

Water Levels and Artesian Pressure in Observation Wells in the United States in 1945

Part 6. Southwestern States and Territory
of Hawaii

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1028

*Prepared in cooperation with the States
of Arizona, California, and New Mexico,
the Territory of Hawaii, and other
agencies*



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Part 6. Southwestern States and Territory of Hawaii

Prepared under the direction of C. G. PAULSEN, Chief Hydraulic Engineer

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UNITED STATES DEPARTMENT OF THE INTERIOR

J. A. Krug, *Secretary*

GEOLOGICAL SURVEY

W. E. Wrather, *Director*

PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Arizona, California, New Mexico, the Territory of Hawaii, and other agencies, by personnel of the Water Resources Branch under the direction of:

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Part 6. SOUTHWESTERN STATES

INTRODUCTION

By A. N. Sayre and others

Significance of records of water level and artesian pressure

The rock formations of the earth are great natural 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, whether for public waterworks, irrigation, or 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 indicate depletion or replenishment of the artesian reservoirs.

Annual publication of records by Geological Survey

The regular publication of records of water level and artesian pressure in the United States was begun by the Geological Survey in 1935 and has continued yearly since. The records for the entire country were published in a single volume each year through 1939. Beginning with 1940 the records have been published in six volumes, covering the northeastern, southeastern, north-central, south-central, northwestern, and southwestern sections of the country. Hawaii is included in the southwestern section. (See fig. 1.) The following table gives the numbers of these reports. This series of water-supply papers is in a sense an inventory, year by year, of the ground-water supplies of such parts of the country as have been covered.

Water-supply papers on water levels and artesian pressure in observation wells in the United States

Year	North-eastern States	South-eastern States	North-central States	South-central States	North-western States	South-western States and Hawaii
1935	777	777	777	777	777	777
1936	817	817	817	817	817	817
1937	840	840	840	840	840	840
1938	845	845	845	845	845	845
1939	886	886	886	886	886	886
1940	906	907	908	909	910	911
1941	936	937	938	939	940	941
1942	944	945	946	947	948	949
1943	986	987	988	989	990	991
1944	1016	1017	1018	1019	1020	1021
1945	1023	1024	1025	1026	1027	1028

Scope of present volume

The present volume covers the southwestern States and gives records of water level and artesian pressure in about 2,620 observation wells of the Geological Survey and cooperating agencies in Arizona, California, Hawaii, and New Mexico. Of these wells, 60 are equipped with automatic water-stage recorders. For some wells not previously reported complete records of water level are given in this volume, including those of the years before 1945. For wells whose previous records have been published this volume gives only the current records. If a complete description of a well has been published in a previous report, only the well number or the well number and a brief identifying description are given in this report. The numbers in parentheses immediately following a well number are those of the water-supply papers in which earlier records of that well are given and the pages on which they appear. An asterisk indicates that a description of the well is given in the paper whose number is so marked. This report includes about 12,525 individual determinations of water level and artesian pressure.

Land-surface datum

Before 1943, in Geological Survey reports, the water levels and artesian pressures for some wells were given in feet above or below the measuring points and for other wells in feet above or below sea level or above or below various assumed datum planes. It had been considered inadvisable to adopt a standard procedure in expressing water levels and artesian heads until after a period of trial with datum planes of different kinds. In 1943, however, it was decided that uniform practice should be adopted.

Accordingly precise datum planes were established approximating the land surface at each well. The water levels and artesian heads for all wells listed in this report are given in reference to land-surface datum planes. If the water levels or artesian heads are referred to land-surface datum for the first time a conversion factor is given in the descriptive matter

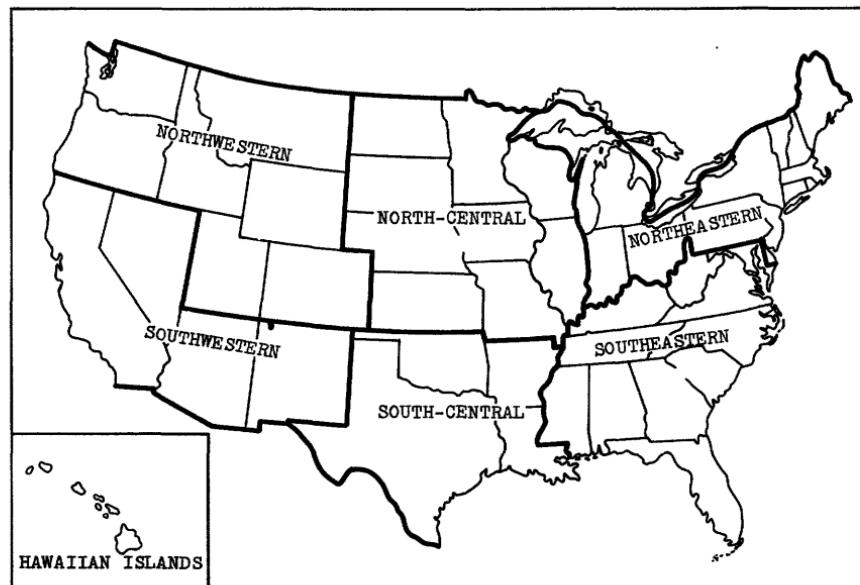


Figure 1.--Outline map of the United States showing sections of the country covered by the six water-supply papers on water levels and artesian pressure in observation wells in 1945. The shaded section represents the part of the country covered by this volume.

preceding them in order to facilitate comparison of the older and newer records. Wherever the conversion factor is given in earlier reports it is not repeated in this report. New data as to the positions of the measuring point and of the bench marks, in feet above or below land-surface datum plane, will be published in succeeding annual reports.

Network of key observation wells

During 1942 the Geological Survey established a network of key observation wells in order to make available current information on general ground-water conditions over the country. These wells were selected because the fluctuations of water level in them are believed to be typical and they represent the general fluctuations that occur in the parts of the country in which the wells are situated. At the end of 1945 the network included about

160 wells in 45 States. About 40 of the wells were established expressly for the network in 1942 and about 20 were established in 1943; the other 100 were selected from wells measured regularly in connection with cooperative ground-water investigations. The coverage of the country is still far from adequate, and it is expected that some wells not now included will be added to the network from time to time.

Changes in ground-water level in 1945 in the southwestern part of the United States

In 1945 precipitation in Arizona and California was considerably above normal; in New Mexico and Hawaii, however, it was below normal. The fluctuations of both water level and artesian pressure in wells depend, however, on many factors besides the amount of precipitation. In certain of the observation wells there are fluctuations caused by differences in the rate of pumping or artesian flow from other wells in the area, but most of the observation wells are not noticeably affected by pumping or artesian flow. A summary of the changes in ground-water level is given in the chapter for each State.

Acknowledgments

Acknowledgments for effective services in the preparation of this water-supply paper are due Miss Dorothy M. Ireland, Rodney Hart, and Mrs. Nauvoo Ragland and Miss Frances Head. Miss Ireland had general charge of the assembling of the several reports and did the editing; Mr. Hart prepared the illustrations; and Mrs. Ragland and Miss Head did the offset typing.

ARIZONA

PROGRAM OF WORK

By S. F. Turner

The investigation of ground-water resources in Arizona was continued during 1945 in cooperation with the State Land Commissioner.

About 936,600 acre-feet of water, or an average of about 836 million gallons a day, was pumped from wells in 1945 in the drainage basin of the Gila River above its confluence with the Salt River. This water was chiefly used for irrigation. The area includes the Santa Cruz basin and all wells in the Queen Creek area east of those of the Salt River Valley Water Users. The amount pumped was an increase of about 63,000 acre-feet over the pumpage in 1944, and about 413,000 acre-feet over that in 1941.

The following table shows the pumpage from wells in this region since the beginning of the cooperative ground-water investigation in Arizona.

Year	Pumpage from wells in southern Arizona, in acre-feet ¹					
	1940	1941	1942	1943	1944	1945
Duncan-Virden Valley in Greenlee County, Ariz., and Hidalgo County, N. Mex.	2,436	1,348	1,900	7,100	9,500	8,300
Safford Valley, Graham County	24,600	8,685	18,900	35,000	52,000	35,200
Santa Cruz River basin in Santa Cruz County	.....	11,500	14,500	15,000	12,500	18,500
Santa Cruz River basin in Pima County	.....	68,500	85,500	100,000	106,000	111,000
Santa Cruz and Gila River basins in Pinal County	372,000	351,000	500,000	515,000	530,000	610,000
Queen Creek area, including all wells between the Salt and the Gila Rivers, east of the Salt River Valley Water Users	112,670	82,450	156,000	173,200	163,800	153,600
Totals	a 511,706	523,483	776,800	845,300	873,800	936,600

¹ 1,000 acre-feet is equal to about 893,000 gallons a day for a period of one year.

a Not including the pumpage in the Santa Cruz River Basin in Pima and Santa Cruz Counties.

The upward trend in pumpage each year and the resulting gradual drop in water levels, as measured in key observation wells, clearly indicate that the withdrawals of ground water greatly exceed the safe annual yield and that large amounts of water are being withdrawn from storage. This fact is especially evident in localities solely dependent upon ground water for irrigation use. Where surface water is being brought into an area for irrigation the ground-water supplies are not being depleted as rapidly because some recharge to the ground-water reservoir occurs from canal seepage and irrigation with surface water.

The following table shows the amount of water pumped in excess of the safe annual yield in two heavily pumped areas of southern Arizona.

Area	Safe annual yield in acre-feet ² /	Acre-feet pumped in excess of safe annual yield				
		1941	1942	1943	1944	1945
Santa Cruz River basin in Pima and Santa Cruz Counties	80,000	0	20,000	35,000	38,500	49,500
Santa Cruz and Gila River basins in Pinal County	135,000	216,000	365,000	380,000	395,000	475,000

²/ From the report entitled "Ground-water resources of the Santa Cruz basin, Arizona" by S. F. Turner and others, released in mimeographed form by the Geological Survey, May 14, 1943.

Other projects

The project to investigate the amount of water used by river-bottom vegetation in the Gila River valley in Graham County, started in March 1943, at the request of the Defense Plant Corporation, United States Department of Commerce and their agent, the Phelps Dodge Corporation, was completed in the early part of 1945.

The investigation of possibilities of further development of the ground-water resources of the Verde River valley from Camp Creek to the junction of the Salt River was continued during 1945. This work was undertaken in cooperation with the city of Phoenix. A preliminary report entitled "Geology and ground-water resources of the Verde River valley near Fort McDowell, Arizona" by Harris R. McDonald and Harold D. Padgett, Jr., was completed November 1. The work will continue into 1946.

An investigation of the geology and ground-water resources of the upper Pinal Creek area, Gila County, was begun in 1945 in cooperation with

the city of Globe. Field work was completed by the end of the year and a report is being prepared.

The safe annual yield of the ground-water reservoirs of the Gila and Salt River basins in Pinal and Maricopa Counties was studied under a program of cooperation with the Bureau of Reclamation of the United States Department of the Interior. A report on this investigation is in preparation.

The continuous drop in water levels in some portions of the State was recognized by the governor, and a special session of the State Legislature was called in the early part of September 1945, to consider a law regulating the use of ground water. The legislature realized that information regarding ground-water resources of the entire State was insufficient to enact an adequate law. The Geological Survey was requested to make a reconnaissance investigation of each basin in the State during 1946 and report its findings prior to the next general session of the legislature, which meets in January 1947. The State cooperative program was therefore expanded in the latter part of 1945 to embrace the entire program.

The records of water-level measurements made in 1945, totaling 1,501 in 400 selected observation wells, are given in the following pages.

Acknowledgments

The writers are much indebted to the officials of the San Carlos Irrigation District, the Office of Indian Affairs, United States Department of the Interior, the Salt River Valley Water Users Association, the Roosevelt Water Conservation District, the Arizona Edison Electric Co., the Tucson Gas & Electric Co., the Citizens Utilities Co. of Nogales, the Eloy Light & Power Co., and to the owners of wells throughout the counties covered by this report, who furnished much useful information.

COCHISE COUNTY

By R. L. Cushman

Intensive investigations of the ground-water resources of parts of Cochise County were started in 1945, under the State cooperative program. Prior to this, occasional water-level measurements had been made since 1939 in a few selected wells in the county. With the exception of the San Simon basin, all of the measurements made in prior years are published here

with the 1945 measurements. A total of 172 measurements in 47 wells are listed. The measurements in the San Simon basin will be published with the 1946 measurements.

The ground-water resources of the San Pedro River basin were first studied by Kirk Bryan and G. E. P. Smith in 1920 and 1921. An abstract of Bryan's geologic work was published^{3/} and his manuscript report was available to the author. In 1934 G. A. Waring, of the Geological Survey, worked in the area under the Public Works Administration and revisited many of the wells. The results of this work were also available to the author.

Water-level measurements have been made since 1939 in a few wells in the St. David-Benson-Pomerene area. The deep wells in the area show no significant change but the shallow wells show a drop in water level. Some of the old flowing wells in the area are now being pumped for irrigation and some irrigation wells have recently been drilled to the shallow water-table aquifers.

In 1941 a few observation wells were selected in the Fort Huachuca-Charleston area of the San Pedro River basin as a part of a special investigation of the water supply for Fort Huachuca. It was found that recharge to the area was not sufficient to maintain the rate of withdrawal planned by the Army for the duration of the war, but that the ground-water reservoir was sufficiently extensive to prevent serious lowering of water levels. Measurements were continued in a few observation wells to observe the rate of decline of the water level. It was found that in the period from May 21, 1942, to October 22, 1945, the average drop in water level in five wells was 2.3 feet.

The ground-water resources of Sulphur Springs were first investigated by Meinzer and Kelton^{4/} in 1910 and 1911. Water levels have been measured since 1942 in a few selected wells in the Sulphur Springs valley. An intensive investigation of the ground-water resources of the valley from the international boundary, on the south, to the Graham-Cochise county line, on the north, was started in 1945. A rapid expansion of irrigation

^{3/} Bryan, Kirk, San Pedro Valley, Arizona, and the geographic cycle (abstract); Geol. Soc. Amer. Bull., vol. 37, No. 1, pp. 169-170, Mar. 30, 1926; Pan-Amer. Geologist, vol. 45, No. 2, p. 66, March 1926.

^{4/} Meinzer, O. E., and Kelton, F. C., Geology and water resources of Sulphur Spring Valley, Ariz.: U. S. Geol. Survey Water-Supply Paper 320, 1913.

farming is under way in the valley, although some irrigation wells have been in use since about 1914. The average drop in water level in 27 representative wells in the Sulphur Springs valley during the period from May 12, 1942 to October 15, 1945, was 2.6 feet.

Ground-water resources of the San Simon valley were first investigated by Schwennesen^{5/} in 1913. Water levels and artesian pressures were measured by this office in 1942. An intensive investigation of the declining artesian pressure will be undertaken during 1946 and the results published in the water-level report for that year.

Well descriptions and water-level measurements

St. David-Benson-Pomerene area

302. W. N. East. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T. 16 S., R. 20 E., at rear of shed, 100 feet east of road, 0.75 mile west and north of Pomerene post office. Drilled well, diameter 8 inches, depth 45 feet. Measuring point, top of casing at north side, 3.5 feet above land-surface datum.

Water level, in feet below land-surface datum, 1940-42, 1944-45

Date	Water level	Date	Water level	Date	Water level
Mar. 29, 1940	32.24	May 29, 1942	41.50	June 6, 1945	44.05
June 12, 1941	39.60	June 15, 1944	42.92	Oct. 31	44.94
Dec. 4	41.33	July 27	43.26		

305. L. A. Scott. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 16 S., R. 20 E., in corral 50 feet north of barn, about 400 feet west of Church of the Latter Day Saints, in Pomerene. Drilled well, diameter 6 inches, depth 98 feet. Measuring point prior to June 14, 1944, top of casing at north side, 3.5 feet above land-surface datum; subsequent to June 14, 1944, top of 2- by 2-inch wood pipe clamp at south side, 0.2 foot above old measuring point and 3.7 feet above land-surface datum.

Water level, in feet below land-surface datum, 1941-42, 1944-45

June 12, 1941	70.42	June 15, 1944	71.69	June 6, 1945	72.66
Dec. 4	72.31	July 27	72.05	Oct. 31	73.86
May 29, 1942	72.40				

475. Earl M. Brown. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 12, T. 17 S., R. 20 E., in field, 200 feet east of abandoned adobe house, 0.1 mile southeast of irrigation ditch, 0.3 mile east of Pomerene-Benson road, 0.6 mile north of intersection with Benson-Willcox highway. Unused drilled well, diameter 4 $\frac{1}{2}$ inches, depth 78 feet. Measuring point, top of casing at east side, 1.9 feet above land-surface datum. Water levels, in feet below land-surface datum: June 15, 1944, 56.64; July 27, 1944, 56.45; June 6, 1945, 56.92; Oct. 31, 1945, 56.41.

477. City of Benson. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T. 17 S., R. 20 E., in galvanized-iron shed on west side of street, 0.25 mile south of Benson post office. Unused drilled well, diameter 4 inches, depth 700 feet. Measuring point, top of valve at south side of casing, 3.6 feet above land-surface datum. Water levels, in feet below land-surface datum: Sept. 8, 1944, 14.44; Oct. 20, 1944, 11.83; June 6, 1945, 15.32; Oct. 31, 1945, 10.85.

^{5/} Schwennesen, A. T., Ground water in San Simon Valley, Arizona and New Mexico: U. S. Geol. Survey Water-Supply Paper 425-A, 1917.

583. Will Campbell. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 31, T. 17 S., R. 21 E., 50 feet southeast of gray stucco house, 0.1 mile east of river, 600 feet north of U. S. Highway 80, in St. David. Unused drilled well, diameter 6 inches, depth 27 feet. Measuring point, top of casing at north side, 2.0 feet above land-surface datum.

Water level, in feet below land-surface datum, 1940-42, 1944-45

Date	Water level	Date	Water level	Date	Water level
Mar. 28, 1940	8.90	May 29, 1942	17.99	Oct. 19, 1944	22.71
June 12, 1941	16.08	June 15, 1944	19.82	June 5, 1945	19.61
Dec. 4	17.08	July 27	21.29	Oct. 31	23.08

594. H. W. Busby. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 31, T. 17 S., R. 21 E., 0.75 mile north of U. S. Highway 80, 0.5 mile west of St. David High School, in St. David. Unused drilled well, diameter 6 inches, depth 78 feet. Measuring point, top of casing at south side, 0.6 foot above land-surface datum. Water levels, in feet below land-surface datum: Sept. 8, 1944, 47.24; Oct. 19, 1944, 47.64; June 6, 1945, 47.79; Nov. 1, 1945, 48.52.

599. Boquillas Cattle Co. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 17 S., R. 21 E., in field, 50 feet southeast of frame house, 0.9 mile north of St. David High School, in St. David. Drilled well, diameter 6 inches, depth 520 feet. Measuring point, top of boards at south side, 1.3 feet above land-surface datum. Water levels, in feet below land-surface datum: Sept. 7, 1944, 17.44; June 6, 1945, 19.45; Oct. 1, 1945, 17.02.

600. Mrs. E. M. Miller. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 32, T. 17 S., R. 21 E., 10 feet west of adobe house, 100 feet north of U. S. Highway 80, about 0.1 mile east of St. David High School. Drilled well, diameter 6 inches, depth 200 feet. Measuring point, top of casing at east side, 1.3 feet above land-surface datum. Water levels, in feet below land-surface datum: Sept. 4, 1944, 6.34; Oct. 19, 1944, 5.47; June 6, 1945, 5.62; Nov. 1, 1945, 4.84.

601. Mrs. Parley McRae. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 32, T. 17 S., R. 21 E., about 0.2 mile north of well 600. Drilled well, diameter 6 inches, depth 300 feet. Measuring point prior to Oct. 31, 1945, top of iron-pipe clamp at south side, 1.0 foot above land-surface datum; subsequent to Oct. 31, 1945, top of casing at west side, 1.2 feet below old measuring point and 0.2 foot below land-surface datum. Water levels, in feet below land-surface datum: Sept. 4, 1944, 1.46; Oct. 19, 1944, 1.23; June 6, 1945, 1.74; Nov. 1, 1945, 1.74.

701. Leo Westfield. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 1, T. 18 S., R. 20 E., 300 feet west of paved Apache powder plant road, about 0.7 mile south of U. S. Highway 80, 0.8 mile west of San Pedro River. Unused drilled well, diameter 3 inches, depth 550 feet. Measuring point, top of casing at east side, at land-surface datum. Water levels, in feet below land-surface datum: Sept. 6, 1944, 6.71; Oct. 18, 1944, 5.67; June 5, 1945, 7.03; Oct. 31, 1945, 5.84.

745. Walter Haymore. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 6, T. 18 S., R. 21 E., about 10 feet southwest of white lumber house, 50 feet south of U. S. Highway 80, about 0.6 mile east of steel bridge on San Pedro River. Drilled well, diameter 4 inches, depth 60 feet. Measuring point, top of casing at east side, 1.0 foot above land-surface datum. Water levels, in feet below land-surface datum: July 28, 1944, 27.65; Oct. 19, 1944, 28.80; June 8, 1945, 27.42; Nov. 1, 1945, 29.94.

748. F. J. Miller. $NW\frac{1}{4}SE\frac{1}{4}$ sec. 6, T. 18 S., R. 21 E., 50 feet north of paved Apache powder plant road, 0.8 mile southeast of well 701, about 1.5 miles southeast of U. S. Highway 80. Dug well, 32 feet deep. Measuring point, top of casing at northeast side, 2.0 feet above land-surface datum. Water levels, in feet below land-surface datum: Sept. 7, 1944, 27.04; Oct. 18, 1944, 26.21; June 6, 1945, 27.16.

749. A. L. Owens. SW_{1/4}NE_{1/4} sec. 5, T. 18 S., R. 21 E., 300 feet east of abandoned adobe house, about 0.3 mile south of St. David post office. Unused well, diameter 5 inches, depth 80 feet. Measuring point, top of casing at south side, 1.0 foot above land-surface datum. Water levels, in feet below land-surface datum: Sept. 5, 1944, 56.13; Oct. 19, 1944, 56.77; June 5, 1945, 55.02; Nov. 1, 1945, 57.16.

752. E. W. McCommas. NW_{1/4}SE_{1/4} sec. 28, T. 18 S., R. 21 E., 0.7 mile east of San Pedro River, 1.25 miles southwest of U. S. Highway 80, about 6.95 miles southeast of St. David. Dug well, diameter 4 inches, depth 65 feet. Measuring point, prior to June 5, 1945, top of 2- by 6-inch board at south side, 0.5 foot above land surface; subsequent to June 5, 1945, top of pipe coupling at north side, 0.2 foot above old measuring point and 0.7 foot above land-surface datum. Water levels, in feet below land-surface datum: Sept. 6, 1944, 51.09; Oct. 18, 1944, 51.18; June 5, 1945, 50.83; Nov. 1, 1945, 51.16.

753. Milton Curtis. SE_{1/4} sec. 34, T. 18 S., R. 21 E., at ranch house, 0.5 mile east of county road, 1.5 mile south of U. S. Highway 80 at intersection 5.6 miles southeast of St. David. Depth 560 feet. Measuring point, top of casing at east side, 0.2 foot above land-surface datum. Water levels, in feet below land-surface datum: Sept. 6, 1944, 23.82; Oct. 18, 1944, 23.44; June 5, 1945, 24.12; Nov. 1, 1945, 24.45.

Charleston area

950. Lon Hunt. SE_{1/4}SW_{1/4} sec. 32, T. 20 S., R. 20 E., in field between road and Southern Pacific Railroad, 0.6 mile east of State Highway 92, 4.2 miles south of junction with State Highway 82, 23 miles west of Tombstone. Unused drilled well, diameter 6 inches, depth 125 feet. Measuring point, top of casing at west side, 2.1 feet above land-surface datum.

Water level, in feet below land-surface datum, 1941-43, 1945

Date	Water level	Date	Water level	Date	Water level
Apr. 2, 1941	86.17	May 12, 1943	88.11	Oct. 22, 1945	89.38
May 21, 1942	87.22	June 22	88.78		

951. Lon Hunt. SW_{1/4}SE_{1/4} sec. 32, T. 20 S., R. 20 E., at rear of shed on north side of road, 0.9 mile east of State Highway 92, 4.2 miles south of junction with State Highway 82, 23 miles west of Tombstone. Drilled well, diameter 6 inches, depth 125 feet. Measuring point, top of casing at south side, 0.8 foot above land-surface datum.

Water level, in feet below land-surface datum, 1941-45

Apr. 2, 1941	79.52	May 12, 1943	81.24	Oct. 22, 1945	82.28
May 21, 1942	79.98	June 22, 1944	81.88		

1070. Cochise County. SW_{1/4}SW_{1/4} sec. 31, T. 21 S., R. 21 E., near water tank, 25 feet west of school, 100 feet east of right-angled turn in State Highway 92, 3 miles east of Fry. Drilled well, diameter 4 inches, depth unknown. Measuring point, top of $\frac{1}{4}$ -inch steel plate, 1.5 feet above land-surface datum. Water levels, in feet below land-surface datum: May 21, 1942, 284.19; May 11, 1943, 284.59; Oct. 22, 1945, 285.04.

1071. E. Fry. SW_{1/4}SW_{1/4} sec. 29, T. 21 S., R. 21 E., between tank and shed, 0.4 mile northeast of railroad, 0.6 mile northwest of county highway, 2.1 miles northeast of right-angled turn in State Highway 92, 6 miles northeast of Fry. Drilled well, diameter 6 inches, depth 180 feet. Measuring point, top of casing, 0.5 foot above land-surface datum.

Water level, in feet below land-surface datum, 1942-45

Apr. 1, 1942	194.97	May 11, 1943	195.64	Oct. 22, 1945	196.96
May 21	195.13	June 23, 1944	196.29		

1126. War Department. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 22 S., R. 20 E., on Fort Huachuca Military Reservation, 290 feet west of east gate. Nearest pumping well 90 feet further west. Unused test well, diameter 6 inches, depth 622 feet. Measuring point, top of pipe collar, at land-surface datum. Water levels, in feet below land-surface datum: May 21, 1942, 470.75; May 11, 1943, 478.09; June 22, 1944, 484.63; Oct. 23, 1945, 475.18.

Sulphur Springs Valley

1500. Frank R. Harris. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 12 S., R. 23 E., in pasture, 100 feet south of Fort Grant-Willcox road, 16 miles north of Willcox. Unused drilled well, diameter 6 inches, depth 75 feet. Measuring point, top of casing, flush with surface of 2- by 4-foot concrete block, 0.4 foot above land-surface datum. Water levels, in feet below land-surface datum: May 12, 1942, 64.32; Oct. 16, 1945, 66.41.

1527. Owner unknown. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 12 S., R. 24 E., in pasture, 100 feet east of county road, 2 miles north of intersection with Fort Grant-Willcox road, 12 miles north of Willcox. Used drilled stock well, diameter 6 inches, depth unknown. Measuring point, top of wooden pipe clamp, 0.6 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 55.29; June 8, 1944, 57.52; Oct. 16, 1945, 61.43.

1528. Mrs. A. W. Towne. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 12 S., R. 24 E., in pasture, 75 feet east of Fort Grant-Willcox road, 11.5 miles north of Willcox. Used drilled stock well, diameter 6 inches, depth 70 feet. Measuring point, top of casing, 1.3 feet above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 12, 1942, 49.90; June 8, 1944, pumping; Oct. 16, 1945, 55.61.

1575. J. D. Rutledge. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 13 S., R. 24 E., between house and small shed, 200 feet south of county road, 0.6 mile east of Fort Grant-Willcox road, 8.5 miles north of Willcox. Used drilled domestic well, diameter 8 inches, depth unknown. Measuring point, top of casing at west side, 0.6 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 51.23; June 7, 1944, 53.77; Oct. 15, 1945, 55.88.

1578. Mrs. Theirman. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T. 13 S., R. 24 E., at rear of house, 0.1 mile west of county road, 0.2 mile north of east-west county road, 3 miles west of Fort Grant-Willcox road, 9.3 miles northwest of Willcox. Used drilled stock well, diameter 4 inches, depth 65 feet. Measuring point, top of concrete curb, at land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 12, 1942, 41.55; June 8, 1944, 41.69; Oct. 16, 1945, 42.89.

1582. State of Arizona. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 13 S., R. 24 E., in pasture, 30 feet south of county road, 2 miles west of Fort Grant-Willcox road, 8 miles northwest of Willcox. Unused drilled test well, diameter 16 inches, depth 1,400 feet. Measuring point, top of casing at west side, 0.5 foot below land-surface datum. Water levels, in feet below land-surface datum: May 13, 1942, 30.49; June 8, 1944, 30.37; Oct. 16, 1945, 31.89.

1583. Bruce Wilson. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 21, T. 13 S., R. 24 E., in field, 0.5 mile northwest of farmhouse, 1.8 miles west along county road from Fort Grant-Willcox road, 6.3 miles northwest of Willcox. Used drilled irrigation well, diameter 16 inches, depth 60 feet. Measuring point, west side of pump base, 2.0 feet above land-surface datum. Equipped with turbine and gasoline engine. Water levels, in feet below land-surface datum: May 12, 1942, 32.08; June 8, 1944, pumping; Oct. 16, 1945, 35.55.

1584. J. J. Meyer. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 23, T. 13 S., R. 24 E., in yard, 20 feet east of house, 150 feet south of county road, 0.25 mile east of Fort Grant-Willcox road, 4.25 miles northwest of Willcox. Used drilled domestic well, diameter 8 inches, depth 50 feet. Measuring point, top of wooden pipe clamp, 0.5 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 34.12; June 8, 1944, 36.90; Oct. 15, 1945, 36.72.

1585. W. A. Hines. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 25, T. 13 S., R. 24 E., in pasture, 500 feet east of county road and 200 feet north of Fort Grant-Willcox road, 2 miles northwest of Willcox. Used drilled stock well, diameter 12 inches, depth unknown. Measuring point, top of casing at west side, 0.4 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 22.04; June 7, 1944, 23.15; Oct. 15, 1945, 24.22.

1588. P. H. Pregenzer. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 35, T. 13 S., R. 24 E., at rear of house, 20 feet east of other windmill well, 0.3 mile north of Willcox-Cascabel road, 1.9 miles west of Willcox. Used drilled domestic and stock well, diameter 6 inches, depth 54 feet. Measuring point, top of casing, 1.3 feet above land-surface datum. Equipped with windmill on red wooden tower. Water levels, in feet below land-surface datum: May 12, 1942, 20.12; June 7, 1944, 21.63; Oct. 15, 1945, 22.87.

1700. Fay Proctor. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 36, T. 14 S., R. 23 E., between house and shed, 0.4 mile west along trail from intersection of U. S. Highway 666 with State Highway 86, 11.4 miles southwest of Willcox. Used drilled domestic and stock well, diameter 6½ inches, depth 50 feet. Measuring point, top of casing at north side, 0.5 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 36.05; June 7, 1944, 36.85; Oct. 15, 1945, 38.50.

1725. C. A. Williamson. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 13, T. 14 S., R. 24 E., at rear of house, 0.15 mile west of Southern Pacific Railroad, 2 miles southwest of Willcox. Used drilled domestic and stock well, diameter 8 inches, depth 35 feet. Measuring point, top of wooden pipe clamp, 0.3 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 11.81; June 7, 1944, 13.18; Oct. 15, 1945, 13.35.

1726. W. L. Woodrow. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 14, T. 14 S., R. 24 E., at rear of Lakeside Store, at west side of State Highway 86, 3 miles southwest of Willcox. Used drilled domestic well, diameter 5 inches, depth unknown. Measuring point, top of casing at west side, 1.0 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 13, 1942, 12.53; June 7, 1944, 13.63; Oct. 15, 1945, 15.22.

1728. Fay Proctor. $NW\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 14 S., R. 24 E., in pasture, west side of State Highway 86, 1.0 mile northeast of intersection of U. S. Highway 666 with State Highway 86, 7 miles southwest of Willcox. Used drilled stock well, diameter 6 inches, depth unknown. Measuring point, top of wooden pipe clamp, 2.8 feet above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: Mar. 13, 1942, 20.05; June 7, 1944, 21.45; Oct. 15, 1945, 23.32.

1776. Dunlap Auto Court. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 6, T. 14 S., R. 25 E., at rear of service station, east side of State Highway 86, at south city limits of Willcox. Used domestic drilled well, diameter 6 inches, depth 34 feet. Measuring point, top of concrete curb at east side, 0.2 foot above land-surface datum. Water levels, in feet below land-surface datum: May 14, 1942, 12.00; June 7, 1944, 13.15; Oct. 15, 1945, 13.98.

1953. B. B. Gibbons. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 11, T. 16 S., R. 25 E., about 100 feet west of Kansas Settlement Road, 15 miles southeast of Willcox. Used drilled stock well, diameter 6 inches, depth unknown. Measuring point, top of 2- by 12-inch board over casing, 0.3 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 14, 1942, 42.30; June 6, 1944, 43.20; Oct. 16, 1945, 44.56.

1954. Henry Gibbons. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 13, T. 16 S., R. 25 E., about 200 feet east of Kansas Settlement Road, 16 miles southeast of Willcox. Used drilled domestic and stock well, diameter 8 inches, depth 60 feet. Measuring point, top of casing, 2.5 feet above land-surface datum. Water levels, in feet below land-surface datum: May 14, 1942, 43.86; June 7, 1944, 44.94; Oct. 16, 1945, 46.61.

1956. State of Arizona. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 16, T. 16 S., R. 25 E., near abandoned adobe house, 300 feet west of county road, 2.0 miles west of Kansas Settlement Road, 18.8 miles south of Willcox. Used drilled stock well, diameter 6 inches, depth unknown. Measuring point, top of casing, at land-surface datum. Water levels, in feet below land-surface datum: May 28, 1942, 36.74; June 7, 1944, 33.99; Oct. 16, 1945, 41.25.

2701. W. H. Seaver. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 12, T. 20 S., R. 26 E., 30 feet east of house, 2 miles east of U. S. Highway 666, 4 miles northeast of Elfrida. Used dug and drilled domestic stock and irrigation well, diameter 60 to 10 inches, depth 150 feet. Measuring point, top of iron rail, 0.5 foot above land-surface datum. Equipped with turbine and electric motor. Water levels, in feet below land-surface datum: May 27, 1942, 86.03; June 6, 1944, pumping; Oct. 16, 1945, 89.22.

2702. Gilbert Thompson. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 11, T. 20 S., R. 26 E., at west side of house, 0.1 mile west of county highway, 2 miles east of U. S. Highway 666, 3 miles northeast of Elfrida. Used dug and drilled domestic and stock well, diameter 10 inches, depth 106 feet. Measuring point, top of casing at $\frac{1}{4}$ -inch hole on west side, 1.0 foot above land-surface datum. Water levels, in feet below land-surface datum: May 27, 1942, 65.45; June 6, 1944, 71.78; Oct. 16, 1945, 71.29.

2709. F. O. Mackey. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 33, T. 20 S., R. 26 E., inside pump house, 100 feet west of county road, 2.5 miles south of Elfrida. Used drilled irrigation well, diameter 16 inches, depth unknown. Measuring point, top of casing at south side, at land-surface datum. Water levels, in feet below land-surface datum: May 27, 1942, 22.46; June 6, 1944, 24.48; Oct. 16, 1945, 26.97.

3350. J. E. Brophy. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 22 S., R. 26 E., about 600 feet west of private road, 0.5 mile west of county road, 12.5 miles south of Elfrida. Used dug and drilled irrigation well, diameter 8 inches, reported depth 500 feet. Measuring point, top of 4- by 6-inch timber at south side, at land-surface datum. Water levels, in feet below land-surface datum: May 28, 1942, 24.64; June 6, 1944, 25.11; Oct. 17, 1945, 26.57.

3650. W. E. Mason. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 19, T. 23 S., R. 27 E., 0.33 mile north of county road, 3.5 miles north of Southern Pacific Railroad, 6.5 miles northwest of Douglas. Unused dug and drilled domestic and stock well, diameter 48- by 48-inches, depth 39 feet. Measuring point, top of 1-inch board, south side of pipe, 0.3 foot above land-surface datum. Water levels, in feet below land-surface datum: May 26, 1942, 27.89; June 4, 1943, 28.60; June 5, 1944, 28.34; Oct. 17, 1945, 29.13.

3800. Walter Holland. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 1, T. 24 S., R. 26 E., in yard at rear of house, 0.1 mile east of county road, 0.5 mile north of U. S. Highway 80, 7.0 miles west of Douglas. Used drilled domestic well, diameter 6 inches, depth 110 feet. Measuring point, top of casing at south side, 1.0 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 26, 1942, 103.70; June 5, 1944, 108.26; Oct. 17, 1945, 105.62.

3803. Cochise County Hospital. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 3, T. 24 S., R. 27 E., in yard, 200 feet northwest of nurses' quarters, 0.8 mile north of U. S. Highway 80, 3.3 miles west of Douglas. Unused drilled well, diameter 6 inches, depth 265 feet. Measuring point, top of casing, at land-surface datum: Water levels, in feet below land-surface datum: May 26, 1942, 72.0; June 5, 1944, 77.10; Oct. 17, 1945, 68.66.

3804. L. L. Keith. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 5, T. 24 S., R. 27 E., in field, 0.3 mile east of county road, 1.0 mile north of U. S. Highway 80, 5.5 miles northwest of Douglas. Used dug stock well, diameter 96 inches, depth 82 feet. Measuring point, top of 2- by 12-inch plank across center of well, 1.0 foot above land-surface datum. Equipped with windmill. Water levels, in feet below land-surface datum: May 26, 1942, 54.30; June 5, 1944, 54.95; Oct. 17, 1945, 55.82.

3810. Victor Nelson. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 24 S., R. 27 E., at rear of house, 0.05 mile east of county road, 0.1 mile south of section corner, 0.4 mile south of U. S. Highway 80, 4.4 miles west of Douglas. Used drilled domestic well, diameter 6 inches, depth 65 feet. Measuring point, top of casing at east side, 0.2 foot above land-surface datum. Water levels, in feet below land-surface datum: May 26, 1942, 49.64; June 5, 1944, 49.45; Oct. 17, 1945, 50.65.

GRAHAM COUNTY

By R. L. Cushman

Measurements of water levels were made in 129 wells in Graham County during 1945. A continuous water-stage recorder was maintained on one of these wells. Water levels were measured at bimonthly intervals in 24 wells, and two or three times during the year in all other wells. A total of 548 tape measurements was made. An average of measurements in 27 representative wells showed a 0.5 foot decline in water levels during 1945.

Water pumped from wells decreased 32 percent from that pumped in 1944. The following table shows the water pumped each year since 1940.

Year	Acre-feet	Year	Acre-feet
1940	24,600	1943	35,000
1941	8,685	1944	52,000
1942	18,900	1945	35,200

The decreased pumpage in 1945 was principally the result of good rains in the fall of 1944 and of rains in the summer of 1945 which caused an increase in flow of the Gila River. Figure 2 shows the volume pumped each month, compared with the precipitation at Safford and with the graphs of water-level fluctuations in five typical wells.

Precipitation was 6.99 inches during 1945, which was 2.82 inches below normal. Rainfall in July was 0.66 inch above normal.

Well 662 is near the Gila River and the lowering of the water level in the well reflects the discharge of ground water to the river during low flow periods. Conversely, the water level rises when the river flow is sufficient to recharge the ground water.

The declining water level in well 597 is a result of pumping ground water for irrigation. The reversal of slope starting early in September shows the lessening in the pumping draft as a result of rains which supplies an increased surface-water supply for irrigation.

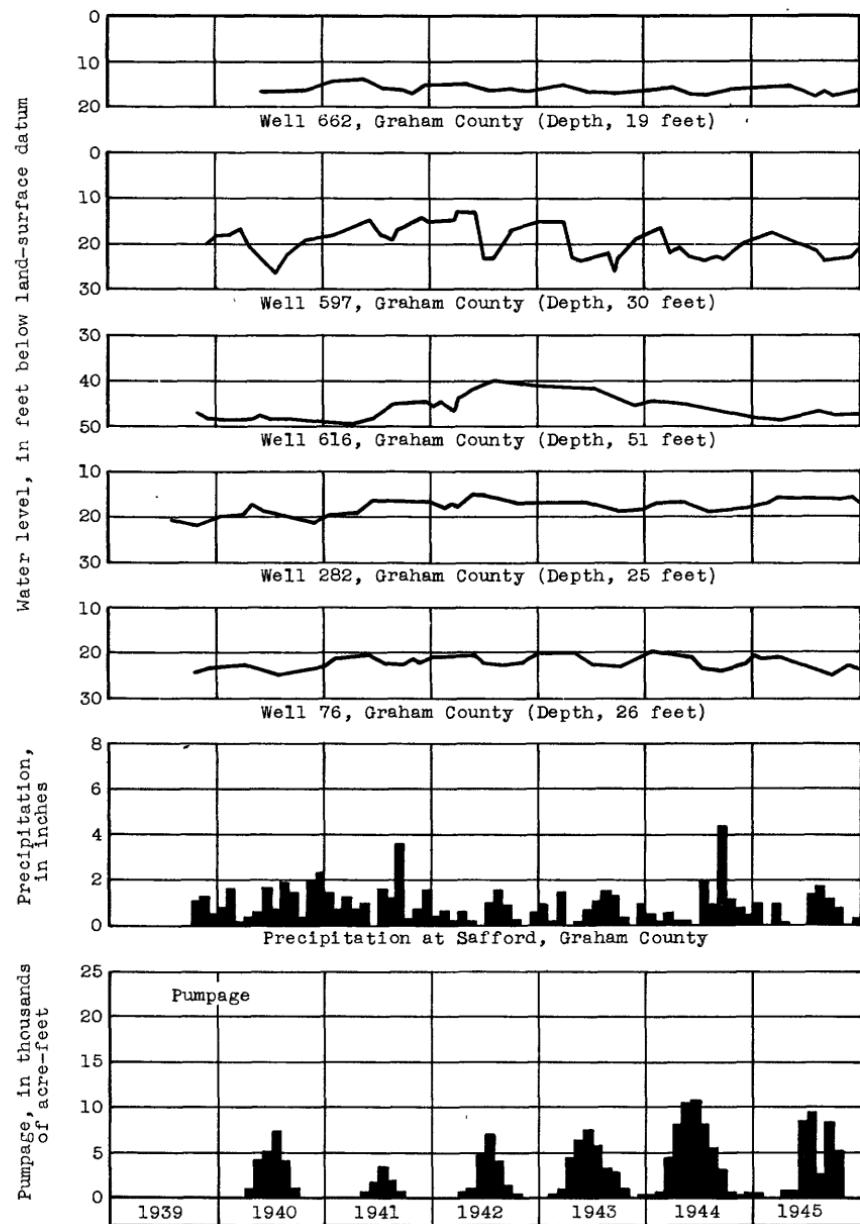


Figure 2.--Graphs showing fluctuations of water level in observation wells in the Safford Valley, Graham County, Ariz.

The water level in well 616 is influenced by recharge to ground water occurring from seepage losses from irrigation without the immediate counter effects of nearby pumping withdrawals.

The rising water level in well 282, starting in February, indicates recharge to the ground water occurring as seepage loss from irrigation water applied to the land. Although there is only a slight effect of nearby pumping, the regional water table is lowered by pumping as shown by the declining water level during May, June, and July.

Transpiration occurring in an extensive stand of mesquite near well 76 caused the steady decline in water level from March to September. The small rise in water level during November may have been caused by recharge from irrigation water in a nearby ditch.

Well descriptions and water-level measurements

8 (*911, p. 13; *941, p. 11; 949, p. 11; *991, p. 12; 1021, p. 10).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 7.12; Mar. 16, 7.31; Aug. 7, 8.70.

9 (*911, p. 13; *941, p. 11; 949, p. 11; *991, p. 12; 1021, p. 11).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 6.00; Mar. 16, 6.27; Aug. 7, 7.48.

11 (*911, p. 14; *941, p. 11; 949, p. 11; *991, p. 12; 1021, p. 11).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 4.49; Mar. 16, 4.69; Aug. 7, 5.11.

12 (*911, p. 14; *941, p. 11; 949, p. 11; *991, p. 12; 1021, p. 11).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 4.57; Mar. 16, 4.72.

13 (*911, p. 14; *941, p. 12; 949, p. 12; *991, p. 13; 1021, p. 11).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 9.50; Mar. 16, 9.62.

14 (*911, p. 14; *941, p. 12; 949, p. 12; *991, p. 13; 1021, p. 12).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 10.42; Mar. 16, 10.50.

17 (*911, p. 15; *941, p. 12; 949, p. 12; *991, p. 13; 1021, p. 12).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 6.69; Mar. 16, 6.76.

18 (*911, p. 15; *941, p. 12; 949, p. 12; *991, p. 13; 1021, p. 12).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 7.30; Mar. 16, 7.54; Aug. 7, 8.55.

19 (*911, p. 15; 941, p. 12; 949, p. 12; *991, p. 13; 1021, p. 12).
U. S. Indian Service. No measurements made in 1945.

20 (*911, p. 16; *941, p. 13; 949, p. 13; *991, p. 13; 1021, p. 13).
U. S. Indian Service. Water levels, in feet below land-surface datum,
1945: Jan. 25, 7.80; Mar. 16, 7.97; Aug. 7, 9.05.

21 (*911, p. 16; *941, p. 13; 949, p. 13; *991, p. 14; 1021, p. 13).
U. S. Indian Service. Measurements discontinued.

51 (*911, p. 16; 941, p. 13; 949, p. 13; *991, p. 14; 1021, p. 13).
Bert Hinton. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 4 S., R. 22 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	18.13	Aug. 7	18.82	Oct. 11	20.23	Dec. 9	19.82
Mar. 16	18.67	Sept. 10	20.16	Nov. 11	19.26		

52 (*911, p. 17; 941, p. 13; 949, p. 13; *991, p. 14; 1021, p. 13).
Bert Hinton. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 4 S., R. 22 E. Water levels, in feet
below land-surface datum, 1945: Jan. 25, pumping; Mar. 16, pumping;
Aug. 7, 18.30.

55A (*1021, p. 13). J. G. Willis. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 4 S., R. 23 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	30.48	Aug. 7	32.93	Oct. 11	31.60	Dec. 9	32.34
Mar. 16	29.95	Sept. 10	(a)	Nov. 11	32.11		

a Pumping.

56 (*911, p. 17; 941, p. 13; 949, p. 13; *991, p. 14; 1021, p. 14).
Eliza Allen. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T. 4 S., R. 22 E. Water levels, in feet
below land-surface datum, 1945: Jan. 25, 39.95; Mar. 16, 40.72; Aug. 7,
25.35.

60 (*941, p. 13; 949, p. 13; *991, p. 15; 1021, p. 14). Pat Hinton.
SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 4 S., R. 22 E. No measurements made in 1945.

71 (*911, p. 18; *941, p. 14; 949, p. 13; *991, p. 15; 1021, p. 14).
Ed McEuen. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 4 S., R. 23 E. Water levels, in feet below
land-surface datum, 1945: Jan. 25, 17.74; Mar. 16, 17.80.

72 (*911, p. 18; *941, p. 14; 949, p. 13; *991, p. 15; 1021, p. 14).
Ed McEuen. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 4 S., R. 23 E. Water levels, in feet
below land-surface datum, 1945: Jan. 25, 3.62; Mar. 16, 3.80; Aug. 7, 4.27.

74 (*911, p. 19; 941, p. 14; 949, p. 14; *991, p. 15; 1021, p. 14).
Graham County. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 4 S., R. 23 E. Measurements discontinued
after Oct. 27, 1944.

76 (*911, p. 19; 941, p. 15; *949, p. 14; *991, p. 15; 1021, p. 14).
E. W. Black. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 4 S., R. 23 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	21.81	Mar. 16	21.27	Sept. 10	24.56	Nov. 11	22.83
Feb. 26	21.37	Aug. 7	24.00	Oct. 11	24.46	Dec. 9	23.79

77 (*911, p. 20; 941, p. 15; 949, p. 14; *991, p. 16; 1021, p. 15).
E. M. Claridge. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T. 4 S., R. 23 E. Water levels, in feet
below land-surface datum, 1945: Jan. 25, pumping; Mar. 16, pumping;
Aug. 7, pumping.

80 (*911, p. 20; 941, p. 15; 949, p. 14; *991, p. 16; 1021, p. 15).
Fay Rabb. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 4 S., R. 23 E. Water levels, in feet below
land-surface datum, 1945: Jan. 25, 15.34; Mar. 16, 14.90; Aug. 7, 16.45.

81 (*911, p. 20; 941, p. 15; 949, p. 14; *991, p. 16; 1021, p. 15).
Mrs. J. B. Blessing. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 4 S., R. 23 E. Water levels, in
feet below land-surface datum, 1945: Jan. 25, 27.69; Mar. 16, 27.38;
Aug. 7, pumping.

82A (*1021, p. 16). Fay Rabb. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 4 S., R. 23 E.
Water levels, in feet below land-surface datum, 1945: Jan. 25, 17.70;
Mar. 16, 17.53; Aug. 7, 19.50.

91 (*911, p. 21; 941, p. 15; 949, p. 14; *991, p. 17; 1021, p. 16).
Ben Montierth. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 29, T. 4 S., R. 23 E. Water levels, in feet
below land-surface datum, 1945: Jan. 25, 49.90; Mar. 16, 49.77; Aug. 7,
51.17.

92 (*911, p. 21; 941, p. 15; 949, p. 14; *991, p. 17; 1021, p. 16). Wendell Montierth. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 28, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 58.95; Mar. 16, 58.60; Aug. 7, 60.90.

93 (*911, p. 21; 941, p. 16; 949, p. 14; *991, p. 17; 1021, p. 16). Graham County. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 12.61; Mar. 16, 12.70; Aug. 7, 13.99.

94 (*911, p. 21; 941, p. 16; 949, p. 15; *991, p. 17; 1021, p. 17). Graham County. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 8.70; Mar. 16, 8.87; Aug. 7, 9.52.

95 (*911, p. 22; 941, p. 16; 949, p. 15; *991, p. 18; 1021, p. 17). Graham County. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 9.26; Mar. 16, 9.52; Aug. 7, 9.98.

98 (*911, p. 23; 941, p. 16; 949, p. 15; *991, p. 18; 1021, p. 17). Graham County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 35, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 3.56; Mar. 16, 3.67; Aug. 7, 4.90.

100 (*911, p. 23; 941, p. 17; 949, p. 15; *991, p. 18; 1021, p. 17). C. N. Higgins. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 34, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 10.33; Mar. 16, 10.69; Aug. 7, 11.92.

105 (*911, p. 24; *941, p. 17; 949, p. 15; *991, p. 18; 1021, p. 17). Edward McEuen. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 35, T. 4 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 45.95; Mar. 16, 45.51; Aug. 7, obstruction in casing.

106 (*911, p. 24; 941, p. 17; 949, p. 15; *991, p. 19; 1021, p. 18). L. L. Morrison. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 35, T. 4 S., R. 23 E. Measurements discontinued.

107 (*911, p. 24; 941, p. 17; 949, p. 15; *991, p. 19; 1021, p. 18). Port McEuen. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 35, T. 4 S., R. 23 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	40.62	Aug. 7	42.82	Oct. 11	43.27	Dec. 9	44.09
Mar. 16	40.46	Sept. 10	43.20	Nov. 11	42.59		

108 (*911, p. 25; 941, p. 17; 949, p. 15; *991, p. 19; 1021, p. 18). W. O. Tyler. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 2, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 17.00; Mar. 16, 16.94; Aug. 7, 19.17.

122A (*1021, p. 18). Elliot Montierth. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 28, T. 4 S., R. 23 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	32.35	Aug. 7	34.50	Oct. 11	34.77	Dec. 9	(a)
Mar. 16	31.94	Sept. 10	34.82	Nov. 11	34.63		

a Pumping.

124A (*991, p. 19; 1021, p. 18). Mr. Willis. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 27, T. 4 S., R. 23 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	33.87	Aug. 7	(a)	Dec. 9	28.10
Mar. 16	(a)	Sept. 10	(a)		

a Pumping.

126 (*911, p. 25; 941, p. 17; 949, p. 15; *991, p. 19; 1021, p. 18).
 YL Ranch. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 24, T. 5 S., R. 21 E. No measurements made in 1945.

143 (*911, p. 25; 941, p. 18; 949, p. 16; *991, p. 19; 1021, p. 18).
 R. S. Snedigar. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 25, T. 5 S., R. 22 E. No measurements made in 1945.

156 (*911, p. 25; 941, p. 18; 949, p. 16; *991, p. 20; 1021, p. 18).
 Roy Layton. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 1, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 11.81; Mar. 16, pumping; Aug. 7, 13.30.

157 (*911, p. 20; 1021, p. 19). M. J. Ferguson. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 2, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 14.87; Mar. 16, 14.77; Aug. 7, 16.95; Sept. 10, 16.81.

158 (*911, p. 26; 941, p. 18; 949, p. 16; *991, p. 20; 1021, p. 19).
 W. C. Rhodes. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 2, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 44.41; Mar. 16, 45.38; Aug. 7, 52.29.

160 (*911, p. 26; *941, p. 18; 949, p. 16; *991, p. 20; 1021, p. 19).
 W. O. Tyler. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 2, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 28.50; Mar. 16, 28.69; Aug. 7, 31.55.

194 (*911, p. 27; 941, p. 18; 949, p. 16; 991, p. 21; 1021, p. 19).
 Virgil McEuen. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 18, T. 5 S., R. 24 E. Measurements discontinued.

194A. Ed and Port McEuen. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 18, T. 5 S., R. 24 E., 50 feet west of county road, 3.5 miles along road north and west of Eden. Unused drilled irrigation well, diameter 16 inches, depth 50 feet. Measuring point, bottom of slot at top of casing, 2.2 feet above land-surface datum.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	17.62	Sept. 11	16.76	Nov. 11	18.83
Aug. 9	18.33	Oct. 12	17.13	Dec. 9	18.77

195 (*911, p. 27; *941, p. 18; 949, p. 16; *991, p. 21; 1021, p. 20).
 Fay Rabb. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 19, T. 5 S., R. 23 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 15.70; Mar. 16, 15.31; Aug. 7, plugged; measurements discontinued.

198A (*991, p. 21; 1021, p. 20). C. J. Farrington. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 19, T. 5 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	21.64	Aug. 7	22.83	Oct. 11	22.89	Dec. 9	23.33
Mar. 16	21.27	Sept. 10	22.34	Nov. 11	23.21		

199 (*991, p. 21; 1021, p. 20). Joe Morgan. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 20, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 40.84; Mar. 14, pump house locked; Aug. 6, pump house locked.

200 (*911, p. 27; 941, p. 18; 949, p. 16; *991, p. 22; 1021, p. 20).
 J. R. Thatcher. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 20, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 19.40; Mar. 14, 18.97; Aug. 6, dry. Measurements discontinued after Aug. 6, 1945.

202 (*911, p. 27; *941, p. 19; 949, p. 16; *991, p. 22; 1021, p. 20).
 A. D. Nelson. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 5 S., R. 24 E. Measurements discontinued after Dec. 21, 1944.

205 (*911, p. 27; 941, p. 19; 949, p. 16; *991, p. 22; 1021, p. 21).
 W. B. Marshall. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 28, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 26.90; Mar. 14, 27.22; Aug. 6, 26.80.

206 (*911, p. 28; 941, p. 19; 949, p. 16; *991, p. 22; 1021, p. 21).
J. D. Colvin. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 29, T. 5 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	21.01	Aug. 6	20.80	Oct. 12	21.19	Dec. 9	20.81
Mar. 14	21.50	Sept. 11	21.07	Nov. 11	20.70		

208 (*911, p. 28; 941, p. 19; 949, p. 16; *991, p. 22; 1021, p. 21).
L. W. Farrington. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 23.36; Mar. 16, 23.24; Aug. 7, 24.01.

210 (*911, p. 28; *941, p. 19; 949, p. 16; *991, p. 23; 1021, p. 21).
Boyd Hawkins. $SW\frac{1}{4}NE\frac{1}{4}$ sec. 31, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 33.10; Mar. 16, 32.75; Aug. 7, 33.70.

211 (*911, p. 28; 941, p. 19; 949, p. 16; *991, p. 23; 1021, p. 21).
Producers Ginning Co. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 31, T. 5 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Jan. 29	23.03	Aug. 7	23.55	Oct. 11	23.41	Dec. 9	22.70
Mar. 16	22.99	Sept. 10	23.49	Nov. 11	22.55		

212 (*911, p. 28; 941, p. 20; 949, p. 17; *991, p. 23; 1021, p. 21).
Graham County. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 31, T. 5 S., R. 24 E. Measurements discontinued after June 28, 1944.

214 (*911, p. 29; 941, p. 20; 949, p. 17; *991, p. 23; 1021, p. 22).
Graham County. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 31, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 13.05; Mar. 16, 13.41; Aug. 7, 13.72.

216 (*911, p. 30; 941, p. 20; 949, p. 17; *991, p. 23; 1021, p. 22).
Graham County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 5 S., R. 24 E. Well destroyed; measurements discontinued after Jan. 24, 1945.

217 (*911, p. 30; 941, p. 20; 949, p. 17; *991, p. 24; 1021, p. 22).
Graham County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 3.49; Mar. 14, 3.77; Aug. 6, 4.20.

218 (*911, p. 30; *941, p. 21; 949, p. 17; *991, p. 24; *1021, p. 22).
Graham County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 5 S., R. 24 E. Well buried or pulled out; measurements discontinued after Jan. 29, 1945.

220 (*911, p. 30; 941, p. 21; 949, p. 17; *991, p. 24; 1021, p. 22).
Lionel Hancock. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 33, T. 5 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Jan. 24	16.04	Aug. 6	15.55	Oct. 12	15.33	Dec. 9	15.55
Mar. 14	14.90	Sept. 11	14.93	Nov. 11	15.95		

222 (*911, p. 31; 941, p. 21; 949, p. 17; *991, p. 24; 1021, p. 22).
Dave Hawkins. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 33, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, pumping; Mar. 14, 25.56; Aug. 6, 24.98.

223A (*1021, p. 23). Ira Hancock. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 33, T. 5 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 32.12; Mar. 14, 31.97; Aug. 6, pumping.

259. (*1021, p. 23). Jess Udall. $SW\frac{1}{4}NE\frac{1}{4}$ sec. 1, T. 6 S., R. 24 E.
Water level, in feet below land-surface datum, 1945

Jan. 24	25.51	Aug. 6	28.36	Oct. 12	27.40	Dec. 9	26.40
Mar. 14	25.36	Sept. 11	27.39	Nov. 11	26.42		

262 (*911, p. 31; 941, p. 21; 949, p. 17; *991, p. 25; 1021, p. 23).
 J. Hancock. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 6 S., R. 24 E. Well destroyed; measurements discontinued after Dec. 21, 1944.

264 (*911, p. 31; 941, p. 21; *949, p. 18; *991, p. 25; 1021, p. 23).
 J. Hancock. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 3, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, pumping; Mar. 14, 12.55; Aug. 6, 13.79.

267 (*911, p. 32; 941, p. 21; 949, p. 18; *991, p. 25; 1021, p. 24).
 Wm. Carpenter. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 24	22.23	Aug. 6	25.14	Oct. 12	24.72	Dec. 9	23.80
Mar. 14	22.35	Sept. 11	24.14	Nov. 11	23.87		

269A (*991, p. 25; 1021, p. 24). Silas Jarvis. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Jan. 29	24.10	Aug. 7	24.25	Oct. 11	23.67	Dec. 9	25.30
Mar. 16	23.49	Sept. 10	23.97	Nov. 11	24.04		

270A (*991, p. 26; 1021, p. 24). M. J. Ferguson. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 51.53; Mar. 16, 50.64; Aug. 7, 50.70.

273 (*911, p. 32; *941, p. 22; 949, p. 18; *991, p. 26; 1021, p. 24). Eldon Palmer. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 29	41.54	Sept. 10	41.17	Nov. 11	40.47
Mar. 16	40.82	Oct. 11	41.24	Dec. 9	41.67

275 (*911, p. 33; 941, p. 22; 949, p. 18; *991, p. 26; 1021, p. 25). Lamar Bellman. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 10, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 22.37; Mar. 14, 21.20; Aug. 7, 22.39.

276A (*991, p. 26; 1021, p. 25). M. J. Ferguson. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	34.20	Aug. 7	34.12	Oct. 11	34.25	Dec. 9	35.07
Mar. 14	34.22	Sept. 10	34.20	Nov. 11	34.12		

279 (*911, p. 33; 941, p. 22; 949, p. 18; *991, p. 26; 1021, p. 25). Howard McBride. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 5.00; Mar. 14, 4.77; Aug. 7, 5.00.

282 (*911, p. 33; 941, p. 22; 949, p. 18; *991, p. 27; 1021, p. 25). Guy Anderson. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Jan. 26	17.22	Mar. 14	15.95	Sept. 9	16.41	Nov. 11	15.99
Feb. 26	16.93	Aug. 7	16.26	Oct. 11	16.22	Dec. 9	16.13

285 (*911, p. 33; 941, p. 22; 949, p. 18; *991, p. 27; 1021, p. 25). Guy Anderson. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 30.07; Mar. 16, 29.12; Aug. 7, 31.27.

289 (*949, p. 18; *991, p. 27; 1021, p. 25). W. J. Preston. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 13, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 34.10; Mar. 14, 34.06; Aug. 7, pumping.

298 (*911, p. 34; 941, p. 23; 949, p. 18; *991, p. 27; 1021, p. 26).
 Joe Rogers. $NE_4^1 NW_4^1$ sec. 25, T. 6 S., R. 24 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 16.50; Mar. 14, 16.05; Aug. 7, pumping.

302A (*991, p. 28; 1021, p. 26). Mattice Bros. $SE_4^1 NE_4^1$ sec. 23, T. 6 S., R. 24 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	46.12	Aug. 7	47.65	Oct. 11	47.09	Dec. 9	47.01
Mar. 14	45.70	Sept. 9	46.87	Nov. 11	46.87		

313 (*911, p. 34; 941, p. 23; 949, p. 19; *991, p. 28; 1021, p. 26).
 Jack Bryce. $NW_4^1 NE_4^1$ sec. 7, T. 6 S., R. 25 E.

Water level, in feet below land-surface datum, 1945

Jan. 24	58.91	Aug. 6	61.75	Oct. 12	61.43	Dec. 9	60.59
Mar. 14	58.46	Sept. 11	60.55	Nov. 11	59.98		

318 (*941, p. 23; 949, p. 19; *991, p. 28; 1021, p. 26). Vance Marshall. $NE_4^1 NE_4^1$ sec. 17, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 19.62; Mar. 14, 19.42; Aug. 6, 23.32.

320 (*911, p. 35; 941, p. 23; 949, p. 19; *991, p. 28; 1021, p. 26). Vance Marshall. $SE_4^1 SE_4^1$ sec. 17, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 14.28; Mar. 14, 14.15; Aug. 6, 16.20.

321 (*911, p. 35; 941, p. 23; 949, p. 19; *991, p. 29; 1021, p. 27). Graham County. $SW_4^1 SE_4^1$ sec. 7, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 7.62; Mar. 14, 7.94; Aug. 6, 8.25.

322 (*911, p. 35; *941, p. 24; 949, p. 19; *991, p. 29; 1021, p. 27). Bryce Bros. $NE_4^1 NW_4^1$ sec. 18, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 7.05; Mar. 14, 7.38; Aug. 6, 7.66.

323 (*911, p. 35; 941, p. 24; 949, p. 19; *991, p. 29; 1021, p. 27). Graham County. $NW_4^1 NE_4^1$ sec. 18, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 6.65; Mar. 14, 7.34; Aug. 6, 7.49.

324 (*911, p. 36; 941, p. 24; 949, p. 19; *991, p. 29; 1021, p. 27). Graham County. $SW_4^1 NE_4^1$ sec. 18, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 3.47; Mar. 14, 4.45; Aug. 6, 4.61.

325 (*911, p. 36; 941, p. 24; 949, p. 19; *991, p. 30; 1021, p. 27). Graham County. $SW_4^1 NE_4^1$ sec. 18, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 4.11; Mar. 14, 4.96; Aug. 6, 5.18.

326 (*911, p. 36; 941, p. 24; 949, p. 19; *991, p. 30; 1021, p. 27). Graham County. $SW_4^1 NE_4^1$ sec. 18, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 3.40; Mar. 14, 4.47; Aug. 6, 5.25.

335 (*911, p. 37; 941, p. 25; 949, p. 20; *991, p. 31; 1021, p. 28). E. B. McBride. $NW_4^1 SW_4^1$ sec. 20, T. 6 S., R. 25 E. Measurements discontinued.

342 (*991, p. 37; 941, p. 25; 949, p. 20; *991, p. 31; 1021, p. 28). Ed Howard. $SE_4^1 SW_4^1$ sec. 23, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 24.00; Mar. 14, 23.11; Aug. 6, 26.35.

346 (*911, p. 37; 941, p. 25; 949, p. 20; *991, p. 31; 1021, p. 28). Graham County. $SE_4^1 NE_4^1$ sec. 27, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 5.67; Mar. 14, 5.06; Aug. 6, 7.18.

347 (*911, p. 38; 941, p. 26; 949, p. 20; *991, p. 31; 1021, p. 28). Graham County. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 27, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 6.32; Mar. 14, 6.32; Aug. 6, 7.53.

350 (*911, p. 38; 941, p. 26; 949, p. 20; *991, p. 32; 1021, p. 28). Graham County. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 5.18; Mar. 14, 5.60; Aug. 6, 6.80.

352 (*911, p. 39; 941, p. 27; 949, p. 20; *991, p. 32; 1021, p. 29). Graham County. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 27, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 6.13; Mar. 14, 6.65; Aug. 6, well plugged.

354 (*911, p. 40; *941, p. 27; 949, p. 20; *991, p. 32; 1021, p. 29). Ned Daley. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 6 S., R. 25 E.

Water level, in feet below land-surface datum, 1945							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	6.65	Aug. 6	12.52	Oct. 11	10.37	Dec. 9	10.07
Mar. 14	6.50	Sept. 9	10.62	Nov. 11	10.13		

366 (*911, p. 40; 941, p. 27; 949, p. 21; *991, p. 32; 1021, p. 29). Charles M. Beals. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 20.10; Mar. 14, 17.11; Aug. 6, 19.58.

372 (*911, p. 41; 941, p. 28; 949, p. 21; *991, p. 33; 1021, p. 29). George Layton. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 33, T. 6 S., R. 25 E. Measurements discontinued.

408 (*991, p. 33; 1021, p. 29). Roy Saline. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 30, T. 6 S., R. 25 E.

Water level, in feet below land-surface datum, 1945							
Jan. 29	50.70	Aug. 6	50.12	Oct. 11	50.13	Dec. 9	50.11
Mar. 14	50.30	Sept. 9	50.09	Nov. 11	50.00		

409 (*991, p. 33; 1021, p. 29). Joe Alder. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 29, T. 6 S., R. 25 E.

Water level, in feet below land-surface datum, 1945							
Jan. 29	3.90	Aug. 6	5.55	Oct. 11	5.77	Dec. 9	4.69
Mar. 14	(a)	Sept. 9	5.49	Nov. 11	5.11		

a Irrigation water running in top of well.

410 (*991, p. 33; 1021, p. 30). Smithville Canal Co. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 28, T. 6 S., R. 25 E. No measurements made in 1945.

430 (*911, p. 42; 941, p. 28; 949, p. 21; *991, p. 34; 1021, p. 30). Graham County. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 35, T. 6 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 8.74; Mar. 14, 8.45; Aug. 6, 9.50.

431 (*911, p. 42; *941, p. 28; 949, p. 21; *991, p. 34; 1021, p. 30). Jesse Tyler. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 35, T. 6 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 4.23; Mar. 14, 4.00; Aug. 6, 4.92.

434 (*911, p. 43; 941, p. 29; 949, p. 22; *991, p. 34; 1021, p. 30). Abel Sanchez. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 36, T. 6 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 20.20; Mar. 14, 19.90; Aug. 6, 21.12.

452 (*911, p. 43; *941, p. 29; 949, p. 22; *991, p. 34; 1021, p. 30). S. A. Clontz. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 31, T. 6 S., R. 28 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 22.70; Mar. 14, 21.60; Aug. 6, 22.91.

454 (*911, p. 43; 941, p. 29; 949, p. 22; *991, p. 34; 1021, p. 30). Brown Canal Co. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 31, T. 6 S., R. 28 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 21.66; Mar. 14, 21.46; Aug. 6, 22.65.

506 (*991, p. 34; 1021, p. 30). Roy Layton. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 2, T. 7 S., R. 25 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	28.20	Aug. 6	27.65	Oct. 11	27.99	Dec. 9	27.71
Mar. 14 a	26.86	Sept. 9	27.87	Nov. 11	27.81		

a Irrigation nearby recently.

508 (*911, p. 44; 941, p. 29; 949, p. 22; *991, p. 35; 1021, p. 30). Graham County. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 34, T. 6 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 13.17; Mar. 14, 10.97; Aug. 6, 15.18.

509 (*911, p. 44; 941, p. 30; 949, p. 22; *991, p. 35; 1021, p. 31). Ellis Welker and Eldon Palmer. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 3, T. 7 S., R. 25 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 36.46; Mar. 14, 35.64; Aug. 6, 35.15.

554 (*911, p. 45; 941, p. 30; 949, p. 22; *991, p. 35; 1021, p. 31). Graham Canal Co. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 5, T. 7 S., R. 26 E. Measurements discontinued.

565A (*941, p. 31; 949, p. 22; *991, p. 35; 1021, p. 31). Z. C. Prina. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Jan. 30	10.02	Aug. 10	9.42	Oct. 11	9.49	Dec. 9	9.36
Mar. 14	9.81	Sept. 9	9.67	Nov. 11	9.37		

566A (*941, p. 31; 949, p. 22; *991, p. 36; 1021, p. 31). Z. C. Prina. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 7.30; Mar. 14, 6.91; Aug. 10, 6.83.

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567A (*941, p. 32; 949, p. 22; *991, p. 36; 1021, p. 31). Z. C. Prina. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 5.45; Mar. 14, 5.16; Aug. 10, 5.00.

568A (*941, p. 32; 949, p. 23; *991, p. 36; 1021, p. 31). Z. C. Prina. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 5.40; Mar. 14, 5.21; Aug. 10, 5.09.

569A (*941, p. 33; 949, p. 23; *991, p. 36; 1021, p. 31). Graham County. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 8 T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 4.86; Mar. 14, 4.74; Aug. 10, 4.57.

570 (*911, p. 48; *941, p. 33; 949, p. 23; *991, p. 36; 1021, p. 32). Z. C. Prina. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 7 S., R. 26 E. Measurements discontinued after May 15, 1944.

574 (*911, p. 48; *941, p. 33; 949, p. 23; *991, p. 37; 1021, p. 32). Z. C. Prina. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 4.49; Mar. 14, 4.77; Aug. 10, 6.38.

575 (*911, p. 49; *941, p. 34; 949, p. 23; *991, p. 37; 1021, p. 32). Z. C. Prina. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 6.60; Mar. 14, 6.95; Aug. 10, 8.52.

576 (*911, p. 50; *941, p. 35; 949, p. 24; *991, p. 37; 1021, p. 32). Z. C. Prina. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 7 S., R. 26 E. Measurements discontinued after Sept. 23, 1944.

580 (*911, p. 51; *941, p. 35; 949, p. 24; *991, p. 37; 1021, p. 33). City of Safford. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 8, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 11.30; Mar. 14, 10.62; Aug. 6, 13.90.

585 (*911, p. 51; *941, p. 36; 949, p. 24; *991, p. 37; 1021, p. 33). Graham Canal Co. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 9, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 14.00; Mar. 14, 13.99; Aug. 10, dry.

586 (*911, p. 51; 941, p. 36; 949, p. 24; *991, p. 38; 1021, p. 33). Ted Tidwell. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 12, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 17.90; Mar. 14, pumping; Aug. 6, 18.32.

592 (*911, p. 52; 941, p. 37; 949, p. 24; *991, p. 38; 1021, p. 33). E. M. Claridge. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 13, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 16.80; Mar. 14, pumping; Aug. 6, 19.80.

593 (*911, p. 53; 941, p. 37; 949, p. 24; *991, p. 38; 1021, p. 33). E. M. Claridge. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 13, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 18.25; Mar. 14, 18.48; Aug. 6, 20.97.

594 (*911, p. 53; 941, p. 37; 949, p. 25; *991, p. 38; 1021, p. 33). E. M. Claridge. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 14, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 10.38; Mar. 14, 9.00.

597 (*911, p. 53; 941, p. 37; 949, p. 25; *991, p. 38; 1021, p. 33). C. M. Pursley. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 15, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 26	18.30	Mar. 14	17.50	Sept. 9	23.58	Nov. 11	22.89
Feb. 26	17.87	Aug. 6	21.25	Oct. 11	23.03	Dec. 9	22.77

598 (*911, p. 53; 941, p. 37; 949, p. 25; *991, p. 38; 1021, p. 33). Union Canal Co. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 15, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 16.36; Mar. 14, 15.58; Aug. 6, 19.64.

603 (*911, p. 53; 941, p. 37; 949, p. 25; *991, p. 38; 1021, p. 33). L. A. Nelson. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 16, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Jan. 30	34.55	Aug. 6	36.20	Oct. 11	37.34	Dec. 9	.37.21
Mar. 16	34.15	Sept. 9	36.39	Nov. 11	37.27		

606 (*911, p. 54; 941, p. 37; 949, p. 25; *991, p. 39; 1021, p. 33). Pedro Solas. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 16, T. 7 S., R. 26 E. Water level, in feet below land-surface datum, 1945: Jan. 29, 5.26. Measurements discontinued after Mar. 14, 1945.

609 (*911, p. 54; *941, p. 37; 949, p. 25; *991, p. 39; 1021, p. 33). Mrs. Annie Collins. $SW\frac{1}{4}NE\frac{1}{4}$ sec. 17, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 27.33; Mar. 14, 26.82; Aug. 6, 27.40.

610 (*911, p. 54; 941, p. 38; 949, p. 25; *991, p. 38; 1021, p. 33). Bert Hatch. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 17, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 49.23; Mar. 14, 49.90.

616 (*911, p. 55; *941, p. 38; 949, p. 25; *991, p. 39; 1021, p. 33). Kimball & Greenhalgh. $NW\frac{1}{4}SE\frac{1}{4}$ sec. 20, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Jan. 26	48.55	Mar. 14	48.87	Sept. 9	46.61	Nov. 11	47.11
Feb. 26	48.80	Aug. 9	46.42	Oct. 11	47.37	Dec. 9	47.04

621 (*941, p. 39; 949, p. 25; *991, p. 39; 1021, p. 34). Lee Johns. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 35.17; Mar. 16, 34.30; Aug. 6, 36.68.

623 (*911, p. 56; 941, p. 39; 949, p. 25; *991, p. 39; 1021, p. 34). Lee Johns. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 28.24; Mar. 14, 27.43; Aug. 6, 31.35.

625 (*911, p. 56; 941, p. 39; 949, p. 26; *991, p. 40; 1021, p. 34). Willard Welker. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 22, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	33.92	Aug. 6	33.05	Oct. 11	34.38	Dec. 9	34.11
Mar. 14	33.31	Sept. 9	33.52	Nov. 11	34.09		

628 (*911, p. 56; *941, p. 39; 949, p. 26; *991, p. 40; 1021, p. 34). Kempton & Larson. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 21.32; Mar. 14, 21.85. Measurements discontinued Aug. 6, 1945.

630 (*911, p. 57; 941, p. 39; 949, p. 26; *991, p. 40; 1021, p. 34). E. L. Claridge. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T. 7 S., R. 26 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	17.04	Aug. 6	20.13	Oct. 11	19.92	Dec. 9	19.83
Mar. 14	17.48	Sept. 9	20.28	Nov. 11	19.86		

639 (*911, p. 57; 941, p. 39; 949, p. 26; *991, p. 40; 1021, p. 34). Amos Cook. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 7 S., R. 26 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 26.30; Mar. 16, 25.87; Aug. 8, 25.07.

661 (*911, p. 57; *941, p. 39; 949, p. 26; *991, p. 40; 1021, p. 34). Louis Michelena. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 30.20; Mar. 14, 30.28, Aug. 6, dry.

662 (*911, p. 57; 941, p. 40; *949, p. 26; *991, p. 40; 1021, p. 34). Mrs. Jose Somora. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 7 S., R. 27 E.

Daily noon water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.99	15.81	15.77	15.75	15.68	16.28	16.92	17.32	16.61	17.20	17.02	16.61
2	15.98	15.80	15.78	15.74	15.69	16.30	16.94	17.30	16.64	17.21	17.01	16.60
3	15.98	15.80	15.78	15.75	15.70	16.32	16.96	17.28	16.67	17.22	17.00	16.59
4	15.98	15.79	15.78	15.75	15.71	16.34	16.98	17.24	16.70	17.22	16.99	16.58
5	15.98	15.79	15.78	15.75	15.73	16.36	17.00	17.22	16.73	17.22	16.98	16.56
6	15.97	15.79	15.79	15.74	15.76	16.38	17.02	17.19	16.76	17.22	16.98	16.55
7	15.96	15.79	15.79	15.74	15.77	16.40	17.03	17.16	16.78	17.23	16.97	16.53
8	15.95	15.79	15.80	15.73	15.80	16.42	17.05	17.12	16.80	17.22	16.96	16.52
9	15.95	15.78	15.80	15.72	15.82	16.44	17.06	17.08	16.82	17.20	16.94	16.51
10	15.94	15.77	15.80	15.74	15.84	16.46	17.08	17.03	16.84	17.19	16.92	16.50
11	15.93	15.77	15.80	15.74	15.86	16.48	17.10	16.96	16.86	17.18	16.90	16.48
12	15.92	15.76	15.80	15.73	15.88	16.50	17.12	16.90	16.89	17.17	16.89	16.47
13	15.92	15.75	15.79	15.72	15.90	16.52	17.13	16.84	16.91	17.16	16.88	16.46
14	15.91	15.75	15.79	15.71	15.92	16.54	17.14	16.78	16.94	17.14	16.86	16.45
15	15.90	15.75	15.79	15.71	15.95	16.56	17.15	16.73	16.95	17.13	16.85	16.44
16	15.89	15.74	15.80	15.70	15.97	16.58	17.17	16.68	16.97	17.11	16.83	16.43
17	15.89	15.74	15.80	15.69	15.98	16.61	17.19	16.65	16.99	17.11	16.82	16.42
18	15.88	15.73	15.79	15.69	15.99	16.63	17.21	16.61	17.01	17.10	16.80	16.41
19	15.87	15.73	15.80	15.68	16.02	16.65	17.22	16.58	17.03	17.10	16.79	16.40
20	15.87	15.76	15.79	15.68	16.04	16.68	17.23	16.56	17.05	17.10	16.77	16.39
21	15.86	15.77	15.79	15.68	16.06	16.70	17.24	16.54	17.07	17.10	16.76	16.38
22	15.86	15.77	15.78	15.67	16.08	16.72	17.25	16.53	17.09	17.09	16.74	16.36
23	15.85	15.76	15.78	15.67	16.10	16.75	17.26	16.51	17.10	17.09	16.72	16.35
24	15.85	15.76	15.79	15.67	16.12	16.77	17.27	16.50	17.12	17.08	16.71	16.35
25	15.84	15.76	15.79	15.66	16.14	16.79	17.28	16.49	17.14	17.07	16.69	16.34
26	15.83	15.76	15.78	15.66	16.16	16.81	17.29	16.49	17.15	17.06	16.69	16.33
27	15.83	15.77	15.77	15.66	16.18	16.83	17.30	16.50	17.16	17.06	16.67	16.32

622--Continued.

Daily noon water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
28	15.83	15.77	15.76	15.66	16.20	16.85	17.32	16.50	17.18	17.05	16.65	16.31
29	15.82		15.75	15.66	16.22	16.87	17.33	16.52	17.19	17.04	16.64	16.30
30	15.82		15.75	15.67	16.24	16.90	17.33	16.55	17.19	17.03	16.62	16.29
31	15.81		15.75		16.26		17.33	16.58		17.02		16.29

664 (*911, p. 58; 941, p. 40; 949, p. 26; *991, p. 41; 1021, p. 35). San Jose Canal Co. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 17.55; Mar. 14, 17.00; Aug. 6, 18.80.

674 (*911, p. 58; 941, p. 40; 949, p. 26; *991, p. 41; 1021, p. 35). Louis Michelena. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 14.81; Mar. 14, 14.53; Aug. 6, 17.84.

675 (*941, p. 40; 949, p. 26; *991, p. 41; 1021, p. 35). Louis Michelena. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 13.50; Mar. 14, 12.24; Aug. 6, 14.62.

676 (*911, p. 58; 941, p. 41; 949, p. 26; *991, p. 41; 1021, p. 35). Louis Michelena. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 14.65; Mar. 14, 14.25; Aug. 6, 16.08.

683 (*911, p. 59; 941, p. 41; 949, p. 26; *991, p. 41; 1021, p. 35). Tom Gardner. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 22.55; Mar. 14, 21.91; Aug. 6, dry.

685 (*911, p. 59; 941, p. 41; 949, p. 27; *991, p. 41; 1021, p. 35). Brijido Carrasco. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 26.50; Mar. 14, 25.90; Aug. 6, 27.34.

689 (*911, p. 59; 941, p. 41; 949, p. 27; *991, p. 41; 1021, p. 35). San Jose Canal Co. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 43.24; Mar. 14, 42.16; Aug. 6, 56.52.

696 (*911, p. 59; *941, p. 41; 949, p. 27; *991, p. 41; 1021, p. 35). Louis Carassco. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 18, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 29, 15.70; Mar. 14, 14.58; Aug. 6, dry.

701 (*911, p. 60; 941, p. 42; 949, p. 27; *991, p. 42; 1021, p. 35). Graham County. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 8.00; Mar. 14, 7.34. Well destroyed; measurements discontinued after Aug. 6.

703 (*911, p. 61; 941, p. 42; 949, p. 27; *991, p. 42; 1021, p. 35). William Waldrom. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 7 S., R. 27 E. No measurements made in 1945.

705 (*911, p. 61; 941, p. 42; 949, p. 27; *991, p. 42; 1021, p. 35). J. M. Hatfield. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 7 S., R. 27 E. Well filled with trash; measurements discontinued Jan. 29, 1945.

708 (*911, p. 61; *941, p. 42; 949, p. 28; *991, p. 42; 1021, p. 35). Pete Bertaldo. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 7 S., R. 27 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29	38.09	Aug. 6	38.90	Oct. 11	39.02	Dec. 9	39.01
Mar. 14	37.80	Sept. 9	38.87	Nov. 11	38.93		

709 (*911, p. 61; 941, p. 42; 949, p. 28; *991, p. 42; 1021, p. 35). E. E. Taylor. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30, T. 7 S., R. 27 E. Water levels, in feet below land-surface datum, 1945: Jan. 30, 22.35; Mar. 14, 22.36; Aug. 6, 20.76.

791 (*911, p. 62; 941, p. 43; 949, p. 28; *991, p. 42; 1021, p. 36). Howard Olsen. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 16, T. 8 S., R. 27 E. No measurements made in 1945.

792 (*911, p. 62; *941, p. 43; 949, p. 28; *991, p. 42; 1021, p. 36). Howard Olsen. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 8 S., R. 27 E. No measurements made in 1945.

793 (*911, p. 62; *941, p. 43; 949, p. 28; *991, p. 43; 1021, p. 36). Howard Olsen. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, T. 8 S., R. 27 E. No measurements made in 1945.

GREENLEE COUNTY (DUNCAN VALLEY)

By R. L. Cushman

The western portion of the Duncan-Virden Valley, along the upper Gila River, is known as the Duncan Valley. The eastern portion, known as the Virden Valley, lies within Hidalgo County, New Mexico. Water-level observations in the Virden Valley are given in the New Mexico section of this report.

There were 76 water-level measurements made in 21 wells in Greenlee County during 1945.

There were 8,300 acre-feet of water pumped from wells during 1945 in the entire Duncan-Virden Valley. This water is used to supplement surface water for irrigation use. The following table shows the amount pumped each year since 1940.

Year	Acre-feet	Year	Acre-feet
1940	2,436	1943	7,100
1941	1,548	1944	9,500
1942	1,900	1945	8,300

Figure 3 shows the amount pumped each month, compared with the precipitation and with the graphs of water-level fluctuations in seven wells that are typical of the various portions of the valley.

Precipitation was 6.69 inches at Duncan during 1945, which was 3.08 inches less than in 1944. Most of this fell during July, August, and September.

The graphs of water-level fluctuations all show a drop in water level as a result of pumping, followed by a rise in water level when pumping

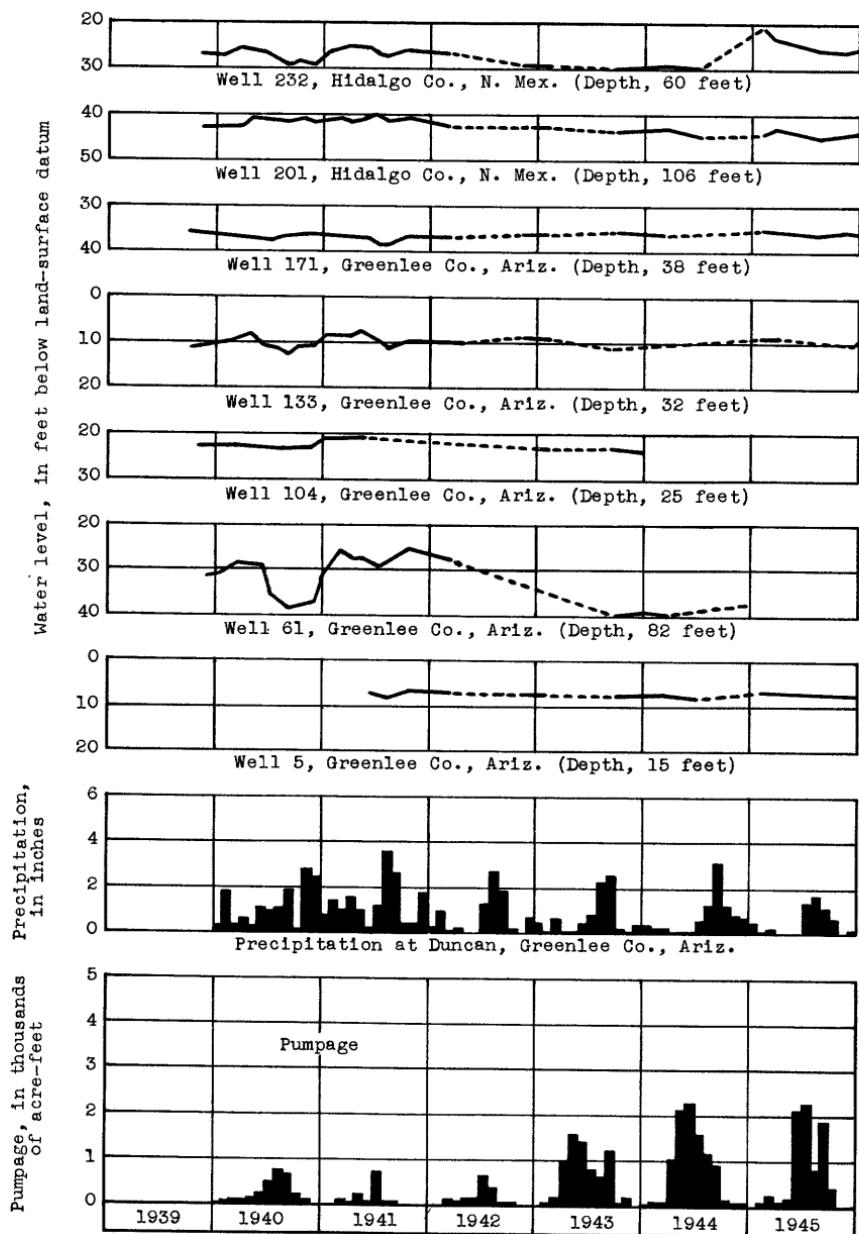


Figure 3.--Graphs showing fluctuations of water level in observation wells in the Duncan-Virden Valley, Greenlee County, Ariz., and Hidalgo County, N. Mex.

caused. Well 63 was used to replace well 61. It is a quarter of a mile south of well 61. Well 92, half a mile east of well 104, was used to replace well 104. Well 133 was not measured during 1944, but the well has been deepened and measurements were continued during 1945. Wells 5 and 171 are located away from the heavily pumped areas and show seasonal changes in lesser magnitude than do wells 63, 92, 133, 201, and 232.

Well descriptions and water-level measurements

5 (*941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 36). Warner Foote. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 7, T. 6 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 6.60; Mar. 15, 6.52; Aug. 8, 7.07; Nov. 5, 6.99.

12 (*911, p. 65; 941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 36). Mr. Wilton. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 20, T. 6 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 23.70; Mar. 15, 23.46; Aug. 8, 24.55; Nov. 5, mill running.

14 (*911, p. 65; *941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 38). Victor Rowden. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 19, T. 6 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 35.83; Mar. 15, 35.36; Aug. 8, 36.12; Nov. 5, 36.10.

31 (*911, p. 65; 941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 38). J. C. Merritt. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 4, T. 7 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 28.28; Mar. 15, 28.15; Aug. 8, 30.31; Nov. 5, 29.86.

36 (*911, p. 66; 941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 38). M. M. Cosper. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 16, T. 7 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 20.52; Mar. 15, 20.08; Aug. 8, 19.75; Nov. 5, 20.45.

43 (*911, p. 66; 941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 38). Ernest Campbell. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 7 S., R. 31 E. Measurements discontinued after Mar. 13, 1944.

49 (*911, p. 66; 941, p. 45; 949, p. 30; *991, p. 45; 1021, p. 38). W. M. Zumwalt. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 34, T. 7 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 51.96; Mar. 15, 49.72; Aug. 8, 52.90; Nov. 5, 54.55.

61 (*911, p. 66; 941, p. 46; 949, p. 30; *991, p. 45; 1021, p. 38). M. W. McKelvey. $SW\frac{1}{4}NE\frac{1}{4}$ sec. 3, T. 8 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 36.54; Mar. 15, 35.70. Measurements discontinued Aug. 8.

63 (*911, p. 67; 941, p. 46; 949, p. 30; *991, p. 45; 1021, p. 38). M. W. McKelvey. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 3, T. 8 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 62.49; Mar. 15, 60.00; Aug. 8, 61.80; Nov. 5, 64.60.

72 (*911, p. 67; 941, p. 46; 949, p. 30; *991, p. 45; 1021, p. 38). J. C. Campbell. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 12, T. 8 S., R. 31 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 43.48; Mar. 15, 47.14; Aug. 8, 46.15; Nov. 5, 53.17.

92 (*911, p. 68; 941, p. 46; 949, p. 30; *991, p. 46; 1021, p. 38). Raymond Davis. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 17, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 66.47; Mar. 15, 66.90; Aug. 8, 69.68; Nov. 5, 68.45.

96 (*911, p. 68; 941, p. 46; 949, p. 30; *991, p. 46; 1021, p. 38). L. Deane. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 28.42; Mar. 15, 28.27; Aug. 8, 29.95; Nov. 5, 29.11.

111 (*911, p. 68; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 38). Franklin Irrigation District well 8. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28, T. 8 S., R. 32 E. No measurements made in 1945.

120 (*911, p. 69; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 38). D. E. Wilkins. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 9.61; Mar. 15, 8.66; Aug. 8, 8.94; Nov. 5, 11.15.

122 (*911, p. 69; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 38). Delbert Moyers. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 22.90; Mar. 15, 22.68; Aug. 8, 23.42; Nov. 5, 23.80.

125 (*911, p. 69; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 38). V. L. Crotts. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 33, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 21.78; Mar. 15, 20.50; Aug. 8, 21.55; Nov. 5, 22.10.

131 (*911, p. 69; *941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 38). Franklin Irrigation District well 2. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 20.54; Aug. 8, pumping.

133 (*911, p. 71; 941, p. 47; *949, p. 31; *991, p. 46; 1021, p. 38). Floyd McDaniels. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 8 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 9.16; Mar. 15, 8.83; Nov. 5, 10.10.

136 (*911, p. 71; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 39). Franklin Irrigation District well 1. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 8 S., R. 32 E. Water level, in feet below land-surface datum, 1945: Nov. 5, 44.71.

160 (*911, p. 71; 941, p. 47; 949, p. 31; *991, p. 46; 1021, p. 39). Franklin Irrigation District well 7. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 9 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 5.81; Mar. 15, 5.28; Aug. 8, 10.90; Nov. 5, pumping.

161 (*911, p. 71; 941, p. 48; 949, p. 31; *991, p. 47; 1021, p. 39). Franklin Irrigation District well 6. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 9 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 5.88; Mar. 15, 5.30; Aug. 8, 10.64; Nov. 5, 7.34, well 160, nearby, pumping.

162 (*911, p. 72; 941, p. 48; 949, p. 31; *991, p. 47; 1021, p. 39). Franklin Irrigation District well 5. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 9 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 18.38; Mar. 15, 17.82; Aug. 8, 23.56; Nov. 5, 21.20, well 160, nearby, pumping.

171 (*911, p. 72; 941, p. 48; 949, p. 31; *991, p. 47; 1021, p. 39). John Chapman. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 9 S., R. 32 E. Water levels, in feet below land-surface datum, 1945: Feb. 1, 35.16; Mar. 15, 35.10; Aug. 8, 36.17; Nov. 5, 35.20.

MARICOPA COUNTY (QUEEN CREEK AREA)

By H. R. McDonald

Ground-water investigations were continued in the Queen Creek area of Maricopa and Pinal Counties during 1945. Measurements of water levels were continued in selected observation wells and an inventory of water pumped was made. A total of 123 measurements was made in 43 wells in the Queen Creek area. Of these, 43 measurements were made in 27 wells in Maricopa County. The measurements made in wells in Pinal County are reported in the Pinal County section.

Records of water levels in two wells in the city of Phoenix well field in the Verde River valley are given here. A water-stage recorder was installed on one of these from October 18, 1944, to April 29, 1945.

Records of water levels in five wells in Paradise Valley and three wells in the Gila Bend area are also given in this report. Measurements will be continued in these wells during 1946 under the program of investigation of ground-water resources of each important basin in Arizona.

The amount of water pumped from wells in the Queen Creek area decreased slightly during 1945. The following table shows the water pumped each year since 1939 in the Queen Creek area.

Year	Acre-feet	Year	Acre-feet
1939	89,756	1943	173,200
1940	112,670	1944	163,800
1941	82,450	1945	153,600
1942	156,000		

Figure 4 shows the volume pumped each month, compared with precipitation at Superior and with graphs of water-level fluctuations in selected wells that are described below.

Precipitation at Superior was 17.26 inches during 1945, which was 2.66 inches below normal. Almost half of this fell in the 4 months beginning July 1.

Well 23, a shallow dug well, is situated in the valley of Queen Creek about 2 miles above the desert plain. Recharge from floods in Queen Creek is quickly registered in this well. Two such peaks in water level are shown in the 1945 portion of the graph for this well.

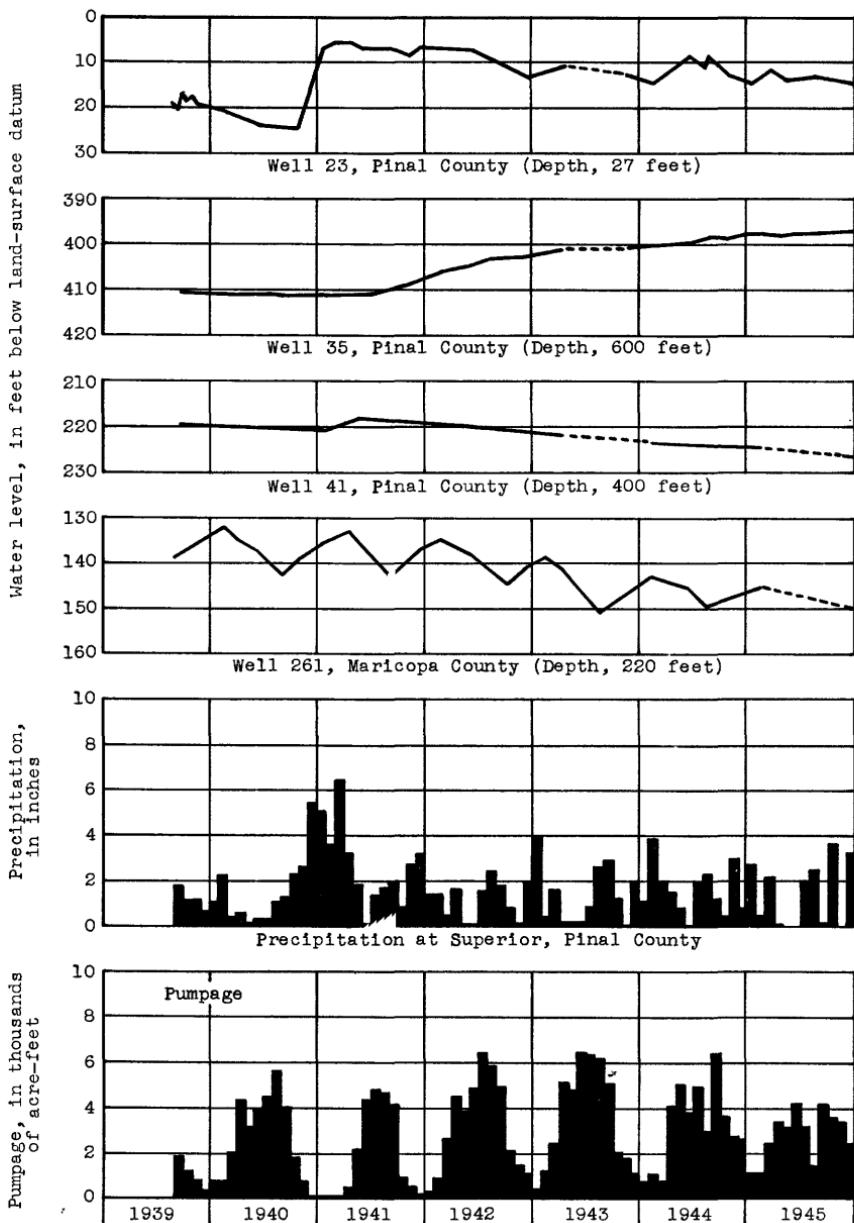


Figure 4.--Graphs showing fluctuations of water level in observation wells in the Queen Creek area, Maricopa and Pinal Counties, Ariz.

Well 35 is a deep well located on the desert plain about half a mile from Queen Creek and a few miles downstream from the mouth of the canyon. The water level in this well continued on an upward trend during 1945 and during the year it rose about 0.5 foot. The rise in the water level in this well began as a result of heavy rains during the spring of 1941.

Well 41 is situated a few hundred feet from the Queen Creek channel on the desert plain and several miles upstream from a heavily pumped area. The effect of pumping is apparent as shown by the steady downward trend of the water level in this well. From the latter part of May 1941 to the end of 1945 the water level has declined about 8 feet.

In well 261, in an area of heavy pumping, the water level shows a seasonal lowering as a result of this pumping, with only partial recovery after the pumping season. There has been a gradual downward trend of the water level in this well for the past 6 years.

Well descriptions and water-level measurements

1 (*941, p. 51; 949, p. 34; *991, p. 50; 1021, p. 41). Roosevelt Water Conservation District. $NE_1^4NW_1^4$ sec. 4, T. 1 N., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 182.51; Aug. 21, 187.57.

19 (*911, p. 74; 941, p. 51; 949, p. 34; *991, p. 50; 1021, p. 42). E. D. Edwards. $NE_1^4NE_1^4$ sec. 28, T. 1 N., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 138.96; Aug. 21, 148.50.

68 (*911, p. 75; 941, p. 51; 949, p. 34; *991, p. 50; 1021, p. 42). Mr. Schmitt. $NW_1^4SE_1^4$ sec. 23, T. 1 N., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 304.03; Aug. 21, 304.45.

84 (*911, p. 75; 941, p. 51; 949, p. 34; *991, p. 50; 1021, p. 42). W. A. Anderson. $SW_1^4SE_1^4$ sec. 11, T. 1 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 177.52; Aug. 21, 177.88.

87 (*911, p. 75; 941, p. 52; 949, p. 34; *991, p. 50; 1021, p. 42). Mrs. Gardner. $NW_1^4NW_1^4$ sec. 18, T. 1 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 119.58; Aug. 21, 120.77.

89 (*911, p. 75; 941, p. 52; 949, p. 34; *991, p. 50; 1021, p. 42). D. Cole. $NE_1^4SE_1^4$ sec. 18, T. 1 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 118.15; Aug. 21, 119.00.

94 (*911, p. 75; 941, p. 52; 949, p. 34; *991, p. 50; 1021, p. 42). "Old Clifford Place". $NE_1^4NE_1^4$ sec. 21, T. 1 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 136.30; Aug. 21, 136.52.

101 (*911, p. 76; 941, p. 52; 949, p. 34; *991, p. 50; 1021, p. 42). Mr. Gardiner. $NE_1^4SE_1^4$ sec. 25, T. 1 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 10, 165.89.

102 (*911, p. 76; 941, p. 52; 949, p. 34; *991, p. 51; 1021, p. 42). Florence McEntire. $NE_1^4NE_1^4$ sec. 33, T. 1 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 121.51; Aug. 21, 123.17.

125 (*911, p. 77; 941, p. 52; 949, p. 35; *991, p. 51; 1021, p. 42). G. H. Dunn. $NW_1^4NW_1^4$ sec. 12, T. 1 S., R. 6 E. Water level, in feet below land-surface datum, 1945: Feb. 10, 155.53.

128 (*911, p. 77; 941, p. 52; 949, p. 35; *991, p. 51; 1021, p. 42). Roosevelt Water Conservation District. $SE_1^4SW_4^1$ sec. 14, T. 1 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 122.24; Aug. 21, 123.72.

136 (*911, p. 77; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). Roosevelt Water Conservation District. $NE_1^4NE_4^1$ sec. 25, T. 1 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 102.06; Aug. 21, 103.62.

151 (*911, p. 77; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). Roosevelt Water Conservation District. $SW_4^1SE_4^1$ sec. 13, T. 2 S., R. 5 E. Water level, in feet below land-surface datum, 1945: Feb. 9, 65.91.

155 (*911, p. 78; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). F. C. Harris. $SW_4^1NE_4^1$ sec. 25, T. 2 S., R. 5 E. Measurements discontinued.

164 (*911, p. 78; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). Roosevelt Water Conservation District. $SE_1^4NW_4^1$ sec. 5, T. 2 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 82.65; Aug. 21, 86.38.

170 (*911, p. 78; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). A. Sanford. $SE_1^4SW_4^1$ sec. 3, T. 2 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 104.48; Aug. 21, 105.02.

177 (*911, p. 78; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). J. O. Power. $SE_1^4NW_4^1$ sec. 12, T. 2 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 127.23; Aug. 21, 129.57.

185 (*911, p. 78; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 42). J. S. Gephart. $SE_1^4SE_4^1$ sec. 8, T. 2 S., R. 6 E. Measurements discontinued.

205 (*911, p. 79; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 43). J. E. Watson. $SE_1^4SW_4^1$ sec. 24, T. 2 S., R. 6 E. Water level, in feet below land-surface datum, 1945: Feb. 10, 118.44.

208 (*911, p. 79; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 43). H. O. Backer. $SE_1^4NE_4^1$ sec. 20, T. 2 S., R. 6 E. Water level, in feet below land-surface datum, 1945: Feb. 9, 84.92. Measurements discontinued.

217 (*911, p. 79; 941, p. 53; 949, p. 35; *991, p. 51; 1021, p. 43). Chandler Heights Citrus Irrigation District. $SW_4^1SE_4^1$ sec. 36, T. 2 S., R. 6 E. Measurements discontinued.

218 (*911, p. 79; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). Clyde Fitzgerald. $SE_1^4NW_4^1$ sec. 34, T. 2 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 102.37; Aug. 21, 104.80.

221 (*911, p. 79; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). Roosevelt Water Conservation District. $NE_1^4NE_4^1$ sec. 31, T. 2 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 44.74; Aug. 21, 43.87.

252 (*911, p. 80; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). Jack Barnes. $SE_1^4SE_4^1$ sec. 9, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 12, 147.56.

254 (*911, p. 80; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). W. J. Germann. $SE_1^4NE_4^1$ sec. 7, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 10, 134.61.

260 (*911, p. 80; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). Lawrence Ellsworth. $SE_1^4SE_4^1$ sec. 16, T. 2 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 150.09; Aug. 22, 160.56.

261 (*911, p. 80; 941, p. 54; 949, p. 35; *991, p. 52; 1021, p. 43). Higley Ward School. $NW_4^1NW_4^1$ sec. 15, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 12, 145.33.

271 (*911, p. 80; 941, p. 43; 949, p. 36; *991, p. 52; 1021, p. 43). Sossaman Bros. $NE_1/4$ $NE_1/4$ sec. 19, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 10, 143.28.

273 (*911, p. 81; 941, p. 43; 949, p. 36; *991, p. 52; 1021, p. 43). Leo Ellsworth. $SE_1/4$ $NE_1/4$ sec. 28, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 12, 145.33.

279 (*911, p. 81; 941, p. 55; 949, p. 36; *991, p. 52; 1021, p. 43). Southern Pacific Railroad Co. $SE_1/4$ $SE_1/4$ sec. 25, T. 2 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 12, 161.89.

601. City of Phoenix. $NE_1/4$ sec. 6, T. 3 N., R. 7 E., 500 feet north of graded road, 150 feet west of west bank of Verde River, 0.5 mile east of Fort McDowell. Drilled test well, diameter 6 inches, depth 50 feet. Measuring point, top of casing, 2.3 feet above land-surface datum. Water levels, in feet below land-surface datum, 1945: Nov. 5, 20.85; Nov. 20, 20.90.

602. City of Phoenix. $NW_1/4$ $NE_1/4$ sec. 30, T. 3 N., R. 7 E., 400 feet west and 200 feet north of city well 10, about 4 miles south of Fort McDowell. Drilled observation well, diameter 6 inches, depth 35 feet. Measuring point, top of casing, 0.7 foot above land-surface datum, and 1,367.7 feet above mean sea level. Well equipped with automatic water-stage recorder from Oct. 28, 1944, to Apr. 26, 1945.

Water level at noon, in feet below land-surface datum, 1944-45

Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1944	a 20.72	Dec. 9, 1944	19.01	Jan. 22, 1945	17.36
25	a 20.69	10	19.40	23	18.59
28	20.45	11	19.68	24	17.20
29	20.29	12	20.91	25	17.52
30	20.18	13	20.05	26	16.85
31	20.10	14	20.15	27	16.37
Nov. 1	20.06	15	20.20	28	16.05
2	20.01	16	20.23	30	15.55
3	21.04	17	20.25	31	15.40
4	21.08	18	20.28	Feb. 1	15.24
5	21.12	19	20.27	2	15.07
6	21.16	20	19.71	3	14.95
7	21.20	21	19.65	4	14.82
8	21.23	22	19.59	5	14.68
9	21.24	23	19.53	6	15.12
10	21.26	24	19.50	7	15.30
11	21.28	25	19.51	8	15.34
12	21.30	27	20.13	9	15.32
14	21.34	28	20.15	10	15.15
15	21.35	29	20.13	11	14.60
16	21.37	30	20.10	12	14.25
17	21.32	31	20.07	13	14.25
18	21.10	Jan. 1, 1945	20.11	14	14.18
19	20.34	2	20.13	15	14.03
20	19.85	3	20.18	16	13.90
21	19.68	4	20.45	17	13.77
22	19.52	5	20.31	18	13.68
23	19.35	6	20.30	19	13.60
24	19.22	7	20.31	20	13.46
25	19.09	8	20.33	21	13.43
26	18.98	10	20.40	22	13.38
27	18.87	11	20.40	23	13.32
30	18.25	12	20.10	24	13.27
Dec. 1	18.35	13	19.80	25	13.24
2	18.35	14	19.50	26	13.18
3	18.34	15	19.20	27	13.20
4	18.30	16	19.07	28	13.25
5	18.03	18	18.75	Mar. 3	13.01
6	18.21	19	18.58	5	13.01
7	17.70	20	19.90	6	12.57
8	18.50	21	18.13	7	12.28

a Tape measurement.

602--Continued.

Water level at noon, in feet below land-surface datum, 1944-45

Date	Water level	Date	Water level	Date	Water level
Mar. 12, 1945	14.20	Mar. 29, 1945	15.48	Apr. 15, 1945	15.44
13	15.25	30	14.95	16	15.57
14	15.85	31	14.68	17	15.65
15	16.25	Apr. 1	14.52	18	15.70
16	16.50	2	14.74	19	15.80
17	16.73	3	14.84	20	16.05
18	16.92	4	14.89	21	16.65
19	17.12	5	14.87	22	17.14
20	17.40	6	14.86	23	17.48
21	17.65	8	14.51	24	17.77
22	17.82	9	15.70	25	17.96
25	17.22	10	15.75	26	17.61
26	17.12	11	14.97	29	18.14
27	16.32	12	14.60	Dec. 10	a 21.85
28	15.71	13	15.08		

a Tape measurement.

1061. W. L. Brooks. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T. 3 N., R. 5 E., 500 feet south of graded road, 6 miles north and 3 miles east of Scottsdale. Unused drilled well, diameter 4 inches, depth unknown. Measuring point, hole in pump base, 1.2 feet above land-surface datum. Water level, in feet below land-surface datum: Oct. 10, 1944, 179.2. No measurements made in 1945.

1086. Salt River Valley Water Users' Association. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 8, T. 2 N., R. 5 E., 35 feet south of edge of Arizona Canal, 10 feet south of road, 3.4 miles west of Evergreen diversion station, 5.75 miles east and 1.0 mile north of Scottsdale. Unused drilled irrigation well, diameter 20 inches, depth 183 feet. Measuring point, top of casing, at land-surface datum. Water level, in feet below land-surface datum, 1945: Apr. 24, 97.75.

1701. Caswell. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 3 N., R. 4 E., 50 feet north of frame house, 400 feet east of trail, 7.5 miles north of Scottsdale. Dug well, diameter 60 inches, depth unknown. Equipped with windmill and cylinder pump. Measuring point, top of wooden well cover, 0.2 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 3, 170.55; Aug. 24, 172.65.

1886. Owner unknown. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 34, T. 4 N., R. 3 E., 0.4 mile west of graded road, 3.2 miles north of Cactus. Unused drilled well, diameter 8 inches, depth unknown. Measuring point, top of casing, 1.0 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Nov. 7, 184.20.

1906. George O'Clair. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 3 N., R. 3 E., 500 feet north and 200 feet east of road intersection 0.25 mile east of Sunnyside schoolhouse. Unused drilled well, diameter 8 inches, depth unknown. Measuring point, top of casing, at land-surface datum. Water level, in feet below land-surface datum, 1945: Oct. 24, 183.06.

5350. Owner unknown. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 5 S., R. 5 W., 500 feet north of church, in small Indian village, 2.8 miles north of Gila Bend. Drilled domestic well, diameter 10 inches, depth unknown. Measuring point, top of casing, 1.8 feet above land-surface datum. Equipped with cylinder pump and windmill. Water levels, in feet below land-surface datum, 1945: Oct. 23, 33.19; Dec. 21, 31.91.

5502. Gillespie Land & Irrigation Co. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 36, T. 2 S., R. 5 W., 75 feet southwest of U. S. Highway 80, 2.75 miles southeast of Gillespie Dam. Unused drilled irrigation well, diameter 12 inches, depth 65 feet. Measuring point, top of casing, 0.6 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: Apr. 26, 48.55; Oct. 25, 50.92; Dec. 18, 51.40.

6260. Gillespie Land & Irrigation Co. NE¹NE⁴ sec. 4, T. 6 S., R. 6 W., 50 feet west of dirt road, 1.4 miles northeast of Theba. Drilled domestic well, diameter 6 inches, reported depth 244 feet. Measuring point, top of pipe clamp at south side, 0.4 foot above land-surface datum. Equipped with gasoline-powered air compressor and air-lift pump. Water levels, in feet below land-surface datum, 1945: Apr. 27, 121.60; Oct. 23, 124.70; Dec. 21, 122.52.

PIMA COUNTY

By R. L. Cushman

Measurements of water levels were made in 45 wells in Pima County during 1945. Two wells were measured at monthly intervals and the others were measured from one to nine times each. A total of 176 measurements was made.

Water pumped from wells increased 5 percent over 1944. The following table shows the water pumped each year since 1941.

Year	Acre-feet	Year	Acre-feet
1941	68,500	1944	106,000
1942	85,500	1945	111,000
1943	100,000		

Precipitation at Tucson was 7.63 inches during 1945, which was 3.93 inches below normal. Over half of this fell during July and August, and three-fourths of it fell during the 4 months beginning July 1.

Figure 5 shows the volume pumped each month, compared with precipitation at Tucson and with graphs of water-level fluctuations in the selected wells discussed below.

Wells 1337 and 4379 have water-table fluctuations typical of heavily pumped aquifers. The downward trending water levels between March and June are the result of large ground-water withdrawals needed for irrigation, because only 0.11 inch of rain fell during the period. About 7 inches of precipitation during July and August reduced the demand for ground water, thus causing a more even balance between draft and recharge.

Well 2823 is in a moderately pumped area and has water table fluctuations similar to, but with less magnitude, than wells 1337 and 4379. The rising water table in March was caused by recharge from surface flow seepage losses in nearby Rillito Creek.

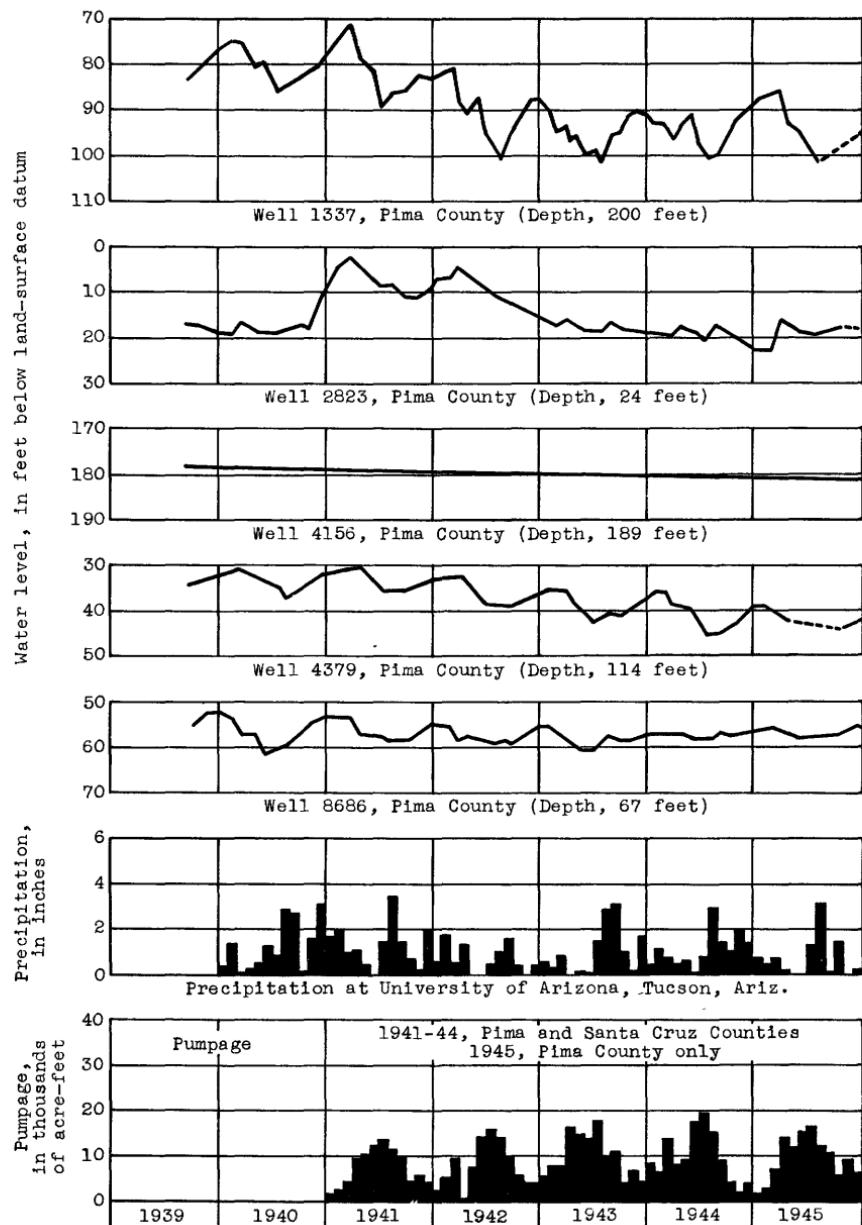


Figure 5.--Graphs showing fluctuations of water level in observation wells in the Santa Cruz Valley, Pima County, Ariz.

