	44.71	44.34
26	42.08	41.95	42.13	42.65	43.36	43.90	45.19	45.27	46.07	45.21	44.72	44.37
27	42.08	41.96	42.13	42.71	43.30	43.89	45.27	45.30	46.08	45.21	44.71	44.33
28	42.07	41.96	42.14	42.73	43.28	43.92	45.28	45.30	46.08	45.18	44.68	44.33
29	42.06	41.94	42.15	42.70	43.25	43.94	45.29	45.37	46.04	45.16	44.65	44.30
30	42.05	.....	42.15	42.70	43.21	43.89	45.29	45.45	45.95	45.12	44.65	44.28
31	42.04	.....	42.14	.....	43.19	.....	45.27	45.48	.....	45.11	.....	44.29

2.34.4.441. Maud Wallace.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 17	4.70	May 21	5.31	Sept.20	6.41
Mar. 26	4.87	July 11	5.94	Nov. 21	6.09

2.34.6.321. V. W. Kyte. Well filled and measurements discontinued after Nov. 20, 1940.

Water level, in feet below land-surface datum, 1940

Jan. 17	25.34	May 21	25.79	Sept.20	26.06
Mar. 26	25.62	July 11	25.93	Nov. 20	26.24

2.34.6.412. R. F. McCalip. Measurements discontinued after Jan. 17, 1940. Water level, in feet below land surface datum, 1940: Jan. 17, 22.68.

2.34.6.421. R. F. McCalip. Well filled, measurements discontinued after Jan. 17, 1940. Water level, in feet below land surface datum, 1940: Jan. 17, 20.00.

2.34.10.343. H. J. Bollen. Water level, in feet below land surface datum, 1940: Jan. 27, 35.50.

2.34.12.143. E. J. Pendergraft. Water level, in feet below land surface datum, 1940: Jan. 27, 18.17.

2.34.12.231. E. A. Herndon. Pit dry 1940. Measurements discontinued.

2.34.13.111. Lon. J. Partin. Water level, in feet below land surface datum, 1940: Jan. 27, 17.42.

2.34.14.113. E. E. McNew. Water level, in feet below land surface datum, 1940: Jan. 27, 29.04.

2.34.14.412. N. R. Blackard.

Water level, in feet below land-surface datum, 1940

Jan. 27	25.61	May 21	25.98	Sept.21	26.64
Mar. 27	25.93	July 12	26.38	Nov. 21	26.73

2.34.14.443. J. M. Shim. Water level, in feet below land surface datum, 1940: Jan. 27, 35.66.

Roosevelt County--Continued.

2.34.15.212. Mrs. R. B. Rogers.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 27	30.99	May 21	31.18	Sept.21	a 41.62
Mar. 26	30.85	July 12	32.20	Nov. 21	32.65

2.35.4.111. W. W. Hampton.

Water level, in feet below land-surface datum, 1940

Jan. 27	22.10	May 21	23.19	Sept.21	a 26.61
Mar. 26	22.12	July 12	a 25.63	Nov. 21	24.28

2.35.5.311. H. G. Black. Water level, in feet below land surface datum, 1940: Jan. 27, 23.10.

2.35.5.341. H. R. Sadler. Water level, in feet below land surface datum, 1940: Jan. 27, 23.56.

2.35.6.121. Wayne Culpepper.

Water level, in feet below land-surface datum, 1940

Jan. 26	26.85	May 21	27.10	Sept.21	a 32.47
Mar. 26	b 43.58	July 12	a 29.39	Nov. 21	30.74

2.35.6.213. Mrs. Beulah Ownby. Water level, in feet below land surface datum, 1940: Jan. 26, 26.66.

2.35.6.312. Ray Snelson. Water level, in feet below land surface datum, 1940: Jan. 27, 24.95.

2.35.6.331. J. H. Akers. Water level, in feet below land surface datum, 1940: Jan. 27, 23.03.

2.35.6.411. F. A. Jewell. Water level, in feet below land surface datum, 1940: Jan. 27, 24.75.

2.35.6.443. B. H. Howard. Water stage recorder installed Mar. 28, 1940 on well drilled on bank of pit of irrigation well. Measuring point, top edge of recorder shelter shelf, 0.08 foot above reference point, 0.81 foot above land surface datum. Highest and lowest non-pumping water level, in feet below land surface datum, 1940: Apr. 16, 22.99; Sept. 30, 31.83.