Well 4156 is away from the immediate effects of large scale ground-water withdrawal. The water-level fluctuations in this well reflect the steady water-table decline in the Tucson area.

Well 8686 is in an area in which moderate to heavy pumping occurs.

From the water-level trend it appears that the safe yield of water from the ground-water reservoir has not been exceeded in the vicinity.

Well descriptions and water-level measurements

454 (*949, p. 39; *991, p. 55; 1021, p. 47). Cortaro Farms. $SE_4^NE_4^S$ sec. 11, T. 11 S., R. 11 E. Water levels, in feet below land-surface datum, 1945: Feb. 8, 160.07; Oct. 15, 153.70; Dec. 7, 153.45.

457 (*941, p. 57; *949, p. 39; *991, p. 55; 1021, p. 47). T. J. Smith. $SE_4^NE_4^S$ sec. 22, T. 11 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Apr. 24, pumping; Oct. 11, 148.12; Dec. 7, 146.48.

460 (*941, p. 57; *949, p. 39; *991, p. 55; 1021, p. 47). W. E. Anway. NW_4^S sec. 27, T. 11 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Apr. 24, 144.59; Oct. 11, 144.09; Dec. 7, 144.15.

461 (*941, p. 57; *949, p. 39; *991, p. 55; 1021, p. 47). T. V. Valenzuela. NE_4^S sec. 32, T. 11 S., R. 10 E. Water level, in feet below land-surface datum, 1945: Apr. 24, 158.49.

463 (*941, p. 57; *949, p. 39; *991, p. 55; 1021, p. 47). Bud Parker. $SE_4^SE_4^S$ sec. 36, T. 11 S., R. 10 E. Water level, in feet below land-surface datum, 1945: Oct. 11, 169.00.

535 (*911, p. 85; *941, p. 58; *949, p. 39; *991, p. 55; 1021, p. 47). Cortaro Farms. $NE_4^NE_4^S$ sec. 30, T. 11 S., R. 11 E. Water levels, in feet below land-surface datum, 1945: Feb. 8, 175.43; Oct. 15, 176.95; Dec. 7, pumping.

1254 (*911, p. 85; *941, p. 58; *949, p. 39; *991, p. 55; 1021, p. 47). Cortaro Farms. $SE_4^SW_4^S$ sec. 31, T. 12 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 8, 96.75; Oct. 11, 99.94; Dec. 7, 101.10.

1337 (*911, p. 85; 941, p. 58; *949, p. 39; *991, p. 55; 1021, p. 47). Cortaro Farms. $NE_4^NW_4^S$ sec. 16, T. 12 S., R. 12 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 26	87.78	Mar. 26	86.38	May 28	94.71
Feb. 22	86.70	Apr. 23	93.09	July 30	b 101.70

b Well pumping north; river flowing.

1367 (*911, p. 86; 941, p. 58; *949, p. 39; *991, p. 56; 1021, p. 47). Grady Adams. $NE_4^NE_4^S$ sec. 33, T. 12 S., R. 12 E. Water levels, in feet below land-surface datum, 1945: Feb. 8, 126.50; Oct. 15, 133.52; Dec. 7, 133.54.

1425 (*911, p. 86; 941, p. 58; *949, p. 40; *991, p. 56; 1021, p. 48). Cortaro Farms. $SW_4^NE_4^S$ sec. 1, T. 12 S., R. 11 E. No measurements made since Apr. 14, 1943. Dry; measurements discontinued.

1428. J. E. Glover. $NE_{\frac{1}{4}}SW_{\frac{1}{4}}$ sec. 8, T. 12 S., R. 11 E., 0.65 mile southwest of Silver Bell Road, 20.5 miles northwest of Tucson. Drilled well, diameter 6 inches, depth unknown. Measuring point, top of casing, north side, 1.1 feet above land-surface datum.

Water level, in feet below land-surface datum, 1940-42, 1944-45

Date	Water level	Date	Water level	Date	Water level
Mar. 27, 1940	180.59	Dec. 7, 1942	184.05	Sept. 1, 1944	185.72
June 13, 1941	(a)	Mar. 8, 1944	185.09	Oct. 11, 1945	185.02
Dec. 5	(a)				

a Pumping.

1430 (*941, p. 58; *949, p. 40; *991, p. 56; 1021, p. 48). J. E. Glover. $SE_{\frac{1}{4}}SE_{\frac{1}{4}}$ sec. 18, T. 12 S., R. 11 E. Water level, in feet below land-surface datum, 1945: Oct. 11, 194.21.

1432 (*941, p. 59; *949, p. 40; *991, p. 56; 1021, p. 48). P. Johansen. $NE_{\frac{1}{4}}NE_{\frac{1}{4}}$ sec. 29, T. 12 S., R. 11 E. Water level, in feet below land-surface datum, 1945: Oct. 11, 231.9.

1435 (*941, p. 59; *949, p. 40; *991, p. 56; 1021, p. 48). S. B. Niles. $SW_{\frac{1}{4}}SW_{\frac{1}{4}}$ sec. 34, T. 12 S., R. 11 E. Water level, in feet below land-surface datum, 1945: Oct. 11, 302.25.

1503 (*941, p. 59; *949, p. 40; *991, p. 56; 1021, p. 48). V. Valenzuela. $NW_{\frac{1}{4}}NW_{\frac{1}{4}}$ sec. 9, T. 12 S., R. 10 E. Water level, in feet below land-surface datum, 1945: Apr. 23, 164.68.

1505. Alonso Stephens. $SE_{\frac{1}{4}}SE_{\frac{1}{4}}$ sec. 20, T. 12 S., R. 10 E., in pump house by tank, 0.5 mile west and 2.5 miles south along trail from Silver Bell Road, 25 miles northwest of Tucson. Unused well, diameter 7 inches, depth 220 feet. Measuring point, top of casing, 0.6 foot above land-surface datum.

Water level, in feet below land-surface datum, 1940, 1942, 1944-45

Apr. 15, 1940	184.79	Aug. 4, 1942	185.18	Mar. 8, 1944	185.47
June 16, 1942	185.09	Dec. 8	185.23	Apr. 24, 1945	190.80
July 29	185.11				

1506 (*941, p. 59; *949, p. 40; *991, p. 56; 1021, p. 48). Harry Alexander. $NE_{\frac{1}{4}}NE_{\frac{1}{4}}$ sec. 26, T. 12 S., R. 10 E. No measurements made in 1945.

2504. R. R. Manville. $NW_{\frac{1}{4}}NW_{\frac{1}{4}}$ sec. 10, T. 13 S., R. 10 E., at ranch headquarters, 3 miles north and 6 miles west of Tucson Mountain Park Road, 14 miles north of Ajo Road, about 25 miles west of Tucson. Drilled well, diameter 7 inches, depth unknown. Measuring point, top of casing, 0.25 foot above land-surface datum. Water levels, in feet below land-surface datum: Apr. 15, 1940, 211.54; Dec. 8, 1942, 212.05; Mar. 8, 1944, 212.25; Apr. 24, 1945, pumping.

2651. Pima County. $SW_{\frac{1}{4}}NE_{\frac{1}{4}}$ sec. 7, T. 13 S., R. 12 E., at rear of adobe ruin at road forks in Kinney Road, 4.25 miles south of cross road, 0.75 mile west of Silver Bell Road at point 12 miles northwest of Tucson. Unused dug well, diameter 48 inches, depth unknown. Measuring point, point of rock at northwest corner of well, 0.5 foot below land-surface datum.

Water level, in feet below land-surface datum, 1940-42, 1944-45

Apr. 19, 1940	33.79	Dec. 7, 1942	24.66	Aug. 31, 1944	29.20
June 17, 1941	22.09	Mar. 8, 1944	28.59	Oct. 11, 1945	26.75
Dec. 5	21.46				

2708 (*911, p. 87; 941, p. 59; *949, p. 40; *991, p. 56; 1021, p. 48). Cortaro Farms. $SE_{\frac{1}{4}}SE_{\frac{1}{4}}$ sec. 7, T. 13 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 8, 43.28; Oct. 15, dry; filled in to 39.0 feet.

2731 (*911, p. 88; 941, p. 60; *949, p. 40; *991, p. 56; 1021, p. 48). Ralph Wetmore. $NE_{\frac{1}{4}}SE_{\frac{1}{4}}$ sec. 24, T. 13 S., R. 13 E. Water level, in feet below land-surface datum, 1945: Feb. 9, 32.20.

2738 (*911, p. 88; 941, p. 60; *949, p. 40; *991, p. 56; 1021, p. 48).
 Bruce Knapp. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 28, T. 13 S., R. 13 E. Water levels, in feet
 below land-surface datum, 1945: Feb. 8, 59.15; Oct. 15, 35.25; Dec. 7,
 36.55.

2808 (*911, p. 88; 941, p. 60; *949, p. 40; *991, p. 56; 1021, p. 48).
 Courtright Stables. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 25, T. 13 S., R. 14 E. Water levels, in
 feet below land-surface datum, 1945: Feb. 9, 6.88; Oct. 22, 11.05.

2823 (*911, p. 89; 941, p. 61; *949, p. 41; *991, p. 56; 1021, p. 48).
 Southern Arizona Polo Association. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 28, T. 13 S., R. 14 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 26	22.55	Feb. 27	22.13	Apr. 27	16.08	July 27	19.39
Feb. 2	22.53	Mar. 28	15.46	May 29	18.25	Oct. 22	17.27
9	22.43						

2903 (*911, p. 90; 941, p. 61; *949, p. 41; *991, p. 56; 1021, p. 48).
 E. L. Urquides. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 13 S., R. 15 E. Water levels, in feet
 below land-surface datum, 1945: Feb. 9, 13.49; Oct. 22, 12.67.

2910 (*911, p. 90; 941, p. 61; *949, p. 41; *991, p. 57; 1021, p. 48).
 V. C. Crouch. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 36, T. 13 S., R. 15 E. Water level in feet,
 below land-surface datum, 1945: Feb. 9, 34.08.

4156 (*911, p. 90; 941, p. 62; *949, p. 41; *991, p. 57; 1021, p. 48).
 Charles Reynard. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 7, T. 14 S., R. 15 E.

Water level, in feet below land-surface datum, 1945

Jan. 26	180.83	Apr. 27	180.93	July 28	181.23	Oct. 29	181.32
Feb. 9	180.78	May 29	181.00	Aug. 31	181.25	Nov. 28	181.35
27	180.83	June 29	181.09	Sept. 28	181.29	Dec. 26	181.52
Mar. 28	180.86	July 12	181.18				

4375 (*911, p. 91; 941, p. 62; *949, p. 41; *991, p. 57; 1021, p. 48).
 Hal Manning. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 34, T. 14 S., R. 13 E. Water levels, in feet
 below land-surface datum, 1945: July 27, pumping; Oct. 12, 47.52; Dec. 6,
 44.82.

4379 (*911, p. 91; 941, p. 62; *949, p. 41; *991, p. 57; 1021, p. 49).
 Hal Manning. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 35, T. 14 S., R. 13 E. Measuring point, beginn-
 ing Oct. 22, 1945, 0.3 foot above old measuring point, 2.3 feet above land-
 surface datum.

Water level, in feet below land-surface datum, 1945

Jan. 26	38.53	Mar. 28	(a)	May 30	(a)	Oct. 22	43.95
Feb. 9	38.60	Apr. 28	42.17	July 27	(a)	Dec. 6	42.70
27	(a)						

a Pumping.

4450 (*941, p. 62; *949, p. 41; *991, p. 56; 1021, p. 49). Pima
 County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 6, T. 14 S., R. 12 E. Water levels, in feet below
 land-surface datum, 1945: Feb. 17, 78.90; Oct. 16, 66.10.

4452 (*941, p. 62; *949, p. 41; *991, p. 57; 1021, p. 49). Pima
 County. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 17, T. 14 S., R. 12 E. Water levels, in feet below
 land-surface datum, 1945: Feb. 17, 85.80; Oct. 16, 65.67.

4453 (*941, p. 62; *949, p. 41; *991, p. 57; 1021, p. 49). Pima
 County. $NE\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 14 S., R. 12 E. Water level, in feet below
 land-surface datum, 1945: Oct. 16, 57.91.

4454. State of Arizona. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 14 S., R. 12 E., at side
 of trail 1.5 miles west of Tucson Mountain Park Road, 3.8 miles north of
 Ajo Road, about 11 miles west of Tucson. Unused dug well, diameter about
 60 inches, depth unknown. Measuring point, top of west side of 6- by 6-inch
 wood curb, at land-surface datum.

4454--Continued.

Water level, in feet below land-surface datum, 1940-42, 1944-45

Date	Water level	Date	Water level	Date	Water level
Mar. 15, 1940	69.59	June 6, 1941	68.33	Mar. 9, 1944	64.12
Aug. 12	69.02	Dec. 6	59.44	Oct. 10, 1945	62.50
Mar. 1, 1941	68.16	10, 1942	59.96		

4601 (*941, p. 63; *949, p. 42; *991, p. 57; 1021, p. 49). J. Burrell. Sec. 10, T. 14 S., R. 10 E. No measurements made in 1945.

4602 (*941, p. 63; *949, p. 42; *991, p. 57; 1021, p. 49). J. Burrell. Sec. 10, T. 14 S., R. 10 E. No measurements made in 1945.

4604 (*941, p. 63; *949, p. 42; *991, p. 57; 1021, p. 49). Frank R. Rendon. SW $\frac{1}{4}$ sec. 24, T. 14 S., R. 10 E. No measurements made in 1945.

6404 (*941, p. 63; *949, p. 42; *991, p. 47; 1021, p. 49). Everett Inscho. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 29, T. 15 S., R. 10 E. Water level, in feet below land-surface datum, 1945: Oct. 16, 144.34.

6405 (*941, p. 63; *949, p. 42; *991, p. 57; 1021, p. 49). C. W. Van Camp. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 33, T. 15 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Oct. 16, 150.38; Nov. 27, 150.30.

6410 (*941, p. 63; *949, p. 42; *991, p. 57; 1021, p. 49). C. W. Van Camp. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 35, T. 15 S., R. 10 E. No measurements made in 1945.

6575 (*911, p. 91; 941, p. 63; *949, p. 42; *991, p. 58; 1021, p. 49). H. C. Barker. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 15 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 53.14; July 27, 54.24; Oct. 22, 54.12; Dec. 6, 54.19.

6582 (*911, p. 91; 941, p. 64; *949, p. 42; *991, p. 58; 1021, p. 49). San Xavier School. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 15 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 39.54; July 27, 41.81; Oct. 12, 40.52; Dec. 6, 41.10.

6593 (*911, p. 92; 941, p. 64; *949, p. 42; *991, p. 58; 1021, p. 49). U. S. Indian Service. San Xavier Reservation. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 22, T. 15 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 29.67; July 27, 31.35; Oct. 12, 30.15; Dec. 6, 30.44.

6612 (*949, p. 42; *991, p. 58; 1021, p. 49). City of Tucson. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 15 S., R. 13 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 26	33.21	Apr. 28	34.45	July 27	37.55	Oct. 29	35.75
Feb. 9	33.53	May 30	35.15	Aug. 31	35.04	Nov. 28	35.80
27	33.49	June 29	36.16	Sept. 28	35.96	Dec. 26	35.41

7152 (*911, p. 93; 941, p. 64; *949, p. 42; *991, p. 58; 1021, p. 50). State of Arizona. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 7, T. 16 S., R. 14 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 43.56; July 27, 45.57; Oct. 12, 44.70; Dec. 6, 43.31.

7166 (*911, p. 93; 941, p. 65; *949, p. 42; *991, p. 58; 1021, p. 50). Lane Farms. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 16 S., R. 14 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 50.24; Oct. 12, 50.42; Dec. 6, 47.78.

8578 (*911, p. 93; 941, p. 65; *949, p. 43; *991, p. 58; 1021, p. 50). Lane Farms. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 17 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 63.12; Oct. 12, 65.08; Dec. 6, 64.60.

8686 (*911, p. 94; 941, p. 65; *949, p. 43; *991, p. 58; 1021, p. 50). Arizona State Highway Department. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T. 17 S., R. 14 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 27	55.75	Mar. 29	56.13	May 30	57.92	Oct. 12	57.24
Feb. 10	55.68	Apr. 28	56.28	July 27	57.90	Dec. 6	55.73
27	55.24						

9230 (*911, p. 95; 941, p. 65; *949, p. 43; *991, p. 58; 1021, p. 50). J. B. Bull. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 18 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, pumping, July 27, pumping; Dec. 6, 50.51.

9238 (*911, p. 95; 941, p. 66; *949, p. 43; *991, p. 58; 1021, p. 50). Intercontinental Ranch Co. well E2. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 26, T. 18 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 10, 45.17; July 27, 46.13; Oct. 12, 46.91; Nov. 6, 46.37.

10477 (*911, p. 95; 941, p. 66; *949, p. 43; *991, p. 58; 1021, p. 50). Intercontinental Ranch Co. well W1. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 19 S., R. 13 E. Measuring point, beginning Feb. 10, 1945, top of 8 by 8, south side, 0.9 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 10, 56.74; July 27, 55.20; Oct. 12, 53.76; Dec. 6, 53.86.

10483 (*911, p. 96; 941, p. 66; *949, p. 43; *991, p. 58; 1021, p. 50). Gustavo Amado. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 19 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 30.96; July 27, 32.62; Oct. 12, 30.97; Dec. 6, 31.39.

PINAL COUNTY

By R. L. Cushman

Measurements of water levels were made in 99 wells in Pinal County during 1945. About one-third of these wells were measured at monthly intervals the first 5 months of the year and again during the summer low level in August. Most of the other wells were measured twice or three times during the year. A total of 370 water-level measurements was made in the county during 1945.

Wells 12 to 71, inclusive, lie within the Queen Creek area of Pinal and Maricopa Counties. Water-level fluctuations and pumping in this area are discussed in the Maricopa County section of this report. The rest of the wells listed in Pinal County lie in the Casa Grande-Florence-Maricopa-Eloy area.

Water pumped from wells increased 15 percent over 1944. The following table shows the water pumped each year since 1941.

Year	Acre-feet	Year	Acre-feet
1940	372,000	1943	515,000
1941	351,000	1944	530,000
1942	500,000	1945	610,000

The rate of withdrawal of water from ground-water storage in the Eloy and Maricopa areas of Pinal County is greatly in excess of the annual safe yield, and as a result, water levels in these areas are dropping at an alarming rate.

Summary of data on ground-water levels in typical observation wells, in Pinal County, in feet below land-surface datum

Well No. and location	Year	Average water level	Highest static level	Lowest static level
<i>Eloy-Redrock area:</i>				
1795	1941	131.91	124.47	141.95
	1942	141.60	138.70	144.47
	1943	153.32	138.70	164.70
	1944	155.85	144.51	170.79
	1945	160.75	150.00	174.82
1798	1941	109.32	107.14	111.89
	1942	116.80	112.61	118.52
	1943	119.73	118.54	121.75
	1944	122.80	121.67	124.15
	1945	124.59	124.18	125.31
<i>Chuichu-Maricopa area:</i>				
890	1941	32.22	30.09	33.89
	1942	29.27	27.32	30.61
	1943	28.48	27.61	29.24
	1944	29.09	28.40	29.69
	1945	30.32	29.35	31.60
1532	1941	110.01	107.78	111.94
	1942	114.45	112.33	116.76
	1943	118.38	114.66	121.49
	1944	123.02	119.06	126.90
	1945	128.03	124.09	135.40
<i>Casa Grande-Coolidge-Florence area:</i>				
249	1943	33.46	32.91	34.34
	1944	34.68	33.49	36.39
	1945	34.95	34.49	35.80
324	1943	78.99	77.03	81.27
	1944	81.63	80.23	83.84
	1945	85.12	81.40	86.60
341	1943	19.50	15.30	24.17
	1944	22.82	20.21	24.97
	1945	24.57	23.43	25.94
975	1941	33.84	33.35	34.57
	1942	36.01	33.70	38.06
	1943	38.00	36.58	39.45
	1944	37.57	35.99	40.25
	1945	36.38	35.92	36.90

Figure 6 shows the volume pumped each month, compared with precipitation at Casa Grande Ruins National Monument and with graphs of water-level fluctuations in selected observation wells. Precipitation at Casa Grande Ruins National Monument was 6.81 inches during 1945, which was 3.80

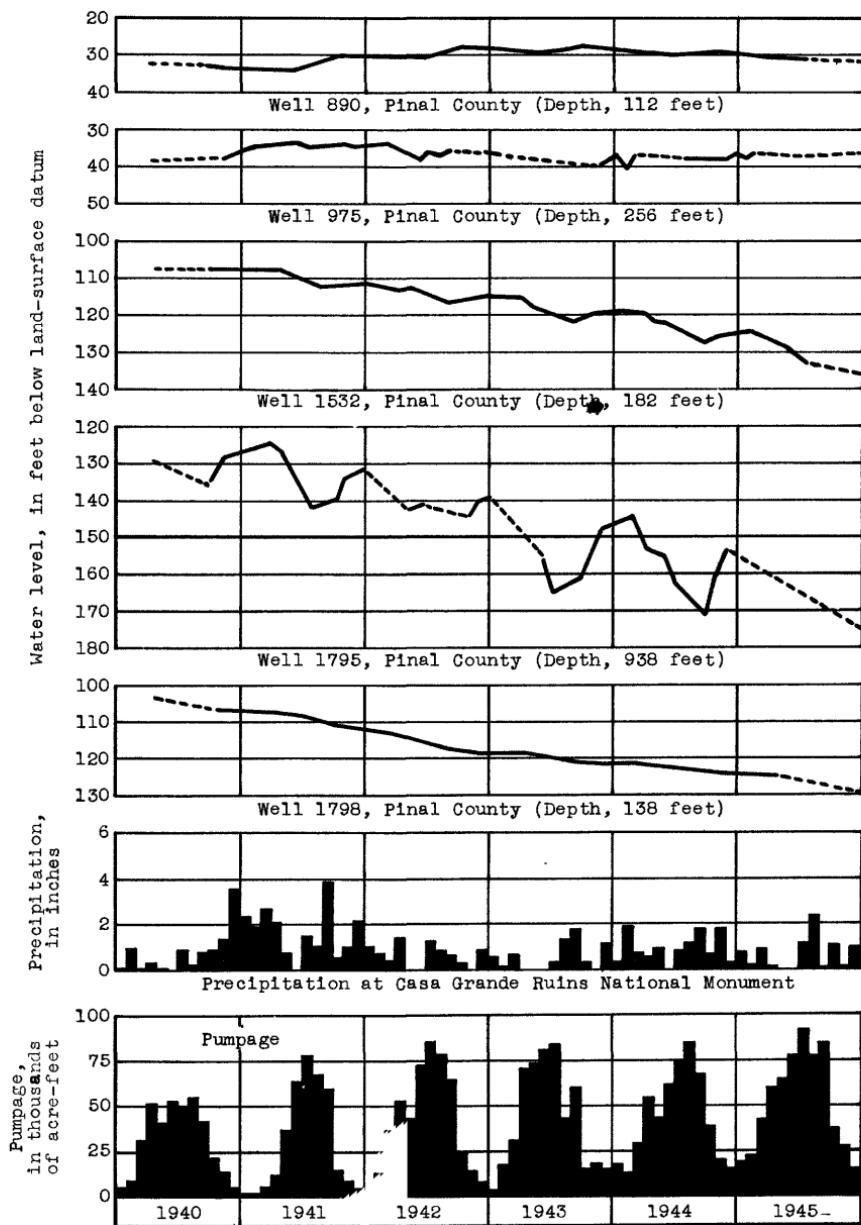


Figure 6.--Graphs showing fluctuations of water level in observation wells in the Casa Grande-Eloy area, Pinal County, Ariz.

inches below normal. About one-third of this total fell during August, causing a decrease in the volume pumped during that month.

Well 890 is an unused well a few miles northwest of Casa Grande, at the western edge of an area irrigated mainly with surface water and at the eastern edge of an area irrigated with pumped water. The water level declined in the well until May, when recharge from irrigation and canal seepage caused a rise. The amount pumped was greater than the recharge in the vicinity after June 1, so the water level continued to drop the rest of the year.

Well 975 is an active irrigation well about 1 mile northeast of Casa Grande. The water level in this well declined slightly during the pumping season and recovered after pumping had ceased. At the end of the year the water level was 0.06 foot higher than at the beginning of the year.

Well 1532, which is about 7 miles southwest of Casa Grande, is in a heavily pumped area. The water level rose slightly during January and February and declined during the balance of the year. The water level dropped a total of 11.04 feet during the year, and the total drop since measurements began in April 1940 was 28.08 feet.

Well 1795 is an active irrigation well about 4.5 miles south of Eloy, and reflects general conditions in the center of this heavily pumped area. Since the well was pumping each time it was visited until December 21, 1945, the graph for 1945 was plotted with the same trend as shown in previous years. The drop in water level from November 27, 1944, to December 21, 1945, was 20.99 feet. The total drop in water level since measurements were begun in April 1940 was 45.21 feet.

Well 1798, an unused well about 6.5 miles southwest of Eloy, is near the western edge of the heavily pumped Eloy area. The water level in this well declined slowly during the first part of the year, indicating movement of ground water into the cone of depression of the heavily pumped area. The decline continued at a more rapid rate after the beginning of the irrigation season.

Well descriptions and water-level measurements

12 (*941, p. 69; 949, p. 46; *991, p. 62; 1021, p. 55). Mr. Dobson. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 1 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 9, 259.94; Aug. 20, casing obstructed at 30 feet.

ARIZONA, PINAL COUNTY

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22 (*911, p. 81; 941, p. 69; 949, p. 46; *991, p. 62; 1021, p. 55). Hart Mullins. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 1 S., R. 10 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	15.09	Mar. 27	12.89	May 29	14.91
Feb. 16	13.82	Apr. 25	13.86	Aug. 20	14.30

23 (*911, p. 81; 941, p. 69; 949, p. 47; *991, p. 62; 1021, p. 55). Hart Mullins. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 1 S., R. 10 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	14.35	Mar. 27	11.89	May 29	14.04
Feb. 16	12.83	Apr. 25	12.91	Aug. 30	13.32

24 (*911, p. 82; 941, p. 69; 949, p. 47; *991, p. 62; 1021, p. 55). Jack Gray. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 1 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 36.42; Feb. 16, water seeping into well prevented measurement; Mar. 27, water seeping into well prevented measurement; Aug. 20, 38.29.

25b (*1021, p. 55). Clemens Cattle Co. Unsurveyed territory, approximately SW $\frac{1}{4}$ sec. 32, T. 1 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	17.67	Mar. 27	13.33	May 29	14.59
Feb. 16	15.32	Apr. 25	13.85	Aug. 20	16.00

25d (*1021, p. 55). Francisco Rascon. Unsurveyed territory, approximately SW $\frac{1}{4}$ sec. 28, T. 1 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	13.79	Mar. 27	8.49	May 29	11.26
Feb. 16	11.06	Apr. 25	9.57	Aug. 20	12.61

25g (*1021, p. 56). Agapito Camarena. Unsurveyed territory, approximately NW $\frac{1}{4}$ sec. 33, T. 1 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	17.83	Mar. 27	13.20	May 29	15.29
Feb. 16	15.35	Apr. 25	13.90	Aug. 20	16.62

25i (*1021, p. 56). Magma Railroad. Unsurveyed territory, approximately NE $\frac{1}{4}$ sec. 33, T. 1 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	7.02	Mar. 27	1.64	May 29	3.53
Feb. 16	4.01	Apr. 25	1.96	Aug. 20	5.40

25j (*1021, p. 56). Owner unknown. Unsurveyed territory, approximately NW $\frac{1}{4}$ sec. 34, T. 1 S., R. 11 E. Measuring point, beginning Feb. 16, 1945, top of timber, 0.26 foot above land-surface datum.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	23.93	Apr. 25	17.42	Aug. 20	19.96
Feb. 16	20.37	May 29	18.32		

25k (*1021, p. 56). R. E. Olson. Unsurveyed territory, approximately SE $\frac{1}{4}$ sec. 34, T. 1 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	26.23	Mar. 27	14.48	May 29	18.62
Feb. 16	21.52	Apr. 25	15.91	Aug. 20	23.98

25o (*1021, p. 56). Unsurveyed territory, approximately SE $\frac{1}{4}$ sec. 2, T. 2 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	31.15	Mar. 27	14.73	May 29	18.31
Feb. 16	21.27	Apr. 25	14.64	Aug. 20	27.60

25r (*1021, p. 56). 88 Ranch. Unsurveyed territory, approximately NE_4^1 sec. 10, T. 2 S., R. 11 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	2.85	Mar. 27	2.72	May 29	3.75
Feb. 16	2.79	Apr. 25	2.76		

32 (*911, p. 82; 941; p. 69; 949, p. 47; *991, p. 62; 1021, p. 57). L. C. Baldwin. $SE_4^1 SW_4^1$ sec. 34, T. 1 S., R. 10 E.

Water level, in feet below land-surface datum, 1945

Jan. 24	19.38	Mar. 27	12.22	May 29	19.01
Feb. 16	16.96	Apr. 25	16.38	Aug. 20	19.78

35 (*911, p. 82; 941, p. 70; 949, p. 47; *991, p. 62; 1021, p. 57). E. M. Little. $SW_4^1 SW_4^1$ sec. 8, T. 2 S., R. 10 E.

Water level, in feet below land-surface datum, 1945

Jan. 24	397.81	Mar. 27	397.88	May 29	397.38
Feb. 12	397.63	Apr. 25	397.99	Aug. 20	397.60

41 (*911, p. 82; 941, p. 70; 949, p. 47; *991, p. 62; 1021, p. 57). W. A. Barkley. $NW_4^1 SE_4^1$ sec. 27, T. 2 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 224.72; Aug. 22, plug rusted; no measurement made.

71 (*911, p. 82; 941, p. 70; 949, p. 47; *991, p. 63; 1021, p. 57). Magma Arizona Railroad. $NE_4^1 NE_4^1$ sec. 35, T. 3 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 12, 157.08; Aug. 22, 158.73.

93 (*949, p. 47; *991, p. 63; 1021, p. 57). U. S. Indian Service well 64. $NW_4^1 SE_4^1$ sec. 35, T. 3 S., R. 6 E.

Water level, in feet below land-surface datum, 1945

Jan. 24	52.25	Mar. 26	53.18	May 29	(a)
Feb. 16	52.76	Apr. 23	53.55	Aug. 2	(a)

a Plugged.

122 (*949, p. 47; *991, p. 63; 1021, p. 57). U. S. Indian Service well 52. $SW_4^1 SW_4^1$ sec. 35, T. 3 S., R. 4 E. Water levels, in feet below land-surface datum, 1945: Feb. 16, 28.29; Aug. 1, 28.40; Dec. 17, dry; filled in.

123 (*949, p. 47; *991, p. 63; 1021, p. 57). U. S. Indian Service well 66. $SW_4^1 NE_4^1$ sec. 36, T. 3 S., R. 4 E. Water levels, in feet below land-surface datum, 1945: Feb. 16, 24.20; Dec. 18, 24.35.

174 (*949, p. 47; *991, p. 63; 1021, p. 57). G. W. Yancy. $NW_4^1 SE_4^1$ sec. 23, T. 4 S., R. 3 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	25.43	Mar. 26	25.27	May 29	(a)	Dec. 18	26.16
Feb. 16	25.35	Apr. 24	25.29	Aug. 1	26.40		

a Mill on; well pumped dry.

176 (*949, p. 47; *991, p. 63; 1021, p. 57). Mr. Sherman. $SE_4^1 SE_4^1$ sec. 23, T. 4 S., R. 3 E. No measurements made after Feb. 4, 1944. Obstruction in well; measurements discontinued.

249 (*949, p. 48; *991, p. 63; 1021, p. 57). U. S. Indian Service well 11-X. $NW_4^1 SE_4^1$ sec. 4, T. 4 S., R. 6 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	34.49	Apr. 23	34.89	Aug. 2	35.80
Feb. 16	34.57	May 29	35.01		

257 (*949, p. 48; *991, p. 63; 1021, p. 58). U. S. Indian Service well 44. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 19, T. 4 S., R. 7 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 24	21.63	Mar. 26	21.64	May 29	22.46	Dec. 19	30.19
Feb. 16	21.58	Apr. 23	22.10	July 31	23.25		

258 (*949, p. 48; *991, p. 63; 1021, p. 58). U. S. Indian Service well 42. $SW\frac{1}{4}NE\frac{1}{4}$ sec. 20, T. 4 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 19.41; Feb. 16, 19.31.

259 (*949, p. 48; *991, p. 63; 1021, p. 58). U. S. Indian Service well 43. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 30, T. 4 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 16, 20.39; July 31, 21.44.

278 (*941, p. 70; 949, p. 48; *991, p. 63; 1021, p. 58). Arizona Ranches, Inc. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 2, T. 4 S., R. 8 E. No measurements made after Aug. 17, 1944.

299 (*949, p. 48; *991, p. 63; 1021, p. 58). E. C. High. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 32, T. 4 S., R. 9 E. Obstruction in well; measurements discontinued.

324 (*949, p. 48; *991, p. 63; 1021, p. 58). U. S. Indian Service well 1. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 21, T. 4 S., R. 10 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	84.63	Mar. 27	85.62	May 29	86.39
Feb. 16	85.05	Apr. 25	86.16	July 31	86.60

327 (*949, p. 48; *991, p. 64; 1021, p. 58). U. S. Indian Service well 4. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 31, T. 4 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Feb. 16, 96.00; July 31, 97.17.

341 (*949, p. 48; *991, p. 64; 1021, p. 58). U. S. Indian Service well 7. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 7, T. 4 S., R. 11 E. Water levels, in feet below land-surface datum, 1945: Jan. 24, 23.43; Feb. 16, 24.46; July 31, 24.45; Dec. 19, 25.94.

437 (*949, p. 49; *991, p. 64; 1021, p. 58). U. S. Indian Service well 76. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 29, T. 5 S., R. 9 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	115.33	Mar. 26	115.34	May 29	117.42
Feb. 15	115.48	Apr. 23	116.69	July 31	118.96

493 (*949, p. 49; *991, p. 64; 1021, p. 58). S. H. Wynn. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 5 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 15, 62.09; July 31, pumping; Dec. 19, 71.46.

503 (*949, p. 49; *991, p. 64; 1021, p. 58). L. D. Ulmer. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 1, T. 5 S., R. 8 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 24	39.34	Mar. 26	39.48	May 29	39.67	Dec. 19	40.12
Feb. 15	39.32	Apr. 23	39.52	Aug. 22	39.76		

554 (*949, p. 49; *991, p. 64; 1021, p. 59). S. B. Rial. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 13, T. 5 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 15, 52.78; July 31, 61.80.

556 (*1021, p. 59). Owner unknown. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 24, T. 5 S., R. 7 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 24	53.95	Mar. 26	55.03	May 29	60.79
Feb. 15	54.27	Apr. 23	57.51	Aug. 1	63.46

616 (*949, p. 49; *991, p. 64; 1021, p. 59). H. D. Murphy. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 4, T. 5 S., R. 4 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	73.71	Mar. 26	73.84	May 29	75.29	Dec. 18	78.68
Feb. 17	73.61	Apr. 24	74.49	Aug. 1	75.58		

618 (*949, p. 49; *991, p. 64; 1021, p. 59). J. R. Ross. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 30, T. 5 S., R. 4 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	87.36	Mar. 26	87.45	May 29	87.89	Dec. 18	89.74
Feb. 16	87.39	Apr. 24	87.63	Aug. 1	88.62		

653 (*949, p. 49; *991, p. 64; 1021, p. 59). Bernice White. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 3, T. 5 S., R. 3 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	58.52	Mar. 26	58.59	May 29	58.78
Feb. 16	58.60	Apr. 24	58.66	Aug. 1	59.10

724 (*1021, p. 59). Vester Branum. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 29, T. 6 S., R. 3 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	213.88	Mar. 26	(a)	May 29	214.76
Feb. 16	213.99	Apr. 24	(a)	Aug. 1	215.80

a Water seeping in casing.

738 (*949, p. 50; *991, p. 64; 1021, p. 59). A. A. Wallace. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 9, T. 6 S., R. 3 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 16	135.44	Apr. 24	(a)	Aug. 1	(a)
Mar. 26	134.84	May 29	(a)	Dec. 18	148.56

a Pumping.

801 (*941, p. 70; 949, p. 50; *991, p. 64; 1021, p. 59). Jake Stegmeier. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 1, T. 6 S., R. 4 E. Water level, in feet below land-surface datum, 1945: Feb. 17, 80.47.818 (*949, p. 50; *991, p. 65; 1021, p. 59). Earl Lane. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 6 S., R. 4 E. Domestic pump installed Feb. 21, 1945. Measurements discontinued.887 (*941, p. 71; 949, p. 50; *991, p. 65; 1021, p. 59). Paul Knobloch. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 9, T. 6 S., R. 5 E. Water levels, in feet below land-surface datum, 1945: Feb. 17, 43.03; July 30, 43.43.890 (*941, p. 71; 949, p. 50; *991, p. 65; 1021, p. 59). Mrs. Gus Dratzka. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 15, T. 6 S., R. 5 E.

890--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 24	29.35	Mar. 27	30.22	May 30	30.15	Dec. 17	31.60
Feb. 17	29.72	Apr. 23	30.38	July 30	30.80		

893 (*941, p. 71; 949, p. 50; *991, p. 65; 1021, p. 60). P. H. Ethington. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 16, T. 6 S., R. 5 E. Measuring point, beginning Feb. 17, 1945, top of south $\frac{1}{2}$ -inch hole in pump base, west side, 0.19 foot above old measuring point, 0.99 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 17, 49.68; Aug. 2, pumping; Dec. 17, 50.58.

906 (*949, p. 51; *991, p. 65; 1021, p. 60). U. S. Indian Service well 100. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 23, T. 6 S., R. 5 E. Water levels, in feet below land-surface datum, 1945: Feb. 17, 34.34; July 30, 36.40; Dec. 17, 38.70.

907 (*941, p. 72; 949, p. 51; *991, p. 65; 1021, p. 60). Burris Bros. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 23, T. 6 S., R. 5 E. Water levels, in feet below land-surface datum, 1945: Feb. 17, 36.24; July 30, 43.05; Dec. 17, 41.42.

961 (*941, p. 72; 949, p. 51; *991, p. 65; 1021, p. 60). Floyd Smith. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 7, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 17, 29.76; July 31, 31.30; Dec. 18, 31.40.

967 (*941, p. 73; 949, p. 51; *991, p. 65; 1021, p. 60). E. E. Rosenberry. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 10, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, road impassable; Feb. 15, 35.32; July 31, 35.67; Dec. 13, pumping.

968 (*941, p. 73; 949, p. 51; *991, p. 65; 1021, p. 60). C. E. Sherrill. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 13, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 15, pumping; July 31, pumping; Dec. 18, 46.01.

975 (*941, p. 73; 949, p. 51; *991, p. 65; 1021, p. 60). Gilbert Bros. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 17, T. 6 S., R. 6 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 25	36.77	Mar. 27	(a)	May 29	(a)	Dec. 18	35.93
Feb. 15	35.92	Apr. 24	(a)	July 31	36.90		

a Pumping.

981 (*941, p. 74; 949, p. 51; *991, p. 65; 1021, p. 60). Gilbert Bros. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 20, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 42.58; Feb. 15, 42.39; Apr. 24, 42.43.

991 (*941, p. 74; 949, p. 51; *991, p. 65; 1021, p. 60). Mrs. Emma Pennington. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 25, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 15, 42.80; July 31, 47.11; Dec. 18, 48.34.

1002 (*949, p. 52; *991, p. 66; 1021, p. 60). U. S. Indian Service well 103. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 33, T. 6 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 19, 35.51; Aug. 1, pumping; Dec. 20, 38.78.

1066 (*941, p. 74; 949, p. 52; *991, p. 66; 1021, p. 60). Diwan Singh. $SE\frac{1}{4}NW\frac{1}{4}$ sec. 22, T. 6 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 58.75; July 31, pumping; Dec. 18, 72.42, pumping recently.

1072 (*949, p. 52; *991, p. 66; 1021, p. 60). U. S. Indian Service well 85. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 27, T. 6 S., R. 7 E. Measuring point beginning Feb. 14, 1945, top of 3- by 12-inch timber, 0.27 foot above old measuring point, 1.37 feet above land-surface datum. Water level, in feet below land-surface datum, 1945: July 31, 65.88.

1079 (*949, p. 52; *991, p. 66; 1021, p. 60). U. S. Indian Service well 84. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 35, T. 6 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 78.99; July 31, 97.70.

1118 (*941, p. 75; 949, p. 52; *991, p. 66; 1021, p. 60). Dick Shiflet. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, T. 6 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 16, 59.84; Aug. 2, 76.20; Dec. 18, 75.90.

1153 (*949, p. 52; *991, p. 66; 1021, p. 60). U. S. Indian Service well 82. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 30, T. 6 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 76.43; July 31, 90.50.

1157 (*949, p. 52; *991, p. 66; 1021, p. 61). U. S. Indian Service well 78. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 35, T. 6 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 35.75; July 31, 40.70; Dec. 19, 36.62.

1162 (*949, p. 52; *991, p. 66; 1021, p. 61). Mr. McFarland. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 27, T. 6 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 69.85; July 31, 81.29; Dec. 19, 79.04.

1172 (*1021, p. 61). W. W. Ray. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 20, T. 6 S., R. 8 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 25	77.78	Mar. 26	86.39	May 29	91.92	Dec. 19	91.16
Feb. 15	81.23	Apr. 23	91.77	July 31	99.88		

1173 (*1021, p. 61). Owner unknown. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T. 6 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 15, 57.77; July 31, dry.

1331 (*949, p. 52; *991, p. 66; 1021, p. 61). D. C. Roberts. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 20, T. 7 S., R. 8 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	108.65	Mar. 26	111.06	May 30	114.33
Feb. 14	110.16	Apr. 23	(a)	Aug. 2	119.00

a Pumping.

1405 (*949, p. 53; *991, p. 66; 1021, p. 61). S. C. McFarland. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T. 7 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 100.24; July 31, pumping; Dec. 19, 111.21.

1421 (*941, p. 75; 949, p. 53; *991, p. 66; 1021, p. 61). F. W. Shedd. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 27, T. 7 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 96.99; Aug. 2, 100.30.

1422 (*941, p. 75; 949, p. 53; *991, p. 66; 1021, p. 61). D. S. Cramer. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 7 S., R. 7 E. No measurements made in 1945.

1430 (*1021, p. 61). Les Milligan. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 7 S., R. 7 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 25	92.68	Mar. 26	106.56	May 30	109.38	Dec. 19	102.73
Feb. 15	94.02	Apr. 23	103.19	July 31	114.10		

1476 (*941, p. 75; 949, p. 53; *991, p. 66; 1021, p. 61). D. A. Trekkell. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T. 7 S., R. 6 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	40.36	Mar. 28	40.12	May 30	41.07	Dec. 20	42.78
Feb. 19	40.22	Apr. 23	40.53	Aug. 1	41.90		

1479 (*941, p. 76; 949, p. 53; *991, p. 67; 1021, p. 61). Paul Brophy. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 7 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 64.23; Aug. 2, 66.70.

1485 (*941, p. 76; 949, p. 53; *991, p. 67; 1021, p. 62). F. W. Shedd. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T. 7 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 19, 65.88; Aug. 1, 68.42; Dec. 20, pumping.

1489 (*949, p. 53; *991, p. 67; 1021, p. 62). Albert Steinfeld. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30, T. 7 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Aug. 1, 58.35; Dec. 20, dry.

1532 (*941, p. 76; 949, p. 53; *991, p. 67; 1021, p. 62). Phoenix Church of Brethren. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 7, T. 7 S., R. 5 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	124.18	Mar. 28	125.48	May 30	128.14	Dec. 20	135.40
Feb. 19	124.09	Apr. 23	126.69	Aug. 1	132.22		

1539 (*949, p. 54; *991, p. 67; 1021, p. 62). W. S. Stephenson Estate. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 22, T. 7 S., R. 5 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	88.38	Mar. 28	87.60	May 30	97.54	Dec. 20	96.51
Feb. 19	88.07	Apr. 23	88.67	Aug. 1	99.96		

1540 (*949, p. 54; *991, p. 67; 1021, p. 62). L. R. Meyers. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 3, T. 7 S., R. 5 E. No measurements made since Feb. 3, 1944.

1548 (*1021, p. 62). Myers Farms. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T. 7 S., R. 5 E. Water levels, in feet below land-surface datum, 1945: Jan. 25, 75.56; Feb. 19, 75.59. Well sealed by pump; measurements discontinued.

1716 (*941, p. 77; 949, p. 54; *991, p. 67; 1021, p. 62). Smith-Thornburg Co. SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 29, T. 8 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 19, 69.99; Aug. 1, 71.10.

1725 (*949, p. 54; *991, p. 67; 1021, p. 62). State of Arizona. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 21, T. 8 S., R. 6 E. Water level, in feet below land-surface datum, 1945: Feb. 19, 73.30.

1776 (*941, p. 77; 949, p. 54; *991, p. 67; 1021, p. 62). S. C. Milligan. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 9, T. 8 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 130.63; Aug. 2, 159.40; Dec. 20, pumping.

1787 (*941, p. 77; 949, p. 54; *991, p. 67; 1021, p. 62). Sam Phillips. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 15, T. 8 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, pumping; Aug. 2, pumping; Dec. 20, pumping.

1791 (*941, p. 77; 949, p. 54; *991, p. 67; 1021, p. 62). S. G. Wilson. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 22, T. 8 S., R. 7 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 139.09; Aug. 2, pumping; Dec. 20, 150.75.

1795 (*941, p. 78; 949, p. 54; *991, p. 67; 1021, p. 62). Jack Pretzer, Jr. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T. 8 S., R. 7 E.

Water level, in feet below land-surface datum, 1945

Jan. 25	al51.00	Feb. 22	al50.00	Apr. 23	al61.20	July 30	al67.60
Feb. 14	(a)	Mar. 26	al57.60	May 28	al63.00	Dec. 21	174.82

a Pumping.

1798 (*941, p. 78; 949, p. 55; *991, p. 68; 1021, p. 63). F. W. Shedd. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 33, T. 8 S., R. 7 E.

1798--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	124.18	Mar. 26	124.43	May 28	125.31
Feb. 13	124.22	Apr. 23	124.82	July 30	(a)

a Dry.

1855 (*949, p. 55; *991, p. 68; 1021, p. 63). D. A. Trekell. $SE_4^1SE_4^1$ sec. 7, T. 8 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 14, 148.59; July 30, 162.60; Dec. 21, pumping.

1864 (*1021, p. 63). John Arujo. $NE_4^1NE_4^1$ sec. 18, T. 8 S., R. 8 E. Water level, in feet below land-surface datum, 1945

Jan. 25	155.23	Mar. 26	156.21	May 28	161.12
Feb. 14	154.95	Apr. 23	158.45	July 30	165.60

1884 (*941, p. 78; 949, p. 55; *991, p. 68; 1021, p. 63). Arizona Farm Products Co., locally known as Jack Pretzer well 6. $SE_4^1SW_4^1$ sec. 33, T. 8 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 165.30; Dec. 21, 171.72.

2104 (*941, p. 79; 949, p. 55; *991, p. 68; 1021, p. 63). P. G. Wolfe. $SE_4^1NE_4^1$ sec. 20, T. 9 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, pumping; Aug. 2, pumping; Dec. 21, 179.20.

2108 (*949, p. 55; *991, p. 68; 1021, p. 63). J. F. Nutt. $SE_4^1SE_4^1$ sec. 26, T. 9 S., R. 8 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 164.61; July 30, pumping; Dec. 21, 170.52.

2173 (*949, p. 55; *991, p. 68; 1021, p. 63). Owner's well 2. R. W. Dickey. $SE_4^1SE_4^1$ sec. 15, T. 9 S., R. 7 E. Measuring point beginning Feb. 13, 1945, top of casing, 0.76 foot below land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 13, 137.85; July 30, pumping; Dec. 20, 158.13.

2174 (*1021, p. 63). Carl West. $SE_4^1SE_4^1$ sec. 16, T. 9 S., R. 7 E. Measuring point beginning Mar. 26, 1945, top of 1-inch hole, south side pump base, 0.48 foot above old measuring point, 1.27 feet below land-surface datum.

Water level, in feet below land-surface datum, 1945

Jan. 25	128.35	Apr. 23	(a)	July 30	161.37
Mar. 26	147.67	May 28	(a)	Dec. 20	164.79

a Pumping.

2233 (*949, p. 55; *991, p. 68; 1021, p. 64). J. Sevak. $SE_4^1SE_4^1$ sec. 24, T. 9 S., R. 6 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 89.59; July 30, 92.40; Dec. 20, 91.42.

2236 (*949, p. 56; *991, p. 68; 1021, p. 64). B. F. Nelssen. $SW_4^1SE_4^1$ sec. 3, T. 9 S., R. 6 E. No measurements made since Aug. 3, 1944.

2311 (*941, p. 79; 949, p. 56; *991, p. 68; 1021, p. 64). J. C. Kinney. NW_4^1 sec. 3, T. 10 S., R. 7 E. Water level, in feet below land-surface datum, 1945: Feb. 13, 105.29.

2332 (*941, p. 79; 949, p. 56; *991, p. 69; 1021, p. 64). J. C. Kinney. $SE_4^1SE_4^1$ sec. 5, T. 10 S., R. 8 E. Water level, in feet below land-surface datum, 1945: Feb. 13, 166.02.

2351 (*949, p. 56; *991, p. 69; 1021, p. 64). J. C. Kinney. $NW_4^1SE_4^1$ sec. 5, T. 10 S., R. 9 E.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 26	(a)	Feb. 22	152.87	Apr. 23	153.30	July 30	153.90
Feb. 13	(b)	Mar. 26	153.07	May 28	153.58	Dec. 21	155.73

a Water seeping into casing prevented measurement.

b Pumping.

2354 (*941, p. 79; 949, p. 56; *991, p. 69; 1021, p. 64). H. H. Cake. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 10 S., R. 9 E. Water levels, in feet below land-surface datum, 1945: Feb. 7, 151.15; Oct. 15, 152.45; Dec. 21, 154.68.

2361 (*941, p. 80; 949, p. 56; *991, p. 69; 1021, p. 64). King Bros. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 22, T. 10 S., R. 9 E. No measurements made in 1945.

2363 (*941, p. 80; *949, p. 56; *991, p. 69; 1021, p. 64). H. B. Aguirre. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 36, T. 10 S., R. 9 E. Water levels, in feet below land-surface datum, 1945: Oct. 11, 141.56; Dec. 7, pumping.

2383 (*991, p. 69; 1021, p. 64). Tom Soleng. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 34, T. 10 S., R. 10 E. Water levels, in feet below land-surface datum, 1945: Feb. 7, 152.26; Oct. 11, 152.70; Dec. 7, 152.40.

SANTA CRUZ COUNTY

By R. L. Cushman

Measurements of water levels were made in nine wells in Santa Cruz County during 1945. Two wells were measured at monthly intervals and the other wells were measured during spring high and summer low stages only. A total of 42 measurements was made.

Water pumped from wells increased 48 percent over 1944. The increase was primarily in the northern end of the county along the Santa Cruz River. The following table shows the water pumped each year since 1941.

Year	Acre-feet	Year	Acre-feet
1941	11,500	1944	12,500
1942	14,500	1945	18,500
1943	15,000		

Precipitation at Nogales was 12.75 inches during 1945, which was 3.31 inches below normal, although it was above normal during August. Stream flow at Nogales was greatest during the heavy rains of July and August. Figure 7 shows the volume pumped each month, compared with precipitation at Nogales, flow of Santa Cruz River near Nogales, and graphs of water-level fluctuations in two selected wells. The rate of pumpage decreased sharply in July and August as a result of heavy rains.

Well 915 lies near the upstream end of the heavily pumped area along the Santa Cruz River north of Nogales. The graph shows a steady decline of water level in the well during the first 6 months of 1945, principally caused by increased pumpage in the area. The rains of July and August caused a decrease in the rate of pumping and an increase in the amount of recharge.

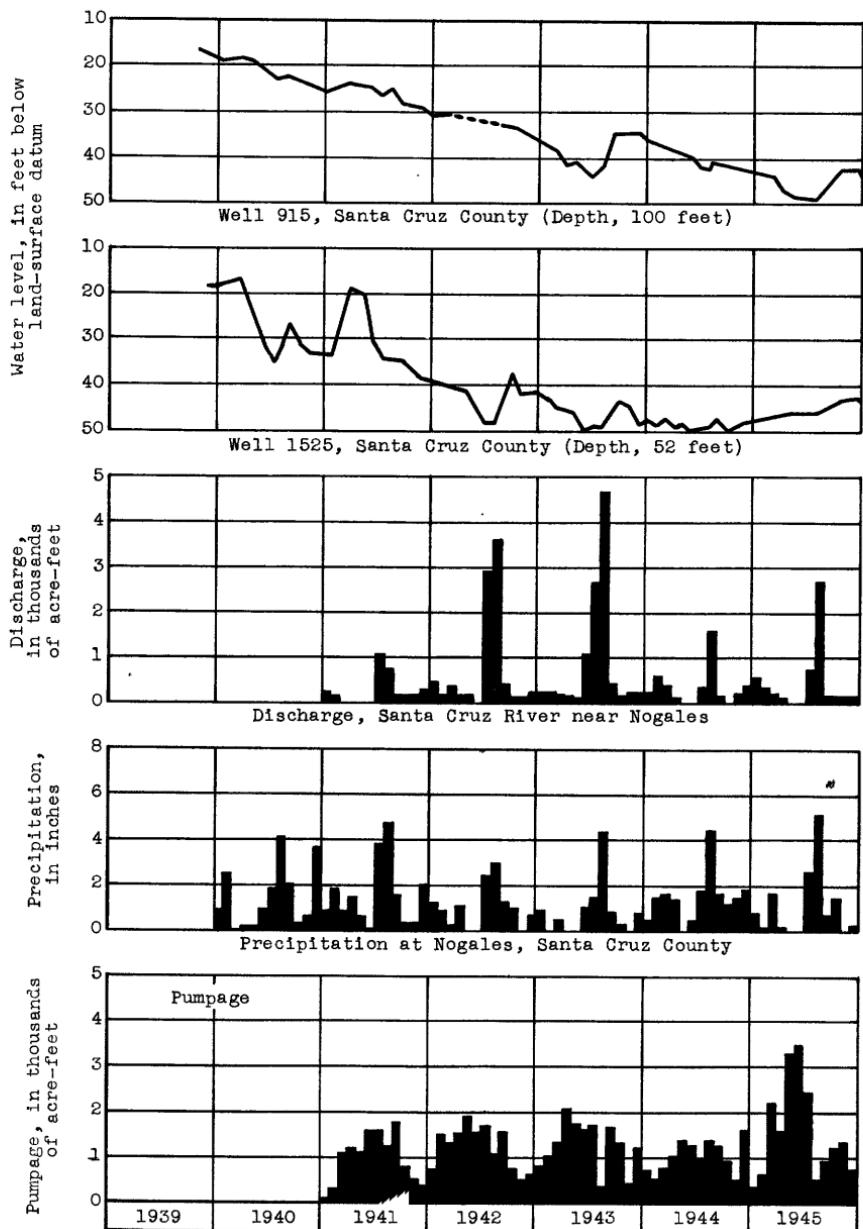


Figure 7.--Graphs showing fluctuations of water level in observation wells in the Santa Cruz Valley, Santa Cruz County, Ariz.

Well 1525 is on the opposite side of the Santa Cruz River from the Nogales pumping plant. The graph of this well shows a slight rise during the first 6 months of 1945 and a greater rise during the last 6 months of the year. Recharge from the summer rains was the principal factor contributing to this rise.

Well descriptions and water-level measurements

5 (*911, p. 96; 941, p. 81; *949, p. 57; *991, p. 70; 1021, p. 65). R. W. Littlejohn. $SE\frac{1}{4}NE\frac{1}{4}$ sec. 13, T. 20 S., R. 12 E. Measuring point beginning Dec. 6, 1945, top of concrete curb east side, 2.95 feet below old measuring point, 0.35 foot below land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 13, 61.22; July 27, 63.14; Oct. 12, 62.06; Dec. 6, 61.80.

79 (*911, p. 97; 941, p. 81; *949, p. 57; *991, p. 70; 1021, p. 66). Mrs. Schenkel. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 32, T. 20 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, pumping; Dec. 6, 28.51.

616 (*911, p. 97; 941, p. 81; *949, p. 57; *991, p. 70; 1021, p. 66). Mrs. Mary Ellen Cotter. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 19, T. 21 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 30.92; July 27, 29.60.

901 (*911, p. 98; 941, p. 82; *949, p. 58; *991, p. 70; 1021, p. 66). T. T. Pendleton. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 5, T. 22 S., R. 13 E. Well dry; measurements discontinued.

908 (*911, p. 98; 941, p. 82; *949, p. 58; *991, p. 70; 1021, p. 66). T. T. Pendleton. $SW\frac{1}{4}SE\frac{1}{4}$ sec. 16, T. 22 S., R. 13 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, pumping; July 7, 26.22; Oct. 12, pumping; Dec. 6, 22.68.

915 (*911, p. 99; 941, p. 82; *949, p. 58; *991, p. 70; 1021, p. 66). T. T. Pendleton. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 35, T. 22 S., R. 13 E. Measuring point beginning Oct. 12, 1941, 0.14 foot above old measuring point, 0.40 foot above land-surface datum.

Water level, in feet below land-surface datum, 1945							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	44.30	Mar. 29	47.60	May 30	(a)	Oct. 12	42.67
Feb. 11	44.66	Apr. 28	48.16	July 27	49.74	Dec. 6	42.56
27	44.82						

a Pumping.

1504 (*911, p. 100; 941, p. 83; *949, p. 58; *991, p. 71; 1021, p. 66). J. F. Dalton. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 19, T. 23 S., R. 14 E. Water levels, in feet below land-surface datum, 1945: Feb. 13, 16.25; July 27, 17.55; Oct. 12, 14.40; Dec. 6, 13.88.

1513 (*911, p. 100; 941, p. 83; *949, p. 58; *991, p. 71; 1021, p. 66). Dines Nelson. $NE\frac{1}{4}NW\frac{1}{4}$ sec. 27, T. 23 S., R. 14 E. Water levels, in feet below land-surface datum, 1945: Feb. 11, 18.48; July 27, 20.82; Oct. 12, 18.55; Dec. 6, 18.05.

1525 (*911, p. 100; 941, p. 83; *949, p. 58; *991, p. 71; 1021, p. 66). Camberos Bros. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 36, T. 23 S., R. 14 E.

Water level, in feet below land-surface datum, 1945							
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 27	47.45	Mar. 29	46.33	May 30	45.89	Oct. 12	43.47
Feb. 11	47.18	Apr. 28	45.98	July 27	46.24	Dec. 6	42.53
27	46.83						

1912 (*911, p. 101; 941, p. 84; *949, p. 59; *991, p. 71; 1021, p. 66). Simon Mastick. SW₁NE₁ sec. 8, T. 24 S., R. 14 E. Water levels, in feet below land-surface datum, 1945: Feb. 11, 25.20; July 27, 25.48; Oct. 12, 23.20; Dec. 6, 22.37.

YUMA COUNTY

By H. M. Babcock and R. L. Cushman

Field work began in Yuma County in April 1945 as a part of an investigation of the ground-water resources of the ground-water basins of the State. Observation wells were selected and water-level measurements were made at irregular intervals during 1945. This program will be continued in 1946 with measurements being made more frequently than in 1945, and the number of observation wells will be increased to cover a larger area. A pumping inventory is being made for 1944 and 1945 and will also be made for 1946. A total of 50 water-level measurements in 17 wells was made during 1945.

Well 1280, a few hundred feet from a newly constructed large irrigation canal near Blaisdell, showed a rise in the water level of 13.89 feet between May 1943 and December 1945. This rise was caused by recharge from seepage from the newly constructed canal nearby.

Well descriptions and water-level measurements

155. Western Farm Management Co. NE₁NW₁ sec. 19, T. 6 S., R. 12 W., 50 feet south of gravel road, about 7 miles north of Dateland. Unused drilled irrigation well, diameter 24 inches, depth 1,352 feet. Measuring point, top of casing, south side, at land-surface datum. Water levels, in feet below land-surface datum, 1945: May 4, 35.50; Oct. 24, 36.50; Dec. 19, 36.67.

195. H. P. Johnson. NE₁NW₁ sec. 13, T. 7 S., R. 12 W., at Aztec, about 200 feet north of U. S. Highway 80. Unused drilled domestic well, diameter 6 inches, reported depth 180 feet. Measuring point, top of casing, 0.1 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: May 4, 104.20; Oct. 24, 104.39; Dec. 19, 104.30.

200. Owner unknown. NW₁SW₁ sec. 18, T. 7 S., R. 12 W., 20 feet east of gravel road, 1.3 miles north of Dateland. Unused drilled irrigation well, diameter 12 inches, depth unknown. Measuring point, top of casing, west side, 0.7 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: May 4, 26.72; Oct. 24, 24.29; Dec. 19, 21.80.

312. Owner unknown. SE₁SE₁ sec. 1, T. 7 S., R. 13 W., on west side of gravel road, 20 feet northwest of fence corner, 3.0 miles north of Dateland. Unused drilled irrigation well, diameter 18 inches, depth 145 feet. Measuring point, top of casing at seam, at land-surface datum. Water levels, in feet below land-surface datum, 1945: May 4, 81.82; Oct. 24, 82.10; Dec. 19, 82.44.

440. Southern Pacific Railroad. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 25, T. 6 S., R. 14 W., 20 feet north of Kofa siding, 200 feet north of section house. Unused drilled railroad well, diameter 10 inches, depth unknown. Measuring point, top of wood curbing, north side, 1.0 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Dec. 20, 55.50.

575. Mohawk Municipal Water Conservation District. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 7 S., R. 15 W., on west bank of canal, 13.5 miles east of Roll. Unused drilled irrigation well, diameter 20 inches, depth unknown. Measuring point, top of casing, west side, at land-surface datum. Water levels, in feet below land-surface datum, 1945: May 2, 28.88; Oct. 24, 30.02; Dec. 20, 28.09.

680. Mohawk Municipal Water Conservation District. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 7 S., R. 16 W., 20 feet south of canal, 7.0 miles east of Roll. Used drilled irrigation well, diameter 20 inches, depth unknown. Measuring point, bottom of hole in east side of casing, 0.4 foot above land-surface datum. Equipped with turbine pump. Water levels, in feet below land-surface datum, 1945: May 3, 28.30; Oct. 24, 28.98; Dec. 20, 29.44.

710. Western Farm Management Co. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 8 S., R. 16 W., 200 feet south of ranch house, about 10 miles northwest of Mohawk. Used drilled domestic well, diameter 6 inches, reported depth 114 feet. Measuring point, hole in pump base on east side, 0.3 foot above land-surface datum. Equipped with cylinder pump. Water levels, in feet below land-surface datum, 1945: May 4, 26.60; Oct. 24, 27.64; Dec. 19, 27.89.

722. Smiley Airfield. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 8 S., R. 16 W., in shed, 1,000 feet north of U. S. Highway 80, 0.4 mile west of Colfred. Unused drilled irrigation well, diameter 16 inches, depth unknown. Measuring point, top of casing on northwest side, at land-surface datum. Equipped with turbine pump and electric motor. Water levels, in feet below land-surface datum, 1945: May 3, 83.20; Oct. 10, 82.63; Dec. 19, 82.62.

784. Mohawk Municipal Water Conservation District. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 8 S., R. 17 W., 50 feet west of road, 0.75 mile north of Mohawk school, 2 miles northeast of Roll. Unused drilled irrigation well, diameter 20 inches, depth unknown. Measuring point, top of casing, north side, 1.4 feet above land-surface datum. Water levels, in feet below land-surface datum, 1945: May 3, 32.18; Oct. 24, 33.45; Dec. 20, 33.15.

795. Roy Killen. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 8 S., R. 17 W., 100 feet west of gravel road, 2.3 miles north of U. S. Highway 80, about 6 miles northwest of Colfred. Unused drilled irrigation well, diameter 16 inches, reported depth 100 feet. Measuring point, top of casing, east side, 0.6 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: May 3, 23.20; Oct. 24, 24.20; Dec. 19, 24.32.

817. Sweenson. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 8 S., R. 17 W., at Tacna, 75 feet northeast of Tacna service station. Used drilled domestic irrigation well, diameter unknown, reported depth 308 feet. Measuring point, top of metal cover, north side, 0.6 foot above land-surface datum. Equipped with cylinder pump and small gasoline engine. Water levels, in feet below land-surface datum, 1945: Oct. 24, 106.90; Dec. 19, 106.64.

900. Robert Welch. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 9 S., R. 18 W., in garage back of Standard service station, south side of U. S. Highway 80, in Wellton. Unused drilled domestic well, diameter 6 inches, reported depth 70 feet. Measuring point, top of casing, at land-surface datum. Water levels, in feet below land-surface datum, 1945: May 3, 55.96; Oct. 24, 56.30; Dec. 19, 55.08.

975. Owner unknown. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T. 9 S., R. 19 W., north side of square concrete discharge box, 0.4 mile north of U. S. Highway 80, 5.2 miles west of Wellton. Unused dug and drilled domestic well, diameter 72 inches to depth of 10 feet and drilled from 10 feet to 88 feet. Measuring point, top of 6 by 6-inch timber directly above 1-inch bolt, 0.7 foot above land-surface datum. Equipped with cylinder pump and windmill. Water levels, in feet below land-surface datum, 1945: May 2, 20.80; Oct. 24, 21.50; Dec. 19, 21.35.

1280. Owner unknown. SW_{1/4}NW_{1/4} sec. 21, T. 8 S., R. 21 W., 20 feet north of pump house, 400 feet west of U. S. Highway 95, 0.9 mile north of Blaisdell railroad station. Unused drilled irrigation well, diameter 16 inches, depth 66 feet. Measuring point, top of casing, north side, 0.35 foot above land-surface datum.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
May 6, 1943	54.75	Apr. 30, 1945	42.71	Dec. 19, 1945	40.86
Sept. 15	54.88	Oct. 25	40.79		

1485. Owner unknown. NW_{1/4}NW_{1/4} sec. 27, T. 8 S., R. 22 W., 100 feet south of U. S. Highway 95, 5 miles west of Blaisdell. Unused drilled domestic well, diameter 6 inches, depth unknown. Measuring point, hole near top of casing, on south side, 0.5 foot above land-surface datum. Equipped with cylinder hand pump. Water levels, in feet below land-surface datum, 1945: Apr. 30, 31.34; Oct. 24, 31.78; Dec. 19, 29.36.

1520. Owner unknown. SE_{1/4}SE_{1/4} sec. 17, T. 9 S., R. 22 W., 4 feet from southeast corner of concrete tank, 500 feet northwest of canal, 1.7 miles south of U. S. Highway 80, 8 miles southeast of Yuma. Unused drilled irrigation well, diameter 16 inches, depth 195 feet. Measuring point, top edge of bent section of casing, west side, at land-surface datum. Water levels, in feet below land-surface datum, 1945: May 1, 97.38; Oct. 25, 96.85; Dec. 19, 96.87.

CALIFORNIA

By V. H. Bartolome, A. A. Garrett, A. S. Sollid, H. M. Stafford,
J. E. Upson, G. F. Worts, Jr., and others

SCOPE OF THE WATER-LEVEL PROGRAM

This report shows the progress made in 1945 in the measurement of water levels in California by the Geological Survey in cooperation or collaboration with several other Federal, State, and local agencies. It also reviews, in general, the other principal water-level programs in the State in which the Geological Survey did not participate, but concerning which general information is available.

The following table shows, by ground-water areas, under counties, the distribution of observation wells and the scope of water-level measurements as given in this report. As indicated by the table, the report lists 6,311 water-level measurements made during 1945 in 602 observation wells in 8 of the 58 counties in the State. One of these counties, San Joaquin, is in the central part of California, but all the remaining seven for which water-level records appear in this report are in the southern part of the State, beyond the Tehachapi Mountains. For two counties, San Diego and Santa Barbara, water levels in wells in all the principal ground-water areas are given; for the other six counties only scattered basins or areas are covered.

Distribution of observation wells in California in 1945

County	Number of obser- vation wells			Number of records of water levels in this report	Number of wells with water-stage recorders (R) or float gages (F)		
	Estab- lished during 1945a/	Discon- tinued in 1945	At year end		Through- out 1945	Part of 1945	At year end
Kern County:							
Antelope Valley, part	4	0	b 6	c 20	0	0	0
Los Angeles County:							
Antelope Valley, part	106	5	d 133	c 297	1R	1R	1R
San Gabriel River Basin	0	0	1	365	1R	0	1R
Coastal plain	84	3	102	2,135	0	8R	1R
Orange County: Coastal plain	1	0	24	541	0	0	0

a Includes wells established prior to 1945 but for which water-level records are renewed or are given for the first time in this report.

b One additional well in which no measurement was made in 1945.

c In 1945 only; previous water-level records also given in this report.

d Nine additional wells in which no measurements were made in 1945.

Distribution of observation wells in California in 1945--Continued

County	Number of obser-			Number of	Number of wells with		
	Estab-	Discon-	At		records	water-stage recorders	(R) or float gages (F)
	lished	tinued	year	levels in	Through-	Part	At
	1945a/	1945	end	this	1945	1945	year
Riverside County:							
San Jacinto Valley	0	0	b 7	28	0	0	0
San Bernardino County:							
Mojave River Basin	2	0	b 75	139	0	0	0
Santa Ana River Basin	0	0	10	95	0	0	0
San Diego County:							
San Luis Rey River Basin	0	0	17	109	0	0	0
San Dieguito River Basin	2	0	6	17	0	0	0
San Diego River Basin	1	2	20	103	0	0	0
Sweetwater River Basin	0	0	2	8	0	0	0
Otay River Basin	0	0	2	8	0	0	0
Tia Juana River Basin	0	0	5	20	0	0	0
San Joaquin County:							
Mokelumne River Basin	0	0	24	279	0	0	0
Santa Barbara County:							
Carpinteria Basin	0	0	17	169	0	0	0
Goleta Basin	4	1	36	495	1R,1F	1R	1R,1F
Middle Santa Ynez Valley	0	2	16	177	0	1R	0
Lower Santa Ynez Valley	11	35	44	724	2R,3F	1R	2R,3F
San Antonio Valley	0	0	4	41	0	0	0
Santa Maria Valley	4	0	42	c 482	2F	0	2F
Cuyama Valley	0	0	7	58	0	0	0
The State	219	48	600	6,310	5R,6F	12R	6R,6F

a Includes wells established prior to 1945 but for which water-level records are renewed or are given for the first time in this report.

b One additional well in which no measurement was made in 1945.

c Six additional wells in which no measurements were made in 1945.

d Eighteen additional measurements made by San Joaquin Power Division of Pacific Gas & Electric Co.

In addition to this program in which the Geological Survey participated, systematic measurements of water level were made by other agencies in widely scattered parts of California. Measurements were continued in Ventura County basins by the Ventura County Water Survey. The San Bernardino Valley Water Conservation District continued measurements in about 300 wells in the San Bernardino Valley and summarized the fluctuations of ground-water level in an annual statement issued in mimeographed form. In the western portion of the San Fernando Valley, in the city of Los Angeles, monthly measurements were made in about 40 piezometer wells by the Soil Conservation Service, United States Department of Agriculture, in cooperation with

the city of Los Angeles and the San Fernando Valley Soil Conservation District. In the East Mesa area, between the Coachella Branch of the All-American Canal and the East High Line Canal of Imperial Irrigation District, in continuation of observations begun in 1942 by the Bureau of Reclamation of the United States Department of the Interior, biweekly measurements were made in about 30 observation wells by the Imperial Irrigation District in cooperation with the Division of Irrigation of the Soil Conservation Service, United States Department of Agriculture. Within the coastal plain, in Los Angeles County, about 100 wells were measured at monthly or more frequent intervals by the San Gabriel Valley Protective Association, the city of Long Beach, or the Los Angeles County Flood Control District, and nearly 200 wells were measured semiannually by the last-named agency; in Orange County about 200 wells were measured monthly and about 20 wells were measured weekly by the Orange County Flood Control District; and 16 wells in Santa Ana Gap were measured monthly by the Orange County Water District. From various agencies, the Division of Water Resources of the Department of Public Works, State of California, continued to assemble records of water levels in wells in the south-coastal basins and in the Antelope Valley. These assembled records for 1943 have been published in the Division's Bulletin 39-L, which continues the series beginning with Bulletin 39, published in 1932.

In the central and northern parts of California a number of substantial water-level programs were maintained by irrigation districts and local water-conservation agencies, partly through collaboration with the Division of Water Resources in the Department of Public Works, State of California. The facilities available to the Geological Survey have not been adequate to coordinate these programs for inclusion in this report.

RAINFALL AND SNOWFALL

The following general summary of precipitation in California for the calendar-year 1945 is quoted from the annual report of climatologic data issued by the Weather Bureau:^{1/}

"The average total precipitation for 1945 exceeded the 49-year average by nearly 3 inches, equivalent to 12%. It was above normal everywhere except along the southern coast. Annual totals ranged from less than 2 inches in Death Valley to more than 100 inches at

^{1/} U. S. Department of Commerce, Weather Bureau, Climatological data, vol. 49, No. 13, 1945.

places in Del Norte, Shasta, and southern Humboldt counties. January, April, and September were dry months throughout California. The other months, especially December, were comparatively wet. Floods occurred in the Sacramento-San Joaquin Valley in the first part of February. A flood occurred in the Klamath Basin in May. Unusually heavy rains fell in southern California in August. Considerable damage resulted from heavy rain in the Tehachapi Mountains and Owens Valley in October. Rivers reached flood stages in the northern portion of the State as a result of the heavy rains in December."

Because ground water is derived essentially from rain and snow, the volume in storage, as indicated by the water levels in wells, generally fluctuates in response to fluctuations in precipitation. Where there is a marked seasonal range in precipitation, such as prevails throughout California and the remainder of the Pacific Coast region, ground-water storage generally is greatest and natural ground-water levels are highest during or somewhat after the height of the wet season, but during the ensuing dry season the unconfined ground-water storage is depleted by natural discharge and water levels commonly decline in wells. This depletion goes on until soil-moisture deficiencies have been replenished by the first rains of the next wet season. Thus, for the climatic conditions of California the ground-water level commonly is related less closely to precipitation within the calendar year than to precipitation within a "water year" which spans one wet season and the following dry season--that is, which ends in mid-autumn. For this treatment of climatic conditions and for the following summary treatment of runoff the water year is taken as ending September 30, the most practicable average data for near-maximum depletion of unconfined ground-water storage and near-minimum runoff.

The first of the two following tables shows the average seasonal distribution of precipitation in California in the 49-year period, 1897-1945. The second table shows the relative wetness of the water year ending September 30, 1945, at 15 representative stations in the State, both in inches and in percentage of the average for the 50-year period ending September 30, 1940. This second table brings out that the precipitation during the water-year 1944-45, in percentage of the average for the 50-year period ending with 1939-40, ranged considerably from one part of the State to another, but with the indicated exception of the south coastal area including Santa Barbara and Los Angeles Counties, the range was confined to greater than average amounts of precipitation. Over the areas for which water levels are given in this report, it ranged from about 80 percent of average in Los Angeles County to about 120 percent of average in San Diego County.

State-wide average monthly and yearly precipitation in California,
in inches, based on the 49-year period 1897-1945
(From U. S. Weather Bureau, Climatological data, vol. 49, No. 13, 1945)

October	1.23	April	1.71
November	2.40	May	.95
December	3.87	June	.33
January	4.80	July	.07
February	4.61	August	.10
March	3.69	September	.43
	20.60		3.59
The year			24.19

Precipitation and relative wetness for the year ending September 30, 1945,
at 15 representative climatologic stations in California

Province	Station and county	Precipitation, 1944-45	
		Inches	Percentage of 50-year average a/
Northern Coast Ranges	Eureka, Humboldt	43.93	113
Coast Ranges of central and southern California	San Francisco, San Fran- cisco	21.86	109
	San Luis Obispo, San Luis Obispo	21.42	103
	Santa Barbara, Santa Barbara	15.29	85
	Los Angeles, Los Angeles	11.62	80
	San Bernardino, San Bernardino	19.28	119
	San Diego, San Diego	11.94	122
	Cuyamaca, San Diego	41.23	107
Great Valley (California Trough)	Red Bluff, Tehama	23.57	101
	Stockton, San Joaquin	14.79	105
	Fresno, Fresno	9.59	101
Sierra Nevada	Nevada City, Nevada	52.57	108
	West Point, Calaveras	40.43	102
Great Basin (Southwestern Bolton province)	Indio, Riverside	4.94	151
	Needles, San Bernardino	6.09	134

a Average for years ending Sept. 30, 1891, to 1940.

RUNOFF

The runoff in California streams during the water year ending September 30, 1945, ranged from less than 50 percent to more than 150 percent of the average. Representative of the runoff in the northern and central parts of the State are the year's total for Trinity River at Lewiston, in the north coastal drainage, which was 108 percent of normal; for the combined flow of Sacramento and San Joaquin Rivers and tributaries, about 90 percent of normal; and that for Kings River at Piedra, in the southern Sierra drainage, 132 percent of normal.

In southern California, the greatest runoff in relation to the average occurred in the upper Santa Ana and San Gabriel River basins where it ranged up to 150 percent of the average. In the remaining portions of these basins, in the mountain drainages of the Mojave, Los Angeles, and Santa Clara Rivers,

and in the extreme headwater streams of San Diego and Riverside Counties, it ranged between 75 and 100 percent of the average, but with the exception of the lower San Gabriel and Los Angeles River basins, it was less than 75 percent of the average in a 30-mile belt along the coast from the Mexican border on the south to San Luis Obispo County on the north. Moreover, within this belt, the runoff of most of the shorter coastal streams and of the lower portions of the Santa Maria, Santa Ynez, Santa Ana, San Luis Rey, San Diego, and Sweetwater Rivers was less than 50 percent of the average.

SUMMARIES OF PROGRAMS, HYDROLOGIC CONDITIONS, AND WATER-LEVEL FLUCTUATIONS

Coastal plain in Los Angeles and Orange Counties

Program of work

In 1945 the Geological Survey, in cooperation with the Orange County Flood Control District, the Orange County Water District, the Los Angeles County Flood Control District, and the Board of Water Commissioners of the city of Long Beach, continued and nearly completed its intensive investigation of the ground-water bodies that underlie the so-called Long Beach-Santa Ana area. Two interpretative reports comprising the first two of four chapters presenting the results of the study were released during the year, ^{2/} also a factual report containing critical chemical data. ^{3/}

In 1945 the Geological Survey also continued its investigation of the so-called Torrance-Santa Monica area in cooperation with the Los Angeles County Flood Control District and certain municipalities. By the end of the year field work on that project was nearly completed.

Early in the year the Geological Survey began an investigation for the United States Engineer Office pertaining to ground-water conditions proximate to the channels of the Rio Hondo and of the lower Los Angeles River, in connection with a proposed program for flood control.

No periodic measurements of water level for wells in the Long Beach-Santa Ana area were made by the Geological Survey in 1945. However, extensive programs for periodic measurements of observation wells in this area are being continued by several local agencies--in Orange County, chiefly by

^{2/} Poland, J. F., Piper, A. M., and others, Geologic features in the coastal zone of the Long Beach-Santa Ana area, California, with particular respect to ground-water conditions: U. S. Geol. Survey duplicated report, 327 pp., May 1945.

Poland, J. F., Sinnott, Allen, and others, Withdrawals of ground water from the Long Beach-Santa Ana area, California, 1932-41: U. S. Geol. Survey duplicated report, 112 pp., November 1945.

^{3/} Piper, A. M., Garrett, A. A., Poland, J. F., and others, Appendix to accompany report entitled "Chemical character of native and contaminated ground waters in the Long Beach-Santa Ana area, California: U. S. Geol. Survey duplicated report, 111 pp., November 1945.

the Orange County Flood Control District, and, in Los Angeles County, chiefly by the Los Angeles County Flood Control District and the San Gabriel Valley Protective Association.

In this report records are included for 129 wells in the areas covered by the three cooperative projects. Of these wells, records for 25 have been furnished by local agencies. Of the 104 wells measured by the Geological Survey, 62 were measured about semiannually, 14 were measured about monthly, and 22 were measured weekly for at least part of the year. In addition, 6 "permanent" observation wells were measured only at the end of the year. For this report, 5 new wells have been added to the 31 "continuing" observation wells and, for that reason, the previous water-level records by other agencies are included here. Four of these wells, 2/15-34H1, 3/13-18G2, 3/14-3K1, and 21B1 are in the West Basin; one well, 3/13-8L2, is in the main coastal basin.

Hydrologic conditions and water-level fluctuations

According to records released by the United States Weather Bureau, rainfall in the Long Beach-Santa Ana area in the calendar-year 1945 was about 1.6 percent above the long-term average. In February, rainfall in the area was 25 percent above and in March about 100 percent above the long-term averages for those months. From March until December, rainfall for the area was chiefly below the long-term monthly averages, hence irrigation requirements were greater than normal for much of the year.

The following table summarizes the range in water level for the 36 "continuing" observation wells in the Long Beach-Santa Ana and Torrance-Santa Monica areas. In this table water levels at the end of the year are compared to those at the end of 1944 and to those of the historic low-water year of 1936. Data for wells in the main coastal basin are tabulated separately from those in the so-called West Basin, southwest of the Newport-Inglewood uplift. Within the main coastal basin, 16 "continuing" index wells in Orange County show an average decline in water level of 2.2 feet in the year 1945, and 8 "continuing" index wells in Los Angeles County show an average decline of 3.0 feet. Within the West Basin of Los Angeles County, 9 "continuing" wells show an average drop of only 1.5 feet during 1945, indicating that the accelerated lowering of water level in the war years 1942-44 has diminished substantially.

Summary of water-level fluctuations in 36 selected observation wells on the coastal plain in Los Angeles and Orange Counties, Calif., 1936-45

Well	Water level at end of December, in feet above (+) or below (-) sea level a/			Net rise (+) or net decline (-) in water level, in feet	
	1936	1944	1945	1936-45	1944-45
Wells in the main coastal basin--Orange County					
3/11-36Q2	+18.2	+39.2	+35.9	+17.7	-3.3
4/9-7B1	+11.2	+55.5	+47.5	+36.3	-8.0
4/10-22L2	+10.2	+33.9	+32.8	+22.6	-1.1
4/11-19K1	+10.9	+22.3	+19.5	+8.6	-2.8
5/10-9D1	+10.0	+28.5	+26.4	+16.4	-2.1
5/10-28B1	+7.8	+20	+18.7	+10.9	-1.3
5/11-2B1	+4.4	+23.7	+19.9	+15.5	-3.8
5/11-16D2	+2.0	+12.9	+10.8	+8.8	-2.1
5/11-25P1	+3.5	+13.4	+11.9	+8.4	-1.5
5/11-28A1	-.6	+18.3	b +8.2	+8.8	...
5/11-29C4	....	+9.0	+6.4	....	-2.6
5/12-12P1	+.9	+9.3	+6.3	+5.4	-3.0
6/10-1B1	+.2	+17.1	+15.3	+15.1	-1.8
6/10-11L2	+17.1	+22.9	+22.3	+5.2	-.6
6/10-5G1	+3.5	+13.9	+13.1	+9.6	-.8
6/11-13G2	+.8	0.0	+2.0	+1.2	+2.0
I-9F1	-1.8	+23.4	+20.8	+22.6	-2.6
Averages:	+6.1	+21.4	+19.4	+13.6	-2.2
Wells in the main coastal basin--Los Angeles County					
2/12-13A1	+133.5	+161.6	+158.2	+24.7	-3.4
3/12-8L3	+62.6	+73.1	+71.3	+8.7	-1.8
3/13-8L2	+35.4	+27.3	+23.0	-12.4	-4.3
3/13-35B2	+28.0	+37.2	+34.2	+6.2	-3.0
4/11-5D1	+14.5	+18.3	+14.9	+.4	-3.4
4/12-8P1	-14.2	-23.4	-25.2	-11.0	-1.8
4/12-27K2	+3.5	+13.9	+9.5	+6.0	-4.4
5/12-2B1	+3.0	c +10.9+	+8.7	+5.7	-2.2
Averages:	+33.3	+39.9	+36.8	+3.5	-3.0
Wells in the West (coastal) Basin, tapping the Silverado water-bearing zone of Pleistocene age or its equivalent westward extension					
2/15-34H1	-.8	+.1	-.9	-.1	-1.0
3/13-18G2	+13.4	-29.2	-34.2	-47.6	-5.0
3/13-32F2	-24.3	-37.7	-39.2	-14.9	-1.5
3/14-3K1	....	-28	-34	....	-6
3/14-21B1	-.11	-31	-32	-21	-1
3/14-36M3d/	-13.5	-16.5	-18.4	-4.9	-1.9
4/13-14L1s/	+.3	+3.5	+2.2	+1.9	-1.3
4/13-23G2	-34.3	-61.5	-59.5	-25.2	+2.0
4/13-33D1	-30.5	-49.2	-47.6	-17.1	+1.6
4/14-8E1	-8.3	-9.0	-10.1	-1.8	-1.1
4/14-13F1	-22.3	-31.9	-33.4	-11.1	-1.5
Averages	-14.8	-30.8	-32.3	-17.4	-1.5

a Chiefly interpolated.

b Flowing; measuring point is 8.2 feet above sea-level datum of 1941; excluded from average.

c Flowing; top of casing is 10.9 feet above sea-level datum of 1941.

d Taps shallow deposits of Pleistocene age; excluded from averages.

e Taps Gaspur water-bearing zone of Recent age; excluded from averages.

Mojave Desert region

Antelope Valley, Kern and Los Angeles Counties

Observations of water level in Antelope Valley by the Geological Survey and by the Los Angeles County Flood Control District were continued in 1945 in 144 wells. These included 111 wells of which a few were established during 1945 and the remainder during earlier years, and for which water-level records are renewed or are given for the first time in this report. In most of these wells, levels were measured in both the spring and fall, but for only 25 wells do the measurements afford a direct comparison of the fall levels in 1944 and 1945. The measurements indicate a continuation of the downward trend in levels of the past several years. For the entire basin the average decline in level from the fall of 1944 to the fall of 1945 was about 4.9 feet. An exception to this trend was shown by four wells in the extreme west portion of the basin, in which the average of the 1945 fall levels was 1.2 feet higher than that of the 1944 fall levels. Water-level fluctuations in the Wilsona district have been such as to indicate that the ground water there may be separated from the main ground-water body of the valley; as shown by four wells in this district, the average decline in level from the fall of 1944 to the fall of 1945 was 0.8 foot.

Mojave River Basin, San Bernardino County

Observations of water level in the Mojave River Basin were continued in 1945 in 75 wells; in all of these, levels were measured in both the spring and fall of the year. During the water year ending September 30, 1945, the discharge of the Mojave River near Victorville was 77 percent of the 20-year average, and there was continuous flow at Barstow from February 2 to May 9. Although there was considerable fluctuation in level in individual wells, for the basin as a whole, ground-water levels were generally about the same at the end of 1945 as they were at the end of 1944.

Measurements of water level in 12 wells between the Forks and the area of effluent ground water near Verde Crossing indicated an average net decline of 1.9 feet. In 9 of these wells, however, a net rise in level was shown, so that the average decline of 1.9 feet is a reflection largely of greater net declines in 3 wells, particularly in wells 3/4W-12J1 and 3/3W-6El. These two wells are near the Forks and in an area where the ground-water levels rise or fall quickly in response to precipitation or drainage.

Wells in the valley between Victorville and Hodge showed an average decline in water level of 0.3 foot from the preceding year. Downstream from Hodge Crossing and north to the Barstow-Mojave highway there was an average net rise of 0.4 foot, but farther north a slight decline in water levels was indicated. In the Lenwood-Barstow area net rises averaged 0.4 foot.

In the area between Barstow and Daggett the water levels showed an average net decline during the year of 0.5 foot.

In the sub-basin between Daggett and the Kouns-Newberry sand-dune belt the measured water levels indicated an average net rise of 0.9 foot. East of the sand-dune belt and in the Newberry-Troy Lake area changes in water level shown by the measurements were too slight to indicate a definite trend.

Mokelumne River Basin, San Joaquin County

During 1945 the East Bay Municipal Utility District continued monthly water-level measurements in selected observation wells in the Mokelumne area in the central part of the Great Valley. Records for 24 of these wells were first published by the Geological Survey in 1935 (Water-Supply Paper 777), when they were selected as an index to changes in ground-water storage in the area. During the year 279 measurements of water level were made in these wells.

The following table correlates the average yearly water-level changes in the 24 selected wells with the fluctuations in yearly rainfall, beginning with 1934. As the table shows, in 1945 the water level in the Mokelumne area declined for the third successive year.

Average yearly rise or decline of water level, in feet, in 24 observation wells, and yearly rainfall, in inches, in the Mokelumne area, 1934-45

Year	Water level		Rainfall a/	
	Yearly rise (+) or decline (-)	Accumulated rise (+) or decline(-)	Excess (+) or deficiency(-)	Accumulated excess (+) or deficiency(-)
1934	-0.72	-0.72	-13.54	-13.54
1935	+.07	-.65	-3.96	-17.50
1936	+.15	+.88	+11.10	-6.40
1937	+.17	+2.05	+4.35	-2.05
1938	+.24	+3.29	+13.55	+11.50
1939	-3.58	-.29	-13.46	-1.96
1940	+.31	+1.02	+14.42	+12.46
1941	+.34	+2.36	+4.92	+17.38
1942	+.72	+3.08	+7.76	+25.14
1943	-.19	+2.89	-2.93	+22.21
1944	-2.32	+.57	+.46	+22.67
1945	-.06	+.51	+9.50	+32.17

a Average of yearly rainfall at Electra, West Point, and Twin Lakes, 1906-45, was 38.74 inches.

The second table shows the average change in water level in 1945 during the periods of increasing and diminishing withdrawal for irrigation, respectively. As in 1944, the table shows that recharge early in 1945 was insufficient to offset the withdrawals for irrigation. At the end of the year, however, average levels were only 0.06 foot below those at the close of 1944.

Seasonal changes in water level, in feet, in 24 observation wells in the Mokelumne area, 1945

Period	Greatest rise	Greatest recession	Average change in water level
Jan. 1 to May 31 (increasing withdrawal for irrigation)	+5.03	-10.26	-1.59
June 1 to Dec. 31 (diminishing withdrawal)	+9.53	-3.39	+1.53
The year	+4.41	-2.33	-.06

San Gabriel River Basin, Los Angeles County

A continuous water-stage recorder was in operation throughout 1945 on well 1S/10-18 at Baldwin Park, in the upper San Gabriel Valley. The water level in this well declined from a mean daily stage of 311.63 feet above sea level on January 1 to a stage of 311.33 feet on January 29. It then rose to a stage of 314.48 feet, the highest of the year, on April 1. Again declining, it reached a stage of 303.81 feet, the lowest of the year, on December 20. On December 31, its mean daily stage of 304.53 feet was 9.95 feet below the highest stage of the year, 0.72 foot above the lowest stage, 7.04 feet below the mean daily stage of December 31, 1944, and 24.6 feet below the record high stage of 329.1 feet on May 19, 1916.

Basins in San Diego County

The measurements of water level in 46 wells in San Diego County in 1945 indicate net declines during the year in all of the 6 principal river basins of the county. As shown in the following table, the average net decline in San Luis Rey, San Dieguito, San Diego, and Tia Juana River basins ranged from 0.74 foot in 18 wells in the San Diego River basin to 1.25 feet in 4 wells in the San Dieguito River basin. In Sweetwater and Otay River basins the net changes in water level are indicated by measurements made in only one well in each basin; well 18/2W-22, in Otay River basin, showed a net decline of 0.58 foot, and well 17/1W-19a, in Sweetwater

River basin, a net decline of 10.03 feet, the greatest in any one of the measured wells in the 6 basins. Small net rises in water level were shown in some wells in San Luis Rey, San Dieguito, San Diego, and Tia Juana River basins, the greatest of which was the rise of 2.73 feet in well 15/1E-2 in San Diego River basin.

Net changes in water level, in feet, in observation wells
in San Diego County, 1945

Basin	Number of wells	Number of measurements	Greatest net rise	Greatest net decline	Average net change
San Luis Rey River, Monserate Narrows to Oceanside	17	109	1.65	8.57	-1.01
San Dieguito River, San Pasqual Valley	a 4	15	.71	3.40	-1.25
San Diego River, El Monte Park to coast	b 18	93	c 2.73	1.96	-.74
Sweetwater River, at Sunnyside	d 1	4	....	e 10.03	-10.03
Otay River, at Otay	f 1	4	....	.58	-.58
Tia Juana River, near San Ysidro	5	20	.41	2.80	-.98

a Wells 12/LW-35A1 and 12/LW-35K1 not included because of incomplete records.

b Wells 15/LW-24a and 15/LW-28 not included because of incomplete records.

c Well 15/1E-2.

d Well 17/LW-19 not included; dry on Jan. 1, 1946.

e Well 17/LW-19a.

f Well 18/2W-22a not included; dry on Jan. 1, 1946.

Santa Ana River Basin, Riverside and San Bernardino Counties

San Bernardino area

The water level in well 1S/3-17C1, the Williams well near Redlands, rose from 13.62 feet below land-surface datum on January 6 to 2.70 feet, the highest observed stage of the year, on April 14 and 21. It then declined to 16.53 feet on August 18, rose again to 15.95 feet on August 25 in response to a summer storm, and then declined to 17.45 feet, the lowest observed stage of the year, on October 6. On December 29, reflecting the heavy rains during Christmas week, it had risen to a stage of 11.03 feet below land-surface datum, representing a net rise of 2.59 feet for the year.

Measurements of water level made during 1945 in eight wells distributed over the San Bernardino area indicate an average net rise of 0.3 foot from the levels of November 1944 to those of November 1945. This is 2.3 feet less than the corresponding rise from November 1943 to November 1944, and may indicate that generally the water levels have about reached the highest stages to be anticipated as a result of the recent series of years

of average or greater than average precipitation. However, the net change in water level during the year in individual wells shows considerable departure from the average change. Thus, in well 1N/4-36F1, east of San Bernardino, near Del Rosa Avenue, there was a net rise of 5.1 feet, while in well 1S/3-28E1, west of Redlands, near Alabama Street, there was a net decline of 2.2 feet.

San Jacinto Valley

Measurements of water level made during 1945 in six wells distributed over the San Jacinto Valley indicate net changes from November 4, 1944, to November 2, 1945, ranging from a net rise of 5.18 feet in well 3/2W-35Q1, near Lakeview, to a net decline of 4.68 feet in well 5/2W-27E2, in Winchester. The average net change for the six wells was a rise of 0.3 foot.

Basins in Santa Barbara County

Program of work

The Geological Survey in cooperation with Santa Barbara County, has maintained periodic water-level measurements in observation wells in the seven principal ground-water areas of the county since the early part of 1941. These measurements, made in connection with the inventory of the ground-water resources of the county, have been published through 1943 in Water-Supply Papers 941, 949, and 991; and also through 1945 have been released locally in typewritten form. The several different ground-water areas have been described briefly in Water-Supply Paper 949.

In addition to measurements by the Geological Survey, measurements were also made during 1945 in the Santa Maria Valley by the Santa Maria Valley Water Conservation District, the city of Santa Maria, and the San Joaquin Power Division of the Pacific Gas and Electric Company and are included in this report. Of the 185 observation wells being maintained at the end of 1944, measurements were discontinued during 1945 in 38 wells. Measurements were begun in 19 new observation wells, making a total of 166 at the end of 1945. During the year most of the wells were visited once a month, and tape measurements made, but some were equipped with water-stage recorders or "high-low" float gages.

General hydrologic conditions and fluctuations of water level

Rainfall in 1945 was 15 to 18 percent less than in 1944. For the year ending September 30, rainfall at Santa Maria was 11.31 inches as compared with 14.56 inches in 1944; at Santa Barbara it was 15.29 inches as compared with 17.92 inches in 1944. Also, the rainfall was about the same percent below the average long-term rainfall at those stations for the period 1910-40. At 12 local stations maintained by the Geological Survey (see Water-Supply Paper 949, p. 182), the rainfall was also somewhat less in the calendar-year 1945 than in 1944. Records at three of the stations are incomplete for 1945, but the average at the remaining nine was 14.99 inches as compared with an average of 18.28 inches at the same nine stations the preceding year. Furthermore, the rains were not well distributed. They began in November 1944 with one large storm and essentially ended in another single storm in late January and early February. Considerable rain fell in March, but was so scattered that it did little good to crops in much of the county. In the fall, rains did not begin in force until near the end of December necessitating scattered late pumping. Accordingly, pumping for irrigation began in April, and extended into November, making a rather long pumping season. As a result, the maximum stages reached by water levels in the spring of 1945 were appreciably lower than the corresponding stages reached in 1944 in all but two areas. In the Carpinteria Basin the March rains were adequate to forestall irrigation; and in the Cuyama Valley irrigation did not begin until May when temperatures were high enough to allow planting. In all areas the year-end levels in 1945 were generally lower than the year-end levels in 1944. Figure 8, which gives graphs of water-level fluctuations in nine representative wells, illustrates these features.

Carpinteria Basin

In the Carpinteria Basin water levels recovered slowly after the 1944 pumping season, reaching a maximum in most wells at the end of April. The maximum levels were from 1 to 8 feet higher than corresponding levels the preceding year. The net rise was greatest in the part of the basin east of Carpinteria Creek, where the average rise in four wells was 6 feet. Year-end levels were lower than in December 1944 in all observation wells but one, and the net decline was between 3 and 5 feet in nearly all the wells.

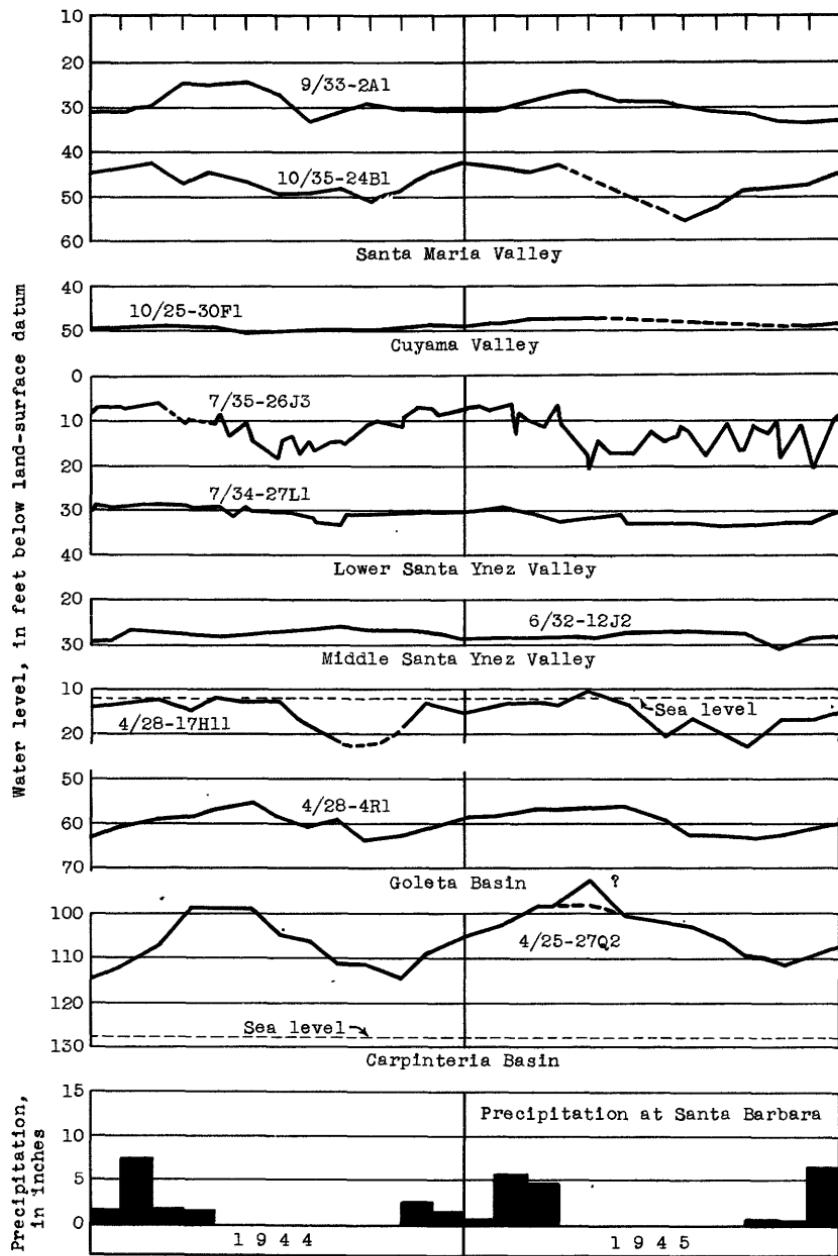


Figure 8.--Graphs showing water-level fluctuations in nine wells in Santa Barbara County, Calif., and monthly rainfall at Santa Barbara, 1944-45.

Goleta Basin

In most wells the maximum levels were reached in April and, in general, were lower than corresponding levels for the preceding year. The net drop was 1 to 2 feet in the southern part of the area, and 2 to 4 feet in the central part. Along the northern margin and in the southwestern part, some wells had a small net rise, but the change, either up or down, was less than 1 foot. Year-end levels in almost all wells were lower than in 1944 by amounts ranging from about 1 foot in most of the area to 4 to 8 feet in the central heavily pumped area.

Middle Santa Ynez Valley

Throughout the Middle Santa Ynez Valley maximum stages were everywhere lower than in 1944. The difference was greatest in wells in the upland north of the river where the net decline amounted to as much as 4 feet. Along the river the decline was less than 1 foot. Similarly, year-end levels ranged from about the same as in 1944 to as much as 4.5 feet lower, with the greatest declines in the area away from the river, except in one well along the river in which the year-end net decline was 7.05 feet.

Lower Santa Ynez Valley

In the Lompoc Plain water level in the deep observation wells that tap the main aquifers reached their highest stages in February or March. They were from less than 1 foot to more than 4 feet lower than the 1944 maximum levels. In most of the area the decline amounted to between 1 and 2 feet, but was greater near the southern margin of the plain. Year-end levels were about the same in 1945 as in 1944 except in wells immediately east of Lompoc near the river where, because of low river stage, there was a net decline of about 3 feet.

San Antonio Valley

Water levels in wells in the San Antonio Valley fluctuated only slightly in 1945, and reached their highest stages during the spring months. Both the year-end and maximum levels were lower than those in 1944 by amounts ranging from 0.1 to 1 foot.

Santa Maria Valley

In the Santa Maria Valley maximum water levels were attained in all months from January to July, with a concentration of peaks in March and April. In nearly all wells the highest levels were lower than in the pre-

ceding year by amounts ranging from less than 1 foot to nearly 14 feet. Similarly, year-end levels were universally lower than in 1944 by amounts ranging from less than 1 foot to more than 8 feet. In general, the declines were less than 2 feet in the western part of the valley.

Cuyama Valley

In four of the seven observation wells in the Cuyama Valley the highest levels of the year were lower than those in 1944 by amounts ranging from less than 1 foot to more than 7 feet; in the remaining three wells the levels were higher by amounts ranging from less than 1 foot to nearly 2 feet. The maximum net rise of nearly 2 feet was in a well near the middle of the valley where pumping for irrigation is concentrated. In this well also, the year-end level was almost 1 foot higher than that in 1944, whereas in all other wells the year-end level was lower.

SYMBOLS ASSIGNED TO OBSERVATION WELLS

In the following descriptions and records of water level, observation wells are identified by symbols or "numbers" that indicate their respective locations according to the rectangular system for subdivision of public land. In Water-Supply Paper 991 these symbols were assigned for the first time to all Geological Survey observation wells in the State, according to the system described in that water-supply paper and there accompanied by a cross-reference table of previous numbers and location symbols.

The descriptions and records are given by counties in alphabetical sequence, and for each county in numerical order of the location symbols. Thus, certain groups of the data each pertain to a distinct ground-water area as indicated by sub-headings in the record. However, other groups of data each span two or more ground-water areas--under this circumstance, the area is indicated in the text statements that introduce the several records of individual wells.

WELL DESCRIPTIONS AND WATER-LEVEL MEASUREMENTS

Kern County

Antelope Valley

9/12-21D1 (*991, p. 100; 1021, p.85). Southern Pacific Lands Agency. Measuring point beginning June 28, 1945, top of casing, at land-surface datum. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum; 1945: June 28, 41.2; Oct. 2, 42.5; Nov. 7, 41.6.

9/13-20H1 (*991, p. 101; 1021, p.86). Harry White. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Feb. 7, 64.2; June 28, 70.2; Oct. 2, 71.5; Nov. 7, 68.0.

9/13-20H2 (*991, p. 101; 1021, p. 86). Harry White. No measurements made in 1945.

9/13-35Pl. P. D. Gaskill. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 9 N., R. 13 W., 50 feet north of Avenue A and 0.25 mile east of 60th Street W., in small green pump house. Used irrigation well. Measuring point, pump base, 0.1 foot above land-surface datum which is about 2,378 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 6, 1943, 43.4; May 9, 1944, 54.1; Mar. 5, 1945, 46.6; Nov. 7, 1945, 56.8.

9/14-24Q1. De Fone. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 9 N., R. 14 W., 0.2 mile north of south line of section and 0.5 mile west of 100th Street W., extended. Used irrigation well, diameter 14 inches. Measuring point, hole in metal pump base, 1.0 foot above land-surface datum which is about 2,492 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941, 1943-45

Date	Water level	Date	Water level	Date	Water level
Nov. 22, 1941	93.5	Dec. 7, 1943	98.1	Mar. 12, 1945	97.7
Aug. 10, 1943	97.9	May 3, 1944	98.0	Nov. 14	102.2

9/14-29ML. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 9 N., R. 14 W., 500 feet east of 150th Street W., extended, and 1,500 feet north of south line of section. Diameter 6 inches. Measuring point, top of casing, 0.7 foot above land-surface datum which is about 2,630 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Nov. 22, 1941	175.5	Aug. 20, 1943	176.8	Nov. 28, 1944	176.6
Apr. 24, 1942	175.5	Sept. 24	176.3	Dec. 11	176.6
Sept. 25	175.6	Dec. 7	176.5	Jan. 8, 1945	176.7
Jan. 9, 1943	175.9	Apr. 24, 1944	176.4	Feb. 7	176.7
Feb. 19	176.1	May 4	176.3	Mar. 12	176.7
Mar. 26	176.5	July 1	176.5	May 7	176.8
Apr. 30	177.1	29	176.5	June 28	176.7
May 28	178.4	Sept. 21	176.6	Oct. 2	176.8
June 25	178.2	Oct. 28	176.6	Nov. 14	176.8
July 23	177.5				

9/14-32DL. Sears. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 9 N., R. 14 W., 200 feet east of 150th Street W., extended, and 375 feet south of north line of section. Diameter 16 inches. Equipped with windmill. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,630 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Nov. 22, 1941	164.8	May 28, 1943	179.5	June 28, 1945	170.2
Apr. 24, 1942	165.2	Apr. 4, 1944	176.6	Oct. 2	169.9
30, 1943	180.1	May 7, 1945	b166.8	Nov. 14	168.3

a Pumping.

b Stopped windmill to measure.

Los Angeles County

Antelope Valley

5/9-6B1. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 6, T. 5 N., R. 9 W., 0.7 mile east of 147th Street E., and 800 feet south of Avenue S. Diameter 12 inches. Measuring point, top of casing, 1.3 feet above land-surface datum which is about 2,846 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Apr. 2, 1940	47.6	Nov. 25, 1940	49.1	Aug. 29, 1941	33.4
May 18	47.8	Dec. 28	49.1	Sept. 27	34.8
July 27	48.5	Jan. 31, 1941	49.2	Nov. 26	36.3
Aug. 23	48.8	Apr. 9	40.1	Dec. 2	36.5
Sept.	48.9	May 30	34.9	Jan. 31, 1942	36.7
Oct.	49.0	July 18	32.6	Feb. 13	36.9

5/9-6B1--Continued.

Water level, in feet below land-surface datum, 1940-45

Date	Water level	Date	Water level	Date	Water level
Mar. 28, 1942	37.5	Nov. 21, 1942	41.2	Aug. 20, 1943	37.0
Apr. 24	36.2	Dec. 26	41.4	Sept. 25	39.1
May 29	39.3	Jan. 30, 1943	40.8	Dec. 2	30.9
June 28	39.8	Feb. 19	37.3	Jan. 22, 1944	32.5
July 31	40.4	Mar. 26	31.9	May 15	25.8
Aug. 21	40.8	May 3	32.9	July 29	25.1
Sept. 25	41.0	June 26	34.0	Mar. 16, 1945	29.8
Oct. 23	41.1	July 22	35.3	Dec. 5	a 32.9

a Measurement by Geological Survey.

5/9-20J1 (*1021, p. 86). L. M. Nixon. Measurements by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 15, 46.8.

5/10-6N1. Little Rock Irrigation District. SW_{1/4}SW_{1/4} sec. 6, T. 5 N., R. 10 W., 25 feet north of Avenue T and 45 feet east of 87th Street E. Unused well. Measuring point, base of pump at oil line, at land-surface datum which is about 2,777 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1938, 1940-45

May 1, 1938	a108	Nov. 26, 1940	92.4	Dec. 16, 1943	90.5
July 16	107.8	Apr. 28, 1941	87.2	May 10, 1944	88.4
Aug. 13	94.6	Nov. 25	90.8	Mar. 2, 1945	85.0
Nov. 19	93.0	21, 1942	93.5	Nov. 5	88.0
Mar. 28, 1940	91.5				

a Water seeping into well.

5/10-7E1. Calavally. SW_{1/4}NW_{1/4} sec. 7, T. 5 N., R. 10 W., 40 feet north of Avenue T8 and 130 feet east of 87th Street E. Irrigation well, unused since 1941, diameter 16 inches, original depth 550 feet. Measuring point, top of concrete pump base and casing, 1.5 feet above land-surface datum which is about 2,815.5 feet above sea level. Water-stage recorder installed and operated since July 1, 1944, by Los Angeles County Flood Control District. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1938, 1940-45

July 16, 1938	129.0	July 28, 1944	120.1	Apr. 27, 1945	117.1
Aug. 13	125.9	Aug. 24	119.3	May 21	120.0
Mar. 28, 1940	123.5	Sept. 30	119.3	June 28	127.3
Nov. 27	125.0	Oct. 29	118.2	July 31	a 131.9
Apr. 28, 1941	120.1	Nov. 28	117.4	Aug. 31	123.9
Nov. 26	121.8	Dec. 21	116.9	Sept. 19	123.8
21, 1942	124.3	Jan. 9, 1945	116.7	Oct. 3	131.5
Dec. 16, 1943	121.5	Feb. 8	116.4	Nov. 5	121.0
May 10, 1944	119.9	Mar. 28	116.2	Dec. 3	121.4

a Affected by pumping of well 5/11-12H1.

5/10-7R1. Tamarack Park. SE_{1/4}SE_{1/4} sec. 7, T. 5 N., R. 10 W., 50 feet north of Avenue U and 200 feet west of 97th Street E. Domestic well, diameter 16 inches. Measuring points: (1) Through Apr. 28, 1941, base of pump and top of concrete block, 1.0 foot above land-surface datum; (2) since Apr. 28, 1941, base of pump, raised, 1.5 feet above land-surface datum which is about 2,892 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1938, 1940-45

July 16, 1938	204.0	Nov. 26, 1941	200.9	May 11, 1944	200.7
Mar. 28, 1940	201.7	21, 1942	204.0	Mar. 7, 1945	200.4
Nov. 27	202.8	Dec. 15, 1943	201.7	May 5	202.1
Apr. 28, 1941	199.2				

5/10-12B1. Ed Sanner. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 5 N., R. 10 W., 2,800 feet east of 137th Street E., 300 feet south of Avenue T, extended, and 300 feet east of desert road. Dug domestic well, depth 70 feet; 20 feet of 10-inch diameter casing. Equipped with plunger pump and gasoline engine. Measuring point, top of timber floor at bottom of pump base, 0.4 foot above land-surface datum which is about 2,884 feet above sea level.

Water level, in feet below land-surface datum, 1940-41, 1943-45

Date	Water level	Date	Water level	Date	Water level
Mar. 28, 1940	a 64.9	May 15, 1944	a 55.4	Sept. 7, 1945	51.9
Nov. 25	a 63.4	Mar. 16, 1945	a 53.2	Oct. 5	51.7
Apr. 9, 1941	a 56.2	July 5	52.4	Nov. 6	51.5
Nov. 26	a 53.8	Aug. 2	52.1	Dec. 5	51.3
Dec. 2, 1943	a 56.3				

a Measurement by Los Angeles County Flood Control District.

5/10-21J1. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 21, T. 5 N., R. 10 W., 130 feet west of 117th Street E. and 20 feet south of Avenue V-8 (Pear Blossom Highway). Unused well, diameter 18 inches, depth 35 feet. Measuring point, floor of pump house, 1.0 foot above land-surface datum which is about 3,078 feet above sea level. Measurement on Mar. 29 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 29, 21.0; Dec. 5, 19.6.

5/10-23F1 (*1021, p. 86). New pump installed in 1945; no entry to casing. Measurements discontinued.

5/10-26B1. R. J. Darling. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 26, T. 5 N., R. 10 W., 400 feet south of Avenue W (Pear Blossom Highway) and 1,150 feet east of 132d Street E. Unused well, diameter 10 inches, depth 86.5 feet. Measuring point, top of casing, at land-surface datum which is about 3,155 feet above sea level.

Water level, in feet below land-surface datum, 1940-42, 1945

Sept. 13, 1940	a 49.6	Dec. 5, 1942	a 51.3	Dec. 5, 1945	47.8
Apr. 22, 1941	a 48.2	Mar. 15, 1945	a 42.9		

a Measurements by Los Angeles County Flood Control District.