Highest daily water level, in feet below land-surface datum, 1940
(from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	23.09	23.45	23.80	25.02	26.40	27.45	27.97	26.56	25.99
2	.....	23.11	23.49	23.88	25.08	26.87	27.38	27.89	26.53	25.97
3	.....	23.15	23.49	23.96	25.17	27.03	27.28	27.83	26.49	25.93
4	.....	23.16	23.43	24.07	25.23	26.91	27.34	27.71	26.48	25.92
5	.....	23.13	23.40	24.17	25.16	26.73	27.39	27.64	26.45	25.89
6	.....	23.09	23.36	24.31	25.11	26.85	27.48	27.59	26.43	25.89
7	.....	23.10	23.37	24.42	25.07	26.88	27.60	27.53	26.41	25.87
8	.....	23.09	23.41	24.33	25.04	26.96	27.76	27.51	26.37	25.85
9	.....	23.09	23.55	24.26	25.22	26.84	27.63	27.47	26.35	25.83
10	.....	23.06	23.59	24.26	25.32	26.76	28.14	27.41	26.33	25.83
11	.....	23.11	23.57	24.28	25.39	26.66	27.85	27.36	26.33	25.81
12	.....	23.08	23.51	24.25	25.52	26.61	27.77	27.31	26.31	25.80
13	.....	23.05	23.47	24.22	25.92	26.53	27.68	27.26	26.30	25.79
14	.....	23.00	23.51	24.20	25.69	26.51	27.83	27.23	26.27	25.76
15	.....	23.00	23.66	24.40	25.64	26.47	27.86	27.19	26.25	25.75
16	.....	22.99	23.76	24.37	25.77	26.44	27.79	27.14	26.22	25.75
17	.....	23.01	23.89	24.35	25.88	26.53	27.86	27.10	26.20	25.73
18	.....	23.01	23.91	24.48	25.81	26.51	27.78	27.05	26.19	25.71
19	.....	23.00	23.82	24.61	25.96	26.47	27.91	27.01	26.19	25.70
20	.....	23.01	23.81	24.61	26.29	26.62	27.85	.....	26.17	25.69
21	.....	23.00	23.99	24.55	25.99	26.65	27.87	.....	26.15	25.66

a Pumped recently.
b Pumping approximately 800 gallons a minute.

Roosevelt County--Continued.

2.35.6.443.--Continued.

Highest daily water level, in feet below land-surface datum, 1940 (from recorder charts)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	.....	23.00	23.95	24.53	25.95	26.59	27.80	.....	26.13	25.64
23	.....	23.13	23.91	24.61	26.03	26.76	27.77	.....	26.11	25.63
24	.....	23.15	23.86	24.60	25.97	26.59	27.93	.....	26.09	25.59
25	.....	23.17	23.88	24.69	25.93	27.20	27.93	.....	26.07	25.57
26	.....	23.19	23.85	24.67	26.11	27.27	27.87	.....	26.07	25.61
27	.....	23.19	23.85	24.69	26.22	27.35	28.17	26.70	26.05	25.55
28	23.08	23.19	23.85	24.67	26.16	27.31	28.18	26.67	26.03	25.57
29	23.07	23.16	23.84	24.87	26.37	27.30	27.93	26.63	26.00	25.54
30	23.11	23.25	23.82	25.19	26.41	27.37	27.88	26.62	25.99	25.53
31	23.09	.....	23.81	.....	26.46	27.49	.....	26.59	.....	25.51

2.35.7.134. A. L. Kelly. Water level, in feet below land surface datum, 1940: Jan. 27, 33.11.

2.35.7.311. W. H. Seefield.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 27	15.82	May 21	a 16.89	Sept.21	17.05
Mar. 27	a 15.73	July 12	a 16.37	Nov. 21	a 17.15

2.35.8.331. G. C. Cooper. Water level, in feet below land surface datum, 1940: Jan. 27, 26.75.

2.35.9.211. Fred Smith.

Water level, in feet below land-surface datum, 1940

Jan. 27	18.37	May 21	18.66	Sept.21	19.23
Mar. 27	18.53	July 12	18.90	Nov. 21	19.53

2.35.10.211. C. H. Hare. Unused drilled irrigation well, diameter 12 (?) inches, depth 140 feet. Measuring point, top of hole in base of pump at west side, 0.20 foot above land surface datum. Reference point, surface of concrete pump base, 0.20 foot below measuring point. Water level, in feet below land surface datum, 1940: Jan. 27, 18.14.