5/11-4RL. Joe Martin. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T. 5 N., R. 11 W., 300 feet east and 300 feet north of bend in Pear Blossom Highway, and 2.5 miles west of Little Rock Creek. Unused well. Measuring point, hole in south side of pump base, 0.5 foot above land-surface datum which is about 2,756 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 13, 1940	153.4	Nov. 21, 1942	151.8	Mar. 16, 1945	145.3
Nov. 26, 1941	149.2	Dec. 16, 1943	152.6	Nov. 5	140.7
Feb. 13, 1942	148.4	May 9, 1944	154.7		

5/11-9Q1. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 5 N., R. 11 W., approximately 1 mile south along road from Pear Blossom Highway and 15 feet west of road. Unused well, diameter 10 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,857 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 12, 1940	51.8	Nov. 21, 1942	37.8	Mar. 7, 1945	29.4
Apr. 9, 1941	50.5	Dec. 16, 1943	40.6	Nov. 5	30.4
Dec. 2	46.1	May 15, 1944	39.5		

5/11-9RL. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 5 N., R. 11 W., approximately 0.9 mile south along road from Pear Blossom Highway, at mouth of canyon, 175 feet east of road, on east side of creek. Casing on mound in barbed-wire corral. Unused well, diameter 12 inches. Measuring point, top of casing, 2.0 feet above land-surface datum which is about 2,833 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 12, 1940	52.1	Nov. 27, 1942	40.9	Mar. 7, 1945	32.8
Apr. 19, 1941	51.6	Dec. 16, 1943	43.4	Nov. 5	32.6
Dec. 2	48.7	May 15, 1944	41.5		

5/11-10R1. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T. 5 N., R. 11 W., 400 feet west of Pear Blossom Highway and 0.75 mile southwest of bridge over Little Rock Creek. Abandoned well, diameter 16 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,835 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1927-28, 1930, 1932, 1937-45

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1927	107.0	May 31, 1940	113.4	Feb. 19, 1943	80.3
Dec. 6	108.0	June 29	113.6	Mar. 26	80.6
Jan. 21, 1928	108.0	July 27	115.6	May 3	81.2
July 29	109.0	Aug. 24	113.7	29	81.7
Dec. 5	110.5	Jan. 31, 1941	116.8	June 26	81.6
Feb. 4, 1930	114.0	Apr. 9	114.7	July 22	73.8
Apr. 26	114.6	May 30	114.9	Aug. 20	42.8
July 17	115.0	July 18	41.8	Sept. 25	43.2
Nov. 29	115.5	Aug. 29	42.8	Dec. 16	71.6
Mar. 9, 1932	119.9	Sept. 27	61.2	Jan. 23, 1944	76.6
Apr. 12	120.0	Nov. 26	61.3	May 9	42.2
May 10	120.1	Feb. 13, 1942	77.6	July 28	35.9
29, 1937	126.0	Mar. 28	77.6	Jan. 9, 1945	57.6
June 26	125.0	Apr. 24	77.8	Feb. 8	59.2
Feb. 26, 1938	137.2	May 29	78.0	Mar. 2	59.0
May 1	131.2	June 27	78.2	May 8	57.1
July 16	140.7	July 31	78.5	June 7	51.2
Aug. 13	144.5	Aug. 21	79.0	29	48.3
Sept. 24	131.3	Sept. 25	78.3	July 31	54.4
Nov. 19	134.2	Oct. 23	78.9	Aug. 31	59.7
Feb. 11, 1939	135.1	Nov. 17	79.4	Oct. 3	60.9
May 20	125.5	Dec. 26	79.8	Nov. 5	60.0
Mar. 28, 1940	113.3	Jan. 30, 1943	80.1	Dec. 3	62.6

5/11-12H1. Wheelock. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 5 N., R. 11 W., 600 feet east of 85th Street E., and 500 feet north of Avenue T8. Northeast well in pump house. Used irrigation well, diameter 16 inches, depth 310 feet. Measuring point, air-line hole in pump base, 1.5 feet above land-surface datum which is about 2,804 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1937, 1940-45

Nov. 11, 1937	111.5	Nov. 26, 1941	104.1	May 10, 1944	101.5
Mar. 29, 1940	106.0	24, 1942	106.5	July 24, 1945	120.7
Nov. 27	107.4	Dec. 16, 1943	103.9	Nov. 5	102.8
Apr. 28, 1941	102.3				

5/11-12Q1. Wheelock. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 5 N., R. 11 W., 400 feet east of 82d Street E., and 700 feet north of Avenue U. Used irrigation well, diameter 16 inches, depth 392 feet. Measuring point, air-line hole in pump base, 1.0 foot above land-surface datum which is about 2,833 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Mar. 29, 1940	131.4	Nov. 26, 1941	130.4	May 10, 1944	131.7
Nov. 27	135.2	21, 1942	135.1	Mar. 2, 1945	122.2
Apr. 28, 1941	129.8	Dec. 16, 1943	134.2	Nov. 5	128.2

5/11-13J1. Little Rock Irrigation District. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 5 N., R. 11 W., 50 feet south of Pear Blossom Highway and 2,500 feet east of 82d Street E. Irrigation well, diameter 14 inches, sounded depth Dec. 16, 1943, 254 feet. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,913 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: May 11, 1944, 211.4; Mar. 29, 1945, 207.9; Nov. 5, 1945, 213.0.

5/11-14F1 (*991, pp. 101-102; 1021, p. 86). Littleton. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 7, 26.1; Nov. 5, well filled with rocks to 20.0 feet. Measurements discontinued.

6/8-10N1 (*991, p. 102; 1021, p. 86). W. G. Baguet. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 26.0; Nov. 7, 23.8.

6/8-18D1 (*991, p. 102; 1021, p. 86). Hoff. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 159.5; July 5, 169.6, pumping; Sept. 7, 160.5; Dec. 7, 158.6.

6/8-32P1 (*1021, p. 86). M. B. Scofield. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 190.7; Dec. 7, 196.6.

6/9-4H1 (*991, pp. 102-103; 1021, p. 87). Wilsons School. Measurement on Jan. 10 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Jan. 10, 110.2; Nov. 7, 111.2.

6/9-29G1 (*991, p. 103; 1021, p. 87). Rankin. No measurements made in 1945.

6/9-31R1. Barlow. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 6 N., R. 9 W., 85 feet north of Avenue S, 60 feet west of branch of Big Rock Creek, and 400 feet west of southeast corner of section. Unused well, diameter 16 inches. Measuring point, top of casing, 0.8 foot below land-surface datum which is about 2,833 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Date	Water level	Date	Water level	Date	Water level
May 18, 1940	40.5	Nov. 26, 1941	28.2	May 15, 1944	a 9.8
Nov. 25	41.2	Dec. 3, 1942	34.4	Mar. 16, 1945	22.3
Apr. 9, 1941	32.1	2, 1943	24.6	Dec. 5	b 27.5

a Creek flowing within 10 feet of well.

b Measurement by Geological Survey.

6/10-9C1. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 6 N., R. 10 W., 0.25 mile south of Avenue N, 0.5 mile west of 110th Street E., and 15 feet east of old sheet-metal pump house. Abandoned well. Measuring point, top of casing in concrete block, at land-surface datum which is about 2,578 feet above sea level. Measurements by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 28, 182.8.

6/10-9E1. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 6 N., R. 10 W., 0.25 mile east of 100th Street E., extended, and 0.3 mile south of Avenue N, extended. Used irrigation and domestic well. Measuring point, hole in east side of pump base, 0.3 foot above land-surface datum which is about 2,576 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-43, 1945

Nov. 27, 1940	135.1	Dec. 5, 1942	134.2	Mar. 14, 1945	187.6
Apr. 24, 1941	129.9	Oct. 15, 1943	136.4	Dec. 5	a 189.4
Dec. 2	125.4				

a Measurement by Geological Survey.

6/10-9Q1. N. C. and O. C. Riley. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 6 N., R. 10 W., 120 feet north of Avenue O, and 175 feet east of 105th Street E. Used irrigation and domestic well. Measuring point, hole in casing under pump base at top of concrete block, 2.5 feet above land-surface datum which is about 2,596 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Nov. 27, 1940	152.7	Dec. 5, 1942	150.9	Mar. 14, 1945	151.3
Apr. 24, 1941	147.2	15, 1943	153.0	Dec. 5	a 150.3
Dec. 2	142.1	May 9, 1944	153.0		

a Measurement by Geological Survey.

6/10-10Q1. SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T. 6 N., R. 10 W., 45 feet north of Avenue O and 75 feet east of 115th Street E., extended. Unused well, depth 169 feet (1943). Measuring point, top of casing, 2.0 feet above land-surface datum which is about 2,612 feet above sea level.

6/10-10Q1--Continued.

Water level, in feet below land-surface datum, 1943-45

Date	Water level	Date	Water level	Date	Water level
Sept. 23, 1943	a 66.5	May 9, 1944	a 66.2	Dec. 5, 1945	69.8
Dec. 15	a 65.6	Mar. 14, 1945	a 75.9		

a Measurements by Los Angeles County Flood Control District.

6/10-20P1. Mrs. Johnson. $SE_1^4SW_1^4$ sec. 20, T. 6 N., R. 10 W., 2,600 feet east of 90th Street E., and 30 feet north of Avenue Q. Wooden tower over casing. Unused well, diameter 10 inches. Measuring point, top of casing, 2.4 feet above land-surface datum which is about 2,637 feet above sea level.

Water level, in feet below land-surface datum, 1940-45

Sept. 11, 1940	ab165.6	Oct. 23, 1942	a157.8	Dec. 15, 1943	a150.1
Nov. 26	a164.6	Nov. 21	a157.3	Jan. 23, 1944	a148.9
Apr. 9, 1941	a158.1	Dec. 26	a157.0	May 9	a144.0
May 30	ab166.6	Jan. 30, 1943	a156.4	July 29	a136.8
July 18	ab163.8	Feb. 19	a156.1	Mar. 14, 1945	a135.0
Aug. 29	ab164.3	Mar. 26	a155.6	June 5	139.6
Sept. 27	a162.5	May 3	a154.6	July 5	140.2
Jan. 1942	a156.3	29	a153.1	Aug. 2	140.4
Feb. 13	a155.6	June 26	a152.7	Sept. 7	142.5
Apr. 24	a153.9	July 22	a153.2	Oct. 5	142.4
June 28	a157.6	Aug. 20	a153.3	Nov. 6	141.9
Aug. 21	ac158.2	Sept. 25	a153.2	Dec. 5	142.3
Sept. 25	ac158.5				

a Measurements by Los Angeles County Flood Control District.

b Adjacent well pumping.

c Heavy pumping nearby.

6/10-27B1. $NW_1^4NE_1^4$ sec. 27, T. 6 N., R. 10 W., 50 feet north of Avenue Q and 0.5 mile east of 110th Street E. Used irrigation well. Measuring point, air-line hole in northeast quadrant of pump base, 0.5 foot above land-surface datum which is about 2,676 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-41, 1943-45

Sept. 11, 1940	161.9	Nov. 26, 1941	152.8	Dec. 5, 1944	152.7
Nov. 27	161.7	Dec. 15, 1943	148.1	5, 1945	a152.7
Apr. 23, 1941	159.3				

a Measurement by Geological Survey.

6/10-27B3. $NW_1^4NE_1^4$ sec. 27, T. 6 N., R. 10 W., 85 feet north of Avenue Q and 0.6 mile east of 110th Street E. Unused well, diameter 12 inches. Measuring point, top of casing, 1.4 feet above land-surface datum which is 2,678 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-41, 1943-45

Sept. 11, 1940	163.3	Nov. 26, 1941	154.1	May 9, 1944	a164.3
Nov. 27	163.2	Dec. 15, 1943	148.8	Mar. 14, 1945	153.2
Apr. 23, 1941	160.9				

a Two nearby wells pumping.

6/10-32E1. McAlester. $SW_1^4NW_1^4$ sec. 32, T. 6 N., R. 10 W., 30 feet east of 90th Street E. and 25 feet north of Avenue R8. (West well.) Unused well, diameter 12 inches, depth 600 feet. Measuring point, hole in east side of pump base, 1.0 foot above land-surface datum which is about 2,684 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 11, 1940	100.3	May 30, 1941	85.4	Feb. 13, 1942	89.0
Nov. 26	101.0	July 18	85.0	Mar. 24	90.5
Dec. 28	101.4	Aug. 29	84.8	June 29	91.7
Jan. 31, 1941	101.6	Sept. 27	85.4	July 31	92.1
Apr. 9	94.9	Nov. 26	87.3	Aug. 21	92.6

6/10-32E1--Continued.

Water level, in feet below land-surface datum, 1940-45

Date	Water level	Date	Water level	Date	Water level
Oct. 23, 1942	93.6	May 3, 1943	74.1	Sept. 25, 1943	91.8
Nov. 21	94.2	29	78.4	Dec. 13	88.5
Dec. 26	94.8	June 26	81.2	Jan. 23, 1944	87.8
Jan. 30, 1943	94.0	July 22	84.8	Mar. 14, 1945	88.3
Feb. 19	88.8	Aug. 20	88.6	Dec. 5	a 96.4
Mar. 26	80.3				

a Measurement by Geological Survey.

6/10-32F1. McAlester. $SE_1^4 NW_1^4$ sec. 32, T. 6 N., R. 10 W., 35 feet west of 95th Street E. and 25 feet north of Avenue RB. Used domestic and stock well, diameter 16 inches, depth 700 feet. Measuring point, top of casing, 1.5 feet above land-surface datum which is about 2,692 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 11, 1940	117.3	Nov. 26, 1941	111.5	May 11, 1944	a105.4
Nov. 26	118.0	21, 1942	118.4	Mar. 14, 1945	101.4
Apr. 9, 1941	111.6	Dec. 15, 1943	111.2	Dec. 5	b105.4

a Adjacent well pumping. b Measurement by Geological Survey.

6/11-4C1. Lyons Bros. $NE_1^4 NW_1^4$ sec. 4, T. 6 N., R. 11 W., 0.45 mile east of 40th Street E., and 20 feet north of a dirt road which is 0.25 mile south of Avenue M. Irrigation well. Measuring point, bottom of pump base at oil line, 1.0 foot above land-surface datum which is about 2,480 feet above sea level. Water levels, in feet below land-surface datum: Dec. 5, 1942, 147.0; Dec. 13, 1943, 151.1; Mar. 13, 1945, 149.1.

6/11-5A1 (*991, p. 103; 1021, p. 87). Lyons Bros. Measurement on Mar. 13 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 13, 148.1; Nov. 6, 162.2.

6/11-8R1. $SE_1^4 SE_1^4$ sec. 8, T. 6 N., R. 11 W., 50 feet north of Avenue O and 1,100 feet west of 40th Street E. Used irrigation well. Measuring point, base of pump at air line in northeast quadrant, 1.0 foot above land-surface datum which is about 2,522 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 18, 1940	70.0	Dec. 4, 1942	178.8	May 10, 1944	182.3
Nov. 28	70.5	13, 1943	181.8	Dec. 4, 1945	a188.9

a Measurement by Geological Survey.

6/11-9F1. Elmer Benson. $SE_1^4 NW_1^4$ sec. 9, T. 6 N., R. 11 W., 1,300 feet south of Avenue N and about 0.5 mile east of 40th Street E. Used irrigation well. Measuring point, hole in northeast quadrant of pump base, 0.2 foot above land-surface datum which is about 2,505 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-43, 1945

Nov. 27, 1940	66.6	Dec. 5, 1942	163.1	Mar. 13, 1945	167.1
25, 1941	158.4	13, 1943	167.3	Dec. 4	a173.6

a Measurement by Geological Survey.

6/11-12M1. E. J. Ball. $NW_1^4 SW_1^4$ sec. 12, T. 6 N., R. 11 W., 1,400 feet north of Avenue O extended, and 1,200 feet east of 70th Street E., extended. Irrigation well. Measuring point, pump base, east side of air line, 1.0 foot above land-surface datum which is about 2,540 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-43, 1945

Nov. 25, 1941	171.1	Dec. 14, 1943	176.2	Dec. 5, 1945	a180.5
Dec. 4, 1942	173.0	Mar. 14, 1945	178.2		

a Measurement by Geological Survey.

6/11-12Q1 (*1021, p. 87). E. J. Ball. Water level, in feet below land-surface datum, 1945: Dec. 6, 177.3

6/11-19E1. Palmdale Irrigation District. SW₁NW₄ sec. 19, T. 6 N., R. 11 W., 35 feet east of 20th Street E. and 45 feet north of Avenue P8, extended. Corrugated-iron pump house. Domestic and irrigation well. Measuring point, bottom of east pump base, at land-surface datum which is about 2,583 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1930, 1937-45

Date	Water level	Date	Water level	Date	Water level
Feb. 4, 1930	185.6	May 31, 1940	220.1	Dec. 26, 1942	231.2
Apr. 26	186.0	Aug. 23	223.4	Jan. 30, 1943	230.6
July 17	187.6	Nov. 29	220.9	Feb. 19	230.2
Nov. 29	188.0	Jan. 31, 1941	219.7	Mar. 26	b231.8
May 29, 1937	208.8	Apr. 9	219.4	May 29	b233.7
June 25	209.4	24	219.8	July 27	b235.8
Nov. 9	210.9	May 30	b224.0	Aug. 20	b236.2
Jan. 22, 1938	218.4	Oct. 31	221.8	Sept. 25	b236.4
May 1	211.6	Nov. 24	b225.4	Nov. 30	236.8
July 16	214.6	Dec. 6	222.5	Dec. 13	236.9
Sept. 24	217.8	Jan. 31, 1942	222.6	Jan. 22, 1944	235.6
Nov. 19	213.6	Feb. 13	222.8	May 1	235.2
Feb. 11, 1939	213.0	Mar. 28	224.4	28	239.5
Nov. 18	217.0	Apr. 24	b228.0	Mar. 14, 1945	227.6
Dec. 9	216.4	Nov. 17	232.0	May 8	238.4
Feb. 16, 1940	217.0				

a Well 0.25 mile northeast pumping.

b Nearby well pumping.

6/11-20PL. Mrs. F. C. Smith. SE₁SW₄ sec. 20, T. 6 N., R. 11 W., 30 feet north of Avenue Q and 200 feet west of 35th Street E. Irrigation well. Measuring point, hole on east side of pump base, 0.5 foot above land-surface datum which is about 2,580 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Apr. 28, 1941	209.7	Dec. 13, 1943	223.3	Mar. 14, 1945	224.9
Dec. 2	212.3	May 8, 1944	226.0	Dec. 4	a230.1
Nov. 21, 1942	218.7				

a Measurement by Geological Survey.

6/11-26RL. SE₁SE₄ sec. 26, T. 6 N., R. 11 W., 225 feet west of 70th Street E and 300 feet north of Avenue R. Unused well, 5-inch casing below 4-foot square dug pit. Measuring point, top of timber on concrete cribbing at northeast corner of pit, 0.5 foot below land-surface datum which is about 2,664 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Nov. 29, 1940	114.2	Nov. 21, 1942	99.7	Mar. 7, 1945	97.3
Apr. 28, 1941	111.7	29, 1943	98.9	Dec. 5	a101.9
Dec. 2	97.0	May 8, 1944	98.6		

a Measurement by Geological Survey.

6/11-29E1 (*991, p. 103; 1021, p. 87). Pierce. Measurements discontinued in 1945.

6/11-28N1. SW₁SW₄ sec. 28, T. 6 N., R. 11 W., 150 feet north of Avenue R and 0.25 mile east of 40th Street E. Measuring point, edge of 8-inch discharge pipe north side of pump, 2.5 feet horizontally from top of casing, at land-surface datum which is about 2,625 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Apr. 28, 1941	93.5	Nov. 29, 1943	95.5	Mar. 7, 1945	93.0
Dec. 2	94.3	May 8, 1944	93.2	Nov. 5	95.9
4, 1942	95.0				

6/11-32Pl (See Water-Supply Paper 578, p. 366, well 111). Palmdale Rancho. Formerly owned by J. Boyle. $SE\frac{1}{4}SW\frac{1}{4}$ sec. 32, T. 6 N., R. 11 W., 30 feet north of Avenue S and 50 feet west of 35th Street E. Irrigation well, diameter 16 inches, depth 495 feet, May 1917. Measuring point through May 10, 1927, bottom of pump base, at land-surface datum; since 1940, bottom of I-beam pump support, 2.5 feet above land-surface datum which is about 2,675 feet above sea level.

Water level, in feet below land-surface datum, 1919, 1921, 1924-27, 1940-43, 1945

Date	Water level	Date	Water level	Date	Water level
Sept. 1919	114.0	Oct. 7, 1925	140.7	Dec. 2, 1941	b168.3
Feb. 12, 1921	118.1	May 12, 1926	136.5	Nov. 21, 1942	b170.0
Aug. 119.0		10, 1927	a147.0	Dec. 13, 1943	b172.0
Oct. 24, 1924	134.5	Sept. 13, 1940	b177.5	Nov. 6, 1945	b175.5
May 5, 1925	137.1	Apr. 28, 1941	b166.6		

a Pumping in vicinity.

b Measurement by Los Angeles County Flood Control District.

6/11-33R1. Thornberg. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 33, T. 6 N., R. 11 W., 30 feet north of Avenue S and 750 feet east of Pear Blossom Highway. Irrigation well. Measuring point, pump base at air line, 0.5 foot above land-surface datum which is 2,682 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Apr. 28, 1941	119.5	Nov. 29, 1943	122.4	Mar. 7, 1945	116.4
Dec. 2	121.2	May 9, 1944	a138.0	Nov. 5	123.7
Nov. 21, 1942	122.4				

a Down only a short time.

6/12-25N1 (*1021, p. 87). Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

June 7	285.1	Aug. 31	286.8	Nov. 5	286.8
29	285.8	Oct. 3	287.1	Dec. 3	287.7
July 31	286.4				

6/13-12J1. Glick. $NE\frac{1}{4}SE\frac{1}{4}$ sec. 12, T. 6 N., R. 13 W., 35 feet south of half -section line and 200 feet west of 40th Street W., extended. Stock well. Measuring point though Apr. 23, 1941, top of 3- by 4-inch timber on east side of pump, 0.5 foot above land-surface datum; since Apr. 23, 1941, top of casing, at land-surface datum which is about 2,608 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

May 31, 1940	233.7	Nov. 18, 1941	240.4	May 1, 1944	240.8
Nov. 26	234.7	24, 1942	244.6	Mar. 27, 1945	242.2
Apr. 23, 1941	235.8	Dec. 1, 1943	239.8	Nov. 6	243.2

7/9-17N1. Ernest Koch. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 17, T. 7 N., R. 9 W., 30 feet north of Avenue J and 30 feet east of 150th Street E. Drilled irrigation well, diameter 14 inches. Measuring point, top of casing at bolt head sunk in casing on west side, 1.8 feet above land-surface datum which is about 2,489 feet above sea level. Water level, in feet below land-surface datum, 1945: Dec. 6, 129.9.

7/9-28N1. Tygeson. $SW\frac{1}{4}SW\frac{1}{4}$ sec. 28, T. 7 N., R. 9 W., 275 feet east of 160th Street E., extended, and 0.33 mile south of Avenue K8. Domestic well, diameter 12 inches, depth 138 feet. Equipped with windmill. Measuring point, top of wooden clamp 0.4 foot above top of casing, 1.0 foot above land-surface datum which is about 2,552 feet above sea level. Measurements on Nov. 30, 1942, and Mar. 6, 1945, by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 30, 1942, 128.4; Mar. 6, 1945, 133.4; Dec. 6, 1945, 135.6.

7/10-5M1 (*991, p. 103; 1021, p. 87). Ella E. Cunningham. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 74.8; Nov. 7, 87.0.

7/10-5N1 (*991, p. 104; 1021, p. 87). Christ Laras. Measurements discontinued in 1945.

7/10-5N2 (*991, p. 104; 1021, p. 87). Ella E. Cunningham. Measurements discontinued in 1945.

7/10-5N3. Ella Cunningham. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 7 N., R. 10 W., 500 feet north of Avenue H and 1,100 feet east of 90th Street E. Drilled irrigation well, depth 980 feet. Measuring point, hole in pump base, at land-surface datum which is about 2,397 feet above sea level. Water level, in feet below land-surface datum, 1945: Nov. 7, 109.7.

7/10-6R1. Mrs. Jessie Hollingsworth. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 7 N., R. 10 W., 20 feet west of 90th Street E., and 100 feet north of Avenue H. Irrigation and domestic well, diameter 7 inches, depth about 1,500 feet. Measuring point, pump base at setting on large circular base under discharge pipe, 0.6 foot above land-surface datum which is about 2,397 feet above sea level. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 84.1; Dec. 10, 99.9.

7/10-7B1 (*991, p. 104; 1021, p. 88). Boege. Measurement on Mar. 5 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 5, 68.4; Nov. 7, 72.9.

7/10-12H1. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 7 N., R. 10 W., 0.45 mile south of Avenue H and 130 feet west of 140th Street E. Domestic well, equipped with windmill. Measuring point, top of casing, at land-surface datum which is about 2,449 feet above sea level. Water levels, in feet below land-surface datum: May 11, 1944, 107.4; Mar. 6, 1945, 111.0; Dec. 6, 1945, 114.4. Measurements on May 11, 1944, and Mar. 6, 1945, by Los Angeles County Flood Control District.

7/10-21A1. NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 21, T. 7 N., R. 10 W., 40 feet west of pole line along west side of 110th Street E. and 1,300 feet south of Avenue J, 5 feet north of dirt road. Abandoned well, diameter 12 inches. Measuring point, top of casing, at land-surface datum which is about 2,465 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 6, 1945. Water levels, in feet below land-surface datum: Dec. 15, 1943, 131.8; May 11, 1944, 132.5; Mar. 13, 1945, 131.4; Dec. 6, 1945, 140.6.

7/10-31B1 (*991, p. 105; 1021, p. 88). No measurements made in 1945.

7/10-31N1. H. O. Bakken. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 7 N., R. 10 W., 1,300 feet east of 80th Street E., and 1,300 feet north of Avenue M, extended, in corrugated-iron shelter back of engine house. Used irrigation well, diameter 12 inches, depth 365 feet. Measuring point, base of pump, 0.7 foot above land-surface datum which is about 2,505 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 6, 1945. Water levels, in feet below land-surface datum: Nov. 27, 1940, 151.0; Dec. 2, 1941, 153.6; Dec. 15, 1943, 171.6; Dec. 6, 1945, 176.4.

7/11-1Q1 (*1021, p. 88). H. L. Gordon. Water level, in feet below land-surface datum, 1945: Dec. 11, 92.1.

7/11-8P1 (*991, p. 105; 1021, p. 88). Mae Avery. Measurement on Mar. 2 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 2, 61.3; Nov. 7, 64.1.

7/11-16B1. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, T. 7 N., R. 11 W., 275 feet south of Avenue I and 1,850 feet west of 50th Street E., extended. Domestic well, equipped with windmill. Measuring point, top of iron clamp, 0.5 foot above land-surface datum which is about 2,392 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 10, 1945. Water levels, in feet below land-surface datum: Dec. 6, 1943, 82.2; May 11, 1944, 83.6; Mar. 2, 1945, 82.4; Dec. 10, 1945, 90.0.

7/11-19N1. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 19, T. 7 N., R. 11 W., 300 feet north of Avenue K and 25 feet east of 20th Street E., in wooden pump house. Used irrigation well. Measuring point, hole in pump base, 0.2 foot above land-surface datum which is about 2,430 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 4, 1945. Water levels, in feet below land-surface datum: Dec. 14, 1943, 112.3; Mar. 13, 1945, 112.4; Dec. 4, 1945, 123.4.

7/11-23L1. Barnes. NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T. 7 N., R. 11 W., 100 feet west of 65th Street E. and 1,600 feet north of Avenue K. Domestic well with two 8-inch casings in 3-by 6-foot pit. Measuring point, top of north casing, 0.5 foot above land-surface datum which is about 2,438 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-43, 1945

Date	Water level	Date	Water level	Date	Water level
Sept. 18, 1940	122.2	Dec. 2, 1941	124.3	Dec. 14, 1943	134.7
Nov. 27	122.4	5, 1942	130.1	6, 1945	al24.3
Apr. 24, 1941	122.6				

a Measurement by Geological Survey.

7/11-24C1 (*991, p. 105; 1021, p. 88). Stevenson.

Water level, in feet below land-surface datum, 1945

June 5	126.8	Aug. 2	131.5	Nov. 7	130.8
July 5	130.0	Sept. 7	130.9	Dec. 6	127.4

7/11-28E1. Leshin. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 7 N., R. 11 W., 25 feet east of 40th Street E., and 0.3 mile south of Avenue K. Used irrigation well. Measuring point, top of measuring pipe, 0.8 foot above land-surface datum which is about 2,440 feet above sea level. Measurement on Dec. 14, 1943, by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 14, 1943, 112.0; Dec. 6, 1945, 130.5.

7/11-28H1. Leshin. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 28, T. 7 N., R. 11 W., 0.5 mile south of Avenue K and 50 feet west of 50th Street E. Used irrigation well. Measuring point, under side of pump base, 0.2 foot above land-surface datum which is about 2,449 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 6, 1945. Water levels, in feet below land-surface datum: Nov. 27, 1940, 101.3; Dec. 2, 1941, 103.4; Dec. 14, 1942, 121.7; Dec. 6, 1945, 134.0.

7/11-28L1 (*991, p. 106; 1021, p. 88). Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 13, 108.2.

7/12-4H1. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, T. 7 N., R. 12 W., 150 feet west of 10th Street W., and 0.7 mile north of Avenue H. Unused well, diameter 6 inches. Measuring point, top of casing, 2.0 feet above land-surface datum which is about 2,313 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Dec. 5, 1941	3.2	Dec. 4, 1943	8.3	Mar. 12, 1945	3.2
26, 1942	3.6	May 2, 1944	3.2		

7/12-4P1. SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T. 7 N., R. 12 W., 170 feet north of Avenue H, 1.2 miles west of Sierra Highway, 0.3 mile east of 20th Street W. Unused well, diameter 8 inches. Measuring point, top of plug in casing, 1.2 feet above land-surface datum which is about 2,315 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

July 25, 1940	5.2	June 27, 1942	6.5	Apr. 30, 1943	6.6
Nov. 29	(a)	July 31	8.2	May 29	7.2
Apr. 23, 1941	(a)	Aug. 21	8.6	June 25	7.8
Aug. 29	5.7	Sept. 25	8.8	Dec. 8	8.4
Sept. 26	5.6	Oct. 23	8.9	Jan. 22, 1944	7.9
Oct. 31	2.2	Nov. 17	8.6	May 2	5.4
Dec. 5	(a)	Dec. 26	7.6	July 27	7.2
Mar. 28, 1942	(a)	Jan. 30, 1943	5.0	Mar. 1, 1945	6.2
Apr. 24	(a)	Feb. 19	4.2	Oct. 3	9.1
May 29	3.6	Mar. 26	5.6	Nov. 6	9.0

a Flowing.

7/12-4P2. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4, T. 7 N., R. 12 W., 50 feet north of Avenue H, 1.2 miles north of Sierra Highway, 0.3 mile east of 20th Street W. Unused well, diameter 3 inches. Measuring point, bottom of slot in south side of pipe, 1.2 feet below land-surface datum which is about 2,316 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Date	Water level	Date	Water level	Date	Water level
July 25, 1940	5.4	July 31, 1942	6.0	July 23, 1943	5.4
Nov. 29	(a)	Aug. 21	6.8	Aug. 21	6.7
Apr. 23, 1941	(a)	Sept. 25	7.9	Sept. 24	7.4
Aug. 29	5.2	Oct. 23	8.2	Dec. 8	4.5
Sept. 26	5.5	Nov. 17	7.7	Jan. 22, 1944	4.1
Oct. 31	4.7	Dec. 26	5.7	May 2	1.7
Dec. 5	3.5	Jan. 30, 1943	3.4	July 27	9.4
Jan. 31, 1942	(a)	Feb. 19	(a)	May 8, 1945	5.9
Mar. 28	(a)	Mar. 26	(a)	June 29	11.3
Apr. 24	3.7	Apr. 30	(a)	Oct. 3	15.2
May 29	4.1	May 29	3.9	Nov. 6	10.9
June 27	4.6	June 25	4.8		

a Flowing.

7/12-6D1. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 6, T. 7 N., R. 12 W., 50 feet east of 40th Street W., 4,300 feet north of Avenue H, 250 feet south of dirt road, in west quarter of dirt reservoir. Abandoned well, diameter 6 inches. Measuring point, top of casing, at land-surface datum which is about 2,330 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 6, 1943, 14.2; May 1, 1944, 18.2; Nov. 6, 1945, 22.1.

7/12-6M1. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 6, T. 7 N., R. 12 W., 100 feet east of 40th Street W., extended, and 2,200 feet north of Avenue H, on south side of reservoir. Abandoned well. Measuring point, top of casing, at land-surface datum which is about 2,329 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 6, 1943, 12.4; May 1, 1944, 17.7; Mar. 12, 1945, 6.6.

7/12-8D1. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 7 N., R. 12 W., 900 feet south of Avenue H and 300 feet east of 30th Street W., extended. Abandoned well, diameter 4 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,316 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 6, 1943, 1.2; May 2, 1944, 5.6; Mar. 1, 1945, flowing; Nov. 6, 1945, 12.5.

7/12-15F1. A. H. Powell. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 15, T. 7 N., R. 12 W., 50 feet north of 9th Street and 130 feet west of Elm Street, Lancaster. Domestic well, equipped with windmill. Measuring point, top of iron clamp, 1.0 foot above land-surface datum which is 2,348 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-45

Oct. 28, 1942	26.7	Mar. 1, 1945	29.4	Oct. 3, 1945	49.4
Dec. 8, 1943	31.8	June 29	45.8	Nov. 6	40.4
May 2, 1944	41.2				

7/12-15F2. Los Angeles County Water District No. 4. SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 15, T. 7 N., R. 12 W., 53 feet east of Date Street and 260 feet south of 10th Street, Lancaster. Unused well, diameter 16 inches for 244 feet and 12 inches for 372 feet. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,355 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Sept. 23, 1943	56.4	May 2, 1944	62.3	Nov. 6, 1945	54.0
Dec. 8	46.6	Feb. 28, 1945	42.9		

7/12-22J1. F. La Horgue. $NE_1^4SE_1^4$ sec. 22, T. 7 N., R. 12 W., 250 feet west of Sierra Highway and 0.8 mile south of Avenue J. Domestic well, diameter 8 inches, depth 255 feet. Measuring point, top of casing, at land-surface datum which is about 2,405 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-45

Date	Water level	Date	Water level	Date	Water level
Oct. 28, 1942	88.2	May 4, 1944	89.6	Nov. 8, 1945	99.5
Dec. 8, 1943	90.8	Feb. 27, 1945	94.2		

7/12-29Pl. $SE_1^4SW_1^4$ sec. 29, T. 7 N., R. 12 W., 25 feet north of Avenue L and 300 feet west of 25th Street W. Used irrigation well. Measuring point, hole in southeast side of pump base, 0.4 foot above land-surface datum which is about 2,449 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1939-43, 1945

Dec. 9, 1939	111.3	Nov. 18, 1941	113.8	Feb. 27, 1945	124.1
Nov. 29, 1940	112.5	17, 1942	120.9	Nov. 6	142.0
Apr. 4, 1941	112.1	Dec. 4, 1943	122.4		

7/12-32J1 (*991, p. 106; 1021, p. 88). Lord. No measurements made in 1945.

7/12-32R1 (*991, p. 106; 1021, p. 88). No measurements made in 1945.

7/12-34El (*1021, p. 88). G. Lane. No measurements made in 1945.

7/12-34H1 (*991, p. 106; 1021, p. 88). Morrison. Measurements made by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

June 29	178.9	Aug. 31	180.4	Nov. 8	181.4
July 31	179.6	Oct. 3	181.0	Dec. 3	181.5

7/13-3D1. F. Gorrindo. $NW_1^4NW_1^4$ sec. 3, T. 7 N., R. 13 W., 150 feet east of 70th Street W. and 1,000 feet south of Avenue G, in wood pump house. Measuring point, north edge of pump base, 0.5 foot above land-surface datum which is about 2,378 feet above sea level. Measurements made by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 27, 65.5; Nov. 8, 64.8.

7/13-3D2. F. Gorrindo. $NW_1^4NW_1^4$ sec. 3, T. 7 N., R. 13 W., 35 feet east of 70th Street W., and 1,200 feet south of Avenue G, at southwest corner of reservoir. Unused well, diameter 14 inches. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,378 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 27, 43.5; Nov. 8, 48.4.

7/13-6A1 (*991, p. 107; 1021, p. 88). Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 8, 122.1.

7/13-11C1. $NE_1^4NW_1^4$ sec. 11, T. 7 N., R. 13 W., 1,300 feet east of 60th Street W., and 400 feet south of Avenue H, in west side of concrete pit. Measuring point, top of casing, at land-surface datum which is about 2,354 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 12	23.1	July 24	36.1	Oct. 2	36.2	Oct. 20	a 33.0
June 7	33.7	31	36.8	9	a 34.4	Nov. 6	30.2
29	35.0	Aug. 31	37.0	16	a 32.8	Dec. 3	28.4

a From recorder chart.

7/13-11D1. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 7 N., R. 13 W., 40 feet east of 60th Street W., and 0.1 mile south of Avenue H. Unused well. Measuring point, top of board cribbing, at land-surface datum which is about 2,356 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-45

Date	Water level	Date	Water level	Date	Water level
Oct. 27, 1942	3.7	May 1, 1944	2.0	Nov. 6, 1945	4.0
Dec. 6, 1943	3.5	Mar. 5, 1945	3.0		

7/13-11D2. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 7 N., R. 13 W., 45 feet south of Avenue H and 325 feet east of 60th Street W., in corrugated-iron pump house at east side of reservoir. Diameter 8 inches, depth 450 feet. Measuring point, top of casing, 3.0 feet above land-surface datum which is about 2,358 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 8	88.2	July 24	95.3	Oct. 2	85.9	Nov. 14	48.4
June 29	92.5	Aug. 31	95.0	Nov. 8	49.1		

7/13-11M1 (*991, p. 107; 1021, p. 88). John Payne. No measurements made in 1945.

7/13-16B1. J. R. Harris. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 7 N., R. 13 W., 100 feet south of Avenue I and 50 feet east of 75th Street W., extended, in west end of pump house. Unused well, diameter 12 inches, depth approximately 260 feet. Measuring point, top of casing, at land-surface datum which is about 2,376 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 24, 1942, 42.5; Dec. 1, 1943, 37.5; May 2, 1944, 38.8; Nov. 8, 1945, 36.2.

7/13-16B2. J. R. Harris. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 7 N., R. 13 W., 100 feet south of Avenue I and 75 feet east of 75th Street W., extended, at east end of pump house. Measuring point, top of casing, 2.0 feet above land-surface datum which is about 2,376 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 4, 38.3.

7/13-17D1 (*991, p. 108; 1021, p. 88). G. Zaro. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 5, 93.4; Nov. 15, 107.3.

7/13-21J1. L. H. Benson. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 21, T. 7 N., R. 13 W., 1,300 feet west of 70th Street W., and 1,300 feet north of Avenue K, 500 feet west of house. Abandoned irrigation well, diameter 12 inches, depth 250 feet. Measuring point, under side of pump base, 1.0 foot above land-surface datum which is about 2,371 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 24, 1942, 65.9; Dec. 1, 1943, 68.4; May 9, 1944, 87.0; Feb. 28, 1945, 63.9.

7/13-21J2. L. H. Benson. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 21, T. 7 N., R. 13 W., 800 feet west of 70th Street W., and 1,600 feet north of Avenue K, 150 feet north-west of house. Unused well, diameter 10 inches, depth 250 feet. Measuring point, top of flange on casing, 1.2 feet above land-surface datum which is about 2,372 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-45

Date	Water level	Date	Water level	Date	Water level
Nov. 24, 1942	62.8	May 9, 1944	86.8	Nov. 6, 1945	77.5
Dec. 1, 1943	65.2	Feb. 28, 1945	59.0		

7/13-23N1. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T. 7 N., R. 13 W., 0.2 mile east of 60th Street W., and 50 feet north of Avenue K. Used irrigation well. Measuring point, hole in north side of pump base, 1.0 foot above land-surface datum which is about 2,385 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 6, 61.2.

7/13-27N1. A. F. Godde. SW₁SW₄ sec. 27, T. 7 N., R. 13 W., 200 feet east of 70th Street W., and 1,300 feet north of Avenue L. Used irrigation well. Measuring point, base of pump, 1.0 foot above land-surface datum which is about 2,120 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-43, 1945

Date	Water level	Date	Water level	Date	Water level
Nov. 24, 1941	116.8	Dec. 1, 1943	124.3	Nov. 6, 1945	147.0
24, 1942	119.7	Feb. 28, 1945	122.9		

7/13-28P1. Crenmer. SE₁SW₄ sec. 28, T. 7 N., R. 13 W., 750 feet north of Avenue L and 0.3 mile east of 80th Street W. Domestic well, diameter 8 inches, depth 172.5 feet. Equipped with windmill. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,475 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: July 7, 1941, 171.5; Nov. 24, 1941, 172.0; May 1, 1944, 178.9; Nov. 6, 1945, 189.5.

7/13-34H1 (*991, p. 108; 1021, p. 88). E. P. Wieman. No measurements made in 1945.

7/13-35E1 (*991, p. 108; 1021, p. 88). George Lane. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 6, 184.2.

7/14-10F1. F. A. Ullman. SE₁NW₄ sec. 10, T. 7 N., R. 14 W., 700 feet south of State Highway 138 and 250 feet east of old Willow Springs-Elizabeth Lake road. Domestic well, diameter 10 inches, depth 250 feet. Equipped with windmill. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,557 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-43, 1945

Nov. 7, 1942	184.2	May 7, 1945	185.7	Oct. 2, 1945	186.6
Dec. 1, 1943	186.7	June 28	186.2	Nov. 13	186.2
Mar. 12, 1945	186.0				

8/9-4N1 (*1021, p. 88). United States Army Reservation. Measurement by Geological Survey. Water level, in feet below land-surface datum, 1945: Nov. 7, 13.6.

8/9-4N2. United States Army Reservation. SW₁SW₄ sec. 4, T. 8 N., R. 9 W., 800 feet north of Avenue B and 500 feet east of 160th Street E., extended. Originally domestic well, diameter 6 inches, depth 245 feet. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,294 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Dec. 6, 1941	12.2	Dec. 9, 1943	13.7	Dec. 10, 1945	a 13.2
Nov. 25, 1942	12.5	May 11, 1944	12.6		

a Measurement by Geological Survey.

8/9-4F1. United States Army Reservation. SE₁SW₄ sec. 4, T. 8 N., R. 9 W., 50 feet north of Avenue B and 1,900 feet east of 160th Street E., extended. Unused domestic well, equipped with windmill. Measuring point, bottom side of block on east side, 0.5 foot above land-surface datum which is 2,305 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-43, 1945

Apr. 24, 1941	21.1	Nov. 25, 1942	21.8	Mar. 6, 1945	23.4
Dec. 6	21.1	Dec. 9, 1943	23.3	Dec. 10	a 22.6

a Measurement by Geological Survey.

8/9-6N1. United States Army Reservation. SW₁SW₄ sec. 6, T. 8 N., R. 9 W., 500 feet north of Avenue B and 0.2 mile east of road, which is 250 feet west of 140th Street E., extended. Diameter 5 inches. Measuring point, top of casing, 1.5 feet above land-surface datum which is about 2,302 feet above sea level. Measurements by Los Angeles County Flood Control District.

8/9-6N1--Continued.

Water level, in feet below land-surface datum, 1941-45

Date	Water level	Date	Water level	Date	Water level
Apr. 4, 1941	9.0	July 24, 1943	10.8	Jan. 23, 1944	12.0
Dec. 6	9.6	Aug. 27	12.1	May 11	10.2
Nov. 25, 1942	13.6	Sept. 25	12.6	Mar. 6, 1945	10.6
May 3, 1943	10.7	Dec. 9	12.4	Dec. 10	a 11.0
June 26	10.0				

a Measurement by Geological Survey.

8/9-6R1. United States Army Reservation. $SE_4^1SE_4^1$ sec. 6, T. 8 N., R. 9 W., 165 feet north of Avenue B and 200 feet west of 150th Street E. Domestic well, diameter 6 inches. Measuring point, top of casing, 0.8 foot above land-surface datum which is about 2,298 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 25, 1942, 11.4; Dec. 9, 1943, 13.0; Mar. 6, 1945, 11.7.

8/10-2P1. United States Army Reservation. $SE_4^1SW_4^1$ sec. 2, T. 8 N., R. 10 W., 725 feet north of Avenue B and 1,900 feet east of 120th Street E. Unused well, depth 75 feet. Measuring point, top of railroad tie at north end of pit, at land-surface datum which is about 2,310 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Apr. 24, 1941	4.8	Feb. 19, 1943	7.2	Mar. 6, 1945	9.7
Dec. 6	6.6	Dec. 9	8.3	Dec. 10	a 12.7
Nov. 25, 1942	8.1	May 11, 1944	9.5		

a Measurement by Geological Survey.

8/10-9M1 (*991, p. 109; 1021, p. 89). J. M. Hamilton. Measurement on Mar. 6 by Los Angeles County Flood Control District and on June 5 by Geological Survey. Water levels, in feet below land-surface datum, 1945: Mar. 6, 20.9; June 5, 21.0.

8/10-19Q1 (*991, p. 109; 1021, p. 89). Union Trust & Savings Bank. Measurement on Mar. 5 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 5, 41.6; Nov. 7, 75.2.

8/11-8P1. $SE_4^1SW_4^1$ sec. 8, T. 8 N., R. 11 W., 40 feet north of Avenue C and about 0.25 mile east of 30th Street E., extended, 100 feet south of old adobe ruin. Measuring point, top of 2-inch pipe with elbow, 0.5 foot above land-surface datum which is about 2,290 feet above sea level. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, flowing; Dec. 11, 1.5.

8/11-10N1. E. R. Siple. $SW_4^1SW_4^1$ sec. 10, T. 8 N., R. 11 W., 1,000 feet north of Avenue C and 400 feet east of 50th Street E., near Rosamond Dry Lake. Domestic well, equipped with hand pump and windmill. Measuring point, top of concrete pump base, 0.2 foot above land-surface datum which is about 2,290 feet above sea level. Measurement on Mar. 8 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 8, 10.5; Dec. 11, 13.8.

8/11-20L1. $NE_4^1SW_4^1$ sec. 20, T. 8 N., R. 11 W., 1,400 feet north of Avenue E and 2,100 feet east of 30th Street E., extended, in circular concrete pit. Unused well, diameter 12 inches. Measuring point, top of concrete pit, at land-surface datum which is about 2,315 feet above sea level. Measurements by Los Angeles County Flood Control District except on Dec. 11, 1945. Water levels, in feet below land-surface datum: Dec. 8, 1943, 27.1; May 11, 1944, 26.2; Mar. 2, 1945, 25.9; Dec. 11, 1945, 27.1.

8/11-22N1 (*991, p. 110). Lewis Prothro. Water level, in feet below land-surface datum, 1945: Nov. 6, 59.9.

8/11-22N2 (*991, p. 110; 1021, p. 89). Lewis Prothro. No measurements made in 1945.

8/11-22N3 (*991, p. 110; 1021, p. 89). Lewis Prothro. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 2, 43.9.

8/11-30RL. $SE\frac{1}{4}SE\frac{1}{4}$ sec. 30, T. 8 N., R. 11 W., 850 feet west of 30th Street E., and 400 feet north of Avenue F, west of dirt side-road. Unused well. Measuring point, top of casing, 0.2 foot above land-surface datum which is about 2,350 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941, 1943-45

Date	Water level	Date	Water level	Date	Water level
Dec. 6, 1941	36.8	Dec. 8, 1943	35.4	Mar. 2, 1945	34.5
Jan. 10, 1943	42.3	May 11, 1944	34.2	Dec. 11	a 34.9

a Measurement by Geological Survey.

8/12-4K1. $NW\frac{1}{4}SE\frac{1}{4}$ sec. 4, T. 8 N., R. 12 W., 800 feet west of Sierra Highway and 0.5 mile south of Avenue A, 10 feet north of dirt reservoir. Unused well. Measuring point, top of casing, 0.7 foot above land-surface datum which is about 2,307 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Jan. 10, 1943	0.8	May 3, 1944	1.3	Nov. 7, 1945	8.9
Dec. 7	4.4	Mar. 1, 1945	1.1		

8/12-20B1. $NW\frac{1}{4}NE\frac{1}{4}$ sec. 20, T. 8 N., R. 12 W., 75 feet south of Avenue D and 1,800 feet west of 20th Street W. Unused well, diameter 6 inches. Measuring point, top of casing, 2.0 feet above land-surface datum which is about 2,317 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Dec. 5, 1941	5.5	July 31, 1942	10.2	May 2, 1944	7.0
Jan. 31, 1942	3.2	Dec. 26	5.2	Mar. 1, 1945	5.6
Apr. 24	5.2	4, 1943	10.2	Nov. 7	15.7

8/12-22A2. I. B. Wibigler, Antelope Valley Gun Club. $NE\frac{1}{4}NE\frac{1}{4}$ sec. 22, T. 8 N., R. 12 W., 175 feet west of Division Street and 250 feet north of Avenue E. Domestic well, depth 115 feet. Measuring point, top of casing, at land-surface datum which is about 2,299 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 5, 1941, 1.4; Mar. 1, 1945, 0.6; Nov. 7, 1945, 4.8.

8/12-22D1. $NW\frac{1}{4}NW\frac{1}{4}$ sec. 22, T. 8 N., R. 12 W., 60 feet south of Avenue D extended, and 200 feet east of railroad tracks, along Sierra Highway. Former railroad well, now a stock water-hole, having 4-inch pipe with tee. Measuring point, bottom of tee, 0.5 foot above land-surface datum which is about 2,301 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 20, 1940	(a)	Nov. 24, 1941	(a)	May 2, 1944	(a)
Dec. 6	(a)	Dec. 26, 1942	(a)	Mar. 1, 1945	(a)
Apr. 22, 1941	(a)	June 25, 1943	(a)	Nov. 7	6.0
Sept. 27	(a)	Dec. 4	(a)		

a Flowing.

8/12-22M1. $NW\frac{1}{4}SW\frac{1}{4}$ sec. 22, T. 8 N., R. 12 W., 2,900 feet south of Avenue D and 200 feet west of Sierra Highway, at northwest corner of dirt reservoir. Unused well, diameter 6 inches. Measuring point, top of plug in casing, at land-surface datum which is about 2,302 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Jan. 10, 1943	(a)	May 2, 1944	(a)	Nov. 7, 1945	5.4
Dec. 4	(a)	Mar. 1, 1945	(a)		

a Flowing.

8/12-22M2. NW₁¹SW₁¹ sec. 22, T. 8 N., R. 12 W., 2,900 feet south of Avenue D measured along Sierra Highway and 125 feet east of railroad right-of-way fence, at northwest corner of dirt reservoir. Used stock well, diameter of casing 6 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,300 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Date	Water level	Date	Water level	Date	Water level
Jan. 10, 1943	(a)	May 2, 1944	(a)	Nov. 7, 1945	5.0
Dec. 4	(a)	Mar. 1, 1945	(a)		

a Flowing.

8/12-24R1. SE₁¹SE₁¹ sec. 24, T. 8 N., R. 12 W., 250 feet north of Avenue E and 200 feet west of 20th Street E. extended, in pit north of old reservoir. Unused well. Measuring point, top of concrete pit curb, at land-surface datum which is about 2,310 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1941-45

Dec. 6, 1941	8.0	Dec. 8, 1943	1.1	Mar. 5, 1945	14.6
Jan. 10, 1942	8.4	May 11, 1944	5.8	Dec. 11	15.2

8/12-30Q1. SW₁¹SE₁¹ sec. 30, T. 8 N., R. 12 W., 300 feet north of Avenue F and 2,340 feet west of 30th Street W., in southeast corner of reservoir embankment. Abandoned well, diameter 6 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,323 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 4, 1943, 8.5; May 2, 1944, 8.0; Mar. 12, 1945, 5.2; Nov. 7, 1945, 16.8.

8/13-2C1. NE₁¹NW₁¹ sec. 2, T. 8 N., R. 13 W., 125 feet south of Avenue A and 0.3 mile east of 60th Street W., 200 feet east of west fence. Domestic well, diameter 8 inches. Measuring point, small hole in east side of casing, 0.3 foot above land-surface datum which is about 2,377 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1942-45

Oct. 27, 1942	44.0	May 9, 1944	49.3	Nov. 7, 1945	41.0
Dec. 6, 1943	46.5	Mar. 5, 1945	47.2		

8/13-8C1. A. Boulin. NE₁¹NW₁¹ sec. 8, T. 8 N., R. 13 W., 175 feet south of Avenue B and 0.3 mile west of 90th Street W. Domestic well, diameter 6 inches, depth 120 feet. Equipped with windmill. Measuring point, top of pipe flange, 1.0 foot above land-surface datum which is about 2,436 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Dec. 6, 1940	89.7	Apr. 30, 1943	92.0	Jan. 22, 1944	95.4
Apr. 23, 1941	85.3	May 28	92.6	May 4	93.6
Jan. 31, 1942	88.6	June 25	93.8	Mar. 5, 1945	95.2
Apr. 25	88.8	July 23	94.8	May 7	96.4
July 31	91.8	Aug. 20	95.2	June 28	98.7
Sept. 25	93.2	Sept. 24	96.0	Oct. 2	101.9
Nov. 24	92.8	Dec. 15	95.8	Nov. 7	102.0

8/13-8D1 (*991, p. 110; 1021, p. 89). Rogers School. No measurements made in 1945.

8/13-20M1. O. T. Kelly & Son. NW₁¹SW₁¹ sec. 20, T. 8 N., R. 13 W., 40 feet east of 90th Street W. and 0.5 mile south of Avenue D. Diameter 16 inches, depth 600 feet. Measuring point, hole in southeast side of pump base, at land-surface datum which is about 2,437 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Mar. 27, 103.2; Nov. 8, 110.3.

8/13-22K1. A. G. Andrews. NW₁¹SE₁¹ sec. 22, T. 8 N., R. 13 W., 70 feet south of Avenue D8 and 1,300 feet west of Avenue 60 W., in corrugated-iron pump house near northeast corner of reservoir. Used irrigation well, depth approximately 475 feet. Measuring point, under side of pump base, 2.0 feet above land-surface datum which is about 2,384 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 28, 1942, 55.6; Dec. 6, 1943, 56.6; Nov. 8, 1945, 65.5.

8/13-23M1. A. G. Andrews. NW_{1/4}SW_{1/4} sec. 23, T. 8 N., R. 13 W., 125 feet east of 60th Street W. and 100 feet south of Avenue D8. Used irrigation and domestic well. Measuring point, bottom of iron pump base, at land-surface datum which is about 2,376 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 28, 1942, 50.6; Dec. 6, 1943, 51.8; Nov. 8, 1945, 61.8.

8/13-32N1. Pedro Lizarraga. SW_{1/4}SW_{1/4} sec. 32, T. 8 N., R. 13 W., 170 feet north of Avenue G and 90 feet east of 90th Street W., at south side of reservoir. Used irrigation well, diameter 16 inches, depth 570 feet. Measuring point, hole in east quadrant of pump base, at land-surface datum which is about 2,436 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 8, 108.4.

8/13-33Q1. SW_{1/4}SE_{1/4} sec. 33, T. 8 N., R. 13 W., 50 feet north of Avenue G and 75 feet east of 75th Street W., in frame pump house 25 feet west of small reservoir. Unused well, 6 feet square. Measuring point, top of timber cribbing, at land-surface datum which is about 2,387 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Date	Water level	Date	Water level	Date	Water level
Jan. 10, 1943	20.7	May 4, 1944	20.0	Mar. 27, 1945	20.1
Dec. 6	20.1	Mar. 5, 1945	20.0	Nov. 8	19.0

8/14-2R1. SE_{1/4}SE_{1/4} sec. 2, T. 8 N., R. 14 W., 200 feet north of Avenue B and 1,280 feet west of 110th Street W. Unused well, diameter 14 inches. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,494 feet above sea level. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 24, 1942, 124.3; Dec. 7, 1943, 127.4; Mar. 12, 1945, 125.9; Nov. 14, 1945, 127.5.

8/14-12A1. H. G. Ranch No. 1. NE_{1/4}NE_{1/4} sec. 12, T. 8 N., R. 14 W., 1,100 feet west of 100th Street W. and 50 feet south of Avenue B. Used irrigation well, depth approximately 500 feet. Measuring point, bottom of pump base, 2.0 feet above land-surface datum which is about 2,470 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1940-45

Sept. 20, 1940	124.0	Nov. 24, 1942	111.6	Mar. 12, 1945	116.8
Nov. 29	124.1	Dec. 7, 1943	114.5	Nov. 14	121.2

8/14-12D1. H. G. Ranch No. 1. NW_{1/4}NW_{1/4} sec. 12, T. 8 N., R. 14 W., 660 feet south of Avenue B and 1,300 feet east of 110th Street W. Used irrigation well. Measuring point, pump base at oil line, 0.5 foot above land-surface datum which is about 2,482 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1939-40, 1942-45

Apr. 11, 1939	121.5	Nov. 24, 1942	119.3	May 3, 1944	124.2
Sept. 1, 1940	123.5	Dec. 15, 1943	122.4	Nov. 14, 1945	128.5

8/14-14R1. SE_{1/4}SE_{1/4} sec. 14, T. 8 N., R. 14 W., 1,300 feet west of 110th Street W. and 400 feet north of Avenue D, in field 50 feet east of fence. Unused well, diameter 16 inches. Measuring point, top of casing, 1.0 foot above land-surface datum which is 2,494 feet above sea level. Measurements by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1943-45

Jan. 10, 1943	147.9	May 4, 1944	135.2	Nov. 14, 1945	140.6
Dec. 7	149.8	Mar. 12, 1945	135.2		

8/14-23A1. NE_{1/4}NE_{1/4} sec. 23, T. 8 N., R. 14 W., 15 feet west and 40 feet south of street marker post of Avenue D and 110th Street W. Diameter 18 inches. Measuring point, top of casing, 0.5 foot above land-surface datum which is about 2,488 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 12, 133.7.

8/14-25C1. $NE_1^4NW_1^4$ sec. 25, T. 8 N., R. 14 W., 1,600 feet east of 110th Street W. and 200 feet south of Avenue E. Measuring point, hole in pump base near air line, at land-surface datum which is about 2,476 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 12, 132.2.

8/14-25C2. $NE_1^4NW_1^4$ sec. 25, T. 8 N., R. 14 W., 1,800 feet east of 110th Street W. and 180 feet south of Avenue E. Domestic well, diameter 10 inches. Equipped with windmill. Measuring point, top of casing, at land-surface datum which is about 2,476 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Dec. 1, 138.0.

8/15-10Pl. Scott. $SE_1^4SW_1^4$ sec. 10, T. 8 N., R. 15 W., 100 feet north of Avenue C and 1,800 feet east of 190th Street W., at north side of reservoir. Domestic well, equipped with windmill. Measuring point, top of casing in round concrete block, 1.0 foot above land-surface datum which is about 2,712 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Dec. 17, 141.8.

8/15-24B1 (*1021, p. 89, published erroneously as 8/15-24D1). C. L. Schneider. Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: June 28, 155.4; Oct. 2, 155.1, Nov. 13, 155.2.

8/15-27RL. I. T. Brandt. $SE_1^4SE_1^4$ sec. 27, T. 8 N., R. 15 W., 1,100 feet north and 200 feet west of southeast corner of sec. 27, 0.75 mile north of Highway 138, and west of 180th Street W. extended south. Domestic well, equipped with windmill. Measuring point, top of timber over casing, 0.5 foot above land-surface datum which is about 2,806 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Dec. 17, 144.7.

8/15-29M1. Soil Conservation Service, U. S. Dept. of Agriculture. $NW_1^4SW_1^4$ sec. 29, T. 8 N., R. 15 W., 1,275 feet south of west quarter section corner of sec. 29, 15 feet east of 210th Street W. and 0.75 mile south of Highway 138. Test hole, diameter 6 inches, depth 189 feet. Measuring point, top of casing, 2.0 feet above land-surface datum which is about 3,010 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Dec. 17, dry.

8/15-36M1 (*1021, p. 89). Fairmont School. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 13, 75.6.

8/16-5N1 (*1021, p. 89). Carpy (International Harvester Co.). Measurements by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: June 28, 205.5; Oct. 7, 204.2; Nov. 13, 205.5.

8/16-14L1. Snyder. $NE_1^4SW_1^4$ sec. 14, T. 8 N., R. 16 W., 0.33 mile north of Neenach Road, 0.4 mile north of south line of sec. 14, and 450 feet west of old dirt road, 100 feet west of half-section line of sec. 14. Domestic well, diameter 10 inches. Equipped with windmill. Measuring point, top of casing, 1.0 foot above land-surface datum which is about 2,859 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 13, 105.5.

8/16-18H1 (*1021, p. 90). Neenach School. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Nov. 13, 95.6.

8/17-14E1. P. M. Barnes. $SW_1^4NW_1^4$ sec. 14, T. 8 N., R. 17 W., 60 feet north of Highway 138, 200 feet east of dirt road, 3 miles west of Neenach School. Domestic well, diameter 10 inches, depth 42 feet. Measuring point, top of timber on casing, 2.4 feet above land-surface datum which is about 3,045 feet above sea level. Measurement by Los Angeles County Flood Control District. Water level, in feet below land-surface datum, 1945: Mar. 9, 30.5.

San Gabriel River Basin

18/10-18 (*817, pp. 9-11; 840, pp. 28-29; 845, pp. 17-18; 886, pp. 23-24; 911, p. 119; 941, pp. 90-91; 949, pp. 64-65; 991, pp. 111-113; 1021, p. 91). Key well U. S. 75. At Baldwin Park. Equipped with water-stage recorder.

Water level, in feet, 1945

	January		February		March		April	
Day	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level
1	75.37	311.63	75.62	311.38	73.82	313.18	72.52	314.48
2	75.41	311.59	75.57	311.43	73.79	313.21	72.59	314.41
3	75.45	311.55	75.58	311.42	73.70	313.30	72.70	314.30
4	75.46	311.54	75.57	311.43	73.60	313.40	72.72	314.28
5	75.43	311.57	75.48	311.52	73.63	313.37	72.67	314.33
6	75.45	311.55	75.40	311.60	73.57	313.43	72.70	314.30
7	75.48	311.52	75.33	311.67	73.51	313.49	72.75	314.25
8	75.49	311.51	75.20	311.80	73.45	313.55	72.70	314.30
9	75.48	311.52	75.13	311.87	73.39	313.61	72.69	314.31
10	75.50	311.50	75.07	311.93	73.35	313.65	72.83	314.17
11	75.51	311.49	74.99	312.01	73.29	313.71	72.81	314.19
12	75.51	311.49	74.96	312.04	73.24	313.76	72.83	314.17
13	75.49	311.51	74.90	312.10	73.16	313.84	72.88	314.12
14	75.44	311.56	74.79	312.21	73.12	313.88	72.92	314.08
15	75.43	311.57	74.73	312.27	73.05	313.95	72.96	314.04
16	75.45	311.55	74.70	312.30	73.11	313.89	72.97	314.03
17	75.51	311.49	74.63	312.37	73.03	313.97	73.02	313.98
18	75.49	311.51	74.54	312.46	73.00	314.00	73.09	313.91
19	75.45	311.55	74.52	312.48	72.95	314.05	73.11	313.89
20	75.53	311.47	74.46	312.54	72.82	314.18	73.15	312.85
21	75.53	311.47	74.42	312.58	72.78	314.22	73.15	313.85
22	75.55	311.45	74.34	312.66	72.76	314.24	73.18	313.82
23	75.61	311.39	74.22	312.78	72.65	314.35	73.25	313.75
24	75.61	311.39	74.17	312.83	72.71	314.29	73.27	313.73
25	75.54	311.46	74.14	312.86	72.65	314.35	73.30	313.70
26	75.57	311.43	74.06	312.94	72.61	314.39	73.36	313.64
27	75.61	311.39	73.95	313.05	72.61	314.39	73.39	313.61
28	75.64	311.36	73.86	313.14	72.59	314.41	73.41	313.59
29	75.67	311.33			72.52	314.48	73.42	313.58
30	75.65	311.35			72.55	314.45	73.52	313.48
31	75.64	311.36			72.53	314.47		

Water level, in feet, 1945

	May		June		July		August	
Day	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level
1	73.59	313.41	75.03	311.97	76.61	310.39	78.62	308.38
2	73.60	313.40	75.12	311.88	76.68	310.32	78.71	308.29
3	73.58	313.42	75.13	311.87	76.75	310.25	78.73	308.27
4	73.71	313.29	75.16	311.84	76.79	310.21	78.78	308.22
5	73.77	313.23	75.22	311.78	76.89	310.11	78.82	308.18
6	73.75	313.25	75.27	311.73	76.92	310.08	78.94	308.06
7	73.79	313.21	75.29	311.71	76.96	310.04	78.99	308.01
8	73.85	313.15	75.31	311.69	76.98	310.02	79.07	307.93
9	73.85	313.15	75.32	311.68	77.03	309.97	79.13	307.87
10	73.85	313.15	75.36	311.64	77.08	309.92	79.20	307.80
11	73.89	313.11	75.46	311.54	77.14	309.86	79.30	307.70
12	73.94	313.06	75.48	311.52	77.19	309.81	79.29	307.71
13	73.95	313.05	75.50	311.50	77.26	309.74	79.40	307.60
14	73.98	313.02	75.57	311.43	77.36	309.64	79.42	307.58
15	74.00	313.00	75.65	311.35	77.43	309.57	79.46	307.54

CALIFORNIA, LOS ANGELES COUNTY

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18/10-18--Continued.

Water level, in feet, 1945

Day	May		June		July		August	
	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level
16	74.03	312.97	75.75	311.25	77.54	309.46	79.55	307.45
17	74.06	312.94	75.78	311.22	77.61	309.39	79.66	307.34
18	74.22	312.78	75.83	311.17	77.66	309.34	79.66	307.34
19	74.26	312.74	75.93	311.07	77.71	309.29	79.64	307.36
20	74.30	312.70	76.01	310.99	77.81	309.19	79.71	307.29
21	74.34	312.66	76.03	310.97	77.90	309.10	79.74	307.26
22	74.45	312.55	76.08	310.92	77.90	309.10	79.77	307.23
23	74.55	312.45	76.12	310.88	78.02	308.98	79.83	307.17
24	74.57	312.43	76.19	310.81	78.07	308.93	79.84	307.16
25	74.69	312.31	76.23	310.77	78.12	308.88	79.91	307.09
26	74.72	312.28	76.30	310.70	78.16	308.84	79.95	307.05
27	74.77	312.23	76.41	310.59	78.23	308.77	80.08	306.92
28	74.88	312.12	76.47	310.53	78.31	308.69	80.11	306.89
29	74.95	312.05	76.48	310.52	78.37	308.63	80.18	306.82
30	74.97	312.03	76.57	310.43	78.47	308.53	80.21	306.79
31	74.97	312.03			78.53	308.47	80.28	306.72

Water level, in feet, 1945

Day	September		October		November		December	
	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level	Below land- surface datum	Above sea level
1	80.31	306.69	81.43	305.57	82.05	304.95	82.74	304.26
2	80.31	306.69	81.53	305.47	82.07	304.93	82.81	304.19
3	80.37	306.63	81.55	305.45	82.09	304.91	82.84	304.16
4	80.47	306.53	81.60	305.40	82.09	304.91	82.85	304.15
5	80.51	306.49	81.65	305.35	82.16	304.84	82.89	304.11
6	80.56	306.44	81.67	305.33	82.15	304.85	82.90	304.10
7	80.61	306.39	81.63	305.37	82.14	304.86	82.88	304.12
8	80.68	306.32	81.65	305.35	82.13	304.87	82.90	304.10
9	80.69	306.31	81.66	305.34	82.12	304.88	82.94	304.06
10	80.74	306.26	81.65	305.35	82.11	304.89	82.92	304.08
11	80.76	306.24	81.67	305.33	82.13	304.87	82.95	304.05
12	80.81	306.19	81.69	305.31	82.17	304.83	83.03	303.97
13	80.86	306.14	81.72	305.28	82.22	304.78	83.06	303.94
14	80.95	306.05	81.74	305.26	82.22	304.78	83.08	303.92
15	81.01	305.99	81.76	305.24	82.23	304.77	83.09	303.91
16	81.07	305.93	81.81	305.19	82.27	304.73	83.09	303.91
17	81.12	305.88	81.82	305.18	82.27	304.73	83.12	303.88
18	81.16	305.84	81.84	305.16	82.29	304.71	83.13	303.87
19	81.17	305.83	81.86	305.14	82.29	304.71	83.17	303.83
20	81.19	305.81	81.87	305.13	82.32	304.68	83.19	303.81
21	81.23	305.77	81.88	305.12	82.38	304.62	83.18	303.82
22	81.27	305.73	81.91	305.09	82.40	304.60	83.14	303.86
23	81.24	305.76	82.01	304.99	82.46	304.54	83.17	303.83
24	81.29	305.71	82.06	304.94	82.52	304.48	83.12	303.88
25	81.30	305.70	82.01	304.99	82.53	304.47	83.02	303.98
26	81.32	305.68	82.05	304.95	82.57	304.43	82.94	304.06
27	81.35	305.65	82.10	304.90	82.61	304.39	82.85	304.15
28	81.37	305.63	82.13	304.87	82.64	304.36	82.73	304.27
29	81.39	305.61	82.11	304.89	82.68	304.32	82.63	304.37
30	81.42	305.58	82.07	304.93	82.71	304.29	82.56	304.44
31			82.02	304.98			82.47	304.53

Coastal plain

1S/11-21B1. Selbach. California Division of Water Resources serial No. C-231p and location No. 2962A. In El Monte, 55 feet south of First Street and 15 feet west of Center Avenue, in back yard of residence at 121 Center Avenue, on north side of frame tank house. Unused drilled well, diameter 8 inches, reported depth 54 feet. Measuring point, top west side of casing, 0.5 foot above land-surface datum which is 286 feet above mean sea level (interpolated from topographic map). Additional measurements made semiannually since 1934 by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
July 7	13.97	Aug. 31	15.45	Nov. 2	16.23
Aug. 2	14.92	Oct. 4	16.40	Dec. 5	16.29

2S/12-13A1 (*941, p. 105; 949, p. 89; 991, p. 113; 1021, p. 92). Lycan Bros. About 1 mile east of Montebello. Records furnished by San Gabriel Valley Protective Association.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	19.42	Apr. 4	18.83	July 2	19.46	Sept. 19	22.51
10	19.39	11	18.86	4	19.52	26	22.76
17	19.40	18	18.92	11	19.59	Oct. 3	23.05
24	19.49	25	19.02	18	19.83	10	23.32
31	19.50	May 2	19.08	25	20.07	17	23.47
Feb. 7	19.30	9	19.02	Aug. 1	20.34	24	23.60
14	19.20	16	18.90	8	20.69	31	23.67
21	19.14	23	19.08	15	21.03	Nov. 28	23.39
28	19.06	30	19.15	22	21.33	Dec. 5	23.32
Mar. 7	19.00	June 6	19.22	29	21.54	12	23.20
14	18.94	13	19.29	Sept. 5	21.84	19	23.15
21	18.88	20	19.37	12	22.18	26	22.91
28	18.81						

2S/12-23G1. Hadley Ranch Co. California Division of Water Resources serial No. C-807p and location No. 1591. About 1 mile southeast of Montebello, 0.51 mile northwest of Rosemead Boulevard, 49 feet northeast of lane and 84 feet northwest of Arroyo irrigation ditch, in frame pump house. Drilled irrigation well, diameter 20 inches, reported depth 1,100 feet. Measuring point, hole at northeast side of pump base, at land-surface datum which is 161 feet above mean sea level (interpolated from topographic map). Additional measurements made semiannually since 1931 by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Feb. 28	26.59	June 2	28.72	Aug. 30	34.83	Nov. 1	37.96
Apr. 4	25.96	29	30.23	Oct. 4	39.17	Dec. 5	37.45
May 4	27.63	Aug. 1	32.87				

2S/12-27B1. Bell Cooperative Association. California Division of Water Resources serial No. C-833v and location No. 1572F. About 1 mile south of Montebello, 200 feet northeast of Anaheim Telegraph Road, 150 feet north of west end of railroad trestle across Rio Hondo, in metal pump house. Drilled domestic well, diameter 12 inches, reported depth 133 feet. Owner reports casing not perforated. Measuring point, 1-inch capped hole at south side of pump base, 0.5 foot above land-surface datum which is 149 feet above mean sea level (interpolated from topographic map). Additional measurements made weekly 1937-38 by San Gabriel Valley Protective Association and monthly 1940-42 by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Feb. 28	21.52	June 2 a	26.41	Aug. 30	33.47	Nov. 2	35.75
Apr. 4	20.20	29	28.42	Oct. 3 b	35.44	Dec. 4	36.52
May 8 a	22.09	Aug. 1 b	31.11				

a Pump shut off prior to measurement.

b Pumping recently.

2S/12-27H2. S. E. Locke. California Division of Water Resources serial No. C-844v and location No. 1582L. About 1.5 miles southeast of Montebello, 170 feet southwest of Anaheim Telegraph Road and 320 feet northwest of Paramount Boulevard, 10 feet southwest of small frame pump house. Drilled domestic well, diameter 8 inches, depth 110.0 feet. Measuring point, top of 2-inch coupling in casing cap, at land-surface datum which is 145 feet above mean sea level (interpolated from topographic map). Additional measurements made monthly 1934-36 by Los Angeles County Flood Control District and monthly since 1937 by the San Gabriel Valley Protective Association.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 28	19.67	June 2	22.28	Aug. 30	28.74	Nov. 1	31.50
Apr. 4	18.94	29	24.31	Oct. 3	30.63	Dec. 4	32.43
May 4	19.24	Aug. 1 a	26.53				

a Pumping.

2S/12-29R1. V. Marino. Los Angeles Department of Water and Power No. 12-A-23. About 2 miles northwest of Downey, 250 feet north of Clara Street and 150 feet northwest of Perry Road, in frame pump house. Drilled domestic well, reported depth 375 feet. Measuring point, top of 1-inch pipe, west side of pump, in pit, 1 foot below land-surface datum and 118.04 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1930-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Feb. 27	24.62	June 2	28.75	Aug. 30	32.84	Nov. 1	36.52
Apr. 5	23.93	29	29.71	Oct. 3	33.25	Dec. 3	31.72
May 8	26.59	Aug. 1	31.85				

2S/12-33B2. Tide Water Associated Oil Co. California Division of Water Resources serial No. C-829c and location No. 1554A, Los Angeles Department of Water and Power No. 12-B-24. About 1.5 miles northwest of Downey, 600 feet southwest of Florence Avenue and 205 feet northwest of Old River School Road, in open, at east edge of concrete pit. Unused drilled well, depth 432.0 feet. Casing perforated from 349 to 421 feet below land surface. Measuring point, top of 1-inch pipe at east edge of concrete pit, at land-surface datum and 121.70 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made in 1923 and monthly 1930-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Feb. 28	29.75	May 8	36.18	Aug. 1	44.84	Nov. 1	42.34
Apr. 5	30.29	June 2	39.93	30	45.94	Dec. 4	41.23
May 4	36.03	29	39.80	Oct. 3	47.18		

2S/12-33B3. E. McDonnell. California Division of Water Resources serial No. C-829r and location No. 1564F, Los Angeles Department of Water and Power No. 12-B-22. About 1.5 miles northwest of Downey, 110 feet northeast of Florence Avenue and 75 feet northwest of Old River School Road extended, at rear of residence at 903 West Florence Avenue, in open. Unused drilled well, diameter 6 inches, depth 71.1 feet. Measuring point, 1-inch hole in top of capped casing, 2 feet above land-surface datum and 126.86 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1930-41 and since 1944 by the San Gabriel Valley Protective Association.

Water level, in feet below land-surface datum, 1945

Feb. 28	24.32	June 2	28.02	Aug. 30	32.39	Nov. 1	32.72
Apr. 5	23.76	29	28.90	Oct. 3	33.09	Dec. 3	32.30
May 4	25.65	Aug. 1	31.35				

2S/12-33L2. H. Rigg. California Division of Water Resources serial No. C-829n and location No. 1554E; Los Angeles Department of Water and Power No. 12-E-26. About 1 mile northwest of Downey, 0.63 mile southwest of Florence Avenue and 180 feet northwest of Old River School Road, in back yard of residence at 337 Old River School Road. Unused drilled well, diameter 8 inches, depth unknown. Measuring point, top west side of casing, 0.2 foot above land-surface datum and 116.45 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made semiannually since 1938 by Los Angeles County Flood Control District and monthly 1930-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Aug. 1 30	29.49 30.10	Oct. 3 Nov. 1	31.04 29.17	Dec. 4	28.32

2S/14-27D1. City of Inglewood well 7. California Division of Water Resources serial No. B-38 and location No. 1352. In Centinela Park Inglewood, 1,600 feet north and 1,600 feet east of the intersection of Centinela Avenue and Redondo Boulevard, in pit at west end of amphitheater stage. Drilled public-supply well, diameter 18 inches, reported depth 300 feet. Casing perforated from 80 to 115, 135 to 159, 177 to 191, and 245 to 265 feet below land surface. Measuring point, top west side of casing, opposite vertical slot in concrete foundation, 0.3 foot below concrete floor, 7.5 feet below land-surface datum and 140.00 feet above mean sea level (altitude by Inglewood Water Department). Water-stage recorder maintained on well Jan. 3, 1945, to Apr. 30, 1945, by Geological Survey. Additional measurements made semiannually since 1927 by Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945
(Chiefly high level for the day from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	a153.59	Feb. 5	a148.48	Mar. 10	148.67	Apr. 16	a163.60
5	151.10	10	147.52	15	145.61	20	147.43
10	149.67	15	147.40	20	145.00	25	a146.70
15	152.67	20	147.30	25	144.72	30	a153.07
20	149.11	25	148.00	31	147.40	Nov. 8	a150.61
25	150.05	28	147.63	Apr. 5	149.29	Dec. 17	a154.16
31	150.12	Mar. 5	a146.48	10	149.94		

a Tape measurement.

2S/14-27D2. City of Inglewood well 10. California Division of Water Resources serial No. B-38c and location No. 1352C. In Centinela Park, Inglewood, 1,600 feet north and 1,250 feet east of the intersection of Centinela Avenue and Redondo Boulevard, in pit. Drilled public-supply well, diameter 18 inches, reported depth 295 feet. Casing perforated from 110 to 130, 181 to 197, and 256 to 273 feet below land surface. Measuring point, lower edge of 2-inch diagonal pipe into west side of casing, 0.07 foot above concrete floor, 13 feet below land-surface datum and 142.46 feet above mean sea level (altitude by Inglewood Water Department). To adjust tape reading for angular correction, subtract 1.67 feet. Additional measurements semiannually 1927-41 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 3, 1944, 166.39, pump shut off 1 hour and 20 minutes prior to measurement; Nov. 8, 1945, 143.08, well 2/14-22P2 pumping; Dec. 17, 1945, 163.27, wells 2/14-22P2, 22N3, pumping.

2S/14-27F3. Inglewood Park Cemetery well 11. In Inglewood, 2,300 feet south of Florence Avenue and 1,750 feet west of Crenshaw Boulevard, 20 feet southeast of well 27F2, an open casing outside of white pump house and tower. Unused drilled well, diameter 16 inches, reported depth 350 feet. Casing perforated from 180 to 266 feet below land-surface. Measuring point, top of casing, at land-surface datum, and 165 feet above mean sea level (interpolated from topographic map). Beginning July 16, measurements are approximate only because made to top of wood debris floating on water surface. All water levels are below sea level.

2S/14-27F3--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 16	177.07	May 28	175.13	July 16	a176.9	Sept. 10	a183.9
Apr. 13	174.52	June 4	179.93	30	a177.5	24	a178.9
May 14	178.46	11	186.49	Aug. 20	a179.2	Oct. 8	a178.8
21	177.68	18	180.66				

a Obstruction level, probably floating.

2S/14-27P2. Inglewood Park Cemetery well 13. California Division of Water Resources serial No. B-42x and location No. 1363F. In Inglewood, 0.29 mile east of Prairie Avenue, 125 feet north of Manchester Avenue, in white pump house. Drilled irrigation well, diameter 16 inches, reported depth 707 feet. Casing may be perforated from 380 to 613 feet. Land-surface datum is 161 feet above mean sea level (interpolated from topographic map). All measurements are by air gage. Pumping before measurements.

Water level, in feet below land-surface datum, 1945

Apr. 13	a220	June 11	281.5	July 16	285.5	Oct. 8	221.0
May 21	279	18	282.5	30	239.5	22	233.5
28	278.5	25	284.0	Aug. 20	227.0	Nov. 19	a220.5
June 4	a257.5	July 2	288.5	Sept. 10	228.5		

a Pump idle.

2S/14-34C1. Inglewood Country Club. California Division of Water Resources serial No. B-43a and location No. 1364. About 1.5 miles southeast of Inglewood, 0.16 mile south of Manchester Avenue, and 0.4 mile east of Prairie Avenue, amid several buildings. Drilled irrigation well, diameter 16 inches, reported depth 450 feet. Casing perforated from 264 to 290 feet below land surface. Measuring point, bottom west edge of pump base at horizontal slot in concrete floor, at land-surface datum and 147.2 feet above mean sea level (altitude by Los Angeles Department of Water and Power). All measurements are by air gage, unless otherwise indicated. Additional measurements made semiannually 1934-41 by Los Angeles County Flood Control District, and monthly 1930-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Nov. 7, 1944, 220; Apr. 13, 1945, 200; Nov. 8, 1945, 222; Nov. 8, 1945, 222.35, tape measurement.

2S/15-34A3. Palisades del Rey Water Co. well 5. California Department of Water Resources serial No. B-281 and location No. 1264F. About 1 mile east of Playa del Rey, 2,600 feet northeast of Pershing Drive and 500 feet south of Manchester Avenue, in fenced enclosure, about 30 feet south of white stucco pump house, under small box. Unused drilled public-supply well, diameter 16 inches, reported depth 250 feet. Measuring point, lower edge of 2-inch diagonal pipe into north side of casing, 0.5 foot above land-surface datum which is 134 feet above mean sea level (interpolated from topographic map). Additional measurements made about semiannually 1935-36 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Nov. 2, 1944, 132.09; Apr. 13, 1945, 133.20; July 20, 1945, 138.40, well 40 feet north pumping; Nov. 8, 1945, 132.96.

2S/15-34H1. Don Benshoof. Geological Survey continuing observation well. California Division of Water Resources serial No. B-28c and location No. 1264C; Los Angeles Department of Water and Power No. 9-B-43. About 2.5 miles northwest of El Segundo, 1,750 feet south of Manchester Avenue, and 0.68 mile west of intersection of Manchester Avenue and Lincoln Boulevard, measured along Manchester Avenue, 25 feet southeast of two-story garage in large shed southeast of tower. Unused drilled well, diameter 12 inches, reported depth 250 feet. Casing perforated from 185 to 203 feet below land surface. Measuring point, top of concrete pump foundation at north side of casing, at land-surface datum and 131.29 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Water level measured monthly 1929-41 by Los Angeles Department of Water and Power, semiannually since 1929 by Los Angeles County Flood Control District, and semi-monthly since July 9, 1945, by Geological Survey. Measurements through 1941 are by Los Angeles Department of Water and Power and since Nov. 6, 1944, by Geological Survey.

2S/15-34H1--Continued.

Water level, in feet below land-surface datum, 1929-45

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1929	130.0	Oct. 4, 1933	b131.35	May 24, 1938	130.95
24	a129.7	Nov. 1	b131.3	July 14	130.85
Nov. 18	129.8	Dec. 4	b131.35	Nov. 2	130.75
Jan. 7, 1930	a130.0	Jan. 15, 1934	131.2	Dec. 27	131.10
Apr. 3	130.0	Feb. 2	131.25	Jan. 19, 1939	130.85
May 9	a130.1	Mar. 15	131.15	Feb. 28	130.70
June 3	130.0	Apr. 3	131.1	Mar. 29	130.62
July 2	130.1	May 3	131.15	May 3	130.88
Aug. 6	130.35	June 4	131.15	June 5	130.85
Sept. 3	130.5	July 10	131.25	July 13	130.95
Oct. 21	131.0	Aug. 2	b131.40	Aug. 22	131.15
Dec. 12	131.0	Sept. 5	b131.45	Sept. 12	131.15
Jan. 28, 1931	a b135.5	Oct. 1	b131.55	Oct. 5	131.15
Feb. 9	131.0	31	a b131.6	Nov. 20	131.15
Apr. 1	131.0	Nov. 1	b131.55	Dec. 7	131.15
May 1	130.9	Dec. 3	b131.5	Jan. 8, 1940	131.12
7	a b131.0	Jan. 3, 1935	b131.6	Feb. 8	131.05
July 2	131.1	Feb. 5	b131.4	Mar. 5	131.03
Aug. 3	131.1	19	b132.0	Apr. 5	a130.8
Sept. 1	131.0	Mar. 1	b132.0	9	129.95
Oct. 2	131.0	Apr. 1	b132.2	June 24	129.9
Nov. 2	131.1	May 8	b132.4	Oct. 7	b132.75
Dec. 1	131.0	29	b132.5	Nov. 7	a b137.7
12	a b131.0	July 12	b132.6	May 6, 1941	130.25
Jan. 4, 1932	131.0	Aug. 28	b132.5	14	a130.1
Feb. 4	131.0	Oct. 21	b132.3	Oct. 14	130.90
Mar. 1	131.0	Dec. 5	b132.25	Nov. 4	a129.6
Apr. 7	131.0	Jan. 16, 1936	b132.0	Apr. 8, 1942	a130.5
25	a b131.0	Feb. 27	b132.1	Nov. 17	a130.8
May 1	130.9	May 5	b132.05	Apr. 27, 1943	a130.0
June 1	131.0	June 15	b132.1	Dec. 17	a130.3
July 11	131.0	July 20	b132.25	Apr. 20, 1944	a b131.8
Aug. 1	131.2	Aug. 20	b132.15	Nov. 6	b131.55
Sept. 7	131.2	Oct. 2	b132.1	28	a131.2
Oct. 3	131.2	Nov. 5	b132.05	July 9, 1945	b131.80
Nov. 1	131.1	Dec. 11	b132.05	23	b131.88
Dec. 21	131.0	Feb. 1, 1937	b132.15	Aug. 6	b132.01
29	a b131.1	Mar. 5	b132.15	20	b132.03
Jan. 18, 1933	131.0	Apr. 12	b132.0	Sept. 3	b132.04
Feb. 2	131.0	May 5	131.2	17	b132.08
Mar. 1	131.0	June 11	131.15	Oct. 1	b132.09
30	131.25	July 12	131.05	15	b132.09
Apr. 27	a b131.2	Aug. 12	131.15	29	b132.07
May 1	131.15	Sept. 21	131.25	Nov. 12	b132.11
June 1	131.1	Nov. 24	b131.4	26	b132.20
July 5	131.2	Jan. 26, 1938	b131.35	Dec. 10	b132.16
Aug. 1	b131.5	Apr. 12	131.05	31	b132.21
Sept. 6	131.2				

a Measurement by Los Angeles County Flood Control District.

b Below sea level.

2S/15-34K1. Palisades del Rey Water Co. well 1. California Division of Water Resources serial No. B-28 and location No. 1264. About 0.8 mile southeast of Playa del Rey, 110 feet northwest of Moscow Street and 190 feet southwest of Pershing Drive, in large frame building. Drilled public-supply well, diameter 16 inches, reported depth 208 feet. Casing perforated from 97 to 133 feet below land surface. Measuring point, lower edge of slanted 2-inch pipe into north side of casing, 1.5 feet above land-surface datum and 83.88 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements about monthly 1929-41 by Los Angeles Department of Water and Power, and semiannually 1930-32 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 2, 1944, 80.26; Apr. 13, 1945, 80.47; July 20, 1945, 80.51; Nov. 8, 1945, 80.63.

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3S/12-7A2. J. W. Urmston. Los Angeles Department of Water and Power No. 12-C-44. About 2 miles northeast of Lynwood, 700 feet west of Garfield Avenue, 180 feet south of Imperial Highway, in small fram pump house in front of residence at 5588 East Imperial Highway. Drilled domestic well, diameter 10 inches, depth 61.5 feet. Measuring point, top north side of casing, 0.3 foot below land-surface datum which is 94 feet above mean sea level (interpolated from topographic map). Additional measurements made monthly 1930-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 24	16.90	June 1	32.78	Aug. 29	a 35.38	Nov. 1	a 26.53
Apr. 5	21.94	30	32.98	Oct. 3	33.53	Dec. 4	24.45
May 8	28.29	Aug. 1	35.16				

a Pump shut off 5 minutes prior to measurement.

3S/12-7N1. Frank Goforth. Los Angeles Department of Water and Power No. 12-C-71. About 2 miles northeast of Compton, 60 feet north of Cortland Avenue and 40 feet west of Louise Avenue, east of residence at 5221 Cortland Avenue. Unused well, reported depth 214 feet. Measuring point, top of 2-inch threaded coupling in casing cap, 1 foot above land-surface datum and 84.75 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional water-level measurements made monthly 1931-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Feb. 24	12.95	June 2	28.25	Aug. 29	31.16	Oct. 31	22.20
Apr. 5	14.86	30	27.13	Oct. 2	28.59	Dec. 4	19.49
May 8	22.33	July 31	32.39				

3S/12-7P1. A. E. Perry. California Division of Water Resources serial No. B-81d and location No. 1528C; Los Angeles Department of Water and Power No. 12-C-28. About 2 miles northeast of Compton, 45 feet south of Century Boulevard and 440 feet east of Wright Road, in front yard of residence at 5444 East Century Boulevard. Unused drilled well, diameter 10 inches, depth 715.2 feet. Measuring point, top of casing, at land-surface datum and 85.89 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1930-33 by Los Angeles Department of Water and Power and semiannually since 1936 by the Los Angeles County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Feb. 24	17.32	June 1	34.70	Aug. 29	41.70	Oct. 31	32.60
Apr. 5	18.48	30	34.49	Oct. 2	41.38	Dec. 4	28.55
May 7	27.82	July 31	41.35				

3S/12-8D3. F. G. Newton. California Division of Water Resources serial No. C-872 and location No. 1536; Los Angeles Department of Water and Power No. 12-C-40. About 1 mile southeast of South Gate, 100 feet north of Imperial Highway, 280 feet east of Union Pacific Railroad, measured along Imperial Highway, in small wooden pump house at rear of residence at 1063 Imperial Highway. Drilled domestic well, diameter 5 inches, reported depth 117 feet. Measuring point, top of 4- by 4-inch board over casing at north side of pump base, 1 foot above land-surface datum and 96.05 feet above mean sea level (altitude by Los Angeles Department of Water and Power.) Additional measurements made monthly 1927-41 by Los Angeles Department of Water and Power and monthly since 1928 by the San Gabriel Valley Protective Association.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 5	22.33	June 30	34.46	Aug. 29	(a)	Nov. 1	(a)
May 4	28.99	Aug. 1	(a)	Oct. 3	(a)	Dec. 4	25.17
June 1	34.04						

a Unable to enter well August to November.

3S/12-8F1. Los Angeles County Farm. California Division of Water Resources serial No. C-872t and location No. 1537F; Los Angeles Department of Water and Power No. 12-C-70. About 2 miles southeast of South Gate, 0.29 mile southwest of Imperial Highway, 50 feet northwest of Hawthorne Avenue and 50 feet northeast of Esperanza Avenue, in pit under low-roofed shelter. Drilled domestic and irrigation well, diameter 16 inches, reported depth 1,755 feet. Casing perforated at intervals from 578 feet to 1,608 feet below land surface. Measuring point, lower edge of hole in north side of pump base, 0.9 foot above concrete floor of pit, 3.4 feet below land-surface datum and 88.76 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1931-41 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 5	a 30.01	June 29	d 31.14	Aug. 29	c 38.23	Nov. 1	b 30.68
29	b 31.96	Aug. 1	a 37.17	Oct. 3	c 38.24	Dec. 4	26.76
29	c 31.34						

a Pumping recently.

b Pump shut off 5 minutes prior to measurement.

c Pump shut off 10 minutes prior to measurement.

d Pump shut off 15 minutes prior to measurement.

3S/12-8L3 (*941, p. 107; 949, p. 89; 991, p. 113; 1021, p. 92). Los Angeles County Farm. About 2 miles southwest of Downey. Records furnished by San Gabriel Valley Protective Association.

Water level, in feet below land-surface datum, 1945

Jan.	1	18.86	Apr.	9	19.95	July	9	30.34	Oct.	8	30.81
	8	13.98		16	22.41		16	32.24		15	29.98
	15	19.04		23	23.17		23	34.80		22	29.13
	22	19.57		30	24.94		30	35.80		29	28.30
	29	19.80	May	7	26.75	Aug.	6	36.27	Nov.	5	27.40
Feb.	2	18.47		14	26.03		13	34.42		12	26.00
	12	18.07		21	29.04		20	32.44		19	26.46
	19	17.40		28	31.10		27	33.39		26	26.38
	26	18.32	June	4	31.01	Sept.	3	33.05	Dec.	3	24.85
Mar.	5	16.94		11	30.11		10	33.54		10	24.71
	12	17.13		18	31.77		17	33.59		17	24.72
	19	16.99		25	30.71		24	31.18		24	22.63
	26	16.62		July	2	30.41	Oct.	1	32.30	31	20.72
Apr.	2	17.22									

3S/13-8C2. Southern California Water Co., South Los Angeles system, Delmar plant well 1. California Division of Water Resources serial No. B-58d and location No. 1437B. About 2 miles southwest of Watts, 1,100 feet south of Imperial Highway, 135 feet south of 116th Place and about 0.13 mile east of San Pedro Street. Drilled public-supply well, diameter 12 inches, reported depth 549 feet. Casing perforated from 165 to 175, 301 to 319, and 390 to 425 feet below land surface. Measuring point, lower edge of 2-inch measuring pipe into north side of well, 0.85 foot above concrete platform at land-surface datum, and 124.55 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly since 1929 by owner, monthly 1930-31 by San Gabriel Valley Protective Association and about monthly 1931-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Dec. 29, 1944, 100.93; Jan. 23, 1945, 99.08; Apr. 12, 1945, 154.27, just stopped pumping; Nov. 6, 1945, 154, pumping.

3S/13-8G1. Clara Peopping. California Division of Water Resources serial No. B-63a and location No. 1437F. About 2.5 miles northwest of Compton, 130 feet north of 120th Street and 330 feet east of Stanford Avenue, in back yard. Drilled unused well, diameter 16 inches, reported depth 790 feet. Measuring point, base of slit in east side of 14-inch casing atop the 16-inch casing, 0.8 foot above land-surface datum and 110.50 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1931-39 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Dec. 31, 1944, 89.60; Apr. 10, 1945, 89.37; Nov. 6, 1945, 98.57.

3S/13-8L2. H. N. Edison. Geological Survey continuing observation well. California Division of Water Resources serial No. B-58e and location No. 1437C, Los Angeles Department of Water and Power No. 11-C-34. About 2 miles southwest of Watts, 205 feet south of 120th Street and 0.11 mile west of Avalon Avenue, in back yard at 400 120th Street. Unused domestic well, diameter 5 inches, reported depth 254 feet. Measuring point, top of 1-inch coupling in welded casing cover, 0.08 foot above top of casing, 0.23 foot above concrete block about casing, 0.6 foot above land-surface datum, and 128.27 feet above sea-level datum (altitude by Los Angeles Department of Water and Power). Measurements as follows: (1) monthly 1930-33 by San Gabriel Valley Protective Association; (2) monthly 1931-41 by Los Angeles Department of Water and Power; (3) semiannually since 1938 by Los Angeles County Flood Control District; (4) weekly since Apr. 12, 1945, by Geological Survey. Measurements for 1930 are by San Gabriel Valley Protective Association, 1931-41 by Los Angeles Department of Water and Power, 1942-44 by Los Angeles County Flood Control District, and since Apr. 12, 1945, by Geological Survey.

Water level, in feet below land-surface datum, 1930-45

Date	Water level	Date	Water level	Date	Water level
Jan. 18, 1930	70.12	July 26, 1934	90.28	May 7, 1941	a 92.5
Feb. 4	69.72	Aug. 24	90.93	Oct. 21	96.78
Mar. 3	70.00	Sept. 17	89.23	27	a 96.0
Apr. 8	71.49	Oct. 12	89.93	Apr. 15, 1942	92.0
May 2	72.82	Nov. 7	89.33	Nov. 6	97.9
June 9	77.39	Jan. 7, 1935	85.58	Apr. 26, 1943	95.4
July 7	78.73	Feb. 12	84.38	Nov. 23	100.6
Aug. 11	79.43	Mar. 8	84.08	Apr. 26, 1944	99.4
Sept. 15	80.34	May 10	85.08	Dec. 5	101.0
Oct. 13	79.86	June 19	88.93	29	b 100.34
Nov. 10	79.76	July 24	90.83	Apr. 12, 1945	99.30
Dec. 8	76.88	Oct. 15	89.88	13	a 99.2
22	77.03	Nov. 25	88.43	16	99.91
Feb. 17, 1931	75.58	Jan. 6, 1936	87.53	23	99.99
Mar. 17	76.08	Feb. 21	86.98	30	100.98
Apr. 10	78.78	Apr. 30	88.73	May 7	101.65
May 19	78.98	June 10	92.48	14	101.42
June 12	79.33	July 17	93.93	21	102.73
July 23	83.43	Aug. 13	94.88	28	103.62
Sept. 11	85.08	Sept. 28	95.03	June 4	103.55
Oct. 15	82.08	Oct. 24	94.08	11	103.55
Nov. 6	80.98	Dec. 4	93.03	18	104.32
Dec. 3	78.68	Jan. 27, 1937	91.48	25	104.29
Jan. 7, 1932	76.93	Mar. 2	90.23	July 2	104.52
Feb. 17	75.68	Apr. 1	89.68	9	105.18
Mar. 14	76.28	May 4	91.38	16	106.01
Apr. 13	79.53	June 9	93.38	23	106.68
May 12	79.73	July 2	95.33	30	107.16
July 6	82.98	Aug. 4	97.73	Aug. 6	107.68
Aug. 10	84.78	Sept. 14	98.08	13	107.88
Sept. 16	84.23	Nov. 19	95.63	20	107.58
Oct. 5	85.83	Jan. 24, 1938	93.18	27	108.24
Nov. 16	83.68	Apr. 1	92.03	Sept. 3	108.38
Dec. 13	81.68	May 13	93.28	10	108.60
Jan. 3, 1933	81.58	June 28	95.48	17	108.71
Feb. 6	79.53	Oct. 27	97.33	24	107.21
Mar. 10	82.58	Dec. 29	94.28	Oct. 1	108.49
Apr. 14	85.43	Feb. 2, 1939	92.48	8	108.18
May 5	83.28	Mar. 3	92.23	15	108.48
June 1	86.73	Apr. 4	91.88	22	108.38
July 10	83.38	May 15	94.53	29	108.65
Sept. 7	86.98	June 14	97.03	Nov. 5	107.96
Oct. 5	86.08	July 20	98.58	5	a 107.98
Nov. 7	86.08	Oct. 11	97.28	12	106.81
Jan. 3, 1934	83.08	Dec. 19	95.58	19	106.42
Feb. 13	82.53	Jan. 24, 1940	93.23	26	106.38
Mar. 14	82.98	Feb. 15	92.83	Dec. 3	105.94
Apr. 11	84.93	Mar. 12	92.68	10	105.48
May 15	87.58	Oct. 9	98.78	17	105.68
June 26	89.08	Apr. 23, 1941	92.76	31	104.79

a By Los Angeles County Flood Control District.

b By Geological Survey.

3S/13-9N2. Mrs. H. Saulque. California Division of Water Resources serial No. B-64f and location No. 1448B. About 2 miles northwest of Compton, 220 feet north of El Segundo Boulevard and 110 feet east of Central Avenue, in east end of long frame pump house 20 feet north of large corrugated metal tank. Unused drilled well, diameter 13 inches, reported depth 408 feet. Measuring point, top east side of casing, 0.04 foot above concrete platform, 0.7 foot above land-surface datum, and 92.19 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made in 1923 and 1930-31 by Los Angeles Department of Water and Power and semiannually 1933-34 and since 1944 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 29, 1944, 56.25; Apr. 10, 1945, 54.98.

3S/13-16H2. Southern California Water Co., South Los Angeles system, Willowbrook plant well 2. California Division of Water Resources serial No. B-64m and location No. 1459C. About 1.5 miles northwest of Compton, 120 feet south of 134th Street and 685 feet west of Wilmington Boulevard, in frame pump house in fenced enclosure. Drilled public-supply well, diameter 12 inches, reported depth 250 feet. Casing perforated from 180 to 226 feet below land surface. Measuring point, lower edge of measuring pipe in pump base 0.47 foot above concrete floor, 0.8 foot above land-surface datum which is 82 feet above mean sea level (interpolated from topographic map). Additional measurements made monthly beginning 1943 by owner. Water levels, in feet below land-surface datum: Dec. 27, 1944, 41.33; Apr. 12, 1945, 43.62; Nov. 6, 1945, 52.66.

3S/13-18G2. Union Oil Co. Geological Survey continuing observation well, California Division of Water Resources serial No. B-54p and location No. 1418F, Los Angeles Department of Water and Power No. 11-C-7. About 2 miles northeast of Gardena, 0.39 mile south of El Segundo Boulevard, 65 feet east of Figueroa Street, in corrugated-metal pump house, 25 feet west of low tank under derrick. Unused drilled well, diameter 12 inches, depth 384.0 feet. Measuring point, top of casing at concrete floor which is at land-surface datum, and 131.5 feet above sea-level datum (altitude by Los Angeles Department of Water and Power). Measurements monthly 1930-41 by Los Angeles Department of Water and Power, in 1945 by Los Angeles County Flood Control District, and since Apr. 10, 1945, by Geological Survey. Measurements from 1930-41 are by Los Angeles Department of Water and Power and since Dec. 29, 1944, by Geological Survey.

Water level, in feet below land-surface datum, 1930, 1932-33, 1935-41, 1944-45

Date	Water level	Date	Water level	Date	Water level
June 23, 1930	105.0	Jan. 7, 1935	116.95	Mar. 22, 1938	124.1
Sept. 11	104.7	Feb. 5	116.6	Apr. 29	126.8
Nov. 14	119	Mar. 4	116.6	June 9	127.95
Jan. 20, 1931	117.9	Apr. 18	116.7	July 28	132.3
Feb. 17	118.0	June 11	117.4	Oct. 28	135.2
Mar. 17	118.8	23	117.55	Dec. 30	134.0
May 17	119.0	Sept. 4	117.3	Feb. 1, 1939	130.05
June 5	120.0	Nov. 27	117.55	Mar. 3	131.60
July 22	119.75	Dec. 18	117.3	Apr. 4	132.45
Aug. 21	119.8	Jan. 30, 1936	117.6	May 15	137.10
Sept. 3	119.8	Mar. 31	117.4	June 14	141.80
Oct. 15	119.6	May 20	117.7	July 12	136.35
Nov. 5	119.9	June 24	118.25	18	138.35
Dec. 3	119.5	July 3	117.8	20	139.60
Jan. 26, 1932	118.7	Aug. 31	117.9	Aug. 24	141.65
Feb. 5	118.6	Oct. 14	118.45	Oct. 11	145.48
Mar. 14	120.7	Nov. 19	117.75	Nov. 2	145.45
May 3	119.4	Jan. 5, 1937	117.65	27	144.10
14, 1933	118.75	Feb. 11	117.75	Dec. 15	146.05
June 7	118.6	Mar. 17	118.05	Jan. 12, 1940	146.40
July 16	117.9	Apr. 19	118.2	23	144.95
Aug. 8	118.7	May 18	118.6	Feb. 15	144.32
Sept. 25	118.35	June 18	118.9	Mar. 8	146.70
Oct. 8	118.05	July 19	126.7	28	144.85
Nov. 5	117.45	Aug. 19	128.2	Apr. 12	148.50
21	117.35	Oct. 15	133.3	June 26	151.10
Dec. 10	117.1	Dec. 7	127.7	Oct. 9	157.40

3S/13-18G2--Continued.

Water level, in feet below land-surface datum, 1930, 1932-33, 1935-41,
1944-45

Date	Water level	Date	Water level	Date	Water level
Apr. 23, 1941	148.35	June 18, 1945	168.09	Sept. 24, 1945	170.40
Oct. 17	155.85	25	167.66	Oct. 1	171.07
Dec. 29, 1944	160.73	July 2	168.72	8	169.36
Apr. 10, 1945	160.13	9	169.01	15	169.11
13	a160.7	16	170.18	22	168.92
16	161.25	23	170.88	29	168.36
23	161.40	30	170.86	Nov. 5	166.79
30	162.17	Aug. 6	171.45	12	166.58
May 7	164.38	13	171.14	19	167.17
14	164.24	20	170.54	26	167.36
21	165.50	27	170.72	Dec. 3	165.94
28	166.66	Sept. 3	170.23	10	166.56
June 4	166.79	10	170.14	17	166.79
11	167.35	17	170.23	31	165.70

a Measurement by Los Angeles County Flood Control District.

3S/13-19A1. Gordon Ranch. California Division of Water Resources serial No. B-106f and location No. 820A; Los Angeles Department of Water and Power No. 7-A-11. About 1.5 miles northeast of Gardena, 1,100 feet south of Rosecrans Avenue, 90 feet west of Main Street, under derrick in frame pump house. Drilled well, diameter 12 (?) inches, depth unknown. Measuring point, top edge of opening in southeast side of pump base, 0.5 foot above land-surface datum and 110.07 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1930-32 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: June 16, 1944, 134.16; Nov. 9, 1944, 126.97; Nov. 6, 1945, 139.64, pumping.

3S/13-20G1. G. L. Douglas. California Division of Water Resources serial No. B-59L and location No. 1439F; Los Angeles Department of Water and Power No. 11-C-2. About 2.5 miles west of Compton, 450 feet south of Rosecrans Avenue, measured along San Pedro Street, and 100 feet northeast of San Pedro Street, in field. Unused drilled well, diameter 12 inches, reported depth 403 feet. Casing perforated from 183 to 199 feet and 228 to 243 feet below land surface. Measuring point, hole in 2-inch plank over casing, 0.8 foot above concrete slab at land-surface datum, and 106.15 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1930-40 by Los Angeles Department of Water and Power and about semiannually since 1938 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 15, 1944, 119.47; Nov. 19, 1945, 122.45.

3S/13-20H4 (*1021, p. 92). East Gardena Water Co. About 2 miles west of Compton.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	71.54	Apr. 2	a 71.43	July 2	a 91.26	Oct. 8	90.25
8	72.13	9	72.10	9	a 94.19	15	88.80
15	73.35	16	a 81.16	16	a 95.54	22	a 91.73
22	75.98	23	a 81.73	23	a 96.40	29	86.71
29	75.62	30	75.68	30	a 96.14	Nov. 5	85.77
Feb. 5	72.68	May 7	80.69	Aug. 6	a 98.06	12	84.92
12	70.77	14	81.29	20	a 98.92	19	86.09
19	72.74	21	81.39	27	a 96.67	26	87.50
26	73.03	28	a 89.24	Sept. 3	a 96.71	Dec. 3	83.60
Mar. 5	72.16	June 4	a 90.02	10	a 99.33	10	81.68
12	69.93	11	84.80	17	a 93.71	17	83.13
19	68.72	18	a 91.19	24	a 92.51	31	a 80.09
26	68.45	25	87.90	Oct. 1	a 95.82		

a Well 100 feet northeast pumping.

3S/13-20J2. Clyde Morton. California Division of Water Resources serial No. B-1110 and location No. 840B; Los Angeles Department of Water and Power No. 7-A-19. About 2 miles west of Compton, 105 feet south of Compton Boulevard and 200 feet east of McKinley Avenue, under derrick at rear of dwelling. Unused drilled well, diameter 7 inches, depth 68.0 feet. Measuring point, top northeast side of casing, 0.5 foot above land-surface datum and 103.91 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1931-32 by Los Angeles Department of Water and Power, and about semiannually 1933-34 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Apr. 6, 1944, 59.92; Nov. 9, 1944, 60.34; Nov. 6, 1945, 60.79.

3S/13-25Q1. Constructed by Geological Survey on property of Los Angeles County. In north Long Beach, 50 feet north of Artesia Street, 50 feet west of toe of west dike of Los Angeles River. Bored water-table well, diameter 8 inches, initial depth 12.8 feet, deepened to 15.5 feet June 19, 1945. Casing perforated from 9.5 to 15.5 feet below land surface. Measuring point, top north side of casing, 0.59 foot above land-surface datum and 57.28 feet above sea-level datum of 1944. Water-stage recorder installed Feb. 19, 1945, by Geological Survey.

Water level, in feet below land-surface datum, 1945
(Chiefly noon levels from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 19 a	8.68	May 5	8.48	July 25	11.82	Oct. 15	12.50
20	8.64	10	8.69	31	12.21	20	12.34
25	8.60	15	8.90	Aug. 5	12.49	25	12.29
28	8.55	20	9.39	10	12.60	31	12.17
Mar. 5	8.35	25	9.81	15	12.77	Nov. 5	12.06
10	8.22	30	10.15	20	12.72	10	11.95
15	8.18	June 5	10.40	25	12.77	15	11.92
20	6.86	10	10.65	31	12.97	20	11.85
25	6.36	15	10.85	Sept. 5	13.01	25	11.85
31	6.20	20	(b)	10	13.04	30	11.70
Apr. 5	6.66	25	11.20	15	13.08	Dec. 5	11.50
10	7.08	30	11.18	20	12.94	10	11.32
15	7.40	July 5	11.39	25	12.80	15	11.34
20	7.73	10	11.49	30	12.79	20	11.34
25	(b)	15	11.68	Oct. 5	12.85	25	9.95
30	8.14	20	11.92	10	12.73	31	9.95

a Tape measurement.

b Recorder not operating.

3S/13-26D1 (138, p. 46, Downey quadrangle well 167). Robert W. Poe. Formerly owned by Dr. J. A. Monk. California Division of Water Resources serial No. B-121b and location No. 881A, Los Angeles Department of Water and Power No. 7-B-21. In Compton, 40 feet south of Olive Street and 205 feet east of Petrolia Avenue, 5 feet south of sidewalk. Unused drilled well, diameter 12 inches, reported depth 811 feet. Casing perforated from 670 to 698 and 773 to 793 feet below land surface. Measuring point, top inside edge of vertical pipe into casing, flush with top of casing, 1.3 feet above land-surface datum, and 66.6 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1927-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Dec. 16, 1944, 41.00; Apr. 10, 1945, 38.61; Nov. 5, 1945, 53.66.

3S/13-27NL. MacClintoch. California Division of Water Resources serial No. B-117 and location No. 862; Los Angeles Department of Water and Power No. 7-B-34. About 1.5 mile southwest of Compton, 0.59 mile north of Victoria Street, 100 feet east of Wilmington Avenue. Unused drilled well, diameter 7 inches, depth 155.0 feet. Measuring point, top north side of casing between clamps, 1.4 feet above land-surface datum and 98.79 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1929-41 by Los Angeles Department of Water and Power and about semiannually 1930-40 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Jan. 15, 1944, 83.71; Apr. 11, 1945, 81.38; Nov. 7, 1945, 86.95.

3S/13-28P1 (*1021, p. 93). Gardena Syndicate, Inc. About 2 miles southwest of Compton. Water-stage recorder maintained on well to June 16, 1945; tape measurements after that date and as indicated.

Water level, in feet below land-surface datum, 1945
(Partly high level for the day from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	90.73	Mar. 20	89.37	June 10	99.69	Sept. 17	97.27
10	90.91	25	89.13	15	96.40	24	96.80
15	90.61	31	89.46	18	99.59	Oct. 1	98.89
20	91.32	Apr. 5	90.67	25	95.12	8	99.56
25	91.54	10	90.76	July 2	96.17	15	97.55
31	91.34	15	91.54	9	96.63	22	96.26
Feb. 5	90.35	23	a 93.55	16	96.70	29	98.90
10	90.07	25	92.25	23	97.47	Nov. 5	96.17
15	89.88	30	93.36	30	97.32	12	96.40
20	89.86	May 5	93.81	Aug. 6	97.85	19	97.02
25	90.14	14	a 93.49	13	98.24	26	96.55
28	89.65	21	a 96.40	20	96.96	Dec. 3	95.20
Mar. 5	89.35	25	95.93	27	97.66	10	95.03
10	89.51	31	95.30	Sept. 3	99.35	17	96.18
15	89.14	June 5	99.68	10	99.16	31	93.50

a Tape measurement.

3S/13-29A3. A. Kilgore. About 2 miles southwest of Compton, 0.32 mile east of Avalon Boulevard, 500 feet north of Olive Street, 3 feet south of pump house. Drilled domestic and irrigation well, depth 172.0 feet. Measuring point, top east side of pipe clamps, 0.16 foot above top of casing, 0.5 foot above land-surface datum which is 65 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Dec. 9, 1943, 85.83; Nov. 9, 1944, 86.66; Apr. 11, 1945, 86.97, pumping; Nov. 7, 1945, 90.03.

3S/13-30A2. J. P. Schlaegel. California Division of Water Resources serial No. B-106e and location No. 821B; Los Angeles Department of Water and Power No. 7-A-52. About 1 mile east of Gardena, 600 feet south of Olive Street and 320 feet west of Main Street, in frame pump house. Drilled domestic and stock well, diameter 12 inches, reported depth 704 feet. Casing perforated from 363 to 373, 528 to 538, 560 to 577, 616 to 628, and 660 to 690 feet below land surface. Measuring point, lower edge of 1-inch measuring pipe into south side of casing, 1.0 foot above land-surface datum and 46.32 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1930-40 by Los Angeles Department of Water and Power and about semiannually 1933-37 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Dec. 2, 1943, 73.50; Nov. 7, 1945, 79.28.

3S/13-30G4. G. H. Mason. About 0.8 mile east of Gardena, 300 feet north of Gardena Boulevard and 170 feet west of Broadway. Drilled stock and irrigation well, diameter 6 inches, depth 41.1 feet. Measuring point, top northeast side of casing, 0.5 foot above land-surface datum which is 43 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Dec. 2, 1943, 36.35; Nov. 9, 1944, 36.51; Apr. 10, 1945, 36.54; Nov. 7, 1945, 37.43.

3S/13-30H3. Mrs. Emma Hart. About 1 mile east of Gardena, 210 feet south of East 165th Street and 450 feet east of South Main Street, under windmill tower. Drilled stock well, diameter 8 inches, depth 59.0 feet. Measuring point, top north side of casing, 0.3 foot above land-surface datum which is 43 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Dec. 3, 1943, 42.14; Nov. 9, 1944, 42.01; Apr. 11, 1945, 42.34; Nov. 7, 1945, 43.48.

3S/13-32F2 (*949, p. 90; 991, p. 113; 1021, p.). John Larronde. About 1.5 miles southeast of Gardena.