2.35.14.414. Well 2.35.14.244 in Water-Supply Paper 886. First National Bank of Portales.

Water level, in feet below land-surface datum, 1940

Jan. 29	2.86	May 21	3.24	Sept.21	4.23
Mar. 27	2.81	July 12	3.90	Nov. 21	3.84

2.35.14.313. First National Bank of Portales.

Water level, in feet below land-surface datum, 1940

Jan. 29	10.62	May 21	10.45	Sept.21	11.51
Mar. 27	10.34	July 12	10.95	Nov. 21	11.54

2.35.15.131. First National Bank of Portales.

Water level, in feet below land-surface datum, 1940

Jan. 29	2.29	May 21	2.66	Sept.21	3.67
Mar. 27	2.29	July 12	3.19	Nov. 21	3.14

2.35.16.333. A. J. Cline.

Water level, in feet below land-surface datum, 1940

Jan. 27	8.02	May 21	8.19	Sept.21	9.16
Mar. 27	7.93	July 12	8.76	Nov. 21	8.79

2.35.18.211.

Water level, in feet below land-surface datum, 1940

Jan. 27	4.72	May 21	5.09	Sept.21	6.57
Mar. 27	4.56	July 12	6.06	Nov. 21	5.82

a Windmill pumping.

Roosevelt County--Continued.

2.35.19.134. J. S. Martin. Measurements discontinued after May 21, 1940. Water levels, in feet below land surface datum, 1940: Jan. 27, 28.92; Mar. 27, 29.04; May 21, 29.10.

2.35.25.123. Dr. L. C. Buchanan.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 29	22.17	May 22	22.49	Sept.21	a 23.19
Mar. 27	22.29	July 12	22.66	Nov. 21	23.13

2.36.8.432. S. W. Davis.

Water level, in feet below land-surface datum, 1940

Jan. 29	19.60	May 22	b 21.18	Nov. 21	21.02
Mar. 27	b 26.59	Sept.21	b 24.26		

2.36.9.431. J. E. Polly. Water level, in feet below land surface datum, 1940: Jan. 29, 20.59.

2.36.18.341. Bob Stokes.

Water level, in feet below land-surface datum, 1940

Jan. 29	15.80	May 22	15.99	Nov. 21	16.65
Mar. 27	15.91	Sept.21	16.40		

2.36.20.321. W. O. Davis. Water levels, in feet below land surface datum, 1940: Jan. 30, 14.94; Mar. 27, 14.70; May 22, 18.82; Nov. 21, 16.17.

2.36.21.432. Sam H. McCarson. Water level, in feet below land surface datum, 1940: Jan. 30, 15.87.

2.36.24.322. J. L. Hampton. Measurements discontinued after Mar. 27, 1940. Water levels, in feet below land surface datum, 1940: Jan. 29, 16.72; Mar. 27, 16.86.

2.36.25.112. W. D. Pate. Water level, in feet below land surface datum, 1940: Jan. 29, 15.42.

2.36.26.131. L. L. Bugg.

Water level, in feet below land-surface datum, 1940

Jan. 29	12.93	May 22	12.98	Sept.21	13.68
Mar. 27	12.93	July 12	13.19	Nov. 21	14.03

2.36.26.311. J. S. Riley. Water level, in feet below land surface datum, 1940: Jan. 29, 12.24.

2.36.26.423. Well 2.36.26.244 in Water-Supply Papers 845 and 886. New measuring point, top of concrete curb, center of southeast side, 1.00 foot above land surface datum. New measuring point could not be accurately referenced to old, possible discrepancy of several tenths of a foot between preceding and succeeding records. Water level, in feet below land surface datum, 1940: Jan. 29, 14.88.

2.36.27.111. B. L. Kennedy. Water level, in feet below land surface datum, 1940: Jan. 30, 14.28.

2.36.27.131. B. L. Kennedy. Water level, in feet below land surface datum, 1940: Jan. 30, 14.35.

2.36.27.211. M. O. Pate. Water level, in feet below land surface datum, 1940: Jan. 29, 13.45.

2.36.27.311. J. M. Riley.

Water level, in feet below land-surface datum, 1940

Jan. 29	14.67	May 22	15.13	Sept.21	16.31
Mar. 27	14.68	July 12	15.43	Nov. 21	15.95

a Well 0.1 mile west pumping. b Pumped recently.

Roosevelt County--Continued.

2.36.28.114b. Morgan Trammel. Recorder well.

Water level, in feet below land-surface datum, 1940

Date	Water level	Date	Water level	Date	Water level
Jan. 30	15.13	May 22	15.35	Sept.21	16.45
Mar. 27	15.05	July 12	15.73	Nov. 21	16.45

2.36.28.411. C. A. Tevis. Water level, in feet below land surface datum, 1940: Jan. 30, 14.76.

2.36.28.421. C. A. Tevis. Water level, in feet below land surface datum, 1940: Jan. 30, 15.89.

2.36.28.441. J. W. Robinson. Water level, in feet below land surface datum, 1940: Jan. 29, 16.58.

2.36.34.111. M. F. Riley. Water level, in feet below land surface datum, 1940: Jan. 29, 15.40.

2.36.34.221. W. H. Davenport. Water level, in feet below land surface datum, 1940: Jan. 29, 9.88.

2.36.34.341. W. J. Murrill. Measuring point, top of concrete well curb, at point north of pump discharge pipe, 0.50 foot above land surface datum.

Water level, in feet below land-surface datum, 1940

Jan. 29	18.82	May 22	19.19	Nov. 21	20.10
Mar. 27	18.83	July 12	19.06		

2.36.34.421. I. F. Dacus. Water level, in feet below land surface datum, 1940: Jan. 29, 9.48.

2.36.35.212. A. E. Whitehead. Not used in 1940.

Water level, in feet below land-surface datum, 1940

Jan. 29	9.25	May 22	9.25	Sept.21	10.80
Mar. 27	9.08	July 12	9.91	Nov. 21	10.79

2.37.19.331. W. H. McDougal. Water levels, in feet below land surface datum, 1940: Jan. 29, 19.28; Nov. 21, 19.99.

2.37.19.341. C. R. Anderson. Water level, in feet below land surface datum, 1940: Jan. 29, 19.00.

SIERRA COUNTY

HOT SPRINGS

By C. Richard Murray

At Hot Springs, on the Rio Grande in Sierra County, N. Mex., a large quantity of mineral water, with temperatures ranging in different wells and springs from 98° to 114° Fahrenheit, rises to the surface. The proximate source of this water is the Magdalena (Pennsylvanian) limestone, but the water apparently rises from considerable depths along a fault zone.

The water rises under artesian pressure and discharges into Quaternary and Tertiary sediments overlying the Magdalena. The occurrence of the hot mineral water is confined to an area of only about 130 acres in the town of Hot Springs. It discharges through the alluvium into the Rio Grande. The water is used largely for medicinal baths and is developed by wells drilled into the Magdalena limestone, or by sumps - essentially artifical springs - excavated in the alluvium.

In February 1939 the United States Geological Survey in cooperation with the State engineer of New Mexico began an investigation of the occurrence of the hot mineral water at Hot Springs. Results of the investigation will be published in a forthcoming Biennial Report of the State engineer.

The water table in the alluvium and the artesian pressure in lower beds of the alluvium and in the Magdalena limestone decline during the day as a result of the withdrawal of water for bathing. The magnitude of the decline in unused artesian wells ranges from about 0.1 foot to 0.4 foot. During the night recovery from this drawdown takes place gradually. Water levels and artesian pressures fluctuate seasonally with the stage of the Rio Grande at Hot Springs. During the winter months water is impounded at Elephant Butte Reservoir above Hot Springs, and the stage of the river at Hot Springs is low. During this period the water levels and artesian pressures are also low. When water is discharged from the reservoir during the irrigation season and the river is at high stages, the water levels and artesian pressures rise. This seasonal change in artesian pressures usually amounts to approximately 0.7 foot, whereas the variation between the highest and lowest river stage in 1940 at Hot Springs was 4 feet. The water drawn from wells is presumably balanced by a decrease in the natural discharge into the river, and no indication of a permanent lowering of water level or artesian pressure has been observed. There are 28 artesian wells drilled to the Magdalena limestone, of which 17 are being used at the present time. There are also 33 flowing sump baths and two natural springs in use for bathing or drinking purposes.