Water level, in feet below land-surface datum, 1945

Jan. 8	86.02	Feb. 5	85.96	Mar. 5	84.04	Apr. 2	85.07
15	85.96	12	85.70	12	85.04	9	85.37
22	86.00	19	85.25	19	85.07	16	86.05
29	86.39	26	85.21	26	82.96	23	86.55

3S/13-32F2--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 30	86.87	July 2	91.65	Sept. 3	95.40	Nov. 5	90.57
May 7	89.78	9	91.77	10	95.65	12	90.39
14	91.06	16	94.45	17	93.24	19	90.18
21	88.93	23	92.93	24	93.62	26	90.19
28	89.89	30	95.42	Oct. 1	92.10	Dec. 3	89.70
June 4	89.93	Aug. 6	95.37	8	91.82	10	88.89
11	92.75	13	95.37	15	90.84	17	90.02
18	93.13	20	95.08	22	91.00	31	87.53
25	93.72	27	94.60	29	91.00		

3S/13-33A1. Union Oil Co. Los Angeles Department of Water and Power No. 7-B-36. About 2 miles southwest of Compton, 1,050 feet north of Victoria Street and 1,275 feet west of Wilmington Avenue, easterly well of 2 in open. Drilled industrial well, reported depth 250 feet. Measuring point, hole in southeast side of pump base, at land-surface datum and 145.06 feet above sea-level datum of 1941. Additional measurements irregularly 1931-41 by Los Angeles Department of Water and Power. Well 125 feet west pumping at time of each measurement. Water levels, in feet below land-surface datum, 1945: Apr. 11, 147; Nov. 7, 142.82.

3S/13-35B2 (*949, p. 90; 991, p. 114; 1021, p. 93). H. Y. Sasaki. About 1.5 miles south of Compton.

Water level, in feet below land-surface datum, 1945

Jan. 1	18.06	Apr. 9	17.20	July 9	24.46	Oct. 8	26.34
15	17.77	16	18.02	16	25.23	15	25.80
22	17.90	23	18.24	23	26.14	22	25.25
29	18.04	30	19.10	30	26.24	29	24.33
Feb. 5	17.52	May 7	20.29	Aug. 6	26.90	Nov. 5	24.32
12	17.33	14	20.84	13	a 27.66	12	23.88
19	17.14	21	22.14	20	a 27.30	19	23.85
26	17.20	28	23.15	27	27.20	26	23.67
Mar. 5	16.88	June 4	23.66	Sept. 3	27.23	Dec. 3	23.10
12	16.73	11	24.06	10	27.59	10	22.68
19	16.55	18	24.06	17	27.32	17	22.48
26	16.32	25	24.50	24	26.68	31	21.10
Apr. 2	16.40	July 2	24.18	Oct. 1	26.60		

a Well 350 feet northeast pumping.

3S/14-3K1. Southern California Water Co., Yukon plant well 1. California Division of Water Resources serial No. B-44g and location No. 1366B. About 2 miles southeast of Inglewood, 1,500 feet north of Imperial Highway and 2,900 feet east of Prairie Avenue, 50 feet north of 111th Street and 200 feet east of Yukon Avenue, in 10- by 10-foot pump house. Drilled public-supply well, diameter 16 inches, reported depth 652 feet. Casing perforated from 368 to 414, 538 to 552, and 562 to 578 feet below land surface. Land-surface datum is 74 feet above mean sea level (interpolated from topographic map). Measured monthly since 1941 by Southern California Water Co. Records furnished by Southern California Water Co. Measurements are by air gage. All water levels are below sea level.

Water level, in feet below land-surface datum, 1941-45

Date	Water level	Date	Water level	Date	Water level
July 14, 1941	112	June 1, 1942	108	May 1, 1943	106
Aug. 1	112	July 1	106	June 1	110
Sept. 1	112	Aug. 1	116	July 1	110
Oct. 1	111	Sept. 1	112	Aug. 1	112
Nov. 1	112	Oct. 1	112	Sept. 1	112
21	102	Nov. 1	108	Oct. 1	111
Jan. 1, 1942	108	Dec. 1	104	Nov. 1	109
Feb. 1	97	Jan. 1, 1943	102	Dec. 1	108
Mar. 1	100	Feb. 1	104	Jan. 1, 1944	103
Apr. 1	100	Mar. 1	98	Feb. 1	100
May 1	101	Apr. 1	98	Mar. 1	100

3S/14-3K1--Continued.

Water level, in feet below land-surface datum, 1941-45

Date	Water level	Date	Water level	Date	Water level
Apr. 1, 1944	102	Oct. 1, 1944	110	June 1, 1945	116
25	107	Nov. 1	109	July 1	116
June 1	110	Dec. 1	103	Aug. 1	122
July 1	110	Jan. 1, 1945	102	Sept. 1	123
Aug. 1	110	Feb. 1	103	Oct. 1	123
28	117	Mar. 1	100	Nov. 1	119
Sept. 1	110	Apr. 1	100	Dec. 1	113
21	110	May 1	106		

3S/14-7K1 (*1021, p. 94). Standard Oil Co. About 2 miles west of Hawthorne. Water-stage recorder maintained on well to Jan. 22, 1945, by Geological Survey. Tape measurements since Feb. 12. Measurements discontinued Dec. 3. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945
(Partly noon levels from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	115.28	Apr. 9	115.00	June 25	115.84	Sept. 24	116.63
10	115.35	16	115.25	July 2	115.81	Oct. 1	116.66
15	115.15	23	115.41	9	115.93		116.73
20	115.32	30	115.48	16	115.93	15	116.64
Feb. 12	115.27	May 7	115.53	23	116.01	22	116.51
19	116.38	14	115.46	30	116.12	29	116.71
26	115.43	21	115.51	Aug. 6	116.17	Nov. 5	116.52
Mar. 5	115.33	28	115.59	20	116.26	12	116.66
12	115.32	June 4	115.60	Sept. 3	116.42	19	116.55
19	115.36	11	115.69	10	116.60	26	116.58
26	115.24	18	115.71	17	116.54	Dec. 3	116.62
Apr. 2	115.16						

3S/148D2. Airways Water Co. well 1. California Division of Water Resources serial No. B-36n and location No. 1327D. About 1.5 miles northwest of Hawthorne, 1,200 feet south of Imperial Highway and 800 feet east of Aviation Boulevard, 65 feet north of West 118th Street and 400 feet west of Isis Avenue, in stucco pump house. Drilled public-supply well, diameter 10 inches, reported depth 200 feet. Measuring point, lower lip of 2-inch slanted pipe into east side of casing, 2.17 feet above land-surface datum which is 89 feet above mean sea level (interpolated from topographic map). Additional water-level measurements made about annually since 1942 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 7, 1944, 112.92; Apr. 13, 1945, 112.97; Nov. 9, 1945, 110.20.

3S/14-8G2. Airways Water Co. well 4. California Division of Water Resources serial No. B-36q and location No. 1337B. About 1 mile northwest of Hawthorne, 85 feet south of West 119th Street and 130 feet east of Anza Avenue, in frame pump house at pressure tank. Drilled public-supply well, diameter 12 inches, reported depth 304 feet. Casing perforated from 118 to 132 and 282 to 290 feet below land surface. Measuring point, lower edge of 2-inch diagonal pipe into northeast side of casing, 1.81 feet above concrete floor of pump house, at land-surface datum which is 87 feet above mean sea level (interpolated from topographic map). Additional measurements made annually since 1943 by owner. Water levels, in feet below land-surface datum: Nov. 3, 1944, 104.81; Apr. 13, 1945, 117.96; Nov. 9, 1945, 106.54.

3S/14-9N2. City of Hawthorne well 2. California Division of Water Resources serial No. B-41s and location No. 1348A. In Hawthorne, about 550 feet north of El Segundo Boulevard and 90 feet west of Ramona Avenue, in corrugated metal pump house. Drilled public-supply well, diameter 14 inches, reported depth 679 feet. Casing perforated from 321 to 360, 400 to 403; 454 to 469, and 622 to 634 feet below land surface. Measuring point, bottom edge of hole at northeast side of pump base, 0.46 foot above concrete floor, at land-surface datum which is 96 feet above mean sea level (interpolated from topographic map). Additional measurements made about semiannually 1934-43 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 7, 1944, 123.79; Apr. 11, 1945, 123.7; Nov. 9, 1945, 128, nearby wells pumping.

3S/14-10A1. A. P. Wright. California Division of Water Resources serial No. B-44a and location No. 1376, Los Angeles Department of Water and Power No. 10-D-6. About 1.5 miles northeast of Hawthorne, 75 feet south of Imperial Highway and 110 feet west of Crenshaw Avenue, in frame pump house. Drilled irrigation well, reported depth 600 feet. Casing perforated from 230 to 240, 371 to 385, 490 to 496, and 530 to 580 feet below land surface. Measuring point, bottom northwest edge of pump base at hole, 0.32 foot above top of concrete foundation, 1.2 feet above land-surface datum, and 77.77 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about semi-annually 1930-34 and 1941-44 by Los Angeles County Flood Control District and monthly 1930-40 by Los Angeles Department of Water and Power.

Water level, in feet below land-surface datum, 1944-45

Date	Water level	Date	Water level	Date	Water level
Aug. 25, 1944	121.26	Nov. 7, 1944	123.38	Nov. 9, 1945	117.09
28	120.85	Dec. 7	101.85		

a Pump idle 39 minutes prior to measurement.

3S/14-11C1. O. T. Johnson Ranch well 3. California Division of Water Resources serial No. B-48a and location No. 1386A, Los Angeles Department of Water and Power No. 10-D-10. About 2 miles northeast of Hawthorne, 0.51 mile west of Western Avenue, 60 feet south of Imperial Highway, in long frame pump house, at east end of earth-diked reservoir. Unused drilled well, reported depth 407 feet. Casing perforated from 233 to 248 and 320 to 344 feet below land surface. Land-surface datum is 115 feet above mean sea level (interpolated from topographic map). All measurements are by air gage. Water levels, in feet below land-surface datum: Nov. 7, 1944, 112; Apr. 11, 1945, 111; Nov. 9, 1945, 116.

3S/14-11G1. O. T. Johnson Ranch. California Division of Water Resources serial No. B-48g and location No. 1387. About 2.5 miles east of Hawthorne, 0.28 mile south of Imperial Highway, and 0.25 mile west of Western Avenue, 20 feet east of reservoir, in pump house. Unused drilled well, diameter 12 inches, depth unknown. Measuring point, top west side of casing, at land-surface datum which is 152 feet above mean sea level (interpolated from topographic map). Additional measurements made monthly 1931-32 and about semiannually since 1933 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum, 1945: Apr. 11, 179.41; Nov. 9, 188.05.

3S/14-13E1. B. M. Phillips. California Division of Water Resources serial No. B-49a and location No. 1399, Los Angeles Department of Water and Power No. 10-D-1. About 2 miles north of Gardena, 165 feet north of West 135th Street, 0.22 mile east of Western Avenue, under windmill in back yard of dwelling. Unused drilled well, diameter 10 inches, depth unknown. Measuring point, top north side of casing between pipe clamps, 0.2 foot above land-surface datum and 51.84 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1929-40 by Los Angeles Department of Water and Power and about semiannually since 1939 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 7, 1944, 61.10; Apr. 11, 1945, 63.74; Nov. 9, 1945, 62.45.

3S/14-16A3. Los Angeles County. California Division of Water Resources serial No. B-41m and location No. 1358E. In Hawthorne, 200 feet south of East 129th Street and 490 feet west of Prairie Avenue. Unused drilled well, diameter 6 inches, depth 95.0 feet. Measuring point, top of casing, 0.2 foot above land-surface datum which is 60 feet above mean sea level (interpolated from topographic map). Additional measurements made semiannually since 1936 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: May 25, 1944, 76.08; Nov. 8, 1944, 77.50; Apr. 11, 1945, 76.90; Nov. 9, 1945, 79.32.

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3S/14-20P1. K. H. Lew. California Division of Water Resources serial No. B-89e and location No. 731A, Los Angeles Department of Water and Power No. 8-A-15. In Redondo Beach, 0.46 mile east of Aviation Boulevard, 150 feet north of Manhattan Beach Boulevard, 650 feet east of Rindge Lane, extended, 30 feet west of water tank, in small frame pump house. Drilled irrigation well, diameter 12 inches, reported depth 320 feet. Measuring point, bottom of vertical slot in east side of casing, 0.50 foot below top of casing, at land-surface datum and 74.8 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1932-40 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Oct. 9, 1943, 91.48; Nov. 8, 1944, 92.39; Apr. 13, 1945, 87.50; Nov. 9, 1945, 95.65.

3S/14-21B1. Southern California Water Co., Rosecrans plant well 1. Geological Survey continuing observation well. California Division of Water Resources serial No. B-41d and location No. 1349. About 1 mile south of Hawthorne, 160 feet south of Rosecrans Avenue and 120 feet east of east lane of Hawthorne Avenue, in pump house under derrick. Drilled public-supply well, diameter 12 inches, reported depth 500 feet. Measured monthly since 1931 by Southern California Water Co. Land-surface datum is 63 feet above mean sea level (interpolated from topographic map). Records furnished by Southern California Water Co. Measurements are by air gage. All water levels are below sea level.

Water level, in feet below land-surface datum, 1931-37, 1939-45

Date	Water level	Date	Water level	Date	Water level
Jan. 1, 1931	68	July 1, 1934	76	Nov. 1, 1939	80
Feb. 1	68	Aug. 1	78	Dec. 1	80
Mar. 1	68	Sept. 1	78	Jan. 1, 1940	80
Apr. 1	72	Oct. 1	76	Feb. 1	78
May 1	66	Nov. 1	73	Mar. 1	77
June 1	68	Dec. 1	72	Apr. 1	79
July 1	73	Jan. 1, 1935	70	May 1	79
Aug. 1	73	Feb. 1	70	June 1	81
Sept. 1	73	Mar. 1	69	July 1	84
Oct. 1	74	Apr. 1	70	Aug. 1	84
Nov. 1	70	May 1	72	Sept. 1	87
Dec. 1	68	June 1	76	Oct. 1	87
Jan. 1, 1932	68	July 1	77	Nov. 1	86
Feb. 1	68	Aug. 1	79	Dec. 1	79
Mar. 1	67	Sept. 1	80	Jan. 1, 1941	79
Apr. 1	70	Oct. 1	79	Feb. 1	84
May 1	74	Nov. 1	79	Mar. 1	84
June 1	72	Dec. 1	76	Apr. 1	77
July 1	74	Jan. 1, 1936	76	May 1	81
Aug. 1	75	Feb. 1	76	June 1	86
Sept. 1	75	Mar. 1	72	July 1	88
Oct. 1	72	Apr. 1	75	Aug. 1	86
Nov. 1	72	May 1	75	Sept. 1	87
Dec. 1	70	June 1	78	Oct. 1	87
Jan. 1, 1933	70	July 1	78	Nov. 1	87
Feb. 1	69	Aug. 1	81	Dec. 1	84
Mar. 1	69	Sept. 1	80	Jan. 1, 1942	85
Apr. 1	71	Oct. 1	80	Feb. 1	89
May 1	72	Nov. 1	77	Mar. 1	87
June 1	74	Dec. 1	77	Apr. 1	88
July 1	74	Jan. 1, 1937	74	May 1	87
Aug. 1	75	Feb. 1	73	June 1	92
Sept. 1	75	14	73	July 1	91
Oct. 1	75	7, 1939	75	Aug. 1	82
Nov. 1	74	Mar. 1	77	Sept. 1	88
Dec. 1	73	Apr. 1	75	Oct. 1	84
Jan. 1, 1934	70	May 1	81	Nov. 1	83
Feb. 1	69	June 1	83	Dec. 1	81
Mar. 1	70	July 1	84	Jan. 1, 1943	82
Apr. 1	73	Aug. 1	86	Feb. 1	82
May 1	76	Sept. 1	86	Mar. 1	82
June 1	74	Oct. 1	86	Apr. 1	83

3S/14-21B1--Continued.

Water level, in feet below land-surface datum, 1931-37, 1939-45

Date	Water level	Date	Water level	Date	Water level
May 1, 1943	86	Apr. 1, 1944	85	Feb. 1, 1945	96
June 1	92	May 1	87	Mar. 1	91
July 1	93	June 1	98	Apr. 1	91
Aug. 1	94	July 1	101	May 1	95
Sept. 1	95	Aug. 1	101	June 1	91
20	93	Sept. 1	102	July 1	99
Oct. 1	92	21	100	Aug. 7	99
Nov. 1	91	Oct. 1	100	Sept. 7	101
Dec. 1	92	Nov. 1	99	Oct. 21	98
Jan. 1, 1944	87	Dec. 1	93	Nov. 1	98
31	87	Jan. 1, 1945	94	Dec. 1	97
Mar. 1	85				

3S/14-23R3. Bell. California Division of Water Resources serial No. B-101e and location No. 781C. In Gardena, 1,600 feet east of Arlington Avenue, measured along Redondo Beach Boulevard, and 35 feet north of Redondo Beach Boulevard, under derrick. Unused drilled well, diameter 6 inches, reported depth 250 feet. Measuring point, top of coupling atop casing, 1.0 foot above land-surface datum which is 46 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Oct. 15, 1943, 61.97; Nov. 8, 1944, 62.67; Apr. 11, 1945, 61.74; Nov. 13, 1945, 65.60.

3S/14-24P1. In Gardena, 0.31 mile east of Western Avenue, measured along Redondo Beach Boulevard, 150 feet northwest of Redondo Beach Boulevard, and 5 feet north of wood-stave tank atop tower. Unused drilled well, diameter 4 inches, reported depth 180 feet. Measuring point, top of $\frac{1}{2}$ -inch coupling atop air line into casing, 2.56 feet above top of casing, 4.0 feet above land-surface datum which is 49 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Oct. 14, 1943, 67.50; Nov. 8, 1944, 66.03; Apr. 11, 1945, 65.64; Nov. 9, 1945, 70.05.

3S/14-25L1. M. G. Marcellus. In Gardena, 210 feet north of 169th Street and 220 feet west of Brighton Street, 15 feet north of shed and 4 feet east of tank tower. Drilled irrigation well, diameter 8 inches, depth 56.6 feet. Measuring point, top west side of casing, 2.0 feet above land-surface datum which is 34 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Nov. 18, 1943, 21.22; Nov. 8, 1944, 20.18; Apr. 13, 1945, 19.05; Nov. 9, 1945, 20.86.

3S/14-25N2. A. D. Seaback. In Gardena, 1,125 feet north of 174th Street and 225 feet east of Western Avenue, under windmill, 10 feet west of tank tower. Drilled domestic and irrigation well, diameter 6 inches, reported depth 205 feet. Measuring point, top of $\frac{3}{4}$ -inch hole at east side of wood pipe clamps, 0.37 foot above top of casing, 2.1 feet above land-surface datum which is 36 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Nov. 18, 1943, 57.41; Nov. 20, 1944, 56.89; Apr. 14, 1945, 57.98; Nov. 9, 1945, 61.06, pumping.

3S/14-26D2 (*468, p. 18, well 8a). Ben Long. California Division of Water Resources serial No. B-96d and location No. 771A, Los Angeles Department of Water and Power No. 8-B-36. About 1 mile west of Gardena, 355 feet south of Manhattan Beach Boulevard and 190 feet east of Crenshaw Boulevard, in back yard, 5 feet south of wood-stave tank. Unused drilled well, diameter 8 inches, reported depth 188 feet. Casing perforated from 126 to 136 feet below land surface. Measuring point, bottom edge of pump base, 0.17 foot above top of casing, 0.50 foot above land-surface datum and 48.71 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Measurements made about semiannually from 1914 through 1920 by Geological Survey and published in Water-Supply Paper 468. Additional measurements made about monthly 1931-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Oct. 18, 1943, 44.52; Nov. 8, 1944, 44.39; Apr. 14, 1945, 44.35; Nov. 9, 1945, 45.50.

3S/14-27J3. Houillion. About 1.5 miles west of Gardena, 1,000 feet west of Crenshaw Boulevard, measured along Cherry Street, 250 feet west of intersection of Cherry Street and 168th Street and 90 feet north of 168th Street, 6 feet east of frame pump house and tank. Drilled irrigation well, diameter 7 inches, reported depth 225 feet. Measuring point, top of pipe clamps at west side of casing, 0.5 foot above land-surface datum which is 43 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Nov. 5, 1943, 62.18; Nov. 8, 1944, 62.12; Apr. 14, 1945, 62.55.

3S/14-27P5. Gaston Diche. About 2 miles west of Gardena, 1,000 feet west of Yukon Avenue, and 400 feet south of 171st Street, among poultry enclosures, under windmill. Drilled stock well, diameter 8 inches, reported depth 200 feet. Measuring point, top south side of casing, 1.0 foot above land-surface datum which is 58 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Nov. 17, 1943, 80.56; Nov. 2, 1944, 82.12; Apr. 14, 1945, 82.53; Nov. 9, 1945, 85.39, pumping.

3S/14-33F2. Maude Harrington. In Redondo Beach, 1,050 feet north of 182d Street and 1,200 feet west of Hawthorne Avenue, in stock pen, under windmill. Unused drilled well, diameter 10 inches, reported depth 400 feet. Measuring point, top south side of pipe clamps atop casing, 0.77 foot above top of casing, at land-surface datum which is 100 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Oct. 21, 1943, 115.32; Nov. 15, 1944, 115.97; Apr. 14, 1945, 116.11, pumping; Nov. 13, 1945, 118.10.

3S/14-34J1. Earl Wing. In Torrance, 650 feet south of 182d Street, 60 feet west of Crenshaw Boulevard and 60 feet south of frame dwelling, under windmill, 10 feet south of wood-stave tank. Drilled domestic well, diameter 8 inches, depth 264.0 feet. Measuring point, top north side of casing, 2.0 feet above land-surface datum which is 62 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Oct. 29, 1943, 84.80; Apr. 14, 1945, 86.00; Nov. 8, 1945, 88.94.

3S/14-35R1 (*1021, p. 94). Southern California Edison Co., Ltd. About 2 miles north of Torrance. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	94.13	Apr. 9	93.24	July 16	101.30	Oct. 8	100.50
	94.10		94.08		101.81		100.14
	93.59		94.30		102.04		99.98
	93.96		95.05		102.48		99.92
	94.24		95.93		102.54		98.81
Feb. 5	93.95	May 14	96.71	Aug. 6	102.45	Nov. 5	99.23
	93.74		97.37		102.30		98.95
	93.50		98.43		102.32		99.30
	93.04		98.82		102.55		99.10
Mar. 5	93.17	June 11	99.01	Sept. 3	101.80	Dec. 3	98.68
	93.06		99.87		100.76		98.46
	92.97		100.06		100.72		95.94
Apr. 2	92.87	9	100.47				

3S/14-36M3 (139, well 560, Redondo; *1021, p. 94). H. T. Potomkin. Formerly owned by Frank Styskal. About 2 miles north of Torrance. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945

Jan. 1	67.15	Mar. 5	66.98	May 7	68.24	July 9	69.93
8	67.32	12	67.01	14	68.47	16	69.89
15	67.10	19	66.98	21	69.32	21	70.20
22	67.36	26	66.90	28	69.35	23	70.29
29	67.30	Apr. 2	67.01	June 4	69.00	30	70.63
Feb. 5	67.13	9	67.48	11	69.43	Aug. 6	70.50
12	67.10	16	68.00	18	69.83	13	70.58
19	67.10	23	67.88	25	69.61	20	70.31
26	67.13	30	68.12	July 2	69.43	27	70.74

3S/14-36M3--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 3	70.69	Oct. 8	70.58	Nov. 5	69.85	Dec. 3	69.44
10	70.84	15	70.33	12	69.83	10	69.28
17	70.55	22	70.10	19	69.79	17	69.52
24	70.46	29	70.08	26	69.77	31	68.99
Oct. 1	70.60						

3S/15-12G2. City of El Segundo well 5. California Division of Water Resources serial No. B-35h and location No. 1297D, Los Angeles Department of Water and Power No. 9-D-14. In El Segundo, 230 feet south of Palm Avenue and 50 feet west of California Street, in frame pump house in fenced enclosure. Drilled public-supply well, diameter 16 inches, reported depth 394 feet. Casing perforated from 135 to 153, 197 to 203, and 318 to 323 feet below land surface. Measuring point, bottom of hole in west side of casing, 0.21 foot below bottom of pump flange and 0.92 foot above concrete floor at land-surface datum, and 108.52 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly since 1939 by owner, about semiannually since 1939 by Los Angeles County Flood Control District, and irregularly 1939-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum, 1945: Apr. 17, 118.04; Nov. 9, 118.75, well 180 feet north pumping.

3S/15-24D1 (*1021, p. 95). City of Manhattan Beach well 5. In Manhattan Beach. Water-stage recorder maintained on well to Jan. 8, 1945, by Geological Survey. Water levels, in feet below land-surface datum, 1945: Jan. 1, 104.14; Jan. 8, 104.35; Jan. 15, 103.88.

3S/15-25A1. City of Manhattan Beach well 3. California Division of Water Resources serial No. B-84b and location No. 701A, Los Angeles Department of Water and Power No. 8-A-2. In Manhattan Beach, 40 feet south of 8th Street and 115 feet west of Sepulveda Boulevard, in frame pump house. Drilled public-supply well, diameter 14 inches, reported depth 547 feet. Casing perforated from 214 to 218 and from 225 to 235 feet below land surface. Measuring point, top south side of casing, 0.14 foot above concrete floor, at land-surface datum, and 145.08 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made monthly 1931-41 by Los Angeles Department of Water and Power and semiannually since 1934 by Los Angeles County Flood Control District. Water levels are below sea level.

Water level, in feet below land-surface datum, 1944-45

Date	Water level	Date	Water level	Date	Water level
Oct. 3, 1944	a180.68	Aug. 20, 1945	160.98	Oct. 29, 1945	b158.94
24	158.32	Sept. 3	b159.56	Nov. 12	155.98
July 9, 1945	156.46	17	b159.50	26	156.63
23	b163.53	Oct. 1	b160.01	Dec. 10	b158.34
Aug. 6	b163.14	15	b159.09	31	b158.16

a Pumping.

b Nearby well or wells pumping.

3S/15-25H1. City of Manhattan Beach well 1. California Division of Water Resources serial No. B-84 and location No. 701B, Los Angeles Department of Water and Power No. 8-A-3. In Manhattan Beach, 250 feet south of 8th Street and 55 feet west of Sepulveda Boulevard, in frame pump house. Drilled public-supply well, diameter 16 inches, depth 579.1 feet. Casing perforated from 221 to 240 and 527 to 541 feet below land surface. Measuring point, lower lip of 3-inch nipple, 2.60 feet above concrete floor, at land-surface datum, and 145.0 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1930-41 by Los Angeles Department of Water and Power, and about semiannually 1929-36 and since 1940 by Los Angeles Flood Control District. Water levels, in feet below land-surface datum, 1945: Jan. 2, 151.96; Jan. 3, 152.07; Apr. 17, 181.24, pumping; Nov. 9, 153.76.

3S/15-25H2. City of Manhattan Beach well 4. California Division of Water Resources serial No. B-84c and location No. 701C, Los Angeles Department of Water and Power No. 8-A-17. In Manhattan Beach, 275 feet south of 8th Street and 275 feet west of Sepulveda Boulevard, in frame pump house, 220 feet east of well 25H1. Unused drilled public-supply well, diameter 16 inches, reported depth 617 feet. Casing perforated from 239 to 258 feet below land surface. Measuring point, top of coupling in welded casing cover, 0.3 foot above concrete floor at land-surface datum and 152.4 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements about monthly 1931-41 by Los Angeles Department of Water and Power, irregularly 1937-38 and since 1940 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Oct. 8, 1943, 165.48; Aug. 25, 1944, 165.09; Apr. 17, 1945, 165.92, well 25H1 pumping; Nov. 9, 1945, 162.94.

4S/11-5D1 (*#949, p. 91; 991, p. 114; 1021, p. 95). V. Capovilla. About 3.5 miles south of Norwalk. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 18	25.24	Apr. 23	22.56	July 19	44.14	Oct. 16	50.85
Feb. 19	27.78	May 21	31.21	Aug. 21	47.71	Nov. 20	a 37.19
Mar. 19	25.01	June 19	42.19	Sept. 24	52.63	Dec. 31	a 29.80

a Just stopped pumping.

4S/12-8P1 (138, p. 74, well 934; *#941, p. 110; 949, p. 93; 991, p. 114; 1021, p. 96). Montana Land Co. About 2 miles north of Signal Hill. Records furnished by city of Long Beach.

Water level, in feet below land-surface datum, 1945

Jan. 1	90.91	Apr. 9	88.99	July 9	95.61	Oct. 8	105.25
8	87.73	16	90.48	16	96.25	15	104.64
15	85.20	23	90.81	23	96.90	22	103.82
22	87.23	30	91.98	30	98.18	29	103.65
29	88.15	May 7	93.65	Aug. 6	98.88	Nov. 5	102.26
Feb. 5	87.86	14	94.69	13	99.65	12	98.33
12	87.67	21	94.81	20	99.25	19	100.62
19	86.97	28	95.07	27	99.37	26	101.41
26	87.00	June 4	95.31	Sept. 3	101.54	Dec. 3	101.81
Mar. 2	86.02	11	95.47	10	103.61	10	100.04
12	86.70	18	96.55	17	104.91	17	99.45
19	87.12	25	96.65	25	104.87	24	96.50
26	87.18	July 2	96.26	Oct. 1	104.85	31	93.58
Apr. 2	87.64						

4S/12-27K2 (*#949, p. 94; 991, p. 115; 1021, p. 96). Bryant Ranch. About 2 miles east of Signal Hill. Records furnished by R. A. Shafer

Water level, in feet below land-surface datum, 1945

Jan. 3	3.31	Apr. 5	5.33	July 5	11.79	Oct. 5	15.81
17	4.09	19	5.00	16	13.08	17	14.42
Feb. 6	4.48	May 4	9.05	Aug. 2	16.97	Nov. 5	11.83
16	4.92	17	7.16	17	18.20	12	11.21
Mar. 3	7.96	June 4	11.27	Sept. 4	16.94	Dec. 3	9.81
15	8.56	18	13.59	17	16.43		

4/13-2K1 (*#949, p. 97). Del Amo Estate Co. Shallow water-table well. Measurements resumed Apr. 4, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 4, 20.05; July 5, 22.02.

4S/13-2P1 (*#949, p. 97). Del Amo Estate Co., H. R. Wilson, lessee. Near Long Beach, 0.6 mile west of Los Angeles River.

Water level, in feet below land-surface datum, 1945

May 3	26.43	June 30	29.36	Aug. 29	32.86	Oct. 31	31.03
June 2	28.65	July 31	31.44	Oct. 2	29.93	Dec. 3	28.26

4/13-10F1 (*949, p. 98). Dominguez Estate Co. Shallow water-table well. Measurements resumed Apr. 3, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 3, 11.30; July 5, 11.53; Oct. 2, 11.63.

4/13-10RL (*949, p. 99). Los Angeles County. Shallow water-table well. Measurements resumed Apr. 3, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 3, 17.54; July 5, 19.04; Oct. 2, 19.74.

4/13-11BL (*949, p. 99). Del Amo Estate Co. Shallow water-table well. Measurements resumed Feb. 20, 1945. Water levels, in feet below land-surface datum, 1945: Feb. 20, 19.00; Apr. 4, 18.60; July 5, 22.76; Oct. 2, 23.92.

4/13-11B3 (*949, p. 99). Los Angeles County. Shallow water-table well. Measurements resumed Feb. 20, 1945. Water levels, in feet below land-surface datum, 1945: Feb. 20, 21.95; Apr. 4, 21.58. Well dry in July and early October.

4/13-11D2 (*949, p. 99). Los Angeles County. Shallow water-table well. Measurements resumed Feb. 20, 1945. Water levels, in feet below land-surface datum, 1945: Feb. 20, 25.87; Apr. 4, 25.69.

4/13-11F1 (*949, p. 100). Dominguez Estate Co. Shallow water-table well. Measurements resumed Apr. 4, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 4, 24.48; July 5, 27.03; Oct. 2, 27.84.

4/13-11K5 (*949, p. 100). Carson Estate Co. Shallow water-table well. Measurements resumed Apr. 4, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 4, 16.54; July 5, 19.04. Well dry in early October.

4S/13-12E1. Virginia Country Club. California Division of Water Resources serial No. B-129b and B-127c, and location Nos. 906A and 896B, Los Angeles Department of Water and Power No. 6-C-1. In north Long Beach, 250 feet north of Dominguez Street, extended, 525 feet southeast of Union Pacific Railroad, 0.50 mile west of Long Beach Boulevard, in open field. Unused drilled well, diameter 12 inches, reported depth 336 feet. Measuring point, hole in 5/8-inch plate welded to top of casing, 0.54 foot above land-surface datum and 37.89 feet above sea-level datum of 1941. Water-stage recorder maintained on well June 15 to Dec. 31, 1945, by Geological Survey. Additional water-level measurements as follows: (1) Monthly in 1929 by Pasadena Water Department; (2) monthly 1930-31 by San Gabriel Valley Protective Association; (3) about semiannually 1929-32 by Los Angeles County Flood Control District; (4) about monthly 1930-35 by Los Angeles Department of Water and Power; and (5) monthly since 1933 by Long Beach Water Department.

Water level, in feet below land-surface datum, 1945
(Chiefly high level for the day from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
June 15	a 36.47	Aug. 5	37.33	Sept. 25	36.84	Nov. 15	34.43
20	36.40	10	38.44	30	36.80	20	34.40
25	36.51	15	38.37	Oct. 5	37.58	25	34.20
30	36.38	20	37.30	10	37.05	30	34.45
July 5	36.02	25	38.25	15	35.66	Dec. 5	33.80
10	36.50	31	38.05	20	35.86	10	33.58
15	35.97	Sept. 5	38.32	25	36.55	15	33.71
20	38.06	10	38.93	31	35.30	20	(b)
25	37.15	15	38.40	Nov. 5	34.72	25	33.31
30	a 37.75	20	37.97	10	34.54	31	a 33.07

a Tape measurement.

b Recorder not operating.

4S/13-12H1. L. S. Whaley Co. California Division of Water Resources serial No. C-935d and location No. 915, Los Angeles Department of Water and Power No. 6-C-3. In north Long Beach, 1,000 feet west of Atlantic Avenue, 125 feet north of 46th Street and 85 feet east of Talbert Avenue, extended, at rear of residence at 335 46th Street, at northwest corner of garage. Unused drilled well, diameter 10 inches, reported depth 674 feet. Measuring point, top west side of casing, at land-surface datum and 46.95 feet above sea-level datum of 1941. Additional measurements made monthly 1930-41 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum, 1945: Apr. 12, 29.04; Aug. 4, 38.56; Oct. 31, 37.66; Dec. 3, 35.28.

4/13-14F3 (*949, p. 101). Los Angeles County. Shallow water-table well. Measurements resumed Apr. 3, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 3, 19.07; July 5, 20.48; Oct. 2, 21.55.

4S/13-14L1 (*949, p. 101; 991, p. 116; 1021, p. 96). Southern California Edison Co., Ltd. In Long Beach. Records furnished by city of Long Beach. Water levels from Oct. 22, 1943, to Dec. 26, 1944, incorrectly published in Water-Supply Papers 991 and 1021. To correct, subtract 0.21 foot from each measurement.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	24.73	Apr. 9	24.73	July 2	a 29.55	Oct. 8	a 29.98
8	24.91	16	25.26	9	28.10	15	28.41
15	24.64	18	24.6	16	a 29.53	22	a 28.80
22	24.92	23	26.32	23	a 30.07	29	a 29.44
29	24.87	30	26.98	30	a 29.79	Nov. 5	27.84
Feb. 5	24.53	May 7	26.94	Aug. 6	a 30.40	12	27.60
12	24.50	14	26.96	13	a 30.33	19	28.50
19	24.63	21	27.57	20	a 30.21	26	28.91
26	24.66	28	a 28.66	Sept. 3	a 29.6	Dec. 3	27.26
Mar. 5	24.41	June 4	a 28.88	10	a 28.66	10	27.04
12	24.36	11	a 29.29	17	a 28.68	17	27.62
19	24.29	18	a 29.10	24	a 29.13	24	26.61
26	24.16	25	a 29.74	Oct. 1	27.88	31	26.40
Apr. 2	24.21						

a Below sea level.

4/13-14P1 (*949, p. 102). City of Long Beach. Shallow water-table well. Measurements resumed July 5, 1945. Water levels, in feet below land-surface datum, 1945: July 5, 26.75; Oct. 2, 27.09.

4S/13-20K1. Southern California Edison Co., Ltd. California Division of Water Resources serial No. B-115a and location No. 839A. About 1.5 miles north of Wilmington, 125 feet south of Sepulveda Boulevard and 220 feet east of Broad Avenue, 55 feet west of tank atop tower. Drilled domestic and industrial well, diameter 12 inches, reported depth 550 feet. Casing perforated from 461 to 550 feet below land surface in the Silverado water-bearing zone of the San Pedro formation of Pleistocene age. Measuring point, top west side of casing, 2.0 feet above land-surface datum which is 37 feet above mean sea level (interpolated from topographic map). Additional measurements made about semiannually 1930-34 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Jan. 31, 1941, 58.34; Apr. 14, 1945, 76.40; Nov. 19, 1945, 79.20.

4/13-23F2 (*949, p. 104). City of Long Beach. Shallow water-table well. Measurements resumed Apr. 3, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 3, 20.16; July 5, 21.48; Oct. 2, 22.54.

4S/13-23G2 (*941, p. 115; 949, p. 105; 991, p. 116; 1021, p. 96). City of Long Beach. Records furnished by city of Long Beach. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945

Jan. 2	86.1	Apr. 21	84.5	July 14	93.1	Oct. 6	91.8
6	86.1	May 1	86.7	21	95.7	15	88.7
13	87.5	12	89.6	Aug. 1	97.7	22	89.7
20	85.9	19	86.6	11	102.0	Nov. 1	90.7
Feb. 17	88.4	26	89.3	18	102.1	8	90.5
Mar. 1	84.3	June 1	90.4	25	92.7	17	89.0
10	84.1	9	88.7	31	92.2	23	89.2
17	79.5	16	90.6	Sept. 8	93.5	Dec. 1	86.6
24	84.0	23	91.2	14	93.5	7	86.1
Apr. 2	85.4	30	93.1	22	92.5	24	82.7
7	85.9	July 7	93.2	Oct. 1	93.6	31	84.0
14	86.0						

4/13-26P6 (*949, p. 107). City of Long Beach. Shallow water-table well. Measurements resumed Apr. 4, 1945. Water levels, in feet below land-surface datum, 1945: Apr. 4, 12.84; July 5, 13.30; Oct. 2, 13.77.

4S/13-33D1 (*949, p. 100; 991, p. 116; 1021, p. 97). City of Los Angeles, Wilmington plant well 14. In Wilmington.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	81.91	Apr. 9	82.07	July 9	86.70	Oct. 8	84.33
	82.19	16	82.58	16	87.13	15	84.34
	82.53	23	82.60	23	87.42	22	86.50
	82.51	30	83.30	30	87.74	27	8106.17
Feb.	81.19	May 7	84.03	Aug. 6	87.89	Nov. 5	8104.25
	80.59	14	84.01	13	87.40	12	85.56
	80.10	21	84.72	20	87.03	19	85.14
	80.90	28	85.44	27	87.24	26	84.66
Mar.	81.13	June 4	85.18	Sept. 3	86.88	Dec. 3	83.67
	81.43	11	85.35	10	87.66	10	82.43
	81.69	18	86.38	17	87.49	17	82.44
	81.36	25	86.47	24	86.57	31	80.27
Apr. 2	81.79	July 2	86.34	Oct. 1	87.16		

a Pumping.

4S/13-33B6 (*949, p. 110; 1021, p. 97). City of Los Angeles, Wilmington plant well 10. In Wilmington.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	56.53	Apr. 23	56.76	July 16	60.21	Oct. 8	59.59
	56.77	30	57.31	23	60.46	15	59.45
	56.84	May 7	57.84	30	60.68	22	61.00
	56.13	14	57.84	Aug. 6	60.99	29	61.88
Feb.	56.37	21	58.32	13	60.83	Nov. 5	65.85
	56.51	28	58.80	20	60.68	12	61.05
	56.45	June 4	58.89	27	60.84	19	60.20
	56.49	11	58.93	Sept. 3	60.69	26	59.76
Mar.	56.34	18	59.57	10	61.01	Dec. 3	59.57
	56.42	25	59.73	17	61.07	10	58.97
	56.59	July 2	59.59	24	60.61	17	58.57
	56.89	9	59.71	Oct. 1	60.79	31	57.68

4S/14-8E1 (*1021, p. 97). California Water Service Co. station 3. In Redondo Beach. Water-stage recorder maintained on well to May 9, 1945, by Geological Survey. Tape measurements beginning May 9, 1945.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	162.48	Mar. 25	162.49	June 18	163.16	Sept. 24	163.97
	162.56	31	162.46	25	163.26	Oct. 1	163.98
	162.63	Apr. 5	162.49	July 2	163.29	8	164.05
	162.58	10	162.62	9	163.34	15	164.01
Feb.	162.62	15	162.63	16	163.39	22	163.98
	162.69	20	162.73	23	163.45	29	164.01
	162.64	25	162.77	30	163.51	Nov. 5	163.99
	162.60	30	162.82	Aug. 6	163.60	12	163.95
Mar.	162.59	May 5	162.89	13	163.56	19	163.90
	162.57	9	162.92	20	163.70	26	163.92
	162.51	14	162.93	27	163.80	Dec. 3	163.92
	162.59	21	162.94	Sept. 3	163.80	10	163.84
10	162.55	28	163.04	10	163.88	17	163.87
15	162.51	June 4	163.08	17	163.94	31	163.77
20	162.46	11	163.14				

a Tape measurement.

4S/14-11F1. Columbia Steel Co. well 3. California Division of Water Resources serial No. B-103c and location No. 785B. In Torrance, 80 feet northeast of intersection of Arlington and Border Avenues, in pump house, 5 feet east of west property line of company. Drilled industrial well, diameter 16 inches, reported depth 620 feet. Casing perforated from 198 to 218, 260 to 280, and 305 to 390 feet below land surface. Measuring point, lower lip of coupling atop slanted pipe into south side of casing, 0.9 foot above concrete floor at land-surface datum, and 69.8 feet above mean sea level (altitude by owner). Water levels, in feet below land-surface datum: Nov. 20, 1943, 92.07; Nov. 15, 1944, 94.04; Apr. 14, 1945, 94.30; Nov. 8, 1945, 96.30.

4S/14-13F1 (*1021, p. 99). David E. Crutcher. About 1 mile southeast of Torrance. Water-stage recorder maintained on well by Geological Survey. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945
(Chiefly high level for the day from recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	80.04	Apr. 10	80.22	July 10	83.62	Oct. 8	b 83.82
10	80.10	15	80.38	15	84.08	15	b 83.85
15	80.07	20	80.47	20	84.26	17	b 84.30
20	80.14	25	80.50	25	84.44	22	b 84.86
25	80.18	30	80.90	30	a 84.43	25	85.06
31	80.31	May 5	81.35	Aug. 5	84.79	31	85.25
Feb. 5	79.98	10	81.25	10	84.85	Nov. 5	b 85.37
10	79.95	15	81.56	15	84.67	10	84.84
15	79.82	20	82.16	20	84.45	15	84.29
20	79.80	25	82.53	25	84.87	20	83.84
25	79.83	31	82.66	31	84.85	25	83.87
28	79.83	June 5	82.65	Sept. 5	84.66	30	84.06
Mar. 5	79.80	10	82.91	10	b 84.87	Dec. 5	83.81
10	79.85	15	83.12	15	84.97	10	b 83.41
15	79.81	20	(a)	20	84.45	15	83.24
20	79.86	25	b 83.60	25	84.15	20	83.02
25	79.87	July 2	b 83.15	30	84.61	25	82.50
30	79.83	5	83.20	Oct. 5	84.52	31	b 82.08
Apr. 5	80.12						

a Recorder not operating.

b Tape measurement.

4S/14-16L1. C. A. Quandt. California Division of Water Resources serial No. B-94b and location No. 747; Los Angeles Department of Water and Power No. 8-C-10. About 2 miles southwest of Torrance, 0.11 mile south of Sepulveda Boulevard, and 150 feet east of Ocean Avenue, under pump house floor. Unused drilled well, diameter 12 inches, depth 240.0 feet. Measuring point, top of casing, at land-surface datum and 83.22 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made in 1931 by Los Angeles Department of Water and Power. Water levels, in feet below land-surface datum: Nov. 27, 1943, 94.9; Nov. 2, 1944, 96.7; Apr. 14, 1945, 96.64; Nov. 8, 1945, 98.33.

4S/14-22D1 (*1021, p. 99). Standard Oil Co. About 2 miles southwest of Torrance. Measurements discontinued Dec. 3, 1945. All water levels are below sea level.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 99.18	Apr. 23	100.58	July 9	a101.44	Sept. 24	101.27
8	99.22	30	100.37	16	a101.36	Oct. 1	a101.52
Feb. 5	99.29	May 7	100.13	23	101.19	8	101.40
12	99.34	14	100.14	30	100.97	15	a101.50
19	101.93	21	99.92	Aug. 6	101.25	22	a101.40
Mar. 5	a 99.18	28	a100.20	13	a101.66	29	a101.50
12	99.04	June 4	100.47	20	a102.17	Nov. 5	a101.52
19	99.15	11	100.89	27	101.45	12	a101.54
26	99.20	18	a100.95	Sept. 3	101.28	19	101.35
Apr. 2	99.20	25	100.97	10	101.19	26	101.44
9	a 99.39	July 2	100.51	17	101.18	Dec. 3	101.45
16	99.40						

a Well 240 feet northwest pumping.

4S/14-23J2. Narbonne Ranch Water Co. well 3. About 0.5 mile northeast of Lamita, 60 feet north of 238th Street and 390 feet east of Eshelman Avenue, in 8- by 8-foot frame pump house. Drilled public-supply well, diameter 16 inches, reported depth 460 feet. Measuring point, top edge of hole in plate next to pump shaft, level with concrete floor, at land-surface datum which is 76 feet above mean sea level (interpolated from topographic map). Water levels, in feet below land-surface datum: Nov. 20, 1944, 101.45; Apr. 14, 1945, 102.86; Nov. 13, 1945, 105.97.

4S/14-27Q1. Ben Weston. California Division of Water Resources serial No. B-130f and location No. 260B, Los Angeles Department of Water and Power No. 2-B-7. About 1 mile southwest of Lomita, 400 feet southwest of Pacific Coast Highway, 450 feet southeast of Crenshaw Boulevard, in center of large driveway, amid buildings, about 5 feet east of tank and tower. Unused drilled well, diameter 12 inches, reported depth 251 feet. Measuring point, top edge of coupling in welded casing cover, at land-surface datum and 162.03 feet above mean sea level (altitude by Los Angeles Department of Water and Power). Additional measurements made about monthly 1929-41 by Los Angeles Department of Water and Power, and semiannually since 1939 by Los Angeles County Flood Control District. Water levels, in feet below land-surface datum: Nov. 9, 1944, 183.22; Feb. 23, 1945, 183.54; Apr. 14, 1945, 183.74; Nov. 8, 1945, 186.04.

4S/14-28H1. Weston Ranch well 5a. California Division of Water Resources serial No. B-130b and location No. 250B; Los Angeles Department of Water and Power No. 2-B-2. About 1.5 miles southwest of Lomita, 750 feet southwest of Pacific Coast Highway, 60 feet north and 790 feet east of the intersection of Madison and Newton Streets, 18 feet southwest of large corrugated-metal tank, in open. Unused drilled well, diameter 14 inches, reported depth 553 feet. Casing perforated from 410 to 425 and from 450 to 467 feet below land surface. Measured monthly 1929-41 by Los Angeles Department of Water and Power, semiannually since 1941 by the Los Angeles County Flood Control District, and weekly since Dec. 18, 1944, by Geological Survey. Measuring point, top of coupling in casing cover 0.04 foot above top of casing, at land-surface datum, and 147.08 feet above mean sea level (altitude by Los Angeles Department of Water and Power). All water levels are below sea level.

Water level, in feet below land-surface datum, 1944-45

Date	Water level	Date	Water level	Date	Water level
Jan. 3, 1944	163.92	Apr. 23, 1945	168.48	Aug. 27, 1945	168.65
Dec. 18	165.75	30	168.16	Sept. 3	168.04
25	165.76	May 7	167.60	10	167.90
Jan. 8, 1945	165.80	14	167.95	17	167.90
15	165.70	21	166.57	24	167.96
22	165.95	28	167.41	Oct. 1	168.09
29	165.96	June 4	168.14	8	168.07
Feb. 5	165.90	11	168.47	15	168.05
12	165.89	18	168.13	22	167.98
19	165.84	25	168.42	29	168.10
26	166.00	July 2	167.88	Nov. 5	168.07
Mar. 5	165.97	9	169.03	12	168.14
12	165.85	16	168.78	19	168.11
19	165.94	23	168.57	26	168.17
26	165.97	30	167.68	Dec. 3	168.18
Apr. 2	165.92	Aug. 6	168.48	10	168.11
9	165.92	13	168.94	17	168.15
16	166.14	20	168.70	31	168.07

4S/14-36H1. Palos Verdes Water Co. well 1. California Division of Water Resources serial No. B-133 and location No. 301. In Wilmington, 250 feet northeast of Anaheim Street, and 400 feet east of Normandie Avenue, in pump house west of aerator tank. Drilled public-supply well, diameter 26 inches, reported depth 610 feet. Casing perforated from 208 to 214 and 332 to 610 feet below land surface. Measuring point, bottom edge of south side of pump base, at land surface which is 45.59 feet above mean sea level (altitude by owner). Additional measurements made irregularly by owner. Water levels, in feet below land-surface datum: Jan. 5, 1944, 73.84; Nov. 20, 1944, 78.96; Apr. 14, 1945, 80.99; Nov. 19, 1945, 85.63, well 400 feet southeast pumping.

5S/12-2B1 (*949, p. 111; 991, p. 117; 1021, p. 103). Bryant Ranch. About 2 miles north of Seal Beach. Records furnished by R. A. Shafer.

5S/12-2B1--Continued.

Water level, in feet with reference to land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	(a)	Apr. 5	+0.5	July 5	-4.7	Oct. 5	-7.7
17	(a)	19	.8	16	-4.9	17	-6.8
Feb. 6	(a)	May 4	-.3	Aug. 2	-7.5	Nov. 5	-4.8
16	+.8	17	-1.0	17	-8.2	12	-4.7
Mar. 3	-.9	June 4	-3.6	Sept. 4	-8.1	Dec. 3	-3.3
15	-2.2	18	-5.7	17	-7.6	17	-2.2

a Flowing.

Orange County

Coastal plain

3S/11-36Q2 (*941, p. 117; 949, p. 116; 991, p. 117; 1021, p.100).
M. Del Giorgio. About 1 mile southeast of Buena Park. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 3	52.10	Apr. 4	48.03	July 5	63.45	Oct. 3	71.21
10	51.99	11	48.28	11	65.13	10	69.84
17	53.47	18	48.93	18	67.00	17	68.27
24	55.15	25	49.86	25	68.64	24	68.33
31	55.12	May 2	50.98	Aug. 1	68.97	31	65.48
Feb. 7	52.20	9	53.23	8	71.02	Nov. 7	64.81
14	51.21	16	56.62	16	71.01	14	65.02
21	50.14	23	61.22	22	70.23	21	63.70
28	49.96	31	64.30	29	70.82	28	63.07
Mar. 7	49.54	June 6	64.00	Sept. 5	71.93	Dec. 5	61.54
14	49.20	13	64.06	12	72.82	12	61.47
21	48.53	20	64.79	19	71.42	19	60.65
28	48.02	27	63.65	26	69.92	26	57.20

4S/9-7B1 (*941, p. 120; 949, p. 117; 991, p. 117; 1021, p.100).
Dowling & Prentice. About 3 miles east of Anaheim. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 3	159.39	Apr. 11	119.42	July 11	142.79	Oct. 10	163.15
10	157.67	18	120.82	18	143.80	17	159.15
17	157.25	25	124.18	25	144.36	24	158.56
24	157.24	May 2	127.61	Aug. 1	147.19	31	162.28
31	156.94	9	130.23	8	151.26	Nov. 8	168.88
Feb. 7	155.95	16	132.74	16	149.75	14	165.34
14	150.17	23	135.96	22	150.40	21	168.47
21	150.48	31	143.87	29	152.84	28	167.42
Mar. 7	141.40	June 6	137.73	Sept. 5	152.90	Dec. 5	172.24
14	135.65	13	138.65	12	154.18	12	169.78
21	130.18	20	148.83	19	156.11	19	170.58
28	122.75	27	141.35	26	160.40	26	169.34
Apr. 4	119.01	July 5	141.80	Oct. 3	156.65		

4S/10-22L2 (*840, p. 28; 845, p. 18; 886, p. 24; 941, p. 123; 949, p. 117; 991, p. 118; 1021, p.100). Halderman & Callens. Records furnished by San Gabriel Valley Protective Association and Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 11	a101.92	Mar. 6	a100.03	May 8	a 97.86	Sept. 14	a120.72
18	b101.22	22	b 99.11	June 8	a101.43	Oct. 5	a107.25
Feb. 9	a100.97	Apr. 12	a 97.36	July 10	a115.40	Nov. 13	a106.20
Mar. 1	b102.67	May 3	b 97.16	Aug. 13	a117.16	Dec. 11	a104.71

a Measured by Orange County Flood Control District.

b Measured by San Gabriel Valley Protective Association.

c Pumping.

4S/11-19KL (138, p. 83, well 1183; #941, p. 123; 949, p. 117; 991, p. 118; 1021, p. 101). Los Alamitos Sugar Co. About 0.5 mile north of Los Alamitos. Records furnished by city of Long Beach.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	6.01	Apr. 2	5.22	July 2	19.58	Oct. 8	24.42
8	5.52	9	5.46	9	19.62	15	22.81
15	5.22	16	5.40	16	21.24	22	20.39
22	5.19	23	6.57	23	21.48	29	19.44
29	5.72	30	a 7.37	30	22.75	Nov. 1	a 18.72
30	a 5.75	30	7.37	31	a 23.57	5	18.38
Feb. 5	5.60	May 7	9.41	Aug. 6	23.56	12	16.77
12	5.16	14	11.73	13	26.97	19	16.28
19	5.24	21	13.58	20	27.11	26	15.48
26	5.86	28	18.79	27	26.92	30	a 14.43
Mar. 1	a 6.19	31	a 17.41	31	a 27.03	Dec. 3	13.62
5	5.85	June 4	17.29	Sept. 10	26.45	10	12.84
12	6.31	11	19.35	17	26.69	17	12.92
19	6.31	18	20.68	24	26.19	24	11.10
26	5.90	25	19.37	28	a 25.94	31	9.12
30	a 5.11	28	a 19.55	Oct. 1	26.22	31	a 9.02

a Measured by Geological Survey.

5S/10-9D1 (*#941, p. 126; 949, p. 118; 991, p. 118; 1021, p.101). Julio Martinez. About 1 mile south of Garden Grove. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 11	45.60	Apr. 12	46.38	July 10	57.02	Nov. 13	53.90
Feb. 9	45.64	May 8	51.94	Aug. 13	a 60.32	Dec. 11	51.08
Mar. 6	46.56	June 8	55.90	Sept. 14	a 60.22		

a Pump shut off prior to measurement.

5S/10-28B1 (*#949, p. 119; 991, p. 118; 1021, p.101). John Sturtevant. About 3.5 miles southwest of Santa Ana. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 12	23.90	Apr. 16	25.36	July 16	(a)	Oct. 10	33.92
Feb. 13	26.17	May 14	30.85	Aug. 14	39.04	Nov. 15	34.14
Mar. 12	27.68	June 11	35.90	Sept. 19	37.22	Dec. 13	27.93

a Pumping.

5S/11-2E1 (*#949, p. 121; 991, p. 119; 1021, p.101). Western Trust & Savings Bank. About 1 mile north of Westminster. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 9	23.53	Apr. 10	23.22	July 9	39.25	Oct. 4	42.05
Feb. 9	24.77	May 2	27.07	Aug. 7	43.98	Nov. 9	34.46
Mar. 9	25.63	June 7	(a)	Sept. 14	42.44	Dec. 11	31.75

a Pumping.

5S/11-16D2 (*#941, p. 127; 949, p. 124; 991, p. 119; 1021, p.101). Anaheim Sugar Co. About 4 miles east of Seal Beach. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 3	2.50	Mar. 7	4.21	May 9	3.79	July 11	10.60
10	2.14	14	4.62	16	5.98	18	12.50
17	2.30	21	3.88	23	6.95	25	12.14
24	4.37	28	3.40	31	9.32	Aug. 1	12.25
31	5.67	Apr. 4	2.45	June 6	10.03	8	12.77
Feb. 7	3.40	11	2.05	13	11.85	16	13.96
14	5.25	18	2.10	20	10.56	22	14.84
21	4.38	25	1.96	27	10.71	29	14.07
28	4.56	May 2	2.98	July 5	10.55	Sept. 5	13.05

5S/11-16D2--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sept. 12	13.20	Oct. 10	15.70	Nov. 7	11.37	Dec. 5	8.00
19	13.90	17	15.01	14	9.58	12	8.06
26	13.77	24	12.90	21	9.42	19	7.26
Oct. 3	14.43	31	10.80	28	8.59	26	5.18

5S/11-18N1 (*949, p. 125; 991, p. 119; 1021, p. 102). United States Naval Depot. About 2 miles southeast of Seal Beach. Water level, in feet below land-surface datum, 1945: Dec. 31, 3.27.

5S/11-18P1 (*949, p. 126; 991, p. 120; 1021, p. 102). United States Naval Depot. About 2 miles southeast of Seal Beach. Water level, in feet below land-surface datum, 1945: Dec. 31, 0.65.

5S/11-25P1 (*949, p. 131; 991, p. 120; 1021, p. 102). E. J. Lecrivain. About 3.5 miles north of Huntington Beach. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 12	34.24	Apr. 16	34.78	July 16	40.25	Oct. 10	40.55
Feb. 13	36.84	May 14	36.32	Aug. 14	42.47	Nov. 15	39.33
Mar. 12	38.43	June 11	39.13	Sept. 19	42.02	Dec. 13	36.66

5S/11-28A1 (*949, p. 133; 991, p. 120; 1021, p. 102). A. Ruff. About 4 miles northwest of Huntington Beach. Records furnished by Orange County Flood Control District.

Water level, in feet with reference to land-surface datum, 1945

Jan. 12	+11.78	Apr. 18	+19.08	June 11	+13.43	Oct. 10	-3.14
Feb. 13	+8.38	May 11	+20.72	July 16	(a)	Nov. 15	(a)
Mar. 12	+5.78	14	(a)	Aug. 14	+7.73	Dec. 13	(a)
Apr. 16	+14 $\frac{1}{2}$	23	+15.18	Sept. 14	(a)		

a Flowing; height of static level unknown.

5S/11-29C4 (*949, p. 135; 991, p. 121; 1021, p. 103). Sunset Land & Water Co. About 1 mile southeast of Sunset Beach. Records furnished by Orange County Flood Control District.

Water level, in feet with reference to land-surface datum, 1945

Jan. 12	+1.73	Apr. 16	+1.20	July 16	-3.95	Oct. 10	-10.31
Feb. 13	+.19	May 14	+.59	Aug. 14	-5.10	Nov. 15	-6.00
Mar. 12	+.35	June 11	-3.74	Sept. 19	-5.85	Dec. 13	-2.82

5S/11-29E1 (*949, p. 136; 991, p. 121; 1021, p. 103). U. S. Government. About 1 mile southeast of Sunset Beach. Water level, in feet below land-surface datum, 1945: Dec. 31, 5.25.

5S/11-29E2 (*949, p. 136; 991, p. 121; 1021, p. 103). U. S. Government. About 1 mile southeast of Sunset Beach. Water level, in feet below land-surface datum, 1945: Dec. 31, 4.80.

5S/12-12P1 (*949, p. 140; 991, p. 122; 1021, p. 103). United States Naval Depot. About 1 mile east of Seal Beach. Pump removed and casing covered. Measuring point since Oct. 16, 1945, top of plate welded atop casing, 0.62 foot above previous measuring point, 0.82 foot above land-surface datum, and 16.79 feet above sea-level datum of 1941. Records furnished by city of Long Beach. Water levels, in feet below land-surface datum, 1945: Oct. 16, 15.58; Nov. 7, 13.79; Nov. 27, 11.92; Dec. 27, 10.00.

5S/12-13D1 (*949, p. 143; 991, p. 122; 1021, p. 103). United States Naval Depot. Water level, in feet below land-surface datum, 1945: Dec. 31, 23.58.

5S/12-13D2 (*949, p. 144; 991, p. 122; 1021, p. 103). United States Naval Depot. In Seal Beach. Water levels, in feet below land-surface datum, 1945: Oct. 16, 22.96; Dec. 31, 22.86.

6S/10-1E1 (*949, p. 144; 991, p. 123; 1021, p.104). About 3.5 miles northeast of Costa Mesa. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	16.98	Apr. 17	19.09	July 12	29.27	Oct. 6	29.88
	20.13		21.978		31.28		29.33
	21.71		17.93		33.17		30.01
	25.39		18.52		35.90		29.45
	27.57		19.18		34.33		27.13
	27.71		19.60		32.86		25.03
	28.12		19.67		31.98		24.12
Feb. 10	27.86	May 5	21.35	Aug. 4	31.87	Nov. 3	23.52
	28.33		21.96		29.52		23.37
	30.18		23.23		29.38		23.16
	27.53		24.15		29.79		22.23
Mar. 13	27.25	June 2	24.96	Sept. 1	29.06	Dec. 1	21.38
	19.67		24.58		28.51		20.93
	17.58		24.38		28.80		20.59
	16.13		27.95		28.90		19.13
Apr. 14	18.20	July 7				29	

6S/10-1L2 (137, p. 137, Santa Ana quadrangle well 1356; *949, p. 147; 991, p. 123; 1021, p.104). I. A. W. Henry. About 3.5 miles northeast of Costa Mesa. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 15	16.70	Apr. 17	16.07	July 12	17.10	Oct. 9	18.03
Feb. 15	17.03	May 15	16.20	Aug. 17	17.88	Nov. 14	17.77
Mar. 13	16.96	June 12	16.40	Sept. 18	17.80	Dec. 17	17.55

6S/10-5C1 (*941, p. 130; 949, p. 150; 991, p. 123; 1021, p.104). Robert Gisler. About 3 miles northeast of Huntington Beach. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Jan. 6	5.05	Mar. 10	11.32	Sept. 8	14.48	Nov. 3	10.04
13	4.83	24	9.60	15	13.98	10	10.05
20	5.69	31	6.89	22	13.08	17	10.05
27	7.15	Apr. 7	6.65	29	12.30	24	9.27
Feb. 10	10.14		5.51	Oct. 6	13.00	Dec. 1	8.70
17	9.10		8.05	13	12.92	8	7.85
24	11.84		12.33	20	11.91	15	7.84
Mar. 3	12.13	July 14	15.17	27	10.72	29	6.20

6S/10-11B2. United States Government. About 5 miles south of Santa Ana, 0.75 mile south of Baker Street, 100 feet north of east-west lane and 200 feet northwest of Newport Boulevard, in pump house. Drilled public-supply well, diameter 16 inches, reported depth 586 feet. Casing perforated from 271 to 292 feet, 298 to 301 feet, and 338 to 372 feet below land surface. Measuring point, hole in top east side of pump base, at land-surface datum which is 51 feet above mean sea level (interpolated from topographic map).

Water level, in feet below land-surface datum, 1943-45

Date	Water level	Date	Water level	Date	Water level
Feb. 1, 1943	a 66.30	Sept. 30, 1943	68.03	Aug. 31, 1944	a 78.77
Mar. 31	57.45	Nov. 30	a 72.10	Jan. 30, 1945	56.36
31	a 74.97	Feb. 29, 1944	a 69.23	30	a 71.28
June 1	a 70.86	Apr. 26	a 70.42	Sept. 28	a 74.96
30	a 76.06	June 30	a 74.09		

a Pumping.

68/11-13G2 (*949, p. 163; 991, p. 124; 1021, p.104). Surf Land & Water Co. About 1.5 miles east of Huntington Beach. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	2.37	Apr.	0.40	July	3.33	Oct.	5.45
	1.52		.72		4.92		4.20
	1.91		1.38		5.51		3.74
	3.67		.96		7.30		1.72
	4.68		1.14		7.19		1.30
	3.79		1.66		5.14		3.94
Feb.	5.32	May	3.12	Aug.	5.29	Nov.	3.22
	3.94		5.35		4.45		1.81
	5.13		5.34		6.39		3.03
	1.70		4.81		4.96		1.87
Mar.	1.58	June	5.61	Sept.	6.07	Dec.	.97
	1.38		3.24		4.20		.63
	1.33		4.72		4.47		.18

a Below sea level.

I-9F1 (*941, p. 133; 949, p. 169; 991, p. 124; 1021, p.105). The Irvine Co. About 3 miles south of Santa Ana. Records furnished by Orange County Flood Control District.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	26.80	Apr.	23.62	July	ab155.18	Oct.	41.98
	26.05		25.49		ab155.51		43.99
	27.00		25.19		ab155.01		41.29
	28.10		26.04		45.24		38.81
	29.36		26.10		41.94		58.08
	28.49		27.95		41.47		39.37
Feb.	28.70	May	29.92	Aug.	39.10	Nov.	37.56
	29.09		31.91		38.44		34.96
	29.58		33.23		38.01		34.35
	28.69		ab143.17		39.57		34.44
Mar.	26.47	June	32.95	Sept.	40.20	Dec.	ab153.58
	24.73		ab147.53		41.25		31.69
	23.67		ab150.65				

a Pumping.

b Below sea level.

Riverside County

Santa Ana River Basin, San Jacinto Valley

3/2W-35Q1 (*1021, p.105). I. E. Facemire. Water levels, in feet below land-surface datum, 1945: Mar. 7, 28.05; May 24, 29.25; Aug. 1, 36.37; Nov. 2, 35.68.

4/2W-7J1 (*1021, p.105). Albert McDonald. No measurements made in 1945.

4/3W-32E1 (*817, p. 12; 840, p. 30; 845, p. 18; 886, p. 24; 911, p. 120; 941, p. 92; 949, p. 66; 991, p. 124; 1021, p.106). James Malcolm. Key well. At Perris, Riverside County. Water levels, in feet below land-surface datum, 1945: Mar. 7, 66.10; May 24, 66.05; Aug. 1, 65.27; Nov. 2, 64.87.

4/4W-1L1 (*1021, p.106). B. H. LeCont. Water levels, in feet below land-surface datum, 1945: Mar. 7, 39.10; May 24, 38.98; Aug. 1, 39.25; Nov. 9, 39.02.

5/1W-2N1 (*1021, p.107). J. A. Barger. Water levels, in feet below land-surface datum, 1945: Mar. 7, 70.25; May 24, 72.64, after pumping had stopped; Aug. 1, 79.61, after pumping had stopped; Nov. 2, 85.87, pumping.

5/2W-24A1 (*1021, p.107). L. Wilhelm. Water levels, in feet below land-surface datum, 1945: Mar. 7, 29.01; May 24, 36.98; Aug. 1, 37.20; Nov. 2, 34.98.

5/2W-27E2 (*1021, p.108). L. L. Whiting. Water levels, in feet below land-surface datum, 1945: Mar. 7, 32.31; May 24, 27.94; Aug. 1, 29.18; Nov. 2, 35.64, after pumping had stopped.

6/3W-4A2 (*1021, p.108). Menifee School. Water levels, in feet below land-surface datum, 1945: Mar. 7, 45.79; May 24, 50.82; Aug. 1, 48.08; Nov. 2, 48.36.

San Bernardino County

Mojave River Basin

3/3W-6E1 (*886, p. 30; 911, p. 125; 941, p. 96; 949, p. 66; 991, p. 124; 1021, p.109). Mike Spranger. Water levels, in feet below land-surface datum, 1945: Apr. 26, 3.88; Nov. 21, 25.90.

3/4W-12J1 (*886, p. 30; 911, p. 125; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.109). Water levels, in feet below land-surface datum, 1945: Apr. 26, 5.07; Nov. 9, 15.18.

3/4W-12B1 (*886, p. 30; 911, p. 125; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.109). Olive. Water level, in feet below land-surface datum, 1945: Apr. 26, 65.23.

4/2W-5N1 (*886, p. 33; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.109). A. B. Sheridan. No measurements made in 1945.

4/3W-1M1 (*886, p. 33; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.109). E. D. S. Pope. New measuring point established Nov. 20, 1945, top of concrete pump base, 0.2 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Nov. 20, 197.05.

4/3W-5P1 (*886, p. 34; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). Water levels, in feet below land-surface datum, 1945: May 2, 166.22; Dec. 7, 167.55.

4/3W-6B1 (*886, p. 35; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). A. J. Linther. Water levels, in feet below land-surface datum, 1945: Apr. 26, 50.91; Nov. 21, 50.78.

4/3W-6D1 (*886, p. 35; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). A. W. Phillips. Water levels, in feet below land-surface datum, 1945: Apr. 26, 51.26; Nov. 21, 52.06.

4/3W-17M1 (*886, p. 34; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). Arrowhead Reservoir & Power Co. Water levels, in feet below land-surface datum, 1945: May 2, 12.04; Nov. 21, 16.45.

4/3W-18E1 (*886, p. 34; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). C. O. Evans. Water levels, in feet below land-surface datum, 1945: May 2, 14.36; Nov. 21, 21.71.

4/3W-19G1 (*886, p. 33; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 125; 1021, p.109). G. W. McLister. Water levels, in feet below land-surface datum, 1945: May 2, 12.63; Nov. 21, 26.57.

4/3W-19R1 (*886, p. 31; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.110). Arrowhead Reservoir & Power Co. Water levels, in feet below land-surface datum, 1945: May 2, 10.93; Nov. 21, 26.54.

4/3W-20K1 (*886, p. 32; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.110). N. F. Marsh. Water level, in feet below land-surface datum, 1945: May 3, 11.2.

4/3W-20L1 (*886, p. 32; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 125; 1021, p.110). J. M. Allison. Water levels, in feet below land-surface datum, 1945: May 3, 19.27; Nov. 21, 27.07.

4/3W-21A1 (*886, p. 32; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 126; 1021, p.110). W. O. Wade. Water levels, in feet below land-surface datum, 1945: May 3, 247.2; Nov. 21, 248.48.

4/3W-30E1 (*886, p. 30; 911, p. 126; 941, p. 96; 949, p. 66; 991, p. 126; 1021, p.110). A. W. Cole. Water levels, in feet below land-surface datum, 1945: Apr. 26, 21.19; Dec. 7, 36.60.

5/3W-9K1 (*886, p. 35; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 126; 1021, p. 110). F. A. Fletcher. Water levels, in feet below land-surface datum, 1945: May 3, 88.84; Nov. 20, 88.85.

5/3W-18P1 (*886, p. 35; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 126; 1021, p. 110). J. D. Humiston. Water levels, in feet below land-surface datum, 1945: May 3, 103.98; Nov. 20, 103.92.

5/4W-10M1 (*886, p. 36; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 126; 1021, p. 110). In Victorville. Water levels, in feet below land-surface datum, 1945: Apr. 27, 43.70; Nov. 20, 44.30.

5/4W-11P1 (*886, p. 36; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 126; 1021, p. 110). Lee Saul. Water levels, in feet below land-surface datum, 1945: May 3, 53.88; Nov. 20, 53.89.

5/4W-11P2 (*886, p. 36; 911, p. 126; 941, p. 96; 949, p. 67; 991, p. 126; 1021, p. 110). Lee Saul. New measuring point established Nov. 20, 1925, top of casing, 0.4 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Nov. 20, 44.54.

5/4W-35A1 (*886, p. 36; 911, p. 126; 941, p. 97; 949, p. 67; 991, p. 126; 1021, p. 110). A. Sorenson. On Verde Ranch. Well flowing on Nov. 21, 1945.

5/4W-36N1 (*886, p. 36; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 126; 1021, p. 110). On Verde Ranch. Water level, in feet below land-surface datum, 1945: Apr. 26, 4.31.

6/4W-19G1 (*886, p. 37; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 126; 1021, p. 110). John Bennetts. No measurements made in 1945.

7/4W-30C1 (*886, p. 37; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 126; 1021, p. 110). Water levels, in feet below land-surface datum, 1945: May 4, 56.76; Nov. 27, 57.04.

8/3E-3E1 (*886, p. 43; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 126; 1021, p. 110). C. W. Beaverstock. Water levels, in feet below land-surface datum, 1945: May 11, 5.60; Nov. 15, 6.85.

8/3E-3F1 (*886, p. 44; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 126; 1021, p. 110). Water levels, in feet below land-surface datum, 1945: May 4, 21.60; Nov. 15, 21.92.

8/3E-4B1 (*886, p. 43; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 126; 1021, p. 110). Lyle Graham. Water levels, in feet below land-surface datum, 1945: May 11, 3.22; Nov. 15, 3.39.

8/3E-4B2 (*886, p. 43; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 126; 1021, p. 111). Lyle Graham. Water levels, in feet below land-surface datum, 1945: May 11, 3.68; Nov. 15, 4.61.

8/3W-4M1 (*886, p. 38; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 127; 1021, p. 111). Everett Swing. Water levels, in feet below land-surface datum, 1945: May 4, 13.13; Nov. 27, 15.18.

8/4E-7E1 (*1021, p. 111). Bodine. Water levels, in feet below land-surface datum, 1945: Jan. 3, 23.10; May 11, 23.42.

8/4E-12L1 (*886, p. 44; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 127; 1021, p. 111). Mojave Camp service station. Water levels, in feet below land-surface datum, 1945: May 11, 38.78, after pumping had stopped; Nov. 15, 30.84.

8/4W-2Q1 (*886, p. 38; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 127; 1021, p. 111). Water levels, in feet below land-surface datum, 1945: May 4, 23.63; Nov. 27, 26.04, almost dry.

8/4W-12Q1 (*886, p. 38; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 127; 1021, p. 111). Holcomb Bros. Water level, in feet below land-surface datum, 1945: Nov. 27, 9.42.

8/4W-20N1 (*886, p. 37; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 127; 1021, p. 111). Lord. Water level, in feet below land-surface datum, 1945: May 4, 13.11.

8/4W-31D1 (*886, p. 37; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 127; 1021, p. 111). F. H. Merrell. Water levels, in feet below land-surface datum, 1945: May 4, 43.57; Nov. 27, 44.21.

8/4W-31R1 (*886, p. 37; 911, p. 127; 941, p. 97; 949, p. 67; 991, p. 127; 1021, p. 111). Water levels, in feet below land-surface datum, 1945: May 4, 15.03; Nov. 27, 15.57.

9/1E-2E1. M. L. Goodwin. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 2, T. 9 N., R. 1 E., about 50 feet north of house. Well equipped with electric pump and tank on tower, diameter 8 inches, depth 122 feet. Measuring point, top of casing flush with concrete block, 0.7 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: May 10, 56.27.

9/1E-12D1 (*886, p. 45; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 127; 1021, p. 111). Water levels, in feet below land-surface datum, 1945: May 10, 34.71; Nov. 28, 37.14.

9/1E-13E1 (*886, p. 45; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 127; 1021, p. 111). Water levels, in feet below land-surface datum, 1945: May 10, 54.51; Nov. 15, 57.12.

9/1E-13E2 (*886, p. 45; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 127; 1021, p. 111). Water levels, in feet below land-surface datum, 1945: May 10, 55.70; Nov. 15, 58.04.

9/1E-15L1 (*886, p. 45; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 128; 1021, p. 111). G. Linguenfelder. Water levels, in feet below land-surface datum, 1945: May 9, 51.92; Nov. 14, 59.24.

9/1E-18E1 (*886, p. 47; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 128; 1021, p. 112). B. A. Funk. Water levels, in feet below land-surface datum, 1945: May 5, 7.21; Nov. 14, 11.08.

9/1E-24D1 (*886, p. 47; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 128; 1021, p. 112). Water levels, in feet below land-surface datum, 1945: May 10, 61.35; Nov. 15, 62.30.

9/1W-10A1 (*886, p. 42; 911, p. 128; 941, p. 98; 949, p. 68; 991, p. 128; 1021, p. 113). Gibbs. Water levels, in feet below land-surface datum, 1945: May 5, 8.91; Nov. 27, 10.42.

9/1W-10D1 (*886, p. 42; 911, p. 128; 941, p. 98; 949, p. 68; 991, p. 128; 1021, p. 113). R. Harlan. New measuring point established May 5, 1945, 3 notches cut in top of railroad-tie curb on north side of well, at land-surface datum. Water level, in feet below land-surface datum, 1945: May 5, 3.37.

9/1W-10D2. R. E. Hettick. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 9 N., R. 1 W. Irrigation well equipped with electric pump, diameter 12 inches, depth 132 feet. Measuring point, top of 1-inch pipe elbow in hole in west side of casing, 0.5 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Nov. 27, 7.74.

9/1W-10M1 (*886, p. 43; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 128; 1021, p. 113). Greystone Auto Camp. Water level, in feet below land-surface datum, 1945: May 5, 48.09.

9/1W-13B1 (*886, p. 43; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 128; 1021, p. 113). F. Ryerse. Water levels, in feet below land-surface datum, 1945: May 5, 6.76; Nov. 14, 9.82.

9/2E-3A1 (*886, p. 46; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p. 112). Bruce McCormick. Water levels, in feet below land-surface datum, 1945: May 10, 9.93; Nov. 28, 12.39.

9/2E-3A2 (*886, p. 46; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p. 112). Bruce McCormick. Water levels, in feet below land-surface datum, 1945: May 10, 18.45, after pumping had stopped; Nov. 28, 15.73.

9/2E-4D1 (*886, p. 46; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p.112). Water levels, in feet below land-surface datum, 1945: May 10, 14.98; Nov. 28, 15.74.

9/2E-8J1 (*886, p. 47; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p.112). Annie Escholtz. Water levels, in feet below land-surface datum, 1945: May 10, 34.86; Nov. 15, 35.64.

9/2E-12N1 (*886, p. 49; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p.112). Hunter. Water levels, in feet below land-surface datum, 1945: May 10, 1.80; Nov. 16, 2.00.

9/2E-14N1 (*886, p. 49; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 128; 1021, p.112). Scobel & Haimut. Water levels, in feet below land-surface datum, 1945: May 10, 21.90; Nov. 16, 21.97.

9/2E-14N2 (*886, p. 49; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). Scobel & Haimut. Water levels, in feet below land-surface datum, 1945: May 10, 16.21; Nov. 16, 15.30.

9/2E-14N3 (*886, p. 50; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). Scobel & Haimut. Water levels, in feet below land-surface datum, 1945: May 10, 17.07; Nov. 16, 16.49.

9/2E-18F1 (*886, p. 47; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). Water levels, in feet below land-surface datum, 1945: May 10, 47.95; Nov. 15, 48.92.

9/2E-20Q1 (*1021, p.112). Daggett Airport. Water levels, in feet below land-surface datum, 1945: Jan. 3, 42.04; May 10, 41.89; Nov. 15, 41.81.

9/2W-19B1 (*886, p. 39; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 129; 1021, p.112). Shobel. Water levels, in feet below land-surface datum, 1945: May 9, 62.84; Nov. 28, 62.77.

9/3E-3D1 (*886, p. 50; 911, p. 130; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). Water levels, in feet below land-surface datum, 1945: May 10, 42.70; Nov. 15, 42.34.

9/3E-10D1 (*886, p. 50; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). Bozarth. Water levels, in feet below land-surface datum, 1945: Jan. 3, 35.63; May 10, 35.44; Nov. 15, 35.41.

9/3E-12E1 (*886, p. 51; 911, p. 130; 941, p. 99; 949, p. 70; 991, p. 129; 1021, p.112). B. Nicholas. No measurements made in 1945.

9/3E-34D1 (*886, p. 48; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 129; 1021, p.113). Clinkenbeard. No measurements made in 1945.

9/3W-10P1 (*886, p. 39; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 129; 1021, p.113). Water levels, in feet below land-surface datum, 1945: May 4, 88.72; Nov. 27, 88.32.

9/3W-10R1 (*886, p. 40; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 129; 1021, p.113). Osborn. Water levels, in feet below land-surface datum, 1945: May 4, 8.12; Nov. 27, 11.13.

9/3W-14D1 (*886, p. 40; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 129; 1021, p.113). Bullock. Water levels, in feet below land-surface datum, 1945: May 4, 7.33; Nov. 27, 12.10.

9/3W-28A1 (*886, p. 39; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 129; 1021, p.113). J. Slagill. Water levels, in feet below land-surface datum, 1945: May 4, 4.79; Nov. 27, 16.69.

9/3W-34R1 (*886, p. 38; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 130; 1021, p.113). Nellie Storey. Water level, in feet below land-surface datum, 1945: Nov. 27, 125.5.

9/4E-31K1 (*886, p. 44; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 130; 1021, p.113). A. M. Monroe. Water levels, in feet below land-surface datum, 1945: May 11, 13.02; Nov. 15, 13.10.

10/1W-31C1 (*886, p. 42; 911, p. 128; 941, p. 98; 949, p. 68; 991, p. 130; 1021, p.113). Nelson. Water levels, in feet below land-surface datum, 1945: May 5, 46.25; Nov. 27, 47.57.

10/1W-33D1 (*886, p. 42; 911, p. 128; 941, p. 98; 949, p. 68; 991, p. 130; 1021, p.113). Sandoz. No measurements made in 1945.

10/2E-32P1 (*886, p. 45; 911, p. 128; 941, p. 98; 949, p. 69; 991, p. 130; 1021, p.113). Yermo Mutual Water Co. Water levels, in feet below land-surface datum, 1945: May 10, 21.88; Nov. 28, 23.53.

10/2E-34L1 (*886, p. 46; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 130; 1021, p.113). Water levels, in feet below land-surface datum, 1945: May 10, 52.94; Nov. 28, 54.09.

10/2W-19P1 (*886, p. 41; 911, p. 128; 941, p. 97; 949, p. 68; 991, p. 130; 1021, p.114). Loftus. Water levels, in feet below land-surface datum, 1945: May 4, 66.72; Nov. 27, 66.85.

10/2W-30R1 (*886, p. 41; 911, p. 128; 941, p. 97; 949, p. 68; 991, p. 130; 1021, p.114). J. D. Rich. Water levels, in feet below land-surface datum, 1945: May 4, 22.11; Nov. 27, 19.98.

10/3E-21A1 (*886, p. 46; 911, p. 129; 941, p. 99; 949, p. 70; 991, p. 130; 1021, p.113). G. F. Getty. No measurements made in 1945.

10/3E-34E1 (*886, p. 50; 911, p. 130; 941, p. 99; 949, p. 70; 991, p. 130; 1021, p.113). Henderson. Water levels, in feet below land-surface datum, 1945: May 10, 7.53; Nov. 15, 8.50.

10/3W-32C1 (*886, p. 39; 911, p. 127; 941, p. 97; 949, p. 68; 991, p. 130; 1021, p.114). Water levels, in feet below land-surface datum, 1945: May 4, 57.88; Nov. 27, 57.93.

11/3W-28R1 (*1021, p.114). S. F. Edwards. Water levels, in feet below land-surface datum, 1945: May 4, 25.69; Nov. 27, 26.05.

11/3W-34F1 (*886, p. 41; 911, p. 128; 941, p. 97; 949, p. 68; 991, p. 130; 1021, p.114). Water levels, in feet below land-surface datum, 1945: May 4, 32.86; Nov. 27, 33.05.

Santa Ana River Basin, San Bernardino area

1N/4-28R1 (*1021, p.114). S. F. Kelley.

Water levels, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 28	44.66	May 23	43.47	Nov. 5	44.34
Apr. 11	43.97	Aug. 4	43.80		

1N/4-36F1 (*1021, p.115). G. M. Cooley. Water levels, in feet below land-surface datum, 1945: Feb. 28, 41.81; May 22, 42.69; Aug. 4, 44.82; Nov. 9, 44.06.

1S/3-3N1 (*1021,p.115). R. C. Gerber. Water levels, in feet below land-surface datum, 1945: Mar. 1, 75.68; Aug. 4, 73.91; Nov. 9, 78.24.

1S/3-16L1 (*1021, p.116). S. Ronzone. Water levels, in feet below land-surface datum, 1945: Mar. 1, 58.75; May 23, 62.32; Aug. 4, 68.42; Nov. 23, 68.57.

1S/3-17C1. Known as Williams well (*817, pp. 12-16; 840, p. 30; 845, pp. 18-19; 886, p. 24; 911, pp. 119-120; 941, pp. 91-92; 949, pp. 65-66; 991, p. 131; 1021, p.116). Records furnished by Gage Canal Co.

18/3-17C1--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 6	13.62	Apr. 14	2.70	July 14	13.86	Oct. 13	17.36
13	13.70	21	2.70	21	14.36	20	17.12
20	13.70	28	3.53	28	15.28	27	16.86
27	13.78	4.45	15.95	16.62			
Feb. 3	13.45	12	5.53	Aug. 4	16.12	Nov. 3	16.45
10	7.78	19	6.86		16.53		17
17	7.45	26	7.70		15.95		16.36
24	7.53	June 2	8.95	Sept. 1	16.03	Dec. 1	16.62
Mar. 3	7.70	9	9.95		16.28		16.70
10	7.78	16	10.62		16.45		16.95
17	7.78	23	11.62		16.70		16.95
24	5.70	30	12.53		17.12		11.03
Apr. 7	3.20	July 7	13.28	Oct. 6	17.45		

18/3-20B1 (*1021, p.116). Emmet Martin.

Water level, in feet below land-surface datum, 1945

Feb. 1	37.3	May 23	37.40	July 30	38.31	Nov. 1	37.30
Mar. 1	36.8	June 1	37.7	Aug. 31	38.02	26	37.03
Apr. 2	36.4	30	38.29	Oct. 1	37.83	29	36.27
May 1	36.8						

18/3-28E1 (*1021, p.117). George Hinckley. Water levels, in feet below land-surface datum, 1945: Mar. 1, 39.81; May 23, 41.42; Aug. 4, 41.64; Nov. 23, 41.95.

18/3-29K1 (*1021, p.118). J. Yount. Water levels, in feet below land-surface datum, 1945: Mar. 1, 32.69; May 23, 32.27; Aug. 4, 32.82.

18/3-32C1 (*1021, p.118). W. H. Martin. Water levels, in feet below land-surface datum, 1945: Mar. 1, 58.21; May 23, 57.96; Aug. 3, 61.04; Nov. 23, 61.84.

18/4-4K1 (*1021, p.119). W. J. Walsh. Water levels, in feet below land-surface datum, 1945: Feb. 28, 3.02; May 23, 5.76; Aug. 4, 6.16; Nov. 6, 6.35.

San Diego CountySan Luis Rey River Basin

10/3W-1 (*840, p. 35; 845, p. 42; 886, p. 27; 911, p. 123; 941, p. 94; 949, p. 73; 991, p. 131; 1021, p.119). On San Luis Rey Ranch. Water levels, in feet below land-surface datum, 1945: Jan. 1, 6.04; Apr. 2, 5.95; July 2, 6.60; Oct. 2, 6.40.

10/3W-1a (*840, p. 36; 845, p. 42; 886, p. 27; 911, p. 123; 941, p. 94; 949, p. 73; 991, p. 131; 1021, p.119). On San Luis Rey Ranch, 4 miles west of Pala. Water levels, in feet below land-surface datum, 1945: Jan. 1, 7.50; Apr. 2, 7.28; July 2, 8.15; Oct. 2, 8.19.

10/3W-1b (*840, p. 36; 845, p. 43; 886, p. 28; 911, p. 124; 941, p. 94; 949, p. 73; 991, p. 131; 1021, p.119). On San Luis Rey Ranch, 4 miles west of Pala. Water levels, in feet below land-surface datum, 1945: Jan. 1, 5.96; Apr. 2, 5.73; July 2, 6.60; Oct. 2, 6.67.

10/3W-1c (*886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 131; 1021, p.120). Fallbrook Public Utility District observation well. On San Luis Rey Ranch. Water levels, in feet below land-surface datum, 1945: Jan. 1, 6.52; Apr. 2, 6.20; July 2, 7.22; Oct. 2, 7.38.

10/3W-15 (*840, p. 35; 845, p. 42; 886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 132; 1021, p.120). On Gird Ranch, 2.5 miles east of Bonsall. Water levels, in feet below land-surface datum, 1945: Jan. 1, 3.94; Apr. 2, 3.77; July 2, 4.92; Oct. 2, 6.02.

10/3W-16 (*845, p. 42; 886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 132; 1021, p. 120). Hart, Inc. 2 miles east of Bonsall. Water levels, in feet below land-surface datum, 1945: Jan. 1, 3.20; Apr. 2, 3.16; July 2, 6.54; Oct. 2, 6.09.

10/3W-20 (*840, p. 35; 846, p. 42; 886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 132; 1021, p. 120). Bonsall School well. At Bonsall. Water levels, in feet below land-surface datum, 1945: Jan. 11, 8.08; Apr. 2, 8.03; Oct. 2, 9.78.

10/3W-20a (*991, p. 132; 1021, p. 120). Sickler Ranch. At Bonsall. Water levels, in feet below land-surface datum, 1945: Jan. 1, 14.94; Apr. 2, 14.37; July 2, 15.98; Oct. 2, 20.06, pumping.

10/3W-30 (*886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 132; 1021, p. 120). Fall Brook Public Utility District observation well. On property of San Diego County Water Co. Water levels, in feet below land-surface datum, 1945: Jan. 1, 10.34; Apr. 2, 10.00; July 2, 10.85; Oct. 2, 11.02.

11/4W-5 (*886, p. 28; 911, p. 124; 941, p. 94; 949, p. 74; 991, p. 132; 1021, p. 120). City of Oceanside observation well. On Stokes property. Measurements made by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	7.48	Apr. 17	6.32	July 9	9.15	Nov. 5	13.07
Feb. 10	6.48	May 14	6.98	Aug. 6	10.65	Dec. 13	13.81
Mar. 14	6.36	June 11	7.90	Oct. 6	12.65		

11/4W-8 (*886, p. 29; 911, p. 124; 941, p. 95; 949, pp. 74-75; 991, p. 133; 1021, p. 120). Carlsbad Mutual Water Co. observation well. Measurements by Carlsbad Mutual Water Co. Water levels, in feet below land-surface datum, 1945: Jan. 2, 7.65; Apr. 2, 5.94; July 2, 8.02; Oct. 1, 10.50.

11/4W-9F1 (*911, p. 125; 941, p. 95; 949, p. 74; 991, p. 133; 1021, p. 120). City of Oceanside observation well. On Williams Ranch. Measurements made by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Jan. 13	7.27	Apr. 17	4.77	July 9	8.60	Nov. 5	12.60
Feb. 10	5.35	May 14	5.60	Aug. 6	9.60	Dec. 13	13.27
Mar. 14	4.60	June 11	6.77	Oct. 6	12.27		

11/4W-18 (*886, p. 29; 911, p. 125; 941, p. 95; 949, p. 75; 991, p. 133; 1021, p. 120). Carlsbad Mutual Water Co. observation well. Measurements made by Carlsbad Mutual Water Co. Water levels, in feet below land-surface datum, 1945: Jan. 2, 10.45; Apr. 2, 12.10; July 2, 19.36; Oct. 1, 28.80.

11/5W-13a (*886, p. 29; 911, p. 125; 941, p. 95; 949, p. 75; 991, p. 133; 1021, p. 121). City of Oceanside. On city property about 2 miles northeast of Oceanside. Measurements made by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Jan. 13	10.25	Apr. 17	10.75	July 9	13.33	Nov. 5	15.60
Feb. 10	8.58	May 14	14.17	Aug. 6	13.83	Dec. 13	14.83
Mar. 14	3.07	June 11	12.25	Oct. 6	15.91		

11/5W-13b (*886, p. 29; 911, p. 125; 941, p. 95; 949, p. 75; 991, p. 133; 1021, p. 121). City of Oceanside. On city property about 2 miles northeast of Oceanside. Measurements made by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Jan. 13	10.41	Apr. 17	8.75	July 9	11.33	Nov. 5	13.83
Feb. 10	8.50	May 14	9.58	Aug. 6	12.41	Dec. 13	14.58
Mar. 14	9.00	June 11	10.67	Oct. 6	13.75		

11/5W-13c (*886, p. 29; 911, p. 125; 941, p. 95; 949, p. 75; 991, p. 133; 1021, p. 121). City of Oceanside. On city property about 2 miles northeast of Oceanside. Measurements by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	11.08	Apr. 17	10.92	July 9	13.17	Nov. 5	14.75
Feb. 10	9.17	May 14	11.25	Aug. 6	13.83	Dec. 13	14.75
Mar. 14	9.17	June 11	12.42	Oct. 6	15.25		

11/5W-15 (*886, p. 29; 911, p. 125; 941, p. 95; 949, p. 75; 991, p. 133; 1021, p. 121). City of Oceanside. On city property north of Oceanside. Measurements made by city of Oceanside.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 13	4.02	Apr. 17	3.92	July 9	6.02	Nov. 5	7.62
Feb. 10	2.75	May 14	4.46	Aug. 6	6.67	Dec. 13	7.12
Mar. 14	2.75	June 11	6.48	Oct. 6	7.40		

San Dieguito River Basin

12/1W-31a (*840, pp. 38-39; 845, p. 42; 886, p. 27; 911, p. 123; 941, p. 93; 949, p. 73; 991, p. 134; 1021, p. 121). City of San Diego. Water levels, in feet below land-surface datum, 1945: Feb. 8, 7.16; May 22, 7.93, pumping; Aug. 9, 9.05; Oct. 16, 9.55.

12/1W-32 (*991, p. 134; 1021, p. 121). County Road Station. Pumping intermittently. Water levels, in feet below land-surface datum, 1945: Feb. 8, 19.57; May 22, 20.26; Aug. 9, 22.23.

12/JW-33 (*840, p. 39; 845, p. 42; 886, p. 27; 911, p. 123; 941, p. 93; 949, p. 73; 991, p. 134; 1021, p. 121). H. G. Fenton. Water levels, in feet below land-surface datum, 1945: Feb. 8, 12.80; May 22, 13.48; Aug. 9, 15.15, pumping.

12/1W-33a (*991, p. 134; 1021, p. 122). F. B. Gierman. Formerly owned by W. H. Dyer. Water levels, in feet below land-surface datum, 1945: Feb. 8, 0.24; May 22, 0.61; Aug. 9, 3.11; Oct. 16, 3.76.

12/1W-35K1. June Chase. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 12 S., R. 1 W., on east side of oiled county road leading south from State highway bridge across Santa Ysabel Creek, near wooden derrick. Diameter 8 inches, depth 36 feet. Measuring point, top of casing, 0.5 foot above land-surface datum. Water levels, in feet below land-surface datum, 1945: Aug. 14, 7.86; Oct. 16, 8.60.

12/1W-36D1. Jorgensen. NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 36, T. 12 S., R. 1 W., 500 feet north of State Highway, and 500 feet east of house. Diameter 16 inches, depth 53 feet. Drilled in 1945 to replace well 12/1W-35A1, which was filled in. Measuring point, top of casing, at land-surface datum. Water levels, in feet below land-surface datum, 1945: Feb. 8, 8.02; May 22, 7.84.

San Diego River Basin

15/1E-2 (*845, p. 26; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 71; 991, p. 135; 1021, p. 122). San Diego County. At El Monte Park. Water levels, in feet below land-surface datum, 1945: Jan. 26, 29.20; May 23, 25.08; Oct. 11, 31.93; Dec. 31, 26.13.

15/1E-7 (*845, p. 28; 886, p. 25; 911, p. 122; 941, p. 93; 949, p. 71; 991, p. 135; 1021, p. 122). J. F. Ricketts.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 26	9.05	May 23	8.97	Oct. 11	10.38
Feb. 9	8.99	Aug. 10	10.07	Nov. 30	9.90

15/1E-16C1. Formerly well 15/1E-16 (*845, p. 26; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 71; 991, p. 135; 1021, p.122). Pratt test well. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 15 S., R. 1 E.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 26	9.31	Aug. 10	10.52	Dec. 31	11.30
May 23	9.49	Oct. 11	11.16		

15/1E-17a (*845, p. 27; 886, p. 25; 911, p. 121; 941, p. 93; 949, p. 71; 991, p. 135; 1021, p.122). On Dr. Irey Ranch.

Water level, in feet below land-surface datum, 1945

Jan. 26	9.51	May 23	9.84	Oct. 11	11.52
Feb. 9	9.40	Aug. 10	11.14	Dec. 31	10.63

15/1E-17b (*845, p. 27; 886, p. 25; 911, p. 121; 941, p. 93; 949, p. 71; 991, p. 135; 1021, p.122). In county yard, east of Lakeside.

Water level, in feet below land-surface datum, 1945

Jan. 26	9.29	May 23	9.34	Oct. 11	11.27
Feb. 9	9.19	Aug. 10	10.82	Dec. 31	10.41

15/1E-17B1. Formerly well 15/1E-17 (*845, p. 26; 886, p. 25; 911, p. 121; 941, p. 93; 949, p. 71; 991, p. 135; 1021, p.122). On Truttmann Ranch. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T. 15 S., R. 1 E.

Water level, in feet below land-surface datum, 1945

Jan. 26	7.74	Aug. 10	9.48	Dec. 31	9.36
May 23	8.26	Oct. 11	9.85		

15/1E-17H6. Formerly well 15/1E-16a (*845, p. 26; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 71; 991, p. 135; 1021, p.122). Irrigation District well. SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 15 S., R. 1 E.

Water level, in feet below land-surface datum, 1945

Jan. 26	7.04	Aug. 10	8.35	Dec. 31	8.75
May 23	7.26	Oct. 11	8.34		

15/1E-19 (*845, p. 32; 886, p. 26; 911, p. 122; 941, p. 35; 949, p. 71; 991, p. 136; 1021, p.123). Mr. Langdon. Near Benedict Avenue, Lakeside.

Water level, in feet below land-surface datum, 1945

Feb. 1	10.84	Aug. 10	11.39	Dec. 31	a 12.14
May 23	9.75	Oct. 11	14.05		

a Pumping.

15/1W-13N2 (*845, p. 34; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 136; 1021, p.123). Riverview well 3. At Riverview.

Water level, in feet below land-surface datum, 1945

Feb. 1	3.94	Aug. 10	5.33	Dec. 31	5.33
May 23	3.62	Oct. 11	6.14		

15/1W-13R5. Formerly well 15/1W-13 (*845, pp. 32-33; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 136; 1021, p.123). Mr. Levi. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 15 S., R. 1 W.

Water level, in feet below land-surface datum, 1945

Feb. 1	11.34	Aug. 10	13.11	Dec. 31	12.90
May 23	10.79	Oct. 11	13.93		

15/1W-23H2 (*845, p. 35; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 136; 1021, p.123). Riverview well. At Riverview.

Water level, in feet below land-surface datum, 1945

Feb. 1	1.98	Aug. 10	2.86	Dec. 31	2.71
May 23	1.65	Oct. 11	3.60		

15/1W-24 (*845, p. 33; 886, p. 26; 911, p. 122; 941, p. 93; 949, pp. 71-72; 991, p. 136; 1021, p.123). E. G. Squires. Water levels, in feet below land-surface datum, 1945: Feb. 1, 7.12; Feb. 9, 7.23; May 23, plugged. Measurements discontinued.

15/1W-24a. E. G. Squires. NE^{1/4} sec. 24, T. 15 S., R. 1 W., at Riverview, 200 feet south of well 15/1W-24, which it replaces. Domestic well, diameter 6 inches, depth 23 feet. Measuring point, top of casing, 1.6 feet below land-surface datum. Water levels, in feet below land-surface datum, 1945: May 23, 8.58; Aug. 10, 11.53; Oct. 11, 12.53; Dec. 31, 10.67.

15/1W-24D7 (*845, p. 33; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 136; 1021, p.123). Riverview well 2. At Riverview.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 1	2.99	Aug. 10	8.37	Dec. 31	4.74
May 23	4.60	Oct. 11	8.26		

15/1W-27 (*845, p. 36; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 136; 1021, p.123). On County Farm. At Santee.

Water level, in feet below land-surface datum, 1945

Feb. 1	6.32	May 23	6.18	Oct. 11	7.72
9	6.25	Aug. 10	7.18	Dec. 31	7.20

15/1W-28 (*845, p. 36; 886, p. 26; 911, p. 122; 941, p. 39; 949, p. 72; 991, p. 137; 1021, p.123). Dr. Good. On El Cajon land grant, at Santee. New well dug at this site May 1945. Diameter 10 inches, depth 44 feet. Measuring point established Aug. 10, 1945, top of casing, 4.0 feet above land-surface datum. Water levels, in feet below land-surface datum, 1945: Aug. 10, 13.24; Oct. 11, 13.76; Dec. 31, 12.29.

16/2W-16 (*845, p. 37; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 137; 1021, p.123). Mr. Jaussaud.

Water level, in feet below land-surface datum, 1945

Feb. 1	11.92	Aug. 10	15.22	Dec. 31	12.94
May 23	a 20.25	Oct. 11	15.05		

a Nearby well pumping.

16/2W-16a (*845, p. 38; 886, p. 26; 911, p. 122; 941, p. 93; 949, p. 72; 991, p. 137; 1021, p.124). Mr. Jaussaud. Water levels, in feet below land-surface datum, 1945: Feb. 1, 12.08; Aug. 10, 15.41; Oct. 11, 15.25; Dec. 31, 13.12.

16/3W-21 (*845, p. 40; 886, p. 27; 911, p. 123; 941, p. 93; 949, p. 73; 991, p. 137; 1021, p.124). Mr. Chapman. Water levels, in feet below land-surface datum, 1945: Jan. 30, 5.35; May 29, well filled in. Measurements discontinued.

16/3W-22 (*845, p. 39; 886, p. 27; 911, p. 123; 941, p. 93; 949, p. 72; 991, p. 137; 1021, p.124). H. Tatreau. Formerly owned by Mr. Confar.

Water level, in feet below land-surface datum, 1945

Jan. 30	11.55	Aug. 10	13.29	Dec. 31	11.48
May 29	11.96	Oct. 11	13.77		

16/3W-23 (*845, p. 39; 886, p. 27; 911, p. 123; 941, p. 93; 949, p. 72; 991, p. 137; 1021, p.124). S. H. McIntosh.

Water level, in feet below land-surface datum, 1945

Jan. 30	5.59	May 29	6.15	Oct. 11	7.56
Feb. 9	. 5.44	Aug. 10	7.30	Dec. 31	5.74

16/3W-24 (*845, p. 38; 886, p. 26; 911, p. 123; 941, p. 93; 949, p. 72; 991, p. 137; 1021, p.124). R. I. Officer.

Water level, in feet below land-surface datum, 1945

Jan. 30	8.29	Aug. 10	9.19	Dec. 31	8.38
May 29	8.63	Oct. 11	9.43		

Sweetwater River Basin

17/IW-19 (*845, p. 25; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 75; 991, p. 138; 1021, p.124). L. C. Kincaid. Water levels, in feet below land-surface datum, 1945: Feb. 6, 9.63; May 16, 9.41; Aug. 2, 16.00; Oct. 10, dry.

17/IW-19a (*991, p. 138; 1021, p.124). L. C. Kincaid. In river bed, 200 yards south of 17/IW-19. Water levels, in feet below land-surface datum, 1945: Feb. 6, 4.54; May 16, 5.11; Aug. 2, 11.50; Oct. 10, 15.92.

Otay River Basin

18/2W-22 (*845, p. 23; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 70; 991, p. 138; 1021, p.124). G. W. St.Clair. Water levels, in feet below land-surface datum, 1945: Feb. 6, 21.08; May 24, 20.87; Aug. 2, 22.30; Oct. 10, 23.58.

18/2W-22a (*845, p. 23; 886, p. 25; 911, p. 121; 941, p. 92; 949, p. 70; 991, p. 138; 1021, p.124). N. Bard. Water levels, in feet below land-surface datum, 1945: Feb. 6, 29.55; May 16, 29.03; Aug. 2, dry; Oct. 10, dry.

Tia Juana River Basin

18/2W-33 (*845, p. 20; 886, p. 24; 911, p. 120; 941, p. 92; 949, p. 76; 991, p. 138; 1021, p.125). On Hewitt Bros. Hog Ranch. Water levels, in feet below land-surface datum, 1945: Feb. 6, 7.90, nearby well pumping; May 16, 8.67; Aug. 2, 11.74, nearby well pumping; Oct. 10, 12.69.

18/2W-34 (*845, p. 20; 886, p. 24; 911, p. 120; 941, p. 92; 949, p. 76; 991, p. 138; 1021, p.125). On Owens Ranch. Water levels, in feet below land-surface datum, 1945: Feb. 6, 9.34; May 16, 10.72; Aug. 2, 13.79; Oct. 10, 13.79.

18/2W-34a (*845, p. 21; 886, p. 25; 911, p. 120; 941, p. 92; 949, p. 76; 991, p. 139; 1021, p.125). On Evans Ranch. Near San Ysidro. Water levels, in feet below land-surface datum, 1945: Feb. 6, 6.50; May 16, 7.93; Aug. 2, 8.80; Oct. 10, 8.64.

19/2W-1 (*845, p. 22; 886, p. 25; 911, p. 120; 941, p. 92; 949, p. 76; 991, p. 139; 1021, p.125). Mrs. A. W. Jackson. Water levels, in feet below land-surface datum, 1945: Feb. 6, 3.99; May 16, 4.39; Aug. 2, 4.82; Oct. 10, 4.79.

19/2W-4 (*845, p. 21; 886, p. 25; 911, p. 120; 941, p. 92; 949, p. 76; 991, p. 139; 1021, p.125). At Nestor Bridge. Water levels, in feet below land-surface datum, 1945: Feb. 2, 6.21; May 16, 6.99; Aug. 2, 9.16; Oct. 10, 8.68.

San Joaquin County

Mokelumne River Basin

3N/6-3K3 (*840, p. 45; 845, p. 44; 886, p. 53; 911, p. 132; 941, p. 137; *949, p. 171; 991, p. 139; 1021, p.125). F. B. Mills.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 2	15.89	Mar. 1	15.82	Oct. 1	15.82	Dec. 1	16.05
Feb. 1	15.81	June 1	18.15	Nov. 1	15.88		

3N/6-17D1 (*840, p. 45; 845, p. 44; 886, p. 53; 911, p. 132; 941, p. 137; *949, p. 172; 991, p. 139; 1021, p.125). Otto Helmie.

Water level, in feet below land-surface datum, 1945

Jan. 2	13.22	Apr. 1	10.77	July 2	14.51	Oct. 1	16.02
Feb. 1	12.59	May 1	10.69	Aug. 1	16.90	Nov. 1	14.43
Mar. 1	11.34	June 1	11.95	31	17.63	Dec. 1	13.74

3N/6-36R2 (*619, p. 311; *777, p. 28; *817, p. 18; 840, p. 46; 845, p. 44; 886, p. 53; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 139; 1021, p. 125). Leland W. Bunch.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 3	19.17	Apr. 1	15.65	July 2	19.83	Oct. 5	21.79
Feb. 2	18.74	May 1	17.48	Aug. 1	20.86	Nov. 1	21.08
Mar. 1	15.42	June 1	18.52	31	21.85	Dec. 1	21.03

a Just stopped pumping.

3N/7-3C1 (*777, p. 28; *817, p. 18; 840, p. 46; 845, p. 44; 886, p. 53; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 139; 1021, p. 126). Jacob Knoll.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 5	35.77	Apr. 1	34.14	July 2	30.70	Oct. 6	35.07
Feb. 2	35.70	May 1	32.17	Aug. 1	33.05	Nov. 1	35.50
Mar. 1	34.54	June 1	30.74	31	34.13	Dec. 1	35.77

3N/7-6M8 (*777, p. 28; *817, p. 18; 840, p. 46; 845, p. 44; 886, p. 53; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 140; 1021, p. 126).

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 3	22.49	Apr. 1	20.98	July 2	22.22	Oct. 4	23.72
Feb. 2	22.33	May 1	22.70	Aug. 1	23.02	Nov. 1	23.46
Mar. 1	21.54	June 1	22.47	31	23.47	Dec. 1	23.44

3N/7-7M1 (*777, p. 29; *817, p. 19; 840, p. 46; 845, p. 45; 886, p. 54; 911, p. 133; *941, p. 138; *949, p. 172; 991, p. 140; 1021, p. 126). J. and Rachel Goetken.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 3	27.89	Apr. 1	28.56	July 2	33.42	Oct. 5	31.62
Feb. 2	27.68	May 1	31.43	Aug. 1	33.69	Nov. 1	30.70
Mar. 1	27.91	June 1	33.57	31	32.72	30	29.79

3N/7-10L3 (*777, p. 29; *817, p. 19; 840, p. 46; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 140; 1021, p. 126). Edward Preszler.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 5	38.84	Apr. 1	44.19	July 2	46.56	Oct. 6	44.05
Feb. 2	39.10	May 1	49.49	Aug. 1	46.96	Nov. 1	42.30
Mar. 1	40.44	June 1	46.96	31	46.66	Dec. 1	41.05

a Adjacent well pumping.

3N/7-10L4 (*777, p. 29; *817, p. 19; *840, p. 46; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 140; 1021, p. 126). Edward Preszler.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 5	37.98	Apr. 1	44.32	July 2	46.38	Oct. 6	42.82
Feb. 2	38.28	May 1	49.02	Aug. 1	47.11	Nov. 1	b 40.99
Mar. 1	39.95	June 1	48.24	31	45.82	Dec. 1	39.99

a Adjacent well pumping. b Pumping.

3N/7-15P2 (*777, p. 29; *817, p. 19; 840, p. 47; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 138; *949, p. 172; 991, p. 140; 1021, p. 126). Eugene R. Hieb.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 5	40.11	Apr. 1	39.03	July 2	46.18	Oct. 6	45.24
Feb. 2	39.57	May 1	a 42.89	Aug. 1	46.81	Nov. 1	43.67
Mar. 1	39.33	June 1	a 47.86	31	47.89	Dec. 1	42.68

a Adjacent well pumping.

3N/7-19D2 (*777, p. 30; *817, p. 19; 840, p. 47; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 138; *949, p. 173; 991, p. 140; 1021, p. 126). C. M. Ferdun.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 3	28.62	Apr. 1	27.10	July 2	31.70	Oct. 5	33.09
Feb. 2	27.65	May 1	23.03	Aug. 1	33.57	Nov. 1	31.97
Mar. 1	27.14	June 1	28.79	31	34.09	Dec. 1	31.18

3N/7-27F3 (*777, p. 30; *817, p. 20; 840, p. 47; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 139; *949, p. 173; 991, p. 141; 1021, p. 127). John F. Heitzmann.

Water level, in feet below land-surface datum, 1945

Jan. 4	36.84	Apr. 1	35.08	July 2	39.19	Oct. 6	40.45
Feb. 2	a 36.22	May 1	35.45	Aug. 1	b 40.50	Nov. 1	39.78
Mar. 1	35.63	June 1	37.64	31	b 40.18	Dec. 1	39.75

a Adjacent land flooded.

b Adjacent well pumping.

3N/7-30E2 (*619, p. 322; *777, p. 30; *817, p. 20; 840, p. 47; 845, p. 45; 886, p. 54; 911, p. 133; 941, p. 139; *949, p. 173; 991, p. 141; 1021, p. 127). W. L. Flanigan. Beginning Feb. 2 measuring point is 42.57 feet above sea-level datum.

Water level, in feet below land-surface datum, 1945

Jan. 10	22.47	Mar. 1	19.91	July 2	28.89	Nov. 1	25.83
Feb. 2	a 21.91	June 1	24.18	Oct. 5	27.39	Dec. 1	24.81

a Nearby creek flowing.

4N/6-12RL (*619, p. 337; *777, p. 31; *817, p. 20; 840, p. 47; 845, p. 46; 886, p. 54; 911, p. 134; 941, p. 139; *949, p. 173; 991, p. 141; 1021, p. 127). G. A. Jahant.

Water level, in feet below land-surface datum, 1945

Jan. 3	31.34	Apr. 1	29.04	July 2	33.97	Oct. 4	36.04
Feb. 2	30.40	May 1	29.83	Aug. 1	35.90	Nov. 1	35.23
Mar. 1	29.69	June 1	30.90	31	36.52	Dec. 1	34.43

4N/6-34RL (*619, p. 344; *777, p. 31; *817, p. 20; *840, p. 47; 845, p. 46; 886, p. 55; 911, p. 134; *941, p. 139; *949, p. 173; 991, p. 141; 1021, p. 127). E. M. Smith.

Water level, in feet below land-surface datum, 1945

Jan. 2	16.86	Apr. 18	a 14.68	July 2	16.45	Oct. 1	16.32
Feb. 1	a 18.00	May 1	a 16.65	Aug. 1	a 16.36	Nov. 1	a 16.01
Mar. 1	16.28	June 1	a 16.31	31	16.32	Dec. 1	a 15.92

a Adjacent well pumping.

4N/6-36DL (*619, p. 345; *777, p. 31; *817, p. 20; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 139; *949, p. 173; 991, p. 141; 1021, p. 127). D. D. Smith and S. H. and I. Zimmerman.

Water level, in feet below land-surface datum, 1945

Jan. 3	21.09	Apr. 1	20.60	July 2	26.87	Oct. 4	20.88
Feb. 2	20.94	May 1	23.86	Aug. 1	a 27.10	Nov. 1	20.72
Mar. 1	19.99	June 1	23.74	31	21.65	Dec. 1	22.00

a Adjacent well pumping.

4N/7-15B3 (*777, p. 32; *817, p. 21; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 139; *949, p. 174; 991, p. 141; 1021, p. 127). Robert L. Carter.

Water level, in feet below land-surface datum, 1945

Jan. 5	49.50	Apr. 2	48.13	July 2	51.62	Oct. 8	53.99
Feb. 2	49.02	May 1	48.37	Aug. 1	a 53.37	Nov. 1	53.11
Mar. 1	48.37	June 1	49.48	31	54.30	Dec. 1	52.13

a Adjacent well pumping.

4N/7-18N3 (*777, p. 32; *817, p. 21; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 139; *949, p. 174; 991, p. 142; 1021, p.127). Martha Eddlemon.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 3	32.95	Apr. 2	31.15	July 2	39.28	Oct. 4	39.18
Feb. 2	32.18	May 1	31.65	Aug. 1	42.65	Nov. 1	37.49
Mar. 1	31.46	June 1	35.99	31	42.70	Dec. 1	36.17

4N/7-22Q4 (*777, p. 32; *817, p. 21; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 139; *949, p. 174; 991, p. 142; 1021, p.128). Adolphus Eddlemon.

Water level, in feet below land-surface datum, 1945

Jan. 5	40.39	Apr. 2	39.28	July 2	42.80	Oct. 8	43.49
Feb. 2	39.96	May 1	39.77	Aug. 1	43.97	Nov. 1	42.72
Mar. 1	39.56	June 1	41.16	31	43.87	Dec. 1	42.02

4N/7-22Q5 (*777, p. 32; *817, p. 21; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 139; *949, p. 174; 991, p. 142; 1021, p.128). Adolphus Eddlemon.