Sierra County--Continued.

4. C. E. James. Lot 21, block 2, Hot Springs townsite, sec. 33, T. 13 S., R. 4 W., at southwest corner of James Bathhouse. Drilled artesian well supplying bathhouse, diameter 6-3/4 inches, depth 105 feet. Measuring point, top of 6-3/4-inch casing, 0.10 foot above land surface datum, 4240.38 feet above sea level.

Water level, in feet above land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 29, 1939	0.40	Sept.13, 1939	0.64	Apr. 26, 1940	0.96
Apr. 13	.76	Dec. 1	.48	June 15	.94
27	.70	Feb. 28, 1940	.49	Oct. 23	.25
June 16	.71	Apr. 6	.89		

5. J. E. Malone. Lot 12, block 9, Hot Springs townsite, sec. 4, T. 14 S., R. 4 W., at Frenchy's Bathhouse. Drilled artesian well supplying bathhouse, diameter 6-5/8 inches, depth 125 feet. Measuring point, top of concrete curbing, 0.28 foot above casing, 0.78 foot above land surface datum, 4241.67 feet above sea level.

Water level, in feet below land-surface datum, 1939-40

Mar. 29, 1939	0.72	Sept.13, 1939	0.47	Apr. 26, 1940	0.12
Apr. 13	.35	Dec. 1	.76	June 15	.16
27	.25	Feb. 28, 1940	.66	Oct. 23	.86
June 16	.40	Apr. 6	.21		

6. C. E. James. Lot 4, block 8, Hot Springs townsite, sec. 4, T. 14 S., R. 4 W. Drilled unused artesian well, diameter 6-5/8 inches, depth 105 feet. Measuring point, top of casing, 1.20 feet above land surface datum, 4241.23 feet above sea level.

Water level at 4:00 a.m., in feet above land-surface datum, 1940 (from recorder charts)

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	0.79	0.87	0.75	0.63	0.56	0.28	0.19	0.20
2	....	.81	.89	.72	.61	.56	.26	.18	.21
3	....	.83	.91	.70	.60	.55	.26	.20	.20
4	....	.82	.90	.65	.64	.53	.24	.20	.23
5	....	.82	.90	.64	.67	.52	.23	.14	.20
6	....	.80	.88	.57	.62	.52	.21	.18	.24
7	0.82	.83	.88	.60	.60	.50	.20	.18	.21
8	.79	.82	.90	.62	.58	.49	.23	.21	.22
9	.79	.82	.89	.63	.56	.51	.23	.22	.24
10	.81	.83	.86	.65	.58	.50	.21	.24	.24
11	.78	.83	.86	.67	.60	.57	.20	.20	.25
12	.76	.83	.87	.66	.59	.50	.22	.20	.26
13	.82	.86	.87	.68	.59	.50	.23	.19	.25
14	.83	.84	.90	.71	.60	.49	.23	.17	.24
15	.86	.83	.88	.75	.58	.48	.19	.19	.28
16	.87	.84	.78	.72	.59	.49	.20	.20	.30
17	.84	.84	.81	.72	.59	.46	.18	.19	.32
18	.83	.83	.79	.73	.57	.47	.19	.22	.32
19	.83	.84	.78	.72	.59	.46	.19	.22	.33
20	.84	.86	.78	.74	.60	.43	.20	.17	.33
21	.86	.84	.77	.75	.61	.42	.21	.19	.37
22	.87	.84	.78	.70	.59	.40	.19	.20	.39
23	.83	.86	.78	.67	.59	.42	.18	.19	.38
24	.86	.85	.75	.68	.62	.39	.19	.19	.42
25	.84	.84	.75	.64	.63	.33	.20	.24	.47
26	.83	.81	.76	.64	.62	.33	.21	.21	.47
27	.83	.83	.76	.63	.58	.32	.22	.20	.43
28	.81	.82	.76	.63	.58	.31	.20	.22	.45
29	.82	.80	.75	.64	.58	.29	.19	.22	.46
30	.81	.81	.76	.62	.56	.29	.22	.23	.48
31	....	.85	....	.63	.54	....	.19	....	.48

Sierra County--Continued.

12. Mr. Mathis. Lot 8, block 40, Hot Springs townsite, sec. 4, T. 14 S., R. 4 W. at Artesian Baths. Drilled artesian well supplying bathhouse, diameter 6-3/4 inches, depth 176 feet. Measuring point, top side of pipe, E. of gate valve and W. of spigot, outside of building, 2.15 feet above land surface datum, 4239.03 feet above sea level.

Water level, in feet above land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 29, 1939	3.71	Sept.13,1939	3.88	Apr. 26, 1940	4.19
Apr. 13	3.99	Dec. 1	3.58	June 15	4.19
27	4.12	Feb. 28, 1940	3.76	Oct. 23	3.51
June 16	3.98	Apr. 6	4.13		

18. Mrs. J. Schauer. Lot 7, block 105, Hot Springs townsite, sec. 33, T. 13 S., R. 4 W. at Texas Home. Drilled artesian well, supplying bathhouse, diameter 6-5/8 inches, depth 55 feet. Measuring point, top of casing, 0.60 foot above land surface datum, 4241.22 feet above sea level.

Water level, in feet below land-surface datum, 1939-40

Mar. 29, 1939	1.92	Sept.13, 1939	1.63	Apr. 26, 1940	1.42
Apr. 13	1.55	Dec. 1	1.98	June 15	1.40
27	1.46	Feb. 28, 1940	1.85	Oct. 23	2.03
June 16	1.58	Apr. 6	1.45		

19. Bill Green. Lot 12, block 105, sec. 33, T. 13 S., R. 4 W. at Central Bathhouse. Drilled artesian well supplying bathhouse, diameter 4 inches, depth 27 feet. Measuring point, bottom of elbow on pump column pipe, 0.74 foot above top of casing, 0.74 foot above land surface datum, 4241.45 feet above sea level.

Water level, in feet below land-surface datum, 1939-40

Feb. 7, 1939	0.96	June 16, 1939	0.68	Apr. 6, 1940	0.51
Mar. 22	.98	Sept.13	.70	26	.47
28	.97	Dec. 1	1.06	June 15	.49
Apr. 13	.66	Feb. 28, 1940	.85	Oct. 23	1.06
27	.51				

25. Jim Knox. Lot 4, block 93, Hot Springs townsite, sec. 33, T. 13 S., R. 4 W. at base of bluff, north of State Springs. Unused well dug to Magdalena limestone. Formerly supplied Vera Hotel bathhouse. Pit 5 by 5 feet, depth 20 feet. Measuring point, top edge of USGS washer on 2 by 8-inch stringer, 7.54 feet below top of concrete well curb, center of west side of well, 6.04 feet below land surface datum, 4242.20 feet above sea level.

Water level at 4:00 a.m., in feet below land-surface datum, 1939 (from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	7.58	7.51	7.52	7.61	7.59	7.91	7.89
2	....	7.61	7.52	7.54	7.62	7.57	7.92	7.89
3	....	7.61	7.55	7.59	7.62	7.58	7.94	7.88
4	....	7.57	7.53	7.60	7.62	7.59	7.93	7.88
5	....	7.53	7.52	7.58	7.64	7.59	7.92	7.88
6	....	7.54	7.54	7.57	7.61	7.60	7.93	7.87
7	7.37	7.55	7.54	7.59	7.61	7.58	7.91	7.87
8	7.36	7.54	7.55	7.69	7.62	7.56	7.91	7.86
9	7.38	7.51	7.55	7.63	7.61	7.61	7.88	7.86
10	7.38	7.50	7.57	7.60	7.61	7.60	7.91	7.86
11	7.38	7.50	7.55	7.61	7.60	7.58	7.91	7.86
12	7.38	7.49	7.54	7.60	7.59	7.66	7.91	7.86
13	7.41	7.50	7.52	7.61	7.59	7.72	7.93	7.88
14	7.41	7.49	7.53	7.71	7.51	7.78	7.91	7.85
15	7.38	7.48	7.52	7.61	7.34	7.80	7.90	7.86
16	7.40	7.48	7.51	7.62	7.42	7.84	7.90	7.85
17	7.45	7.47	7.51	7.62	7.48	7.86	7.90	7.85
18	7.46	7.51	7.50	7.62	7.51	7.85	7.90	7.85
19	7.45	7.48	7.52	7.62	7.51	7.87	7.90	7.86
20	7.45	7.48	7.52	7.63	7.52	7.88	7.92	7.85
21	7.45	7.50	7.51	7.64	7.52	7.89	7.90	7.83

Sierra County--Continued.