Water level, in feet below land-surface datum, 1945

Jan. 5	40.44	Apr. 2	39.69	July 2	50.87	Oct. 8	44.09
Feb. 2	39.82	May 1	42.72	Aug. 1	50.50	Nov. 1	42.90
Mar. 1	39.54	June 1	46.93	31	47.07	Dec. 1	42.10

4N/7-27P1 (*777, p. 33; *817, p. 21; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 140; *949, p. 174; 991, p. 142; 1021, p.128). Frank H. and Leonard W. Buck.

Water level, in feet below land-surface datum, 1945

Jan. 5	32.49	Apr. 2	32.44	July 2	29.78	Oct. 8	34.25
Feb. 2	33.18	May 1	31.61	Aug. 1	32.74	Nov. 1	34.39
Mar. 1	31.00	June 1	29.79	31	35.80	Dec. 1	34.02

4N/7-30M2 (*777, p. 33; *817, p. 22; 840, p. 48; 845, p. 46; 886, p. 55; 911, p. 134; 941, p. 140; *949, p. 174; 991, p. 142; 1021, p.128). Clara A. Barton.

Water level, in feet below land-surface datum, 1945

Jan. 3	29.57	Apr. 2	28.59	July 2	36.38	Oct. 4	32.58
Feb. 2	29.18	May 1	35.70	Aug. 1	35.89	Nov. 1	31.33
Mar. 1	28.49	June 1	35.45	31	34.30	Dec. 1	31.10

4N/7-31M3 (*777, p. 33; *817, p. 22; *840, p. 49; *845, p. 47; 886, p. 55; 911, p. 135; 941, p. 140; *949, p. 174; 991, p. 142; 1021, p.128). Charles H. Woest.

Water level, in feet below land-surface datum, 1945

Jan. 3	24.65	Apr. 2	25.77	July 2	22.89	Oct. 4	23.10
Feb. 2	24.18	May 1	26.72	Aug. 1	24.29	Nov. 1	24.25
Mar. 1	22.49	June 1	a 25.88	31	a 24.26	Dec. 1	24.83

a Just stopped pumping.

4N/7-31N5 (*777, p. 33; *817, p. 22; 840, p. 49; 845, p. 47; 886, p. 55; 911, p. 135; 941, p. 140; *949, p. 175; 991, p. 142; 1021, p.128). Jacob Goehring.

Water level, in feet below land-surface datum, 1945

Jan. 3	10.05	Apr. 2	9.50	July 2	7.11	Oct. 4	7.97
Feb. 2	10.15	May 1	5.58	Aug. 1	6.92	Nov. 1	8.50
Mar. 1	8.34	June 1	6.01	31	7.36	Dec. 1	10.18

4N/7-34G1 (*777, p. 34; 817, p. 22; 840, p. 49; 845, p. 47; 886, p. 55; 911, p. 135; 941, p. 140; *949, p. 175; 991, p. 143; 1021, p.128). John J. Schmiedt.

4N/7-34G1--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level						
Jan. 5	8.60	Apr. 2	8.31	July 2	5.50	Oct. 6	9.00
Feb. 2	8.12	May 1	6.84	Aug. 1	8.03	Nov. 1	9.62
Mar. 1	7.18	June 1	6.24	31	8.35	Dec. 1	9.00

Santa Barbara County

Carpinteria Basin

4/25-19F4 (*949, p. 189; 991, p. 143; 1021, p.129). M. F. Lewis.

Water level, in feet below land-surface datum, 1945

Feb. 5	91.64	Apr. 30	83.92	Aug. 6	90.90	Nov. 6	99.72
Mar. 8	87.38	June 5	83.49	Sept. 6	94.66	Dec. 3	99.47
19	85.80	July 9	88.13	Oct. 1	97.36	30	97.96

4/25-19J5 (*949, p. 190; 991, p. 143; 1021, p.129). Lyman & Young.

Water level, in feet below land-surface datum, 1945

Feb. 5	51.89	Mar. 19	47.33	Nov. 6	a 63.74	Dec. 30	a 59.22
Mar. 8	48.68	Apr. 30	44.97	Dec. 3	a 61.98		

a Below mean sea level.

b Below mean sea level.

4/25-20Q2 (*949, p. 190; *991, p. 143; 1021, p.129). J. B. Romero.

Water level, in feet below land-surface datum, 1945

Feb. 5	30.87	Apr. 30	24.68	Aug. 6	39.40	Nov. 6	b 41.78
Mar. 8	27.74	June 5	30.03	Sept. 6	ab 48.35	Dec. 3	ab 41.88
19	26.70	July 9	a 40.79	Oct. 1	ab 44.38	30	38.63

a Nearby well pumping.

b Below mean sea level.

4/25-21N2 (*941, p. 162; *949, p. 190; 991, p. 143; 1021, p.129). E. S. Pillsbury.

Water level, in feet below land-surface datum, 1945

Feb. 5	35.73	Apr. 30	31.14	Aug. 6	50.82	Dec. 3	46.46
Mar. 8	32.97	June 5	ab 57.59	Nov. 6	49.46		
19	32.65					30	42.85

a Nearby well pumping.

b Below mean sea level.

4/25-21R1 (*949, p. 190; 991, p. 144; 1021, p.129). B. Moore.

Water level, in feet below land-surface datum, 1945

Feb. 5	69.93	Apr. 30	65.19	Aug. 6	67.85	Nov. 6	72.54
Mar. 8	68.28	June 5	64.47	Sept. 6	69.77	Dec. 3	71.72
19	67.74	July 9	66.75	Oct. 1	71.10	30	72.25

4/25-27J1 (*941, p. 163; *949, p. 191; 991, p. 144; 1021, p.129).

J. Rock.

Water level, in feet below land-surface datum, 1945

Feb. 5	118.13	Apr. 30	109.38	Sept. 6	121.34	Dec. 3	126.05
Mar. 8	114.95	July 9	114.56	Oct. 1	a 125.23	30	124.45
19	114.03	Aug. 6	119.42	Nov. 6	127.03		

a Nearby well pumping.

4/25-27Q2 (*941, p. 162; *949, p. 192; *991, p. 144; 1021, p.129). A. F. Heimlich.

Water level, in feet below land-surface datum, 1945

Feb. 5	102.34	Apr. 30	92.86	Sept. 6	105.68	Dec. 3	109.90
Mar. 8	98.98	June 5	101.19	Oct. 1	109.83	30	107.94
19	98.14	Aug. 6	103.02	Nov. 6	111.83		

4/25-27R2 (*949, p. 193; 991, p. 145; 1021, p.130). W. H. Yule.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	104.66	Mar. 19	100.84	June 5	a 98.43	Nov. 6	111.25
Mar. 8	102.05	Apr. 30	94.96	Aug. 6	109.11	Dec. 3	110.17

a Nearby well pumping.

4/25-28J1 (*949, p. 193; 991, p. 145; 1021, p.130). W. C. and C. A. Catlin.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	61.16	Mar. 19	·	June 5	a 59.95
Mar. 8	58.95	Apr. 30	53.60	Oct. 1	b 80.14

a Nearby well pumping.

b Pumping.

4/25-28M1 (*941, p. 163; *949, p. 193; 991, p. 145; 1021, p.130). Mrs. A. Baylor.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	26.50	Apr. 30	19.84	Aug. 5	34.48
Mar. 8	24.48	June 5	27.46	Sept. 6	ab 63.54
19	23.27	July 9	a 42.57	Oct. 1	a 45.00

a Nearby well pumping.

b Below mean sea level.

4/25-29A3 (*949, p. 194; 991, p. 145; 1021, p.130). M. Young.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	14.60	Apr. 30	9.87	Aug. 6	b 33.24
Mar. 8	12.15	June 5	ab 55.62	Sept. 6	ab 66.56
19	11.10	July 9	a 36.33	Oct. 1	a 49.73

a Nearby well pumping.

b Below mean sea level.

4/25-29D1 (*949, p. 194; 991, p. 145; 1021, p.130). H. Sturmer.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	14.59	Mar. 19	9.86	June 5	14.85
Mar. 8	11.05	Apr. 30	9.02	July 9	a 22.97

a Below mean sea level.

4/25-29RL (*949, p. 194; *991, p. 145; 1021, p.130). Carpinteria Union High School.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	12.37	Apr. 30	9.13	Aug. 6	21.23
Mar. 8	10.83	June 5	13.28	Sept. 6	a 41.15
19	10.65	July 9	a 26.91	Oct. 1	a 27.17

a Nearby well pumping.

4/25-33C1 (*949, p. 195; 991, p. 146; 1021, p.130). B. F. Franklin.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	25.02	Apr. 30	24.53	Aug. 6	24.98
Mar. 8	24.88	June 5	24.90	Sept. 8	24.83
19	24.84	July 9	24.84	Oct. 1	25.12

a Nearby well pumping.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	21.05	Apr. 30	20.34	Aug. 6	29.88
Mar. 8	19.18	June 5	23.33	Oct. 1	a 42.74
19	19.32	July 9	27.54	Nov. 6	a 44.87

a Nearby well pumping.

4/25-35D1 (*941, p. 164; *949, p. 196; 991, p. 146; 1021, p.131).
W. B. Knowlton.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	119.70	Apr. 30	115.30	Aug. 6	115.35	Nov. 6	117.18
Mar. 8	118.09	June 5	113.43	Sept. 6	116.43	Dec. 3	117.88
19	117.16	July 9	115.19	Oct. 1	116.88	30	117.04

4/26-24F2 (*949, p. 196; 991, p. 147; 1021, p.131). A. F. Thurmond.

Water level, in feet below land-surface datum, 1945 .

Date	Water level	Date	Water level	Date	Water level
Feb. 5	6.32	Mar. 20	4.17	Dec. 30	8.35
Mar. 8	5.83	Apr. 30	4.12		

Goleta Basin

4/27-6N1 (*949, p. 197; 991, p. 147; 1021, p.131). John McCaughy.

Water level, in feet below land-surface datum, 1945

Date.	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	88.40	Apr. 30	87.59	Sept. 7	88.74	Dec. 30	88.49
Mar. 8	88.23	June 6	88.95	Nov. 5	88.99		

4/28-2N2 (*991, p. 147; 1021, p.131). County of Santa Barbara.
Tucker's Grove. Land-surface datum is 177.65 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

(In part, selected noon levels from recorder charts)

Jan. 5	26.79	Apr. 5	14.96	July 5	20.42	Sept. 30	26.24
10	27.02	10	14.90	10	20.96	Oct. 5	26.48
15	27.13	15	14.89	15	21.30	15	27.12
20	27.45	20	14.82	20	21.70	20	27.34
25	27.64	25	14.81	25	22.06	25	27.68
31	27.85	30	14.73	31	22.63	31	27.96
Feb. 5	27.06	May 5	14.72	Aug. 5	22.90	Nov. 5	28.14
10	22.70	10	14.72	10	23.17	10	28.41
15	16.85	15	15.12	15	23.46	15	28.74
20	16.16	20	15.87	20	23.77	20	28.92
25	16.11	25	16.44	25	24.04	25	29.25
28	15.40	31	17.11	31	24.48	30	29.47
Mar. 5	15.43	June 5	17.63	Sept. 5	24.71	Dec. 5	29.69
10	15.07	10	18.18	10	25.14	10	29.93
15	15.89	20	19.13	15	25.42	13	a 30.12
20	15.67	25	19.60	20	25.66	30	28.10
31	15.14	30	19.99	25	26.02		

a Water-stage recorder removed.

4/28-3E2 (*949, p. 197; 991, p. 147; 1021, p.131). Peter Cavalletto.
Land-surface datum is 116.73 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Jan. 22	11.32	June 6	a 25.95	Aug. 7	11.89	Dec. 4	11.84
Mar. 8	11.11	July 10	a 18.58	Nov. 5	13.02	30	11.39
Apr. 30	11.03						

a Nearby well pumping.

4/28-3M2 (*949, p. 197; 991, p. 147; 1021, p.132). L. W. Fowler.
Land-surface datum is 117.79 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

4/28-3M2--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	91.18	Apr. 30	a 87.89	Aug. 7	102.01	Nov. 5	a 111.80
Mar. 8	a 89.94	June 6	a 101.51	Sept. 7	a 103.98	Dec. 4	a 109.17
27	88.88	July 10	a 103.10	Oct. 2	a 110.40	30	98.76

a Nearby well pumping.

4/28-3P1 (*949, p. 197; 991, p. 148; 1021, p.132). Lynn Sexton. Land-surface datum is 157.42 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Jan. 22	132.56	June 7	132.45	Sept. 7	135.54	Nov. 5	136.87
Mar. 8	131.50	July 10	135.29	Oct. 2	a 135.96	Dec. 4	136.97
Apr. 30	130.26	Aug. 7	134.16				

a Nearby well pumping.

4/28-3P4 (*1021, p.132). Carrigan & Sperry. Land-surface datum is 117.88 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Jan. 22	92.89	Apr. 30	89.83	Nov. 5	98.08	Dec. 30	97.36
Mar. 27	90.74	July 10	94.15	Dec. 4	97.46		

4/28-3Q2 (*991, p. 148; 1021, p.132). A. J. Haverland. Land-surface datum is 120.57 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Mar. 8	89.11	June 6	a 93.56	Aug. 7	93.44	Dec. 4	98.81
27	90.54	July 10	96.03	Nov. 5	97.37	30	95.02
Apr. 30	88.87						

a Nearby well pumping.

4/28-4K4 (*949, p. 198; 991, p. 148; 1021, p.132). R. S. Rowe. Land-surface datum is 91.60 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Mar. 8	13.59	July 10	17.18	Sept. 7	20.45	Nov. 5	19.10
Apr. 30	12.75	Aug. 7	15.63	Oct. 2	18.16	Dec. 4	18.86
June 7	a 31.68						

a Nearby well pumping.

4/28-4P1 (*949, p. 198; 991, p. 148; 1021, p.132). J. Reeber.

Water level, in feet below land-surface datum, 1945

Jan. 23	87.68	Apr. 30	80.68	Sept. 7	87.02	Dec. 4	85.86
Mar. 8	81.57	June 6	81.43	Nov. 5	85.02	30	84.24
27	80.80						

4/28-4Q2 (*949, p. 198; 991, p. 148; 1021, p.132). R. S. Rowe.

Water level, in feet below land-surface datum, 1945

Jan. 23	66.45	Apr. 30	61.24	Sept. 7	a 75.47	Nov. 5	a 79.89
Mar. 8	63.66	June 6	62.11	Oct. 2	ab 88.55	Dec. 4	67.84
27	62.75	July 10	64.80				

a Nearby well pumping.

b Below preliminary sea-level datum of 1934.

4/28-4R1 (*941, p. 164; *949, p. 198; 991, p. 148; 1021, p.133).
 L. M. Cavaletto. Land-surface datum is 93.65 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 23	58.33	Apr. 30	56.48	Aug. 7	62.43	Dec. 4	61.49
Mar. 8	57.42	June 7	56.27	Oct. 2	63.08	30	a 67.02
27	57.20	July 10	59.49	Nov. 5	62.21		

a Nearby well pumping.

4/28-4R2 (*941, p. 165; *949, p. 199; 991, p. 148; 1021, p.133).
 G. M. Gallagher.

Water level, in feet below land-surface datum, 1945

Jan. 23	51.07	Apr. 30	49.78	Aug. 7	55.03	Nov. 5	56.32
Mar. 8	51.02	June 7	49.70	Sept. 7	a 65.49	Dec. 4	55.30
27	51.03	July 10	54.60	Oct. 2	a 58.12	30	56.15

a Nearby well pumping.

4/28-4R3 (*941, p. 165; *949, p. 199; 991, p. 149; 1021, p.133).
 Cavaletto & Gallagher.

Water level, in feet below land-surface datum, 1945

Jan. 23	65.58	Apr. 30	60.87	Aug. 7	67.75	Nov. 5	68.56
Mar. 8	63.26	June 7	61.33	Sept. 7	65.24	Dec. 4	68.29
27	62.28	July 10	65.97	Oct. 2	a 80.50		

a Nearby well pumping.

4/28-5J2 (*949, p. 200; 991, p. 149; 1021, p.133). Harry Sexton.

Water level, in feet below land-surface datum, 1945

Jan. 23	11.87	Apr. 30	10.85	Aug. 7	a 17.02	Dec. 4	15.07
Mar. 8	10.78	June 6	14.06	Sept. 7	15.92	30	13.01
27	10.50	July 10	13.26				

a Pumping recently.

4/28-5R4 (*991, p. 149; 1021, p.133). F. J. Ewing.

Water level, in feet below land-surface datum, 1945

Jan. 23	45.29	Apr. 30	43.94	Sept. 7	43.28	Nov. 5	48.34
Mar. 8	44.90	June 6	43.21	Oct. 2	a 47.25	Dec. 4	47.48
27	45.81	July 10 ab	58.61				

a Nearby well pumping.

b Below preliminary sea-level datum of 1934.

4/28-8C2. G. S. Cavaletto. About 0.8 mile nearly north-northwest of Goleta, 600 yards west of Fairview Road, 270 yards south of Stow Canyon Road, at west edge of ranch road. Measuring point, top north side of 12-inch casing, at land-surface datum and 56.88 feet above preliminary sea-level datum of 1934.

Water level, in feet below land-surface datum, 1945

Feb. 5	53.27	Apr. 30	50.74	Aug. 7	55.50	Nov. 5	a 57.58
Mar. 8	52.37	June 6	52.11	Sept. 7	56.73	Dec. 4	a 57.84
27	51.95	July 10	53.63	Oct. 2	56.80	30	a 57.00

a Below preliminary sea-level datum of 1934.

4/28-8K5 (*991, p. 149; 1021, p.133). Harry Sexton. Measurements discontinued after Oct. 2. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Feb. 5	29.40	Mar. 27	28.35	June 6	28.72	Oct. 2	a 32.34
Mar. 8	28.71	Apr. 30	27.64	Aug. 7	31.35		

a Nearby well pumping.

4/28-9A3 (*941, p. 166; *949, p. 200; *991, p. 150; 1021, p.134).
 L. M. Cavaletto. Land-surface datum is 84.10 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945^a/
 (From float gage)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
	41.75		41.16	Aug. 13	46.58		b 53.65
Jan. 23	b 47.07	June 7	b 47.50		46.54	Nov. 5	49.72
Mar. 8	42.93		43.05		b 53.18		49.55
	42.64		42.55	Sept. 17	50.06		b 53.72
	40.94		b 49.80		49.15	Dec. 4	50.45
b 27	46.18	July 10	46.00		b 52.90		48.06
Apr. 30	41.78		45.60	Oct. 2	50.22		51.26
	42.35		b 54.12		49.41	30	48.06

a Undated entries are highest and lowest levels between dates of observation.

b Nearby well pumping.

4/28-9E1 (*991, p. 150; 1021, p.134). A. T. Spaulding. Land-surface datum is 43.58 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Jan. 23	37.56	Mar. 27	35.85	Nov. 5	42.57	Dec. 30	40.68
Mar. 8	36.59	June 6	37.95	Dec. 4	41.67		

4/28-10A1 (*949, p. 201; 991, p. 150; 1021, p.134). C. C. Lee.

Water level, in feet below land-surface datum, 1945

Jan. 22	101.90	Apr. 30	95.97	Aug. 7	97.59	Nov. 5	101.60
Mar. 8	100.24	June 6	96.22	Sept. 7	a 99.16	Dec. 4	101.93
27	98.70	July 10	96.90	Oct. 2	101.25	30	102.24

a Nearby well pumping.

4/28-10F1 (*949, p. 201; 991, p. 150; 1021, p.134). J. S. Edwards.

Water level, in feet below land-surface datum, 1945

Jan. 22	64.38	Apr. 30	63.00	Aug. 7	66.82	Nov. 5	69.54
Mar. 8	63.57	June 6	64.87	Sept. 7	67.40	Dec. 4	68.87
27	63.14	July 10	67.12	Oct. 2	68.08	30	67.90

4/28-10K2 (*949, p. 201; 991, p. 151; 1021, p.134). Norman Troup. Land-surface datum is 85.47 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 22	88.03	Mar. 27	86.34	Oct. 2	93.85
Mar. 8	87.06	Apr. 30	85.89	Nov. 5	92.95

4/28-10N6 (*949, p. 201; 991, p. 151; 1021, p.134). Dr. E. O. Campbell.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	22.75	Apr. 30	22.51	Aug. 7	24.32	Nov. 5	23.57
Mar. 8	22.72	June 6	22.77	Sept. 7	24.45	Dec. 4	22.91
27	22.57	July 10	23.20	Oct. 2	23.40	30	23.76

4/28-11K3. Giovanni Cavalli. About 2.8 miles nearly east of Goleta, 250 feet east of San Antonio Road, 50 feet north of Southern Pacific Railroad, 80 feet east of former observation well 11K1, in frame pump house. Drilled irrigation well, depth 297 feet. Measuring point, top northwest side of pump base through hole, 1.00 foot above land-surface datum and 69.96 feet above preliminary sea-level datum of 1934. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 12	71.7	Mar. 8	70.28	Nov. 5	79.97
22	74.1	Apr. 30	71.30	Dec. 30	72.09

4/28-12L4 (*941, p. 167; *949, p. 202; *991, p. 151; 1021, p.135). L. More. Land-surface datum is 121.44 feet above preliminary sea-level datum of 1934. Altitude by spirit levels in 1945.

Water level at noon, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 5	45.07	Mar. 31	38.05	July 8	47.42	Oct. 15	a 66.41
10	44.70	Apr. 5	37.89	15	a 62.84	20	a 60.67
15	44.52	10	37.26	20	a 83.99	25	a 58.72
20	a 51.75	15	37.97	25	a 61.94	31	56.34
25	48.50	19	a 51.39	31	a 57.44	Nov. 5	53.97
30	a 63.50	25	39.15	Aug. 5	a 59.22	10	52.79
Feb. 7	46.99	30	37.70	10	a 58.09	15	51.95
10	44.90	May 5	a 44.01	15	a 55.93	20	49.97
15	43.98	10	a 61.35	20	a 71.34	25	48.74
20	45.97	15	a 58.00	25	a 61.49	30	48.18
25	47.05	20	a 63.00	31	a 65.12	Dec. 6	50.44
28	45.26	25	a 54.40	Sept. 5	a 64.07	10	47.42
Mar. 5	42.23	29	a 64.25	8	a 73.49	14	46.74
10	41.32	June 5	46.90	17	a 66.91	20	a 57.09
15	40.25	10	49.88	25	a 84.09	25	47.85
20	39.45	16	a 61.30	30	a 67.39	31	45.51

a Nearby well pumping.

4/28-15E1 (*949, p. 202; 991, p. 152; 1021, p.135). A. J. Holloway. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Feb. 5	44.04	Apr. 30	42.18	Aug. 7	49.44	Nov. 5	47.93
Mar. 8	42.72	June 6	42.28	Sept. 7	50.65	Dec. 30	46.37
27	42.01	July 10	50.50	Oct. 2	49.62		

4/28-15E2 (*949, p. 202; *991, p. 152; 1021, p.135). Ignace Mariani. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Mar. 8	52.40	Apr. 30	51.24	July 10	60.00	Dec. 30	55.75
27	51.46	June 7	a 55.54	Nov. 5	57.25		

a Nearby well pumping.

4/28-15H2. E. C. Drake. About 2.1 miles east-southeast of Goleta, 0.5 mile south of U. S. Highway 101, and about 100 feet north of Alascadero Creek, on alluvial plain. Drilled irrigation well, reported depth 428 feet. Gravel envelope. Derives water from marine sand of the Santa Barbara formation. Measuring point, top north side of casing, 0.50 foot above land-surface datum and about 30 feet above sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	6.84	July 10	8.95	Nov. 5	8.32
Mar. 8	3.57	Oct. 2	7.80	Dec. 30	6.92

4/28-16F2 (*991, p. 152; 1021, p.135). John Begg. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	29.31	Apr. 30	27.80	Aug. 7	a 39.65	Nov. 5	33.73
Mar. 8	28.42	June 6	38.76	Sept. 7	35.53	Dec. 4	33.32
27	27.44	July 10	36.26	Oct. 2	a 38.84	30	31.69

a Nearby well pumping.

4/28-16F3 (*991, p. 152; 1021, p.135). John Begg.

Water level, in feet below land-surface datum, 1945

Feb. 5	12.41	Apr. 30	11.54	Aug. 7	12.44	Nov. 5	13.64
Mar. 8	11.96	June 6	11.53	Sept. 7	12.92	Dec. 4	13.88
27	11.80	July 10	11.95	Oct. 2	13.22	30	13.29

4/28-16RL. Pacific Lighting Corporation. About 1.4 miles southeast of Goleta, 0.8 mile south of U. S. Highway 101, 300 feet southwest of bridge over Alascadero Creek, on south bank of creek, 10 feet north of paved road. Drilled industrial well, diameter 10 inches, reported depth 610 feet. Derives water from marine sand and gravel in the Santa Barbara formation. Measuring point, top north side of 1/4-inch steel plate over casing, 0.50 foot above land-surface datum and about 32 feet above preliminary sea-level datum of 1934.

Water level, in feet below land-surface datum, 1945

Feb. 5	13.27	Mar. 27	7.96	June 6	19.45	Dec. 4	19.98
Mar. 8	9.50	Apr. 30	7.77	Nov. 5	18.25	30	17.00

4/28-17H3 (*941, p. 167; *949, p. 203; 991, p. 152; 1021, p.135). J. J. Mathews.

Water level, in feet below land-surface datum, 1945

Feb. 5	6.69	Apr. 30	4.01	Aug. 7	6.19	Nov. 5	7.00
Mar. 8	4.12	June 6	4.84	Sept. 7	6.60	Dec. 4	7.00
27	3.46	July 10	5.58	Oct. 2	6.86	30	4.93

4/28-17H11 (*941, p. 168; *949, p. 203; 991, p. 153; 1021, p.135). Mrs. L. Oakley and Mrs. M. Bonetti. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Feb. 5	13.64	Apr. 30	10.64	Aug. 7	17.35	Dec. 4	16.50
Mar. 8	12.95	June 6	13.34	Oct. 2	a 22.16	30	15.15
27	13.35	July 10	a 20.35	Nov. 5	17.27		

a Pumping recently.

4/28-18G2 (*949, p. 203; 991, p. 153; 1021, p.136). T. B. Bishop Co. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	21.50	Mar. 27	19.80	July 10	26.32
Mar. 8	20.50	Apr. 30	a 26.12	Oct. 2	28.81

a Nearby well pumping.

4/28-18N3 (*949, p. 204; 991, p. 153; 1021, p.136). G. A. Storke. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 5	13.05	Apr. 30	11.56	Aug. 7	16.42
Mar. 8	11.58	June 7	14.01	Sept. 7	15.09
27	10.65	July 10	21.22	Oct. 2	18.77
				Nov. 5	18.27

4/29-13K2 (*949, p. 204; 991, p. 153; 1021, p.136). T. B. Bishop Co. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 5	42.12	Apr. 30	41.51	Aug. 7	43.80	Nov. 5	44.32
Mar. 8	41.56	June 6	42.95	Sept. 7	44.23	Dec. 4	45.33
20	41.25	July 10	43.19	Oct. 2	44.46	30	43.39

4/29-14A3 (*949, p. 205; 991, p. 153; 1021, p.136). Frank Baker. All water levels are below mean sea level.

Water level, in feet below land-surface datum, 1945

Feb. 5	72.03	Apr. 30	71.40	Aug. 7	73.55	Nov. 5	73.81
Mar. 8	71.68	June 6	72.19	Sept. 7	73.65	Dec. 4	72.61
20	71.44	July 10	75.18	Oct. 2	a 73.74		

a Nearby well pumping.

Santa Ynez, San Antonio, Santa Maria, and Cuyama Valleys

6/30-2P1 (*949, p. 205; 991, p. 154; 1021, p.136). Rex Clark. Formerly owned by L. B. and K. W. Manning. In Middle Santa Ynez Valley. Measurements discontinued after Nov. 1.

Water level, in feet below land-surface datum, 1945

Mar. 3	32.12	Apr. 27	32.34	July 7	a 32.74	Sept. 28	33.75
Apr. 9	32.78	June 2	32.61	Aug. 3	a 40.38	Nov. 1	33.90

a Pumping recently.

6/30-6A1 (*949, p. 205; 991, p. 154; 1021, p.136). Sam Torrence. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	48.25	Apr. 27	a 51.46	Sept. 28	58.53	Dec. 1	54.25
Mar. 3	47.65	June 2	54.04	Nov. 1	59.87	29	51.66
Apr. 9	47.09	July 7	56.22				

a Nearby well pumping.

6/30-7K1 (*949, p. 205; 991, p. 154; 1021, p.136). Mrs. Anderson. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 8	38.61	Apr. 9	38.60	Dec. 1	a 40.24
Mar. 3	38.69	Sept. 28	a 40.50	29	a 40.60

a Pumping.

6/30-9N1 (*949, p. 205; 991, p. 154; 1021, p.136). San Lucas Ranch. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 8	30.81	Apr. 9	30.77	June 2	30.92
Mar. 3	30.79	27	30.97	July 7	30.93

6/30-10RL (*949, p. 206; 991, p. 154; 1021, p.136). Rex Clark. Formerly owned by L. B. and K. W. Manning. In Middle Santa Ynez Valley. Measurements discontinued after Sept. 28.

Water level, in feet below land-surface datum, 1945

Feb. 8	20.42	Apr. 27	20.64	July 7	20.84	Aug. 31	21.37
Mar. 3	20.73	June 2	20.97	Aug. 3	21.38	Sept. 28	21.29
Apr. 9	20.55						

6/30-29EL (*949, p. 206; 991, p. 154; 1021, p.137). Rancho Juan y Lolita. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr. 9	12.45	July 7	14.36	Aug. 31	18.31	Nov. 1	20.40
27	12.45	Aug. 3	16.96	Sept. 28	19.60	Dec. 1	20.58

6/31-11EL (*949, p. 207; 991, p. 155; 1021, p.137). T. Petersen. In Middle Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Feb. 8, 40.35; Nov. 1, 60.12; Dec. 1, 54.28; Dec. 29, 47.05.

6/31-13DL (*949, p. 207; 991, p. 155; 1021, p.137). Mrs. W. E. Parker. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	103.15	Apr. 27	103.13	Aug. 3	105.04	Nov. 1	104.32
Mar. 3	103.09	June 2	103.52	31	104.66	Dec. 1	104.34
Apr. 9	102.98	July 7 a	109.86	Sept. 28	104.34	29	104.14

a Pumping recently.

6/31-17FL (*949, p. 208; *991, p. 155; 1021, p.137). J. R. Orton. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	15.46	Apr. 27	16.77	Aug. 3	18.61	Nov. 1	17.67
Mar. 3	16.60	June 2	17.16	31	18.26	30	17.45
Apr. 9	16.71	July 7	17.64	Sept. 28	18.18	29	16.99

6/31-21H2 (*991, p. 155; 1021, p.137). Alisal Corporation. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	7.31	Apr. 27	7.60	Aug. 3	8.02	Nov. 1	8.31
Mar. 3	7.50	June 2	7.80	31	7.40	Dec. 1	8.30
Apr. 9	7.56	July 7	7.85	Sept. 28	8.30	29	7.98

6/32-6KL (*949, p. 209; 991, p. 156; 1021, p.137). Mrs. M. Barker. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	16.92	Apr. 26	16.63	Aug. 2	16.56	Nov. 1	17.07
Mar. 2	16.76	May 31 a	19.19	31 a	19.79	Dec. 1	18.20
Apr. 9	16.66	July 5	16.51	Sept. 27	16.79	29	16.37

a Pumping.

6/32-9AL (*949, p. 209; 991, p. 156; 1021, p.137). Owen Hollister. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	29.91	Apr. 26	31.08	Aug. 2	34.77	Nov. 1	31.60
Mar. 2	30.78	May 31	32.07	31	32.12	Dec. 1	31.01
Apr. 9	30.00	July 5	33.20	Sept. 28	32.01	29	30.12

6/32-12J2 (*941, p. 153; *949, p. 210; 991, p. 156; 1021, p.138). A. Bodine. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	28.10	Apr. 26	28.57	Aug. 3	27.05	Nov. 1	30.19
Mar. 2	28.05	June 2	27.71	31	27.50	Dec. 1	29.76
Apr. 9	28.28	July 6	27.29	Sept. 28	27.56	29	28.76

6/32-16P3 (*949, p. 210; 991, p. 157; 1021, p.138). Channing Peake. In Middle Santa Ynez Valley.

6/32-16P3--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	44.21	Apr. 9	44.71	Dec. 28	44.90
Mar. 2	44.94	Dec. 1	45.66	.	

6/33-9P1 (*941, p. 154; *949, p. 211; 991, p. 157; 1021, p.138).
Hollister Estate. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945
(From float gage)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	36.75	June 2	36.56	Aug. 3	37.82	Oct. 31	38.17
	36.93		37.34		37.80		38.15
	36.80		37.20		38.03		38.03
	36.49		37.18	31	38.03	Dec. 1	38.43
	36.89		37.95		38.03		38.16
	36.67		37.56		38.17		37.96
Mar. 2	36.58	July 6	37.55	Sept. 28	38.16		38.20
	36.68		37.82		37.95	28	37.96
Apr. 26	36.63						

a Undated entries are highest and lowest levels between dates of observation.

6/33-12LL (*949, p. 211; 991, p. 158; 1021, p.138). J. Corbillini. In Middle Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Apr. 10, 15.69; Oct. 31, 20.27; Dec. 1, 19.26.

6/34-2A1 (*941, p. 154; *949, p. 212; 991, p. 158; 1021, p.). C. Madsen. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	37.55	Apr. 26	36.98	Aug. 2	39.25	Nov. 30	39.01
Mar. 1	38.60	May 31	40.13	Oct. 31	38.88	Dec. 28	38.10
Apr. 6	38.02						

6/34-4D1 (*949, p. 212; 991, p. 158; 1021, p.138). Peter Tognatti. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	27.48	Apr. 26	31.42	Aug. 31	32.20	Dec. 1	30.77
Mar. 1 a	32.95	July 6	32.64	Sept. 27	31.60	29	29.71
Apr. 6	32.78	Aug. 3	33.36	Nov. 1	31.09		

a Nearby well pumping.

6/34-6C2 (*991, p. 158; 1021, p.139). Bank of America. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	53.27	Apr. 26	56.39	Aug. 3	61.51	Nov. 1	58.49
Mar. 2	53.36	June 2 a	58.30	31	59.01	Dec. 1	58.39
Apr. 5	53.21	July 6	60.02	Sept. 27 a	58.73	29	55.57

a Pumping recently.

7/24-13C1 (*949, p. 237; 991, p. 158; 1021, p.139). Ventura County. Apache School District. In Cuyama Valley.

Water level, in feet below land-surface datum, 1945

Jan. 25	9.73	May 29	9.43	Aug. 28	11.78	Nov. 28	14.32
Feb. 28	8.00	July 3	10.30	Sept. 25	12.64	Dec. 26	13.60
Apr. 24	8.42	31	11.07	Oct. 29	13.63		

7/31-23P1 (*949, p. 213; 991, p. 159; 1021, p.139). F. L. Mattei. In Middle Santa Ynez Valley.

7/31-23P1--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 8	11.85	Apr. 27	12.54	Aug. 3	15.77	Dec. 1	15.84
Mar. 3	11.85	June 2	13.79	31	15.73	29	15.85
Apr. 10	12.20	July 7	14.90	Nov. 1	16.00		

7/31-25L1 (*949, p. 213; 991, p. 159; 1021, p.138). Russell Smith. In Middle Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 8	a 60.83	Apr. 27	60.89	Aug. 31	62.66	Dec. 1	66.00
Mar. 3	60.18	June 2	61.21	Nov. 1	61.96	29	62.16
Apr. 10	60.55						

a Pumping.

7/31-36L2 (*949, p. 213; 991, p. 159; 1021, p.139). Dr. W. B. Swackhamer. In Middle Santa Ynez Valley. Water-stage recorder removed on Apr. 10.

Water level, in feet below land-surface datum, 1945
(In part, selected noon levels from recorder charts)

Jan. 5	18.00	Feb. 5	17.88	Mar. 31	17.87	Aug. 3	19.18
10	18.03	10	17.89	Apr. 5	18.08	31	20.56
17	18.17	13	17.89	10	17.91	Sept. 28	19.81
20	18.11	Mar. 3	17.90	June 2	18.59	Nov. 1	19.48
25	18.05	5	17.88	13	18.62	Dec. 1	19.38
31	18.05	10	17.96	July 7	19.30	29	19.09

7/33-30C1 (*949, p. 214; 991, p. 159; 1021, p.140). John Valla. In Lower Santa Ynez Valley. Land-surface datum is 235.24 feet above sea-level datum of 1929. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Feb. 7	150.80	July 5	a 150.58	Sept. 28	a 150.59	Dec. 1	a 150.59
Apr. 26	150.57	Aug. 2	a 150.79	Nov. 1	150.73	29	a 150.52
May 31	a 150.61	30	a 150.70				

a Nearby well pumping.

7/34-22H2 (*949, p. 215; 991, p. 160; 1021, p.140). H. E. Harris. In Lower Santa Ynez Valley. Measurements discontinued after Sept. 27.

Water level, in feet below land-surface datum, 1945

Feb. 7	22.50	Apr. 26	a 23.04	July 5	22.36	Aug. 30	22.42
Mar. 1	22.47	May 31	22.56	Aug. 2	23.13	Sept. 27	22.65
Apr. 6	22.36						

a Nearby well pumping.

7/34-22J3 (*949, p. 215; 991, p. 160; 1021, p.140). H. E. Harris. In Lower Santa Ynez Valley. Measurements discontinued after Sept. 27.

Water level, in feet below land-surface datum, 1945

Feb. 7	23.44	Apr. 26	a 27.61	July 5	23.92	Sept. 27	24.12
Apr. 6	22.93	May 31	23.85	Aug. 30	24.41		

a Nearby well pumping.

7/34-22J5 (*991, p. 160; 1021, p.140). H. E. Harris. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Apr. 5, 6.63; Apr. 26, 6.67. Measurements discontinued.

7/34-22Q1 (*991, p. 160; 1021, p.140). A. Scolari. In Lower Santa Ynez Valley. Measurements discontinued after Aug. 2.

Water level, in feet below land-surface datum, 1945

Feb. 7	12.57	Apr. 5	12.46	May 31	13.34	Aug. 2	13.85
Mar. 1	12.72	26	12.72	July 5	13.52		

7/34-22Q3 (*991, p. 160; 1021, p.140). H. E. Harris. In Lower Santa Ynez Valley. Water level, in feet below land-surface datum, 1945: Apr. 5, 7.71. Measurements discontinued.

7/34-26A2 (*941, p. 155; *949, p. 216; 991, p. 161; 1021, p.140). K. McConnell. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	35.95	Apr. 26	36.12	Aug. 2	36.71	Oct. 31	36.90
Mar. 1	35.90	May 31	36.18	30	36.83	Nov. 30	37.18
Apr. 5	35.86	July 5	36.38	Sept.27	36.78	Dec. 28	37.16

7/34-26D2 (*991, p. 161; 1021; p.141). Union Sugar Co. In Lower Santa Ynez Valley. Measurements discontinued after Oct. 31.

Water level, in feet below land-surface datum, 1945

Feb. 7	9.86	Apr. 26	9.99	Aug. 2	10.82	Sept.27	11.00
Mar. 1	10.00	May 31	10.27	30	11.02	Oct. 31	11.15
Apr. 5	9.75	July 5	10.21				

7/34-26E1 (*991, p. 161; 1021, p.141). Union Sugar Co. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Feb. 7, 8.88; Mar. 1, 9.73; Apr. 5, 9.33; Apr. 26, 9.70. Measurements discontinued.

7/34-26F1 (*941, p. 156; 991, p. 161; 1021, p.141). Union Sugar Co. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Apr. 26	33.34	July 5	33.49	Dec. 28	34.30
May 31	33.38	Sept.27	33.79		

7/34-26F4 (*991, p. 162; 1021, p.141). Union Sugar Co. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Feb. 7	16.61	Apr. 5	16.61	May 31	17.25
Mar. 1	16.60	26	16.82	July 5	17.15

7/34-26F5 (*991, p. 162; 1021, p.141). Union Sugar Co. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Feb. 7, 15.70; Mar. 1, 15.45; Apr. 5, 15.45; Apr. 26, 15.60. Measurements discontinued.

7/34-26M1 (*991, p. 162; 1021, p.142). Vella Bros. In Lower Santa Ynez Valley. Measurements discontinued after May 31.

Water level, in feet below land-surface datum, 1945

Feb. 7	10.07	Apr. 5	10.20	May 31	10.44
Mar. 1	10.44	26	10.50		

7/34-26N2 (*1021, p. 142). Roy Bland. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Feb. 7	8.86	Apr. 5	9.05	July 5	10.60
Mar. 1	9.17	26	9.83		

7/34-26P1 (*991, p. 162; 1021, p.142). Roy Bland. In Lower Santa Ynez Valley. Measurements discontinued after Sept. 27.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	12.70	Apr. 26	13.10	July 5	13.80	Aug. 30	15.82
Apr. 5	12.73	May 31	17.09	2	14.87	Sept.27	16.46

7/34-26Q2 (*991, p. 163; 1021, p.143). A. G. Hibbits. In Lower Santa Ynez Valley. Measurements discontinued after Sept. 27.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	33.70	Apr. 5	33.35	July 5	35.22	Aug. 30	35.52
Mar. 1	33.49	May 31	35.48	Aug. 2	35.08	Sept. 27	35.97

7/34-26R2 (*949, p. 216; 991, p. 163; 1021, p.143). W. T. McHenry. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	34.66	Apr. 5	34.89	July 5	a 37.55	Aug. 30	36.81
Mar. 1	34.55	May 31	22.04	Aug. 2	36.13	Oct. 31	36.13

a Pumping.

7/34-27A3 (*991, p. 163; 1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after Oct. 31.

Water level, in feet below land-surface datum, 1945

Feb. 7	8.03	Apr. 26	8.45	Aug. 2	9.70	Sept. 27	9.84
Mar. 1	8.32	May 31	8.96	30	10.00	Oct. 31	10.92
Apr. 5	8.10	July 5	9.30				

7/34-27H2 (*991, p. 163; 1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after May 31.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	12.22	Apr. 5	12.63	May 31	13.60
Mar. 1	12.95	26	13.08		

7/34-27J2 (*991, p. 164; 1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Feb. 7	12.92	Apr. 5	12.62	May 31	13.52
Mar. 1	12.66	26	13.06	July 5	13.76

7/34-27J3 (*991, p. 164; 1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Feb. 7	14.65	Apr. 5	14.63	May 31	15.62
Mar. 1	14.50	26	15.14	July 5	15.97

7/34-27J4 (*991, p. 164; 1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after Sept. 27.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	16.98	Apr. 26	9.95	July 5	17.89	Aug. 30	19.07
Mar. 1	16.91	May 31	17.35	Aug. 2	18.56	Sept. 27	19.30
Apr. 5	a 16.86						

a Nearby well pumping.

7/34-27J5 (*1021, p.143). L. H. Schuyler. In Lower Santa Ynez Valley. Water-stage recorder removed and measurements discontinued July 5.

Water level at noon, in feet below land-surface datum, 1945

Jan. 5	15.43	Feb. 7	15.30	Mar. 9	15.33	May 3	16.20
10	15.41	10	15.23	Apr. 5	15.37	June 1	16.26
15	15.43	14	15.19	10	15.38	5	16.23
20	15.46	Mar. 2	15.22	26	16.02	July 5	16.41
25	15.47	5	15.26	30	16.12		

7/34-27L1 (*949, p. 217; 991, p. 164; 1021, p.145). Mrs. Susan Van Cleef. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	29.97	Apr. 26	a 31.82	Aug. 2	32.65	Nov. 30	32.71
Mar. 1	30.06	May 31	31.19	30	33.16	Dec. 28	31.95
Apr. 5	a 32.19	July 5	32.63	Oct. 31	32.98		

a Nearby well pumping.

7/34-27P2 (*1021, p.145). Mary Skaarup. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	14.72	Apr. 26	15.08	Aug. 2	16.11	Sept. 27	16.61
Mar. 1	14.55	May 31	15.44	30	16.40	Oct. 31	16.45
Apr. 5	14.58	July 5	15.66				

7/34-28H2 (*949, p. 217; 991, p. 165; 1021, p.145). T. M. Parks. In Lower Santa Ynez Valley.

Water level at noon, in feet below land-surface datum, 1945
(From recorder charts)

Jan. 5	25.05	Mar. 3	25.74	Apr. 30	28.83	Sept. 27	31.66
10	25.33	5	25.44	May 2	27.76	Oct. 31	27.44
15	25.44	9	25.76	June 1	28.37	Nov. 5	27.78
20	25.54	31	24.74	5	28.41	7	27.30
24	26.51	Apr. 5	25.81	July 6	27.51	30	27.29
Feb. 2	25.24	10	25.91	Aug. 2	32.24	Dec. 5	27.17
5	24.91	12	26.81	31	31.16	7	27.05
10	24.75	26	27.31	Sept. 5	27.71	28	26.33
14	24.80						

7/34-28R1 (*991, p. 165; 1021, p.145). A. C. Zvolanek. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	6.72	Apr. 26	a 11.95	Aug. 2	a 10.35	Oct. 31	8.53
Mar. 1	8.15	May 31	8.15	30	a 10.87	Nov. 30	8.31
Apr. 6	a 10.67	July 5	8.73	Sept. 27	a 10.07	Dec. 28	7.34

a Nearby well pumping.

7/34-28R2 (*991, p. 166; 1021, p.146). A. C. Zvolanek. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	5.55	Apr. 26	6.00	Aug. 2	8.97	Oct. 31	7.57
Mar. 1	5.45	May 31	6.40	30	7.73	Nov. 30	7.53
Apr. 6	5.38	July 5	6.72	Sept. 27	7.20	Dec. 28	7.28

7/34-29E4. G. F. Sanor. In Lower Santa Ynez Valley, about 2.5 miles northwest of Lompoc, 0.1 mile north of Central Avenue, 160 yards east of Floradale Avenue, 60 feet south of abandoned well 29E1, at west edge of field, in large pump house. Drilled irrigation well, diameter 16 inches, depth unknown. Confined water in alluvial gravel and sand. Measuring point, top east side of pump base through hole, 1.00 foot above land-surface datum and about 68 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Oct. 12	25.95	Oct. 22	a 40.00	Nov. 8	23.50
17	25.16	27	a 39.15	Dec. 28	19.45

a Pumping.

7/34-29E5. G. F. Sanor. In Lower Santa Ynez Valley, about 2.5 miles northwest of Lompoc, 63 feet north of well 29E4, 17 feet west of abandoned well 29E1, next to white tile standpipe. Bored observation well, diameter 2 inches, measured depth 19.5 feet. Unconfined water in alluvial sand and silt. Measuring point, top south side of coupling on casing, 0.80 foot above land-surface datum and about 68 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 12	18.21	Oct. 22	a 18.40	Nov. 8	18.61	Dec. 28	18.52
17	18.31	26	a 18.52	30	a 18.77		

a Nearby well pumping.

7/34-30A1 (*991, p. 166; 1021, p.146). G. F. Sanor. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Feb. 7, 19.83; Mar. 1, 22.14; Apr. 6, 21.09; Apr. 26, 27.53, nearby well pumping.

7/34-30L2. Union Sugar Co. well L-12. City of Santa Barbara well 105. In Lower Santa Ynez Valley, about 3.0 miles nearly northwest of Lompoc, 40 feet south and 20 feet west of intersection of Legge and Central Avenues, in corrugated-steel pump house. Drilled irrigation well, diameter 16 inches, reported depth 194 feet. Confined water in alluvial gravel and sand. Measuring point, top west side of pump base through 5/8-inch hole, 0.50 foot above land-surface datum and 59.55 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Oct. 12	23.58	Nov. 9	22.57	Dec. 28	17.23
27	23.90	30	19.69		

7/34-30L3. Union Sugar Co. In Lower Santa Ynez Valley, about 3.0 miles northwest of Lompoc and 50 feet south of well 30L2, next to twin power poles. Bored observation well, diameter 2 inches, measured depth 23.2 feet. Unconfined water in alluvial sand and clay. Measuring point, top south side of casing, 1.00 foot above land-surface datum and 59.79 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Oct. 12	17.62	Nov. 5	a 17.63	Nov. 30	17.49
27	17.30	9	17.88	Dec. 28	16.20

a Nearby well pumping.

7/34-30R1 (*949, p. 218; 991, p. 166; 1021, p.146). Mrs. E. Manfrina. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	16.48	Apr. 6	15.40	Nov. 30	a 22.68
Mar. 2	16.44	Sept. 27	a 25.52	Dec. 28	19.47

a Nearby well pumping.

7/34-31C1 (*941, p. 157; *949, p. 218; 991, p. 167; 1021, p.146). Union Sugar Co. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	15.33	Apr. 26	a 26.29	Aug. 3	b 28.95	Nov. 1	b 21.58
Mar. 2	20.61	June 2	a 26.80	31	b 22.56	Dec. 1	b 20.97
Apr. 6	a 19.34	July 6	b 27.06	Sept. 27	b 23.14	29	17.80

a Nearby well pumping.

b Pumping recently.

7/34-32R2 (*941, p. 157; *949, p. 218; 991, p. 167; 1021, p.146).
Lewis Bros. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	23.43	Apr. 6	a 24.75	Aug. 2	28.54	Sept. 27	29.78
Mar. 1	a 25.63	July 5	31.09	31	29.38	Oct. 31	28.48

a Nearby well pumping.

7/34-34A1 (*949, p. 219; 991, p. 167; 1021, p.146). Mary Skaarup. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	30.49	Apr. 26	33.01	Aug. 2	34.69	Oct. 31	34.41
Mar. 1	32.66	May 31	35.68	30	34.63	Dec. 28	33.73
Apr. 5	30.94	July 5	32.08	Sept.27	33.28		

7/34-34H1 (*949, p. 220; 991, p. 167; 1021, p.147). Mrs. M. Balaam. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	36.88	May 31	37.52	Aug. 2	39.55	Sept.27	40.18
Mar. 1	36.81	July 5	a 40.24	30	40.49	Oct. 31	40.14
Apr. 5	38.00						

a Nearby well pumping.

7/34-34H2 (*991, p. 167; 1021, p.147). Mary Skaarup. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	36.44	Apr. 5	a 36.24	May 31	(b)	Sept.27	(b)
Mar. 1	36.37	26	a 37.75	July 5	(b)		

a Nearby well pumping.

b Dry.

7/34-34J1 (*1021, p.148). E. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after Aug. 2.

Water level, in feet below land-surface datum, 1945

Feb. 7	36.92	Apr. 5	36.81	May 31	37.72	Aug. 2	37.72
Mar. 1	36.74	26	36.93	July 5	a 37.20		

a Nearby well pumping.

7/34-35B2 (*991, p. 168; 1021, p.148). A. G. Hibbits. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945: Feb.7, 13.00; Mar. 1, 13.00; Apr. 5, 12.70; measurements discontinued.

7/34-35C2 (*991, p. 168; 1021, p.148). Valla Bros. In Lower Santa Ynez Valley. Measurements discontinued after Aug. 2.

Water level, in feet below land-surface datum, 1945

Feb. 7	13.41	Apr. 5	13.41	May 31	13.50	Aug. 2	14.07
Mar. 1	13.49	26	13.48	July 5	13.63		

7/34-35C3 (*991, p. 168; 1021, p.148). Mary Skaarup. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	14.26	Apr. 5	14.72	May 31	15.39
Mar. 1	15.01	26	15.11	July 5	16.11

7/34-35D3 (*991, p. 169; 1021, p.149). Mary Skaarup. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

7/34-35D3--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	6.38	Apr. 5	6.95	May 31	7.84
Mar. 1	7.18	26	7.60	July 5	8.77

7/34-35D5 (*991, p. 169; 1021, p.149). Mary Skaarup. In Lower Santa Ynez Valley. Measurements discontinued.

7/34-35F2 (*991, p. 169; 1021, p.149). Valla Bros. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	16.11	Apr. 5	16.73	May 31	17.38	Nov. 30	20.30
Mar. 1	16.97	26	17.06	Aug. 2	a 21.13		

a Nearby well pumping.

7/34-35F5 (*991, p. 169; 1021, p.149). M. Schuyler. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	38.31	Apr. 26	41.05	Aug. 2	42.50	Sept. 27	43.82
Mar. 1	38.98	May 31	40.05	30	42.56	Nov. 30	42.36
Apr. 5	38.90	July 5	40.46				

7/34-35F6 (*991, p. 170; 1021, p.150). M. Schuyler. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	37.00	Apr. 5	37.77	May 31	39.68	Aug. 2	(a)
Mar. 1	37.80	26	38.62	July 5	40.10		

a Dry.

7/34-35F8 (*991, p. 170; 1021, p.150). Valla Bros. In Lower Santa Ynez Valley. Measurements discontinued after Aug. 2.

Water level, in feet below land-surface datum, 1945

Feb. 7	16.54	Apr. 5	16.23	May 31	16.18	Aug. 2	17.25
Mar. 1	16.44	26	16.40	July 5	16.51		

7/34-35F10 (*991, p. 170; 1021, p.150). M. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued.

7/34-35F12 (*991, p. 170; 1021, p.150). M. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	3.61	Apr. 5	4.82	May 31	5.72
Mar. 1	5.01	26	5.46	July 5	6.19

7/34-35K2 (*949, p. 221; 991, p. 171; 1021, p.150). Mrs. M. McDonald. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	9.77	Apr. 26	13.68	Aug. 2	12.49
Mar. 1	9.79	May 31	11.66	30.	15.14
Apr. 5	9.62	July 5	13.68	Sept.27	15.12
				Oct. 31	13.08
				Nov. 30	11.79
				Dec. 28	10.82

7/34-35K6 (*991, p. 171; 1021, p.151). A. Dettamanti. In Lower Santa Ynez Valley. Measurements discontinued after Oct. 31.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	7.79	Apr. 26	7.52	Aug. 2	7.78	Sept. 27	8.61
Mar. 1	7.70	May 31	7.73	30	8.11	Oct. 31	8.42
Apr. 5	7.51	July 5	7.53				

7/34-35K7 (*991, p. 171; 1021, p.151). W. P. and N. L. Robinson. In Lower Santa Ynez Valley. Measurements discontinued.

7/34-35L1 (*991, p. 171; 1021, p.151). E. Schuyler. In Lower Santa Ynez Valley. Water levels, in feet below land-surface datum, 1945:

Feb. 7, 36.24; Mar. 1, 37.07; Apr. 5, 37.17; measurements discontinued.

7/34-35L2 (*991, p. 172; 1021, p.151). M. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued.

7/34-35L3 (*991, p. 172; 1021, p.151). M. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued.

7/34-35M1 (*991, p. 172; 1021, p.152). E. Schuyler. In Lower Santa Ynez Valley. Measurements discontinued after July 5.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	37.41	Apr. 5	37.25	July 5	a 37.51
Mar. 1	37.25	26	37.68		

a Nearby well pumping.

7/34-35N1 (*949, p. 221; 991, p. 172; 1021, p.152). E. Schuyler. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Feb. 7	37.27	Apr. 5	37.35	Aug. 2	37.74
Mar. 1	37.20	26	38.08	30	38.50

7/34-35P1 (*949, p. 221; 991, p. 172; 1021, p.152). W. P. and N. L. Robinson. In Lower Santa Ynez Valley.

a/

Water level, in feet below land-surface datum, 1945
(From float gage)

Feb. 7	35.78		36.82		37.77		40.10
	37.37		38.36		40.44		41.69
Mar. 1	35.99	Apr. 26	37.90	Aug. 2	40.14	Oct. 31	40.42
	35.99		37.15		39.97		38.80
Apr. 5	36.89	May 31	38.76	30	40.40	Nov. 30	38.88
	36.31		37.97		40.14		37.11
	37.00		39.20		41.28		38.88
	36.97	July 5	38.24	Sept. 27	40.85	Dec. 28	37.21

a Undated entries are highest and lowest levels between dates of observation.

7/35-18J1 (*941, p. 158; *949, p. 222; 991, p. 173; 1021, p.153). War Department, Camp Cooke Military Reservation. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	1.31	Apr. 6	1.88	July 6	1.84	Aug. 31	1.15
Mar. 2	1.72	26	2.27	Aug. 3	1.58	Sept. 27	1.13

7/35-20J1 (*949, p. 223; 991, p. 173; 1021, p.153). War Department, Camp Cooke Military Reservation. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	6.77	Apr. 26	7.44	Aug. 3	8.75	Nov. 1	8.64
Mar. 2	7.33	June 2	8.12	31	8.91	30	8.42
Apr. 6	7.00	July 6	8.52	Sept. 27	8.76	Dec. 29	7.59

7/35-22J1. Union Sugar Co. well L-1. City of Santa Barbara well 154B. In Lower Santa Ynez Valley, about 5.5 miles west-northwest of Lompoc, 0.4 mile north and 0.5 mile east of junction of State Highway 150 and Fenwick Avenue, in corrugated-steel pump house. Drilled irrigation well, diameter 16 inches, reported depth 185 feet. Confined water in alluvial gravel and coarse sand. Measuring point, lower east edge of pump base through cut-out in casing, 1.28 feet above land-surface datum and 33.32 feet above sea-level datum of 1929. (In measuring, subtract 0.23 foot to offset inclination of tape.)

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Oct. 10 26	11.75 11.70	Nov. 9 30	12.16 11.80	Dec. 29	10.67

7/35-23E2 (*949, p. 224; 991, p. 174). Union Sugar Co. In Lower Santa Ynez Valley. Measurements resumed.

Water level, in feet below land-surface datum, 1945

Oct. 10 27	16.81 16.80	Nov. 7 9	16.90 a 17.31	Nov. 30	16.64
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a Pumping recently.

7/35-23E3. Union Sugar Co. In Lower Santa Ynez Valley, about 5.5 miles west-northwest of Lompoc, 1.4 miles north of State Highway 150, 0.23 mile west of Union Sugar Avenue, and about 30 feet south-southeast of well 23E2. Bored observation well, diameter 2 inches, measured depth 21.0 feet. Unconfined water in alluvial sand and silt. Measuring point, top north side of coupling on casing, 1.50 feet above land-surface datum and 38.40 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Oct. 10 27	17.16 17.12	Nov. 7 9	17.20 17.34	Nov. 30	17.09
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7/35-23N1 (*949, p. 224; 991, p. 174; 1021, p.153). Union Sugar Co. In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 1	11.82	Apr. 26	18.27	Aug. 3	18.86	Nov. 1	18.71
7	10.89	June 2	b 18.15	30	18.25	30	16.35
Mar. 2	14.50	July 6	18.61	Sept. 27	18.72	Dec. 29	11.89
Apr. 6	a 14.14						

a Nearby well pumping.

b Pumping recently.

7/35-23N2. Union Sugar Co. In Lower Santa Ynez Valley, about 5.5 miles west-northwest of Lompoc, 60 feet east-northeast of well 22J1, 10 feet south of ranch road. Bored observation well, diameter 2 inches, measured depth 17.0 feet. Unconfined water in alluvial sand and silt. Measuring point, top west side of coupling on casing, 2.00 feet above land-surface datum and 34.72 feet above sea-level datum of 1929.

7/35-23N2--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Oct. 10 26	12.03 11.99	Nov. 1 9	12.00 12.25	Nov. 30 Dec. 29	12.20 12.05

7/35-24K1 (*949, p. 225; 991, p. 175; 1021, p.153). A. B. Henning. In Lower Santa Ynez Valley. Measurements discontinued after Dec. 29.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Feb. 7	18.44	Apr. 6	21.26	Aug. 3	22.56	Dec. 29	19.47
Mar. 2	19.80	June 2 a	23.65	Nov. 30	21.73		

a Nearby well pumping.

7/35-24K2 (*949, p. 225; 991, p. 175; 1021, p.153). A. B. Henning. In Lower Santa Ynez Valley. Land-surface datum is about 50.91 feet above sea-level datum of 1929. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Feb. 7	17.87	Apr. 6	21.71	Nov. 9	22.00	Dec. 29	18.13
Mar. 2	19.58	Oct. 25	21.00	30	21.37		

7/35-24K3. A. B. Henning. In Lower Santa Ynez Valley, about 4.3 miles northwest of Lompoc, 0.9 mile north of Central Avenue, 200 feet east of DeWolff Avenue, and 20 feet south-southwest of irrigation well 24K2. Bored observation well, diameter 2 inches, measured depth 24.0 feet. Unconfined water in alluvial medium- to fine-grained sand with some pebbles. Measuring point, top west side of casing at seam, 0.90 foot above land-surface datum and 52.01 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Oct. 8 22	22.24 21.98	Oct. 27	22.02	Nov. 30	21.74
		Nov. 9	22.50	Dec. 29	20.77

7/35-25F5. Union Sugar Co. In Lower Santa Ynez Valley, about 3.8 miles northwest of Lompoc, 500 feet north of Central Avenue and 25 feet west of DeWolf Avenue, in corrugated-iron shelter. Diameter 12 inches, reported depth 184 feet. Confined water in alluvial sand and gravel. Measuring point, lower south edge of pump base, 0.50 foot above land-surface datum and 47.44 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Oct. 12 22	17.59 16.30	Oct. 27	a 18.50	Nov. 30	15.18
		Nov. 9	16.96	Dec. 29	11.24

a Pumping recently.

7/35-25F6. Union Sugar Co. In Lower Santa Ynez Valley, about 3.8 miles northwest of Lompoc, 18 feet north of well 25F5. Bored observation well, diameter 2 inches, measured depth 19.3 feet. Unconfined water in alluvial fine sand with some clay. Measuring point, top south side of coupling on casing, 1.00 foot above land-surface datum and 48.70 feet above sea-level datum of 1929.

Water level, in feet below land-surface datum, 1945

Oct. 12 22	10.18 10.01	Oct. 27	9.67	Nov. 30	10.86
		Nov. 9	10.28	Dec. 29	10.86

7/35-26J3 (*949, p. 226; 991, p. 175; 1021, p.153). Santa Barbara County, Artesia School District. In Lower Santa Ynez Valley.

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7/35-26J3--Continued.

Water level at noon, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level	
Jan. 5	7.00	Apr. 15	a 19.60	July 5	13.10	Sept. 25	a 16.35	
10	6.88		a 17.75	10	14.40	30	a 16.09	
15	6.87		26	16.35	15	14.95	Oct. 5	12.70
20	7.65		30	a 20.35	20	13.65	10	11.85
Feb. 5	7.00		May 5	16.30	25	13.60	15	13.33
10	6.55		10	15.80	31	11.78	20	12.40
15	6.34		17	a 21.20	Aug. 5	13.63	25	13.60
20	6.66		20	14.20	10	13.03	31	11.25
25	8.94		25	16.00	15	a 18.17	Nov. 5	a 18.60
28	a 13.43		31	17.07	20	15.14	10	14.03
Mar. 5	7.40	June 5	a 18.04	25	a 16.90	15	13.78	
10	a 14.16	10	a 17.74	31	14.60	20	10.86	
15	a 12.58	15	a 20.70	Sept. 5	11.62	25	11.32	
31	6.48	20	a 17.90	10	11.11	30	a 15.74	
Apr. 5	11.72	25	15.08	15	11.74	Dec. 5	a 21.24	
10	a 15.82	30	13.34	20	10.86	29	8.09	

a Nearby well pumping.

7/35-27C2 (*941, p. 160; *949, p. 226; 991, p. 176; 1021, p. 154).
Southern Pacific Railroad. In Lower Santa Ynez Valley.

a/

Water level, in feet below land-surface datum, 1945
(From float gage)

9.06	9.42	11.01	11.05
10.21	10.48	11.52	11.93
Feb. 7	9.11	Apr. 26	10.43
9.05	10.34	Aug. 2	11.42
9.69	11.71		11.13
Mar. 1	9.69	May 31	10.78
8.65	10.70		12.05
9.74	11.40	31	11.63
Apr. 16	9.45	July 5	11.10
		Sept. 27	11.39

a Undated entries are highest and lowest levels between dates of observation.

7/35-36E3 (*991, p. 176; 1021, p. 154). Southern Pacific Milling Co.
In Lower Santa Ynez Valley.

Water level, in feet below land-surface datum, 1945

Feb. 7	15.29	Apr. 26	a 21.12	Aug. 2	a 22.30	Oct. 31	19.47
Mar. 1	15.44	May 31	15.46	31	a 23.28	Nov. 30	a 20.34
Apr. 6	a 19.85	July 5	a 22.40	Sept. 27	19.78	Dec. 29	17.82

a Nearby well pumping.

8/32-30K2 (*1021, p. 155). John Parma. In San Antonio Valley.

Water level, in feet above land-surface datum, 1945

Jan. 30	1.00	May 31	0.96	Aug. 30	0.80	Nov. 30	0.93
Mar. 1	.83	July 5	.96	Sept. 27	1.05	Dec. 28	1.03
Apr. 25	.96	Aug. 2	1.10	Oct. 31	.43		

8/33-20K1 (*1021, p. 155). Virginia Barca. In San Antonio Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	5.59	Apr. 25	a 12.56	Sept. 27	a 30.08	Nov. 30	7.08
Mar. 1	4.88	May 31	6.32	Oct. 31	7.77	Dec. 28	5.86

a Pumping recently.

8/33-20R1 (*1021, p. 155). Virginia Barca. In San Antonio Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	25.15	May 31	25.40	Aug. 30	a 28.31	Nov. 30	b 27.31
Mar. 1	25.58	July 5	a 27.28	Sept. 27	28.90	Dec. 28	b 29.86
Apr. 25	25.46	Aug. 2	a 27.85	Oct. 31	26.26		

a Nearby well pumping.

b Pumping recently.

8/34-23B1 (*1021, p.156). Josephine Harris Estate. In San Antonio Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	a 13.17	May 31	a 13.10	Aug. 29	a 14.16	Nov. 30	13.94
Mar. 1	12.57	July 5	a 13.82	Sept. 27	a 14.23	Dec. 28	13.65
Apr. 25	a 12.69	Aug. 2	a 19.05	Oct. 31	14.08		

a Nearby well pumping.

9/24-19Q1 (*941, p. 146; *949, p. 237; 991, p. 177; 1021, p.156). Arthur Davis. In Cuyama Valley.

Water level, in feet below land-surface datum, 1945

Jan. 25	23.79	May 29	25.90	Aug. 28	27.86	Nov. 28	29.98
Feb. 28	23.99	July 3	26.30	Sept. 25	28.52	Dec. 26	30.61
Apr. 24	25.08	31	27.26	Oct. 29	a 29.36		

a Pumping recently.

9/32-7N1 (*941, p. 147; *949, p. 228; 991, p. 177; 1021, p.156). Valerio Tognazzini. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 43.10	July 1 ab	42.83	Oct. 1	a 43.60	Nov. 29	45.23
Mar. 1	42.98	4	39.06	30	48.01	Dec. 27	46.00
Apr. 1	a 41.00						

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

9/32-17G1 (*949, p. 228; 991, p. 177; 1021, p.156). E. C. Lyman. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	25.03	May 30	14.59	Aug. 29	24.67	Nov. 29	b 40.23
Mar. 1	19.88	July 4	a 25.22	Sept. 26	24.94	Dec. 27	26.71
Apr. 24	13.43	Aug. 1	21.46	Oct. 30	24.57		

a Nearby well pumping.

b Pumping.

9/33-2A1 (*941, p. 147; *949, p. 229; 991, p. 178; 1021, p.156). Santa Maria Realty Co. In Santa Maria Valley. Land-surface datum is 378.72 feet above sea-level datum of 1929. Altitude by spirit levels in 1945.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 31.00	Apr. 25	26.32	Aug. 29	31.05	Oct. 30	32.75
30	31.30	May 30	28.14	Sept. 26	31.78	Nov. 29	33.36
Mar. 1	29.70	July 1 ab	29.75	Oct. 1	a 31.50	Dec. 27	33.32
Apr. 1	27.30	4	28.94				

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

9/34-3N3 (*941, p. 148; *949, p. 229; 991, p. 178; 1021, p.156). City of Santa Maria well 3. In Santa Maria Valley. Measurements by city of Santa Maria.

Water level, in feet below land-surface datum, 1945

Jan. 31	148.0	Apr. 30	146.8	July 31	148.2	Oct. 31	148.9
Feb. 28	148.0	May 31	147.1	Aug. 31	148.5	Nov. 30	149.2
Mar. 31	148.0	June 30	148.0	Sept. 30	148.9	Dec. 31	148.9

10/25-30F1 (*949, p. 238; 991, p. 178; 1021, p.157). H. S. Russell. In Cuyama Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 25	48.15	Apr. 24	47.36	Dec. 26	48.13
Feb. 28	47.73	Nov. 28	48.65		

10/26-18F1 (*941, p. 146; *949, p. 238; 991, p. 178; 1021, p.157). H. S. Russell. In Cuyama Valley. Water levels, in feet below land-surface datum, 1945: Feb. 28, 53.95; Nov. 28, 59.03; Dec. 26, 57.54.

10/26-22A1 (*941, p. 146; *949, p. 238; 991, p. 178; 1021, p.157). H. S. Russell. In Cuyama Valley.

Water level, in feet with reference to land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 25	+0.15	July 3	a -9.35	Sept. 25	-9.38	Nov. 28	-0.92
Feb. 28	+.13	31	a -17.49	Oct. 29	-2.59	Dec. 26	-.30
Apr. 24	+.11	Aug. 28	a -22.36				

a Nearby well pumping.

10/27-12R1 (*941, p. 147; *949, p. 238; 991, p. 178; 1021, p.157). H. S. Russell. In Cuyama Valley.

Water level, in feet below land-surface datum, 1945

Jan. 25	39.65	Aug. 28	44.09	Oct. 29	43.08	Dec. 26	41.51
Feb. 28	39.43	Sept. 25	44.59	Nov. 28	42.27		

10/33-7R2 (*1021, p.157). P. T. Bonetti. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Feb. 6	82.00	May 30	78.65	Aug. 29	85.99	Nov. 29	90.19
Mar. 1	80.95	July 4	81.79	Sept. 26	87.50	Dec. 27	90.44
Apr. 25	77.90	Aug. 1	84.05	Oct. 30	89.10		

10/33-18G1 (*949, p. 229; 991, p. 178; 1021, p.157). La Brea Securities Co. well 8. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 83.17; Apr. 1, 85.00; July 1, 88.10; Oct. 1, 90.40.

10/33-19B1 (*941, p. 148; *949, p. 229; 991, p. 179; 1021, p.157). Owen T. Rice. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 80.60	Apr. 25	82.06	Aug. 1	b 85.01	Oct. 30	86.00
30	80.24	July 1	a 84.10	29	85.58	Nov. 29	88.78
Mar. 1	80.86	4	84.33	Oct. 1	ab 86.25	Dec. 27	85.82
Apr. 1	a 81.25						

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

10/33-20N2 (*1021, p.158). T. B Adam Estate. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	127.80	May 30	129.70	Aug. 29	131.05	Nov. 29	131.27
Mar. 1	128.12	July 4	130.00	Sept. 26	130.97	Dec. 27	131.44
Apr. 25	128.76	Aug. 1	130.85	Oct. 30	131.40		

10/33-21N2 (*1021, p.158). Frank Costa, Jr. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	a 74.86	May 30	a 74.14	Aug. 29	a 76.32	Nov. 29	76.52
Mar. 1	72.97	July 4	72.54	Sept. 26	74.51	Dec. 27	76.85
Apr. 25	a 74.57	Aug. 1	75.61	Oct. 30	75.88		

a Nearby well pumping.

10/33-27G1 (*949, p. 230; 991, p. 179; 1021, p.158). W. C. Adam. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 44.80; Apr. 1, 36.87; July 1, 37.45; Oct. 1, 48.10, pumping recently.

10/33-27K1 (*941, p. 149; *949, p. 230; 991, p. 179; 1021, p.158). Newhall Land & Farming Co. In Santa Maria Valley.

10/33-27K1--Continued.

Water level, in feet below land-surface datum, 1945
(From float gage)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	44.51	Apr. 25	31.73	Aug. 1	40.86	Sept. 26	45.45
	44.88		31.73		40.82		45.45
	44.85		34.12		40.82		47.09
	38.33	May 30	34.06		43.55	Oct. 30	47.09
Mar. 1	44.85		31.05	29	43.48		46.51
	38.34		37.69		43.43		49.11
	31.70	July 4	37.63		45.47	Dec. 27	48.70
	38.34		37.59				-

a Undated entries are highest and lowest levels between dates of observation.

10/33-28A1 (*949, p. 230; 991, p. 179; 1021, p. 158). Joe Soares. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 50.05	Apr. 1	a 46.05	Oct. 1	ab 52.63	Nov. 29	53.85
30	51.08	July 1	ab 45.47	24	52.89	Dec. 27	54.19
Mar. 1	48.84	4	45.66				

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

10/33-28J1. E. W. Boyd. In Santa Maria Valley, about 5.7 miles southeast of Santa Maria, 0.6 mile south of observation well 28A1, 40 feet west of State Highway 140, in corrugated-steel pump house. Drilled irrigation well, diameter 16 inches, reported depth 352 feet. Unconfined water in alluvial gravel and sand. Measuring point, top west side of pump base through hole, 0.60 foot above land-surface datum and about 328 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Jan. 30	58.21	Apr. 25	52.04	July 4	51.47	Nov. 29	62.09
Mar. 1	56.83	May 30	50.20	Sept. 26	58.10	Dec. 27	63.01

10/33-34H1 (*1021, p. 159). Dan Donovan Estate. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	54.33	July 4	46.39	Aug. 29	52.03	Nov. 29	58.21
Mar. 1	50.49	Aug. 1	48.68	Oct. 30	56.61	Dec. 27	59.11
Apr. 25	44.02						

10/33-35B1 (*1021, p. 159). Newhall Land & Farming Co. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	32.31	May 30	20.13	Aug. 29	33.26	Nov. 29	37.94
Mar. 1	23.79	July 4	26.34	Sept. 26	29.02	Dec. 27	35.81
Apr. 25	17.12	Aug. 1	30.22	Oct. 30	37.14		

10/33-36Q1. La Brea Securities Co. In Santa Maria Valley, about 1.0 mile northeast of Garey, 0.2 mile east of bridge over the Sisquoc River, 300 feet north of paved road, 15 feet north of frame dwelling, beneath metal windmill tower. Drilled domestic well, diameter 6 inches, measured depth 91.6 feet. Unconfined water in alluvial gravel and sand. Measuring point, top west side of 2- by 2-inch wood clamps, 1.00 foot above land-surface datum and about 385 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Jan. 30	a 23.72	May 30	17.80	Aug. 29	22.47	Nov. 29	b 25.53
Mar. 1	20.97	July 4	21.40	Oct. 30	b 24.64	Dec. 27	24.60
Apr. 25	17.08	Aug. 1	21.40				

a Pumping.

b Pumping recently.

10/34-2R1 (*949, p. 231; 991, p. 179; 1021, p.159). Gracio Apalatequi. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	a 84.43	Apr. 24	84.82	Aug. 1	91.09	Oct. 30	92.32
Feb. 6	85.46	May 29	85.76	Sept. 26	90.82	Nov. 29	94.02
28	85.22	July 1	a 86.80	Oct. 1	a 91.15	Dec. 27	92.87
Apr. 1	a 85.27						

a By Santa Maria Valley Water Conservation District.

10/34-4R1. Gerald Donovan. In Santa Maria Valley, about 1.5 miles northwest of Santa Maria, 300 feet north of Donovan Road, 40 feet west of North Blosser Road, in frame pump house. Drilled irrigation well, diameter 16 inches, reported depth 186 feet. Unconfined water in alluvial gravel and sand. Measuring point, top west side of pump base through hole, 0.60 foot above land-surface datum and about 187 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	72.96	Apr. 25	73.65	July 4	77.35	Nov. 29	79.35
Mar. 1	72.89	May 30	75.54	Sept. 26	79.38	Dec. 27	78.70

10/34-6N1 (*949, p. 231; 991, p. 180; 1021, p.159). Grisingher & Signorelli. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level
Jan. 1	a 49.90	Apr. 1	a 48.63	July 1	a 54.72
30	50.19	25	52.15	Oct. 1	a 55.40

a By Santa Maria Valley Water Conservation District.

10/34-8Q1 (*991, p. 180; 1021, p.159). Sawdye & Hunt. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	64.73	Apr. 25	63.30	Sept. 26	a 68.77	Nov. 29	68.23
Mar. 1	62.46	May 30	65.25	Oct. 30	68.40	Dec. 27	66.72

a Pumping recently.

10/34-9F1 (*991, p. 180; 1021, p.160). Mrs. A. E. Preisker. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 72.04; Apr. 1, 71.37; July 1, 75.90, pumping recently; Oct. 1, 78.87, pumping recently.

10/34-14E3 (*941, p. 151; *949, p. 231; 991, p. 180; 1021, p.160). City of Santa Maria. In Santa Maria Valley. Measurements by city of Santa Maria.

Water level, in feet below land-surface datum, 1945

Jan. 7	96.88	Apr. 8	96.90	July 4	a 100.63	Oct. 14	103.62
14	96.75	15	97.15	8	100.50	21	103.52
21	96.77	22	97.33	15	100.29	28	103.52
28	96.88	25	a 97.42	29	101.96	30	a 103.52
31	a 96.78	29	97.56	Aug. 5	102.50	Nov. 4	103.44
Feb. 4	96.91	May 5	97.58	12	102.58	11	103.44
11	96.69	13	97.92	19	102.83	18	103.29
18	96.75	20	98.21	26	103.02	25	103.23
25	96.81	27	98.62	29	ab103.83	30	a 103.16
Mar. 1	a 96.77	30	ab 99.55	Sept. 2	103.21	Dec. 2	103.19
4	96.79	June 4	99.08	9	103.29	9	103.12
11	96.85	10	99.29	16	103.42	16	102.96
18	96.74	17	99.60	23	103.50	23	102.65
25	96.75	24	100.08	26	a 103.42	28	a 102.63
29	a 96.71	July 1	b 105.42	Oct. 7	103.56	30	102.65

a By Geological Survey.

b Nearby well pumping.

10/34-20H1 (*1021, p. 160). Ulisse Tognazzini. In Santa Maria Valley.
Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	66.82	Apr. 25	67.35	July 4	70.37	Nov. 29	71.26
Mar. 1	66.57	May 30	68.96	Sept. 26	71.48	Dec. 27	70.10

10/34-22RL (*949, p. 232; 991, p. 180; 1021, p. 160). George J. Wheat.
In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 93.92	Apr. 1	a 94.90	July 4	96.82	Oct. 31	98.55
30	93.44	May 30	95.29	Aug. 1	97.85	Nov. 30	98.08
Mar. 1	93.19	July 1	a 97.10	29	98.16	Dec. 28	97.38

a By Santa Maria Valley Water Conservation District.

10/34-23H1 (*949, p. 232; 991, p. 181; 1021, p. 161). Marion B. Rice.
In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 105.93	Apr. 25	106.19	July 4	110.21	Oct. 31	112.27
30	105.71	May 30	b 108.39	Aug. 1	111.50	Nov. 29	111.71
Mar. 1	105.59	July 1	a 110.25	Oct. 1	a 112.90	Dec. 28	111.11
Apr. 1	a 105.67						

a By Santa Maria Valley Water Conservation District.

b Nearby well pumping.

c Pumping recently.

10/34-31F1 (*1021, p. 161). Union Sugar Co. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	76.74	May 31	76.86	Aug. 1	78.05	Sept. 26	79.12
Mar. 1	76.03	July 4	77.48	29	79.53	Oct. 30	79.38
Apr. 25	75.95						

10/35-7F1 (*941, p. 152; *949, p. 232; 991, p. 181; 1021, p. 161).
M. J. Ellis. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	(ab)	May 31	6.35	Aug. 1	c 10.26	Oct. 1	a 4.37
30	4.15	July 1	ac 8.80	29	8.67	Nov. 29	.91
Mar. 1	1.32	4	6.45	Sept. 26	6.55	Dec. 28	(b)
Apr. 1	(ab)						

a By Santa Maria Valley Water Conservation District.

b Flowing.

c Nearby well pumping.

10/35-7G3 (*949, p. 233; 991, p. 181; 1021, p. 161). John Jenkins.
In Santa Maria Valley.

s/

Water level, in feet below land-surface datum, 1945

Jan. 30	5.13	May 31	10.56	Aug. 1	b 19.26		a 18.67
	b 12.62		b 17.65		15.29	Oct. 30	10.30
	11.35		13.23		b 21.11		9.34
	4.95		12.26	29	b 17.32		b 16.03
	b 13.23		b 18.73		9.92	Nov. 29	9.26
Mar. 1	7.82	July 4	16.05		b 17.91		5.99
	4.50		13.93	Sept. 26	b 15.55		11.80
	16.09		b 19.27		10.13	Dec. 28	6.02
Apr. 25	b 16.07						

a Undated entries are highest and lowest levels between dates of observation.

b Nearby well pumping.

10/35-9F1 (*941, p. 152; *949, p. 233; 991, p. 181; 1021, p. 161).
Waller-Franklin Seed Co. In Santa Maria Valley.

10/35-9F1--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 1	a 15.45	May 31	b 25.99	Aug. 29	b 28.44	Oct. 30	22.10
30	b 19.42	July 1	ac 33.10	Sept. 26	b 27.34	Nov. 29	20.83
Mar. 1	17.67	4	b 25.09	Oct. 1	a 24.80	Dec. 28	16.32
Apr. 1	a 15.33	Aug. 1	b 32.22				

a By Santa Maria Valley Water Conservation District.

b Nearby well pumping.

c Pumping recently.

10/35-9N1 (*949, p. 234; 991, p. 181; 1021, p.162). Agnes King. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 14.25; Apr. 1, 13.30; July 1, 34.55, pumping recently; Oct. 1, 25.05, nearby well pumping.

10/35-12M1 (*949, p. 234; 991, p. 181; 1021, p.162). E. and G. LeRoy. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 39.20	Apr. 1	a 38.02	Aug. 29	47.49	Oct. 1	a 46.35
30	30	July 1	a 48.17	Sept. 26	48.59	30	45.61
Mar. 1	41.56						

a By Santa Maria Valley Water Conservation District.

10/35-21B1 (*949, p. 234; 991, p. 182; 1021, p.162). C. P. Mathison. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 9.80; Apr. 1, 14.40, pumping recently; July 1, 26.55, pumping recently; Oct. 1, 24.25, pumping recently.

10/35-24B1 (*941, p. 152; *949, p. 234; 991, p. 182; 1021, p.162). Union Sugar Co. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 43.45	July 1	ab 53.00	Sept. 26	48.85	Nov. 30	47.69
Mar. 1	44.45	Aug. 1	c 55.44	Oct. 1	a 49.25	Dec. 28	45.50
Apr. 1	a 43.83	29	c 53.09				

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

c Nearby well pumping.

11/28-17L1 (*949, p. 238; 991, p. 182; 1021, p.162). Seers Ranch. In Cuyama Valley.

Water level, in feet below land-surface datum, 1945

Jan. 25	19.76	May 29	19.49	Aug. 28	20.88	Nov. 28	21.44
Feb. 28	19.72	July 3	20.37	Sept. 25	22.33	Dec. 26	21.05
Apr. 24	19.74	31	20.66	Oct. 29	21.63		

11/34-29F1. Alfred Guerra. In Santa Maria Valley, about 4.4 miles northwest of Santa Maria, 0.38 mile north of observation well 29P1, 700 feet south of dirt road along north edge of alluvial plain, 15 feet west of ranch road, in field. Abandoned drilled irrigation well, diameter 16 inches, reported depth 400 feet. Unconfined water in alluvial sand and silt. Measuring point, top east side of casing, 1.50 feet above land-surface datum and about 164 feet above mean sea level.

Water level, in feet below land-surface datum, 1945

Jan. 30	36.55	May 30	37.53	Aug. 29	a 42.03	Oct. 30	41.01
Mar. 1	36.37	July 4	38.48	Sept. 26	a 41.32	Nov. 29	40.86
Apr. 25	36.55	Aug. 1	a 41.84				

a Nearby well pumping.

11/34-29P1 (*949, p. 235; 991, p. 182; 1021, p.162). Alfred Guerra. In Santa Maria Valley.

11/34-29P1--Continued.

Water level, in feet below land-surface datum, 1945

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 30	48.24	May 30	48.98	Aug. 29	a 63.74	Oct. 30	53.77
Mar. 1	48.13	Aug. 1	a 63.84	Sept. 26	a 55.92	Nov. 29	53.70
Apr. 25	47.17						

a Nearby well pumping.

11/34-30Q1 (*949, p. 235; 991, p. 182; 1021, p.162). Mary Bolton. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Pumping prior to all measurements. Water levels, in feet below land-surface datum, 1945: Jan. 1, 48.10; Apr. 1, 45.83; July 1, 48.75; Oct. 1, 51.60.

11/35-20E1 (*941, p. 153; *949, p. 235; 991, p. 182; 1021, p.163). Union Sugar Co. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 0.40	July 1	ab 40.00	Aug. 1	11.95	Oct. 25	9.80
Apr. 1	a .25		4 6.21	Oct. 1	ab 33.00	Dec. 27	1.20

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

11/35-25H1 (*1021, p. 163). M. J. Mendoza. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	35.50	May 30	35.69	Aug. 29	39.65	Nov. 29	38.06
Mar. 1	35.40	July 4	35.32	Sept. 26	37.04	Dec. 27	37.80
Apr. 25	35.40	Aug. 1	35.93	Oct. 30	37.92		

11/35-26M2 (*1021, p. 163). Sam Tognazzini. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 30	29.90	May 31	a 34.92	Aug. 29	a 43.79	Nov. 29	33.92
Mar. 1	a 36.97	July 4	a 37.04	Sept. 26	a 44.61	Dec. 27	29.88
Apr. 25	a 40.09	Aug. 1	a 46.51	Oct. 30	33.80		

a Nearby well pumping.

11/35-28M1 (*949, p. 236; 991, p. 182; 1021, p.163). Union Sugar Co. In Santa Maria Valley. Measurements by Santa Maria Valley Water Conservation District. Water levels, in feet below land-surface datum, 1945: Jan. 1, 12.83; Apr. 1, 12.65; July 1, 28.62, nearby well pumping; Oct. 1, 20.20.

11/35-33G1 (*949, p. 236; 991, p. 183; 1021, p.163). H. E. Pezzoni. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	ab 19.50	Apr. 25	24.83	Aug. 29	c 28.23	Nov. 29	22.28
Mar. 1	20.15	July 1	ab 28.27	Sept. 26	c 27.60	Dec. 27	19.49
Apr. 1	a 17.85	Aug. 1	22.16	Oct. 1	a 26.60		

a By Santa Maria Valley Water Conservation District.

b Pumping recently.

c Nearby well pumping.

11/35-35A1 (*949, p. 236; 991, p. 183; 1021, p.163). Bello Estate. In Santa Maria Valley.

Water level, in feet below land-surface datum, 1945

Jan. 1	a 34.50	Apr. 1	a 33.00	July 4	39.21	Oct. 1	a 40.00
30	b 35.16	25	b 36.08	Aug. 29	40.34	Nov. 29	39.34
Mar. 1	b 34.45	July 1	ac 40.00	Sept. 26	40.05		

a By Santa Maria Valley Water Conservation District.

b Nearby well pumping.

c Pumping recently.

Water-level measurements, in feet below land-surface datum, in the Santa Maria Valley in 1945, by the San Joaquin Power Division of the Pacific Gas & Electric Co.

Well numbers		Water level August 1945	Elevation of land-surface datum above mean sea level (feet)
Geological Survey	San Joaquin Power Division		
10/33-28A1	1	50.0	325
10/33-21F1	2	a 63.3	312
10/33-20H1	3	a 73.2	251
10/33-19B1	4	84.2	275
10/33-18M1	5	a 96.0	264
10/33-18C1	6	90.3	267
10/34-13A1	7	a 101.1	257
10/34-13C1	8	a 98.5	249
10/34-13G1	9	a 112.4	253
10/34-3P1	11	86.3	203
10/34-16R1	12	91.5	204
10/34-9Q1	13	85.7	192
10/34-17F2	14	70.3	177
10/34-7G1	16	64.0	164
10/35-11C1	17	a 56.3	124
10/35-15C1	18	40.4	106
10/35-7E1	19	5.2	49
10/34-14E3	20	102.7	225

a Pumping recently.

HAWAII

By G. A. Macdonald

INTRODUCTION

Cooperation was continued with the Hawaii Division of Hydrography. The systematic study of the geology and ground-water resources of the island of Molokai was completed and a report is in preparation. Systematic studies of the geology and ground-water resources were begun on Niihau and continued on Kauai. Special investigations were made for the armed forces in the Territory.

The total ground-water draft during 1945 for the Territory of Hawaii was 229,814.41 million gallons (an average of about 630 million gallons a day). This was 13,589.76 million gallons more than the total pumpage for 1944. All islands showed an increase in pumpage except Molokai. The greatest increase was on Oahu, but Maui and Hawaii also showed significant increases, owing largely to the conditions of subnormal rainfall general throughout the Territory.

RECORDS OF ARTESIAN HEAD, WATER LEVEL, AND PUMPAGE

The tables in this report set forth data on ground-water conditions in the Territory in 1945, such as artesian head, water level, and the chloride content of the waters. In the section on Oahu is a table listing, by name and number, the artesian areas on that island and giving the time of high and low artesian heads in each; in the records that follow, these areas are referred to by the numbers shown in this table. At the end of the report is a table showing, by pumping plants, the ground-water draft in the Territory during the year.

In the tables of well records, the measurements of artesian head or water level are given, in feet, with reference both to mean sea level and to land-surface datum. They are listed in two columns, designated A and B--those in A being referred to mean sea level and those in B to land-surface datum. The symbol + in column B indicates that the artesian head or water level is above land-surface datum; no symbol indicates below land-surface datum. In some of the wells the measurement given is the water

level; in others it is the height to which the water would rise in a casing or tube as indicated by the shut-in pressure.

ISLAND OF OAHU

During 1945 the Geological Survey made 338 water-level measurements on 108 wells, and 403 chloride determinations on 181 wells on the island of Oahu, 24 of which being measured monthly. The Board of Water Supply, City and County of Honolulu, made 179 water-level measurements in 91 wells, 6 of which were measured more than once. Automatic water-stage recorders were maintained on 2 wells by the Geological Survey and by the Board of Water Supply on 14 wells.

The drought conditions of the last several years continued and became more severe during 1945. The following table indicates the rainfall during each month of 1945 at 11 index stations in the Honolulu watershed area, expressed in percentage of the normal rainfall at the stations over a period beginning in 1890. The data were supplied by C. K. Wentworth, geologist of the Board of Water Supply, who has listed the monthly and annual indices from 1890 through 1944. ^{1/} During 10 months the rainfall was less than normal, and during 2 months it was less than 20 percent of normal. The average for the year was only 64 percent of normal.

Rainfall in the Honolulu area, 1945, in percentage of normal

Month	Rainfall	Month	Rainfall	Month	Rainfall
January	15	May	17	September	63
February	50	June	47	October	46
March	91	July	61	November	52
April	138	August	108	December	75
Average for the year					
					64

Total pumpage for the island amounted to 149,338.62 million gallons, an increase of 4,465.31 million gallons over that of 1944. The increase was largely the result of drought conditions. Because of both decreased recharge and increased pumpage, the head in wells indicative of artesian conditions in artesian areas 2,3,4,6,7, and 8 fell below the previous all-time low level of 1926. The following table indicates the lowest head in observation wells in 1926 and 1945, and the net change involved. Areas 1 and 12 failed to quite reach the 1926 low level. Data are unavailable

^{1/} Wentworth, C. K., Board of Water Supply, City and County of Honolulu, 10th Biennial Rept., 1943-1944, p. 27, 1945.

for areas 5, 9, 10, and 11, but in area 5 levels had already, in 1944, dropped below those of 1926, and it is probable that they declined still farther in 1945.

Lowest head and net change in head, in feet above sea level, in observation wells on Oahu in 1926 and 1945

Well No.	No.	Artesian area Name	Head		Net change
			1926	1945	
2	1	S. Louis Heights	20.88	21.1	+0.2
83	2	Makiki-Pacific Heights	23.52	22.3	-1.1
132	3	Kapalama	24.84	22.04	-2.80
144	4	Moanalua	24.08	a 19.7	-4.4
201	6	Pearl Harbor	17.09	14.22	-2.87
244			17.27	14.80	-2.47
266			15.75	12.54	-3.21
326	7	Waialua	10.34	9.49	-.85
356	8	Kahuku	13.05	9.80	-3.25
396			18.78	17.04	-1.74
308	12	Mokuleia	17.55	18.16	+.61

a Estimated from head in test boring T24.

Time of high and low heads in artesian areas and net gain or loss in static head, in feet, as shown by typical wells on the island of Oahu, 1945

Area	Name	Well	High	Low	Net gain or loss
1	St. Louis Heights	2	January and April	July	-0.46
2	Makiki-Pacific Heights	83	January and May	October	-.99
3	Kapalama	132	April	October	-.92
4	Moanalua	144 and T24	April	September	-.6
5	Wilhelmina Rise	a Shaft 7	April	September and October	-.19
6	Pearl Harbor	201	April	August and September	-.24
		244	April	September	-.28
		266	April	September	-.18
7	Waialua	326	April	July	+.86
8	Kahuku	356	April	July	+.18
		396	April	September	+.37
9	Kahana	405	May	December	-.68
10	Kaaawa	406	May	March	-.10
11	Gilbert	a T5	April and December	June	.00
12	Mokuleia	286	April	October	+.38
		308	December	August	+.82

a Nonartesian, but indicative of adjacent artesian conditions.

Schofield Barracks shaft 4 (*840, p. 59; 845, p. 56; 886, p. 82; 911, p. 138; 941, p. 171; 949, p. 241; *991, p. 186; 1021, p. 166). Pumps shut down before each measurement.

Schofield Barracks shaft 4--Continued.

Water level, in feet, 1945
(From recorder charts)

Date	Water level		Date	Water level		Date	Water level	
	A	B		A	B		A	B
Jan.	274.66	575.34	Mar.	273.70	576.30	July	273.30	576.70
	274.69	575.31		273.68	576.32		273.33	576.67
	274.57	575.43		273.58	576.42		273.27	576.73
	274.60	575.40		273.57	576.45		273.47	576.53
	274.64	575.36		273.52	576.48		273.35	576.65
	274.53	575.47		273.52	576.48		273.25	576.75
	274.53	575.47		273.55	576.45		273.26	576.74
	274.43	575.57		273.48	576.52		273.34	576.66
	274.51	575.49		273.30	576.70		273.27	576.73
	273.90	576.10		273.36	576.64			

(*817, p. 36; 840, p. 61; 845, p. 56; 886, p. 82; 911, p. 139; 941, p. 171; 949, p. 242; 991, p. 187; 1021, p. 166.)

Artesian head, in feet, in five wells and one test boring in the Honolulu District, 1945 a/

(Mean daily measurements furnished by Board of Water Supply, City and County of Honolulu, from recorder charts)

Area	1		2		3	
	Well	2		83		132
Altitude (ft.)	37		27		43	
	A	B	A	B	A	B
Jan. 1	24.50	12.50	23.9	3.1	23.8	19.2
8	24.60	12.40	24.1	2.9	23.9	19.1
15	24.53	12.47	24.2	2.8	23.9	19.1
22	24.43	12.57	24.3	2.7	23.9	19.1
29	24.27	12.73	24.2	2.8	23.7	19.3
Feb. 5	24.25	12.75	24.2	2.8	23.8	19.2
12	24.20	12.80	24.2	2.8	23.8	19.2
19	24.11	12.89	24.2	2.8	23.7	19.3
26	24.02	12.98	24.10	2.90	23.6	19.4
Mar. 5	24.04	12.96	24.08	2.92	23.6	19.4
12	24.01	12.99	24.0	3.0	23.6	19.4
19	23.80	13.20	23.9	3.1	23.6	19.4
26	23.4	13.6	23.91	3.09	23.4	19.6
Apr. 2	23.34	13.66	23.9	3.1	23.37	19.63
9	23.80	13.20	23.87	3.13	23.47	19.53
16	24.3	12.7	24.0	3.0	23.60	19.40
23	24.58	12.42	24.1	2.9	23.79	19.21
30	24.55	12.45	24.2	2.8	24.03	18.97
May 7	24.46	12.54	24.3	2.7	24.0	19.0
14	23.92	13.08	24.33	2.67	23.9	19.1
21	23.41	13.59	24.25	2.75	23.8	19.2
28	22.92	14.08	24.11	2.89	23.6	19.4
June 4	22.5	14.5	24.00	3.00	23.4	19.6
11	22.15	14.85	23.81	3.19	23.2	19.8
18	21.94	15.06	23.50	3.50	23.0	20.0
25	21.74	15.26	23.38	3.62	22.9	20.1
July 2	21.7	15.3	23.2	3.8	22.8	20.2
9	21.63	15.37	23.05	3.95	22.6	20.4
16	21.27	15.73	22.8	4.2	22.4	20.6
23	21.1	15.9	22.7	4.3	22.25	20.75
30	21.4	15.6	22.66	4.34	22.22	20.78
Aug. 6	21.6	15.4	22.58	4.42	22.2	20.8
13	21.8	15.2	22.52	4.48	22.11	20.89
20	21.89	15.11	22.54	4.46	22.17	20.83
27	21.81	15.19	22.45	4.55	22.12	20.88
Sept. 3	21.78	15.22	22.48	4.52	22.33	20.67
10	21.58	15.42	22.45	4.55	22.27	20.73

† See footnotes at end of table.

Artesian head, in feet, in wells in the Honolulu District--Continued.

Area	1		2		3
Well	2		83		132
Altitude (ft)	37		27		43
	A	B	A	B	A
Sept. 17	21.48	15.52	22.42	4.58	22.16
24	21.4	15.6	22.40	4.60	22.04
Oct. 1	21.5	15.5	22.36	4.64	22.11
8	21.6	15.4	22.38	4.62	22.14
15	21.6	15.4	22.37	4.63	22.14
22	21.32	15.68	22.3	4.7	22.11
29	21.7	15.3	22.35	4.65	22.10
Nov. 5	21.66	15.34	22.3	4.7	22.11
12	22.32	14.68	22.4	4.6	22.24
19	22.9	14.1	22.47	4.53	22.30
26	23.2	13.8	22.6	4.4	22.41
Dec. 3	23.08	13.92	22.59	4.41	22.40
10	23.63	13.37	22.66	4.34	22.53
17	24.00	13.00	22.7	4.3	22.62
24	24.04	12.96	22.91	4.09	22.77
31	23.98	13.02	22.99	4.01	22.85

Area	4		4		5
Well	144		T24 b/		Shaft 7
Altitude (ft.)	26		59.4		160
	A	B	A	B	A
Jan. 1	21.2	4.8	.....	.....	9.31
8	21.36	4.64	.....	.....	9.30
15	21.2	4.8	.....	.....	9.30
22	21.1	4.9	.....	.....	9.33
29	21.04	4.96	.....	.....	9.28
Feb. 5	21.0	5.0	.....	.....	9.33
12	21.08	4.92	.....	.....	9.25
19	21.0	5.0	20.92	38.48	9.24
26	20.8	5.2	20.8	38.6	9.19
Mar. 5	20.79	5.21	20.7	38.7	9.17
12	20.79	5.21	20.61	38.79	9.12
19	20.64	5.36	20.50	38.90	9.18
26	20.54	5.46	20.42	38.98	9.14
Apr. 2	20.57	5.43	20.48	38.92	9.20
9	20.70	5.30	20.53	38.87	9.25
16	21.0	5.0	20.96	38.44	9.35
23	21.28	4.72	21.27	38.13	9.32
30	21.47	4.53	21.32	38.08	9.32
May 7	21.4	4.6	21.25	38.15	9.28
14	21.21	4.79	21.09	38.31	9.27
21	20.9	5.1	20.84	38.56	9.12
28	(c)	(c)	20.62	38.78	9.09
June 4	.....	.....	20.42	38.98	9.09
11	.....	.....	20.30	39.10	9.07
18	.....	.....	20.15	39.25	8.99
25	.....	.....	20.05	39.35	8.96
July 2	.....	.....	19.99	39.41	8.96
9	.....	.....	19.94	39.46	8.94
16	.....	.....	19.85	39.55	8.93
23	.....	.....	19.74	39.66	8.90
30	.....	.....	19.78	39.62	8.93
Aug. 6	.....	.....	19.74	39.66	8.95
13	.....	.....	19.69	39.71	8.91
20	.....	.....	19.68	39.72	8.88
27	.....	.....	19.62	39.78	8.86

†See footnotes at end of table.

Artesian head, in feet, in wells in the Honolulu District--Continued.

Area Well	4		4		5	
	144	T24			Shaft 7	
Altitude (ft.)	26		59.4		160	
	A	B	A	B	A	B
Sept. 3	19.64	39.76	8.82	151.18
10	19.66	39.74	8.84	151.16
17	19.57	39.83	8.82	151.18
24	19.58	39.82	8.83	151.17
Oct. 1	19.55	39.85	.....	.....
8	19.68	39.72	8.32	151.18
15	19.6	39.8	8.83	151.17
22	19.6	39.8	8.82	151.18
29	19.6	39.8	8.86	151.14
Nov. 5	19.6	39.8	8.90	151.10
12	19.8	39.6	8.94	151.06
19	20.09	39.31	8.95	151.05
26	20.15	39.25	.....	.....
Dec. 3	20.03	39.37	8.98	151.02
10	20.13	39.27	9.02	150.98
17	20.33	39.07	9.02	150.98
24	20.39	39.01	9.12	150.88
31	20.45	38.95	9.10	150.90

a A daily record is no longer kept for well 1A. Data in the table stated only to the first decimal place represent approximate readings based on nearby wells, at times when the recorder in the observation well failed to operate.

b Test boring Oahu T24, Board of Water Supply, Honolulu. In Manaiki Gulch, 0.2 mile north 21° west of Puu Kapu; lat. $21^{\circ}21'27''$ N., long. $157^{\circ}53'10''$ W. Drilled in January 1945, diameter 12 inches, depth 115 feet; recorder installed Feb. 6, 1945.

c No daily record after May 18, 1945. Well 144 has been replaced as an observation well by test boring 24, which was drilled for that purpose.

Artesian head, in feet, and chloride, in parts per million, in typical wells in Oahu, 1945

Well 1B (area 5) (*777, p. 50; 817, p. 37; 840, p. 56, 61; 845, p. 57; 886, p. 83; 911, p. 139; 941, p. 172; 949, p. 243; *991, p. 188; 1021, p. 167). Bishop Estate, on north side of Waialae Golf Links, Kaimuki.

Date	Head		Chloride	Date	Head		Chloride
	A	B			A	B	
Jan. 26	8.22	10.00	187	July 28	7.77	10.45	214
Feb. 24	8.03	10.19	220	Aug. 24	7.73	10.49	225
Mar. 28	8.01	10.21	213	Sept. 25	7.52	10.70	220
Apr. 26	8.12	10.10	216	Oct. 24	7.86	10.36	213
May 26	7.89	10.33	210	Nov. 27	7.77	10.45	200
June 26	7.61	10.61	212	Dec. 18	7.92	10.30	186

Well 9 (area 1) (*777, p. 49; 817, p. 37; 840, p. 56, 62; 845, p. 57; 886, p. 83; 911, p. 139; 941, p. 172; 949, p. 243; *991, p. 188; 1021, p. 168). J. J. Gouveia. Kapahulu Road, Honolulu.

Jan. 23	24.30	+8.22	56	July 28	21.31	+5.23	54
Feb. 23	23.95	+7.87	53	Aug. 24	22.12	+6.04	53
Mar. 28	23.30	+7.22	55	Sept. 25	21.38	+5.30	50
Apr. 25	24.60	+8.52	52	Oct. 24	21.32	+5.24	53
May 26	23.22	+7.14	52	Nov. 27	22.82	+6.74	53
June 26	21.32	+5.24	54	Dec. 18	24.12	+8.04	55

Well 81 (area 2) (*777, p. 49; 817, p. 37; 840, p. 56, 62; 845, p. 57; 886, p. 83; 911, p. 139; 941, p. 172; 949, p. 243; *991, p. 188; 1021, p. 168). A. Young. Young St., Honolulu.

Date	Head	Chloride	Date	Head	Chloride		
	A	B		A	B		
Jan. 23	24.25	+6.21	42	July 28	22.56	+4.52	40
Feb. 23	24.05	+6.01	42	Aug. 24	22.27	+4.23	38
Mar. 28	23.85	+5.81	40	Sept. 25	22.23	+4.19	38
Apr. 25	24.05	+6.01	39	Oct. 24	22.21	+4.17	37
May 26	24.07	+6.03	37	Nov. 27	22.44	+4.40	37
June 26	23.27	+5.23	38	Dec. 18	22.66	+4.62	36

Well 119 (area 3) (*777, p. 49; 817, p. 37; 840, pp. 56, 62; 845, p. 57; 886, p. 83; 911, p. 139; 941, p. 172; 949, p. 243; *991, p. 188; 1021, p. 168). Honolulu Gas Co. In Honolulu.

Jan. 26	23.25	+19.03	423	July 28	19.96	+15.74	964
Feb. 23	22.25	+18.03	401	Aug. 24	20.97	+16.75	590
Mar. 28	22.65	+18.43	390	Sept. 26	21.08	+16.86	...
Apr. 27	21.84	+17.62	390	Oct. 24	20.27	+16.05	480
May 26	22.17	+17.95	408	Nov. 29	20.57	+16.35	1035
June 26	.....	.....	388	Dec. 21	21.47	+17.25	435

Well 153 (area 4) (*777, p. 50; 817, p. 37; 840, p. 56, 62; 845, p. 58; 886, p. 83; 911, p. 140; 941, p. 173; 949, p. 243; *991, p. 188; 1021, p. 168). S. Damon Estate. Moanalua Gardens, Honolulu.

Jan. 26	20.93	+0.55	55	July 26	19.76	0.62	58
Feb. 23	20.86	+.48	53	Aug. 24	19.65	.73	54
Mar. 28	20.42	+.04	54	Sept. 26	19.39	.99	54
Apr. 25	21.25	+.87	52	Oct. 24	19.69	.69	55
May 24	20.75	+.37	57	Nov. 27	20.00	.38	56
June 26	20.09	.29	56	Dec. 18	20.32	.06	55

Well 187B (area 6) (*817, p. 37; 840, p. 56, 62; 845, p. 58; 886, p. 83; 911, p. 140; 941, p. 173; 949, p. 243; *991, p. 189; 1021, p. 168). United States Navy. Near Aiea railroad station.

Jan. 27	17.46	+7.53	...	May 9	16.98	+7.05	252
31	16.26	+6.33	...	July 5	15.46	+5.53	...
Apr. 29	17.46	+7.53	...	Aug. 19	15.06	+5.13	...
May 1	17.26	+7.33	...	Dec. 14	16.80	+6.87	...
8	17.07	+7.14	...				

Wells 187A and 187D (combined discharge). United States Navy. Near Aiea railroad station.

Jan. 25	.....	.....	185	Aug. 24	.....	.....	235
Feb. 22	.....	.....	203	Sept. 25	.....	.....	250
Mar. 29	.....	.....	210	Oct. 19	.....	.....	260
Apr. 25	.....	.....	213	Nov. 27	.....	.....	265
July 31	.....	.....	274	Dec. 18	.....	.....	225

Well 190 (area 6) (*771, p. 51; 817, p. 37; 840, p. 57, 62; 845, p. 58; 886, p. 83; 911, p. 140; 941, p. 173; 949, p. 243; *991, p. 189; 1021, p. 169). C. B. Cooper. Half a mile west of Aiea.

Well 190 (area 6)--Continued

Date	Head	Chloride	Date	Head	Chloride		
	A	B		A	B		
Jan. 23	16.92	5.81	120	July 26	15.65	7.08	...
Feb. 23	16.63	6.10	131	Aug. 24	15.38	7.35	152
Mar. 29	16.18	6.55	...	Sept. 25	.....	...	158
Apr. 25	18.20	4.53	144	Oct. 19	16.47	6.26	169
May 23	16.84	5.89	149	Nov. 27	16.38	6.35	...
June 26	16.10	6.63	152	Dec. 18	17.33	5.40	...

Well 193 (area 6)(*777, p. 51; 817, p. 38; 840, p. 57, 62; 845, p. 58; 886, p. 83; 911, p. 140; 941, p. 173; 949, p. 244; *991, p. 189; 1021, p. 169). L. L. McCandless Estate. In Waimalu Valley, 1 mile northwest of Aiea.

Jan. 23	16.21	+3.16	148	July 26	15.25	+2.20	148
Feb. 23	15.92	+2.87	144	Aug. 24	14.84	+1.79	147
Mar. 29	15.45	+2.40	146	Sept. 25	14.65	+1.60	147
Apr. 25	17.45	+4.40	150	Oct. 19	14.98	+1.93	141
May 23	16.07	+3.02	145	Nov. 27	15.49	+1.44	150
June 26	15.37	+2.32	146	Dec. 18	16.68	+3.63	153

Well 201 (area 6)(*777, p. 52; 817, p. 38; 840, p. 57, 62; 845, p. 58; 886, p. 83; 911, p. 140; 941, p. 173; 949, p. 244; *991, p. 189; 1021, p. 169). Bishop Estate. Pearl City.

Jan. 23	15.70	+6.53	340	July 26	14.49	+5.32	279
Feb. 23	15.41	+6.24	346	Aug. 24	14.22	+5.05	285
Mar. 29	14.85	+5.68	320	Sept. 24	14.23	+5.06	290
Apr. 25	16.72	+7.55	430	Oct. 19	14.53	+5.36	304
May 23	15.47	+6.30	405	Nov. 27	14.95	+5.78	340
June 26	14.65	+5.48	290	Dec. 18	15.83	+6.66	370

Well 244 (area 6)(*777, p. 52; 817, p. 38; 840, p. 57, 62; 845, p. 58; 886, p. 84; 911, p. 140; 941, p. 173; 949, p. 244; *991, p. 189; 1021, p. 169). Bishop Estate. Waipahu.

Jan. 23	17.12	+6.65	116	July 26	14.80	+4.33	120
Feb. 22	16.85	+6.38	122	Aug. 24	15.13	+4.66	118
Mar. 29	15.97	+5.50	122	Sept. 24	15.05	+4.58	116
Apr. 25	19.58	+9.11	120	Oct. 19	16.70	+6.23	113
May 23	16.98	+6.51	122	Nov. 27	16.36	+5.89	114
June 26	15.61	+5.14	121	Dec. 18	17.81	+7.34	116

Well 266 (area 6)(*777, p. 52; 817, p. 38; 840, p. 57, 62; 845, p. 58; 886, p. 84; 911, p. 140; 941, p. 173; 949, p. 244; *991, p. 190; 1021, p. 170). Honolulu Ranch. 1.75 miles northeast of Ewa.

Jan. 23	15.36	+2.70	225	July 26	14.46	+1.80	248
Feb. 22	15.34	+2.68	216	Aug. 24	12.84	+1.18	235
Mar. 29	14.16	+1.50	205	Sept. 24	12.54	+1.12	225
Apr. 25	19.03	+6.37	200	Oct. 19	13.96	+1.28	235
May 23	14.76	+2.10	218	Nov. 27	14.76	+2.10	225
June 26	15.54	+.88	238	Dec. 18	17.48	+4.82	210

Well 276 (area 11) (*817, p. 38; 840, pp. 57-63; 845, p. 58; 886, p. 84; 911, p. 140; 941, p. 174; 949, p. 244; 1021, p. 170). Ewa Plantation Co. 4.5 miles west of Ewa. Records furnished by owner; figures are monthly averages.

Well 276 (area 11)--Continued.

Date	Water level		Chloride	Date	Water level		Chloride
	A	B			A	B	
Jan.	12.42	28.16	589	July	11.83	28.75	584
Feb.	12.36	28.22	590	Aug.	11.82	28.76	590
Mar.	11.94	28.64	587	Sept.	11.69	28.89	586
Apr.	12.94	27.64	515	Oct.	11.51	29.07	590
May	12.46	28.12	575	Nov.	12.15	28.43	575
June	11.70	28.88	585	Dec.	12.68	27.90	554

Well 286 (area 12) (*777, p. 54; 817, p. 38; 840, p. 57, 63; 845, p. 59; 886, p. 84; 911, p. 141; 941, p. 174; 949, p. 244; *991, p. 190; 1021, p. 170). Waialua Agricultural Co. Mokuleia.

Date	Head		Chloride	Date	Head		Chloride
	A	B			A	B	
Jan. 24	17.30	+5.76	140	July 27	17.24	+5.70	151
Feb. 21	17.09	+5.55	150	Aug. 27	17.24	+5.70	153
Mar. 30	17.13	+5.59	142	Sept. 26	17.08	+5.54	156
Apr. 26	17.74	+6.20	138	Oct. 17	17.06	+5.52	152
May 24	17.04	+5.50	148	Nov. 28	17.30	+5.76	160
June 25	17.17	+5.63	148	Dec. 19	17.68	+6.14	200

Well 308 (area 12) (*777, p. 54; 817, p. 38; 840, p. 57, 63; 845, p. 59; 886, p. 84; 911, p. 141; 941, p. 174; 949, p. 244; *991, p. 190; 1021, p. 170). J. F. Mendonca. 1.5 miles west of Waialua Mill.

Jan. 24	18.58	+10.12	104	July 27	....	....	114
Feb. 21	18.33	+9.87	109	Aug. 27	18.26	+9.80	112
Mar. 30	18.38	+9.92	106	Sept. 26	18.76	+10.30	114
Apr. 26	18.87	+10.41	108	Oct. 17	18.46	+10.00	112
May 24	18.16	+9.70	120	Nov. 28	19.11	+10.65	115
June 25	18.50	+10.04	116	Dec. 19	19.90	+11.44	116

Well 326 (area 7) (*777, p. 52; 817, p. 39; 840, p. 58, 63; 845, p. 59; 886, p. 84; 911, p. 141; 941, p. 244, 245; *991, p. 190; 1021, p. 170). Waialua Agricultural Co. About 0.5 mile south of Waialua.

Jan. 24	10.19	+4.00	68	July 27	9.49	+3.30	73
Feb. 21	10.15	+3.96	73	Aug. 27	9.61	+3.42	73
Mar. 30	9.79	+3.60	72	Sept. 26	9.84	+3.65	72
Apr. 26	10.77	+4.58	71	Oct. 17	9.89	+3.70	73
May 24	9.77	+3.58	72	Nov. 28	10.44	+4.25	72
June 25	9.73	+3.54	74	Dec. 19	10.95	+4.76	73

Well 337 (area 8) (*777, p. 53; *817, p. 39; 840, p. 58, 63; 845, p. 58; 63; 845, p. 59; 886, p. 84, 911, p. 141; 941, p. 174; 949, p. 245; *991, p. 190; 1021, p. 171). Waialee Training School for Boys.

Jan. 24	11.69	9.76	110	July 27	9.80	11.65	98
Feb. 21	10.38	11.07	112	Aug. 27	10.35	11.10	100
Mar. 27	11.42	10.03	106	Sept. 26	10.12	11.33	100
Apr. 26	13.14	8.31	100	Oct. 19	9.99	11.46	102
May 24	11.03	10.42	107	Nov. 28	12.84	8.61	102
June 25	10.08	11.37	94	Dec. 19	11.93	9.52	100

Well 356 (area 8) (*777, p. 53; 817, p. 39; 840, p. 58, 63; 845, p. 59; 886, p. 85; 911, p. 141; *941, p. 174; 949, p. 245; *991, p. 191; 1021, p. 171). Kahuku Plantation Co. At sugar mill in Kahuku.