25.--Continued.

Water level at 4:00 a.m., in feet below land-surface datum, 1939 (from recorder charts)

Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	7.43	7.48	7.51	7.61	7.52	7.89	7.90	7.84
23	7.45	7.47	7.51	7.61	7.52	7.90	7.89	7.87
24	7.50	7.47	7.51	7.61	7.52	7.89	7.87	7.85
25	7.52	7.47	7.50	7.61	7.52	7.89	7.90	7.84
26	7.53	7.47	7.52	7.62	7.52	7.89	7.90	7.83
27	7.52	7.49	7.50	7.61	7.52	7.92	7.90	7.84
28	7.53	7.52	7.51	7.62	7.52	7.92	7.88	7.84
29	7.57	7.52	7.50	7.62	7.57	7.91	7.86	7.86
30	7.57	7.51	7.51	7.62	7.62	7.95	7.88	7.86
31	7.57	....	7.51	7.62	....	7.92	....	7.84

Water level at 4:00 a.m., in feet below land-surface datum, 1940 (from recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.86	7.78	7.78	7.54	7.41	7.40	7.54	7.62	7.69	7.90	7.97	7.98
2	7.85	7.74	7.81	7.50	7.39	7.38	7.57	7.62	7.69	7.90	7.98	7.97
3	7.81	7.75	7.78	7.48	7.38	7.37	7.57	7.63	7.69	7.91	7.96	7.98
4	7.81	7.74	7.79	7.47	7.39	7.38	7.61	7.61	7.70	7.91	7.96	7.96
5	7.78	7.74	7.81	7.44	7.40	7.38	7.62	7.59	7.71	7.92	8.01	7.97
6	7.81	7.78	7.79	7.43	7.41	7.39	7.68	7.63	7.72	7.93	7.99	7.95
7	7.83	7.74	7.81	7.41	7.38	7.39	7.66	7.64	7.73	7.95	7.98	7.97
8	7.83	7.74	7.78	7.40	7.39	7.38	7.64	7.69	7.74	7.92	7.97	7.96
9	7.82	7.78	7.78	7.40	7.40	7.39	7.63	7.71	7.73	7.93	7.96	7.95
10	7.81	7.80	7.78	7.39	7.38	7.41	7.62	7.69	7.73	7.94	7.94	7.95
11	7.80	7.77	7.77	7.41	7.38	7.41	7.60	7.68	7.70	7.94	7.97	7.94
12	7.79	7.77	7.81	7.43	7.38	7.41	7.60	7.69	7.72	7.92	7.97	7.94
13	7.78	7.82	7.84	7.38	7.36	7.41	7.57	7.70	7.73	7.92	7.97	7.94
14	7.83	7.78	7.82	7.37	7.37	7.40	7.56	7.68	7.74	7.92	7.98	7.94
15	7.85	7.76	7.81	7.34	7.38	7.41	7.52	7.69	7.75	7.96	7.96	7.93
16	7.82	7.80	7.80	7.34	7.37	7.50	7.55	7.69	7.74	7.95	7.96	7.91
17	7.82	7.82	7.80	7.36	7.38	7.48	7.54	7.69	7.77	7.96	7.99	7.90
18	7.80	7.78	7.80	7.36	7.39	7.49	7.52	7.70	7.76	7.98	7.98	7.88
19	7.83	7.78	7.79	7.36	7.39	7.50	7.54	7.68	7.77	7.96	7.97	7.87
20	7.81	7.80	7.78	7.36	7.37	7.49	7.54	7.67	7.78	7.96	8.01	7.88
21	7.79	7.79	7.78	7.34	7.38	7.49	7.53	7.67	7.79	7.95	7.99	7.85
22	7.80	7.77	7.79	7.32	7.32	7.53	7.57	7.68	7.80	7.97	7.98	7.84
23	7.83	7.77	7.78	7.36	7.36	7.53	7.59	7.68	7.79	7.97	7.99	7.84
24	7.80	7.80	7.80	7.34	7.38	7.54	7.59	7.64	7.81	7.98	7.99	7.82
25	7.82	7.80	7.79	7.36	7.42	7.54	7.61	7.65	7.85	7.97	7.96	7.78
26	7.82	7.77	7.75	7.38	7.42	7.53	7.61	7.65	7.85	7.96	7.98	7.81
27	7.82	7.81	7.79	7.38	7.42	7.52	7.61	7.68	7.86	7.96	7.99	7.80
28	7.83	7.78	7.76	7.39	7.44	7.52	7.63	7.68	7.87	7.96	7.97	7.79
29	7.82	7.78	7.64	7.39	7.44	7.53	7.61	7.68	7.89	7.98	7.97	7.79
30	7.81	....	7.62	7.40	7.44	7.53	7.62	7.69	7.89	7.95	7.96	7.78
31	7.78	....	7.58	....	7.41	....	7.62	7.70	....	7.98	....	7.77