Well 356 (area 8)--Continued.

Date	Head	Chloride	Date	Head	Chloride		
Jan. 24	11.69	+2.86	176	July 27	9.80	+0.97	220
Feb. 21	10.38	+1.55	184	Aug. 27	10.35	+1.52	223
Mar. 27	11.42	+2.59	185	Sept. 26	10.12	+1.29	226
Apr. 26	13.14	+4.31	186	Oct. 19	9.99	+1.16	237
May 24	11.03	+2.20	214	Nov. 28	12.84	+4.01	200
June 25	10.08	+1.25	231	Dec. 19	11.93	+3.10	176

Well 396 (area 8) (*777, p. 53; 817, p. 39; 840, p. 58, 63; 845, p. 59; 886, p. 85; 911, p. 141; 941, p. 174; 949, p. 245; *991, p. 191; 1021, p. 171). Kahuku Plantation Co. Hauula.

Jan. 24	18.40	+8.04	62	July 27	17.41	+7.05	62
Feb. 21	18.07	+7.71	63	Aug. 27	17.77	+7.41	61
Mar. 27	17.78	+7.42	60	Sept. 26	17.04	+6.68	61
Apr. 26	19.33	+8.97	58	Oct. 18	17.59	+7.23	61
May 24	18.42	+8.06	60	Nov. 28	18.61	+8.25	62
June 25	17.56	+7.20	60	Dec. 19	19.07	+8.71	61

Well 405 (area 9) (*817, p. 39; 840, p. 58, 63; 845, p. 59; 886, p. 85; 911, p. 141; 941, p. 174; 949, p. 245; *991, p. 191; 1021, p. 171). M. E. Foster Estate. Kahana.

Jan. 24	16.08	+10.32	40	July 27	15.54	+9.78	40
Feb. 21	15.68	+9.92	42	Aug. 27	15.46	+9.70	42
Mar. 27	15.38	+9.62	42	Sept. 26	15.66	+9.90	41
Apr. 26	16.07	+10.31	40	Oct. 18	15.36	+9.60	41
May 24	16.40	+10.64	42	Nov. 28	15.80	+10.04	42
June 25	15.85	+10.09	41	Dec. 19	15.30	+9.54	42

Well 406 (area 10) (*777, p. 53; 817, p. 39; 840, p. 58, 63; 845, p. 59; 886, p. 85; 911, p. 141; 941, p. 175; 949, p. 245; *991, p. 191; 1021, p. 171). F. M. Swanzy. In Kaaawa Valley.

Jan. 24	13.17	+2.90	230	July 27	12.75	+2.48	232
Feb. 21	12.97	+2.70	241	Aug. 27	12.75	+2.48	232
Mar. 27	12.71	+2.44	230	Sept. 26	12.77	+2.50	235
Apr. 26	13.12	+2.85	225	Oct. 18	12.85	+2.58	249
May 24	13.20	+2.93	230	Nov. 28	12.83	+2.56	248
June 25	12.96	+2.69	230	Dec. 19	13.07	+2.80	250

Water levels, in feet, and chloride, in parts per million, in test borings in Oahu, 1945

Test boring Oahu T1 (tributary to area 12) (*845, p. 60; 886, p. 85; 911, p. 141; 941, p. 175; 949, p. 245; *991, p. 191; 1021, p. 172). Waialua Agricultural Co. In Kaukonanua Gulch, 4 miles south of Waialua.

Date	Water level	Chloride	Date	Water level	Chloride		
Dec. 30	17.75	255.86	42	July 31	15.79	257.82	31
Feb. 2	16.04	257.57	21	Aug. 31	15.54	258.07	42
Mar. 1	16.08	257.53	21	Oct. 1	15.75	257.86	31
Apr. 2	16.02	257.59	31	Nov. 1	15.78	257.83	10
May 1	16.02	257.59	31	Dec. 1	16.08	257.53	31
June 30	16.02	257.59	42				

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Test boring Oahu T2 (tributary to area 7) (*845, p. 60; 886, p. 85; 911, p. 142; 941, p. 175; 949, p. 245; *991, p. 192; 1021, p. 172). Waialua Agricultural Co. Near Anahulu Canyon, 3.5 miles east of Haleiwa.

Date	Water level		Chloride	Date	Water level		Chloride
	A	B			A	B	
Dec. 30	6.83	335.05	156	July 31	7.82	334.06	135
Feb. 2	7.16	334.72	145	Aug. 31	5.37	336.51	125
Mar. 1	8.61	333.27	125	Oct. 1	6.33	335.55	145
Apr. 2	9.26	332.62	135	Nov. 1	5.43	336.45	145
May 1	8.03	333.85	145	Dec. 1	5.95	335.93	135
June 30	5.28	336.60	135				

Test boring Oahu T5 (tributary to area 11) (*886, p. 84; 911, p. 142; 941, p. 175; 949, p. 246; *991, p. 192; 1021, p. 172). Suburban Water Works, Honolulu. 5 miles west of Ewa on main highway.

Jan. 25	4.38	74.75	510	July 30	4.04	75.09	300
Feb. 22	4.23	74.90	539	Aug. 28	3.85	75.28	430
Mar. 29	3.95	75.18	510	Sept. 24	3.98	75.15	465
Apr. 27	4.44	74.69	350	Oct. 16	3.97	75.16	460
May 25	3.98	75.15	225	Nov. 29	4.11	75.02	520
June 27	3.80	75.53	465	Dec. 20	4.43	74.70	145

Test boring Oahu T15 (*911, p. 142; 941, p. 175; 949, p. 246; *991, p. 192; 1021, p. 172). Suburban Water Works, Honolulu. 1.8 miles above mouth of Nansakuli Gulch.

Jan. 25	1.92	476.72	89	July 30	1.92	476.72	91
Feb. 22	1.97	476.67	95	Aug. 28	1.79	476.85	103
Mar. 29	1.85	476.79	93	Sept. 24	1.85	476.79	98
Apr. 27	2.04	476.60	92	Oct. 16	1.71	476.93	98
May 25	1.90	476.74	94	Nov. 29	1.80	476.84	97
June 27	1.91	476.73	93	Dec. 20	1.75	476.89	98

Test boring Oahu T20 (tributary to area 6) (*949, p. 246; *991, p. 192; 1021, p. 172). United States Navy. 2 miles northwest of Ewa on main highway to Waianae.

Jan. 25	16.88	122.62	240	July 30	16.21	123.29	238
Feb. 22	16.60	122.90	254	Aug. 28	15.90	123.60	232
Mar. 29	16.35	123.15	242	Sept. 24	16.05	123.45	235
Apr. 27	17.12	122.38	252	Oct. 16	16.12	123.38	234
May 25	16.69	122.81	256	Nov. 29	16.22	123.28	240
June 28	16.21	123.29	232	Dec. 20	16.90	122.60	230

Test boring Oahu T25 (area 6). Board of Water Supply, Honolulu. In Waimalu Gulch, 0.5 mile north and 23° west of Kalauap Springs; lat. 21° 23' 35" N., long. 157° 56' 48" W. Drilled in February 1945, diameter 12 inches, depth 177 feet. Measuring point is at land-surface datum and 25.4 feet above sea level. Recorder installed Dec. 19, 1945.

Date	Water level		Date	Water level		Date	Water level	
	A	B		A	B		A	B
Dec. 21	15.68	9.72	Dec. 25	15.97	9.43	Dec. 29	15.60	9.80
22	15.72	9.68	26	15.88	9.52	30	15.83	9.57
23	15.88	9.52	27	15.68	9.72	31	15.88	9.52
24	15.86	9.54	28	15.57	9.63			

ISLAND OF MAUI

The water levels in the wells of the Hawaiian Commercial and Sugar Company on the windward side of the island, and those of the Pioneer Mill Company on the leeward side of West Maui, showed a net decline in 1945 of 0.03 foot to 1.30 feet. Water levels in wells of the Maui Agricultural Company, on the windward side of the island, showed small net changes both up and down, ranging from +0.08 to -0.04 foot. In most wells the chloride content increased slightly, but in some it decreased slightly.

The East Maui Irrigation Company ditch deliveries to the Isthmus during 1945 were 52,639.19 million gallons, 934.61 million gallons less than in 1944. The decrease is attributable to drought conditions in the source area of the ditches, on the windward slope of East Maui. Pumpage for the year on Maui was correspondingly greater, being 69,686.76 million gallons, or 3,280.34 million gallons more than in 1944. Pumping at all wells but one started in January and continued into or through December. The single exception is Maui Agricultural Company pump 13 (U.S.G.S. well 29), which started pumping on February 15.

Data in the following table were furnished by R. E. Hughes, of the Hawaiian Commercial and Sugar Company, R. Bradley, of the Maui Agricultural Company, and J. T. Moir, Jr., of the Pioneer Mill Company.

Chloride, in parts per million, and water levels and net gain or loss in static level, in feet above sea level on Maui, 1945
 (*911, p. 143; 941, p. 176; 949, p. 247; *991, p. 193; 1021, p. 174).

Location	Geol. Survey		Water level	
	well No.	Chloride	Dec. 31	Gain or loss
<u>Hawaiian Commercial & Sugar Co.</u>				
1 (Kihei)	14	...	...	....
2	25	431	5.11	-.03
3	22	365	3.90	-.17
4	24	501	2.97	-.17
5	19	425	4.12	-.17
6	18	369	4.70	-.25
7	16	273	5.08	-.17
8 (Mill)	17	442	4.95	-.17
3 (Kihei)	15	405	6.25	-.17
<u>Maui Agricultural Co.</u>				
Lower Paia				
(Pumps 1, 5, & 6)	30	571	4.50	+.08
Kaheka (pumps 3 & 4)	27	291	5.17	-.04
Paia School (pump 7)	28	312	4.17	+.05
Mill (pumps 8 & 13)	29	416	4.50	-.04
Kuau (pump 12)	31	312	4.42	+.05

Chloride, in parts per million, and water levels and net gain or loss in static level, in feet above sea level on Maui, 1945--Continued.

Location	Geol. Survey well No.	Chloride	Water level	
			Dec. 31	Gain or loss
Pioneer Mill Co.				
Kaanapali	3	727	1.65	-0.31
Kahoma	5	540	1.93	-0.04
Lahaina	9	671	2.35	-0.05
Mill	7	1038	3.00	-0.25
Olowalu	10	528	2.72	-0.80
Ukumehame	12	447	4.43	-1.30

Water levels, in feet, and chloride, in parts per million,
in test borings on Maui, 1945
(Measurements furnished by Wailuku Sugar Co.)

Test boring Maui T102 (Iao Valley) (*911, p. 144; 941, p. 176; 949, p. 247; *991, p. 194; 1021, p. 174). Geological Survey, U.S. Dept. of Interior. In Iao Valley, 1 mile west of Wailuku.

Date	Water level	Chloride	Date	Water level	Chloride
Jan. 12	31.26	422.64	19	July 13	30.86
Feb. 20	31.16	422.74	19	Aug. 16	(a)
Mar. 16	31.09	422.81	23	Sept. 14	(a)
Apr. 17	30.79	423.11	18	Oct. 17	(a)
May 15	30.88	423.02	19	Nov. 13	(a)
June 16	31.04	422.86	19	Dec. 14	(a)

a Measurement unreliable; wire loose and slipping inside insulation.

Test boring Maui T110 (Puu Hele) (*911, p. 143; 941, p. 177; 949, p. 247; *991, p. 194; 1021, p. 174). Wailuku Sugar Co. 2 miles north of Maalaea.

Jan. 12	7.63	305.07	291	July 13	7.83	304.87	272
Feb. 20	7.60	305.10	291	Aug. 16	(a)	270	
Mar. 16	7.70	305.00	299	Sept. 14	(a)	266	
Apr. 17	7.86	304.84	292	Oct. 17	(a)	276	
May 15	7.99	304.71	291	Nov. 13	(a)	262	
June 15	7.87	304.83	299	Dec. 14	(a)	262	

a Measurement unreliable; wire loose and slipping inside insulation.

ISLAND OF MOLOKAI

Water levels in test boring T1 fluctuated between 6.27 and 5.94 feet above sea level, and showed a net gain for the year of 0.08 foot. Chloride was higher than during 1944, ranging from 600 to 652 parts per million.

The Ualapu and Kamalo wells showed net losses of 0.08 and 0.16 foot.

Records after August 15 are not available for the Connant well.

Total pumpage for the year on Molokai decreased 2.23 million gallons because of decreased pumpage from the Kamakana well at Kawela. That well was operated by the United States Army until August. On September 1 it was taken over by the county of Maui as part of the domestic supply for the town of Kaunakakai.

A drilled well at an altitude of 503 feet, on the northwestern slope of West Molokai, encountered water standing 5.6 feet above sea level, with a chloride content of 2,900 parts per million. The high salinity results from a very low rate of recharge in this arid part of the island.

Test boring Molokai T1 (*845, p. 62; 886, p. 87; 911, p. 144; 941, p. 177; 949, p. 248; *991, p. 195; 1021, p. 175). Geological Survey, U. S. Dept. of Interior. 0.75 mile east of airport.

Water level, in feet, and chloride, in parts per million, 1945
(Measurements made by Solomon Hanakeawe, Hawaiian Homes Commission)

Date	Water level		Chloride	Date	Water level		Chloride
	A	B			A	B	
Jan. 15	6.19	391.25	620	July 15	6.27	391.17	(a)
Feb. 15	6.19	391.25	631	Aug. 15	6.19	391.25	635
Mar. 15	6.19	391.25	600	Sept. 15	6.27	391.17	610
Apr. 15	5.94	391.50	635	Oct. 15	6.27	391.17	620
May 15	6.36	391.08	652	Nov. 15	6.19	391.25	620
June 15	6.19	391.25	610	Dec. 15	6.19	391.25	630

a Sample lost in mail.

Water levels, in feet, in observation wells in Molokai, 1945
(Measurements made by Herbert Wilson)

Connant well (*845, p. 63; 886, p. 87; 911, p. 144; 941, p. 177; 949, p., 248; *991, p. 195; 1021, p. 175). Half a mile inland from Kaunakakai.

Date	Water level		Date	Water level		Date	Water level	
	A	B		A	B		A	B
Jan. 15	0.75	27.25	May 15	1.00	27.00	Sept. 15	(a)	....
Feb. 15	.83	27.17	June 15	.83	27.17	Oct. 15	(a)	....
Mar. 15	1.00	27.00	July 15	.83	27.17	Nov. 15	(a)	....
Apr. 15	.92	27.08	Aug. 15	.92	27.08	Dec. 15	(a)	....

a Well clogged with rubbish.

Kamalo well (*845, p. 63; 886, p. 87; 911, p. 177; 949, p. 248; *991, p. 195; 1021, p. 176). Half a mile northeast of Kamalo wharf.

Jan. 15	1.92	38.08	May 15	1.67	38.33	Sept. 15	1.67	38.33
Feb. 15	1.83	38.17	June 15	1.67	38.33	Oct. 15	1.50	38.50
Mar. 15	1.75	38.25	July 15	1.67	38.33	Nov. 15	1.50	38.50
Apr. 15	1.67	38.33	Aug. 15	1.83	38.17	Dec. 15	1.67	38.33

Ualapue well (*845, p. 63; 886, p. 87; 941, p. 177; 949, p. 248; 991, p. 195; 1021, p. 176). 2.75 miles east of Kamalo well.

Jan. 15	3.67	39.33	May 15	3.67	39.33	Sept. 15	3.67	39.33
Feb. 15	3.83	39.17	June 15	3.67	39.33	Oct. 15	3.67	39.33
Mar. 15	3.67	39.33	July 15	3.75	39.25	Nov. 15	3.75	39.25
Apr. 15	3.67	39.33	Aug. 15	4.00	39.00	Dec. 15	3.75	39.25

ISLAND OF LANAI

The water level in Maunalei shaft 1 varied from a low of 2.33 feet in September to a high of 2.67 feet in December. The net change from December 1, 1944, to December 1, 1945, was a gain of 0.19 foot. The low state, at 2.33 feet, was, however, 0.17 foot lower than the lowest during 1944.

A new well (drilled well 1), was completed during November 1945, in the Palawai Basin, for the Hawaiian Pineapple Company. It is 1,270.85 feet deep and 17.5 inches in diameter. The altitude of the land surface at the well is 1,270 feet above sea level. Water level in the well, on completion, was 814 feet above sea level, and 456 feet below land-surface datum. The water is held at high level in permeable compartments of basaltic lava flows between relatively impermeable dikes.

Maunalei shaft 1 (*817, p. 41; 840, p. 65; 845, p. 63; 886, p. 87; 911, p. 144; 941, p. 178; 949, p. 249; 991, p. 195; 1021, p. 176).

Water level, in feet, 1945
(Records furnished by the Hawaiian Pineapple Co.)

Date	Water level		Date	Water level		Date	Water level	
	A	B		A	B		A	B
Jan. 1	2.55	291.45	May 1	2.54	291.46	Sept. 1	2.33	291.67
Feb. 1	2.56	291.44	June 1	2.43	291.57	Oct. 1	2.54	291.46
Mar. 1	2.50	291.50	July 1	2.35	291.65	Nov. 1	2.38	291.62
Apr. 1	2.43	291.57	Aug. 1	2.35	291.65	Dec. 1	2.67	291.33

ISLAND OF HAWAII

Water levels in the Olaa shaft varied from a low of 12.61 feet above sea level on July 13 to a high of 16.75 feet on April 13, and showed a net decline for the year of 1.43 feet. The records for the year at the Ookala (Kaiwiki) shaft are incomplete due to suspension of measurements during construction of a new tunnel and pump chamber to supply water to the mill and a new cane cleaning plant.

Two pumps with capacities of 2,500 and 250 gallons per minute were installed during February in the new shaft at Paauilo. It is estimated that about 7,315,000 gallons were pumped during 1945, but actual operation will not begin until 1946. On December 31 the water level was 3.17 feet above sea level. From August 29-31 the chloride content ranged from 58 to 76 parts per million.

The tunnel being driven in Honokane Valley, Kohala Mountain, by the Kohala Ditch Company, had reached a length of 1,487 feet on December 31 and was discharging about 5 million gallons of water daily. Its total discharge during 1945 was approximately 1,800 million gallons.

The total amount of ground water pumped during the year on the island of Hawaii was 4,638.67 million gallons. This increase of 2,737.89 million gallons over 1944 is largely attributable to greater pumpage by the Kohala Sugar Company, although pumpage also increased about threefold at Olaa and Okala.

Olaa shaft (*817, p. 42; 840, p. 66; 845, p. 64; 886, p. 88; 911, p. 145; 941, p. 178; 949, p. 249; *991, p. 196; 1021, p. 177).

Water level, in feet, 1945
(Records furnished by George Duncan, Olaa Sugar Co., Ltd.)

Date	Water level		Date	Water level		Date	Water level					
	A	B		A	B		A	B				
Jan.	5	16.32	203.68	May	25	14.92	205.08	Sept.	14	13.40	206.60	
	12	15.90	204.10		1	14.66	205.34		21	13.44	206.56	
	19	15.79	204.21		8	14.52	205.48		28	13.49	206.51	
Feb.	26	15.46	204.54	July	15	14.34	205.66		5	13.36	206.64	
	9	14.94	205.06		22	14.11	205.89		12	13.36	206.64	
	2	14.36	205.64		29	13.99	206.01		19	13.36	206.64	
Mar.	9	14.73	205.17		6	13.91	206.09		26	13.28	206.72	
	16	14.94	205.06		13	12.61	207.39		Nov.	2	13.48	206.52
	23	15.65	204.35		20	13.51	206.49			9	13.35	206.65
	30	15.48	204.52		27	13.32	206.68			16	13.86	206.14
	6	15.36	204.64	Aug.	3	13.28	206.72			23	13.53	206.47
Apr.	13	16.75	203.25		10	13.23	206.77			30	13.59	206.41
	20	15.21	203.79		17	13.09	206.91		Dec.	7	15.26	204.74
	27	15.94	204.06		24	13.19	206.81			14	15.69	204.31
May	4	15.73	204.27	Sept.	31	13.32	206.68			21	15.30	204.70
	11	15.50	204.50		7	13.40	206.60			28	15.19	204.81
	18	15.17	204.83									

Okala shaft (*840, p. 66; 845, p. 64; 886, p. 88; 911, p. 145; 941, p. 178; 949, p. 250; *991, p. 196; 1021, p. 177).

Water level, in feet, and chloride, in parts per million, 1945
(Records furnished by David E. Larsen, manager, Kaiwaki Sugar Co.)

Date	Water level		Chloride	Date	Water level		Chloride
	A	B			A	B	
Mar. 20	a 4.92	a 295.08	25	Oct. 4	....	.....	23
28	a 5.08	a 294.92	16		9	.....	18
July 3	a 4.25	a 295.75	18		11	4.92	295.08
14	a 4.92	a 295.08	23		16	....	21
28	a 4.92	a 295.08	21		23	....	22
Aug. 10	b 4.83	b 295.17	16	Nov. 10	c 5.17	c 294.83*	c 35
21	....	.....	15		d 4.67	d 295.33	d 24
29	5.42	294.58	12		13	....	d 26
Sept. 5	....	.....	14		c 5.50	c 294.50	c 47
11	....	.....	20		21	d 4.67	d 295.33
20	....	.....	21			d 27	
28	....	.....	23		c 4.92	c 295.08	c 41

a Two pumps operating.

b One pump operating.

c Old (domestic supply) tunnel.

d Measurement made simultaneously with c, in new (can cleaning plant) tunnel.

ISLAND OF KAUAI

Artesian heads in Kauai wells 14N and 35 showed net declines for the year of 0.08 and 0.09 foot; those in wells 2F, 8, and 37 showed net gains of 0.01, 0.28, and 0.59 foot. The head in well 8 thus partly recovered from the loss shown in 1944, but the chloride content remained high, ranging from 115 parts per million to the all-time high of 146 parts per million. Chloride also attained all-time highs in other wells, reaching 623 parts per million in well 35 on February 15, 353 parts per million in well 37 on June 15, and 499 parts per million in well 56 on June 15. The increase in total ground-water pumpage on Kauai was small, amounting to only 4.14 million gallons.

Artesian head, in feet, and chloride, in parts per million, in typical artesian wells on Kauai, 1945

Well 2F (*840, p. 67; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 250; *991, p. 197; 1021, p. 179). Kealia, Kauai. Records furnished by East Kauai Water Co. .

Date	Head	Chloride	Date	Head	Chloride		
	A	B		A	B		
Jan. 24	9.92	+1.87	40	July 24	9.34	+1.29	43
Feb. 24	9.44	+1.39	46	Aug. 29	9.58	+1.53	47
Mar. 21	9.42	+1.37	43	Sept. 22	9.44	+1.39	45
Apr. 21	9.32	+1.27	44	Oct. 22	9.49	+1.44	45
May 24	9.20	+1.15	44	Nov. 23	9.82	+1.77	46
June 20	9.40	+1.35	46	Dec. 22	9.77	+1.72	46

Well 7 (*840, p. 68; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 250; *991, p. 197; 1021, p. 179). Wailua, Kauai.

Feb. 27	....	....	149	Aug. 11	....	....	153
Apr. 27	....	....	149	Sept. 30	....	....	161
June 30	....	....	156	Nov. 28	....	....	156

Well 8 (*840, p. 68; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 250; *991, p. 197; 1021, p. 179). Wailua, Kauai.

Feb. 27	8.49	3.46	135	Aug. 11	10.10	1.85	146
Apr. 27	9.81	2.14	115	Sept. 30	10.29	1.66	150
June 30	9.95	2.00	124	Nov. 28	10.05	1.90	130

Well 14N (*840, p. 68; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 250; *991, p. 197; 1021, p. 179). Koloa, Kauai. Records furnished by the Koloa Sugar Co.

Jan. 31	a 10.02	a 76.02	44	July 27	a 9.85	a 76.17	45
Feb. 28	a 8.85	a 77.17	41	Aug. 29	a 9.85	a 76.17	44
Mar. 31	a 9.60	a 76.42	43	Sept. 28	a 9.02	a 77.00	45
Apr. 27	30.02	56.00	42	Oct. 31	28.69	57.33	43
May 29	29.70	56.32	..	Nov. 30	26.94	59.08	..
June 28	a 9.85	a 76.17	42	Dec. 31	29.69	56.33	..

a Pumping.

Artesian head, in feet, and chloride, in parts per million, in the Kekaha Sugar Co.'s wells on Kauai, 1945
(Records furnished by Kekaha Sugar Co.)

Well 35 (*840, p. 68; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 251; *991, p. 198; 1021, p. 179). Near Kekaha.

Date	Head		Chloride	Date	Head		Chloride
	A	B			A	B	
Jan. 15	8.70	+0.88	364	July 16	8.52	+0.70	388
Feb. 15	8.62	+.80	623	Aug. 17	8.44	+.62	522
Mar. 15	8.24	+.42	534	Sept. 17	8.46	+.64	522
Apr. 16	8.22	+.40	431	Oct. 15	8.12	+.30	376
May 15	8.63	+.81	332	Nov. 17	8.40	+.58	382
June 15	8.48	+.66	717	Dec. 18	8.40	+.58	461

Well 37 (*840, p. 68; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 179; 949, p. 251; *991, p. 198; 1021, p. 179). 4 miles northwest of Kekaha.

Jan. 15	10.48	+0.50	176	July 16	9.26	0.72	164
Feb. 15	9.57	.41	291	Aug. 17	9.38	.60	261
Mar. 15	9.15	.83	285	Sept. 17	9.00	.98	200
Apr. 16	9.42	.56	187	Oct. 15	8.93	1.05	206
May 15	9.58	.40	182	Nov. 17	9.25	.73	182
June 15	9.29	.69	353	Dec. 18	9.68	.30	200

Well 56 (*840, p. 68; 845, p. 65; 886, p. 89; 911, p. 146; 941, p. 180; 949, p. 251; *991, p. 198; 1021, p. 180). 7.5 miles northwest of Kekaha. No water-level records available in 1945.

Date	Chloride	Date	Chloride	Date	Chloride
Jan. 15	285	May 15	207	Aug. 17	273
Feb. 15	363	June 15	499	Sept. 17	279
Mar. 15	291	July 16	273	Oct. 15	279
Apr. 16	267				

PUMPAGE

The following table gives the draft from all important ground-water pumping plants in the Territory of Hawaii. The wells represented include irrigation, domestic, and industrial wells. The draft from all other drilled wells entering the main basalt aquifer of Oahu is not included but is estimated to be about 30 million gallons a day. The numbers in parentheses in the records for Oahu and Maui are those used by the Federal Geological Survey.

The total draft during 1945 was 232,817.00 million gallons. This was 10,499.76 million gallons more than in 1944. Of this total 4,465.31 million gallons was pumping on Oahu, 3,280.34 million gallons on Maui, and 2,737.89 million gallons on Hawaii. Severe drought is largely responsible for this rise. Molokai was the only island which showed a slight decrease in draft for the year.

The Honolulu Suburban Water System received 165 million gallons of spring and tunnel water by gravity supply from the Waianae Plantation power house in Waianae Valley in exchange for water used by that plantation from the city and county shaft at Lualualei (shaft 2). The following gravity supplies were also used by the Suburban Water System: Haiku tunnel, Kailua, 1,062 million gallons; Luluku tunnels and springs, Kailua, 306 million gallons; Waimanalo city and county tunnels, 82 million gallons.

The United States Navy used an estimated 125.44 million gallons of water from Luaualei tunnel, on Oahu, in addition to that listed. At Kahului, Maui, 368.00 million gallons of ditch water was purchased from the Hawaiian Commercial and Sugar Company. This water was purified by the Navy and some of it sold back to the plantation for domestic use. The balance was used at the naval air station at Kahului.

The new tunnel being excavated by the Waianae Plantation, in Makaha Valley, Oahu, was flowing at a rate of 1.8 million gallons a day on December 31.

Ground-water draft, in millions of gallons, from wells in the
 Territory of Hawaii, 1945
 (Data furnished by owners)

Island of Hawaii		Island of Kauai--Continued	
Kaiwiki Sugar Co.		Lihue Plantation Co.	
Domestic tunnel	a 71	Domestic shaft	a 420
Cane cleaning plant		Kelia wells	a 150
tunnel	<u>al60</u>	Hanamaula shaft	a 6 <u>576</u>
	231		
Hamakua Mill Co.	a 7		Total 5,930
Kohala Sugar Co.	1,135	Island of Lanai	
Hoea pump	1,135	Hawaiian Pineapple Co.	
Kohala pump	1,986	Tunnels 1 and 2	119
Waikane pump	<u>601</u>	Shaft 2	<u>95</u> 214
	3,722		
Olaa Sugar Co.	679	Island of Maui	
Total	4,639	Hawaiian Commercial & Sugar Co.	
b/		Pump 1 (14) (Kihei)	0
Island of Kauai		Pump 2 (25)	4,189
County of Kauai		Pump 3 (22)	3,628
Waimea water works	173	Pump 4 (24)	2,783
Hanapepe water works	<u>89</u>	Pump 5 (19)	1,538
	262	Pump 6 (18)	5,106
Kekaha Sugar Co.		Pump 7 (16)	5,023
Well 9	512	Pump 8 (17)	4,004
Wells K-1 to K-5	922	Pump 3 (15) (Kihei)	5,926
Wells M-1 to M-12	1,577	Central power plant	
Kekaha pump	732	(20)	<u>3,461</u> 35,658
Mana pump	98		
Waiawa pump	<u>682</u>		
	4,523		
Koloa Sugar Co.	569	Maui Agricultural Co.	
3 pumps		Lower Paia (30)	4,512
		(pumps 1, 5, & 6)	
		Kaheka (27)	3,349
		(pumps 3 & 4)	

† See footnotes at end of table.

Ground-water draft, in millions of gallons, from wells in the
Territory of Hawaii, 1945--Continued
(Data furnished by owners)

Island of Maui--Continued		Island of Oahu--Continued	
Maui Agricultural Co.--Continued		Ewa Plantation Co.--Continued	
Pump 7 (28)	4,488	Pump 11 (276)	1,232
Maliko (32)	1,754	Pump 12 (276)	1,410
(pumps 10 & 11)		Pump 13 (276)	35
Pump 12 (31)	1,655	Pump 15 (shaft 3)	3,326
Mill (29)	2,222	Pump 16 (shaft 3)	3,032
(pumps 8 & 13)	17,980	Pump 20 (dug well 20)	3,582
Maui Pineapple Co.		Pump 21 (dug well 21)	334
Kahului Cannery	a 100	Pump 22 (dug well 22)	347
(13)		Pump 23 (dug well 23)	2,643
Pioneer Mill Co.		Pump 24 (254)	678
Pump A (9)	1,308	Pump 25	411
Lahaina		Hawaiian Electric Co.	37,807
Pump B (8)	2,089	Wells & tunnel	
Lahaina		(199-1 & shaft 8)	3,675
Pump C (7) Mill	c 2,361	Kaluaoopu Spring	2,506
Pump D (3)	d 1,893	Honolulu Board of Water Supply	6,181
Kaanapali		Kalihi Station	3,166
Pump E (9)	(e)	(shaft 6)	
Lahaina		Weialae Station	195
Pump F (2)	1,130	(shaft 7)	
Honokowai		Halawa Station	2,428
Pump G (4) Hahakea	863	(shaft 12)	
Pump H (3)	1,945	Kaimuki Station (7)	1,817
Kaanapali		Beretania Station	3,891
Pump I (6) Wahikuli	125	(88)	
Pump M (5) Kahoma	2,330	Kalihi Station (128) 2,432	13,929
Pump N (10) Olowalu	737	Honolulu Plantation Co.	
Pump O (11) Olowalu	179	Pump 1 (185)	m 665
Pump P (12)	487	Pump 2 (196)	1,132
Ukumehame	15,447	Pump 3 (186)	m 3,734
U. S. Navy		Pump 4 (197)	2,814
Puunene air base (shaft 33)	a 500	Pump 5 (189)	1,905
		Pump 6 (Kalauao Spring)	594
Total	69,685	Pump 16 (199-1)	o 3,571
Island of Molokai		Pump 21 (shaft 13)	986
U. S. Army		Honolulu Suburban Water System	15,401
Kamakana well	4	Aiea (190-1B)	17
County of Maui		Pearl City (shaft 9)	243
Kamakana well	2	Pearl City (202)	144
Other wells	a 1	Waipahu (241)	151
Total	7	Nanakuki (dug well 16)	16
Island of Oahu		Lualualei (shaft 2) r/ 72	
Ewa Plantation Co.		Waialua (well 333)	145
Pump 1 (268)	1,374	Hauula (394)	20
Pump 2 (257)	1,029	Kaaawa (shaft 10)	63
Pump 3 (264)	3,076	Kahuku Plantation Co.	871
Pump 4 (264)	2,926	Pump 1 (353)	1,235
Pump 5 (259)	2,171	Pump 2 (341)	2,757
Pump 6 (259)	3,309	Pump 3 (362)	2,049
Pump 7 (265)	1,693	Pump 5 (352)	2,165
Pump 8 (270)	i 546	Pump 6 (362-1)	397
Pump 9E(273)	473	Pump 7 (363)	206
Pump 9F(273)	af 1,692		
Pump 10(276)	2,488		

† See footnotes at end of table.

Ground-water draft, in millions of gallons, from wells in the
Territory of Hawaii, 1945--Continued
(Data furnished by owners)

Island of Oahu--Continued		Island of Oahu--Continued	
Kahuku Plantation Co.--Continued		Waialei Training School	
Pump 8 (357)	441	Sunset Beach (337-1	9
Pump 12 (361)	149	& 2)	
Pump 14 (338)	a 355	School pump (337-1	29
Pump 15 (346)	162	& 2)	
Pump 17 (362)	157		38
Pump 20 (377)	789		
Pump 23 (387)	115		
Pump 25 (373)	119		
Pump 26 (392)	196		
Pump 27 (396)	493		
Mill pump (355)	a 968	12,753	
Oahu Sugar Co.			
Pump 1 (247)	2,232		
Pump 2 (249)	2,001		
Pump 3 (249)	902		
Pump 4 (248)	1,164		
Pump 4B (tunnel)	1,321		
Pumps 5 & 5B (274)	2,360		
Pump 6 (239)	2,237		
Pump 6B (239)	890		
Pump 7 (246)	2,545		
Pumps 8 & 8A (Waikiki Spring)	1,893		
Pump 9 (Waiawa Spring)	283	17,828	
Private wells in Honolulu		11,522	
U. S. Army			
Schofield (shaft 4)	2,570		
Kahuku air base (339)	161	2,731	
U. S. Navy			
Aiea (shaft 5)	3,453		
Red Hill (shaft 11)	6,818		
Barbers Point (shaft 14)	984		
Aiea wells (187)	2,068		
Wahiawa radio station (330-2)	165		
Moanalua (well 156)	0		
Pearl City well	627		
Ewa Junction	a 4	14,119	
Wahiawa Water Co., Ltd.			
Deep well (330-3)		33	

a Estimated.

b McBryde Sugar Co. not included. Three pumps in Hanapepe Valley and one pump at Lawai Valley pump ground and surface water. It is not possible to separate the ground-water draft from the surface water.

c Of this, 1,110.19 million gallons was wasted.

d Of this, 129.37 million gallons was wasted after being used for cooling.

e Abandoned.

f Pumps 9A, B, and C were abandoned in December 1944. Water from wells 273A, B, C, D, and F now flows directly into a surface-water tunnel and is pumped, together with surface water, by pump 9F.

i Of this, 230.87 million gallons was sold to the United States Navy.

m The pumping at Honolulu Plantation Co. pumps 1 and 3 includes 2,111.71 million gallons sold to the United States Navy.

- o Includes an inseparable amount from Kaluaopu Spring, obtained from the Hawaiian Electric Co.
- r This shaft was pumped by the Waianae Co. for irrigating sugarcane under an agreement whereby the Honolulu Suburban Water System receives water from the mountain tunnels in exchange.
- t Includes pumpage from wells belonging to military establishments in Honolulu, except for well 156 (Moanalua) which is listed under United States Navy.
- w 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 and C. S. Conover

PROGRAM OF WORK

Investigation of ground-water resources in various areas in New Mexico was continued in 1945 in cooperation with the State engineer of New Mexico. Studies of ground water in New Mexico have been largely confined to areas where it is used for irrigation and have been in progress in certain areas for many years. Published reports on these investigations are listed in Part 1, General Discussion, for each county.

Measurement of water levels or artesian head in observation wells constitutes an important part of the ground-water program. A large number of observation wells are measured in January or February each year when recovery from pumping effects of the previous pumping season has taken place and comparison with water levels in former years can best be made. Measurements are also made in selected groups of observation wells at approximately 2-month intervals in order to note seasonal changes in water levels caused by precipitation and changes in pumping schedules. Estimates of the amount of ground water pumped during the year in each area are made to determine the magnitude of the effect of artificial withdrawal on the yearly changes in water level.

In all, 2,528 measurements of water level were made during the year in about 960 observation wells, exclusive of Hidalgo County, and including 294 measurements of water level made in 29 of the observation wells that were equipped with water-stage recorders for which daily records are presented.

FLUCTUATIONS OF WATER LEVEL

Water levels rose during the first few months of 1945 in areas in New Mexico where ground water is pumped for irrigation but began falling in March and April, somewhat earlier than usual, as a result of early pumping in the irrigated areas occasioned by the lack of rainfall. In general, water levels continued to decline until late September, somewhat later than in the previous year, after which rises occurred during the remainder of the year. The precipitation in 1945 throughout New Mexico was considerably below normal, which occasioned the early beginning and late ending of the pumping season as well as the extra water requirements of crops. As a result of the deficient precipitation and increased pumpage, water levels in all areas irrigated by ground water in New Mexico showed an unusually large net yearly decline and in most areas either reached or were approaching the lowest levels on record. Thus the large rises that occurred in water levels in early 1942 as a result of the excessive rains in 1941 had been wiped out or were nearly wiped out by the end of 1945.

WELL-NUMBERING SYSTEM

The system of numbering wells in New Mexico, used in all counties except Hidalgo and Sierra, is based on the common subdivisions in sectionized land, and, by means of it, the well number, in addition to designating the well, locates its position to the nearest 10-acre tract in the land net. The number is divided into four segments by periods. The first segment denotes the township north or south of the New Mexico base line; the second denotes the range east or west of the New Mexico principal meridian; and the third denotes the section. In an area such as Roosevelt County, where wells are situated both north and south of the base line, an N is added to the first segment of the well number if the township is north of the base line, but no letter is added if the township is south of the base line. In areas in which no confusion can arise, the direction north or south of the base line or east or west of the meridian is not given.

The fourth segment of the number, which consists of three digits, denotes the particular 10-acre tract in which the well is situated. For this purpose, the section is divided into four quarters, numbered 1, 2, 3, and 4, in the normal reading order, for the northwest, northeast, southwest, and southeast quarters, respectively. The first digit of the fourth segment

gives the quarter section, which is a tract of 160 acres. Similarly, the quarter section is divided into four 40-acre tracts numbered in the same manner, and the second digit denotes the 40-acre tract. Finally, the 40-acre tract is divided into four 10-acre tracts, and the third digit denotes the 10-acre tract. Thus, well 12.36.24.123 in Lea County is located in the SW_{1/4}NE_{1/4}NW_{1/4} sec. 24, T. 12 S., R. 36 E. If a well cannot be located accurately to a 10-acre tract, a zero is used as the third digit, and if it cannot be located accurately within a 40-acre tract, zeros are used for both the second and third digits. If the well cannot be located more closely than the section, the fourth segment of the well number is omitted. When it becomes possible to more accurately locate a well in whose number zeros have been used, the proper digit or digits are substituted for the zeros. In Water-Supply Paper 911 and earlier reports the digits corresponding to unknown 10-acre and 40-acre tracts were simply omitted, but this practice caused some confusion in cataloging the wells. In Water-Supply Paper 941 and subsequent reports, wells the last segment of whose numbers end in one or two zeros correspond to wells whose numbers in earlier reports are the same except for the omission of the last one or two zeros. Letters a, b, c, are added to the last segment to designate the second, third, fourth, and succeeding wells in the same 10-acre tract.

The following diagram shows the method of numbering the tracts within a section.

111	112	121	122	211	212	221	222
(1)		(2)		(1)		(2)	
113	114	123	124	213	214	223	224
		[1]			[2]		
131	132	141	142	231	232	241	242
(3)		(4)		(3)		(4)	
133	134	143	144	233	234	243	244
311	312	321	322	411	412	421	422
(1)		(2)		(1)		(2)	
313	314	323	324	413	414	423	424
331	332	341	342	431	432	441	442
(3)		(4)		(3)		(4)	
333	334	343	344	433	434	443	444

WELL DESCRIPTIONS, RECORDS OF ARTESIAN HEAD, AND WATER-LEVEL MEASUREMENTS

General discussion

Measurements for most of the observation wells in New Mexico are listed under the counties in which the wells are situated. Two groups of measurements--those of artesian head in the Roswell artesian basin and those of water level in the artesian-intake area of that basin--are listed under the common heading "Chaves and Eddy Counties (Roswell Artesian Basin)."

The data for the counties, Lea, Luna, Quay, Roosevelt, Sierra, and Torrance, are presented in five parts as outlined below. The data for shallow water-level measurements in Chaves and Eddy Counties are also presented in five parts with the exception of part 1, which covers both counties. The five parts are as follows:

Part 1. General discussion.

Part 2. Water levels in January 1945, and highest and lowest recorded water levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders.

Part 5. Miscellaneous data concerning observation wells.

Part 1 for each county gives the number of observation wells, the number of measurements made on the wells during the year, the program of work, the amount of pumpage, and a general discussion of the fluctuations of water level during the year. Also given is a list of water-supply papers in which records of water levels in observation wells in the particular county have been previously published. The descriptions of wells are, in general, given in the water-supply paper covering the year in which the record begins (next to last column in Part 2). In the case of a few wells whose records began in the latter part of a year, the descriptions have been published in the water-supply paper for the year previous to that given in Part 2 as the year when record began. Also, in a very few cases, the description of a well was published in the water-supply paper for the year succeeding that given in Part 2 for the year when record began.

Part 2 lists the water levels in January 1945 for all observation wells, the change since the measurements of the preceding January, and lists for comparison the highest and lowest recorded levels during January in past years, along with the length of record. For years in which January readings were not made, February readings were used if available. If any reading is used other than January or February, a footnote is added stating the month.

The lowest recorded level as published for a well is a nonpumping level, that is, a static level, as far as could be determined, except in a few instances where windmills were pumping and the water level was not lowered appreciably by the pumping. The year of beginning of record is considered as the first year in which a January or February measurement was made and the years of missing record are succeeding years in which a January or February measurement was not made or when the measurement made was affected significantly by pumping. For wells having water-stage recorders, the highest and lowest reported levels are taken from the recorder record for the month of January, when available, except in Torrance County where the levels for February were used. However, the measurement reported for the present year and the yearly change are taken from the tape measurements in order to keep the records of these wells comparable with those of observation wells not equipped with recorders. The lowest reported level when taken from recorder records is the lowest of the highest daily water levels.

In Part 2 the years are all in the present century and the "19" of the year and also the apostrophe commonly used to indicate omission of the "19" are omitted for the sake of brevity. The year 1942, for instance, is shown simply as 42.

This part of the report shows in clear form the current and past changes in the amount of water stored underground in the vicinity of the well. It presents the most critical data concerning the pumping district, that is, the current status of the ground-water reserve.

Part 3 gives the data for wells measured at fixed periods, generally bimonthly, throughout the year. The readings for January are given also in Part 2. Only the last name of the owner is given in Part 3 but the full name may be found in Part 2. These records show the seasonal trend of water levels in the area.

Part 4 presents the data for the wells on which automatic water-stage recorders are maintained. These show the day-to-day fluctuation of typical wells. In some wells they serve to show the effects of precipitation in recharging the ground-water reservoir, in others the effects of transpiration, and in others the effects of nearby pumping.

Part 5 lists miscellaneous data concerning the observation wells, such as changes in ownership, descriptions of new wells and measuring points, and a few miscellaneous water-level records that do not conform to the other tables. Reference to Part 5 and to other parts is given in column 3 in Part 2.

In the following data on New Mexico, except for Hidalgo County, 6 standard footnotes have been employed as follows:

- a Pumping.
- b Pumping recently.
- c Nearby well pumping.
- d Nearby well pumping recently.
- e Dry at depth given.
- f From recorder chart.

Records of mean monthly and mean annual artesian head in the Roswell basin are expressed as water level in feet above mean sea level. All other measurements are given in feet below a precisely established land-surface datum which approximates closely the land surface at the well. Where measurements are made from a measuring point from which the tape cannot hang vertically, the correction to apply to the tape reading to reduce it to the land-surface datum is stated in the description of the measuring point; whereas if the tape hangs vertically throughout the whole length, the distance of the measuring point above the land-surface datum is stated in its description.

CHAVES AND EDDY COUNTIES (ROSWELL ARTESIAN BASIN)

By C. S. Conover

Part 1. General discussion

The program of maintaining records of water level and artesian head in the Roswell artesian basin was continued in 1945 in cooperation with the State engineer of New Mexico. Most of the Roswell artesian basin is in Chaves County, but a considerable part lies in northern Eddy County.

The first intensive investigation by the Federal Geological Survey of the artesian-water resources of the Roswell artesian basin was begun by A. G. Fiedler and S. S. Nye in 1925, and an intensive investigation of the

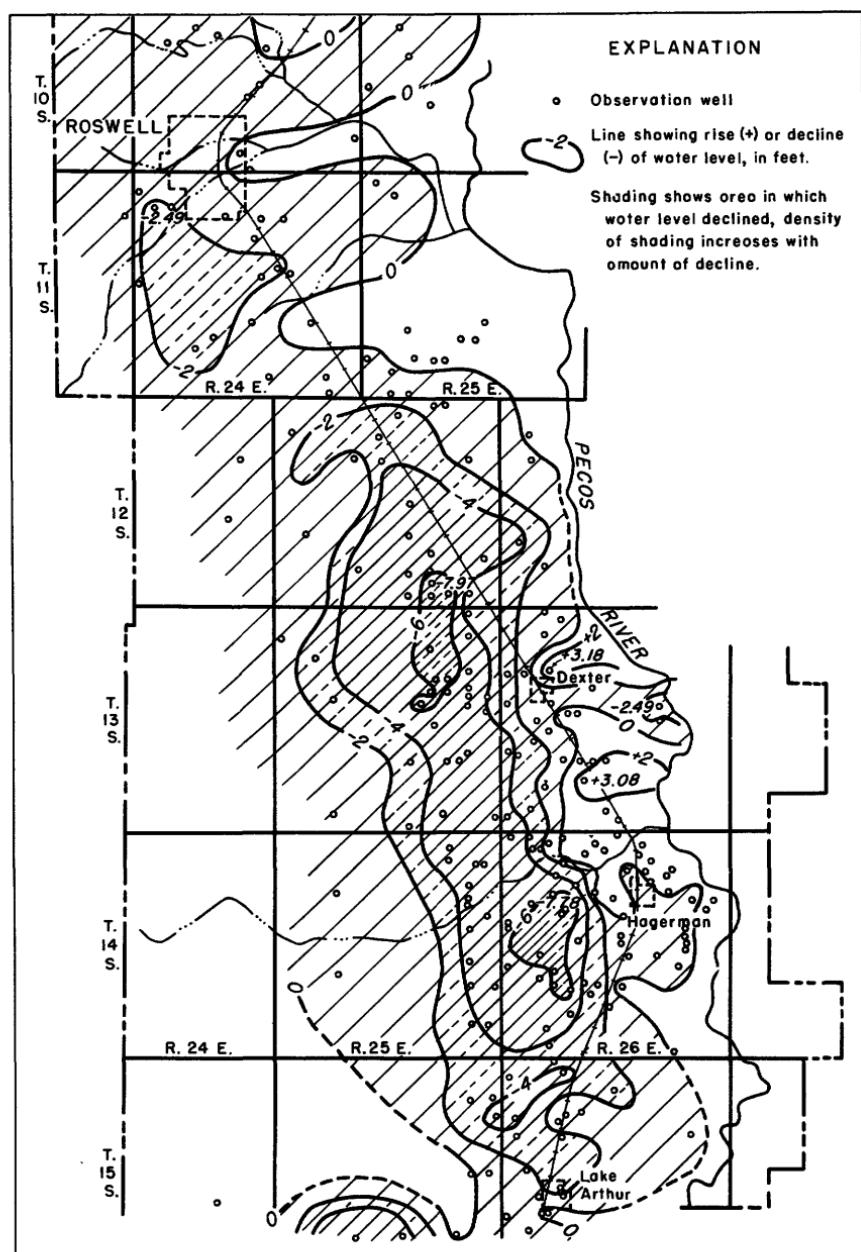


Figure 9.--Map of northern part of Roswell Basin, in Chaves County, N. Mex., showing changes in water level from January 1945 to January 1946.

shallow-water resources was begun by A. M. Morgan in 1937. The findings of these investigations have been published in Geological Survey Water-Supply Paper 639 and in the 7th to 13th biennial reports of the State engineer of New Mexico. A comprehensive report of the hydrology and agricultural development of the Pecos Valley has been published by the National Resources Planning Board as part 10 of the Regional Planning series, "The Pecos River Joint Investigation in the Pecos River Basin in New Mexico and Texas," 1942. Data on artesian head and shallow-water levels have been published in past years in Geological Survey water-supply papers as follows:

Year of record	Water-supply paper	Artesian head	Page numbers Shallow-water levels
1925-35	777	109-114	.....
1936	817	195-197	.....
1937	840	252-254	.....
1938	845	279-282	.....
1926-38	845	.....	282-300
1939	886	376-378	378-422
1940	911	152-154	154-174
1941	941	186-188	190-212
1942	949	259-262	264-293
1943	991	206-209	210-244
1944	1021	188-195	199-232

Shallow water-level measurements from 1926 to 1938, Water-Supply Paper 845, for Chaves and Eddy Counties are given in feet below land-surface datum and not below measuring point as captioned.

Precipitation and pumpage

The precipitation for 1945, as reported by the U. S. Weather Bureau, in the Roswell basin was below normal at all stations. The precipitation at Roswell was 6.88 inches, 46 percent of normal; at Hagerman, 11.62 inches, 89 percent of normal; and at Artesian, 6.40 inches, 50 percent of normal. The deficiency of precipitation was greater through the growing season, April through September, than for the year as a whole, amounting to only 45 percent of normal at Roswell, 79 percent of normal at Hagerman, and 40 percent of normal at Artesia. During the growing season, only in August was there near-normal precipitation, which occurred mainly near the end of the month. An excess of precipitation occurred during July at Hagerman as a result of two thundershowers during the first week. October, after the growing season, was, in general, a month of excess precipitation as a result of thundershowers in the first 10 days.

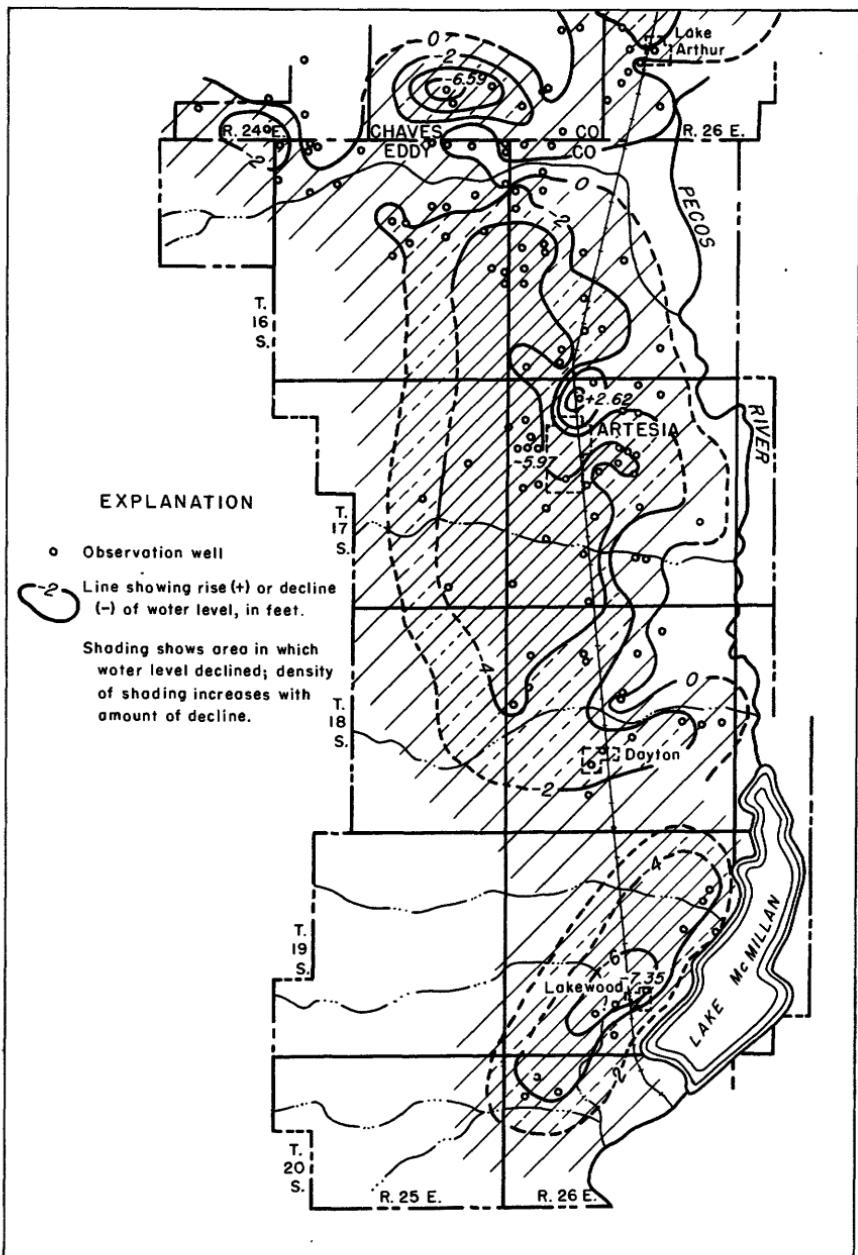


Figure 10.--Map of southern part of Roswell Basin, in Chaves and Eddy Counties, N. Mex., showing changes in water level from January 1945 to January 1946.

Precipitation and departures from normal, in inches, at stations in Roswell basin and vicinity, 1945

Month	Roswell		Hagerman		Artesia		Carlsbad	
	Precip- itation	Depart- ture	Precipi- tation	Depart- ture	Precipi- tation	Depart- ture	Precipi- tation	Depart- ture
Jan.	0.03	-0.50	0.27	-0.16	0.70	+0.34	0.63	+0.29
Feb.	T	-.57	.00	-.36	.00	-.51	T	-.39
Mar.	.19	-.55	.26	-.27	.00	-.64	.00	-.55
Apr.	.15	-.74	1.11	+.26	T	-.98	T	-.80
May	.02	-1.07	T	-2.09	.05	-1.42	.46	-.73
June	.33	-1.34	.18	-1.79	.00	-1.28	.11	-1.52
July	1.45	-.81	3.25	+1.66	.40	-1.57	1.76	-.39
Aug.	1.79	-.36	1.87	+.09	2.00	+.47	2.27	+.47
Sept.	.79	-1.32	1.55	-.31	1.15	-.56	1.34	-.57
Oct.	1.39	-.03	2.43	+1.67	1.65	+.41	6.13	+4.72
Nov.	.00	-.85	.00	-.38	.00	-.57	.00	-.53
Dec.	.74	+.08	.70	+.19	0.45	-.13	.03	-.55
Total	6.88	-8.06	11.62	-1.49	6.40	-6.44	12.73	-.55
Apr.- Sept.	4.53	-5.64	7.96	-2.18	3.60	-5.34	5.94	-3.54

T - Trace.

The deficiency of precipitation during 1945 was greater than during 1943, also a year of deficient precipitation, by about 13 percent. This large deficiency of precipitation caused an appreciable increase in the amount of water pumped for irrigation during 1945. A preliminary study of the records of power and fuel used in 1945 for 308 wells for which records were also available in 1943 and of the pumpage from 63 typical rated wells indicates that about 11 percent more water was pumped in 1945 than in 1943. Apparently there was a slight decrease in the acreage irrigated in 1945 compared to 1944 and 1943. It is probable, therefore, that about 200,000 acre-feet of artesian water and about 115,000 acre-feet of shallow water were used for irrigation in 1945.

ARTESIAN WELLS

The continuous water-stage recorders on the six artesian observation wells reported in previous years were kept in operation in 1945. A total of 88 measurements was made in these wells in 1945, and the records obtained were used to compute the mean monthly and mean annual artesian heads, as has been done in previous years. The mean monthly head was computed by averaging the daily maximum and minimum heads throughout the month. The mean annual head is the average of the mean monthly heads. Values for missing records which occurred within a month were obtained by simple interpolation. In cases where the record was missing for a number of days extending from one month to the next month, or as in two cases where the

record for a whole month was missing, estimated values were inserted for the first and last days of a month, the remaining missing record within the month being obtained by simple interpolation. The estimated values inserted for the first and last days of a month were obtained by using as a guide the change of water level for the appropriate period as shown in the respective well in the previous year. This method takes into account somewhat the variation in rate of change of water level during different periods. The number of months in which there were less than 10 days' record was: 1 for the Orchard Park well, 4 for the Greenfield well, and 2 for the Artesia well. Means for these months are not exact, but are given in order that the record be continuous. A day of record is considered as one in which both a maximum and a minimum water-level reading were recorded.

In the full-page table on the following page the mean monthly and mean annual water levels are given in feet above mean sea level in conformity to previously published reports but the daily maximum water levels are given in feet below land-surface datum.

Mean monthly and mean annual water levels in artesian wells in 1945 and highest and lowest mean annual and mean monthly water levels, in feet above mean sea level

Name Location number	Berrendo	Berrendo- Smith	Mountain View	Orchard Park	Greenfield	Artesia
Month	Days of record	Water level	Days of record	Water level	Days of record	Water level
Jan.	31	3571.83	31	3572.64	31	3571.18
Feb.	28	3572.09	12	3571.64	12	3570.01
Mar.	31	3570.78	10	3569.30	10	3567.41
Apr.	14	3568.45	30	3566.74	30	3563.89
May	29	3568.30	31	3566.74	31	3562.95
June	30	3566.22	30	3564.53	30	3560.95
July	31	3565.98	31	3565.99	31	3559.96
Aug.	31	3564.87	31	3563.20	31	3558.40
Sept.	30	3565.55	30	3563.87	30	3559.45
Oct.	31	3568.36	11	3568.20	31	3564.59
Nov.	30	3569.56	30	3569.50	30	3567.02
Dec.	31	3570.49	31	3570.38	31	3567.90
Mean annual:	347	3568.53	308	3567.56	328	3564.47
Mean annual:	Water level	Date	Water level	Date	Water level	Date
Highest	3571.8	1942	3571.0	1942	3569.6	1942
Lowest	3563.0	1941	3566.2	1941	3564.2	1940
Mean monthly:	Water level	Date	Water level	Date	Water level	Date
Highest	3574.8	Jan. 1943	3574.4	Jan. 1942	3573.6	Jan. 1942
Lowest	3560.0	Aug. 1940	3557.9	Aug. 1940	3553.4	Aug. 1945
Beginning of record:	June 1926	June 1940		July 1940	August 1925	May 1940
						April 1931

Records of artesian head

10.24.9.330. Berrendo well.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.47	13.63	13.77	15.48	.....	17.34	19.74	20.78	20.57	18.55	16.71	15.84
2	13.47	13.87	13.84	15.39	.....	17.29	19.62	20.77	20.58	18.45	17.54	15.82
3	13.48	14.55	13.91	16.58	17.46	17.35	19.65	20.84	20.33	18.24	17.56	15.82
4	13.47	13.66	13.90	16.76	17.63	17.29	18.78	21.06	20.44	18.13	16.62	15.81
5	13.41	13.61	13.89	16.90	16.75	17.48	18.64	20.46	20.63	18.04	16.54	15.75
6	13.39	13.52	14.01	.....	16.67	18.69	18.63	20.25	20.10	17.98	16.54	15.72
7	13.39	13.61	14.09	.....	16.52	18.19	18.63	20.32	19.77	17.84	16.49	15.69
8	13.38	13.51	14.15	.....	16.52	19.40	18.51	20.36	20.06	17.77	16.47	15.67
9	13.41	13.45	14.24	.....	16.54	19.71	18.42	21.10	20.07	17.67	16.49	15.67
10	13.39	13.53	14.32	.....	17.47	18.92	18.55	21.03	19.82	17.61	16.41	15.61
11	13.39	13.47	14.31	.....	17.51	19.04	18.62	20.46	19.89	17.52	16.32	15.54
12	13.42	13.49	14.28	.....	16.74	18.70	18.52	20.15	20.02	17.44	16.32	15.52
13	13.48	13.46	14.35	.....	16.54	19.32	18.32	20.52	19.89	17.38	16.30	15.54
14	13.49	13.49	14.25	.....	16.46	19.04	18.61	20.28	19.86	17.27	16.28	15.52
15	13.58	13.52	14.35	.....	16.51	19.98	18.54	20.24	19.82	17.24	16.21	15.50
16	13.57	13.59	14.44	.....	16.59	20.14	18.58	20.87	19.75	17.16	16.18	15.46
17	13.60	13.67	14.59	.....	16.77	20.09	18.77	20.51	19.48	17.13	16.17	15.41
18	13.61	13.65	14.69	.....	16.57	20.63	20.50	20.23	19.81	17.16	16.15	15.38
19	13.64	13.67	14.92	.....	17.34	20.21	20.51	20.10	19.67	17.19	16.09	15.41
20	13.64	13.64	14.86	.....	17.22	19.88	20.90	20.29	19.58	17.40	15.94	15.38
21	13.61	13.63	14.95	16.78	17.10	19.89	20.98	19.64	19.55	17.32	16.10	15.36
22	14.60	13.71	14.97	17.25	17.21	19.78	20.76	19.50	19.72	17.21	16.06	15.31
23	14.68	13.72	15.01	17.11	17.20	20.03	20.88	20.39	19.52	17.96	15.99	15.24
24	14.66	13.74	15.00	17.14	17.06	19.84	20.25	20.34	19.32	18.01	15.96	15.24
25	14.64	13.72	15.11	17.12	17.06	19.75	20.42	20.24	19.24	17.14	15.91	15.22
26	14.52	13.73	14.97	17.33	17.01	18.92	21.06	20.19	19.26	17.06	15.91	15.22
27	14.59	13.73	15.10	17.53	16.94	18.92	20.53	20.12	19.19	16.97	15.94	15.33
28	14.68	13.77	15.33	17.59	16.84	18.84	20.60	20.31	19.17	16.83	15.90	15.37
29	14.66	15.43	17.44	17.01	20.04	20.65	20.66	18.82	16.81	15.87	15.34	
30	14.68	15.53	17.19	17.34	19.99	20.16	20.40	18.61	16.76	15.84	15.31	
31	14.69	15.58	17.41	.....	20.80	20.33	.....	16.71	.....	15.33	.....

10.24.21.212. Berrendo-Smith well.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.93	8.11	.....	11.37	13.14	13.44	15.43	16.98	18.15	14.04	11.09	10.74
2	7.93	8.19	.....	11.19	13.12	13.72	14.57	17.26	15.88	13.95	11.10	10.68
3	7.92	8.25	.....	11.87	12.74	13.90	14.87	17.29	15.53	13.64	11.17	10.63
4	7.92	8.73	.....	11.93	13.22	13.71	14.60	16.90	16.00	13.52	11.08	10.73
5	7.85	8.13	.....	11.95	13.13	14.14	14.47	17.42	16.26	.....	10.96	10.66
6	7.82	8.19	.....	12.50	12.92	14.61	14.62	16.99	16.49	.....	11.12	10.60
7	7.79	8.43	.....	12.22	12.78	15.11	14.74	17.55	16.05	.....	11.08	10.49
8	7.76	8.47	.....	12.23	13.00	15.18	14.53	17.55	16.53	.....	11.10	10.44
9	7.86	8.31	.....	11.98	13.04	15.37	14.36	17.13	16.28	.....	11.17	10.41
10	7.80	8.46	.....	12.47	12.99	14.88	14.98	16.85	16.02	.....	11.10	10.33
11	7.77	8.27	.....	12.48	13.03	14.49	15.28	17.42	16.49	.....	10.95	10.23
12	7.82	8.59	.....	12.71	12.97	14.98	14.75	16.36	16.42	.....	10.94	10.19
13	7.80	.....	.....	12.79	12.90	15.17	15.01	16.37	16.17	.....	11.00	10.22
14	7.72	.....	.....	12.78	12.64	15.54	14.96	16.88	16.45	.....	11.09	10.22
15	7.80	.....	.....	12.05	12.79	15.53	14.86	16.62	16.32	.....	10.95	10.17
16	7.75	.....	.....	11.88	12.90	15.89	14.46	16.64	15.86	.....	10.96	10.09
17	7.76	.....	.....	12.58	13.14	15.21	15.03	16.85	15.80	.....	10.92	10.02
18	7.74	.....	.....	12.95	12.84	14.97	15.20	16.83	16.22	.....	11.00	9.99
19	7.80	.....	.....	13.21	13.25	15.72	16.08	16.65	16.59	.....	10.93	10.04
20	7.84	.....	.....	13.09	13.00	15.07	16.15	16.73	15.85	.....	10.90	10.00
21	7.89	.....	.....	12.97	12.60	15.32	16.39	15.68	15.83	.....	11.01	9.98

10.24.21.212--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	7.95	....	10.92	12.77	12.80	14.84	15.94	15.40	15.99	....	10.92	9.95
23	7.99	....	11.03	12.44	12.85	15.03	16.08	15.18	15.33	....	10.83	9.85
24	7.95	....	10.63	12.55	12.78	14.88	16.61	15.00	15.04	....	10.77	9.85
25	7.97	....	10.63	12.54	13.08	14.59	16.65	14.89	15.25	11.38	10.74	9.85
26	8.01	....	10.44	13.01	13.07	14.84	16.54	14.77	15.27	11.31	10.70	9.83
27	7.96	....	10.84	13.37	12.94	14.72	16.30	14.88	15.30	11.27	10.91	9.87
28	8.04	....	11.44	13.58	12.78	14.98	16.29	15.15	15.22	11.20	10.83	9.89
29	7.98	....	11.65	13.03	13.11	15.19	16.24	15.34	14.46	11.18	10.78	9.82
30	8.19	....	11.83	13.25	13.42	15.57	16.03	15.47	14.13	11.15	10.73	9.86
31	8.10	....	11.73	13.68	13.68	17.17	15.50	11.09	11.09	11.09	11.09	9.88

11.24.29.242. Mountain View well.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	55.89	56.43	....	61.34	63.73	64.37	66.74	68.25	67.59	65.56	60.42	60.12
2	55.84	56.54	....	61.26	64.03	64.76	66.31	68.34	67.04	65.44	60.46	60.06
3	55.89	56.53	....	61.93	63.93	64.58	66.38	68.53	66.86	64.93	60.51	60.00
4	55.86	56.56	....	62.53	64.15	64.31	66.21	68.58	67.30	64.63	60.26	59.99
5	55.77	56.49	....	62.67	64.13	64.86	65.89	68.46	67.51	64.46	60.16	59.87
6	55.74	56.50	....	62.65	63.85	65.41	66.14	68.25	67.58	64.18	60.33	59.81
7	55.77	56.75	62.91	63.53	65.56	66.26	68.98	66.74	67.40	63.84	60.19	59.62
8	55.71	56.64	....	62.43	63.96	65.58	66.18	69.09	67.45	63.77	60.19	59.53
9	55.83	56.55	....	62.13	64.11	65.92	65.86	69.23	67.84	63.54	60.20	59.51
10	55.76	56.80	....	62.61	64.25	65.78	66.29	69.36	67.64	63.41	60.01	59.37
11	55.72	56.64	....	62.93	64.42	65.44	66.52	69.54	67.60	63.26	59.72	59.22
12	55.77	56.51	....	62.96	64.43	65.71	66.58	68.98	68.15	63.04	59.75	59.19
13	55.73	56.80	....	63.15	63.85	66.10	66.94	68.89	68.15	62.78	59.92	59.28
14	55.59	....	....	63.16	63.62	66.35	67.01	69.57	68.06	62.54	60.04	59.23
15	55.74	....	....	62.23	64.06	66.54	66.38	69.49	68.04	62.43	60.01	59.12
16	55.63	....	....	62.09	64.19	66.83	65.99	69.61	67.51	62.22	59.91	59.03
17	55.66	....	....	62.81	64.23	66.50	66.69	69.82	67.27	62.09	59.94	58.96
18	55.68	....	....	63.05	64.21	66.21	66.94	69.88	67.66	61.94	59.80	58.92
19	55.74	....	....	63.30	64.00	66.59	67.26	69.43	68.04	61.74	59.73	59.00
20	55.86	....	....	63.33	63.60	66.52	67.41	69.36	68.11	61.51	59.73	58.96
21	55.99	....	....	63.55	63.45	66.53	67.47	68.98	67.85	61.46	59.96	58.92
22	56.04	59.89	63.23	63.99	66.48	67.03	67.82	67.55	61.20	59.90	58.88
23	56.06	60.13	63.00	63.97	66.62	66.80	67.45	67.18	61.10	59.80	58.69
24	56.01	60.27	63.24	63.89	66.31	67.36	67.32	66.89	60.98	59.73	58.71
25	56.09	60.26	63.29	63.94	65.95	67.63	67.17	67.14	60.85	59.63	58.62
26	56.19	60.08	63.74	63.78	66.38	67.79	66.64	67.10	60.83	59.67	58.69
27	56.09	60.58	63.78	63.35	66.35	67.90	66.45	67.14	60.71	59.95	58.74
28	56.24	61.16	64.02	63.12	66.43	67.96	66.90	67.08	60.60	60.08	58.73
29	56.14	61.56	63.66	63.45	66.63	67.61	67.15	66.14	60.58	60.04	58.66
30	56.38	61.94	63.48	63.87	66.91	67.33	67.24	65.64	60.55	60.01	58.82
31	56.33	....	....	62.00	64.16	67.83	67.44	60.47	60.47	60.47	58.76	58.76

12.25.23.110. Orchard Park well.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.61	....	38.60	36.84	37.35	47.17	50.77	41.35	29.55	10.89	11.54	
2	3.60	....	36.84	40.64	38.13	45.85	51.95	41.94	30.52	11.33	10.98	
3	3.70	....	37.39	40.78	37.90	47.02	52.71	41.00	27.27	11.66	10.57	
4	3.68	....	39.73	42.76	38.21	46.22	52.54	41.94	25.68	11.50	10.95	
5	3.81	....	40.99	42.66	39.20	44.20	50.87	42.48	25.43	12.22	11.20	
6	4.92	....	42.18	39.33	39.52	41.64	50.36	42.03	24.92	11.89	11.30	
7	4.20	....	43.08	37.39	41.41	44.32	51.42	41.77	23.34	11.65	11.67	
8	4.03	....	40.73	39.80	43.36	42.50	52.49	45.47	22.72	11.65	11.48	
9	4.59	....	39.00	41.92	42.43	42.01	53.28	46.75	21.67	11.30	10.65	
10	4.63	....	40.89	42.80	40.48	44.42	53.73	45.69	20.96	11.12	10.50	
11	4.80	....	41.03	43.57	40.92	46.40	50.67	46.12	18.63	10.50	11.22	

12.25.23.110--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
12	5.60	.....	41.90	44.27	42.92	47.03	47.55	45.51	17.77	10.91	10.84
13	6.07	.....	42.44	40.02	44.98	47.96	47.60	45.42	17.25	11.45	11.03
14	6.02	.....	43.67	39.23	44.84	48.44	50.47	46.48	16.63	11.92	10.02
15	6.38	.....	38.97	41.67	45.31	44.58	50.70	46.84	16.06	11.06	9.44
16	6.51	.....	37.59	41.77	45.85	43.84	49.67	43.05	15.50	10.75	9.15
17	6.81	.....	40.38	42.12	45.94	45.52	51.66	41.43	15.30	11.66	8.81
18	7.12	.....	42.21	43.07	46.03	45.02	51.73	43.64	15.00	11.55	9.22
19	7.45	.....	44.10	41.27	46.63	45.69	50.41	44.42	14.25	11.17	9.36
20	8.07	.....	44.67	37.88	45.17	46.43	50.62	45.60	13.93	11.12	9.37
21	.....	43.95	37.18	47.87	48.87	46.16	44.23	13.43	11.31	9.05	
22	.....	31.70	40.45	38.24	48.92	48.59	39.32	44.02	12.87	10.19	9.25
23	.....	31.80	39.35	38.47	49.37	47.70	38.44	41.54	11.99	9.80	8.88
24	.....	31.67	41.06	36.95	49.90	49.05	39.93	39.59	11.75	9.88	7.93
25	.....	30.80	41.53	34.04	49.27	48.52	39.22	42.52	12.24	10.23	7.07
26	.....	31.20	41.58	34.32	49.83	47.48	37.33	41.88	11.66	10.42	7.05
27	.....	33.57	41.74	.....	48.57	48.90	36.63	41.18	11.15	10.13	7.90
28	.....	36.37	40.89	.....	48.58	50.97	39.18	38.70	11.13	10.02	7.62
29	.....	38.42	39.08	34.01	49.10	50.01	40.60	33.48	11.42	11.12	8.44
30	.....	39.18	38.98	37.40	49.66	49.77	42.34	30.12	11.24	11.03	9.05
31	.....	39.55	.....	37.32	.....	51.56	41.90	.....	11.15	.....	9.34

13.25.27.211. Greenfield well.

Highest daily water level, in feet with reference to
land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	.....	-0.68	.....	-30.80	.....	.....	.....	-44.61	.....	.....	+0.72	-1.17	
2	.....	-0.22	.....	.....	.....	.....	.....	-44.63	-38.92	.....	+.44	+.02	
3	.....	-0.22	.....	.....	.....	.....	.....	-46.58	-37.22	.....	+.29	-.28	
4	.....	+.34	.....	.....	.....	.....	.....	-45.61	-39.78	.....	+.76	-.76	
5	.....	+.77	.....	.....	.....	.....	.....	.....	-39.42	.....	-.93	-1.09	
6	.....	+1.97	.....	.....	.....	.....	.....	.....	-38.96	.....	-.46	-1.06	
7	.....	+.58	.....	.....	.....	.....	.....	.....	-37.01	-14.60	.....	-.70	-.83
8	.....	+.39	.....	.....	.....	.....	.....	.....	-42.41	-13.45	.....	-.70	-.20
9	.....	-.44	.....	.....	.....	.....	.....	.....	-43.33	-12.30	.....	-.57	+1.02
10	.....	-1.21	.....	.....	.....	.....	-37.08	.....	-42.26	-11.61	.....	-.51	-.04
11	.....	-.18	.....	.....	-42.06	.....	.....	.....	-42.76	-10.21	.....	-.33	-.89
12	.....	+1.09	.....	.....	.....	.....	.....	.....	-41.22	-9.32	.....	-.35	-.10
13	.....	-2.00	.....	.....	.....	.....	.....	.....	-41.23	-8.96	.....	-.41	-.82
14	.....	-2.76	.....	.....	.....	.....	-46.83	-41.78	-8.36	.....	.....	+1.99	
15	.....	-4.46	.....	.....	.....	.....	.....	.....	-42.21	-6.83	.....	-.42	+2.65
16	.....	-6.16	.....	.....	.....	.....	.....	.....	-40.58	-5.63	.....	-.48	+3.12
17	.....	-4.72	.....	.....	.....	.....	.....	.....	-38.60	-5.44	.....	-1.08	+3.29
18	+5.93	.....	.....	.....	.....	.....	.....	.....	-40.34	-4.60	.....	-.51	+1.24
19	+5.03	.....	.....	.....	-33.41	.....	.....	.....	-40.29	-4.25	.....	+.10	+.30
20	+4.42	.....	.....	.....	-29.47	.....	-43.23	.....	-39.87	-3.81	.....	+.53	+1.15
21	+4.13	.....	.....	.....	.....	.....	-44.98	.....	-39.33	-1.68	.....	-.52	+.74
22	+4.14	.....	-28.95	.....	.....	-47.57	-42.67	.....	-37.91	-.47	.....	+.74	-.36
23	+4.60	.....	-28.22	.....	.....	.....	-41.34	.....	-35.65	+.07	.....	+.84	+1.21
24	+4.05	.....	-26.63	.....	.....	.....	-44.06	.....	-35.34	+.28	.....	+.68	+4.10
25	+3.04	.....	-24.65	.....	.....	.....	-41.70	.....	-37.60	-.76	.....	+.97	+4.34
26	+1.64	.....	-25.66	.....	.....	.....	-40.03	.....	-38.28	-.11	.....	+1.00	+3.45
27	+2.12	.....	-30.89	.....	.....	.....	-44.95	.....	-38.91	+.57	.....	+1.47	+5.64
28	+1.92	.....	-33.40	.....	.....	.....	-44.43	.....	-34.58	+.65	.....	+.95	+3.73
29	+.83	.....	-33.90	.....	.....	.....	-42.48	.....	.....	+.70	.....	+.35	+3.51
30	+.73	.....	-34.33	.....	.....	.....	-41.84	.....	.....	+.65	.....	-.25	+1.44
31	-.52	.....	-32.95	.....	.....	.....	-41.88	.....	.....	+.82	.....	-.39	

g Tape measurement.

18.26.5.330. Artesia well.

Highest daily water level, in feet with reference to
land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	+5.08	+1.92	.....	-15.63	-17.38	.....	.....	-26.09	-26.44	-19.07	-5.32	-6.56
2	+4.92	.....	.....	-15.33	-17.99	.....	.....	-26.48	-25.88	-18.78	-5.33	-6.79
3	+4.87	.....	.....	-16.16	-18.78	.....	.....	-26.58	-26.01	-17.01	-5.23	-6.56
4	+4.16	.....	.....	-17.01	-19.32	.....	.....	-27.10	-26.77	-15.68	-4.85	-6.63
5	+4.36	.....	.....	-17.26	-19.82	.....	.....	-27.00	-27.72	-14.78	-4.61	-6.58
6	+4.58	.....	.....	-17.00	-19.27	.....	.....	-26.72	-26.28	-14.02	-4.83	-6.80
7	+4.65	.....	.....	-17.23	-18.75	.....	.....	-27.35	-27.63	-13.18	-5.23	-6.77
8	+4.64	.....	.....	-16.72	-20.14	.....	.....	-26.90	-27.81	-12.31	-5.25	-6.98
9	+3.88	.....	.....	-16.32	-20.02	.....	.....	-26.28	-27.51	-11.35	-5.35	-7.14
10	+3.52	.....	.....	-17.26	-20.12	.....	.....	-26.85	-27.53	-11.08	-5.11	-7.09
11	+3.53	.....	.....	-18.01	-20.16	.....	.....	-27.51	-27.72	-10.78	-4.45	-7.35
12	+3.53	.....	.....	-18.08	-19.41	.....	.....	-27.25	-27.71	-10.23	-4.44	-7.55
13	+3.34	.....	.....	-18.15	-18.53	-24.35	.....	-26.83	-27.50	-9.75	-4.50	-7.83
14	+3.38	.....	.....	-17.13	-17.92	-24.98	.....	-27.13	-27.76	-9.43	-4.48	-7.58
15	+3.19	.....	.....	-15.50	-18.89	-25.36	.....	-26.53	-27.78	-9.11	-4.20	-7.40
16	+3.26	.....	.....	-15.13	-19.01	-25.23	.....	-26.70	-26.56	-8.61	-4.84	-7.22
17	+3.12	.....	.....	-16.26	-18.67	-25.33	.....	-27.06	-26.18	-8.35	-4.79	-6.95
18	+3.50	.....	.....	-16.71	-17.42	-25.08	.....	-26.71	-26.45	-8.10	-4.21	-7.28
19	+3.59	.....	.....	-17.66	-17.50	-25.13	.....	-26.25	-26.35	-8.01	-4.15	-7.75
20	+3.42	.....	.....	-17.12	-16.06	.....	.....	-26.42	-25.98	-7.79	-4.10	-8.00
21	+3.20	.....	.....	-17.59	-15.16	-24.63	.....	-26.86	-25.40	-7.66	-4.55	-8.25
22	+3.35	.....	.....	-16.48	.....	-24.31	-22.63	-25.11	-24.67	-7.50	-5.17	-8.15
23	+2.83	.....	.....	-16.37	.....	-24.00	-23.20	-24.50	-23.87	-7.35	-5.31	-7.88
24	+2.38	.....	.....	-17.13	.....	-23.80	-24.31	-25.54	-24.18	-7.36	-5.70	-7.81
25	+2.24	.....	.....	-17.62	.....	.....	-24.86	-25.67	-24.17	-6.88	-5.03	-7.53
26	+1.98	.....	g-14.44	-18.67	.....	.....	-24.88	-25.50	-24.73	-6.78	-5.63	-7.37
27	+1.87	.....	-15.23	-18.23	.....	.....	-24.93	-24.60	-24.06	-6.66	-6.16	-7.59
28	+1.58	.....	-16.27	-17.81	.....	.....	-25.63	-25.97	-23.41	-6.23	-6.56	-7.66
29	+2.11	.....	-17.05	-16.86	.....	.....	-25.16	-26.19	-21.25	-6.11	-6.68	-7.92
30	+1.97	.....	-17.40	-16.49	.....	.....	-24.56	-26.75	-19.45	-5.78	-6.41	-8.06
31	+2.32	.....	-17.07	.....	.....	.....	-25.56	-26.78	.....	-5.45	.....	-8.26

g Tape measurement.

Fluctuations in artesian head

The water level in the artesian wells fluctuates in response to changes in the amount of pumping for irrigation which is, in turn, dependent somewhat upon the amount of precipitation.

Mean monthly water levels were lower in January 1945 than in January 1944, with the exception of the Orchard Park well. This was in spite of the relative rises that occurred in all of the wells during the last four to five months of 1944. Water levels began falling in February as a result of the early pumping occasioned by the lack of precipitation and continued to fall until the lowest level of the year was reached in August. The mean monthly water level for August 1945 was the lowest on record for the Orchard Park well and, on the basis of a poor record, probably for the Greenfield well. The Orchard Park well exceeded by 3.1 feet a previous low set in August 1943. The Greenfield well exceeded the previous low mean monthly water level of August 1940 by about 5.8 feet. In 1944 comparatively

sharp rises occurred in the water level after the low point was reached in August, but in 1945 only a comparatively slow recovery of water level occurred owing to continued heavy pumping. This resulted in the large deficiencies of water level shown in the following table for the month of September 1945 compared with September 1944. This deficiency was 20.10 feet in the Greenfield well and comparatively large in the other wells.

The water levels at the end of 1945 were also low compared with the preceding year, the greatest yearly decline for December being 11.57 feet recorded in the Artesia recorder well. The mean annual water levels for 1945 were lower in all the wells than in 1944 with a maximum fall of 8.31 feet occurring in the Greenfield well. This large decline of water level resulted in a new low mean annual water level in the Greenfield well exceeding the previous low mean annual water level of 1943 by 5.3 feet.

In the comparison of the 1945 mean annual water levels with those for 1943 and 1944, it is apparent that a much greater decline occurred during 1945 than in 1944.

Part of the excessively large fluctuations in the Greenfield well are due to nearness of pumped wells but the other wells are removed somewhat from pumped wells and reflect, in general, the change in artesian head of the aquifer.

Mean monthly rise (+) or decline (-) of water level, in feet,
relative to stage in corresponding months of 1943 and 1944

Berrendo		Berrendo-Smith		Mountain View		Orchard Park		Greenfield		Artesia		
1943	1944	1943	1944	1943	1944	1943	1944	1943	1944	1943	1944	
Jan.	-2.2	-0.99	-1.8	-0.30	-2.6	-0.26	-1.4	+0.43	-1.8	-0.02	-4.6	-2.78
Feb.	-1.6	-1.07	-2.1	-1.57	-3.0	-1.89	-4.8	-5.33	-8.8	-11.52	-3.1	-4.63
Mar.	-2.0	-1.61	-2.2	-2.28	-3.1	-2.09	-8.4	-5.88	-12.8	-9.95	-4.9	-3.30
Apr.	-1.2	-1.38	-8	-1.03	-1.8	-1.35	-6.2	-7.59	-1.1	-2.54	-1.8	-2.20
May	-1.7	-2.22	-2.5	-3.8	-2.6	-.97	-5.2	-4.19	-4.2	-2.90	-5.0	-1.75
June	-2.6	-1.52	-2.4	-1.43	-3.8	-1.97	-10.8	-9.29	-5.5	-7.84	-7.9	-4.71
July	-2.6	-1.72	-3.0	-2.09	-5.1	-3.76	-21.4	-12.39	-23.5	-13.62	-16.6	-8.04
Aug.	-1.3	-1.28	-.6	-1.12	-2.3	-2.76	-3.1	-5.38	-7.0	-9.90	-5.6	-6.24
Sept.	-2.2	-3.43	-1.7	-3.63	-1.9	-3.87	-2.2	-13.29	-6.4	-20.10	-7.3	-15.94
Oct.	-1.8	-1.32	-1.3	-1.92	-1.6	-2.69	+3.9	-3.57	+5.4	-6.70	-5.4	-8.84
Nov.	-.6	-1.86	-1.2	-2.28	-1.6	-2.72	+3.9	-3.63	+3.3	-4.88	-5.1	-7.82
Dec.	-1.6	-1.79	-1.9	-2.06	-2.4	-2.92	-.5	-5.09	-2.4	-9.62	-11.2	-11.57
Ann-												
ual	-1.8	-1.52	-1.8	-1.68	-2.6	-2.27	-4.7	-6.27	-5.3	-8.31	-6.5	-6.49

WELLS IN ARTESIAN INTAKE AREA

Measurements of water levels in the intake area of the Roswell artesian basin were continued in 1945 in order to show the change in ground-water storage and the change in recharge to the artesian aquifer. A total of 32 measurements was made during the year. As stated in the report for the previous year, the water levels in the intake area respond to change in the rate of draft on the aquifer by the artesian wells many miles to the east as well as to changes in storage and rate of recharge.

The water levels in the H. L. Wood well, supplemented by the record of the previously measured R. H. Rosenburg well and the J. Herbst well, in the northern part of the basin, have shown consistent yearly declines of water level since the high level in the years 1942 and 1943. The Diamond A Cattle Company well, which is nearly midway in a north-south line of the intake observation wells, has shown only a slight yearly fall since the high level in early 1943. The water level in the two southernmost intake observation wells, D. W. Runyan and C. R. Coffin, showed net yearly rises through early 1945 from the comparatively high stage reached in early 1942.

In 1945 the water levels in the wells in the intake area reached their minima at about the time that the artesian wells in the basin reached theirs. Also the water levels in the intake wells showed a larger decline from March to September than formerly, which was a result of the increased pumpage from the artesian aquifer in 1945. The intake observation wells all showed net yearly declines in water level averaging about 2.3 feet from January 1945 to January 1946 with the largest decline of 2.77 feet taking place in a northern well (J. Herbst) and the smallest decline of 2.03 feet taking place in a southern well (D. W. Runyan).

Water-level measurements in artesian intake area,
in feet below land-surface datum, 1945

Name	H. L. Wood	J. Herbst	Diamond A Cattle Co.	D. W. Runyan	C. R. Coffin
Location No.	11.22.1.312	12.23.5.320	14.23.8.34	16.23.15.323	19.23.27.111
Jan. 18	253.75	232.63	258.00	211.92	.....
Mar. 20, 21, 25	b253.95	232.68	258.03	211.87	368.92
May 18, 21	255.54	234.11	258.92	212.66	g371.68
July 17, 18, 21	a256.73	235.49	259.97	213.99	370.44
Sept. 13, 17	258.18	236.76	260.99	214.03	371.28
Nov. 12, 15	256.96	236.37	260.86	213.61	369.57
Change					
Jan. 44-Jan. 45	.....	+0.14	+0.40	+0.74	.....
Jan. 45-Jan. 46	-2.16	-2.77	-2.25	-2.03	.....

a Pumping.

b Pumping recently.

g Windmill installed prior to measurement.

Year of highest and lowest water level and first observed water level, in January

January reading	Year	Water level	Year	Water level	Year	Water level	Year	Water level
Highest	1943 228.74	1945 258.00	1945 211.92	1944 369.59			
Lowest	1941 243.33	1941 270.01	1941 225.70	1941 379.30			
First year 1945		1941	1941	1941	1941			

SHALLOW WELLS

In order to show the change during the year in the shallow water level caused by recharge and by withdrawals for irrigation, water levels were measured in 401 shallow wells in January 1945 and again in January 1946. In order to show also the trend of the water table throughout the year, 6 of these wells were equipped with water-stage recorders which, however, could not be operated continuously. The water level was measured in about 45 of the wells at bimonthly intervals. A total of 716 measurements was made during the year including 89 measurements made on the recorder wells, and about 259 made on the bimonthly observation wells. Of the observation wells, 298 are in Chaves County and 130 in Eddy County.

Fluctuations of water level

The water table lowered from January 1945 to January 1946 throughout the Roswell basin in areas where appreciable amounts of shallow water were pumped for irrigation. The water table lowered more than 2 feet under an area of about 220 square miles, more than 4 feet under an area of about 100 square miles, and more than 6 feet under an area of about 9 square miles.

In Chaves County the water level declined more than 2 feet under an area of about 106 square miles, located principally west of the railroad, extending from Lake Arthur to 6 miles southeast of Roswell. In this same general location the water level fell more than 4 feet under an area of about 50 square miles. Water levels fell more than 6 feet in the two heavily pumped districts, 3 miles northwest of Dexter and 3 miles southwest of Hagerman, under a total area of probably 6.5 square miles, the maximum observed decline amounting to 7.97 feet. Small rises of less than a foot were observed in an area along the river about 7 miles southeast of Roswell, and rises of more than 3 feet occurred in an area east of the Hagerman Canal, midway between Dexter and Hagerman.

In Eddy County the decline of water level occurred in two localities. In the area extending from Dayton north nearly to the county line and lying along an axis about 6 miles west of the Pecos River, the water level declined more than 2 feet under an area of about 85 square miles and more than 4 feet under an area of about 37 square miles. In the pumped area, centered near Lakewood, the water level fell more than 4 feet under an area of about 14 square miles and more than 6 feet under an area of nearly 3 square miles, the maximum observed decline being 7.35 feet.

The locations of areas of decline of water level during 1945 coincide very closely with the locations of areas of decline reported in previous years. These are areas in which shallow water is pumped for irrigation. The area under which the water level declined more than 2 feet during 1945 was more than double that in 1944. This decline was a result of the excessive amount of pumping occasioned by the deficient precipitation in 1945.

The areas of water level rises are generally in a narrow strip paralleling the Pecos River on the west, where very little shallow water is pumped for irrigation and the depth to water is small. The area midway between Dexter and Hagerman in which rises of more than 3 feet occurred is an area where mainly surface water from the Hagerman Canal is used for irrigation. At the time of measurement of water levels in January 1946, canal water was being applied to the land around the observation wells in which the large rises were observed.

The following records of water levels in shallow wells in the Roswell artesian basin are divided for convenience into two groups corresponding to the two counties in which they are situated.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also part	Water levels						Record		
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Lowest Level	Highest Year	Year	Begin gan	Years missing	
10.24.8.111	O. S. Stockton	5	45.79	22	+.11-.21	40.16	39	45.79	45	38	42, 44
15.342	W. C. Crawford	5	12.19	22	+.11-.61	8.82	38	12.99	41	38	39, 42, 44
16.133	G. D. Perrine	5	24.08	22	-.63	22.85	43	28.70	41	38	
17.122	Mr. Howard	5	25.93	12	-.63	24.58	42	33.67	41	38	
18.424	L. T. Lewis	5	36.20	12	-.63	34.52	42	44.50	41	38	
20.344	Clyde Blackwell	5	12.87	12	... ¹	36.54	42	46.65	41	38	39, 45
22.322	A. P. Carpenter	5	17.25	12	-.47	11.19	42	19.70	41	38	
27.111	Jack Taylor	5	17.07	17	... ²	15.20	42	25.17	38	38	
29.353	Isaac Durand	5	17.07	17	+.3-.22	32.89	43	41.41	41	38	45
31.444	J. P. Van Winkle	5	5.83	13	-.29	15.68	42	25.45	40	38	
33.244	J. Westover	5	5.83	13	-.29	5.35	43	5.83	45	41	
34.335	Elmer Butler	5	4.94	13	-.63	2.67	42	4.94	45	41	
36.222	State of New Mexico	5	2.53	13	+.23	2.55	45	4.15	41	41	
10.25.7.444	J. R. Pendergrass	5	7.48	13	-.61	3.28	42	8.96	41	41	
17.344	P. R. Cannon	5	6.32	13	-.31	4.16	42	7.65	41	41	
19.351	F. C. Smith, Jr.	3, 5	32.40	13	-.75	30.76	42	32.58	41	41	
29.222	U. S. Government	5	11.10	13	-.05	1.05	44	3.15	41	41	
11.23.1 ^c .221	Mable Clifford	5	55.48	14	+.02	51.57	43	61.14	40	38	41, 42
11.24.3.312	Dee Bristol	5	6.20	14	-.60	4.54	43	16.01	41	39	
6.311	R. R. Wirtz	5	42.25	14	-.61	37.61	39	51.87	41	39	40
6.433	Mr. Watkins	5	32.63	14	-.54	28.93	42	41.29	41	38	
6.444	Morrile Huff	5	33.27	14	-.82	31.20	43	42.26	41	39	
8.122	W. L. Nuly	5	(Measurements discontinued)			22.75	43	34.32	40	38	41, 42, 45
9.122	Raymond McCutchen	5	31.41	22	-.38	27.25	42	34.83	41	38	
9.211	(Incorrect designation used previously for well 11.24.9.122, which see)										
10.114	Claude Hobbs	5	18.85	14	-.08	16.85	42	26.60	41	40	
10.224	C. E. Smith	5	12.96	22	-.95	11.69	42	b 19.61	39	38	
10.321	C. A. Oney	5	23.46	22	+.1-.02	21.13	42	28.64	40	38	
13.144	Frank Peter	5	15.22	17	-.67	12.05	42	16.08	43	38	
14.313b	Wrights Filling Station	5	29.91	17	-.97	27.92	43	38.45	41	38	
15.421	M. L. Barnett	5	32.23	17	-.68	30.09	42	41.49	41	38	
15.431	M. L. & S. Barnett	5	33.20	17	-.84	31.30	h 42	42.80	41	38	
17.121a	D. H. Johnson	5	31.15	14	-.70	48.96	43	51.15	45	42	

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Jan. 1945		Water levels		Record			
			Level	Day	1944-45 Change	Level	Highest Year	Lowest Year	Began	Years missing
11.24.18.333	C. V. Coker	•	81.69	15	-0.75	79.36	43	90.84	41	39
19.345	W. C. Hendricks	•	(Measurements discontinued)			85.53	42	90.58	41	38
22.333	John Tweedy	•	42.58	15	-0.45	40.03	42	52.26	41	38
23.411a	H. R. Babcock	•	1 4.48	17	+7.36	10.35	42	17.34	41	38
23.483	Tweedy Gin	•	14.11	15	+1.13	7.60	42	19.80	40	38
28.113	Rocky Arroyo schoolhouse	3,5	59.76	15	+1.12	53.52	42	69.20	41	38
29.333	F. W. Clow	•	e 84.0	15	••••	78.91	42	83.59	44	42
29.411	Belle Hurst	•	77.20	17	-3.32	69.82	42	85.65	41	38
34.411b	do	•	42.76	15	-1.27	40.40	45	51.63	41	39
36.133	Wiley Grizzel	•	26.75	15	-0.27	25.28	43	36.02	40	39
36.211	Russell Smith	•	••••	••••	••••	15.44	42	24.88	40	38
36.333	Wiley Grizzel	5	29.69	15	-1.12	28.45	42	35.55	39	40
11.25.6.123a	J. P. White & Co.	•	14.17	15	+11.63	13.26	43	14.17	45	44
6.421a	do	•	5.63	15	+1.22	4.44	42	7.13	41	41
22.333	Mrs. T. E. Whitney	•	6.24	15	+1.46	5.36	42	7.59	41	38
28.234	E. Whitney	•	7.50	15	-1.37	5.35	42	8.10	41	38
28.244	R. O. Whitney	•	7.35	15	-3.99	4.07	42	7.62	41	38
28.333	Unknown	•	9.11	15	-3.37	5.34	44	9.11	45	38
29.111	Farmers Incorporated	•								39-45
29.345	Albert Hobson	•	8.63	15	-0.87	5.47	39	8.74	45	38
29.444	Glenn Wheeler	4	7.58	15	-2.61	4.38	40	8.33	41	38
30.333	J. P. White & Co.	•	8.77	15	-3.16	f 4.59	42	f 8.77	45	38
31.223	Ruby Brown	•	12.60	15	+1.75	9.24	42	17.07	40	38
31.453a	Albert Watson	•	12.44	15	-1.61	8.60	42	14.58	41	39
31.453b	do	•	26.15	15	-0.96	19.85	42	30.98	40	38
32.333	George Rogart	•	26.05	15	-0.73	23.60	43	30.68	40	39
12.24.13.111	Leora Newman	3	a 64.63	21	-2.39	16.89	42	26.27	40	38
23.441a	Monte Goodin	•	76.73	21	-1.74	62.35	43	a 64.63	45	42
12.26.2.Lot 3	B. F. Heine	5	15.66	15	+1.96	75.53	43	83.95	40	38
2.Lot 4	E. R. Durall	5	13.58	15	-2.21	9.30	42	15.83	41	38
3.334	J. W. Young	•	26.64	22	-8.85	7.27	42	13.73	41	38
7.144a	Olivia Etz	•	38.25	22	+0.07	37.08	43	29.43	41	38
9.422	Cumberland town-site	3	45.01	21	-1.22	39.60	42	45.00	38	38

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Water levels						Record				
			Jan. 1945	Change	1944-45	Level	Day	1944-45	Level	Year	Lowest	Be- gan	Years missing
12.25.13.111	M. F. Colclazier	•	16.38	21	-2.58	11.23	43	16.38	45	39			
15.112	A. J. Merry Estate	• (Measurements discontinued)	39.33	38	46.01	41	38	45					
16.111	Ernest Nelson	•	31.18	22	+0.04	29.50	43	35.98	41	38			
16.222	State of New Mexi- co		51.29	21	-2.42	42.26	38	51.29	45	38			
22.231	W. T. Clardy	•	72.23	21	-5.63	51.34	39	72.23	45	39			
25.413	Ann F. Freeman	5	28.78	21	-2.47	17.90	42	28.78	45	38	40, 41		
26.311	J. K. Murphey	•	58.24	21	-4.19	40.62	38	59.24	45	38			
27.231	W. T. Clardy	•	67.64	21	-5.34	48.70	39	67.64	45	39			
30.222	Ivy Woodman	•	79.80	20	-3.58	78.24	43	81.50	41	38			
33.112	H. D. Wager	•	79.67	20	-3.45	76.07	39	79.67	45	39			
34.211	Mack Sharp	•	57.18	20	-2.42	39.09	38	57.18	45	38	39-41		
34.411	(Incorrect designation used previously, for well 12.25.34.431, which see)		54.69	20	-4.46	45.14	42	54.69	45	38			
34.451	Jack Mask	5	47.98	20	-3.70	34.00	42	47.98	45	39			
35.111	C. F. Smith	5	49.92	20	-2.78	47.14	44	49.92	45	40			
35.131	do		49.92	20	-3.04	33.81	42	48.53	45	44			
35.311a	H. G. Moberly	•	48.53	20	-3.04	36.42	42	49.28	45	38			
35.311b	do		49.28	20	-2.64	36.42	42	49.28	45	38			
35.411	A. C. Stone	• (Measurements discontinued)	30.15	40.23	••••	30.13	42	42.08	40	38	39, 41		
35.411a	do	3, 5 (a)	20	••••	••••	23.91	42	••••	45	45			
36.133	H. Kuykendall	•	24.27	21	-2.51	13.85	42	24.27	45	38			
36.142	O. B. Berry	•	27.01	21	-2.46	24.55	44	27.01	45	44			
36.211	Unknown	c	35.81	20	-8.28	22.94	38	27.69	41	38	42		
36.313	M. L. Kuykendall	5	2.80	21	-1.15	(J)	5.60	38	38	38	42		
12.26.7.421	Cecil Johnson	•	14.19	21	-0.04	10.87	42	14.19	45	42			
18.221	do	3	14.57	21	••••	••••	••••	••••	41	38			
18.221a	do	3	16.56	21	-3.36	14.20	40	17.48	43	39			
29.333	T. S. Lawing	3	17.07	21	+1.78	13.32	42	18.85	44	38			
30.213	Lowman Wiley	5	21.46	20	-2.17	12.78	42	21.46	45	38	40		
13.25.1.111	M. L. Kuykendall	•	16.73	20	-1.99	9.77	42	17.61	41	38			
1.331	Will Schapphok	•	60.34	20	-4.24	45.40	38	60.34	45	38			
3.111	Grace Stanley	•	63.58	20	-9.21	60.70	42	65.30	41	38	44		
5.111	W. H. Belcher	5	80.78	20	+1.35	78.22	38	82.16	44	38			
6.333	R. L. Lowe	5	61.81	20	+1.46	59.61	42	70.33	41	39			
8.133	W. H. Jeffries	3											

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Jan. 1945 Level	Water levels		Lowest Year Level	Highest Year Level	Change 1944-45	Record	
				Day	Part				Jan. 1945	Year
13.25.10.344	H. W. Reinicke	•	66.98	20	-2.94	38	66.98	45	38	41
11.111	Kermitt Southard	•	44.88	20	-2.79	42	47.33	41	39	
11.345	J. E. Brockman	•	52.80	20	-2.45	42	55.50	41	38	
11.433	do	5	43.73	20	-2.53	32.75	42	48.00	41	40
12.133	M. E. Colclazier	•	(a)	19	••••	17.93	42	28.90	41	38
12.311	do	•	23.77	19	-1.15	16.23	42	27.99	41	39
13.113	W. F. Kerr	•	40.98	19	-2.67	29.95	42	43.14	41	38
15.131	Fletcher Bros.	•	40.37	19	-3.10	29.05	42	43.45	41	38
15.133	do	5	42.45	19	-1.14	32.76	42	42.48	45	42
13.233a	W. F. Kerr	•	31.35	19	-1.89	21.05	42	34.25	41	38
13.233b	do	•	32.20	19	-1.85	22.96	42	35.04	40	41
13.311	Fletcher Bros.	•	43.70	19	-2.71	32.13	42	45.43	40	40
13.433	Mrs. J. W. Weir	5	34.93	19	-2.47	25.54	42	34.93	45	38
14.131	M. C. Conn	5	60.78	19	-2.36	48.65	42	61.57	41	38
14.231	William Zappe	•	51.93	19	-2.99	40.12	42	54.61	41	40
15.311	Rex Richmond	•	(a)	20	••••	68.98	38	76.17	41	38
15.422	do	•	59.91	19	-2.26	49.63	42	59.91	45	38
17.411	R. Thaman	•	59.98	20	••••	55.08	42	68.72	41	39
23.111	J. F. Wortman	•	55.25	19	+3.98	51.21	42	65.17	41	38
24.333	Hal Bogle	•	51.65	17	-2.77	41.34	42	53.52	41	38
26.211	Belle Hurst	•	58.32	17	-2.35	47.33	42	58.32	45	38
26.222	do	•	52.01	17	-2.65	41.42	42	53.72	41	38
27.111	Hal Bogle	•	78.77	19	-1.49	69.30	38	78.77	45	38
27.211b	do	•	69.98	19	••••	61.95	42	69.98	45	39
32.411	William Brashler	3	78.63	16	+6.86	b 76.52	38	85.49	44	38
34.433a	W. F. Kerr	•	76.42	16	-4.43	61.30	42	76.42	45	38
35.511	do	•	70.53	16	-3.12	57.13	38	70.53	45	38
35.322	do	•	66.55	16	-3.12	58.73	43	66.55	45	45
36.421a	R. M. Ware	•	••••	••••	••••	39.00	38	47.45	44	38
36.421b	do	•	(Measurements discontinued)	••••	••••	39.35	42	48.93	44	42
36.421c	do	•	53.39	16	-4.71	39.79	42	53.39	45	38
13.26.5.111	R. H. Aston	•	13.83	21	-1.68	7.40	42	14.17	41	39
5.231a	C. P. Sterrett	•	17.51	21	-9.88	11.85	42	17.79	41	38
5.231b	do	•	12.80	21	-6.62	7.43	42	13.66	40	38
5.351	W. W. Harris	•	13.59	21	-1.11	13.27	42	16.51	40	38

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued, in feet

Location number	Owner	See also part	Water levels						Record Years missing
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year gan	
13.26.7.333	Howard Amason	4	13.10	21	-1.49	f 6.28	42	f 14.48	41
7.433	J. E. Sinn	.	12.70	19	-2.18	8.18	42	12.70	45
8.332	G. M. Sterrett	.	8.95	19	-.96	6.00	42	10.29	38
14.331	G. C. & H. E. Saunders	3	.94	16	+.98	8.01	43	10.92	41
16.114a	U. S. Government (fish hatchery)	*	8.10	16	+.1.61				38
16.114b	do	*	5.28	16	+1.22	4.81	45	7.77	40
16.114c	do	*	5.36	16	+1.61	5.19	43	7.83	41
17.321	Leo Nowak	3	11.47	16	+2.77	8.90	39	14.24	44
17.443	H. Vandenbou	5	13.33	16	-.06	11.28	42	13.33	45
18.444	do	*	13.05	16	+1.20	11.56	42	14.25	44
18.411	P. A. Armor	*	12.62	19	-1.88	10.41	43	12.52	45
18.311	W. F. Kerr	*	19.54	19	-1.83	11.50	42	21.95	41
19.222	A. T. Stone	5	22.28	19	-1.01	18.22	39	22.28	45
19.333	Hal Foggie	*	29.06	17	-10.93	20.00	42	30.35	41
19.343	do	*	24.05	17	-2.40	16.15	42	24.88	41
19.432	Tom Bogie	*	12.29	17	-1.61	6.19	42	12.60	41
20.113	A. T. Stone	5	21.31	19	-1.20	17.25	42	21.81	45
20.333	Mrs. O. W. Lockhead	5	14.41	17	+.45	10.89	42	14.86	44
23.111	G. C. & H. E. Saunders	*	5.56	16	-.12	5.55	42	5.56	45
28.111	Joe Notack	*	14.50	16	+.83	9.66	42	26.02	38
28.121	Goo. Grassie	3	b 17.50	16	+1.48	14.82	39	20.79	41
28.221	Hal Bogie	*	9.92	16	+.30	7.55	39	10.84	41
28.311	Joe Giles & Anna Heinkel	*	13.92	16	+1.27	10.42	39	15.19	44
29.111	J. H. Reid	*	20.57	17	-7.73	9.67	39	15.67	40
29.113	do	*	16.32	17	+.68	13.39	42	17.60	44
29.211	do	*	10.42	17	+.98	7.22	39	14.55	43
29.335	M. Y. Monical	*	15.94	16	-.71	11.04	42	15.94	45
29.324	do	*	9.50	16	-.15	6.80	42	12.73	40
31.241	Hal Foggie	*	14.60	16	-.64	6.03	42	14.68	41
31.311	E. C. Moore	*	45.98	16	-2.47	35.30	38	46.36	41

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Jan. 1945			Water levels			Record	
			Level	Day	Change 1944-45	Highest Level	Lowest Level	Year	Began	Years missing
13.26-33.421	E. P. Malone	•	17.48	16	+0.66	15.62	42	18.14	44	38
34.313	Elton Lankford	5	10.22	16	+0.54	8.38	39	10.76	44	38
34.431	Mrs. Elizabeth Cole	5	22.08	16	+10.71	22.08	45	32.79	44	41
14.25.1.112	P. R. Fuller	5	42.15	13	-2.82	35.97	36	42.15	45	36
1.345	A. W. Langneger	•	60.13	13	-4.34	43.20	38	60.13	45	38
1.344	do	3	56.16	13	-3.77	36.04	36	56.16	45	36
2.235a	L. T. Lewis	•	65.92	13	-3.60	52.13	42	65.92	45	40
2.431	J. V. Thomas	•	78.81	13	-4.88	67.69	43	78.81	45	43
2.444	do	•	••••	13	••••	48.50	38	60.82	44	38
8.411	Ray Mathes	•	95.20	13	-7.52	93.24	42	95.20	45	39
11.353	do	•	92.24	13	-4.06	78.93	42	92.24	45	42
12.133a	C. H. Whitman	5	74.74	13	-4.64	60.92	42	74.74	45	42
12.133b	do	•	75.29	13	-4.66	58.17	38	75.29	45	38
12.313	L. T. Lewis	•	78.44	13	-4.70	60.75	38	78.44	45	41
12.314	do	•	76.04	13	-4.69	71.35	44	76.04	45	44
13.213	Cairin Graham	•	73.10	14	-4.68	59.54	42	73.10	45	42
13.311	E. O. Moore	•	80.38	13	••••	63.35	38	75.74	45	38
13.311a	do	5	96.20	13	-3.66	84.52	39	96.20	45	39
14.131	Ray Mathes	•	74.93	13	-5.53	71.46	42	74.93	45	38
20.445	Freeb Hurst	3	72.02	13	-5.73	56.73	38	72.02	45	38
24.133	E. O. Moore	•	70.24	13	-5.31	56.05	38	70.24	45	38
25.111	J. M. Morris	•	67.92	13	-3.47	59.32	43	67.92	45	43
25.111a	do	4	54.84	12	-3.54	24.5	26	54.84	45	26
36.111	C. H. Foster	•	61.80	13	-2.84	55.69	43	61.80	45	42
36.211	do	•	64.02	13	-3.19	60.83	44	64.02	45	44
14.26.3.111	Flora West	•	13.64	11	+1.64	12.03	39	14.28	44	38
3.213	Mary Brown	•	(Measurements discontinued)			4.78	42	9.02	38	38
3.243	do	5	12.45	11	••••	••••	39	10.98	44	38
3.413	Howard Menefee	5	9.35	11	+1.53	8.35	39	10.98	44	38
3.442	John Langneger	•	17.34	11	+1.56	16.10	38	18.90	44	38
4.133a	W. F. Jacobson	5	20.20	14	+1.49	18.43	39	20.69	44	38
4.141	Roy Lockhead	5	20.95	14	+1.66	18.47	39	21.61	44	38
4.231	G. F. Wade	•	17.96	14	+1.53	15.92	39	18.54	44	38

* See Footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Water levels						Record
			Part	Jan. 1945	Change	Highest	Lowest	Year	
			Level	Day	1944-45	Level	Year	Level	
14.26.5.131	L. M. Harter	•	27.25	13	-0.32	21.70	42	27.25	45
5.211	M. D. Menoud	•	24.84	14	+.62	22.20	42	25.46	44
5.245	J. D. S.	McKulistry	5	21.70	14	+.58	20.00	39	22.28
5.433	D. L. Newsom	•	29.55	13	-.31	25.62	38	29.55	45
6.111	Wiley Grizzle	•	27.81	13	-.51	16.30	38	27.81	45
6.142	W. L. Heitmann	•	28.11	13	-.62	19.77	42	28.11	45
6.211	Wiley Grizzle	•	29.55	13	-.67	18.54	38	29.55	45
6.232	Tom Andrews	•	34.32	13	-.64	26.82	42	34.32	45
6.241	do	•	30.81	13	-.35	23.80	38	30.81	45
7.443	W. W. Adams	•	51.15	14	-.60	30.25	36	46.34	41
8.112	G. L. Truitt	•	31.37	14	-2.34	21.80	38	31.37	45
8.245	P. Flores, Jr.	•	30.58	14	-2.84	19.83	38	30.58	45
8.312	N. C. Newsom	•	54.73	14	-4.19	41.54	42	54.73	45
8.453a	Tom Ferguson	•	55.25	12	•••	35.32	36	55.25	45
9.143	V. R. Barnett	•	29.94	14	-.12	26.06	39	30.18	40
9.454	Cave Bros.	•	7.79	12	+6.98	8.35	38	14.77	44
9.442	Oscar Cave	•	15.17	12	+4.47	12.25	42	15.64	44
10.121	Mrs. Levi Barnett	•	12.62	11	+2.14	12.22	39	14.91	43
10.221	John Langnegger	5	11.93	11	+1.42	10.88	42	13.36	44
10.244	do	•	10.69	11	+5.35	10.69	45	14.14	43
11.111	do	•	15.00	11	+1.77	14.80	38	17.13	43
11.121	H. A. Kiper	•	15.85	11	+.99	15.13	39	16.85	41
11.322	Merle Stewart	•	9.78	11	+3.81	11.65	39	13.59	44
11.444	W. F. Utterback	•	10.68	11	+.31	9.43	42	11.24	41
12.131	do	5	21.99	11	-.21	20.98	42	21.99	45
12.433b	W. N. Olive	•	16.17	11	-.70	12.50	42	16.88	41
13.121	L. M. Lang	5	16.32	11	-.17	14.30	42	17.50	41
14.212	B. L. Barnett	•	12.68	11	+.38	11.36	42	13.40	41
14.421	Jim Michelet	•	12.91	11	-1.11	10.49	43	12.81	45
14.441	do	5	15.03	11	-.77	10.04	42	15.03	45
14.443	Unknown	•	12.60	11	-1.38	11.22	44	12.60	44
15.113	State of New Mexico	•	16.53	12	+.74	13.40	42	18.16	41

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	1944-45 Change	Highest Year	Lowest Year	Year	Be- gan	
14-26-15-322	F. H. Evans	3	8.74	11	-0.21	5.55	42	8.74	45
15-333	E. D. Menoud	3	24.12	11	-0.69	16.42	38	24.12	45
17-122	R. A. & T. A. Bleddoe		56.04	12	-4.16	40.46	42	56.04	45
17-211	William Salomon	*	55.10	12	.....	40.97	42	53.35	44
17-211a	do		55.17	14	-5.04	38.42	38	53.17	45
17-444	Pearson Bros.	*	64.68	14	-4.93	50.57	39	64.68	45
18-113	E. D. Watson	*	64.60	14	-4.71	50.83	42	64.60	45
19-131	do		66.62	12	-5.85	39.68	38	52.70	44
19-211	Pearson Bros.	*	66.62	12	.....	48.05	38	66.62	45
19-242	Oscar H. Pearson	5	53.21	12	-4.49	36.12	38	53.21	45
19-311	W. C. West	5	67.60	12	-5.71	49.10	38	67.60	45
19-444	E. E. Lane	5	67.60	12	.....	48.15	38	60.53	44
20-143	Pearson Bros.	(a)	74.72	12	-5.04	64.36	42	73.34	44
20-334	E. Langneger	*	74.72	12	.....	56.26	38	74.72	45
20-343	do	(a)	22.89	11	.....	33.38	42	40.77	41
21-333	G. E. Wade	*	26.91	11	-0.65	14.32	38	22.89	45
21-422	A. L. Nail	*	12.35	11	-0.93	21.66	42	28.91	45
22-141	J. E. Lusk	*	13.96	11	-3.24	6.89	42	12.35	45
23-131	E. A. White	*	13.75	11	-2.61	8.99	42	12.94	44
23-214	F. E. Pilley	*	16.70	12	-0.95	8.45	42	13.75	45
23-214a	do		24.29	11	-1.32	22.97	44	24.29	44
23-413	E. A. White	*	46.96	12	-3.67	32.32	42	46.96	45
27-111	J. L. Ogle	*	41.58	12	-4.68	29.85	42	41.58	45
27-424	M. C. Brown	*	32.06	12	-2.58	24.18	42	32.06	45
28-111	Ross Sears	*	19.97	12	-1.92	14.14	42	23.89	43
28-211	do		77.88	12	-6.04	58.80	58	77.88	45
28-423	P. E. Stokes	*	68.02	12	-5.97	49.52	38	68.02	45
29-213	do		46.46	12	-5.39	32.25	38	46.46	45
29-441a	J. W. Wiggins	*	46.29	12	-5.87	31.20	38	46.29	45
29-441b	do		64.61	10	-5.28	53.09	43	64.61	45
32-131a	B. F. Knoll	*	41.20	10	42.60	32.85	38	45.80	44
32-331	B. E. Spencer	3							

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Jan. 1945 Level	Change 1944-45	Water levels			Record
					Day	Highest Level	Lowest Year	
14.26.35.344	J. H. King	3,5	67.92	11	-1.19	65.68	43	68.65 41 41
15.24.23.344	Carroll Jackson	.	65.90	9	-.03	66.08	39	67.00 41 38
27.344	S. A. Lanning	.	59.44	9	+1.20	59.44	45	61.75 38 38
28.244	State of New Mexico	.	90.70	9	+.52	88.62	38	92.30 41 38
32.211	Carl Mangum	3	37.63	9	+.19	37.63	45	50.72 42 40
34.341	S. A. Lanning	.	31.80	9	+4.46	30.58	38	39.82 42 38
35.145	E. P. Malone	.	b 24.12	9	-7.51	16.91	44	27.70 38 38
36.245	State of New Mexico	.	41.88	9	-.45	37.67	42	41.88 45 38
15.25.12.111a	Jack Palmer	.	42.67	10	-1.41	35.64	42	42.67 45 38
12.212b	Unknown	5	44.94	10	-3.02	41.92	44	44.94 45 44
12.421	C. H. Foster	.	47.18	10	-5.52	41.66	44	47.18 45 44
24.111	Hal Bogle	.	14.24	10	+.06	12.05	42	14.30 44 38
24.211	do	.	15.53	10	-2.37	7.65	42	15.53 45 38
26.423	R. T. Spence	.	5.96	10	-.01	3.59	42	5.96 45 42
27.321	Pearson Bros.	.	20.92	10	+15.01	17.50	42	35.93 44 38
28.351	T. C. Sexton	.	27.64	9	+2.63	27.64	45	33.30 39 38
28.351a	do	.	26.48	9	+2.90	26.48	45	29.38 44 44
33.112	Carroll Jackson	.	19.84	9	+.49	11.18	42	22.28 40 38
35.111	M. M. Spence	3	26.53	10	+.16	15.51	42	26.69 44 38
35.311	Paul Robinson	.	37.53	9	+.14	28.85	42	37.97 41 38
36.353	J. M. Norris	.	27.92	9	+.04	24.20	42	27.96 44 38
36.353a	do	.	28.02	9	-.27	23.20	42	28.02 45 42
15.26.444	Harry Cowan	3	37.08	10	-1.07	33.14	42	38.22 41 40
5.121	B. E. Spencer	3	47.75	10	-4.59	34.80	38	47.75 45 38
5.142	A. Russell Estate	.	38.46	10	-5.59	25.55	43	38.46 45 38
6.311	Calvin Graham	.	40.52	10	-3.27	28.66	38	40.52 45 38
7.312	C. H. Foster	.	41.84	10	-5.59	36.25	44	41.84 45 44
8.411	E. M. George	.	21.84	10	-5.76	16.08	44	21.84 45 44
8.413	do	.	21.35	10	-5.82	15.53	44	21.35 45 44
9.133	do	.	20.72	10	-2.22	16.68	42	22.42 41 40
14.222	Breeb Hurst	5	6.55	10	-.77	2.33	42	6.55 45 41

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Year	Year	
15.26.17.211	E. M. George	5	17.11	10	-6.05	12.06	44	17.11	45 44
18.11.2	R. T. Spence	5	36.25	10	-4.94	31.29	44	36.23	45 44
19.211	Lake Arthur Cemetery	3	33.39	10	-2.41	23.87	42	33.39	45 42
19.442	J. F. Frazier	10.88	10	-1.23	5.47	42	10.88	45	38
20.144	J. W. Webb	25.48	10	-1.48	18.30	42	25.50	41	38
20.431	Bill Walton Estate	(Measurements discontinued)				10.15	42	15.40	41
20.431a	Unknown	5	16.94	10	***	***	***	***	45
29.111	E. C. Jackson	7.40	10	-83	3.68	42	8.01	41	38
30.131	Paul Robinson	6.38	10	+1.40	2.10	40	7.72	43	39
30.224	1st Nat'l Bank, Artesia	10.53	10	-1.16	6.27	42	10.70	41	38
30.411	J. F. Crook	14.88	10	-29	13.35	43	14.68	45	43
31.111	E. J. Gromo	13.23	10	-25	9.55	42	13.73	41	38
31.333	E. B. Spencer	17.98	9	-11	15.12	42	17.98	45	42
32.231	Mrs. H. C. Evans	9.34	10	-16	7.70	42	9.64	40	38

a Pumping.

b Pumping recently.

c Nearby well pumping.

d Dry at depth given.

e From recorder chart.

f Also 1940.

g Also 1943.

h Measurement doubtful.

i Flowing in 1939, 1940, 1941.

j Water leaking into well from irrigation canal.

k Also 1938.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	10.24. 31.444	10.25. 19.331	11.24. 10.224	11.24. 14.313b	11.24. 28.113	11.25. 6.421a	12.24. 13.111	12.25. 9.422
Owner	Winkle	Van Smith	Smith	Wright	School	White	Newman	Town-site
Jan. 13-22	17.07	32.40	12.96	29.91	59.76	5.63	864.63	45.01
Mar. 21,22	12.50	32.87	18.84	38.62	60.65	7.15	65.08	44.59
May 18,19	12.51	32.80	23.05	42.97	b65.12	9.20	68.80	46.67
July 17-19	11.77	a33.65	26.43	e46.00	67.90	h8.83	a73.26	47.76
Sept. 12,13	.....	a34.03	27.33	.....	b70.45	10.37	72.65	50.04
Nov. 12,13	.....	33.25	15.31	34.03	b66.27	6.04	b69.19	48.84
Location number	12.25. 35.411a	12.26. 18.221a	12.26. 29.333	13.25. 8.133	13.25. 32.411	13.26. 14.331	13.26. 17.321	13.26. 28.121
Owner	Stone	Johnson	Lawing	Jeff- ries	Brash- ler	Saun- ders	Nowal	Grassie
Jan. 16,20,21	40.23	14.57	16.56	61.81	78.63	0.84	11.47	b17.50
Mar. 23	....	c14.22	15.58	65.11	78.66	3.08	11.59	20.74
May 19,20	60.95	c14.46	15.61	72.23	78.75	4.95	(a)	22.25
July 19,20	(a)	c15.01	17.01	75.52	78.83	14.69	b24.54	20.98
Sept. 13,14	65.88	15.34	17.85	76.89	78.94	6.04	a28.32	b22.06
Nov. 12-14	52.09	15.24	18.02	72.27	78.97	3.93	11.84	b18.50
Location number	14.25. 1.344	14.25. 20.443	14.26. 7.443	14.26. 12.131	14.26. 15.322	14.26. 15.333	14.26. 32.331	14.26. 35.344
Owner	Lang- negger	Hurst	Adams	Utt- er- back	Evans	Menoud	Spenn- cer	King
Jan. 10-14	56.16	74.93	a51.15	21.99	8.74	24.12	41.20	67.92
Mar. 23,24	62.76	75.02	53.18	21.83	7.16	23.91	41.24	67.88
May 19,20,22	(a)	75.13	56.20	21.50	8.70	30.63	45.79	68.02
July 20,23	70.59	75.16	55.81	21.66	9.80	32.25	48.03	68.29
Sept. 14,15, 19	69.84	75.26	56.10	21.03	12.97	28.85	48.46	68.68
Nov. 13,14	(a)	75.39	(a)	21.67	12.13	29.15	43.97	68.97
Location number	15.24. 32.211	15.25. 35.111	15.26. 4.444	15.26. 5.121	15.26. 19.211			
Owner	Mangum	Spence	Cowan	Spen- cer	Ceme- tery			
Jan. 9,10	37.63	26.53	37.08	47.75	33.39			
Mar. 24	38.59	b23.96	37.20	48.22	53.23			
May 22	39.90	26.85	38.01	49.00	33.59			
July 23	40.13	28.45	38.76	49.62	34.97			
Sept. 15,19	41.44	30.51	40.18	50.09	36.10			
Nov. 14,16	39.89	30.44	39.72	50.43	36.10			

a. Pumping.

b. Pumping recently.

c. Nearby well pumping.

e. Dry at depth given.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

11.25.29.444. Glenn Wheeler.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 3	7.62	Jan. 9	8.54	Jan. 19	8.70	Jan. 25	8.67
4	7.49	10	8.58	20	8.70	26	8.56
5	7.50	15	8.77	21	8.73	27	8.23
6	8.06	16	8.75	22	8.72	28	8.13
7	8.30	17	8.73	23	8.68	29	8.03
8	8.42	18	8.72	24	8.67	Mar. 22	8.63

11.25.29.444--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 23	8.54	June 17	13.46	July 26	11.32	Oct. 5	12.36
26	8.85	18	13.65	27	11.57	6	12.12
27	8.84	22	g 13.36	Aug. 14	11.49	7	11.92
28	8.73	23	13.39	15	11.29	8	11.76
29	8.65	24	13.25	16	11.30	9	11.60
Apr. 3	11.13	25	13.00	17	11.57	10	11.48
4	11.26	26	13.20	18	11.93	11	11.35
5	11.42	27	13.31	19	12.21	26	10.61
6	11.51	28	13.40	20	12.44	27	10.57
7	11.60	29	13.49	Sept. 3	g 12.55	28	10.54
8	11.67	July 10	10.34	4	12.72	29	10.52
20	g 9.97	11	10.10	5	12.94	30	10.48
21	10.02	12	9.97	6	13.12	31	10.44
May 19	g 13.23	13	9.81	7	13.04	Nov. 12	10.60
20	12.80	14	9.42	8	12.59	13	10.50
21	12.60	15	9.14	9	12.69	14	10.46
22	12.88	16	8.98	12	g 13.06	15	10.42
23	12.76	19	g 9.38	13	13.14	16	10.41
24	12.68	20	9.35	14	12.79	17	10.44
25	12.61	21	9.66	15	12.42	18	10.42
June 12	13.10	22	10.12	16	12.63	19	10.39
13	13.03	23	10.51	17	12.76	Dec. 12	g 12.20
14	13.04	24	10.84	18	12.57	13	12.23
15	13.18	25	11.09	19	12.92	14	12.19
16	13.31						

g Tape measurement.

13.26.7.333. Howard Amason.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Jan.	3	g 13.22	Apr.	10	16.71	June 23	18.19	Oct.	5	19.20
15	13.18	11			16.74	24	18.18	6	19.03	
16	13.17	20			g 17.07	25	18.18	25	17.39	
17	13.17	21			17.09	26	18.25	26	17.35	
18	13.16	22			17.12	27	18.36	27	17.32	
19	13.16	23			17.14	28	18.48	28	17.29	
20	13.16	24			17.14	29	18.58	29	17.27	
21	13.16	25			17.17	July 10	18.96	30	17.25	
22	13.16	26			17.24	11	18.96	31	17.22	
23	13.17	27			17.32	12	18.96	Nov. 1	17.20	
24	13.18	28			17.39	13	18.96	9	g 16.87	
25	13.18	May 19			g 17.54	14	18.94	10	16.87	
26	13.18	20			17.57	15	18.97	11	16.92	
27	13.18	21			17.63	16	18.78	12	16.98	
28	13.18	22			17.69	19	18.59	13	16.91	
Mar. 22	g 15.38	23			17.76	20	18.59	14	16.91	
23	15.42	24			17.83	21	18.68	15	16.90	
24	15.51	25			17.87	22	18.71	16	16.89	
25	15.60	26			17.90	23	18.81	17	16.87	
26	15.69	June 12			17.46	24	18.90	18	16.84	
27	15.77	13			17.43	Aug. 14	g 19.58	19	16.81	
28	15.86	14			17.42	Sept. 13	20.15	20	16.78	
29	15.96	15			17.43	14	20.15	21	16.75	
Apr. 3	g 16.42	16			17.51	15	20.15	Dec. 12	g 16.28	
4	16.46	17			17.65	16	20.14	13	16.27	
5	16.52	18			17.79	17	20.10	14	16.25	
6	16.57	19			17.95	18	20.02	15	16.24	
7	16.62	20			18.04	19	18.94	16	16.23	
8	16.66	22			18.19	20	18.91	17	16.23	
9	16.69									

g Tape measurement.

14.25.25.221. John M. Norris.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 12	g 54.84	Apr. 6	54.88	May 28	57.23	July 11	58.89
13	54.80	7	54.92	29	57.28	12	58.92
14	54.80	8	54.92	June 12	57.86	13	58.93
15	54.77	9	54.97	13	57.83	14	58.96
16	54.74	10	54.98	14	57.89	15	58.98
17	54.74	21	55.60	15	57.94	16	59.01
18	54.73	22	55.62	16	57.99	20	59.05
19	54.70	23	55.68	17	58.01	21	59.07
Mar. 24	54.42	24	55.72	18	58.04	22	59.09
25	54.44	25	55.78	19	58.08	23	59.12
26	54.42	26	55.83	22	58.37	24	59.15
27	54.50	27	55.87	23	58.41	25	59.16
28	54.53	May 22	56.92	24	58.45	26	59.18
29	54.55	23	56.96	25	58.46	27	59.23
30	54.57	24	57.03	26	58.48	Aug. 14	61.16
31	54.60	25	57.09	27	58.53	15	61.18
Apr. 3	54.80	26	57.12	28	58.59	16	61.18
4	54.85	27	57.18	July 10	58.91	17	e 61.5

e Dry at depth given.

g Tape measurement.

Part 5. Miscellaneous data concerning observation wells

10.24.8.111. Stockton. Water level, in feet below land-surface datum, 1939: Feb. 10, 40.16.

10.24.15.342. Crawford. Formerly owned by L. C. Tow. Measuring point beginning Jan. 22, 1945, top edge of pump column clamps, 0.63 foot above concrete floor of pump house and 0.75 foot above land-surface datum. Possible discrepancy between preceding and succeeding record.

10.24.17.122. Howard. Water level, in feet below land-surface datum, 1945: Mar. 21, 27.54.

10.24.31.444. Van winkle. Overflow from water hyrant flows into well.

10.24.33.244. Westover. Water levels, in feet below land-surface datum: Mar. 22, 1940, 2.70; Mar. 25, 1940, 2.81; Aug. 23, 1940, 4.19; Feb. 21, 1941, 5.65.

10.24.34.333. Butler. Water level, in feet below land-surface datum, 1941: Feb. 12, 4.55.

10.24.36.222. State of New Mexico. Water level, in feet below land-surface datum, 1941: Feb. 21, 4.15.

10.25.7.444. Pendergrass. Water level, in feet below land-surface datum, 1941: Feb. 21, 8.96.

10.25.17.344. Cannon. Water level, in feet below land-surface datum, 1941: Feb. 21, 7.65.

10.25.19.331. Smith. Water level, in feet below land-surface datum, 1941: Feb. 21, 32.58.

10.25.29.222. U. S. Government. Water level, in feet below land-surface datum, 1941: Feb. 21, 3.15.

11.24.3.312. Bristow. Artesian well. Measurements discontinued after Jan. 14, 1945.

11.24.6.311. Wirtz. Reference point established Jan. 14, 1945, surface of concrete around casing at contact with casing, south 30° west side of casing, 0.45 foot above land-surface datum. Water-level measurement reported in Water-Supply Paper 886 for Feb. 2, 1939, should be 37.61.

11.24.6.433. Watkins. Reference point established Jan. 14, 1945, form mark at top of lower course of concrete in west wall of pump structure, 10 feet northeast of well, 2.51 feet above land-surface datum.

11.24.6.444. Huff. Measuring point beginning Jan. 14, 1945, north edge of pump base. Subtract 0.60 foot from tape measurements to reduce to land-surface datum as tape does not hang vertically. Pump rests on concrete base which is at land-surface datum.

11.24.9.122. McCutchen. Previously designated incorrectly as 11.24.9.211.

11.24.10.321. Oney. Formerly owned by J. H. Rodgers.

11.24.14.313b. Wright. Formerly owned by H. F. Fairbanks.

11.24.15.431. Barnett. Reference point established Jan. 17, 1945, top of concrete pump base, 0.15 foot below top of opening in basal plate of turbine pump, 0.36 foot above land-surface datum.

11.24.28.113. School. Measuring point beginning Sept. 12, 1945, top edge of casing, 0.75 foot above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

11.24.36.333. Grizzle. Reference point established Jan. 15, 1945, upper surface of concrete engine block, at northeast corner, 1.64 feet above land-surface datum.

12.25.2.Lot 3. Heine. Measuring point beginning Jan. 15, 1945, bottom edge, west side, of pump base, 0.68 foot above concrete pump base and land-surface datum.

12.25.2.Lot 4. Duvall. Reference point established Jan. 15, 1945, top of concrete pump base, 0.20 foot above land-surface datum.

12.25.22.231. Clardy. Measuring point beginning Jan. 21, 1945, top edge of west $\frac{1}{2}$ -inch hole in base of Peerless turbine pump, 0.52 foot above concrete pump base and 0.91 foot above land-surface datum.

12.25.25.413. Freeman. Measuring point beginning Jan. 21, 1945, lower edge of south $\frac{1}{2}$ -inch hole in west side of base of turbine pump, 0.20 foot above concrete pump base and land-surface datum.

12.25.34.431. Mask. Previously incorrectly designated as 12.25.34.411. Water-level measurement reported in Water-Supply Paper 886 is for 1939.

12.25.35.111. Smith. Measuring point beginning Jan. 20, 1945, top edge of wooden pipe clamp, 0.30 foot above wooden board cover over well, 0.60 foot above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

12.25.35.311b. Moberly. Water level, in feet below land-surface datum, 1945: May 19, 66.64.

12.25.35.411a. Stone. Used drilled irrigation well, equipped with electrically driven turbine pump, 350 $\frac{1}{2}$ feet northwest of well 12.25.35.411. Measuring point, top edge of opening in basal plate of pump, inside of pump case, 0.20 foot above concrete pump base, 1.20 feet above land-surface datum.

12.25.36.313. Kuykendall. Measuring point beginning Jan. 20, 1945, top edge of 5-inch casing, just south of 12 $\frac{1}{2}$ -inch casing, 0.25 foot above land-surface datum.

12.26.30.213. Wiley. Well abandoned. Measuring point beginning Jan. 21, 1945, top of casing, west side of well, 4.40 feet below land-surface datum.

13.25.6.333. Lowe. Well equipped with windmill and pump prior to Jan. 20, 1945.

13.25.11.433. Brockman. Water levels, in feet below land-surface datum, 1945: Mar. 23, 53.89; Nov. 13, dry at 58 feet.

13.25.13.133. Fletcher. Measuring point beginning Jan. 19, 1945, top edge of opening in base plate of pump, inside pump case, 0.20 foot above concrete pump base, 1.65 feet above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

13.25.13.433. Weir. Reference point established Jan. 19, 1945, upper surface of concrete pump foundation, 0.55 foot above land-surface datum.

13.25.14.131. Conn. Formerly owned by W. F. Kerr.

13.26.17.443. Vandenburg. Reference point established Jan. 16, 1945, top of concrete pump foundation, 0.08 foot below land-surface datum.

13.26.19.222. Stone. Reference point established Jan. 19, 1945, top of concrete pump foundation, 0.50 foot above land-surface datum.

13.26.20.113. Stone. Measuring point beginning Jan. 19, 1945, top of casing, 0.15 foot above land-surface datum.

13.26.20.333. Lockheed. Measuring point beginning Jan. 17, 1945, top edge of opening in basal plate of new turbine pump, level with concrete pump foundation, at land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

13.26.34.313. Lankford. Reference point established Jan. 16, 1945, top surface of concrete foundation for shelter house over well, 1 foot west of measuring point, 0.36 foot above land-surface datum.

13.26.34.431. Cole. Formerly owned by Chas. J. Michelet.

14.25.1.112. Fuller. Water level, in feet below land-surface datum, 1945: Mar. 23, 44.15.

14.25.12.133a. Whitman. Measuring point beginning Jan. 13, 1945, center of $\frac{1}{2}$ -inch hole in top of discharge pipe. Subtract 2.35 feet from tape measurements to reduce to top of concrete pump foundation, at land-surface datum.

14.25.13.311a. Moore. Used drilled irrigation well, equipped with turbine pump, 10 feet south of well 14.25.13.311. Measuring point, top edge of opening in basal plate of pump, inside pump case, 0.25 foot above concrete pump foundation and land-surface datum.

14.26.3.243. Brown. Used drilled stock well, equipped with windmill and pump. Measuring point, top of concrete well curb around casing, 0.50 foot above land-surface datum.

14.26.3.413. Menefee. Windmill removed and pressure pump installed. Measuring point beginning Jan. 11, 1945, lower edge of basal plate of pressure pump, 0.37 foot above top of casing, and 0.40 foot above land-surface datum.

14.26.4.133a. Jacobson. Formerly owned by L. E. Harshey.

14.26.4.141. Lockheed. Reference point established Jan. 14, 1945, top of concrete pump foundation, 0.07 foot above land-surface datum.

14.26.5.243. McKinstry. Reference point established Jan. 14, 1945, top of concrete pump base, 0.40 foot above land-surface datum.

14.26.10.221. Langnegger. New concrete pump foundation and electric motor installed. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

14.26.13.121. Lang. Measuring point beginning Jan. 11, 1945, lower outer edge of pump base on north side, 0.40 foot above concrete pump base, 1.00 foot above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

14.26.14.441. Michelet. Formerly owned by F. M. Evans.

14.26.17.211a. William Salomon. Used drilled irrigation well, equipped with electric turbine pump which rests directly on 4- by 4-foot concrete pump foundation. 150 feet south of well 14.26.17.211. Measuring point, lower edge of opening in southeast side of pump case, 0.80 foot above concrete pump base, 1.30 feet above land-surface datum.

14.26.19.242. Pearson. Pump removed prior to Jan. 12, 1945. Water level, in feet below land-surface datum, 1945: Sept. 15, 81.65.

14.26.19.311. West. Measuring point beginning Jan. 12, 1945, top edge of opening in basal plate, inside pump case, 0.97 foot above land-surface datum.

14.26.19.444. Lane. Water level, in feet below land-surface datum, 1945: Sept. 19, 80.67.

14.26.23.214a. Pilley. Used drilled irrigation well, equipped with turbine pump, 15 feet south of well 14.26.23.214 which has been filled. Measuring point, top edge of 1½- by 3-inch slot in south side of casing, 1.00 foot above land-surface datum of well 14.26.23.214. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

14.26.35.344. King. Water level, in feet below land-surface datum, 1941: Feb. 19, 68.65.

15.25.12.212b. Unknown. Reference point established Jan. 10, 1945, top northeast edge of 1½-inch pipe which is used for electricity ground, 10 inches south of electric power pole, 4 feet northeast of well, 0.20 foot above land-surface datum.

15.26.14.222. Hurst. Water level, in feet below land-surface datum, 1941: Feb. 19, 6.32.

15.26.18.112. Spence. Measuring point beginning Jan. 10, 1945, top edge of rectangular opening in east side of pump case, 0.82 foot above concrete pump base, 1.32 feet above land-surface datum.

15.26.20.431a. Unknown. Used dug domestic well, diameter 5 feet, equipped with rope and pulleys. 50 feet north of house. Measuring point, west edge of east 2- by 6-inch board well-cover support, across center of well, at land-surface datum.

EDDY COUNTY

Part 1. General discussion

The general discussion of water-level changes in Eddy County has been included with Part 1 for Chaves County as the areas are parts of one continuous hydrologic area and cannot coherently be discussed separately.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also	Part	Water levels				Record	Be- gan years missing
				Jan. 1945 Level	Day	1944-45 Change	Highest Level		
16.25.1.Lot 3	Pearson Bros.			14.60	9	-3.99	10.61	44	19.40
1.Lot 13	(Incorrect designation used for well 16.25.1.)			18.89	9	-4.23	14.66	44	18.89
1.Lot 13a	Charles Buck	5		11.67	8	-1.73	9.50	42	11.67
1.344	Buck Bros.	3		12.00	9	-2.20	14.07	44	420.90
2.Lot 9	Ralph Pearson			10.55	9	-1.96	17.35	44	12.00
2.Lot 15	do			12.94	9	-2.21	10.58	42	12.94
4.Lot 12	J. E. Taylor			13.35	9	-1.68	9.22	42	13.35
5.Lot 4	E. P. Malone, Jr.			14.17	9	-1.68	9.48	42	14.17
5.Lot 5	do			6.17	9	-1.41	5.23	43	6.17
5.Lot 13	Fred Croom			17.81	8	-1.20	8.27	42	15.72
5.443	W. M. Ault			12.06	9	+1.06	11.42	42	17.81
6.Lot 4	F. M. Nelson	3		28.31	8	+1.78	27.27	42	28.31
6.313	Frank Childress	4		24.27	9	+1.37	24.27	45	30.30
8.111	Pearson Bros.			56.85	8	+1.28	56.55	45	31.39
10.335	Orval Gray			51.61	8	+1.53	48.60	42	53.64
10.334	do			34.47	8	+0.01	34.46	44	34.47
11.135	J. J. Terry			31.74	8	+1.48	28.45	42	31.74
11.235	Noah Buck			18.35	8	+1.41	15.45	42	18.35
12.124	Buck Bros.			13.90	8	+1.18	10.85	42	14.17
12.412	T. J. Terry			24.03	8	+1.48	19.64	42	25.22
13.211	do			35.14	8	+1.35	30.70	42	35.14
14.213	L. T. Lewis			73.08	8	+8.4	64.20	39	73.08
15.235	J. H. Everest			91.30	8	+1.57	82.78	38	91.30
15.331	do			36.40	7	+1.29	30.42	42	36.40
24.212	Monroe Howard			27.21	9	+1.12	22.73	42	27.85
16.26.5.Lot 3	Ed Taylor			441.56	9	+9.72	27.35	42	32.00
5.Lot 4	H. V. Parker			20.20	8	+3.65	16.21	38	20.20
5.351	Nancy Parker			30.60	9	+4.42	24.07	42	31.02
6.Lot 2	H. V. Parker			33.45	9	+8.0	27.15	42	34.25
6.Lot 4	do			29.06	9	+1.33	28.73	44	29.06
6.Lot 4a	do			13.70	8	-2.87	10.80	42	13.70
6.333	Scott Meyer			11.24	8	-2.03	7.20	42	15.63
7.121	L. T. Lewis			7.51	8	-1.68	3.09	42	8.10
7.321	T. J. Prink			15.77	8	-2.08	12.45	42	17.00
8.111	Ira S. Reser								40

*See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record	Be- gan Years missing
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year		
16.26.15.333	Carl Manda	5	10.71	8	+0.06	9.66	42	10.77	44	42
16.313	V. L. Gates	5	5.76	8	-0.56	3.80	42	8.60	40	38
17.311	W. R. Roberts	•	20.68	8	-1.45	16.68	42	25.77	41	38
17.331	Elzie Swift	•	9.97	8	-1.15	6.12	43	14.78	41	38
18.331	Monroe Howard	•	20.15	8	-0.79	14.32	42	20.83	41	38
18.411	Ira. S. Reser	•	18.23	8	-0.76	13.29	42	23.69	40	38
19.113	H. E. Hall	•	22.46	7	-1.28	16.19	42	22.46	45	39
19.138	F. M. Privett	•	22.99	7	-1.40	16.54	42	23.70	40	38
19.211	H. V. Parker	•	15.25	7	-1.09	9.34	42	17.50	41	38
19.411	F. M. Privett	3	33.10	7	-0.39	27.84	42	35.32	41	38
21.333	J. H. Everest	•	6.15	8	-0.51	2.09	42	8.11	41	38
28.333	Irvin Dixon	3	12.28	6	+1.00	9.57	42	16.55	41	38
28.431	R. E. Coleman	•	11.78	6	+1.07	8.72	42	14.94	41	38
31.413	T. F. Wilson	•	44.15	7	+0.03	35.33	38	44.18	44	38
32.231	B. E. Green	•	22.54	6	+0.51	20.41	43	23.05	44	38
32.411	do	•	18.91	6	+0.24	15.20	42	20.64	40	38
32.421	W. W. Parker	•	••••	•	••••	13.78	42	17.89	41	38
35.113	J. T. Fulton	5	8.13	6	+1.39	7.86	43	9.52	44	43
17.25.13.131	L. G. Nonseke	5	95.23	7	-1.75	85.20	42	93.23	45	38
22.223	J. M. Jackson	5	147.85	7	-2.47	135.66	42	147.85	45	38
24.433	do	•	90.15	5	-1.69	82.40	42	91.82	41	38
26.222	Mildred and M. L. Doss	•	100.46	5	-2.68	91.56	42	101.77	41	38
35.411	Ed Kinsinger	•	114.72	5	-2.95	107.95	43	116.96	41	38
17.26.2.133	Fred Savoie	3	8.03	6	+0.49	5.62	42	9.68	41	38
5.251	H. R. Rogers	•	7.94	6	+0.73	4.61	42	9.83	41	38
3.333	A. T. Woelk	•	10.55	6	+0.63	9.96	43	11.18	44	43
3.433	Mrs. R. W. Box	•	8.14	6	+0.61	5.23	42	9.52	41	38
4.121	State of New Mexico	5	9.85	7	+3.11	9.25	42	17.39	38	38
4.331a	Howard Stroup	•	3.08	7	+2.75	•10	38	8.52	41	38
4.331b	do	5	12.04	7	-5.84	•55	42	12.04	45	39
4.413	Fred Crawford	•	••••	•	••••	9.48	41	13.47	38	40, 42,
										44, 45

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Water levels						Record	
			Jan. 1945	Change	Highest	Lowest	Year	Year	Be- gan	Years missing
Part	Level	1944-45	Level	1944	1945	Level	1944	1945	1945	38
17.26.5.422	Joe lace Fred and B. A. Savole	5	16.30	7	-1.53	9.83	42	16.30	45	38
6.413	J. W. Collins Buck Jernigan	•	42.24 50.77	7	-1.79 -7.70	34.75 42.87	42	42.24 50.77	45	38
7.131	E. E. Scoggins Ivan Rogers	3	35.43 39.52	7	-2.69 -1.99	32.74 31.53	42	35.43 40.50	45 41	40
7.344	C. A. Houghton Ed Stone	•	27.34 35.20	7	-1.91 -2.75	19.24 15.87	42	27.34 26.49	45 41	38
7.421	Albert Blake N. M. Asphalt & Refining Co.	•	30.38	7	-1.29	26.90	42	35.20	45	38
7.423	V. L. Gates D. D. Sullivan	3	5.54	6	+1.22 +.67	4.60 14.41	42	10.61 18.51	41 41	39
7.444	R. L. Vogel do	•	5.47	6	+.11	1.48	42	5.95	40	38
9.333	J. M. Vogel W. M. Jackson	5	8.27	6	+2.02	5.00	42	10.29	44	38
10.335	W. M. Jackson Artesia Cemetery	5	14.21 12.22	6	+68 +.50	11.57 11.25	42	16.28 16.55	41 41	38
10.433	G. G. Armstrong & Son	16.411	15.91	6	-.41	11.34	42	19.21	41	39
11.113	H. A. Denton A. C. Raca	•	17.93 46.52	6	+.25 -1.72	17.93 38.61	45	19.85 42	38 41	38
12.112	Mrs. Murphy J. W. Sharp & G. V. McCrary	20.135	33.90	6	-1.39	26.30	42	33.97	40	38
13.341	Roger Durand W. S. Hobsett	•	13.35 3.48	6	-1.55 -.46	25.48 8.63	42	36.09 15.85	41	38
14.233	R. L. Paris Mary E. Yates	24.333	20.94 2.82	6	-.38 +.04	18.34 2.13	42	22.95 2.86	38 42	38
15.411	W. L. Martin do	27.413	13.76 12.58	6	+.74 +.13	11.16 10.38	42	14.87 15.90	38 41	38
16.333	C. E. Martin do	28.331	14.03 32.50	5	-.79 -1.45	8.78 26.04	42	19.10 36.52	41	38
17.131a	G. R. Brainard	31.133	63.28	5	-2.52	56.57	43	66.57	41	38

* See footnotes at end of table.

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Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record		
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year	Be-gan	Years missing	
18.25.23.111	Mrs. G. M. Phelps	3	93.08	5	-2.04	90.67	42	93.08	45	42	
18.26.2.333	S. O. Higginns	5	11.77	5	-.75	11.02	44	14.35	40	38	41
4.111b	Frank Watkins	3	22.29	5	-.68	18.19	45	27.10	40	38	
4.453	W. M. Schneider	18.30	5	+.29	16.82	45	23.00	41	38		
7.23.4a	C. H. Hutsongpiller	4	48.12	5	-.75	49.62	45	f53.68	41	39	42
7.23.4c	do	do	53.99	5	-.26	53.73	44	56.83	39	39	42
9.133	Martin Yates, Jr.	30.92	5	-.14	26.01	43	30.92	45	43		
9.311	C. T. McCauley	5	31.11	5	-.12	26.62	43	35.76	41	39	40
10.233	Charles Rogers	11.92	4	+.28	9.80	42	14.82	40	38	39, 41	
15.133	J. D. Terry Es-tate	21.45	4	+.01	15.78	42	23.95	40	38	41	
15.311	Charles Martin	20.85	4	+.27	14.16	42	22.02	40	38		
17.112	W. B. McCrary	(Measurements discontinued)	35.6*	42	43.47	41	38				
18.241	do	45.33	5	-2.27	37.50	43	53.35	41	38	40	
18.323	do	50.30	5	-3.95	38.49	43	54.91	41	38	40	
21.344	Town of Dayton	4	39.52	4	-2.85	f32.97	41	f43.85	41	39	
22.314	Mrs. W. D. Bads	412.00	4	-2.23	8.16	43	11.34	39	38	40, 41	
23.213	A. W. Boyce	23.46	5	-.73	17.55	42	27.80	41	38		
24.131	R. G. Goodwin	15.43	5	-.43	14.16	43	15.43	45			
24.223	Angeline Mackey	3	4.99	5	-.34	1.26	42	5.41	40	39	
28.132	Dayton School	5	54.86	4	-2.99	49.83	43	59.30	41	38	
33.111	Thelma Yates	5	64.22	4	+.08	64.22	45	67.97	40	38	
19.26.12.323	Forrest Lee	25.30	4	-2.20	15.74	42	23.30	45	39		
12.333	do	22.83	4	-1.78	17.06	43	22.83	45	43		
12.333	Ollie Banks	3.5	28.14	4	-1.79	22.21	42	28.24	41	41	42
13.211	R. L. House	3	14.75	4	-.10	8.02	42	14.83	41	38	
13.344	R. W. Rankin	3, 5	@ 9.22	4	....	2.70	42	e 9.22	45	42	
14.431	Albert Lee	3	....	4	....	3.55	42	15.54	41	38	40, 45
27.233	Lakewood School	3	47.10	4	-.28	40.73	43	51.47	41	38	40
28.334	Frank Howard	54.49	4	+4.62	46.20	42	59.96	41	38	40	
28.441	D. D. Sullivan	61.85	4	+.78	55.11	42	62.63	44	38		
33.412	J. H. Everett	45.20	4	-.12	39.63	42	51.90	41			
20.26.6.451	J. G. Moutry & Sons	44.73	4	-.41	35.67	42	45.93	41	38		
7.122	P. S. Campbell	45.42	4	-.17	36.57	42	46.30	41	38		
7.421	E. Manthei	37.52	4	-.03	30.99	42	39.47	41	38		
8.112	J. G. Moutry & Sons	33.00	4	+.09	24.15	42	34.39	41	38		
17.411	J. H. Angell	46.40	4	+.64	43.00	42	48.42	41	38		

a Pumping.

b Pumping recently.

e Dry at depth given.

f From recorder chart.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location	16.25.	16.25.	16.26.	16.26.	17.25.	17.26.	17.26.	17.26.
number	1.344	1.344	6. Lot 4	19.411	28.333	35.411	7.344	10.333
Owner	Buck	Nelson	Privett	Dixon	Kissinger	Scogins	Gates	Cemetery
Jan.	5-9	11.67	12.06	33.10	12.28	114.72	39.52	5.54
Mar.	24-27	119.52	12.13	43.00	16.98	114.85	44.02	(a) 23.16
May	20-22	16.69	12.78	48.16	22.31	118.02	50.21	11.37 a31.92
July	21-23	b17.74	14.00	47.57	22.38	119.51	54.77	12.00 40.14
Sept.	15-19	a32.60	15.04	49.11	26.17	120.96	56.19	(a) 36.55
Nov.	14-16	b14.02	15.34	38.42	18.19	119.84	47.52	9.39 20.67
					18.26.			20.26.
Location	17.26.	18.25.	4.111b	18.26.	19.26.	19.26.	19.26.	7.122
number	24.333	23.111	Watkins	24.223	12.333	13.344	27.233	Campbell
Owner	Yates	Phelps		Mackey	Banks	Rankin	School	
Jan.	4-6	2.82	93.08	22.29	4.99	28.14	e 9.22	47.10 45.42
Mar.	26,27	2.82	107.01	24.52	4.12	30.25	9.32	a57.58 a47.58
May	20-22	3.72	110.34	b26.79	5.14	30.59	9.25	a58.32 a52.00
July	22-24	5.38	115.44	30.23	7.19	32.29	13.49	a56.16 a52.30
Sept.	18	e 5.60	119.10	31.84	8.52	34.20	e14.5	54.04 54.84
Nov.	14-16	4.15	101.74	a49.77	8.45	33.23	13.10	a57.85 a53.25

a Pumping.

b Pumping recently.

e Dry at depth given.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

16.25.6.313. Frank Childress.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	8	29.31	Apr.	22	29.08	Aug.	29.96
	9	29.36		23	29.08	13	29.97
	10	29.28		24	29.01	14	30.01
	11	29.22		25	29.00	15	30.00
	12	29.22		26	29.14	16	30.00
	13	29.23		27	29.18	17	30.00
	14	29.15	May	22	29.46	18	30.00
	15	29.21		23	29.40	19	29.98
Mar.	24	29.05		24	29.36	20	29.97
	25	29.11		25	29.36	Sept.	30.11
	26	29.20		26	29.35	4	30.07
	27	29.21		27	29.35	5	30.02
	28	29.19		28	29.36	6	30.02
	29	29.27		29	29.39	Nov.	16 29.93
	30	29.27	June	12	g 29.80	7	30.03
	31	29.29		23	29.80	8	30.07
Apr.	3	29.22		24	29.80	9	30.14
	4	29.31		25	29.82	10	30.09
	5	29.54		26	29.84	11	30.09
	6	29.41		27	29.84	12	30.10
	7	29.31		28	29.84	13	30.12
	8	29.15		29	29.84	14	30.03
	9	29.01		30	29.86	15	30.10
	21	29.23		31	29.88	16	30.10
						17	29.87
						18	29.87

g Tape measurement.

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18.26.7.234a. C. H. Hutsonpillar.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan.	5 49.11	Apr. 25	51.31	July 10	54.35	Oct. 8	56.66
	6 49.08	26	51.40	11	54.37	9	56.61
	7 49.08	27	51.44	12	54.39	10	56.56
	8 49.07	28	51.49	13	54.42	11	56.50
	9 49.06	May 21	52.51	14	54.45	12	56.44
	10 49.03	22	52.53	15	54.49	25	55.96
	11 48.99	23	52.58	16	54.50	26	55.92
	12 48.99	24	52.61	17	54.53	27	55.87
	26 g 49.40	25	52.63	22	54.79	28	55.83
	27 49.41	26	52.67	23	54.81	29	55.80
Mar.	28 49.47	27	52.69	24	54.85	30	55.76
	29 49.51	28	52.71	25	54.90	Nov. 14	55.14
	30 49.57	June 12	53.34	26	54.96	15	55.08
	31 49.62	13	53.36	27	55.01	16	55.04
	1 49.65	14	53.39	28	55.06	17	55.00
Apr.	2 49.68	15	53.44	29	55.12	18	54.96
	3 49.76	16	53.50	30	55.16	19	54.91
	4 49.88	17	53.55	Aug. 13	56.05	20	54.87
	5 50.00	18	53.61	Sept. 3	56.80	21	54.85
	6 50.08	19	53.66	18	57.06	Dec. 12	54.30
	7 50.15	22	53.85	19	57.11	13	54.29
	8 50.21	23	53.88	20	57.13	14	54.27
	9 50.26	24	53.91	21	57.14	15	54.25
	10 50.31	25	53.94	22	57.15	16	54.22
	11 50.44	26	53.96	23	57.15	17	54.18
	21 51.20	27	55.98	24	57.15	18	54.15
	22 51.22	28	54.01	25	57.15	19	54.13
	23 51.23	29	54.03	Oct. 6	56.76		
	24 51.30	30	54.09	7	56.72		

g Tape measurement.

18.26.21.344. Town of Dayton.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	40.66	.....	.....	.....	.....	44.24	43.67	43.24
2	.....	.....	.....	40.66	.....	.....	.....	.....	44.23	43.66	43.24
3	.....	.....	.....	g39.86	40.67	42.24	.....	43.94	44.20	43.65	43.24
4	39.52	.....	.....	40.72	41.39	.....	.....	.....	44.19	43.61	43.24
5	39.48	.....	.....	40.72	.....	.....	43.11	.....	44.19	43.60	43.23
6	39.48	.....	.....	40.74	.....	.....	43.15	44.01	44.18	43.59	43.25
7	39.48	.....	.....	.....	.....	.....	43.19	.....	44.16	43.55	43.21
8	39.49	.....	.....	.....	.....	.....	43.24	.....	44.12	43.55	43.21
9	39.48	.....	.....	.....	.....	.....	43.25	.....	44.10	43.54	43.22
10	39.47	.....	.....	.....	.....	42.30	43.30	44.11	44.10	43.52	43.20
11	39.45	.....	.....	.....	.....	.....	43.33	.....	44.08	43.49	43.18
12	.....	.....	.....	.....	41.64	.....	43.34	44.19	44.06	43.49	43.17
13	.....	.....	.....	.....	.....	.....	.....	.....	44.04	43.51	43.17
14	.....	.....	.....	.....	41.71	.....	43.42	.....	44.05	43.49	43.17
15	.....	.....	.....	.....	.....	.....	.....	.....	44.01	43.47	43.16
16	.....	.....	40.31	.....	41.76	42.43	.....	.....	43.96	43.44	43.14
17	.....	.....	40.32	.....	.....	.....	.....	.....	43.95	43.42	43.13
18	.....	.....	.....	.....	.....	.....	44.16	45.91	43.45	43.12	
19	.....	.....	.....	.....	.....	.....	44.17	43.90	43.40	43.11	
20	.....	.....	.....	41.10	.....	43.62	44.17	43.86	.....	43.10	
21	.....	.....	g40.50	41.15	.....	.....	44.17	43.87	.....	43.09	
22	.....	.....	.....	41.15	.....	g42.57	.....	44.19	43.83	.....	43.07
23	39.37	.....	.....	41.18	.....	42.63	.....	44.19	43.83	.....	43.05
24	39.35	.....	.....	41.18	.....	42.66	43.68	44.18	43.81	.....	43.06
25	39.35	.....	.....	.....	.....	42.67	.....	44.19	43.80	.....	43.04
26	39.32	39.46	.....	.....	42.08	.....	.....	44.21	43.78	.....	43.03
27	39.32	39.50	.....	.....	.....	.....	43.72	44.22	43.76	43.28	43.05
28	39.32	39.51	.....	.....	.....	.....	.....	44.25	43.74	43.28	43.02
29	39.32	39.52	.....	41.27	.....	.....	.....	44.26	43.74	43.25	43.01
30	.....	39.52	40.63	.....	42.88	.....	44.23	43.71	43.24	43.02	
31	.....	.....	.....	.....	42.95	.....	.....	43.68	.....	43.00	

g Tape measurement.

Part 5. Miscellaneous data concerning observation wells

16.25.1.Lot 13a. Buck. Incorrectly designated as well 16.25.Lot 13 since 1943.

16.26.15.333. Manda. Measuring point beginning Jan. 8, 1945, top edge of inside casing at northwest side of well, 0.08 foot above land-surface datum.

16.26.35.113. Fulton. Formerly owned by Mary E. Strunk. Measuring point beginning Jan. 6, 1945, top west edge of two 2- by 6-inch boards, one resting on top of the other, east side of well, 0.20 foot above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

17.25.22.223. Jackson. Formerly owned by State of New Mexico.

17.26.4.121. State of New Mexico. Measuring point beginning Jan. 7, 1945, top east edge of west 2- by 6-inch board at base of old wooden curb at southwest corner of well, at land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

17.26.4.331b. Stroup. Well casing pulled. Measuring point beginning Jan. 7, 1945, ground surface, approximately at land-surface datum.

17.26.5.422. Luce. Formerly owned by Doris Newberry.

17.26.15.411. Jackson. Formerly owned by M. F. Hardendorf.

17.26.20.133. McCrary. Formerly owned by W. E. Ragsdale.

18.26.2.333. Higgins. Measuring point beginning Jan. 5, 1945, lower edge of discharge pipe. Subtract 10.30 feet from tape measurements to reduce to top of concrete pump foundation and 10.65 feet to land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

18.26.9.311. McCauley. Formerly owned by R. J. Johnston. Measuring point beginning Jan. 5, 1945, lower edge of 1½-inch hole in northeast side of casing, 0.27 foot above land-surface datum.

18.26.22.314. Eads. Formerly owned by George Krauss.

18.26.24.131. Goodwin. Formerly owned by Angeline Mackey.

18.26.33.111. Yates. Formerly owned by Harvey Yates.

19.26.12.333. Banks. Water level, in feet below land-surface datum, 1941: Feb. 19, 28.24.

19.26.13.344. Rankin. Well deepened to 18 feet Mar. 27, 1945. In Water-Supply Paper 949 the correct water level, in feet below land-surface datum, for Jan. 12, 1942, is 2.70.

GRANT COUNTY

By C. R. Murray

Part 1. General discussion

The water-stage recorder installed in April 1943 on the Mracek well, near Central, was continued in operation throughout 1945. Records of water levels for the years 1943 and 1944 are contained in Geological Survey Water-Supply Papers 991, pp. 244, 245, and 1021, pp. 234, 235.

Fluctuations of water level

As in previous years, the water level in the Mracek well declined throughout the year. The precipitation at nearby Fort Bayard during 1945, as recorded by the U. S. Weather Bureau, was only 10.62 inches, 5.21 inches below normal. In only one instance during the year did there seem to be a correlation between precipitation and water level in the observation well. On October 9, 1.83 inches of precipitation fell and for a few days the water level remained stationary before again declining. The water level fell 17.6 feet during the year from 253.3 to 270.9 feet, compared with about 20 feet in 1944. The rate of decline can be roughly divided as follows: From January to June, 1 foot a month, the February decline being exceptionally low, about 0.5 foot; June to November, 1.5 feet a month; and November to January, 2.4 feet a month.

The major factor influencing water levels in this area is the rate at which water is being drained from the area by mining operations. No detailed data are available as to the quantity of water removed from the area in 1945, but variations in the rate of such withdrawals are probably largely responsible for the variations in the rate of decline of the water level in the well. An additional factor, however, is that as the upper part of the aquifer is dewatered the hydrologic constants of the aquifer change. It appears from the sharply accelerated rate of decline, which began in November 1945, that the water level will fall below the bottom of the well, 288 feet, during the first half of 1946.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

17.12.31.121. Albert P. Mracek. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Jan. 1, 253.29; Dec. 31, 270.90.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June
1	253.29	254.46	255.06	256.00	257.10	258.30
2	253.32	254.51	255.10	256.01	257.16	258.32
3	253.37	254.52	255.14	256.04	257.20	258.34
4	253.40	254.50	255.18	256.08	257.22	258.42
5	253.42	254.49	255.18	256.13	257.27	258.46
6	253.47	254.50	255.22	256.18	257.31	258.48
7	253.51	254.51	255.25	256.20	257.33	258.51
8	253.52	254.54	255.31	256.23	257.36	258.54
9	253.59	254.58	255.34	256.24	257.40	258.62
10	253.63	254.61	255.38	256.28	257.43	258.63
11	253.65	254.64	255.41	256.34	257.49	258.67
12	253.70	254.64	255.42	256.39	257.53	258.71
13	253.73	254.65	255.44	256.42	257.55	258.79
14	253.77	254.67	255.48	256.48	257.56	258.80
15	253.81	254.67	255.52	256.51	257.62	258.86
16	253.87	254.70	255.55	256.52	257.64	258.88
17	253.92	254.72	255.59	256.58	257.70	258.93
18	253.95	254.75	255.62	256.60	257.73	258.95
19	254.00	254.77	255.62	256.66	257.76	259.02
20	254.02	254.81	255.65	256.71	257.84	259.08
21	254.06	254.84	255.69	256.74	257.85	259.11
22	254.09	254.87	255.71	256.77	257.92	259.15
23	254.15	254.92	255.72	256.78	257.94	259.21
24	254.20	254.96	255.73	256.82	257.98	259.25
25	254.25	254.97	255.75	256.87	258.03	259.27
26	254.31	255.00	255.80	256.91	258.07	259.30
27	254.34	255.03	255.83	256.96	258.11	259.36
28	254.39	255.05	255.85	257.00	258.12	259.43
29	254.40		255.89	257.03	258.16	259.47
30	254.43		255.91	257.04	258.22	259.51
31	254.44		255.97		258.27	

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	259.55	261.13	262.76	264.38	266.09	268.37
2	259.58	261.15	262.84	264.50	266.16	268.42
3	259.66	261.23	262.89	264.53	266.22	268.51
4	259.70	261.28	262.95	264.59	266.27	268.61
5	259.76	261.30	263.03	264.66	266.32	268.69
6	259.79	261.35	263.09	264.73	266.43	268.77
7	259.85	261.45	263.14	264.79	266.49	268.83
8	259.91	261.48	263.18	264.84	266.59	268.93
9	259.94	261.53	263.27	264.91	266.64	269.00
10	259.97	261.58	263.30	264.94	266.73	269.11
11	260.04	261.66	263.37	264.95	266.79	269.17
12	260.08	261.70	263.40	264.95	266.87	269.23
13	260.13	261.76	263.50	265.01	266.97	269.33
14	260.16	261.84	263.53	265.02	267.01	269.40
15	260.23	261.89	263.60	265.07	267.10	269.53
16	260.26	261.94	263.62	265.11	267.18	269.60

17.12.31.121--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
17	260.30	261.99	263.68	265.14	267.25	269.69
18	260.33	262.05	263.75	265.20	267.34	269.76
19	260.38	262.10	263.81	265.24	267.41	269.84
20	260.47	262.15	263.85	265.30	267.53	269.93
21	260.51	262.23	263.90	265.34	267.59	270.01
22	260.54	262.27	263.95	265.44	267.64	270.09
23	260.61	262.33	264.00	265.49	267.74	270.17
24	260.64	262.35	264.07	265.54	267.82	270.28
25	260.72	262.43	264.10	265.60	267.90	270.35
26	260.75	262.45	264.16	265.67	267.98	270.43
27	260.82	262.49	264.21	265.76	268.03	270.53
28	260.88	262.55	264.25	265.82	268.15	270.62
29	260.92	262.57	264.30	265.89	268.20	270.70
30	260.96	262.69	264.34	265.95	268.29	270.79
31	261.08	262.74		266.03		270.90

HIDALGO COUNTY (VIRDEN VALLEY)

By R. L. Cushman

The Virden Valley is the New Mexico portion of the Duncan-Virden Valley, which lies along the upper Gila River in Greenlee County, Arizona, and Hidalgo County, New Mexico. A graph showing the fluctuations of water level in typical wells in the valley compared with the pumpage and precipitation is presented and discussed in the Greenlee County, Arizona, section of this report.

There were 24 water-level measurements made in 6 wells in the Virden Valley in 1945. Pumpage was slightly less than the year before, as shown in the table in the Greenlee County, Arizona, section.

Well descriptions and water-level fluctuations

181. (*911, p. 75; 941, p. 213; 949, p. 294; *991, p. 246; 1021, p. 236). P. Lunt. SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 18 S., R. 21 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 44.50; Mar. 14, 46.75; Aug. 8, 42.30; Nov. 5, 42.11.

185 (*911, p. 175; 941, p. 213; 949, p. 294; *991, p. 246; 1021, p. 236). J. Pierce. SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 18 S., R. 21 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 31.37; Mar. 15, 31.20; Aug. 8, 31.65; Nov. 5, 31.42.

201 (*911, p. 175; 941, p. 213; 949, p. 294; *991, p. 246; 1021, p. 236). J. E. Payne. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T. 19 S., R. 21 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 45.13; Mar. 15, 44.03; Aug. 8, 45.94; Nov. 5, 45.04.

202 (*991, p. 246; 1021, p. 236). Byron Echols. SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 19 S., R. 21 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 14.30; Mar. 15, 14.14; Aug. 8, 15.18; Nov. 5, 14.79.

217 (*911, p. 176; 941, p. 213; *949, p. 294; *991, p. 246; 1021, p. 236). Nancy O. Pace. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 19 S., R. 21 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 20.24; Mar. 15, 19.80; Aug. 8, 19.60; Nov. 5, 21.82.

232 (*911, p. 177; 941, p. 214; 949, p. 294; *991, p. 246; 1021, p. 236). Floyd Johns. NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 19 S., R. 20 W. Water levels, in feet below land-surface datum, 1945: Feb. 1, 20.05; Mar. 15, 22.30; Aug. 8, 25.57; Nov. 5, 25.98.

LEA COUNTY

By C. R. Murray and U. N. Benge

Part 1. General discussion

The investigation of the ground-water resources of the irrigated part of Lea County, conducted in cooperation with the State engineer of New Mexico, was continued in 1945 by measuring water levels in the observation-well system. Results of this investigation, which began in 1929, have been published in the 9th to 13th biennial reports of the State engineer.

Records of water levels in past years in Lea County have been published in the following Geological Survey water-supply papers:

Year of record	Water-supply paper	Page Nos.
1929-40	911	177-200
1941	941	214-227
1942	949	294-302
1943	991	247-255
1944	1021	237-245

Water levels are measured in a large number of wells in January of each year, when drawdown effects due to pumping are slight, so that the net yearly change in water levels can be determined. (See Part 2.) Water levels are also measured at bimonthly intervals in a selected group of wells to determine the seasonal fluctuations. (See Part 3.) Water levels were measured in 88 wells in January and in about 28 wells in March or April, May, July, September, and November. Water-stage recorders obtained a continuous record of water-level fluctuations in two wells in 1945. (See Part 4.) A total of 229 measurements of water level was made during the year including 17 tape measurements made on the recorder wells.

Fluctuations of water level

The withdrawal of water by wells in Lea County increased considerably in 1945 because of drought conditions and expanded irrigation and industrial uses. The U. S. Weather Bureau recorded 6.79 inches of precipitation at Lovington, 8.14 inches below normal, and 7.72 inches at Hobbs, 8.00 inches below normal. Fortunately, most of the year's precipitation fell in the period from July through October when it could be utilized by growing crops.

About 3,800 acres was irrigated with ground water in Lea County in 1945. Use of water for irrigating pasture land increased considerably. It is estimated that about 6,500 acre-feet of water was used during the year for irrigation purposes. The amount of land irrigated has increased steadily for a number of years and there has been a general increase in the amount of water used, but large variations in the amount of precipitation received from year to year cause similar variations in the amount of water pumped. In addition to the water used for irrigation, 7,000 acre-feet is estimated to have been pumped in 1945 for stock, municipal, and industrial uses.

Water levels declined over practically all the irrigated area of Lea County in 1945. The mean net yearly change for the observation wells was a decline of about 0.5 foot. Declines in excess of 1 foot were noted in only a few wells, mainly in areas where irrigation wells are closely spaced. Rises occurred in a few wells and were of small magnitude. Normally, seasonal fluctuations are of very small magnitude in most of the observation wells; however, where irrigation wells are closely spaced, such as immediately west of Lovington, the position of the water table during the summer has been observed to be as much as 2 feet lower than its winter position. Similarly, daily fluctuations are generally minute; however, in the Byers well, 16.36.4.Lot 12, which is in an area where considerable water is pumped for irrigation, daily changes in water level exceeding 0.1 foot sometimes occur during the pumping season.

Water levels have been unusually high in Lea County since the sharp rises that occurred following the abnormal precipitation of 1941. These rises reached their maximums within a short time in a few of the wells, but water levels continued to rise appreciably for about 2 years in many wells. The small declines of water levels which occurred in 1944 and 1945 have brought water levels nearer their normal positions but the water table is still considerably above its pre-1941 position.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also	Water levels				Record
			Jan. 1945 Level	Day	Change 1944-45	Highest Level	
12.36.19.223	O. V. Fisher	•	825.12	14	-1.65	22.13	43 a.32.05 41 39
24.354	Jerry Clay	•	8 6.04	14	+.10	+1.32	a. 6.14 44 41
25.222	State of New Mexico	3	20.67	14	+.18	20.67	45 24.60 41 36
27.212	E. D. Holt	3, 4, 5	35.42	14	-.48	32.04	42 37.21 41 36
29.110	W. O. Dunlap	•	28.40	11	-.69	227.69	44 f34.25 41 30
12.37.20.351	G. C. Copeland	•	39.42	14	+.87	+15.24	43 +15.39 41 41
12.38.4.312	Ashley Green	•	30.56	13	-.21	39.15	43 45.35 41 41
13.35.11.222	Clara Elkins	•	45.19	13	+.63	29.14	43 33.22 39 30
13.36.6.221	R. W. Duncan	•	33.74	13	+.09	33.74	45 45.19 41 41
35.321	Lewis Beaman	5	40.28	14	+.78	40.58	45 36.27 41 39
33.341	(Incorrect designation used previously for well 13.36.33.321, which see)						45.28 41 39
35.323	M. J. McClish	•	36.07	14	+1.11	36.07	45 38.83 41 39
13.37.3.131	J. H. Simpson	•	38.43	14	-.09	37.94	42 39.86 41 39
3.133	do	•	34.05	14	+.64	33.83	43 35.67 41 42
7.121	W. O. Barrow	5	31.48	14	+.17	31.48	42 34.28 36 30
13.132	A. M. Brownfield	3	28.14	14	-.19	26.46	42 30.09 41 30
28.411	A. F. Hight & W. M. E. Powell	•	(Measurements discontinued)				
28.413	Mr. Dorn	5	31.70	14	•	31.21	44 33.73 41 41
13.38.6.341	Opal Fulton	•	43.02	14	+.36	43.02	45 45.62 41 45
14.35.30.141	W. A. Anderson	•	45.46	13	+.56	45.46	45 48.93 41 39
33.453	do	3	40.10	13	+.03	40.10	45 42.37 30 30
14.36.2.410	C. M. King	5	39.02	14	+.41	39.02	45 40.88 41 39
6.420	S. A. and W. B. Richardson	•	31.70	14	•	31.21	44 33.73 41 41
9.111	A. C. Drake	•	38.70	14	•	39.03	44 40.96 41 45
9.110	Buford Rankings	•	40.75	14	-.13	40.46	43 42.45 41 39
13.211	Mattie Chambers	3	35.82	14	+.11	35.82	45 43.71 18 41 30
14.121	V. M. Chaudhury	•	40.79	14	+.06	40.79	45 42.09 41 39
14.37.3.113	Lois C. Hobbs	•	31.40	14	+.70	31.40	45 34.72 40 39
14.112	R. W. Smith	3	34.53	14	+.02	34.53	45 36.69 41 39
16.421	School land	•	29.05	14	+.34	28.36	43 31.42 39 39

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See al	Water levels						Record
			Part	Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	
14.37.20.410	Doyle Hudgens			33.30	14	+0.24	33.30	45	35.36
14.38.27.283	J. R. Fort	3	36.17	14	+0.02	36.17	45	37.89	41
14.38.27.283	M. M. Gaines	5	34.84	14	-.20	34.57	43	34.84	45
27.240	(Incorrect designation used since 1943 for well 14.38.27.233, which see)								43
28.120	Jilla Cox	3	24.83	14	+.02	24.28	42	26.94	41
15.35.35.112	Will Gorrell		39.89	13	+.22	39.60	43	41.51	41
15.36.8.131	Orren Beatty	3	40.02	13	-.04	39.98	44	41.65	41
14.131	Ben Graham	5	42.38	15	+.15	42.38	45	43.62	41
14.311	(Incorrect designation used previously for 15.36.14.131, which see)								41
29.410	D. A. Hudgens		43.25	13	+.04	41.89	42	43.84	41
29.441	H. R. Fleming		(a)	13	....	41.50	42	43.95	41
15.37.10.113	W. A. Simpson	5	34.66	15	....	34.66	45	36.63	38
21.350	R. W. Dean	3	29.20	15	+1.26	29.20	45	39.46	41
27.110	C. L. Naul		....	....	....	29.38	43	29.61	44
15.38.22.200	(Incorrect designation used previously for 15.38.22.441, which see)								42
22.441	J. W. Motsenbocker								45
16.36.1.400	Lorene Easley	5	30.55	15	-.31	28.72	42	32.50	41
4.Lot 12	E. H. Byers	4	44.40	11	+2.03	39.65	45	43.94	41
5.Lot 10	Mrs. Mary Coxey		45.93	13	-.30	43.50	43	45.05	41
5.Lot 14	W. B. Phillips		47.07	13	-.06	44.53	42	46.16	40
5.321	J. T. Gwin		46.30	13	-.19	45.23	42	47.30	39
5.411	Mrs. E. J. Robinson					44.81	42	47.28	39
8.424	E. B. Yarbo		47.39	13	-.07	45.72	42	48.19	39
10.233	J. E. Simmons		50.94	13	-.18	50.76	44	52.48	41
15.240	J. C. Griffin		51.34	13	-.33	50.22	42	52.61	41
27.133	State of New Mexico		47.33	13	-.26	46.72	43	48.70	41
16.37.19.200	H. T. Montieth		49.41	13	+.06	49.41	45	50.85	41
33.110	Elbert Shipp		29.04	13	-.11	28.60	42	30.90	41
16.38.25.144	J. S. and Rose Eaves		28.35	13	-.38	27.48	42	30.63	41
28.444	J. L. Williams	3,5	32.38	12	-.26	31.90	42	34.61	41
			30.95	12	+.20	30.95	45	33.63	35

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Water levels						Record	Years missing
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Year	Year Began		
16.38.35.110	Mrs. P. S. Bennett	•	34.37	12	-0.35	34.02	44	36.57	41	40
17.34.35.130	Phillips Petro. Co.	3	90.64	12	+.10	90.57	42	91.98	41	41
17.35.35.120	do	3	38.92	12	-.07	38.85	44	41.45	41	41
17.36.3.333	State of New Mexico	3	42.07	13	-.05	42.02	44	44.29	41	39
17.37.13.310	John Catchings	26.35	13	-.30	26.05	44	28.84	41	39	
26.350	(Incorrect designation used previously for 17.37.26.333, which see)									
26.333	Mrs. D. B. Wilhoit	5	26.87	12	-.18	26.21	43	28.99	40	38
34.441	B. J. Caudill	25.41	12	-.41	24.60	43	27.22	41	41	
36.141	State of New Mexico	25.50	12	+.95	23.78	42	26.15	40	39	
17.38.30.113	W. H. Martin	25.29	12	-.38	23.97	42	27.95	41	38	
30.312	C. M. Hawkins	27.93	12	-.50	26.47	42	30.44	41	38	
34.113	W. E. Husby	25.31	12	-.53	24.78	44	25.31	45	44	
18.36.27.111	State of New Mexico	39.16	12	-.46	38.13	43	41.66	41	39	
18.38.2.131	Sam Damont	28.01	12	-.45	27.20	43	30.64	40	39	
4.232	J. R. Isaacs	23.03	12	-.59	22.17	43	25.59	40	39	
15.241	W. L. Greenbow	27.52	11	-.32	26.77	43	29.16	41	40	
22.321	(Incorrect designation used previously for 18.38.22.411, which see)									
22.411	F. C. Browning	34.77	11	+.38	34.43	43	35.67	41	40	
22.412	M. C. Younger	37.77	11	-.04	37.09	43	38.69	41	40	
23.131	Charles Mills	40.59	11	+.03	40.59	45	40.62	44	44	
26.343	J. F. Mettox	b44.23	11	-2.83	h40.30	43	b44.23	45	40	
30.200	Mrs. Sadie Davis	23.70	12	+.13	23.70	45	27.56	31	31	
19.35.13.211	Clara Bowler	21.91	12	-.19	21.38	42	22.67	30	30	
24.222	F. K. Turner	19.20	12	+.06	18.00	42	20.38	41	39	
19.36.19.113	L. S. Evans	16.90	12	-.42	15.18	42	17.95	41	39	
19.411	C. R. Jordan	16.52	12	+.05	16.44	42	16.57	44	42	
32.111	S. P. Jordan	16.65	12	+.09	15.15	42	18.60	40	39	
32.321	E. T. Childers	26.40	12	+.09	23.80	42	26.49	44	42	

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year Began	
19-36.32-323	R. T. Childers	•	25.62	12	+0.15	23.17	42	25.77	44
19-37.32-241	Mrs. R. A. Anderson	•	12.20	12	-.09	11.50	33	12.31	37
19-38.2-122	A. C. Cheser	•	46.54	11	-.29	45.59	42	46.36	40
2-242	J. E. Nickson	5	45.57	11	-.09	44.38	42	46.97	41
2-324	A. C. Cheser	•	44.62	11	-.12	44.00	43	46.54	41
20-35.1-222	J. L. Wood	3	19.99	12	-.29	19.70	44	25.63	42
20-37.9-110	W. H. Laughlin	3	28.61	12	-.37	27.18	43	42.40	30
9-110a	do	3	27.85	12	-.39	26.36	43	38	36,37
						37.12	41		

a Pumping.

b Pumping recently.

c From recorder charts.

d Also 1937.

e Mar. 30.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	12.36. 25.222	12.36. 27.212	13.37. 13.132	14.35. 33.433	14.36. 13.211	14.37. 14.112	14.37. 27.130	14.38. 28.120
Owner	State of N.M.	State of N.M.	Brown- field	Ander- son	Cham- bers	Smith	Fort	Cox
Jan. 13,14	20.67	35.42	28.14	40.10	35.82	34.53	36.17	24.83
Mar. 31,Apr. 1	20.68	35.47	28.16	40.10	35.78	34.51	36.14	24.80
May 26,27	20.75	35.47	28.24	40.09	35.78	34.57	36.16	25.05
July 28	20.85	35.52	28.29	40.10	35.77	34.60	36.18	25.70
Sept.23,24	20.91	35.52	28.34	40.10	35.77	34.66	36.19	26.05
Nov. 22	20.94	35.54	28.37	40.10	35.76	34.63	36.18	25.70
Location number	15.36. 8.131	15.37. 21.330	16.36. 27.133	16.38. 28.444	17.34. 35.130	17.35. 35.120	17.36. 33.333	17.38. 30.312
Owner	Beatty	Dean	State of N.M.	Will- iams	Phillips	Phillips	State Petro.	Haw- kins
Jan.11-13,15	40.02	29.20	49.41	30.95	90.64	38.92	42.07	27.93
Mar. 31	40.04	29.59	49.41	31.03	90.65	38.96	42.17	28.01
May 25-27	40.05	31.23	49.39	31.08	90.64	38.98	42.18	c28.08
July 27,28	40.07	29.29	49.41	30.79	90.62	39.03	42.26	28.26
Sept.22,24	40.09	29.32	49.42	30.77	90.66	39.05	42.40	c28.33
Nov. 21,22	40.09	29.33	49.42	30.84	90.69	39.10	42.40	28.29
Location number	18.36. 27.111	18.38. 4.232	18.38. 15.241	18.38. 30.200	19.35. 13.211	19.37. 32.241	20.35. 1.222	20.37. 9.110
Owner	State of N.M.	Isaacs	Gree- bon	Davis	Fowler	Ander- son	Wood	Laugh- lin
Jan. 11,12	39.16	23.08	27.52	23.70	21.91	12.20	19.99	28.61
Mar. 31	39.26	23.14	27.54	23.69	21.93	12.22	c20.11	28.36
May 25	39.34	23.22	29.16	23.71	21.96	12.23	20.15	28.41
July 27	39.43	23.30	28.29	23.78	22.04	12.25	20.22	27.97
Sept.22	39.48	23.40	c48.07	23.85	22.11	12.28	c20.34	29.58
Nov. 21	39.58	23.47	28.38	23.92	22.16	12.25	20.48	29.48
Location number	20.37. 9.110a							
Owner	Laugh- lin							
Jan. 12	27.85							
Mar. 31	27.64							
May 25	27.70							
July 27	29.60							
Sept.22	28.84							
Nov. 21	28.76							

a Pumping.

c Nearby well pumping.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

12.36.29.110. E. D. Holt. Irrigation pump installed on well approximately 500 feet west of recorder well on Oct. 20, 1945. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Jan. 6, 7, 28.38; Oct. 25, 29.40.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.39	28.43	.....	28.53	28.63	28.77	28.94	29.01	29.09	29.19	29.37	29.28
2	28.39	28.43	.....	28.53	28.63	28.77	28.96	29.01	29.10	29.20	29.37	29.29
3	28.39	28.43	.....	28.54	28.64	28.78	28.96	29.01	29.10	29.21	29.35	29.29
4	28.40	28.43	.....	28.55	28.65	28.79	28.96	29.02	29.10	29.21	29.32	29.28
5	28.39	28.44	.....	28.57	28.65	28.79	28.96	29.02	29.10	29.21	29.30	.....
6	28.38	28.43	.....	28.58	28.65	28.80	28.97	29.02	29.10	29.21	29.33	.....
7	28.38	28.43	.....	28.58	28.65	28.81	28.97	29.02	29.10	29.21	29.31	.....

12.36.29.110--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	28.39	28.42	....	28.57	28.66	28.81	28.98	29.03	29.11	29.21	29.30	....
9	28.40	28.45	....	28.55	28.66	28.82	28.97	29.03	29.11	29.21	29.34	....
10	28.40	28.43	....	28.55	28.66	28.82	28.97	29.03	29.12	29.21	29.32	....
11	28.40	28.43	....	28.57	28.67	28.82	28.98	29.03	29.12	29.22	29.30	....
12	28.40	28.43	....	28.57	28.67	28.83	28.98	29.04	29.12	29.22	29.29	....
13	28.40	28.44	....	28.57	28.67	28.84	28.98	29.04	29.13	29.22	29.29	....
14	28.40	28.45	....	28.58	28.68	28.84	28.98	29.04	29.13	29.22	29.30	....
15	28.41	28.45	....	28.58	28.68	28.85	28.98	29.04	29.13	29.23	29.30	....
16	28.40	28.46	....	28.58	28.69	28.86	28.99	29.04	29.13	29.23	29.29	....
17	28.40	28.46	....	28.58	28.70	28.87	28.99	29.04	29.14	29.23	29.29	....
18	28.40	28.46	....	28.59	28.70	28.88	28.99	29.04	29.14	29.23	29.29	....
19	28.40	28.44	....	28.60	28.71	28.88	28.99	29.05	29.15	29.23	29.29	....
20	28.40	28.44	....	28.60	28.71	28.89	29.00	29.05	29.15	29.23	29.28	....
21	28.41	....	....	28.60	28.71	28.90	29.00	29.05	29.15	29.28	29.28	....
22	28.42	....	....	28.59	28.72	28.90	29.00	29.06	29.16	29.27	29.32	....
23	28.43	....	....	28.59	28.73	28.90	29.00	29.06	29.16	29.32	29.31	....
24	28.42	....	....	28.59	28.73	28.91	29.01	29.07	29.16	29.37	29.29	....
25	28.42	....	....	28.59	28.74	28.91	29.01	29.07	29.17	29.40	29.29	....
26	28.42	....	....	28.61	28.74	28.92	29.01	29.07	29.17	29.39	29.29	....
27	28.42	....	....	28.60	28.75	28.92	29.01	29.07	29.17	29.39	29.29	....
28	28.42	....	....	28.61	28.76	28.92	29.00	29.07	29.18	29.36	29.29	....
29	28.43	....	....	28.54	28.62	28.76	28.93	29.00	29.07	29.19	29.34	29.29
30	28.43	....	....	28.54	28.63	28.76	28.94	29.00	29.08	29.19	29.33	29.28
31	28.43	....	....	28.55	....	28.77	....	29.01	29.09	....	29.34	....

16.36.4.Lot 12. E. H. Byers. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Mar. 4-8, 44.14; Aug. 22, 46.59.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	44.48	44.29	44.16	45.22	45.48	....	45.50	46.26	....	45.76	46.04	45.34
2	44.48	44.28	44.16	45.29	45.42	45.94	45.48	46.30	46.08	45.72	46.15	45.32
3	44.47	44.27	44.16	45.37	45.35	....	45.45	46.33	46.04	45.69	46.21	45.30
4	44.46	44.27	44.14	45.38	45.33	....	45.40	46.38	45.98	45.68	46.31	45.28
5	44.44	44.26	44.14	45.32	45.44	....	45.36	46.42	45.97	45.67	46.31	45.27
6	44.43	44.25	44.14	45.27	45.56	....	45.33	46.43	46.01	45.65	46.25	45.25
7	44.43	44.25	44.14	45.21	45.52	....	45.30	46.46	46.02	45.60	46.19	45.22
8	44.43	44.24	44.14	45.16	45.46	....	45.27	46.50	46.07	45.58	46.12	45.21
9	44.42	44.23	44.16	45.12	45.44	....	45.25	46.55	46.03	45.56	46.08	45.19
10	44.41	44.24	44.24	45.10	45.58	....	45.23	46.58	45.99	45.55	46.01	45.16
11	44.40	44.23	44.36	45.04	45.67	....	45.20	46.56	45.97	45.53	46.96	45.14
12	44.40	44.22	44.22	45.00	45.72	....	45.17	46.48	45.94	45.51	46.92	45.12
13	44.39	44.22	44.39	44.98	45.77	....	45.16	46.43	45.89	45.49	46.88	45.11
14	44.38	44.22	44.37	44.94	45.79	....	45.16	46.38	45.84	45.48	46.83	45.09
15	44.38	44.22	44.37	44.91	45.84	....	45.28	46.33	45.79	45.48	46.78	45.09
16	44.37	44.21	44.36	44.89	45.83	....	45.31	46.30	45.77	45.47	46.74	45.08
17	44.36	44.21	44.37	44.86	45.79	....	45.42	46.30	45.74	45.42	45.71	45.07
18	44.36	44.20	44.46	44.85	45.73	....	45.37	46.38	45.69	45.40	46.69	45.06
19	44.35	44.20	44.52	45.44	45.68	46.03	45.66	46.51	45.70	45.38	46.67	45.05
20	44.34	44.19	44.62	45.10	45.62	46.07	45.81	46.47	45.81	45.35	46.66	45.04
21	44.34	44.19	44.67	45.25	45.55	46.05	45.84	46.57	45.85	45.34	46.62	45.01
22	44.33	44.19	44.64	45.42	45.54	45.95	45.43	46.59	45.81	45.35	46.54	44.99
23	44.32	44.18	44.63	45.46	45.63	45.89	45.98	46.53	45.80	45.39	45.51	44.98
24	44.32	44.18	44.71	45.41	45.62	45.84	45.97	46.44	45.77	45.50	46.49	44.97
25	44.31	44.17	44.84	45.36	45.75	45.76	45.96	46.37	45.75	45.52	46.48	44.96
26	44.31	44.17	44.88	45.30	45.82	45.71	46.00	46.29	45.78	45.52	46.47	44.95
27	44.31	44.17	44.97	45.29	45.82	45.67	46.15	46.27	45.86	45.61	46.45	44.94
28	44.30	44.17	45.02	45.47	45.80	45.64	46.22	46.27	45.86	45.76	45.43	44.93
29	44.30	....	45.02	45.55	....	45.59	46.17	46.29	45.82	45.79	45.39	44.92
30	44.29	....	45.02	45.49	....	45.54	46.16	46.23	45.80	45.91	45.36	44.92
31	44.29	....	45.13	....	....	46.24	....	....	45.94	....	44.91	....

Part 5. Miscellaneous data concerning observation wells

12.36.29.110. Holt. An irrigation well was drilled approximately 500 feet west of this well in October 1945.

13.36.33.321. Beaman. Previously designated incorrectly as well 13.36.33.341. Well unused, pump removed.

13.37.3.131. Simpson. Measuring point beginning Jan. 14, 1946, top edge of hole in base of Johnson pump, east side of well, 0.50 foot above land-surface datum.

13.37.7.121. Barrow. Well filled in May 1945. Measurements discontinued. Water level, in feet below land-surface datum, 1945: Apr. 1, 31.48.

13.37.28.413. Dorn. Used drilled irrigation well, equipped with turbine pump. Measuring point, top edge of north $\frac{1}{2}$ -inch hole in west side of Peerless pump base, 1.50 feet above land-surface datum.

14.36.2.410. King. Measuring point beginning Jan. 14, 1945, top of concrete pump base, 1.00 foot above land-surface datum.

14.38.27.233. Gaines. Designated incorrectly as well 14.38.27.240 since 1943.

15.36.14.131. Graham. Previously designated incorrectly as well 15.36.14.311.

15.37.10.113. Simpson. Measuring point beginning Jan. 15, 1945, lower edge of mouth of discharge pipe. Subtract 4.26 feet from tape measurements to reduce to land-surface datum.

15.38.22.441. Motzenbocker. Previously designated incorrectly as well 15.38.22.200.

16.36.5.411. Robinson. Measuring point beginning Jan. 13, 1945, lower edge of mouth of discharge pipe. Subtract 2.36 feet from tape measurements to reduce to land-surface datum.

16.38.28.444. Williams. Measuring point beginning Sept. 22, 1945, top north edge of north wooden pipe clamp, 1.23 feet above land-surface datum and 0.35 foot above 10-inch steel collar-pipe-clamp support. Reference point, erroneously described in previous reports as being at land-surface datum, is 1.01 feet above land-surface datum.

17.37.26.333. Wilhoit. Previously designated incorrectly as well 17.37.26.330.

18.38.22.411. Browning. Previous designated incorrectly as well 18.38.22.321.

19.38.2.242. Nickson. Formerly owned by Mr. Dunn.

LUNA COUNTY (MIMBRES VALLEY)

By C. R. Murray

Part 1. General discussion

Investigation of the ground-water resources of the Mimbres Valley was continued in 1945 in cooperation with the State engineer of New Mexico. Careful study of the behavior of water levels in this area is essential as major declines have been occurring over an extended period of time, making the recovery of water for irrigation purposes more costly. Granting of permits to drill additional irrigation wells was suspended in 1945 by the

State engineer because of the seriousness of the situation. Data on the early development of the area is contained in Geological Survey Bulletin 618 and Water-Supply Paper 345c. Results of continuation studies have been published in the 8th to 13th biennial reports of the State engineer of New Mexico. Records of water levels in past years in Luna County have been published in the following Geological Survey water-supply papers:

<u>Year of record</u>	<u>Water-Supply Paper</u>	<u>Page Nos.</u>
1927-39	886	423-449
1940	911	200-217
1941	941	228-243
1942	949	302-313
1943	991	256-268
1944	1021	249-262

A number of wells were drilled during the year for which permits had previously been granted, and several wells were deepened so as to tap additional aquifers. Water in the deeper aquifers is under greater pressure and rises closer to the surface than that in the shallow aquifers. Although the deeper water appears to be part of the same hydrologic system from which wells have been obtaining their water in the past and, accordingly, does not represent a previously unknown contribution of water to the system, use of this deeper water does relieve the intensity of the draft on the shallow aquifers.

Pumping of irrigation wells causes a marked lowering of the water table during the summer followed by a period of recovery during the late fall and winter. Water levels were measured in about 68 wells in January, March, May, July, September, and November, to determine the magnitude of this seasonal fluctuation. (See Part 3.) Water levels were measured in 63 additional wells in January by which time the major part of the recovery from the preceding summer's pumping had occurred. By comparing these January readings from year to year the net annual change in water levels in the area is obtained. (See Part 2 and fig. 11.) Water-stage recorders were in operation on four wells in the valley during the year to give a continuous record of the behavior of the water table at these wells. (See Part 4.) A total of 438 water-level measurements was made during the year, including 24 tape measurements made on the recorder wells.

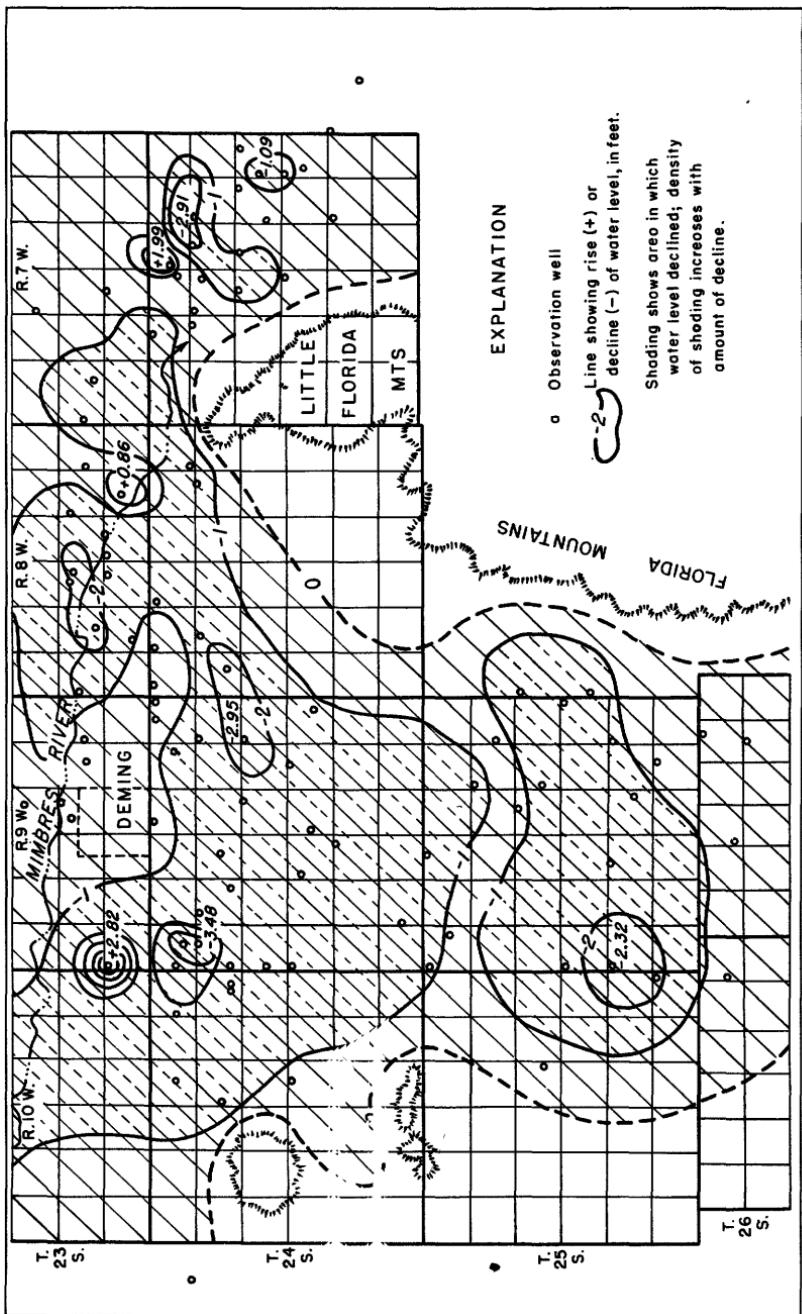


Figure 11.—Map of Mimbres Valley, Luna County, N. Mex., showing changes in water level from January 1945 to January 1946.

Fluctuations of water level

As the precipitation falling on the Mimbres Valley is the ultimate source of the water pumped by the wells the amount of the precipitation received is an important factor in determining the position of the water table. Precipitation not only recharges the aquifers but also decreases the draft on the aquifers by directly supplying part of the crops' requirements. In 1945 the U. S. Weather Bureau reported 5.35 inches of precipitation at Deming, 55 percent of the normal of 9.71 inches. Precipitation in the mountainous area at the headwaters of the Mimbres River was no doubt subnormal also. Recharge was therefore light and pumping intense. It is estimated that about 16,000 acres of land was irrigated in the Deming area in 1945 and that about 32,000 acre-feet of water was pumped for irrigation purposes. An additional 1,800 acre-feet is calculated to have been used for domestic and industrial uses. These figures represent an increase of about 1,000 acres of land irrigated and 1,000 acre-feet of water used over the preceding year. Similar increases have been taking place for a number of years. Figure 11 shows the change in water levels from January 1945 to January 1946. Declines took place over practically the whole irrigated area, rises being restricted to wells which had been deepened. Declines in excess of 1 foot took place over an unusually large area, 133 square miles, as shown by the figure, extending east and south of Deming. The areas over which declines in excess of 1 foot occurred in 1944 and 1943 were 23 and 100 square miles, respectively. This indicates a marked broadening and deepening of the cone of depression in the water table which is being produced by the irrigation wells. Declines in excess of 2 feet took place in two areas along the Mimbres River east of Deming, where rises had occurred in 1944, and in three areas south of Deming. These five areas totaled 9 square miles, approximately equaling the area of similar decline in 1943 and considerably exceeding the $3\frac{1}{2}$ square mile area of 1944. Two wells near the northwest corner of T. 24 S., R. 9 W. showed declines in excess of 3 feet. These wells obtain water from deep aquifers lying between clay strata. The deeper water rises above the ground-water table, and water levels in such aquifers can be expected to fall faster than those in aquifers under water-table conditions. As in previous years, the greatest fluctuations in water level were noted in observation wells along the

Mimbres River in the Spalding area, 16 miles northwest of Deming. Well 21.11.35.310 showed a decline of 8.68 feet, which more than offsets the rise noted in this well in 1944. Little water is pumped for irrigation in the Spalding area. Variations in the amount of water which flows in the Mimbres River channel cause the sharp fluctuations in the water level in these valley-bottom wells.

At the beginning of 1945 water levels were at relatively high positions because of above-normal precipitation in the fall of 1944. Less ground water was required to finish the 1944 crops, recovery from pumping effects began earlier, and more recharge was received by the area. The amount of water used in 1945 was somewhat greater than in previous years so the seasonal decline occasioned by pumping was greater than normal. Recovery after the cessation of pumping in 1945 was about normal; therefore, the net yearly decline from January 1945 to January 1946 was greater than usual, as shown by figure 11.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also	Water levels						Record
			Jan. 1945 Part Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year Begun	
21.10.6.112	Tom Tigner	3	7.71	9	+1.34*	6.57	33	9.05	44
21.11.13.411	Claude Irwin	3,5	40.15	9	-55*	24.83	32	44.30	40
13.411c	do	5	39.99	9	....	....	....	....	45
35.310	State of New Mexico	3	22.20	9	+8.23	18.76	32	31.30	39
22.10.18.121	do	3	74.27	9	-77	68.51	30	74.45	40
20.210	do	•	91.64	9	+28	88.72	40	93.18	41
22.11.2.210	do	3	28.36	9	+2.79	21.11	30	31.70	39
13.122	do	3	66.00	9	-53	59.07	30	66.55	40
13.221	do	3	72.87	9	-53	66.06	30	75.40	40
14.222	do	3	58.17	9	-38	50.23	32	58.94	40
23.222	do	3	52.61	9	-65	47.43	42	60.30	37
23.7.17.242	Jack Smyer	5	93.84	5	....	92.90	42	93.84	45
21.311	Unknown	3	69.55	5	••••	58.42	40	63.19	45
30.433	John Kelly	5	63.19	8	+•08	40	45	45	40
30.Lot 16	H. T. Foster	3	26.67	8	+11	22.62	32	26.67	45
31.111	William Haas	•	47.95	8	-39	39.49	40	47.95	45
31.132	do	•	49.05	8	-43	40.60	40	49.05	45
33.211	Lewis and R. S. Smyer	3	64.40	5	-35	59.99	40	64.40	45
23.8.3.322	U. S. Government	3	131.89	8	+•22	131.14	42	131.89	45
13.411	E. P. Peoples	3	38.42	8	••••	34.67	30	38.42	45
25.311	Ed Remondini	•	21.92	8	+•48	20.75	40	22.40	44
26.131	Geo. Snyder	3	35.45	8	+.93	28.26	28	36.38	44
28.231	C. R. Lewis, Jr.	•	46.77	8	+.51	43.50	42	47.28	44
28.241	do	•	45.96	8	+.40	40.23	40	46.36	44
29.433	E. Krenek	5	48.29	6	+.62	42.56	39	48.91	44
30.133	Lee Wilkerson	•	47.17	6	+1.20	44.96	39	48.37	44
32.323	H. H. Holiday	3,5	43.74	6	-76	33.22	29	43.74	45
33.221	Geo. Dondle	•	39.83	8	+11	35.66	40	39.94	44
34.111	do	•	37.61	8	+18	33.52	40	37.79	44
34.211	E. B. Law	3,5	35.74	8	+1.46	27.50	29	37.20	44
35.233	Joe Remondini	5	30.44	8	-1.30	29.14	44	30.44	45

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record		
			Jan. 1945 Level	Day	1944-45 Change	Measurements discontinued	Jan. 1945 Level	Highest Year	Lowest Year	Begin-	Years missing
24.8.1.333	F. K. Krettek	•	15.86	5	+2.14	15.86	45	18.00	44	40	31,33,45
1.333b	do	3	18.37	5	-5.68	35.59	41	38.37	45	41	31-33,
4.111	Foy Riley	4	45.97	6	-1.59	34.52	29	45.97	45	29	35-37,
5.111	R. A. Hackebell	•									
6.112	Deming Air Base	3	52.78	8	-7.72	49.22	43	52.78	45	43	
7.431	Paul Hrna	5	41.54	6	-3.39	39.06	41	41.54	45	42	43
8.121	Mrs. J. F. Holiday	•	43.30	6	-3.32	40.21	39	43.30	45	39	
11.221	F. K. Fretak	3	16.14	5	+1.36	12.60	34	17.60	44	32	33,35
20.411	J. W. Jones	•	(Measurements discontinued)				35.69	31	43.16	44	30
24.9.1.211	Deming Air Base	3	58.47	8	-7.74	55.64	43	58.47	45	43	33,45
1.222	do	3	55.47	8	-7.78	51.61	47	55.47	45	43	
2.421	Rosendo Trujillo	3,5	56.56	6	-1.05	48.10	33	56.56	45	32	34,35
3.121	Jim Swartz	•	61.51	6	-8.82	59.09	42	61.51	45	42	
6.311	J. B. Wells	3	78.21	4	-2.77	61.35	28	78.21	45	28	31,33
6.431	State of New Mexico	3	63.14	4	-2.68	57.90	42	63.14	45	42	
7.211	Emmanuel Vocale	•	71.71	4	-1.74	67.49	42	78.76	41	39	
7.331	S. R. Moir	3	76.71	4	-7.48	66.10	30	76.71	45	30	31,33
8.112	B. F. Jonas	3	75.56	4	-1.56	61.90	31	75.56	45	30	
8.441	F. A. Predecko	•	72.35	6	-4.46	69.60	40	72.35	45	40	
9.411	Joe Clary	3	68.14	6	-5.50	65.16	39	68.14	45	39	
12.111	E. H. Hatcher	3	56.63	6	-1.90	47.68	28	56.63	45	28	31,32
13.111	Mary E. Barrett	3	29.39	6	-2.99	14.92	28	29.39	45	28	31,33
15.221	Joe Lutonsky	•	64.50	6	-1.46	61.60	40	64.50	45	40	
18.311	Chas. Peter	75.17	6	-1.83	72.38	40	75.17	45	40		
19.111	Francis Ligocky	3	76.26	6	-7.72	72.82	40	76.26	45	40	
21.151	L. L. Gaskill	3	73.23	6	-1.14	59.33	29	73.23	45	28	33
22.311	Joe Hrna	5	69.50	9	-1.10	58.12	30	71.06	45	45	
23.211	C. R. Isbell	3,5	71.06	6	-1.10	57.99	41	60.89	45	30	33
24.421	W. F. Roberts	•	60.89	6	-7.67	62.88	41	70.93	45	41	
28.221	John Hrna	•	70.93	9	-1.84	69.00	40	74.27	45		
32.311	D. D. Roderrick	•	74.27	9	-1.04						

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Water levels						Record
			Jan. 1945	Jan. 1945	Change 1944-45	Highest Level	Lowest Level	Year Begun	
24.9.34.111	H. C. Norwood	•	66.85	9	-2.16	59.13	41	66.85	41
24.10.1.311	R. V. Griggs	5	79.59	8	+2.68	78.45	42	82.27	41
3.411	Josh Bryan	5	87.45	8	-1.88	78.17	30	87.45	30
3.411b	do	3	80.08	3	-1.43	75.34	42	80.08	41
10.311	John Tilch	3	82.82	6	-1.15	76.53	30	82.82	30
12.111	Morgan Garrett	•	83.26	8	+1.75	79.69	39	85.01	44
12.431	Steve Hrina	4	80.30	4	+.09	78.08	40	180.46	44
12.432a	do	79.78	4	-2.29	77.29	40	79.50	45	40
12.432b	do	•	79.92	4	-.26	78.05	40	79.92	45
22.211	E. F. Hurt	3	70.98	6	-.70	69.61	42	70.98	42
29.222	State of New Mexico	3	64.75	6	-.29	63.87	41	64.75	41
24.11.1.333	J. D. Smith	•	99.81	8	-.03	99.78	44	99.81	44
25.8.18.111	Spencer McCann	3,5	53.26	10	+.21	50.00	40	53.47	40
19.331	Unknown	•	60.60	10	-.12	59.01	42	60.60	42
25.9.4.211	Val Miller	4	69.04	9	-1.54	63.70	41	69.04	41
6.111	P. M. Yates	•	67.97	9	-.30	65.14	41	67.97	40
6.421	Roderick & Wheeler	3	71.86	9	-.54	66.41	39	71.86	45
11.111	J. B. Anderson	3	65.83	10	-.71	60.01	39	65.83	39
12.311	Jo Wills Cheek	•	60.65	10	-.33	56.69	40	60.65	40
14.311	C. W. Gaines	•	60.91	10	-.53	57.10	40	60.91	40
15.311	C. H. Paulk	5	64.99	10	-1.00	59.78	39	64.99	39
17.311	Tom Tigner	•	69.20	10	+.34	64.38	40	69.54	40
19.111	Tom Marcak	•	66.07	9	-1.06	62.41	40	66.07	40
21.311	A. W. Speir	3	67.97	10	-.73	63.48	39	67.97	39
24.222	G. P. Watkins	3	50.85	10	+.25	42.26	28	51.10	44
25.111	Alan Crotchet	•	49.60	10	+.06	47.54	40	49.66	40
27.422	H. A. Gray	•	56.82	10	-.56	53.42	40	56.82	45
28.121	Leonard Zumwalt	3	68.69	10	-.85	68.03	42	68.69	42
30.111	M. M. Robertson	5	60.13	10	-.78	55.78	40	60.13	40
35.211	Joe Marcak	3	51.03	10	-.40	47.21	38	51.03	39
25.10.15.422	C. H. Graves	•	58.97	9	-.27	57.18	40	58.97	40
36.111	State of New Mexico	•	(a)	9.	••••	58.84	40	62.38	44

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also part	Water levels						Record	
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year	Began	Years missing
25.10.36.2222	State of New Mexico	3	62.39	9	-0.45	56.94	39	62.89	45	39
26.9.2.221	T. R. Taylor	3	41.63	10	-.45	39.69	41	41.65	45	41
4.331	R. E. Smyer	•	53.96	10	-.57	52.28	41	53.96	45	41
11.211	State of New Mexico	3	39.34	10	-.46	37.30	40	39.34	45	40
26.10.1.310	Theo. Eissen	•	60.89	9	-.62	55.42	28	60.89	45	28
27.8.8.411	Bill Birchfield	3	23.65	7	-.01	23.45	42	24.29	40	40
27.9.12.111	Waterloo School	3	27.15	7	••••	••••	••	••••	45	45
29.7.18.211	R. M. Marshall	•	7.36	7	+7.17	••••	••	14.53	••	40
29.8.12.244	A. G. Anderson	•	7.37	7	•.00	7.07	40	7.37	44	40
13.111	L. L. Burkhead	•	6.65	7	+.03	6.44	40	6.68	44	40

^a Pumping.

^b From Pecker charts.
^c Mar. 5, 1929.

^d Oct. 14, 1942.

^e Also 1945.

^f Also 1942.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	21.10. 6.112	21.11. 13.411	21.11. 13.411c	21.11. 35.310	22.10. 18.121	22.11. 2.210	22.11. 13.122	22.11. 13.221
Owner	Tigner	Irwin	Irwin	State of N.M.	State of N.M.	State of N.M.	State of N.M.	State of N.M.
Jan. 9	7.71	40.15	39.99	22.20	74.27	28.36	66.00	72.87
Mar. 22	7.68	30.02	29.94	18.82	74.17	27.07	65.77	72.68
May 13	7.76	31.47	31.56	25.73	74.34	28.76	66.06	72.92
July 17	9.54	35.92	35.75	29.98	74.72	30.50	66.50	73.30
Sept. 13	9.40	.....	36.23	27.70	74.90	30.18	66.67	73.48
Nov. 9	9.60	.....	34.47	29.46	74.93	31.03	66.74	73.56
Location number	22.11. 14.222	22.11. 23.222	23.7. 21.311	23.7. 30.L 16	23.8. 3.322	23.8. 13.411	23.8. 26.131	23.8. 32.323
Owner	State of N.M.	State of N.M.	Unknown	Foster	U. S. Gov't	Peebles	Snyder	Holl- iday
Jan. 5,6,8,9	58.17	52.61	69.56	26.67	131.89	38.42	35.45	43.74
Mar. 20-22	57.85	52.49	69.85	27.25	131.94	38.33	35.18	43.33
May 11,13	58.30	52.86	69.99	26.52	131.98	38.16	38.38	43.38
July 17,18	58.86	53.26	69.88	28.20	132.00	39.05	(c)	44.31
Sept. 11,13	59.05	53.43	70.15	28.59	132.10	39.09	(c)	44.78
Nov. 7-9	59.16	53.51	70.15	27.62	132.17	39.47	39.57	45.05
Location number	23.8. 34.211	23.9. 22.213	23.9. 25.311	23.9. 27.142	23.9. 7.221	23.10. 15.	24.7. 3.311	24.7. 4.424
Owner	Law	Per- kins	Ernst	Thomas	Hard- away	State of N.M.	Hat- field	Hat- field
Jan. 4-6,8,10	35.74	63.50	57.20	62.28	58.59	94.61	9.35	88.80
Mar. 20-23	b41.88	63.53	58.23	62.33	58.82	94.72	7.05	b87.45
May 11,12	(a)	63.97	57.57	62.36	58.89	94.83	7.09	a93.02
July 17,18	(c)	64.57	b59.32	62.67	59.28	e96.3	7.52	91.95
Sept. 11,12	42.32	64.88	58.60	62.93	59.32	.....	11.62	a93.95
Nov. 7,8	40.44	64.23	(a)	63.02	59.67	.....	8.97	91.28
Location number	24.7. 5.211	24.7. 9.111	24.7. 9.241	24.7. 9.241a	24.7. 16.211b	24.7. 24.111	24.7. 24.312	24.7. 26.113
Owner	William- son	Smyer	Hat- field	Hat- field	Snyder	Wilson	Birch- field	Birch- field
Jan. 5	84.21	84.06	90.75	21.49	85.81	75.42	72.05	70.92
Mar. 21	84.05	83.36	89.99	21.48	85.99	75.37	72.15	71.05
May 11	a85.77	(a)	91.79	24.87	86.12	75.37	72.23	71.14
July 17	85.30	83.96	92.24	23.08	86.32	75.82	72.32	71.23
Sept. 11	85.06	84.63	92.35	(a)	86.43	76.21	72.42	71.36
Nov. 7	a86.96	86.95	91.83	23.64	a86.97	76.63	72.58	71.48
Location number	24.8. 1.333b	24.8. 6.112	24.8. 11.221	24.9. 1.211	24.9. 1.222	24.9. 2.421	24.9. 6.311	24.9. 6.431
Owner	Kretek	Air	Kretek	Air	Air	Tru- Base	Wells	State of N.M.
Jan. 4-6,8	15.86	52.78	16.14	59.47	55.47	56.56	78.21	63.14
Mar. 20-22	(a)	52.66	16.06	58.37	55.34	56.67	77.18	68.07
May 11,12	17.20	53.06	16.42	58.68	55.66	57.51	78.44	c71.90
July 17,18	17.97	53.42	17.36	59.03	56.08	58.19	(a)	c72.60
Sept. 11,12	19.46	53.93	17.75	59.47	56.49	57.71	(a)	80.54
Nov. 7,8	17.61	53.70	17.48	59.29	56.32	57.59	82.14	c71.23

a Pumping.

b Pumping recently.

c Nearby well pumping.

e Dry at depth given.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945--Continued

Location number	24.9. 7.351	24.9. 8.112	24.9. 9.411	24.9. 13.111	24.9. 19.111	24.9. 21.131	24.9. 23.211	24.10. 3.411
Owner	Moir	Jonas	Clary	Barrett	Ligocky	Gaskill	Isbell	Bryan
Jan. 4,6 8,9	76.71	75.56	68.14	29.39	76.26	73.23	71.06	87.45
Mar. 20-22	77.29	74.67	67.49	28.89	76.73	c87.22	70.61	a88.16
May 12	79.07	74.74	69.73	30.54	76.58	c87.22	71.79	a87.79
July 17,18	(a) c76.30	c83.24	33.59	79.37	c87.42	74.14	c88.79	
Sept. 12	(c) 78.67	78.40	35.09	81.60	c87.59	74.56	88.69	
Nov. 7,8	79.80	77.90	71.29	34.43	78.65	81.10	73.45	(a)
Location number	24.9. 3.411b	24.10. 10.311	24.10. 22.211	24.10. 29.222	25.8. 18.111	25.9. 6.421	25.9. 11.111	25.9. 21.311
Owner	Bryan	Tilch	Hurt	State of N.M.	McCann	Wheeler	Ander- son	Speir
Jan. 6,8-10	80.08	82.82	70.98	64.75	52.36	71.86	65.83	67.97
Mar. 20,22	c80.31	83.10	71.00	64.78	53.24	71.16	(a)	(a)
May 12	c81.06	c91.00	71.08	64.80	54.06	71.19	(a)	70.60
July 17,18	(a) c90.95	71.31	64.91	56.29	b80.51	(a)	71.94	
Sept. 12	82.30	c91.02	71.62	65.03	(c)	(a)	(a)	72.26
Nov. 8	(a) c90.82	71.78	65.14	55.15	74.66	66.35	70.79	
Location number	25.9. 24.222	25.9. 28.121	25.9. 35.211	25.10. 38.222	26.9. 2.221	26.9. 11.211	27.8. 8.411	27.9. 12.111
Owner	Wat- kins	Zum- walt	Marcek	State of N.M.	Taylor	State of N.M.	Birch- field	School
Jan. 7,10	50.85	68.69	51.03	62.89	41.63	39.34	23.65	27.15
Mar. 22	50.83	69.20	50.90	62.43	41.58	39.33	23.66	26.95
May 12	(a)	69.73	51.74	(a)	41.81	39.35	23.67	26.98
July 18	.....	73.76	52.50	(a)	42.50	39.53	23.70	27.36
Sept. 12	53.50	75.65	52.95	(a)	(a)	39.73	23.77	27.53
Nov. 8	(c) (a)	52.27	66.12	42.52	39.87	23.83	27.28	

a Pumping.

b Pumping recently.

c Nearby well pumping.

Part 4. Highest daily water levels in wells equipped with water-stage recorders

24.7.14.221. J. H. Winslow. Water runs into well during periods of heavy rainfall. Highest and lowest water levels, in feet below land-surface datum, 1945: Apr. 22, 24, 80.62; Oct. 1-3, 5, 6, 83.64.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	81.96	81.52	.....	80.74	80.72	81.24	81.53	82.42	83.12	83.64	83.44	83.14
2	81.96	81.50	.....	80.73	80.72	81.26	81.55	82.44	83.14	83.64	83.42	83.15
3	81.95	81.49	.....	80.75	80.73	81.27	81.55	82.46	.....	83.64	83.41	83.13
4	81.93	81.49	81.08	80.81	80.71	81.27	81.56	82.50	83.17	83.63	83.39	83.13
5	81.90	81.47	81.08	80.75	80.72	81.28	81.58	82.53	82.19	83.64	83.38	83.12
6	.....	81.43	81.08	80.73	80.70	81.30	81.63	82.55	83.22	83.64	83.37	83.13
7	81.88	81.43	81.06	80.71	80.71	81.31	81.67	82.58	83.25	83.63	83.36	83.12
8	81.87	81.39	81.05	80.68	80.72	81.28	81.70	82.61	83.27	.....	83.35	83.11
9	81.85	81.37	81.00	80.63	80.76	81.28	81.77	82.63	83.30	.....	83.34	83.11
10	81.83	81.38	.....	80.69	80.80	81.31	81.79	82.65	83.31	.....	83.33	83.10
11	81.82	81.34	.....	80.69	80.83	81.33	81.85	82.68	83.32	.....	83.31	83.09
12	81.81	81.33	80.96	80.68	80.87	81.33	81.89	82.70	83.33	.....	83.32	83.09
13	81.79	81.32	80.93	80.67	80.87	81.31	81.93	82.72	83.34	.....	83.29	83.09
14	.....	81.31	80.93	80.65	80.89	81.32	81.97	82.74	83.35	83.60	83.28	83.08
15	81.75	81.30	80.93	80.68	80.95	81.35	82.01	82.77	83.37	83.59	83.27	83.07
16	81.73	81.28	80.92	80.67	81.02	81.37	82.05	82.80	83.38	83.58	83.26	83.07
17	81.73	81.28	80.91	80.69	81.04	81.40	82.08	82.83	83.40	83.57	83.25	83.05

24.7.14.221--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
18	81.71	81.26	80.89	80.68	81.08	81.40	82.15	82.85	83.42	83.56	83.24	83.04
19	81.70	81.25	80.90	80.67	81.10	81.39	82.18	82.88	83.45	83.55	83.22	83.04
20	81.69	81.22	80.87	80.69	81.11	81.38	82.21	82.91	83.47	83.54	83.22	83.03
21	81.68	81.22	80.86	80.65	81.18	81.41	82.23	82.94	83.49	83.55	83.21	83.02
22	81.68	81.23	80.84	80.62	81.18	81.42	82.24	82.97	83.52	83.53	83.21	83.03
23	81.66	.....	80.80	80.65	81.19	81.47	82.25	82.99	83.55	83.52	83.20	83.03
24	81.64	.....	80.85	80.62	81.20	81.48	82.26	83.01	83.56	83.52	83.19	83.00
25	81.62	.....	80.85	80.64	81.21	81.47	82.28	83.02	83.58	83.51	83.18	83.94
26	81.59	81.15	80.80	80.65	81.22	81.47	82.28	83.04	83.60	83.50	83.18	82.92
27	81.59	81.10	80.80	80.58	81.21	81.48	82.30	83.04	83.61	83.49	83.17	82.92
28	81.57	81.08	80.79	80.69	81.22	81.49	82.32	83.04	83.62	83.48	83.16	82.91
29	81.55	.....	80.78	80.69	81.22	81.51	82.34	83.06	83.63	83.47	83.16	82.90
30	81.54	.....	80.77	80.70	81.22	81.51	82.37	83.07	83.63	83.45	83.15	82.90
31	81.53	.....	80.77	.....	81.23	.....	82.39	83.11	.....	83.44	.....	82.88

24.8.4.111. Foy Riley. Lowest recorded water level, in feet below land-surface datum, 1945: Oct. 11, 39.75.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Mar.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	38.26	38.84	39.26	.....	39.73	39.74	39.64	
2	38.27	38.88	39.27	.....	39.74	39.74	39.64	
3	38.29	38.89	39.28	.....	39.74	39.74	39.64	
4	38.31	38.91	39.29	.....	39.74	39.74	39.63	
5	g38.37	.....	.....	38.32	38.92	39.30	.....	39.74	39.73	39.62	
6	38.33	38.94	39.31	.....	39.73	39.73	39.61	
7	38.36	38.96	39.32	.....	39.74	39.72	39.61	
8	38.38	38.97	39.33	.....	39.74	39.73	39.59	
9	38.39	38.99	39.34	.....	39.74	39.73	39.59	
10	38.40	39.00	39.35	.....	39.74	39.73	39.59	
11	38.02	38.42	39.02	.....	39.63	39.75	39.72	39.58
12	38.03	38.45	39.03	.....	39.63	39.74	39.72	39.57
13	38.03	38.46	39.05	.....	39.64	39.73	39.73	39.57
14	38.04	38.47	39.06	.....	39.65	39.73	39.73	39.57
15	38.05	38.49	39.07	.....	39.65	39.73	39.72	39.57
16	38.06	38.51	39.08	.....	39.66	39.73	39.72	39.56
17	38.07	38.54	39.09	.....	39.67	39.73	39.71	39.55
18	38.08	38.56	39.10	.....	39.67	39.72	39.70	39.53
19	38.10	38.58	39.11	.....	39.68	39.72	39.70	39.54
20	38.11	38.60	39.12	.....	39.69	39.72	39.69	39.53
21	g37.88	.....	38.13	38.62	39.13	.....	39.70	39.72	39.70	39.52
22	38.14	38.64	39.14	.....	39.70	39.72	39.69	39.51
23	38.15	38.67	39.15	.....	39.70	39.73	39.69	39.49
24	38.16	38.69	39.16	.....	39.71	39.74	39.68	39.49
25	38.17	38.71	39.17	.....	39.71	39.74	39.68	39.48
26	38.18	38.73	39.18	.....	39.72	39.74	39.68	39.47
27	38.19	38.75	39.21	.....	39.72	39.74	39.68	39.47
28	38.21	38.77	39.21	.....	39.72	39.74	39.67	39.47
29	38.22	38.79	39.22	.....	39.73	39.74	39.66	39.46
30	38.23	38.81	39.23	.....	39.73	39.74	39.64	39.46
31	38.24	.....	39.25	.....	39.74	.....	39.45	.....

g Tape measurement.

24.10.12.431. Steve Hrns. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Apr. 9, 14, 78.94; Sept. 8, 9, 85.08.

24.10.12.431--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	80.35	79.74	79.29	79.00	79.60	79.87	82.36	83.96	84.95	84.16	82.89	82.21
2	80.34	79.71	79.31	78.98	79.58	79.87	82.36	83.95	84.98	84.10	82.88	82.22
3	80.32	79.70	79.20	79.00	79.59	79.87	82.39	83.95	85.01	84.05	82.89	82.29
4	80.30	79.69	79.26	79.06	79.57	79.86	82.43	83.95	85.02	84.00	82.91	82.34
5	80.25	79.66	79.26	79.03	79.57	79.88	82.50	83.98	85.03	83.97	82.92	82.36
6	80.24	79.64	79.26	79.02	79.57	79.94	82.55	84.02	85.05	83.93	82.94	82.43
7	80.22	79.63	79.25	79.00	79.59	80.02	82.61	84.08	85.06	83.88	82.92	82.46
8	80.21	79.59	79.24	78.97	79.59	80.11	82.68	84.15	85.08	83.83	82.92	82.49
9	80.19	79.56	79.21	78.94	79.59	80.23	82.74	84.21	85.08	83.77	82.91	82.55
10	80.17	79.56	79.20	79.02	79.56	80.35	82.81	84.24	85.05	83.73	82.86	82.56
11	80.15	79.52	79.19	78.98	79.55	80.47	82.86	84.26	85.03	83.67	82.81	82.54
12	80.14	79.52	79.18	78.96	79.53	80.60	82.90	84.28	85.00	83.62	82.81	82.50
13	80.11	79.51	79.14	78.96	79.51	80.71	82.89	84.28	84.96	83.57	82.80	82.47
14	80.09	79.49	79.13	78.94	79.49	80.83	82.90	84.30	84.92	83.52	82.75	82.44
15	80.07	79.47	79.12	78.96	79.50	80.97	82.95	84.32	84.90	83.48	82.70	82.40
16	80.03	79.45	79.13	78.95	79.56	81.11	83.01	84.35	84.87	83.43	82.68	82.37
17	80.03	79.45	79.13	78.95	79.59	81.24	83.07	84.37	84.84	83.39	82.65	82.35
18	80.00	79.43	79.12	78.95	79.68	81.36	83.08	84.40	84.80	83.35	82.62	82.35
19	79.98	79.42	79.15	78.95	79.76	81.48	83.14	84.45	84.76	83.31	82.57	82.36
20	79.96	79.40	79.12	79.06	79.81	81.60	83.18	84.48	84.71	83.26	82.53	82.32
21	79.96	79.40	79.10	79.13	79.86	81.71	83.25	84.53	84.68	83.23	82.50	82.28
22	79.94	79.40	79.09	79.20	79.86	81.79	83.30	84.57	84.63	83.17	82.48	82.22
23	79.92	79.37	79.06	79.32	79.86	81.87	83.34	84.61	84.59	83.15	82.43	82.18
24	79.91	79.35	79.08	79.45	79.86	81.97	83.41	84.65	84.54	83.10	82.39	82.13
25	79.89	79.33	79.08	79.54	79.86	82.07	83.47	84.69	84.50	83.08	82.35	82.09
26	79.85	79.33	79.05	79.61	79.85	82.16	83.55	84.73	84.44	83.06	82.33	82.05
27	79.84	79.32	79.05	79.64	79.84	82.25	83.63	84.77	84.44	83.03	82.30	82.02
28	79.82	79.31	79.06	79.64	78.95	82.32	83.70	84.79	84.32	83.01	82.25	81.99
29	79.81	79.30	79.63	78.95	79.36	83.36	83.76	84.83	84.27	82.99	82.22	81.94
30	79.79	79.30	79.62	79.84	82.36	83.83	84.88	84.21	82.95	82.21	81.92	
31	79.76	79.02	79.85			83.89	84.92		82.90			81.88

25.9.4.211. Val Miller. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Jan. 9-11, 69.04; Dec. 24-28, 30, 31, 70.73.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	69.14	.....	69.30	69.53	69.84	.....	70.42	70.55	70.64	
2	69.13	.....	69.30	69.54	69.86	.....	70.43	70.56	70.64	
3	69.14	.....	69.31	69.56	69.87	.....	70.43	70.55	70.66	
4	69.15	.....	69.31	69.57	69.88	.....	70.44	70.56	70.67	
5	69.14	.....	69.32	69.58	69.89	.....	70.43	70.56	70.66	
6	69.15	.....	69.32	69.58	69.90	.....	70.44	70.57	70.67	
7	69.15	.....	69.33	69.59	69.91	.....	70.46	70.57	70.68	
8	69.14	.....	69.34	69.60	69.92	.....	70.47	70.58	70.68	
9	69.04	.....	69.13	.....	69.34	69.61	69.93	.....	70.47	70.58	70.67	
10	69.04	.....	69.15	.....	69.34	69.62	69.95	.....	70.47	70.59	70.69	
11	69.04	.....	69.15	.....	69.35	69.63	69.94	.....	70.47	70.58	70.69	
12	69.16	69.23	69.36	69.65	69.97	70.28	70.48	70.60	70.69	
13	69.16	69.24	69.37	69.66	69.97	70.28	70.49	70.61	70.69	
14	69.17	69.24	69.38	69.68	69.98	70.28	70.49	70.61	70.68	
15	69.18	69.24	69.38	69.68	69.99	70.31	70.49	70.60	70.70	
16	69.18	69.24	69.39	69.69	69.99	70.30	70.49	70.61	70.70	
17	69.19	69.24	69.41	69.70	69.99	70.32	70.50	70.62	70.70	
18	69.25	69.42	69.70	69.97	70.32	70.51	70.62	70.71		
19	69.25	69.43	69.71	69.98	70.33	70.50	70.62	70.72		
20	69.10	.....	69.25	69.44	69.72	69.98	70.34	70.51	70.62	70.72	
21	69.11	.....	69.26	69.45	69.72	69.99	70.33	70.52	70.63	70.71	
22	69.11	.....	69.26	69.45	69.74	69.99	70.37	70.52	70.64	70.72	
23	69.12	.....	69.26	69.47	69.75	69.99	70.36	70.52	70.63	70.70	
24	69.12	.....	69.27	69.47	69.76	69.99	70.36	70.53	70.64	70.73	

25.9.4.211--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
25	69.12	.....	69.27	69.48	69.77	.....	70.37	70.53	70.64	70.73
26	69.12	.....	69.27	69.49	69.78	.....	70.38	70.54	70.65	70.73
27	69.13	.....	69.28	69.50	69.79	.....	70.38	70.54	70.65	70.73
28	69.13	.....	69.28	69.50	69.80	.....	70.41	70.54	70.64	70.73
29	69.13	.....	69.28	69.51	69.81	.....	70.41	70.55	70.64	70.72
30	69.13	.....	69.29	69.52	69.82	.....	70.41	70.55	70.65	70.73
31	69.13	.....	69.29	.....	69.84	.....	70.54	.....	70.73	.....