27. Ben Graham. Lot 4, block 42, sec. 4, T. 14 S., R. 4 W. Unused drilled artesian well, diameter 12 inches, depth 208 feet. Measuring point, top of wooden stake, same elevation as base of tee fitting, 0.60 foot above land surface datum, 4238.48 feet above sea level.

Water level, in feet above land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 23, 1939	2.23	June 16, 1939	2.56	Apr. 6, 1940	2.52
29	2.15	Sept.13	2.38	26	2.67
Apr. 13	2.47	Dec. 1	2.07	June 15	2.76
27	2.70	Feb. 28, 1940	2.13	Oct. 23	(a)

a No flow, minimum measurable reading 1.85 feet.

Sierra County--Continued.

30. Geo. L. Mills. Lot 1, block 102, sec. 33, T. 13 S., R. 4 W., at Kozy Korner Kottages. Drilled artesian well, supplying bathhouse, diameter 6-5/8 inches, depth 125 feet. Measuring point, top of casing, 0.20 foot below land surface datum, 4241.92 feet above sea level.

Water level, in feet below land-surface datum, 1939-40

Date	Water level	Date	Water level	Date	Water level
Mar. 28, 1939	1.41	Sept.13, 1939	1.20	Apr. 26, 1940	0.95
Apr. 13	1.07	Dec. 1	1.53	June 15	.96
27	.91	Feb. 28, 1940	1.48	Oct. 23	1.70
June 16	1.07	Apr. 6	1.05		

31. Mrs. M. J. Scarborough. Lot 3, block 104, sec. 33, T. 13 S., R. 4 W. at Scarborough's Bathhouse. Drilled artesian well supplying bathhouse, diameter 6-5/8 inches, depth 258 feet. Measuring point, surface of concrete drain basin, level with land surface datum, 4241.26 feet above sea level.

Water level, in feet above land-surface datum, 1939-40

Feb. 28, 1939	0.96	June 16, 1939	1.34	Apr. 6, 1940	1.17
Mar. 1	.91	Sept.12	1.16	26	1.59
28	.98	Dec. 1	.93	June 15	1.55
Apr. 13	1.37	Feb. 28, 1940	1.08	Oct. 23	(a)
27	1.47				

32. Tom Jones. Lot 4, block 103, sec. 33, T. 13 S., R. 4 W. at Jones' Baths. Drilled artesian well supplying bathhouse, diameter 4 inches, depth 239 feet. Measuring point, west lip of small circular concrete pool, 0.60 foot below land surface datum, 4241.21 feet above sea level.

Water level, in feet with reference to land-surface datum, 1939-40

Mar. 30, 1939	-0.07	Sept.13, 1939	+0.07	Apr. 26, 1940	+0.49
Apr. 13	+ .37	Dec. 1	- .20	June 15	- .14
27	+ .02	Feb. 28, 1940	- .11	Oct. 23	(b)
June 16	+ .20	Apr. 6	+ .28		

a No flow, minimum measurable reading 0.67 foot.
b No flow, minimum measurable reading -0.60 foot.

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