Part 5. Miscellaneous data concerning observation wells

21.11.13.411. Irwin. Formerly owned by R. A. Gunter. Measurements discontinued after July 17, 1945.

21.11.13.411c. Irwin. Used drilled irrigation well, equipped with turbine pump, 30 feet east of well 21.11.13.411, diameter 12 inches, depth 151 feet. Measuring point, top edge of casing, west side of well, 1.40 feet above land-surface datum of well 21.11.13.411. Water level, in feet below land-surface datum, 1944: Nov. 23, 40.84.

23.7.30.433. Kelly. Measuring point beginning Jan. 8, 1945, top edge of Geological Survey washer on south face of south windmill pipe clamp, 0.82 foot above land-surface datum.

23.8.29.433. Kreneck. Measuring point beginning Jan. 6, 1945, top edge of new concrete pump base on north side of well, 0.72 foot above land-surface datum.

23.8.32.323. Holiday. Formerly owned by J. T. Gosnell.

23.8.34.211. Law. Formerly owned by H. T. Foster. Well deepened to 168 feet in November 1944.

23.8.35.233. Remondini. Measuring point beginning Jan. 8, 1945, lower edge of rectangular hole cut in coupling on casing on east side of well, 0.22 foot above concrete pump case and 1.64 feet above land-surface datum.

23.9.31.110. Neighbors. Formerly owned by Schauer & Lindauer.

24.6.29.300. Birchfield. Formerly owned by Mr. Brownfield.

24.6.30.111. Birchfield. Formerly owned by Mr. Brownfield.

24.7.3.311. Hatfield. Well deepened to 425 feet early part of January 1945. Measuring point beginning Mar. 21, 1945, lowered to 0.68 foot above land-surface datum.

24.7.5.211. Williamson. Windmill installed on well prior to May 11, 1945.

24.7.13.212. Franklin. Formerly owned by Percival & Dwyer.

24.7.13.311. Eggleston. Formerly owned by Jennie Weeks. Pump installed on well during 1944, old concrete pump base removed. Measuring point beginning Jan. 5, 1945, top edge of 1½-inch hole in east side of pump base, 0.60 foot above present concrete pump base, 1.30 feet above land-surface datum. Possible discrepancy of a few tenths of a foot between present and previous land-surface datums.

24.7.15.122. Abrahm. Formerly owned by J. N. McDougall.

24.7.16.211b. Snyder. Windmill installed on well prior to July 17, 1945.

24.7.21.222. Geurin. Formerly owned by Hiram Jeter.

24.7.24.312. Birchfield. Formerly owned by H. E. Emory.

24.8.7.431. Hrma. Measuring point beginning Jan. 6, 1945, lower edge of slot cut in east side of casing, 0.16 foot above land-surface datum.

24.9.2.421. Trujillo. Formerly owned by J. H. Winslow.

24.9.22.311. Hrma. Drilled irrigation well, equipped with turbine pump. Measuring point, top edge of casing, 0.90 foot above concrete pump base and 1.00 foot above land-surface datum.

24.9.23.211. Isbell. Formerly owned by J. H. Winslow.

24.10.1.311. Griggs. Not used in 1944 and 1945. Pump removed to new well 100 feet south. Measuring point beginning Jan. 8, 1945, top edge of casing, north side of well, 0.98 foot above land-surface datum.

25.8.18.111. McCann. Formerly owned by L. S. Gore.

25.9.15.211. Paulk. Measuring point beginning Jan. 10, 1945, top edge of Geological Survey washer on east side of lowest 8- by 8-inch pump support, east side of well, 0.28 foot above land-surface datum.

25.9.30.111. Robertson. Well not used in 1944 and 1945. Pump removed to new well 30 feet south. Measuring point beginning Jan. 10, 1945, top of concrete well curb, at land-surface datum.

QUAY COUNTY (HOUSE AREA)

By C. R. Murray and U. N. Benge

Part 1. General discussion

Investigation of the ground-water resources of the House area, in Quay County, was continued in 1945 in cooperation with the State engineer of New Mexico. Records of water levels collected since the inception of the program in 1940 have been published in the following Geological Survey water-supply papers:

Year of record	Water-Supply Paper	Page Nos.
1940-41	941	243-250
1942	949	314-318
1943	991	269-276
1944	1021	264-272

The letter N in the first segment of well location numbers in these reports has been dropped in the current report as all wells are north of the New Mexico base line and no distinguishing letter is necessary.

Water levels are measured in January or February of each year and at bimonthly intervals thereafter. By January recovery from the drawdown effects caused by the previous season's pumping has largely taken place, and by comparison of measurements made at this time in successive years the net yearly change in water level is obtained. (See Part 2.) The measurements made at bimonthly intervals show the seasonal fluctuations in water level occasioned by changes in the amount of precipitation received and the amount of water pumped. (See Part 3.) Water levels were measured

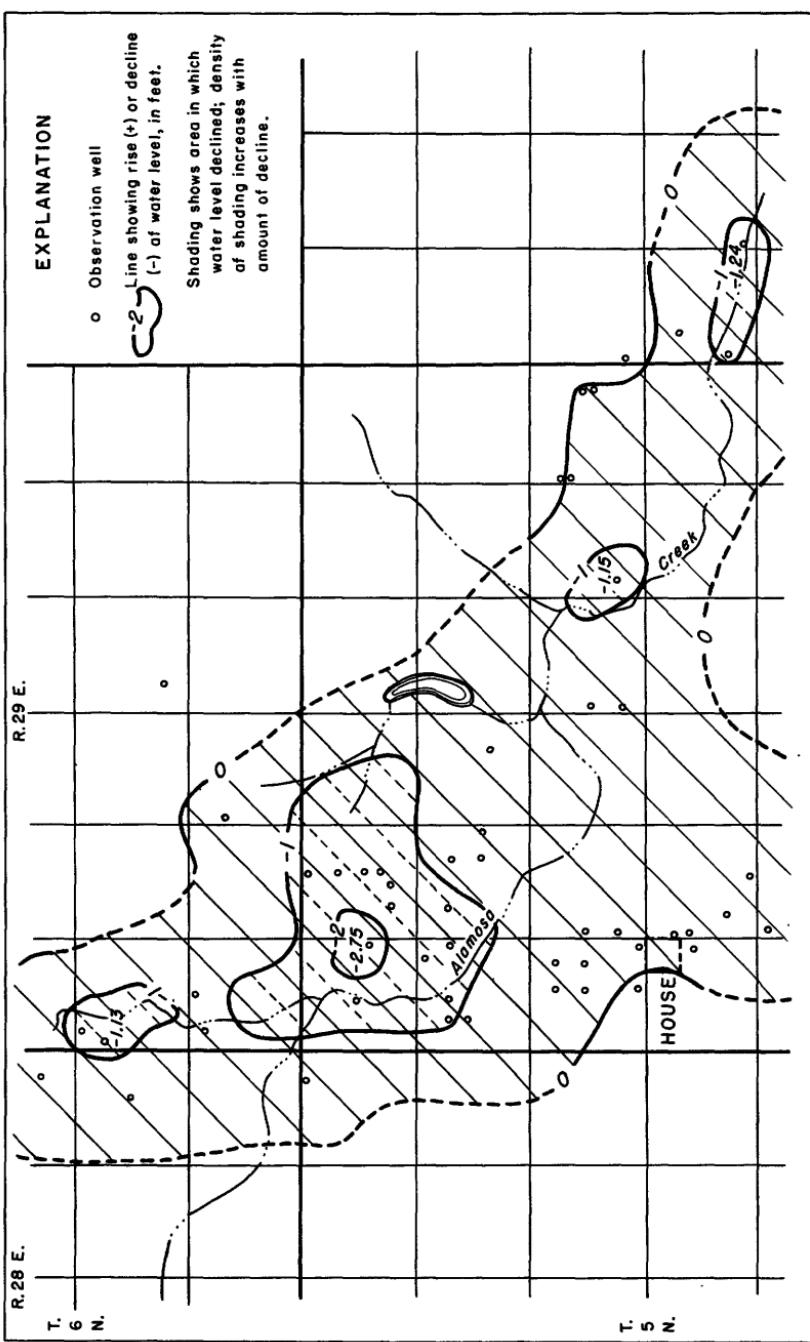


Figure 12.—Map of House area, Quay County, N. Mex., showing changes in water level from January 1945 to February 1946.

in 58 wells in January, 54 wells in April, 51 wells in June, 49 wells in August, 39 wells in September, and 60 wells in November. Automatic water-stage recorders were operated on two wells throughout the year, giving a continuous record of water-level fluctuations in these wells. (See Part 4.) A total of 312 water-level measurements was made during the year, including 12 tape measurements made on the recorder wells.

Fluctuations of water level

Precipitation has a twofold effect on water levels in an area such as House where it partially recharges the aquifer and also reduces the draft on the aquifer by furnishing some of the water requirements of growing crops. Precipitation, judging from the incomplete records which are available, was subnormal in 1945 in the House area, as it was at practically all Weather Bureau stations in New Mexico. The amount of recharge was therefore small and artificial discharge great.

It is estimated that 1,700 acres was irrigated in the House area in 1945 and that about 4,250 acre-feet of water was used thereby. Estimates for land irrigated and water used in 1944 were 1,500 acres and 2,500 acre-feet, respectively. The amount of land irrigated has increased steadily since 1939, and there has been a general increase in the amount of water used. However, variations in precipitation from year to year cause considerable variation in the amount of water pumped.

Water levels declined in 1945 throughout the irrigated part of the House area. In most of the area--about 32 square miles--the declines were less than 1 foot, but in four areas, totaling about 5 square miles, along Alamosa Creek, the declines exceeded 1 foot. Well 5.29.6.422, $2\frac{1}{2}$ miles north of House, showed a decline of 2.75 feet. Drawdowns during the summer were large, and recovery during the fall was less than usual because of drought conditions and prolonged pumping; the net decline for 1945 was, therefore, unusually great.

The rises in water levels which occurred in 1941 following the abnormal precipitation at that time have not been completely dissipated, but during the summer of 1945 water levels in some wells fell to about the same level they had had in the early part of 1941. It is anticipated that declines will continue to occur with the present rate of withdrawal by irrigation wells.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also Part.	Water levels				Record		
			Jan. 1945 Level	Day	Change 1944-45	Highest Level	Lowest Level	Year	Years missing
5.28	1.212	D. C. Wyatt	3,5	49.39	25	-0.44	48.95	44	49.39
5.29	5.211	R. H. Currence	3,5	48.75	25	-.07	48.68	44	48.75
5.231	C. C. Carpenter		42.35	24	+.03	42.35	45	42.35	44
5.341	William Martin	3	31.34	25	-.55	29.73	43	31.54	45
5.342	do	4	31.98	25	-.64	30.15	43	34.26	41
5.411	A. R. Wallace	3	39.16	25	-.53	37.95	43	39.16	45
5.413	do	3	32.72	25	-.68	30.96	43	32.72	42
6.144	H. O. Thomas	3,5	24.00	25	-.55	23.45	44	24.00	45
6.422	L. L. Poe	3	36.24	27	***	***	43	***	45
7.141	D. L. Pirch	3,5	31.29	25	-.72	29.26	43	31.29	45
7.142	do	3,5	17.33	25	-.57	14.31	42	21.00	41
7.143	do	3,5	23.09	24	-.23	22.46	42	24.38	41
7.221	C. P. McFride	3	28.18	26	-.44	25.49	42	28.18	42
7.242	do	3	18.96	25	-.52	18.44	44	18.96	45
8.114	J. C. Davenport	3	25.23	25	-.47	22.75	42	27.88	41
8.232	Carl Johnson	3,5	36.49	25	-1.03	34.19	43	36.49	45
8.412	W. W. Kuykendall	3	30.61	25	-1.07	27.94	43	30.61	42
8.422a	Bill Dwight	3	32.03	25	***	***	42	***	45
9.400	W. Y. Head	3	23.12	25	-.15	21.33	42	23.12	45
13.121	Arthur Shaddon	3,5	77.23	24	+1.22	77.23	45	79.13	41
13.131	do	3,5	56.80	24	+1.66	56.80	45	59.19	41
13.243	H. S. Crosby	5	50.25	24	***	***	43	50.25	45
13.421	Arthur Shaddon	3,5	47.57	24	-.06	46.61	43	47.97	42
14.300	R. A. Tullis	5	35.55	24	***	***	43	***	45
15.311b	do	3,5	c19.5	24	-.65	17.91	43	19.75	43
15.331	do	3	34.48	24	+.03	34.48	45	34.52	43
17.133	W. W. Kuykendall	4	33.92	24	-.94	r29.68	42	35.47	41
17.331	M. M. McEndree	3,5	36.39	24	-1.10	32.92	42	38.12	41
18.213	A. R. Wallace	5	37.04	24	-.87	35.07	43	39.50	41
18.223	do	3,5	31.89	24	***	***	41	***	45
18.233	M. R. Wallace	3	46.89	24	-.57	45.74	42	48.89	41
18.243	L. M. Bright	3,5	34.35	26	***	***	44	***	44
18.433	Chas. Willis	3	52.51	26	-1.09	51.42	44	52.51	45
18.444	L. V. Vaughn	3,5	40.43	26	-1.03	36.70	42	41.59	41

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Year	Lowest Year	Began missing	
5.29-19.244	Lester McCasland	3	49.68	25	-0.89	46.66	42	50.26	41 43
20.131a	J. W. Thompson	3,5	51.02	25	-.91	48.49	43	51.02	45 43
20.131b	do	3	51.36	25	-.92	48.79	43	51.36	45 43
20.133	Walton Henry	3	49.09	25	-.77	48.32	44	49.09	45 44
20.314	Stanley Elliott	3	52.20	26	... ^c	... ^c	... ^c	... ^c	45 45
20.433b	D. J. Speed	3	48.68	26	-.69	f 46.99	43	49.24	41 41
29.111	C. A. Morrow	3	66.67	26	-.21	65.91	43	67.11	41 41
5.30-18.331	Jerry Thompson	3	33.63	24	... ^c	... ^c	... ^c	... ^c	45 45
19.132a	Ralph Hendrix	3	26.67	24	-.50	26.17	44	26.67	45 44
19.313	do	3	417.71	24	-1.17	15.94	42	17.71	45 42
20.333	Arthur Shaddon	3,5	20.99	25	-1.71	16.82	42	20.99	45 42
31.442	T. W. Colemen	3	99.23	24	+.54	99.23	45	99.77	44 44
6.28-13.252	Irwin Estate	3	61.84	26	... ^c	... ^c	... ^c	... ^c	45 45
24.233	Eyers Irwin	3	78.12	26	... ^c	... ^c	... ^c	... ^c	45 45
24.423	R. J. Ferry	3,5	62.83	26	+.09	62.83	45	43.60	42 42
25.411	R. A. Davenport	3,5	52.20	26	+.17	52.20	45	52.37	44 44
6.29-27.332	S. W. Strubling	3,5	44.20	26	... ^c	... ^c	... ^c	... ^c	45 45
30.112	L. M. McDaniels	3,5	48.73	26	-.20	48.08	43	51.12	41 41
31.113	do	3,5	51.87	26	-.17	51.29	43	54.34	41 41
31.114	Clyde Farkendall	3	38.52	26	+.13	36.40	42	41.40	41 41
31.122	G. H. Grieggs	3	55.77	26	-.20	55.57	44	55.77	44 44
33.131	Frank Morrow	3	54.34	25	-.08	54.26	44	54.57	43 43
7.28-9.342	W. E. Giles	3	25.69	26	... ^c	... ^c	... ^c	... ^c	45 45
35.333	Dayton Harris	3	129.62	26	... ^c	... ^c	... ^c	... ^c	45 45

^c Nearby well pumping.
^f From recorder chart.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	5.28. Wyatt	5.29. Cur- rency	5.29. Car- penter	5.29. Martin	5.29. Wallace	5.29. Wallace	5.29. Thomas	5.29. Poe
Jan. 25,27	49.39	48.75	42.35	31.54	39.16	32.72	24.00	36.24
Apr. 7,8	49.85	48.71	42.18	31.77	38.87	32.49	24.02	40.53
June 12,13	49.59	(a)	42.85	35.43	42.07	33.37	(a)	42.20
Aug. 3,4	49.67	53.41	43.68	(a)	42.83	34.29	b28.41	41.85
Sept. 28	49.80	51.34	44.21	34.42	41.26	34.45	25.13	39.54
Nov. 29,30	49.86	50.33	44.00	33.76	40.73	34.20	25.27	b43.07
Location number	5.29. 7.141	5.29. 7.142	5.29. 7.143	5.29. 7.221	5.29. 7.242	5.29. 8.114	5.29. 8.232	5.29. 8.412
Owner	Birch	Birch	Birch	McBride	McBride	Daven- port	John- son	Kuy- kendall
Jan. 24-26	31.29	17.33	23.09	28.18	18.96	25.23	36.49	30.61
Apr. 7,8	31.36	17.36	23.12	28.90	19.13	25.05	37.10	30.54
June 12,13	31.60	a38.96	23.15	30.33	b22.33	27.02	37.68	31.45
Aug. 3,4	32.09	(a)	23.19	30.97	20.77	27.23	39.72	33.36
Sept. 28	32.71	19.17	23.21	30.24	21.59	27.01	.....	.....
Nov. 28-30	32.68	18.88	23.22	29.76	b22.90	26.75	37.58	31.60
Location number	5.29. 8.422a	5.29. 9.400	5.29. 13.121	5.29. 13.131	5.29. 13.421	5.29. 15.311b	5.29. 15.331	5.29. 17.331
Owner	Dwight	Head	Shad- don	Shad- don	Shad- don	Tullis	Tullis	Mc- Endree
Jan. 24,25	32.03	23.12	77.23	56.80	47.57	c19.75	34.48	36.39
Apr. 7,8	32.02	23.04	77.16	56.85	47.48	19.90	a47.14	b40.46
June 11,12	32.92	b23.74	(a)	60.18	47.68	19.95	(a)	40.73
Aug. 2-4	34.77	23.56	a77.22	57.92	47.98	20.07	(a)	45.06
Sept. 27,28	.....	(a)	a77.02	57.02	48.09	20.23	(a)	.....
Nov. 28,29	32.80	23.47	76.77	56.78	48.10	20.35	35.40	37.30
Location number	5.29. 18.223	5.29. 18.233	5.29. 18.243	5.29. 18.433	5.29. 18.444	5.29. 19.244	5.29. 20.131a	5.29. 30.131b
Owner	Wallace	Wallace	Bright	Willis	Vaughn	Mc- Casland	Thomp- son	Thomp- son
Jan. 24-26	31.89	46.89	34.83	52.51	40.43	49.68	51.02	51.36
Apr. 8,9	31.70	46.14	34.53	51.98	40.73	51.67	a53.28	53.22
June 11,12	(a)	50.70	36.12	52.46	42.23	d55.98	a57.14	c56.48
Aug. 3,4	35.08	(a)	37.23	52.80	43.64	c55.43	(a)	(a)
Nov. 29,30	32.95	47.60	35.85	52.63	41.16	50.64	52.08	52.32
Location number	5.29. 20.133	5.29. 20.314	5.29. 20.433b	5.29. 29.111	5.30. 18.331	5.30. 19.132a	5.30. 19.313	5.30. 20.333
Owner	Henry	Elliott	Speed	Morrow	Thompson	Hendrix	Hendrix	Shad- don
Jan. 24-26	49.09	52.20	48.68	66.67	35.63	26.67	c17.71	b20.99
Apr. 7-9	51.08	52.18	48.75	66.65	35.24	26.79	17.79	a22.10
June 11-13	b55.58	52.33	52.63	66.92	35.07	26.93	17.93	a21.83
Aug. 2,4	c54.79	52.49	52.41	69.75	35.02	27.08	18.34	a22.32
Sept. 27	.....	.....	.....	.....	34.92	27.32	18.19	a22.72
Nov. 28-30	50.03	52.73	49.26	66.93	34.89	28.11	17.84	b22.13

a Pumping.

b Pumping recently.

c Nearby well pumping.

d Nearby well pumping recently.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945--Continued

Location number	5.30.	6.28.	6.28.	6.28.	6.28.	6.29.	6.29.	6.29.
Owner	31.442	13.232	24.233	24.423	25.411	27.332	30.112	30.113
Jan. 24,26	99.23	61.84	78.12	62.83	52.20	44.20	48.73	51.87
Apr. 6-8	99.25	61.76	78.19	62.69	52.80	44.15	49.09	53.70
June 11-13	99.21	61.74	a93.94	63.00	(a)	44.09	49.57	54.20
Aug. 2,3	99.43	61.73	79.68	63.56	55.08	44.08	50.40	(a)
Sept. 27,28	99.18	61.78	79.55	63.74	54.21	44.05	50.32	54.05
Nov. 28-30	99.09	61.65	78.62	63.84	53.06	43.98	49.88	53.15
Location number	6.29.	6.29.	6.29.	7.28.	7.28.			
Owner	31.114	31.122	35.131	9.342	35.333			
Kuy-kendall	Griggs	Morrow	Giles	Harris				
Jan. 25,26	38.52	53.77	54.34	25.69	129.62			
Apr. 8	40.34	53.71	54.18	.....	.....	
June 12,13	(a)	60.03	60.95	25.83	129.45			
Aug. 2,3	(a)	60.52	57.07	26.26	129.42			
Sept. 28	41.88	56.15	55.79	26.62	129.48			
Nov. 29,30	40.45	54.82	54.55	26.72	129.38			

a Pumping.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

5.29.5.342. William Martin. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Mar. 23, 31.63; Aug. 15-17, 34.31.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	31.90	31.74	31.73	32.45	32.76	33.56	34.07	34.22	33.93	33.66	33.64
2	.....	31.80	31.76	31.77	32.43	32.77	33.57	34.06	34.19	33.92	33.67	33.66
3	.....	31.88	31.76	31.79	32.46	32.77	33.58	34.06	34.18	33.87	33.73	33.65
4	.....	31.92	31.73	31.87	32.43	32.76	33.61	34.09	34.18	33.85	33.67	33.58
5	.....	31.87	31.72	31.84	32.42	32.76	33.66	34.12	34.13	33.88	33.68	33.54
6	.....	31.86	31.77	31.84	32.39	32.78	33.68	34.14	34.16	33.87	33.76	33.57
7	32.05	31.88	31.76	31.82	32.41	32.84	33.69	34.16	34.14	33.84	33.77	33.53
8	32.05	31.85	31.79	31.79	32.40	32.85	33.70	34.15	34.11	33.86	33.82	33.54
9	32.07	31.85	31.76	31.76	32.38	32.89	33.71	34.17	34.12	33.84	33.88	33.59
10	32.05	31.86	31.73	31.78	32.41	32.92	33.73	34.19	34.10	33.85	33.86	33.53
11	32.03	31.84	31.74	31.86	32.39	32.97	33.70	34.23	34.04	33.85	33.77	33.50
12	32.05	31.83	31.75	31.88	32.39	32.99	33.70	34.26	34.04	33.82	33.84	33.49
13	32.03	31.83	31.70	31.93	32.36	32.98	33.69	34.27	34.05	33.82	33.87	33.54
14	32.00	31.83	31.67	31.97	32.37	33.01	33.70	34.28	34.04	33.84	33.85	33.50
15	.....	31.84	31.70	.....	32.42	33.08	33.74	34.31	34.01	33.83	33.78	33.53
16	.....	31.82	31.71	.....	32.46	33.12	33.76	34.31	33.98	33.81	33.77	33.51
17	.....	31.83	31.73	.....	32.45	33.13	33.76	34.31	33.97	33.81	33.79	33.45
18	.....	31.82	31.69	.....	32.46	33.13	33.79	34.25	33.97	33.76	33.78	33.49
19	.....	31.82	31.72	.....	32.45	33.11	33.83	34.26	34.00	33.77	33.72	33.49
20	.....	31.75	31.75	.....	32.43	33.17	33.85	34.26	33.97	33.72	33.68	33.47
21	31.99	31.77	31.71	.....	32.49	33.23	33.85	34.26	33.96	33.75	33.74	33.46
22	32.01	31.85	31.64	.....	32.55	33.25	33.87	34.26	33.94	33.72	33.74	33.45
23	31.97	31.81	31.63	.....	32.58	33.30	33.87	34.18	33.96	33.73	33.69	33.40
24	31.93	31.78	31.65	.....	32.60	33.33	33.91	34.19	33.96	33.75	33.67	33.43
25	31.93	31.78	31.69	.....	32.64	33.33	33.92	34.16	33.95	33.74	33.65	33.42
26	31.95	31.79	31.69	.....	32.69	33.34	33.95	34.20	33.93	33.74	33.66	33.41
27	31.93	31.77	31.70	.....	32.71	.....	33.97	34.19	33.92	33.71	33.67	33.42
28	31.93	31.78	31.73	.....	32.73	.....	34.00	34.20	33.96	33.71	33.65	33.38
29	31.93	31.76	32.48	32.75	.....	34.21	33.93	33.74	33.63	33.63	33.38	
30	31.91	31.77	32.45	32.71	.....	34.04	34.22	33.88	33.67	33.62	33.45	
31	31.92	31.73	32.75	.....	34.04	34.22	.....	33.64	33.39	33.39		

5.29.17.133. W. W. Kuykendall. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Mar. 22-24, 27, 31, 33.03; Aug. 15-17, 35.08.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	33.28	33.10	33.04	33.48	33.80	34.50	34.94	....	34.65	34.44	34.21
2	....	33.27	33.11	33.05	33.49	33.83	34.53	34.95	34.92	34.66	34.43	34.21
3	....	33.25	33.10	33.08	33.52	33.85	34.58	34.95	34.91	34.66	34.42	34.21
4	....	33.26	33.09	33.13	33.52	33.88	34.54	34.97	34.91	34.65	34.40	34.20
5	....	33.24	33.09	33.14	33.53	33.91	34.55	34.99	34.88	34.65	34.39	34.19
6	....	33.22	33.10	33.16	33.61	33.94	34.56	34.99	34.88	34.65	34.39	34.19
7	33.42	33.24	33.10	33.17	33.64	33.97	34.57	35.02	34.86	34.63	34.38	34.19
8	33.42	33.21	33.11	30.16	33.67	33.99	34.60	35.04	34.86	34.63	34.38	34.18
9	33.41	33.21	33.10	33.16	33.70	34.01	34.62	35.05	34.85	34.63	34.37	34.18
10	33.40	33.21	33.09	33.17	33.73	34.04	34.64	35.04	34.85	34.61	34.35	34.17
11	33.40	33.21	33.08	33.19	33.74	34.08	34.65	35.04	34.82	34.61	34.33	34.16
12	33.40	33.20	33.08	33.19	33.74	34.11	34.67	35.04	34.82	34.60	34.33	34.15
13	33.39	33.20	33.06	33.19	33.73	34.15	34.67	35.06	34.79	34.58	34.33	34.15
14	30.39	33.20	33.05	33.20	33.74	34.17	34.68	35.06	34.78	34.58	....	34.15
15	....	33.18	33.05	....	33.77	34.20	34.69	35.08	34.76	34.57	....	34.16
16	....	33.19	33.06	....	33.78	34.21	34.70	35.08	34.75	34.56	....	34.15
17	....	33.19	33.08	....	33.78	34.22	34.71	35.08	34.75	34.55	....	34.13
18	....	33.18	33.06	....	33.78	34.26	34.73	35.07	34.72	34.54	....	34.13
19	....	33.17	33.07	....	33.78	34.27	34.76	35.06	34.72	34.54	....	34.13
20	....	33.15	33.08	....	33.76	34.30	34.77	35.05	34.71	34.51	....	34.13
21	33.35	33.15	33.06	....	33.78	34.32	34.78	35.05	34.69	34.51	....	34.11
22	33.34	33.19	33.03	....	33.79	34.35	34.80	35.05	34.67	34.50	....	34.09
23	33.33	33.16	33.03	....	33.77	34.35	34.82	35.03	34.67	34.50	....	34.08
24	33.31	33.15	33.03	....	33.76	34.39	34.83	35.03	34.66	34.50	....	34.08
25	33.31	33.14	33.04	....	33.76	34.39	34.87	35.02	34.65	34.50	....	34.07
26	33.31	33.14	33.04	....	33.75	34.40	34.88	35.01	34.64	34.49	....	34.07
27	33.31	33.13	33.03	....	33.73	34.41	34.89	....	34.63	34.48	....	34.07
28	33.31	33.12	33.04	....	33.74	34.43	34.90	....	34.63	34.48	....	34.06
29	33.30	....	33.04	33.48	33.76	34.45	34.92	....	34.63	34.47	34.22	34.04
30	33.29	....	33.04	33.48	33.77	34.46	34.92	....	34.64	34.46	34.21	34.05
31	33.29	....	33.03	....	33.79	....	34.92	....	34.45	....	34.04	....

Part 5. Miscellaneous data concerning observation wells

5.28.1.212. Wyatt. Formerly owned by Drew Dunn.

5.29.5.211. Currence. Formerly owned by Willard Carpenter. Measuring point lowered to 0.80 foot above land-surface datum beginning Aug. 3, 1945, same description as published for 1944.

5.29.6.144. Thomas. Measuring point beginning Aug. 3, 1945, top inside edge of steel barrel well casing, beneath pump base, 2.74 feet above land-surface datum.

5.29.7.141. Birch. Formerly owned by Elmer Phillips.

5.29.7.142. Birch. Formerly owned by Elmer Phillips.

5.29.7.143. Birch. Formerly owned by Elmer Phillips.

5.29.8.232. Johnson. Formerly owned by Joe Douglas.

5.29.13.121. Shaddon. Formerly owned by Mrs. Shoat. Windmill and pump installed prior to June 11, 1945. Measuring point beginning Aug. 2, 1945, top edge of wood floor on concrete base, support for windmill pipe column, 0.15 foot above top of concrete pump base, 0.60 foot above land-surface datum. Possible discrepancy of a few tenths of a foot between preceding and succeeding records.

5.29.13.131. Shaddon. Formerly owned by Mrs. Shoat.

5.29.13.243. Crosby. Used drilled irrigation well, diameter 14 inches, depth 88 feet, equipped with turbine pump. Measuring point, top edge of 3/4-inch hole in base flange of pump, 0.65 foot above top of casing and 1.65 feet above land-surface datum. Water level, in feet below land-surface datum, 1944: July 21, 51.40.

5.29.13.421. Shaddon. Formerly owned by Mrs. Shoat.

5.29.14.300. Tullis. Used drilled irrigation well, equipped with turbine pump. Measuring point, lower edge of mouth of discharge pipe. Subtract 4.45 feet from tape measurements to reduce to land-surface datum. Reference point, surface of concrete pump foundation, 0.50 foot above land-surface datum.

5.29.15.31b. Tullis. Reference point established Apr. 7, 1945, top of Geological Survey washer in top of 1- by 2-inch stake in ground, 2 feet north of well, at land-surface datum.

5.29.17.331. McEndree. Formerly owned by L. V. Vaughn.

5.29.18.213. Wallace. Measuring point beginning Jan. 24, 1945, top edge of $\frac{1}{2}$ -inch hole in north side of pump base, 0.65 foot above land-surface datum. Water level, in feet below land-surface datum, 1945: Nov. 29, 38.12.

5.29.18.223. Wallace. Used drilled irrigation well, diameter 12 inches, depth 76 feet, equipped with turbine pump. Measuring point, top of stovepipe opening in concrete pump foundation, 0.75 foot above land-surface datum.

5.29.18.243. Bright. Unused drilled irrigation well, diameter 12 inches, depth 74 feet. Measuring point, top of well casing at highest point, northwest side of well, level with concrete pump base and 0.80 foot above land-surface datum.

5.29.18.444. Vaughn. Formerly owned by L. M. Head.

5.29.20.131a. Thompson. Well redrilled prior to measurement of June 11, 1945. Measuring point disturbed, description unchanged. Possible discrepancy of a few tenths of a foot between preceding and succeeding measurements.

5.30.20.333. Shaddon. Formerly owned by Emil Kirschenmann.

6.28.24.423. Ferry. New concrete pump base built and turbine pump installed prior to Nov. 29, 1945. Measuring point beginning Nov. 29, 1945, lower edge of mouth of discharge pipe. Subtract 6.21 feet to reduce tape measurement to land-surface datum and 5.15 feet to reduce to surface of new concrete pump base.

6.28.25.411. Davenport. Formerly owned by Travis Dickson.

6.29.27.332. Stribling. Measuring point beginning Apr. 6, 1945, top edge of rim of steel barrel in concrete base around well, 2.90 feet above land-surface datum.

6.29.30.112. McDaniels. Formerly owned by R. W. Dean.

6.29.30.113. McDaniels. Formerly owned by R. W. Dean.

ROOSEVELT COUNTY (PORTALES VALLEY)

By C. R. Murray and U. N. Benge

Part 1. General discussion

The investigation of the ground-water resources of Portales Valley was continued in 1945 in cooperation with the State engineer of New Mexico. Results of the investigation, which began in 1931, have been published in the 10th to 13th biennial reports of the State engineer. Records of water levels in Roosevelt County in past years have been published in Geological Survey water-supply papers as follows:

Year of record	Water-Supply Paper	Page Nos.
1931-38	845	245-278
1939	886	449-467
1940	911	217-235
1941	941	251-270
1942	949	319-336
1943	991	276-295
1944	1021	275-290

Water levels are measured in a large number of wells in January of each year, when most of the recovery from the effects of pumping irrigation wells during the preceding year has taken place, so as to obtain the net yearly change in water level. (See Part 2.) Water levels are measured in a smaller number of wells at bimonthly intervals so as to determine the varying seasonal fluctuations in water levels brought about by changes in the pumping regimen which in turn are largely dependent on the amount of precipitation received. (See Part 3.) In 1945, 177 wells were measured in January; about 56 of these were also measured in March, May, July, September, and November. Water-stage recorders were operated on four wells giving a continuous record of water levels in these wells. (See Part 4.) A total of 451 measurements of water level was made during the year, including 27 tape measurements made on recorder wells.

Fluctuations of water level

As precipitation at Portales was only about 50 percent of normal in 1945, recharge to the aquifer was small and requirements for irrigation large. It is estimated that 18,000 acres was irrigated in Portales Valley in 1945 and that about 47,000 acre-feet of water was used for irrigation. Estimates of acreage irrigated for the years 1941-44 were 15,000, 15,700, 17,000, and 17,500 acres, respectively, and for the water pumped, 9,750,

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 day	Change 1944-45	Highest Level	Lowest Level	Began year	
IN-32.7.300	W. J. Crenshaw	3	415.54	16	-0.33	149.93	43	187.78	41 32
IN-33.16.100a	Hardwick		20.88	17	-.21	19.24	42	26.14	41 41
16.100c	do		21.60	17	-.28	20.00	42	21.60	45 42
26.120	Mary E. Miller		4.87	17	-.56	3.54	42	12.06	39 39
36.400a	A. C. Woodburn	4	1.49	17	-.57	f 41.57	42	f 8.23	41 32
36.400b	do	3	4.95	18	-.58	1.98	42	13.97	41 32
IN-34.29.444	J. N. Teteriller		14.43	18	-1.00	10.78	42	20.62	41 39
35.224	Mrs. Lee Garrett		16.68	18	-1.55	10.96	42	23.15	41 39
35.432	Earl McCollum	(a)	18	18	... ...	21.54	39	22.88	44 39
1.31.1.222	L. H. Lee		75.60	16	... ...	... ...	42	... ...	45
1.32.3.40	M. Nall	3	30.74	16	-.65	24.35	42	39.68	32 32
14.432	Robert Morrison	3	43.63	16	... ...	41.98	44	48.42	41 45
15.111	Mrs. J. P. Nash	3	42.03	16	-.05	41.98	44	48.42	41 40
1.33.5.432	Clay Jones		15.42	16	-.69	13.10	43	23.51	37 35
7.111	E. L. Sisk	3	15.16	16	-.89	12.17	42	22.02	41 40
7.211	A. Q. Smith		15.29	16	... ...	... ...	42	... ...	45
8.112	do		14.08	16	-.77	11.69	43	22.30	37 35
8.311	E. E. Marcus	5	14.56	16	-.76	12.28	43	23.00	41 39
9.111	Earl Plank	5	15.80	16	-.65	13.36	43	22.86	41 39
9.442	John Adams		16.65	16	-.87	12.58	43	22.48	37 35
10.211	O. B. Sherman	5	21.07	16	-.83	18.63	43	25.74	39 39
10.313	Jim Allen	3	18.56	16	-1.27	14.73	43	24.53	37 35
11.312	C. F. Williams		21.26	16	-.93	18.17	43	25.87	41 39
12.144	A. C. Woodburn	3	31.00	17	-1.91	28.61	32	34.42	41 32
13.111	E. Elkins		21.18	16	-1.06	17.83	43	25.70	41 35
13.431	Buddie Black		24.71	19	-1.80	19.23	42	29.88	41 35
14.131	J. V. Miller	5	20.39	16	... ...	13.89	42	23.69	41 35
14.311	Claude Elder	5	19.05	16	-.76	11.81	42	20.87	38 36
14.331	do		18.97	16	-.82	12.06	42	23.87	41 32
14.331c	D. A. Alexander	3	19.37	16	... ...	15.33	42	26.57	41 35
14.421	Leon Jones		22.09	16	-.86	15.33	42	23.20	41 35
15.212	O. D. Minick		18.45	16	-1.24	13.44	42	15.42	45
16.222	Bethel Church	3	15.42	16	-1.62	11.13	43	21.37	37 32
17.221	R. F. Campbell	3	14.28	16	-1.22	11.06	43		

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record	
			Jan. 1945 Level	Jan. 1944 Level	Change 1944-45	Highest Year	Lowest Year	Began		
1.33.35.311	D. H. Smith	•	22.46	19	-1.55	15.84	42	26.15	41	35
23.433	H. A. Miller	•	21.61	19	-1.43	15.75	42	27.09	41	36
24.111	J. E. Dictson	•	25.68	16	-1.96	18.40	42	32.28	41	35
24.433	J. E. Jones	5	22.55	19	-2.18	15.82	42	28.82	41	36
26.221	D. E. Thomas	•	21.62	19	-1.59	15.54	42	27.14	41	36
26.531	C. G. Norton	•	26.26	19	-1.05	22.56	45	32.27	41	37
27.311	J. A. Henley	•	39.25	19	-9.2	36.55	43	45.18	41	41
27.411	W. W. McClary	•	30.42	19	-9.2	27.20	43	36.44	41	41
27.421	Luther Cooper	•	26.75	19	-9.4	23.31	43	26.75	45	42
28.311	J. J. Spires	3	41.77	19	-1.21	39.39	43	47.50	41	39
29.533	M. H. Rea	5	31.95	19	-.92	29.73	43	37.03	41	41
30.	J. S. Lewis	(8)	•	•	•	(8)	•	1.93	35	42-45
34.211	R. T. Billberry	3	22.94	19	-.95	19.72	43	28.94	41	40
36.131	Edwin Johnson	•	34.70	19	-1.10	31.89	43	41.16	41	39
1.34.8.434	Bob Lebette	•	30.67	19	-.19	28.33	43	36.64	41	37
13.412	Ben Donathan	3	51.54	17	-.04	51.50	44	56.44	41	39
16.422	R. E. White	3	44.02	19	-.02	42.33	43	47.96	41	41
17.111	W. D. Ware	5	31.04	19	-.04	28.16	43	36.27	41	36
17.122	Bob Lebette	•	30.47	19	-.06	27.59	43	36.34	41	37
17.233	L. E. Allison	5	28.97	19	-.29	25.10	43	35.20	41	32
17.241	B. F. Ray	•	25.91	19	-.08	22.52	43	31.81	41	35
18.133	J. W. Tucker	•	28.59	19	-1.34	25.64	42	28.59	45	42
18.343	J. W. Terry	•	27.12	19	-1.81	21.19	42	35.52	41	35
19.223	A. H. Keswater	•	25.40	19	-1.98	19.03	42	31.06	41	35
19.341	Floyd Horne	5	23.77	19	-1.99	16.62	42	29.44	41	41
21.121	L. H. Lee	5	32.71	18	-1.69	26.36	42	38.08	41	35
21.141	Douglas Owen	•	32.74	18	-1.79	25.82	42	37.94	41	43
21.222	Elizabeth Tipton	•	•	•	•	34.15	42	44.13	41	36
22.131	Mrs. W. E. Jergins	34.33	18	•	•	27.47	42	39.25	41	35
22.222	Mrs. A. J. Goodwin	3	39.67	17	-.69	31.87	43	43.52	41	32
22.421	R. C. Grunig	35.22	18	-1.39	28.89	42	39.25	41	39	
22.443	Mable Jernigan	32.42	18	-1.23	23.65	42	36.76	41	35	
23.211	Pope Long	•	38.07	17	-.25	36.89	42	41.99	41	37
23.311	J. R. Mahaffey	35.62	18	-1.25	28.85	43	37.04	41	35	
23.313a	R. E. McDonald	3	33.09	18	-1.27	27.47	43	36.75	41	32

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet—Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Began	
1.34-23.422	E. L. Yandell	•	30.27	17	-0.07	27.73	43	34.05	41 36
23.442a	S. B. Fletcher	•	31.94	17	-1.03	28.34	43	35.12	41 41
24.243	J. T. Gorrell	•	44.50	17	-0.85	42.45	45	43.14	37
24.312a	W. A. Cummings	•	31.71	17	-0.29	29.40	43	31.71	45 42
25.200	J. B. H. Young & Smith Feed Pens	•	33.38	17	-1.21	29.20	42	36.89	41 35
25.211	J. B. H. Young	4	35.95	17	-0.78	32.54	32	39.21	41 32
26.345a	Unknown	5	30.65	22	-2.42	24.33	43	34.26	41 40
26.400	(Incorrect designation used previously for 1.34-26.343a, which see)		30.28	18	-1.26	26.343a	42	34.64	41 32
27.211	J. F. Bowman	•	d27.65	19	-1.70	18.90	42	31.72	41 39
27.351	Lewis Kirby	•	28.21	19	-1.56	17.24	42	32.09	41 35
27.341	B. F. Smith	5	28.21	19	••••	20.17	42	33.42	41 45
27.412	J. E. Plummer	•	28.03	22	-1.88	17.95	42	31.44	41 35
27.444	Mr. Huffman	5	27.35	18	-2.04	18.84	42	27.35	45 42
28.111	G. C. Morris	•	29.46	19	-2.52	20.49	42	35.23	41 39
28.155a	Lee Daniels	5	29.26	18	-2.05	19.74	42	33.25	41 35
28.211	G. B. Thomson	5	26.05	19	-2.30	17.93	42	30.75	41 35
29.211	J. W. King	•	23.47	19	-1.98	16.55	42	28.17	41 32
30.121	M. A. Pember	3	14.52	22	-2.00	7.24	42	18.26	41 32
33.451	W. A. Moore	3	30.02	22	-2.06	24.00	45	33.97	41 35
34.143	J. A. Sanders	•	28.05	22	-2.15	19.90	42	31.66	41 35
34.232	J. W. Owens	•	28.53	22	-2.05	20.70	42	32.12	41 35
34.322	T. E. Mears	•	26.98	22	-2.20	20.06	42	30.05	41 35
35.312	Eastern N. Mex. College	•	29.91	23	-1.69	23.05	42	33.94	41 35
36.324	Mr. Disney	5	(Measurements discontinued)		18.94	42	27.75	40	43 41, 45, 46
36.332	T. R. Chambers	•							
36.355	Jim Landiss	•	26.79	23	-2.29	18.84	42	29.76	41 41
36.421	Parl McColium	•	28.05	23	-1.41	26.64	44	32.81	41 35
36.443	Foy Williams	•	27.95	23	-1.87	19.37	42	32.36	41 35
1.35.2.300	Eastern N. Mex. State Park	3	43.54	18	-0.02	43.52	44	48.07	40 36
6.141	Aubrey Ellis	3	41.16	18	-.62	•54	42	10.70	41 39

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Hi- ghest Year	Lowest Level	Year	
1.356.400	J. C. Brown	3	9.01	18	-0.60	5.24	42	15.46	41 32
11.241	Eunice McPherson	3	14.71	23	-0.33	14.03	43	19.02	41 41
19.352	S. D. Foreman	•	44.91	23	•••	37.80	43	44.41	35 44, 45
19.452	D. A. Carroll	•	44.91	23	-2.63	41.12	43	47.98	41 35 36, 37, 39,
27.344	H. J. McGroarty	3	29.72	23	-0.23	128.84	43	35.58	41 41
28.145	Mrs. Albina Krivanek	3, 5	45.01	23	-0.52	44.24	43	51.49	41 35
29.111	Clara Nullmeyer	•	36.58	23	-0.33	35.26	43	41.69	41 40
29.142	R. E. Lee	5	35.53	23	-0.85	33.15	43	40.78	41 35
29.231	(Incorrect designation used previously for 1.35-59.142, which see)		36.28	17	-0.37	33.65	43	39.68	41 35
30.111	E. F. Foreman	•	27.47	23	-1.20	22.67	43	32.37	41 35
30.345	T. E. Livingston	•	27.38	22	-1.67	22.00	43	32.73	41 35
31.122	Mary M. Kenyon	•	25.01	23	-1.71	19.23	43	31.60	41 35
31.231	W. R. McCollum	•	26.48	23	-1.98	18.31	42	31.33	41 35
31.331	R. A. Young	•	(Measurements discontinued)		19.63	43	29.78	39	36 40, 41, 45,
31.341	W. M. Drinkard	•	(Measurements discontinued)						
31.342	E. F. Moore	•	26.04	23	-1.74	19.37	43	31.15	41 35
31.421	Henry Beebe	•	25.15	23	-1.80	18.98	42	30.60	41 36
32.111	Alvin George	5	23.91	23	-1.73	19.65	43	30.52	41 35 37
32.112	(Incorrect designation used previously for 1.35-32.111, which see)		22.79	23	-1.17	18.45	43	27.97	41 40
32.212	R. H. Green	5	22.79	23	-1.17	18.45	43	27.76	41 36
32.311	O. W. Doak	•	22.88	23	-1.79	17.41	42	28.35	41 37
32.332	C. E. Lane	•	23.44	23	-1.65	17.12	42	25.55	41 35
32.413	Q. L. Hanles	•	20.65	23	-1.30	14.77	42	31.29	41 35
33.112	Roy Newberry	•	(Measurements discontinued)		22.34	43	24.03	41 35	
33.331	L. C. Green	•	18.42	23	-0.84	13.03	42	36.01	41 40
1.366.300	W. H. McDaniel	3	b33.09	18	-0.14	32.84	43	40.73	41 40
6.100	O. W. Pivins	•	37.75	18	+0.08	37.08	42		
16.100	State of New Mexico	3, 5	b18.40	18	•••	b18.40	45	a30.20	40 40
2.341.114	E. C. Murrill	•	27.48	23	-2.34	18.24	42	30.37	41 35
1.153	H. R. Knox	•	26.70	23	-2.17	18.18	42	29.64	41 35 36, 37

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also	Part	Water levels				Record			
				Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Year	Year Begun	Years missing	
2.34.1.221	Foy Williams	5	27.64	23	-1.87	18.98	42	32.00	41	35	
2.233	Louis Trout	3	41.28	22	-2.08	f33.04	42	f44.50	41	32	
4.41	Maud Wallace	3	2.46	22	-.96	+4.17	42	6.00	41	39	
10.343	J. E. Bollen	*	33.04	22	-46	32.25	43	36.03	41	35	
11.122	D. W. Pedinger	*	27.13	22	-2.30	19.20	42	30.56	41	41	
13.133	E. W. McFarland	3	19.09	22	****	****	41	45	45		
13.224	Mrs. A. L. Lamm	(Measurements discontinued)	26.39	22	-1.75	20.56	42	30.34	41	45	
14.113	J. P. Tarlton	*	33.44	22	-1.31	29.22	42	36.87	37	35	
14.443	J. M. Shrim	5	27.55	22	-1.51	24.48	43	32.10	41	32	
15.212	J. W. Allen	5	19.12	23	-.99	12.94	42	24.09	41	35	
14.411	W. E. Munsey	3,5	20.84	23	-1.34	12.87	42	25.21	41	35	
5.311	H. G. Black	*	21.18	23	-1.14	13.45	42	25.45	41	35	
5.341	H. R. Sadler	*	25.12	23	-1.89	16.73	42	29.81	41	32	
6.121	Dollie Clark	*	24.95	23	-1.76	16.87	42	29.67	35	37	
6.213	Beulah Ownby	*	24.37	23	-1.45	14.45	42	27.64	41	35	
6.312	Mrs. M. L. Master	(Measurements discontinued)	25.15	22	***	***	41	45	45		
6.312a	Hugh Brassell	5	24.37	23	***	***	41	45	45		
6.331	J. A. Akens	*	25.15	22	-6.52	12.96	42	25.11	41	35	
6.411	F. A. Jewell	*	22.94	23	-1.62	14.25	42	27.41	41	39	
6.443	Ora Johnson	3	21.09	23	-1.28	f13.07	42	f25.92	41	35	
7.134	A. L. Kelly	*	31.09	22	-1.25	24.01	42	34.35	41	37	
7.311	W. E. Elliott	3	13.94	22	-1.18	7.04	42	17.03	41	32	
8.331	D. L. Ray	*	24.75	22	-1.18	16.28	42	27.96	41	35	
9.211	Joe Maxwell	3	16.38	21	-.78	10.26	42	19.75	41	39	
9.331	(Incorrect designation used previously for 2.35.9.333, which see)	*	23.60	21	***	***	41	45	45		
9.333	C. R. Clark	5	15.85	21	-.89	10.30	42	19.52	41	40	
10.211	S. H. Hare	*	8.63	22	+.29	6.79	42	11.21	41	39	
14.313	1st Nat'l Bank, Portales	*	+.05	21	+.80	+.07	43	3.44	41	40	
14.414	do	3	1.04	21	-.15	+.02	42	2.76	41	39	
15.131	A. J. Cline	3	7.17	22	-.24	4.12	42	8.51	41	39	
16.333	State of New Mexico	3	4.08	22	-.31	(g)	42	5.43	41	39	

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet—Continued

Location number	Owner	See also	Water levels						Record	Be- gan Year	Years missing
			Jan. 1945 Level	Jan. 1944-45 Change Day	1944-45 Level	Highest Year	Lowest Year	Level			
2.35.19.133	J. A. Roberson	5	26.53	22	-0.70	24.68	42	31.11	37	32	
19.134	(Incorrect designation used previously for 2.35.19.133, which see)										
25.123	L. C. Buchanan	3	18.94	22	-.35	16.59	43	24.73	37	36	
26.111	T. M. McCrary	•	30.15	22	-.48	28.07	42	32.98	41	41	
2.36.7.352	Loren Johnson	3	16.80	21	••••	13.26	42	20.94	••	45	
8.452	S. W. Davis	3	16.48	21	-.26	15.67	43	21.63	41	39	
9.451	T. F. Polley	•	17.82	21	-.24	15.42	42	18.26	33	32	
18.341	Bob Stokes	3	12.78	21	-.33	9.92	42	22.96	41	41	
19.113	E. O. Hobbs	•	19.80	21	-.51	16.93	42	16.50	32	32	
20.321	W. O. Davis	3	12.28	21	-.47	8.12	43	16.96	41	39	
21.432	S. H. McCarron	•	13.72	21	-.48	10.39	43	16.50	41	39	
25.112	W. D. Pace	•	15.63	21	-.41	8.13	42	14.21	37	32	
26.131	L. L. Buge	3	11.40	21	-.25	5.29	42	13.56	37	36	
26.311	J. S. Riley	•	11.10	21	-.10	5.09	42	16.09	41	35	
26.423	W. B. Cox	•	13.96	21	-.13	8.15	42	15.47	41	39	
27.111	B. L. Kennedy	•	12.17	21	-.23	6.27	42	15.26	37	36	
27.131	do	5	12.40	21	-.30	6.54	42	14.79	37	32	
27.211	M. O. Pace	•	11.70	21	-.30	5.98	42	15.86	41	33	
27.311	J. M. Riley	3	12.90	21	-.35	7.04	42	16.34	37	33	
28.114b	Morgan Trammell	4	13.07	21	-.45	f 7.37	42	15.96	41	36	
28.411	C. A. Tevis	•	12.90	21	-.45	7.06	42	17.05	41	35	
28.421	do	•	13.98	21	-.38	8.26	42	17.4	37	35	
28.441	E. C. Sanders	•	14.80	21	-.40	11.60	43	22.82	42	42	
30.111	L. B. Moronton	3	2.82	21	-1.14	.70	42	16.59	41	36	
34.111	M. F. Riley	•	13.83	21	-.31	8.18	42	17.01	41	35	
34.221	(Incorrect designation used previously for 2.36.34.222, which see)										
34.222	W. H. Davenport	5	8.66	21	+.03	4.01	42	20.65	37	36	
34.341	W. J. Murrill	3	17.56	21	-.30	12.99	42	10.64	41	39	
34.421	F. F. Davis	•	8.62	21	+.05	4.24	42	12.96	32	32	
35.212	A. E. Whitehead	3,5	8.58	21	+.09	3.91	42	20.74	41	39	
2.37.19.331	W. H. McDougal	3	16.77	21	-.43	12.97	42	19.84	41	39	
19.341	C. R. Anderson	.	16.52	21	-.33	12.97	42				

a Pumping.
d Nearly well pumping recently.
f From recorder chart.

J Also 1941.

g Above land-surface datum; well inaccessible.
h Measurement doubtful.
i March 1943.

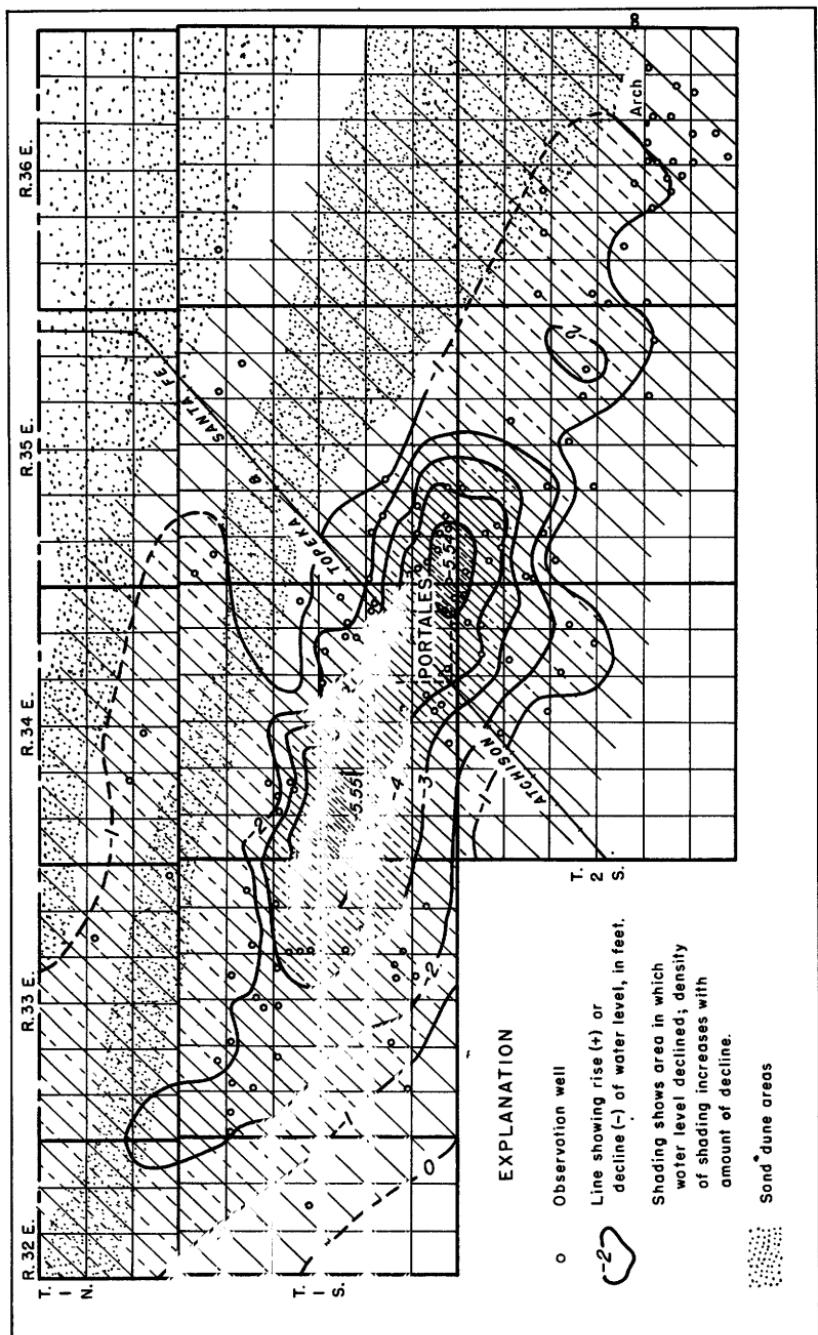
23,500, 45,000, and 35,000 acre-feet. In addition to the increased irrigation use, about 40 percent more water was pumped by the city of Portales in 1945 than in 1944.

The heavy draft on ground water in Portales Valley in 1945 caused net water-level declines from January 1945 to January 1946 in an elliptical area surrounding Portales (fig. 13). The areal distribution of the decline has been similar for several years with the intensity of decline varying with the amount of precipitation received and the quantity of water pumped. The decline of water level in 1945 closely resembled in both areal extent and magnitude that in 1943, another year of greatly subnormal precipitation, and was considerably greater than that in 1944. Declines exceeded 1 foot over an area of about 165 square miles, 2 feet over 60 square miles, 3 feet over 30 square miles, 4 feet over 16 square miles, and 5 feet over approximately 4 square miles. As the summer declines were unusually great, and as less recovery took place during the autumn of 1945 than during the previous year, the net yearly declines were unusually large. In the areas of greatest decline, just east and west of Portales, water levels fell by the end of 1945 to their lowest positions of record in a number of wells. Water levels at the end of 1945 in wells outside of the area of greatest decline still were above their early 1941 positions, when most wells attained their all-time low positions of record. The slope of the cone of depression in the water table redeveloped since 1941 is thus seen to be steeper at present than that of the original cone.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	1N.32. 7.300	1N.33. 36.400b	1.31. 1.222	1.32. 3.440	1.32. 14.432	1.32. 15.111	1.33. 7.111	1.33. 10.313
Owner	Cren- shaw	Wood- burn	Lee	Nall	Morri- son	Nash	Sisk	Allen
Jan. 16,17	815.54	4.95	75.60	30.74	43.63	42.03	15.16	18.56
Apr. 4-6	15.15	5.13	75.44	31.17	43.55	42.07	b16.91	18.72
June 8-10	16.16	6.47	75.42	31.97	45.47	42.00	25.03	25.32
Aug. 1	16.15	7.03	76.10	31.90	(a)	42.17	(a)	22.22
Sept. 24,25	16.22	7.60	75.48	32.44	b48.98	.....	(a)	23.37
Nov. 26,27	15.72	6.57	75.26	31.82	44.65	.....	17.98	21.23
Location number	1.33. 12.144	1.33. 14.331c	1.33. 16.222	1.33. 17.221	1.33. 28.311	1.33. 29.333	1.33. 34.211	1.34. 13.412
Owner	Wood- burn	Alex- ander	Bethel Church	Camp- bell	Spires	Rea	Bil- berry	Dona- thon
Jan. 16-19	31.00	19.37	15.42	14.28	41.77	31.95	22.94	51.54
Apr. 4-6	31.35	(a)	15.48	14.46	41.56	31.90	22.93	51.68
June 8-10	(a)	(a)	15.86	14.73	c42.75	32.06	25.70	51.59

* See footnotes at end of table.



Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945--Continued

Location number	1.33. 12.144	1.33. 14.331c	1.33. 16.222	1.33. 17.221	1.33. 28.311	1.33. 29.333	1.33. 34.211	1.34. 13.412
Owner	Wood- burn	Alex- ander	Bethel Church	Camp- bell	Spires	Rea	Bil- berry	Dona- thon
July 30-								
Aug. 1	35.70	25.04	16.52	15.69	43.32	32.31	26.85	51.74
Sept. 25	(a)	28.31	17.28	16.38	43.80	b32.49	(a)	51.89
Nov. 23, 26, 28	32.44	.....	17.80	16.64	43.14	32.53	25.95	52.04
Location number	1.34. 16.422	1.34. 17.233	1.34. 22.222	1.34. 23.313a	1.34. 33.431	1.35. 2.300	1.35. 6.141	1.35. 6.400
Owner	White	Ray	Good- win	McDon- ald	Moore	State Park	Ellis	Brown
Jan. 17-19, 22	44.02	28.97	39.67	33.09	14.52	43.54	4.16	9.00
Apr. 2-5	43.84	30.56	40.10	32.60	14.54	43.80	4.06	9.00
June 8, 9	44.33	(a)	40.26	34.70	15.05	43.80	4.79	9.09
July 31,								
Aug. 1	44.84	(a)	40.46	36.55	15.84	43.87	5.77	9.40
Sept. 24-26	.....	(a)	40.70	37.79	16.71	44.04	6.46	9.82
Nov. 23, 27	.....	33.13	40.66	36.89	16.96	43.93	6.15	10.09
Location number	1.35. 11.241	1.35. 27.344	1.35. 28.143	1.36. 5.300	1.36. 16.100	2.34. 2.233	2.34. 4.441	2.34. 13.133
Owner	McPher- son	McGro- ary	Kriv- anck	McDan- iel	State of N. M.	Trout	Wal- lace	McFar- land
Jan. 18-23	14.71	29.72	45.01	b33.09	b18.40	41.28	2.46	19.09
Apr. 4, 5	14.81	30.06	45.11	33.51	b18.58	42.08	2.84	19.50
June 8-10	14.94	30.06	b46.09	33.18	18.63	44.49	3.57	20.23
July 30, 31	15.12	30.42	46.27	33.28	18.77	47.08	4.16	20.53
Sept. 24-26	15.23	.....	46.00	33.29	18.82	47.23	4.76	b22.01
Nov. 23, 24	15.14	.....	45.83	33.30	18.37	46.29	4.04	20.84
Location number	2.35. 4.111	2.35. 6.121	2.35. 6.443	2.35. 7.311	2.35. 9.211	2.35. 14.313	2.35. 14.414	2.35. 15.131
Owner	Munsey	Clarke	John- son	Ell- iott	Max- well	Bank	Bank	Bank
Jan. 21-23	19.12	25.12	21.99	13.94	16.38	8.63	+0.05	1.04
Apr. 2-5	19.82	24.80	21.04	13.89	16.58	8.50	+1.14	1.36
June 9-10	25.95	28.76	24.33	a15.30	17.14	9.45	3.16	2.38
July 31	(a)	31.84	c49.74	15.86	17.63	10.42	3.85	2.91
Sept. 26	(a)	33.82	c53.65	17.03	.....	10.94	4.00	3.17
Nov. 23, 24, 27	22.99	31.81	26.48	16.70	18.46	10.62	2.87	2.39
Location number	2.35. 16.333	2.35. 18.211	2.35. 25.123	2.36. 7.352	2.36. 8.432	2.36. 18.341	2.36. 20.321	2.36. 26.131
Owner	Cline	State	Buch- anan	John- son	Davis	Stokes	Davis	Bugg
Jan. 21, 22	7.17	4.08	18.94	16.60	16.48	12.78	12.28	11.40
Apr. 5, 6	7.15	4.01	18.95	16.85	16.61	12.95	12.34	11.38
June 9, 10	8.03	5.27	19.32	17.17	19.89	13.10	13.14	11.87
July 30, 31	8.89	6.08	19.55	17.39	(a)	13.44	13.44	12.27
Sept. 26	9.00	6.75	19.87	17.74	(a)	13.85	19.01	13.20
Nov. 24, 27	8.22	5.42	20.00	17.86	17.87	13.89	13.46	12.20

* See footnotes at end of table.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945--Continued

Location number	2.36. 27.311	2.36. 30.111	2.36. 34.341	2.36. 35.212	2.37. 19.331
Owner	Riley	Thorn- ton	Mur- rill	White- head	Mc- Dougal
Jan. 21	12.90	2.82	17.56	8.58	16.77
Apr. 5,6	13.48	2.82	17.40	8.27	17.05
June 9,10	15.16	3.96	18.16	9.02	17.00
July 30	14.02	4.64	18.47	9.92	17.16
Sept. 26	15.67	4.83	19.70	10.65	17.25
Nov. 27	14.00	3.62	18.20	9.40	16.71

a Pumping.

b Pumping recently.

c Nearby well pumping.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

1N.33.36.400a. A. C. Woodburn. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Jan. 18, 1.32; Sept. 27, 28, 4.09.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.35	1.45	1.42	1.63	1.90	2.74	3.45	3.38	3.65	3.62	....	3.11
2	1.35	1.43	1.44	1.68	1.78	2.78	3.47	3.42	3.67	3.54	....	3.11
3	1.40	1.44	1.48	1.68	1.69	2.80	3.46	3.46	3.70	3.48	....	3.10
4	1.44	1.48	1.47	1.74	1.71	2.83	3.47	3.49	3.72	3.45	....	3.09
5	1.39	1.46	1.48	1.71	1.76	2.86	3.45	3.52	3.76	3.43	....	3.09
6	1.40	1.45	1.53	1.71	1.85	2.89	3.37	3.55	3.76	3.41	....	3.09
7	1.45	1.50	1.53	1.70	1.92	2.93	3.33	3.58	3.77	3.40	....	3.08
8	1.45	1.46	1.52	1.68	1.96	2.96	3.31	3.60	3.79	3.39	....	3.08
9	1.46	1.46	1.57	1.68	1.96	3.00	3.31	3.60	3.82	3.32	....	3.08
10	1.46	1.50	1.56	1.70	2.03	3.05	3.31	3.61	3.78	3.28	....	3.09
11	1.45	1.46	1.56	1.75	1.99	3.07	3.33	3.63	3.78	3.26	....	3.08
12	1.48	1.46	1.52	1.73	2.06	3.10	3.35	3.64	3.78	3.24	....	3.09
13	1.47	1.47	1.54	1.75	2.09	3.12	3.33	3.67	3.83	3.21	....	3.09
14	1.47	1.48	1.58	1.75	2.15	3.13	3.04	3.67	3.89	3.22	....	3.09
15	1.48	1.50	1.56	1.57	2.18	3.16	2.87	3.69	3.95	3.23	....	3.10
16	1.48	1.49	1.52	1.57	2.14	3.18	2.82	3.70	3.97	3.23	....	3.09
17	1.36	1.47	1.53	1.66	2.19	3.20	2.80	3.71	3.99	3.24	....	3.07
18	1.32	1.47	1.56	1.68	2.26	3.21	2.82	3.72	4.00	3.26	....	3.07
19	1.34	1.47	1.57	1.66	2.32	3.23	2.84	3.74	4.01	3.27	....	3.08
20	1.35	1.37	1.59	1.69	2.36	3.25	2.86	3.76	4.03	....	....	3.09
21	1.36	1.37	1.60	1.72	2.41	3.26	2.89	3.78	4.04	....	....	3.07
22	1.43	1.47	1.59	1.72	2.45	3.27	2.92	3.67	4.04	....	....	3.07
23	1.38	1.45	1.56	1.72	2.46	3.29	2.96	3.59	4.05	....	....	3.05
24	1.38	1.43	....	1.70	2.48	3.30	3.01	3.55	4.06	....	....	3.05
25	1.41	1.45	1.62	1.74	2.50	3.32	3.08	3.55	4.07	....	....	3.05
26	1.41	1.48	1.63	1.82	2.52	3.34	3.15	3.55	4.08	....	....	3.05
27	1.41	1.45	1.65	1.79	2.56	3.36	3.20	3.56	4.09	....	....	3.04
28	1.44	1.46	1.67	1.84	2.61	3.38	3.24	3.58	4.09	....	3.17	3.02
29	1.44	1.68	1.88	2.63	3.40	3.27	3.60	3.89	4.09	....	3.14	3.01
30	1.46	1.69	1.89	2.66	3.42	3.31	3.64	3.70	4.09	....	3.12	3.02
31	1.46	1.66	2.69	....	3.35	3.64	....	....	3.02	....	....	3.02

1.34.25.211. J. B. H. Young. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Mar. 14, 35.61; Oct. 2, 4-6, 8, 38.50.

NEW MEXICO, ROOSEVELT COUNTY

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1.34.25.211--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36.04	35.88	35.68	35.67	36.05	36.57	37.21	37.55	37.97	38.49	38.36	38.23
2	36.04	35.87	35.68	35.71	36.05	36.60	37.23	37.57	37.99	38.50	38.35	38.23
3	36.03	35.86	35.68	35.72	36.06	36.61	37.23	37.59	38.01	38.49	38.35	38.23
4	36.03	35.88	35.67	35.76	36.06	36.62	37.24	37.60	38.03	38.50	38.33	38.21
5	36.01	35.86	35.66	35.77	36.07	36.64	37.26	37.62	38.05	38.50	38.32	38.20
6	36.01	35.85	35.67	35.79	36.07	36.67	37.28	37.62	38.06	38.50	38.32	38.20
7	36.01	35.86	35.66	35.80	36.10	36.69	37.29	37.63	38.09	38.49	38.32	38.19
8	36.01	35.83	35.66	35.81	36.11	36.72	37.31	37.64	38.12	38.50	38.31	38.19
9	36.01	35.83	35.65	35.82	36.12	36.73	37.32	37.66	38.15	38.49	38.32	38.20
10	36.00	35.84	35.64	35.83	36.13	36.74	37.34	37.68	38.17	38.48	38.32	38.19
11	35.99	35.82	35.64	35.87	36.15	36.77	37.36	37.70	38.19	38.48	38.32	38.18
12	35.99	35.80	35.64	35.88	36.17	36.79	37.37	37.71	38.21	38.47	38.32	38.18
- 13	35.97	35.79	35.62	35.90	36.20	36.83	37.38	37.71	38.22	38.47	38.32	38.18
14	35.96	35.79	35.61	35.91	36.24	36.85	37.39	37.73	38.24	38.47	38.32	38.18
15	35.96	35.79	35.62	35.91	36.28	36.88	37.40	37.75	38.26	38.46	38.32	38.18
16	35.95	35.79	35.62	35.92	36.29	36.92	37.41	37.76	38.27	38.45	38.32	38.18
17	35.95	35.79	35.65	35.95	36.31	36.93	37.42	37.78	38.27	38.45	38.32	38.17
18	35.94	35.77	35.64	35.96	36.33	36.95	37.42	37.79	38.30	38.44	38.32	38.17
19	35.94	35.76	35.67	35.95	36.34	36.98	37.43	37.81	38.33	38.43	38.32	38.16
20	35.93	35.73	35.68	35.96	36.35	37.00	37.44	37.82	38.35	38.42	38.32	38.15
21	35.93	35.74	35.67	35.96	36.37	37.02	37.45	37.82	38.36	38.42	38.32	38.15
22	35.93	35.75	35.65	35.95	36.40	37.05	37.46	37.86	38.38	38.41	38.32	38.14
23	35.92	35.73	35.65	35.96	36.41	37.07	37.44	37.87	38.40	38.41	38.25	38.14
24	35.90	35.71	35.65	35.96	36.42	37.08	37.45	37.88	38.41	38.41	38.25	38.14
25	35.91	35.72	35.68	35.97	36.42	37.09	37.46	37.90	38.43	38.40	38.24	38.14
26	35.90	35.70	35.68	36.01	36.44	37.11	37.48	37.91	38.44	38.40	38.24	38.14
27	35.89	35.69	35.68	36.02	36.45	37.12	37.49	37.92	38.45	38.39	38.24	38.14
28	35.89	35.69	35.68	36.04	36.49	37.15	37.50	37.93	38.47	38.39	38.23	38.14
29	35.89											
30	35.89											
31	35.88											

2.36.28.114b. Morgan Trammell. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Apr. 22-25, 12.93; Sept. 28-30, Oct. 1-2, 15.12.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.12	13.05	13.01	12.95	12.98	13.45	14.04	14.35	14.56	15.12	14.64	14.44
2	13.12	13.04	13.01	12.95	12.98	13.48	14.08	14.39	14.59	15.12	14.64	14.41
3	13.12	13.04	13.01	12.95	13.01	13.49	14.10	14.40	14.61	15.11	14.64	14.41
4	13.12	13.05	12.99	12.98	13.02	13.51	14.13	14.43	14.61	15.11	14.61	14.41
5	....	13.05	12.99	12.98	13.02	13.53	14.15	14.46	14.62	15.06	14.61	14.41
6	....	13.05	12.99	12.98	13.02	13.55	14.16	14.49	14.66	15.05	14.61	14.41
7	13.10	13.05	12.99	12.98	13.06	13.58	14.17	14.50	14.68	15.01	14.61	14.41
8	13.10	13.05	12.99	12.96	13.06	13.60	14.19	14.53	14.72	15.00	14.60	14.41
9	13.10	13.05	13.00	12.95	13.07	13.62	14.20	14.54	14.73	15.00	14.60	14.37
10	13.10	13.05	12.99	12.95	13.07	13.64	14.20	14.55	14.76	15.00	14.60	14.37
11	13.10	13.03	12.99	12.96	13.07	13.67	14.21	14.57	14.77	15.00	14.54	14.37
12	13.10	13.03	12.99	12.96	13.10	13.67	14.23	14.59	14.77	14.93	14.54	14.37
13	13.10	13.03	12.98	12.96	13.10	13.69	14.25	14.60	14.77	14.92	14.54	14.37
14	13.10	13.03	12.98	12.96	13.12	13.71	14.26	14.60	14.82	14.89	14.54	14.37
15	....	13.03	12.98	12.94	13.13	13.73	14.27	14.59	14.84	14.88	14.53	14.37
16	13.07	13.03	12.98	12.94	13.13	13.76	14.27	14.57	14.87	14.88	14.53	14.34
17	13.07	13.03	12.99	12.94	13.14	13.77	14.27	14.56	14.88	14.88	14.53	14.33
18	13.07	13.02	12.99	12.97	13.15	13.79	14.28	14.56	14.91	14.88	14.49	14.33
19	13.07	13.02	12.99	12.96	13.17	13.80	14.29	14.54	14.93	14.82	14.49	14.33
20	13.07	13.02	13.00	12.96	13.19	13.82	14.29	14.54	14.96	14.79	14.49	14.33
21	13.07	13.02	13.00	12.96	13.21	13.84	14.29	14.54	15.00	14.79	14.49	14.33
22	13.07	13.03	12.97	12.93	13.23	13.86	14.29	14.54	15.00	14.79	14.49	14.33
23	13.08	13.03	12.97	12.93	13.25	13.88	14.29	14.54	15.04	14.79	14.49	14.30

2.36.28.114b--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
24	13.08	13.02	12.97	12.93	13.25	13.90	14.29	14.54	15.08	14.79	14.49	14.30
25	13.07	13.01	12.97	12.93	13.28	13.92	14.29	14.54	15.09	14.70	14.45	14.30
26	13.07	13.01	12.97	12.94	13.29	13.93	14.29	14.54	15.10	14.70	14.45	14.30
27	13.07	13.01	12.97	12.94	13.31	13.93	14.29	14.54	15.11	14.70	14.45	14.30
28	13.06	13.01	12.97	12.94	13.33	13.97	14.30	14.54	15.12	14.70	14.45	14.30
29	13.06		12.97	12.97	13.38	14.00	14.32	14.54	15.12	14.70	14.45	14.30
30	13.05		12.97	12.98	13.40	14.03	14.33	14.54	15.12	14.70	14.44	14.27
31	13.06		12.97		13.42		14.35	14.54		14.70		14.27

Part 5. Miscellaneous data concerning observation wells

1.33.8.311. Marcus. Measuring point raised to 1.44 feet above land-surface datum prior to Jan. 16, 1945.

1.33.9.111. Plank. Measuring point beginning Jan. 16, 1945, bottom of base of pump on east side, 0.90 foot above land-surface datum. Reference point, top of nail in Geological Survey washer in top of timber on east side of well, near center, 0.10 foot above land-surface datum. Previous reference points destroyed; possible discrepancy of a few tenths of a foot between present and previous land-surface datum.

1.33.10.211. Sherman. Measuring point beginning Jan. 16, 1945, top south edge of 1- by 6-inch board west of pump, 0.10 foot above concrete curb at west side of well and land-surface datum. Previous reference points destroyed; possible discrepancy of a few tenths of a foot between present and previous land-surface datum.

1.33.14.131. Miller. Measuring point beginning Jan. 16, 1945, top edge of east suction-pipe clamp on floor of well pit, 18.96 feet below land-surface datum.

1.33.14.311. Elder. Measuring point beginning Jan. 16, 1945, top edge of casing on northeast side of well, 1.55 feet above land-surface datum.

1.33.17.221. Campbell. Measuring point beginning Aug. 1, 1945, top edge of Geological Survey washer in 3 $\frac{1}{2}$ - by 15-inch timber across well pit, 0.70 foot above land-surface datum. Reference point No. 3, established same date, top edge of Geological Survey washer nailed in east side of post painted orange, 29 feet N., 19° E. of well, 2.16 feet above land-surface datum.

1.33.24.433. Jones. Measuring point beginning Jan. 19, 1945, lower edge of discharge pipe, 4.85 feet long, inside of thread protector. Subtract 6.81 feet from tape measurements to reduce to land-surface datum.

1.34.17.111. Ware. Formerly owned by Mrs. Ruth Culpitt. Measuring point beginning Jan. 19, 1945, top of concrete pump base on west side of well, 0.60 foot above land-surface datum.

1.34.19.341. Horne. Reference point established Jan. 19, 1945, top surface at southwest corner of wier box, 3.25 feet east of well, 1.34 feet above land-surface datum.

1.34.21.121. Lee. Measuring point beginning Jan. 18, 1945, mouth of discharge pipe. Subtract 4.47 feet from tape measurements to reduce to land-surface datum.

1.34.26.343a. Unknown. Incorrectly designated in previous reports as 1.34.26.400.

1.34.27.341. Smith. Formerly incorrectly listed as owned by L. O. Dunn. Measuring point beginning Jan. 19, 1945, top east edge of west 8 3/4- by 4 3/4-inch timber supporting pump, 0.29 foot above land-surface datum.

1.34.27.444. Huffman. Measuring point beginning Jan. 22, 1945, north bottom edge of 1-inch board 3 feet north of discharge pipe at a point midway between 8- by 8-inch stringers on east and west sides of well, level with Geological Survey washer on east upper edge of west 8- by 8-inch stringer and 0.25 foot above land-surface datum.

1.34.28.133a. Daniels. Measuring point beginning Jan. 19, 1945, top edge of concrete curb, 0.63 foot below land-surface datum.

1.34.28.211. Thomson. Formerly owned by H. M. Livingston. Measuring point beginning Jan. 18, 1945, top edge of casing on east side of well, 0.76 foot below land-surface datum.

1.35.28.143. Krivanck. Formerly owned by J. C. Dick. Measuring point beginning June 10, 1945, top edge of east 3/4-inch hole in north side of base of pump, 0.18 foot above concrete pump base and land-surface datum.

1.35.29.142. Lee. Designated incorrectly in previous reports as 1.35.29.231.

1.35.32.111. George. Measuring point beginning Jan. 23, 1945, top of casing at southwest side of well, 0.57 foot below concrete curb and 0.89 foot above land-surface datum. Designated incorrectly in previous reports as 1.35.32.112.

1.35.32.212. Green. Measuring point beginning Jan. 23, 1945, mouth of discharge pipe, 1.93 feet long. Subtract 2.41 feet from tape measurements to reduce to land-surface datum.

1.36.16.100. State of New Mexico. Water level has large fluctuation due to pumping by windmill which masks trend of ground-water level.

2.34.1.221. Williams. Measuring point beginning Jan. 23, 1945, top of 1/4-inch hole in north side of base of Pomona pump, 0.31 foot above concrete pump base and 0.78 foot above land-surface datum. Previous reference points destroyed; possible discrepancy of a few tenths of a foot between present and previous land-surface datum.

2.34.14.443. Shim. Measuring point beginning Jan. 22, 1945, upper inside edge of mouth of discharge pipe, 3.4 feet long. Subtract 4.08 feet from tape measurements to reduce to land-surface datum.

2.34.15.212. Allen. Measurements discontinued after Jan. 22, 1945, well filled.

2.35.4.111. Munsey. Measuring point beginning Apr. 2, 1945, top edge of well casing, 0.05 foot above land-surface datum.

2.35.6.312a. Brassell. Used drilled irrigation well, equipped with turbine pump. Measuring point beginning Jan. 23, 1945, top edge of hole in west side of pump base, 0.11 foot above concrete base and 0.61 foot above land-surface datum.

2.35.9.333. Clark. Previously designated incorrectly as 2.35.9.331.

2.35.19.133. Roberson. Designated incorrectly in previous reports as 2.35.19.134. Measurements discontinued.

2.36.27.131. Kennedy. Measuring point beginning Jan. 21, 1945, top edge of wooden well curb at center of south side, 0.03 foot below top of 4- by 4-inch post at southeast corner of well and 0.78 foot above land-surface datum. Previous reference points destroyed; possible discrepancy of a few tenths of a foot between present and previous land-surface datum.

2.36.34.222. Davenport. Incorrectly designated in previous reports as 2.36.34.221. Measuring point beginning Jan. 21, 1945, top edge of casing at northwest side of well, at land-surface datum.

2.36.36.212. Whitehead. Measuring point beginning Apr. 6, 1945, top south edge of vertical discharge pipe, 4.84 feet above land-surface datum.

SIERRA COUNTY (HOT SPRINGS AREA)

By C. R. Murray

Part 1. General discussion

The investigation of the ground-water resources in the thermal water area at Hot Springs was continued in 1945 in cooperation with the State engineer of New Mexico. Results of this cooperative study, which began in 1939, are contained in a manuscript report prepared in 1941, which will be published in a forthcoming biennial report of the State engineer. Water-level measurements made in past years have been published in Geological Survey water-supply papers as follows:

Year of record	Water-Supply Paper	Page Nos.
1939-40	911	235-240
1941	941	270-274
1942	949	336-340
1943	991	295-299
1944	1021	291-294

Water levels were measured in January and at bimonthly intervals thereafter so as to detect any significant changes which might occur in the artesian pressure in the wells now being operated. (See Parts 2 and 3.) A few temperature measurements were also made to see that the constant temperature of the water, which has been observed in wells in the area, is continuing. Water levels were measured in 13 wells in January, March, and May; 14 wells in July; 13 wells in September; and 11 wells in November. Water-stage recorders were operated on one water-table and two artesian wells during the year, giving a continuous record of water-level fluctuations in these wells. (See Part 4.) In all, 87 water-level measurements were made during the year, including 27 tape measurements made on the recorder wells.

Fluctuations of water level and artesian head

The major factor influencing water levels in the Hot Springs artesian wells is the stage of the Rio Grande at Hot Springs into which all the artesian water is discharged either directly or after having moved through the shallow alluvium. As the flow of the Rio Grande is nearly uniform as a result of discharges for developing power at Elephant Butte Dam, there was only about 0.5 foot difference between the highest and lowest water levels in the wells during the year. Similar small fluctuations occurred

in 1943 and 1944, during which years the river was also regulated by power development. Water levels rose slightly during the first 3 months of 1945, declined to about the end of September, and remained about stationary until the end of the year. The average net changes in feet for the artesian observation wells were as follows: January to March, +0.03; March to May, -0.07; May to July, -0.33; July to September, +0.03, September to November, -0.11; November to January 1946, +0.09, giving a net yearly change of -0.36. Water levels throughout 1945 were quite similar to those in 1943 and differed from those in 1944 in being higher at the beginning of the year but lower at the end of the year. Little recovery took place during the last 3 months of 1945, whereas marked recovery had occurred in 1944. A net yearly decline in water levels occurred in 1945, whereas a net yearly rise occurred in 1944.

Part 2. Water levels in January 1945 and highest and lowest recorded levels, in feet above (+) or below (-) land-surface datum, and change from January 1944 to January 1945, in feet

Field No.	Location	Owner	See also	Water levels						Record	
				Jan. 1945	Change	1944-45	Highest	Lowest	Year		
Lot	Block	Part	Level	Day	Level	Year	Level	Year	gan		
2	17	1	H. L. Lockhart	3	+0.70	2	+0.40	+1.20	42	+0.30	44
3	17	1	do	3	+.75	2	+.40	+1.23	42	+.35	44
4	21	2	C. E. James	3	+.84	2	+.37	+1.28	42	+.40	39
5	12	9	J. E. Malone	3	b-.32	2	+.40	+.13	42	-.72	44
6	4	8	C. E. James	4	+1.01	2	+.37	f+1.57	42	f+.52	41
6a	4	8	do	4	-1.41	2	+.22	f-1.24	42	f-1.64	44
12	8	40	Mr. Mathis	3	+4.10	2	+.41	+4.53	42	+3.69	44
18	7	105	W. R. Whitehead	3.5	-1.45	2	+.31	-1.19	42	-1.92	39
19	12	105	Bill Green	3	-.59	2	+.31	-.20	42	-.98	39
25	4	93	Jim Knox	4	-7.66	2	+.24	f-6.95	42	f-7.99	44
27	4	42	Ben Graham	3	+2.52	2	+.33	+2.97	42	+2.13	40
30	1	102	G. L. Mills	3	-1.01	2	+.43	-.63	42	-1.48	39
31	3	104	M. J. Scarbrough	• (Measurements discontinued)	+2.01	42	+.96	39	39		
33	2	106	C. E. James	3	-.12	2	+.36	+.28	42	-.48	44

1/ March 1939, February 1940, February 1941, March 1942, April 1943, January 1944.

2/ Pumping recently.

f From recorder chart.

g Also 1939.

Part 3. Water levels, in feet with reference to land-surface datum,
showing seasonal changes during 1945

Field No. Owner	2 Lock- hart	3 Lock- hart	4 James	5 Malone	12 Mathis	18 White- head	19 Green	27 Graham
Jan. 2	+0.70	+0.75	+0.84	b-0.32	+4.10	-1.45	-0.59	+2.52
Mar. 19	+.71	+.75	+.89	-.34	+4.13	-1.45	-.59	+2.58
May 13	+.70	+.74	+.81	-.40	+3.86	-1.54	-.68	+2.51
July 19	+.20	+.25	+.44	-.75	+3.58	-1.60	-.96	+2.21
Sept. 10	+.32	+.36	+.44	-.72	+3.71	-1.79	-.94	+2.16
Nov. 21	+.31	-.82	+3.60	-1.88	-1.06	+2.10

Field No. Owner	30 Mills	33 James
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Jan. 2	-1.01	-0.12
Mar. 19	-1.04	-.08
May 13	-1.09	-.13
July 19	-1.39	-.48
Sept. 10	-1.42	-.42
Nov. 21	-1.56	-.59

b Pumping recently.

Part 4. Highest daily water levels in wells equipped with automatic
water-stage recorders

6 Lot 4, block 8. C. E. James. Highest and lowest recorded water
levels, in feet above land-surface datum, 1945: Mar. 31, 1.11; Dec. 3,
0.54.

Highest daily water level, in feet above land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.02	1.04	1.09	1.09	1.02	0.93	0.82	0.75	0.72	0.56	0.62	0.59
2	1.01	1.06	1.06	1.07	1.02	.93	.84	.77	.72	.57	.59	.58
3	1.02	1.06	1.07	1.07	1.01	.94	.87	.79	.71	.60	.57	.54
4	1.04	1.04	1.08	1.02	1.01	.91	.87	.78	.71	.61	.60	.57
5	1.05	1.06	1.08	1.03	1.02	.93	.86	.79	.71	.60	.59	.59
6	1.05	1.06	1.05	1.04	1.02	.94	.85	.75	.71	.59	.58	.58
7	1.04	1.02	1.05	1.04	1.03	.93	.85	.79	.69	.60	.62	.60
8	1.03	1.05	1.03	1.09	1.03	.93	.86	.80	.70	.73	.60	.59
9	1.03	1.08	1.04	1.09	1.03	.93	.81	.82	.69	.73	.59	.59
10	1.04	1.04	1.06	1.07	.98	.94	.82	.96	.68	.68	.59	.60
11	1.03	1.09	1.06	1.07	1.00	.88	.82	.95	.70	.64	.63	.63
12	1.02	1.07	1.05	1.09	.98	.90	.81	.90	.70	.64	.58	.63
13	1.03	1.06	1.09	1.07	1.00	.92	.81	.85	.69	.63	.58	.59
14	1.04	1.06	1.10	1.07	.98	.93	.81	.85	.69	.62	....	.61
15	1.04	1.08	1.07	1.07	.98	.92	.81	.83	.67	.60	....	.60
16	1.05	1.07	1.07	1.06	.98	.90	.79	.83	.66	.61	....	.61
17	1.05	1.05	1.06	1.06	.98	.90	.80	.80	.63	.62	....	.62
18	1.05	1.08	1.07	1.05	.97	.90	.80	.80	.64	.61	....	.62
19	1.05	1.06	1.05	1.04	.98	.91	.80	.80	.62	.61	.57	.60
20	1.05	1.08	1.04	1.04	.98	.91	.78	.80	.63	.61	.59	.62
21	1.02	1.07	1.06	1.05	.94	.90	.78	.80	.63	.62	.55	.61
22	1.02	1.03	1.06	1.06	.92	.90	.80	.80	.62	.61	.57	.62
23	1.03	1.06	1.10	1.06	.94	.89	.77	.80	.60	.61	.57	.63
24	1.04	1.06	1.08	1.05	.95	.88	.79	.79	.58	.58	.58	.61
25	1.02	1.07	1.06	1.04	.92	.83	.80	.78	.58	.59	.59	.63
26	1.06	1.06	1.06	1.04	.94	.86	.78	.77	.60	.59	.56	.61
27	1.05	1.04	1.09	1.04	.95	.86	.78	.75	.60	.59	.57	.61
28	1.04	1.07	1.06	1.02	.92	.86	.79	.75	.60	.59	.58	.63
29	1.04	1.09	1.02	.93	.82	.80	.75	.58	.58	.59	.64	..
30	1.04	1.10	1.02	.94	.84	.75	.75	.59	.60	.60	.60	.65
31	1.04	1.11	.....	.94	.75	.72	.....	.....	.....	.....	.....	.....

6a Lot 4, block 8. G. E. James. Highest and lowest recorded water levels, in feet with reference to land-surface datum, 1945: Aug. 10, +1.00; Sept. 25, 26, -1.81.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.38	....	1.39	1.40	1.50	1.61	1.37	1.72	1.71	1.78	1.72	1.69
2	1.39	....	1.38	1.40	1.51	1.60	1.31	1.72	1.72	1.78	1.73	1.69
3	1.40	....	1.39	1.42	1.51	1.60	1.48	1.68	1.73	1.77	1.74	1.69
4	1.41	1.40	1.38	1.45	1.52	1.62	1.57	1.69	1.74	1.76	1.74	1.70
5	1.40	1.40	1.38	1.45	1.51	1.61	1.61	1.70	1.75	1.76	1.74	1.70
6	1.39	1.40	1.40	1.45	1.51	1.61	1.63	1.73	1.75	1.76	1.74	1.69
7	1.40	1.41	1.40	1.44	1.51	1.61	1.64	1.67	1.76	1.76	1.73	1.69
8	1.40	1.41	1.41	1.43	1.51	1.61	1.64	1.61	1.75	g .56	1.72	1.68
9	1.41	1.40	1.42	1.42	1.52	1.61	1.66	1.59	1.74	g .89	1.72	1.67
10	1.41	1.40	1.41	1.43	1.53	1.60	1.66	g1.00	1.74	1.12	1.71	1.68
11	1.41	1.39	1.40	1.44	1.53	1.63	1.67	g .93	1.73	1.46	1.71	1.67
12	1.41	1.38	1.41	1.43	1.54	1.63	1.67	1.00	1.72	1.57	1.71	1.66
13	1.41	1.39	1.41	1.43	1.54	1.62	1.67	1.38	1.74	1.62	1.72	1.66
14	1.41	1.38	1.40	1.43	1.55	1.61	1.68	1.49	1.72	1.65	1.73	1.66
15	1.42	1.38	1.40	1.44	1.56	1.62	1.68	1.54	1.74	1.67	1.72	1.66
16	1.41	1.37	1.40	1.44	1.56	1.64	1.71	1.56	1.75	1.68	1.71	1.66
17	1.37	1.39	1.41	1.45	1.56	1.64	1.69	1.58	1.76	1.67	...	1.66
18	1.36	1.39	1.41	1.45	1.56	1.65	1.69	1.59	1.77	1.68	1.72	1.66
19	1.37	1.38	1.41	1.45	1.57	1.63	1.69	1.60	1.78	1.69	1.72	1.65
20	1.38	1.39	1.43	1.46	1.57	1.63	1.71	1.63	1.78	1.69	1.72	1.65
21	1.39	1.39	1.42	1.46	1.59	1.63	1.72	1.64	1.78	1.68	1.72	1.65
22	1.39	1.40	1.41	1.45	1.61	1.63	1.71	1.63	1.78	...	1.71	1.65
23	1.40	1.40	1.40	1.45	1.60	1.64	1.73	1.63	1.78	1.70	1.71	1.64
24	1.40	1.39	1.40	1.47	1.59	1.65	1.73	1.64	1.80	1.71	1.71	1.64
25	1.41	1.39	1.41	1.47	1.62	1.68	1.72	1.65	1.81	1.71	1.70	1.65
26	1.38	1.39	1.41	1.47	1.59	1.67	1.73	1.66	1.81	1.73	1.89	1.65
27	1.36	1.40	1.41	1.47	1.60	1.68	1.73	1.68	1.80	1.73	1.70	1.66
28	...	1.40	1.41	1.49	1.61	1.68	1.70	1.69	1.80	1.73	1.70	1.65
29	...	1.40	1.41	1.49	1.61	1.69	1.69	1.69	1.80	1.73	1.70	1.64
30	...	1.39	1.49	1.60	1.69	1.72	1.69	1.78	1.73	1.69	1.62	1.62
31	...	1.39	1.60	1.72	1.70	1.73	1.72	1.62	1.73	1.62	1.62	1.62

g Above land-surface datum.

25 Lot 4, block 93. Jim Knox. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Mar. 14, 31, 7.56; Nov. 18, 19, 7.91.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.63	7.61	7.60	7.60	7.65	7.66	7.72	7.76	7.79	7.89	7.89	7.88
2	7.64	7.61	7.61	7.59	7.64	7.66	7.69	7.75	7.79	7.90	7.90	7.88
3	7.64	7.62	7.62	7.58	7.64	7.65	7.68	7.75	7.79	7.89	7.90	7.89
4	7.63	7.62	7.58	7.67	7.64	7.66	7.69	7.75	7.79	7.89	7.89	7.89
5	7.62	7.61	7.58	7.65	7.64	7.66	7.69	7.75	7.79	7.89	7.89	7.88
6	7.62	7.60	7.60	7.65	7.64	7.65	7.70	7.78	7.79	7.90	7.89	7.88
7	7.63	7.63	7.62	7.63	7.62	7.65	7.70	7.65	7.81	7.89	7.86	7.88
8	7.63	7.61	7.62	7.59	7.62	7.66	7.68	7.75	7.81	7.74	7.87	7.88
9	7.63	7.59	7.60	7.57	....	7.66	7.70	7.74	....	7.81	7.87	7.88
10	7.62	7.62	7.59	7.63	7.64	7.65	7.69	7.50	7.83	7.85	7.86	7.88
11	7.63	7.59	7.58	7.63	7.63	7.69	7.69	7.68	7.82	7.88	7.85	7.86
12	7.64	7.58	7.60	7.62	7.73	7.68	7.70	7.70	7.82	7.88	7.87	7.86
13	7.65	7.60	7.57	7.62	7.72	7.67	7.70	7.73	7.82	7.89	7.88	7.87
14	7.63	7.62	7.56	7.63	7.73	7.67	7.70	7.73	7.82	7.89	7.88	7.87
15	7.65	7.61	7.58	7.61	7.64	7.67	7.70	....	7.84	7.90	....	7.87
16	7.60	7.62	7.58	7.60	7.64	7.68	7.75	....	7.84	7.89	....	7.87
17	7.51	7.65	7.60	7.61	7.63	7.68	7.74	....	7.85	....	....	7.86
18	7.62	7.62	7.58	7.64	7.63	7.69	7.73	....	7.84	....	7.91	7.86
19	7.62	7.62	7.59	7.63	7.63	7.68	7.73	....	7.86	....	7.91	7.87
20	7.61	7.64	7.60	7.63	7.62	7.66	7.75	7.75	7.85	....	7.90	7.87
21	7.63	7.62	7.61	7.63	7.64	7.69	7.75	7.75	7.86	7.89	7.89	7.87

25 Lot 4, block 93--Continued.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22	7.63	7.65	7.60	7.65	7.66	7.69	7.74	7.75	7.86	7.89	7.89	7.87
23	7.63	7.63	7.60	7.64	7.65	7.69	7.75	7.75	7.87	7.89	7.89	7.86
24	7.62	7.63	7.58	7.64	7.64	7.70	7.74	7.76	7.88	7.90	7.89	7.86
25	7.63	7.61	7.59	7.64	7.67	7.71	7.74	....	7.88	7.89	7.87	7.86
26	7.61	7.60	7.59	7.63	7.65	7.69	7.75	7.75	7.88	7.89	7.88	7.86
27	7.61	7.64	7.57	....	7.64	7.70	7.75	7.78	7.87	7.90	7.88	7.87
28	7.61	7.63	7.59	....	7.66	7.70	7.74	7.77	7.89	7.90	7.88	7.86
29	7.61	7.63	7.63	7.66	7.66	7.72	7.74	7.77	7.89	7.90	7.88	7.85
30	7.62	7.62	7.57	7.64	7.65	7.72	7.76	7.78	7.88	7.89	7.87	7.85
31	7.60	7.56	7.65	7.65	7.76	7.79	7.79	7.89	7.89	7.89	7.84	7.84

Part 5. Miscellaneous data concerning observation wells

18 Lot 7 Block 105. Whitehead. Formerly owned by Mrs. J. Schauer.

TORRANCE COUNTY (ESTANCIA VALLEY)

By C. R. Murray

Part 1. General discussion

Water levels were measured in the observation wells in Estancia Valley in 1945 in cooperation with the State engineer of New Mexico. A detailed investigation of the geology and hydrology of the area was made by O. E. Meinzer in 1909, and the results thereof have been published in Water-Supply Paper 275. Records of water levels in Torrance County in past years have been published in Geological Survey water-supply papers as follows:

Year of record	Water-Supply Paper	Page Nos.
1941	941	275-282
1942	949	340-344
1943	991	299-305
1944	1021	296-302

Fluctuations of water level

Water levels were measured in 58 wells in January, 51 wells in May, and 59 wells in September. The January measurements are useful in determining the net yearly change in water level, the May readings show the approximate yearly high, and the September readings, the approximate yearly low position for the majority of the wells. Well 7.8.26.121 was equipped with a water-stage recorder until October 9, 1945, and well 7.8.27.221 was so equipped beginning December 6, 1945. The former well is in an area of active transpiration and evaporation, whereas the latter well lies west of the very shallow-water zone. A total of 169 measurements of water level was made during the year, including 4 tape measurements made on the recorder wells.

Recharge to the ground-water table in Estancia Valley was below normal in 1945 as rainfall was subnormal. The U. S. Weather Bureau reported 6.93 inches of precipitation at Estancia, 6.29 inches below normal; and 9.06 inches at McIntosh, 4.97 inches below normal. The amount of water discharged by irrigation wells increased in 1945. It is estimated that 250 acres of land was irrigated with ground water and that about 500 acre-feet of water was used. Natural discharge by transpiration and evaporation was undoubtedly high because of drought conditions.

Water levels showed a net yearly decline of about 0.5 foot in observation wells along Mesteno Draw, south of Estancia and north of Willard. Most of the recent ground-water development for irrigation in Estancia Valley has taken place in this area. Small declines also occurred in the central part of the valley near Estancia and in the northernmost part near Moriarty. Small rises occurred in the southernmost part of the valley near Willard, and in the Witt-McIntosh area lying between Estancia and Moriarty. In 50 wells for which records are comparable, 27 showed rises averaging 0.24 foot and 23 showed declines averaging 0.43 foot from January 1945 to February 1946. Water levels in nearly all wells are higher than they were when measurements were started in the early part of 1941. In wells in the southwestern part of the valley which showed unusually large rises following the abnormal precipitation of 1941, the rises have been nearly dissipated, but in other wells, mainly in the northwestern part of the valley there has been a gradual rise in water levels up to the present time. The general trend of water levels in Estancia Valley will probably be downward for some time, and declines will be relatively large in areas near irrigation wells as compared with other areas.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet

Location number	Owner	See also Part	Water levels				Record			
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year Begun	Years missing	
4.8.1.144	J. M. Harper	3	54.05	24	+0.65	53.70	43	54.70	44	42
4.24.222	M. E. Ottoson	3	56.01	24	+3.36	56.01	45	57.23	41	41
4.9.6.444	Red Ball Camp	3	35.73	24	+3.33	35.60	43	35.66	41	41
7.4.41	Unknown	3	52.98	24	+4.41	52.68	843	53.39	44	42
10.133	Homer Arn	3	17.54	24	+2.27	17.45	43	18.22	41	41
5.7.15.212	Iwing School	3	115.46	25	+1.10	115.46	45	117.88	41	41
5.8.4.343	Unknown	3	331.43	25	+1.28	30.24	42	32.71	44	42
11.222.1a	J. V. Chamberlin	3	9.79	24	***	***	**	***	45	
12.111	do	3	13.97	24	-1.43	12.04	43	17.10	41	41
17.2.41	Ray Brown	3	41.54	25	+0.02	40.78	43	41.36	44	42
17.3.11	do	3	27.59	25	-1.12	26.92	42	30.43	41	41
17.3.23	do	3.5	27.59	25	-4.46	26.05	42	29.66	41	41
17.3.34	do	3	11.02	25	-2.50	9.80	42	13.61	41	41
25.2.12	Mrs. Gregory	3	24.02	24	-5.52	22.45	42	24.02	45	42
25.2.220	Mrs. Frances Backer	3	25.05	24	-87	23.33	42	27.92	41	41
30.1.21	Unknown	3	24.99	25	-2.26	22.68	42	29.66	41	41
36.3.41	Mrs. Iva Moe	3	45.25	24	+1.11	45.25	45	46.69	41	41
5.9.31.331	G. L. McBeth	3	32.67	24	+0.02	32.67	45	34.10	41	41
5.10.27.444	Unknown	3	40.50	24	+0.04	40.50	45	40.78	41	41
6.8.1.244	do	3	21.62	25	-67	20.95	44	22.62	45	42
3.221	Fellison Trimmans	3	26.80	25	-0.05	26.18	42	26.80	45	41
11.4.53	Pablo Lucero	3	6.10	24	-0.05	5.55	43	6.10	45	42
12.1.33	Aurileo Prito	3	18.04	25	-44	16.90	43	18.28	41	41
15.4.44	Estancia Cemetery	3	30.37	24	-11	29.99	43	31.04	41	41
16.2.22	McGee Estate	3	58.70	24	-0.04	58.66	44	59.47	41	41
24.1.11	Aurileo Brito	3	9.58	24	-71	6.22	42	9.58	45	41
27.1.34	R. M. Spruill	3	421.49	25	-1.41	19.59	43	421.49	45	42
30.4.34	J. W. Langley	3	36.36	25	-8.06	25.63	42	40.69	41	41
6.9.6.222	Unknown	3	4.84	25	+4.50	4.84	45	11.93	43	41
6.10.25.344	C. A. Blackwell	3	41.86	24	+0.09	41.86	45	42.38	42	42
7.7.27.444	Major Dean	3	20.37	24	+0.03	20.37	45	20.77	41	41
7.7.12.342	DeHart Estate	3	40.38	25	+0.05	40.38	45	45.39	41	41

* See footnotes at end of table.

Part 2. Water levels in January 1945 and highest and lowest recorded levels in January or February, in feet below land-surface datum, and change from January 1944 to January 1945, in feet--Continued

Location number	Owner	See also Part	Water levels						Record	
			Jan. 1945 Level	Jan. 1945 Day	Change 1944-45	Highest Level	Lowest Level	Year	Be-gan	Years missing
7.7.12.444	C. B. Roland	3	42.08	25	+0.60	42.08	45	46.45	41	41
7.8.1.231	Myrtle Homann Estate	3*	c26.12	25	+.15	26.00	43	c26.27	44	42
1.425	Lloyd Stump	3	24.59	25	+.11	24.55	43	24.79	42	41
9.444	Unknown	3,5	58.92	25	+.17	58.92	45	62.45	41	41
10.221	H. W. Rice	3	16.37	25	+.18	16.37	45	17.52	42	42
10.244	Ted Maxfield	3,5	a22.37	25	-2.26	18.55	43	a22.37	45	42
12.453	G. M. Belknap	3,5	22.13	25	-.08	22.05	44	23.53	41	41
16.422	Jim Ergood	3,5	(a)			44.32	44	45.61	41	41
23.311	J. P. Morgan	3	17.92	25	+.02	17.85	42	18.33	41	41
23.324	do	3	2.22	25	-.03	f 2.03	42	2.45	41	41
24.433	R. T. Floyd	3	24.50	26	+.15	23.68	42	25.15	41	41
25.411	do	3	21.61	25	-.14	21.26	42	22.13	41	41
26.121	Mrs. T. M. MacClosky	4,5	4.03	25	-.36	f 3.66	44	3.98	43	
27.221	Wagner Estate	3,5	19.97	25	+.08	19.35	43	19.35	41	41
33.123	B. A. Kincheloe	3	30.08	25	+.52	29.24	42	32.35	41	41
33.424	E. C. Hayes Estate	3	52.80	25	+.04	52.80	45	53.34	42	41
35.111	W. W. Dunn	3	18.65	25	+.09	17.95	42	19.22	41	41
36.332	do	3	15.62	25	-.12	14.99	42	16.03	41	41
7.9.5.211	Unknown	3	19.04	25	+.08	19.04	45	19.22	42	42
8.8.10.333	Mr. Price	3,5	15.40	26	****	15.10	42	16.40	45	42
8.8.10.244	Dennis Willie	3	(a)	25	****	66.21	43	66.43	43	45
8.9.26.222	Unknown	3	6.75	25	+.04	6.75	45	7.52	42	42
8.9.8.111	do	3	25.00	25	-.04	23.77	42	25.00	45	42
29.111	Mrs. Harry Bigger	a21.91	25	-.69	20.89	42	21.22	44	42	
29.111a	do	3	21.61	25	+.09	21.61	45	21.70	44	
9.8.26.121	Unknown	3	20.59	26	+.59	19.60	43	20.68	44	42
9.9.32.131	G. L. Dean	3	5.91	26	****	5.90	43	6.89	41	41
32.131a	do	3	5.79	26	+.89	5.79	45	6.88	44	

a Pumping.
 b Pumping recently.
 c Nearly well pumping.
 f From recorder chart.
 g Also 1942.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945

Location number	4.8. 1.144	4.8. 24.222	4.9. 6.444	4.9. 7.441	4.9. 10.133	5.7. 15.212	5.8. 4.343	5.8. 11.221a
Owner	Harper	Otto- son	Red Ball	Un- known	Arnn	School	Un- known	Cham- berlin
Jan. 24, 25	54.05	56.01	35.73	52.98	17.54	115.46	831.43	9.78
May 7, 8	(a)	(a)	35.67	52.90	17.35	114.80	(a)	(a)
Sept. 5, 6	b54.34	a55.85	35.76	53.04	17.68	115.27	31.57	10.63
Location number	5.8. 12.111	5.8. 17.241	5.8. 17.311	5.8. 17.323	5.8. 17.334	5.8. 25.212	5.8. 25.222b	5.8. 30.121
Owner	Cham- berlin	Brown	Brown	Brown	Un- known	Greg- ory	Backer	Un- known
Jan. 24, 25	13.87	41.34	27.59	b27.59	11.02	24.02	25.05	24.99
May 7, 8	13.87	41.10	27.41	27.08	10.70	24.12	b25.16	24.73
Sept. 5, 6	14.03	42.32	(a)	a53.55	12.54	24.40	(a)	25.81
Location number	5.8. 36.341	5.9. 31.331	5.10. 27.444	6.8. 1.244	6.8. 3.221	6.8. 11.433	6.8. 12.133	6.8. 15.444
Owner	Moe	McBeth	Un- known	Un- known	Tim- mins	Lucero	Brito	Ceme- ttery
Jan. 24, 25	45.25	32.67	40.50	21.62	26.80	6.10	18.04	30.37
May 7, 8	45.17	32.64	39.89	20.85	26.60	5.60	17.84	30.06
Sept. 5	45.15	32.68	39.63	21.01	26.82	7.82	19.08	30.59
Location number	6.8. 16.222	6.8. 24.111	6.8. 27.134	6.8. 30.434	6.9. 9.222	6.10. 25.344	6.10. 27.444	7.7. 12.342
Owner	McGee	Brito	Spruill	Lang- ley	Un- known	Black- well	Dean	DeHart
Jan. 24, 25	58.70	9.58	a21.49	36.36	4.84	41.86	20.37	40.38
May 7-9	(a)	8.58	20.02	(a)	(a)	41.85	20.38	40.68
Sept. 5, 6	58.72	12.14	20.55	37.10	6.83	b41.81	20.33	.....
Location number	7.7. 12.444	7.8. 1.231	7.8. 1.423	7.8. 9.444	7.8. 10.221	7.8. 10.244	7.8. 12.433	7.8. 16.422
Owner	Roland	Homan	Stump	Un- known	Rice	Max- field	Belknap	Ergood
Jan. 25	42.08	c26.12	24.59	58.92	16.37	a22.37	22.13	(a)
May 8, 9	41.74	c26.28	24.74	58.84	16.26	(a)	(a)	(a)
Sept. 7	41.91	26.32	24.35	58.80	16.37	17.29	21.44	44.32
Location number	7.8. 23.311	7.8. 23.324	7.8. 24.433	7.8. 25.411	7.8. 27.221	7.8. 33.123	7.8. 33.424	7.8. 35.111
Owner	Morgan	Morgan	Floyd	Floyd	Wagner	Kinch- eloe	Hayes	Dunn
Jan. 25, 26	17.92	2.22	24.50	21.61	19.37	30.08	52.80	18.65
May 8	17.72	2.01	25.05	21.59	19.17	30.01	52.74	18.60
Sept. 6, 7	18.48	2.92	25.02	21.44	19.85	30.40	52.68	18.70
Location number	7.8. 35.332	7.9. 5.211	7.9. 10.333	8.8. 10.244	8.8. 26.222	8.9. 8.111	8.9. 29.111a	9.8. 26.121
Owner	Dunn	Un- known	Un- known	Price	Willie	Un- known	Bigger	Un- known
Jan. 25, 26	15.62	19.04	15.40	(a)	6.75	25.00	21.61	20.49
May 8, 9	15.43	19.00	(a)	(a)	b6.80	25.08	21.50	(a)
Sept. 6-8	15.82	19.15	15.73	66.22	6.82	25.19	21.81	20.96

a Pumping.

b Pumping recently.

Part 3. Water levels, in feet below land-surface datum, showing seasonal changes during 1945--Continued

Location	9.9.	9.9.
number	32.131	32.131a
Owner	Dean	Dean
Jan. 26	5.91	5.79
May 9	5.75	5.80
Sept. 7	6.27	6.37

a Pumping.
b Pumping recently.

Part 4. Highest daily water levels in wells equipped with automatic water-stage recorders

7.8.26.121. Mrs. T. M. McCloskey. Water-stage recorder removed Oct. 10, 1945. Highest and lowest recorded water levels, in feet below land-surface datum, 1945: Apr. 24-29, 3.52; Sept. 28, 6.07.

Highest daily water level, in feet below land-surface datum, 1945
(From recorder charts)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	4.30	3.95	3.73	3.61	3.53	4.11	4.84	5.47	5.49	5.89
2	4.29	3.94	3.73	3.61	3.53	4.13	4.87	5.50	5.48	5.83
3	4.28	3.93	3.73	3.61	3.54	4.15	4.89	5.53	5.48	5.77
4	4.27	3.92	3.72	3.61	3.54	4.18	4.91	5.55	5.48	5.73
5	4.24	3.91	3.72	3.62	3.55	4.21	4.93	5.58	5.49	5.69
6	4.23	3.90	3.72	3.62	3.56	4.24	4.95	5.61	5.50	5.65
7	4.22	3.90	3.71	3.61	3.57	4.27	4.97	5.65	5.53	5.62
8	4.21	3.88	3.71	3.60	3.57	4.30	4.99	5.68	5.57	5.58
9	4.20	3.87	3.71	3.59	3.57	4.32	5.00	5.71	5.61	5.54
10	4.19	3.87	3.70	3.59	3.59	4.34	5.00	5.73	5.64	...
11	4.18	3.86	3.69	3.59	3.60	4.37	5.00	5.74	5.67	...
12	4.17	3.85	3.69	3.59	3.62	4.40	5.00	5.75	5.70	...
13	4.15	3.84	3.68	3.59	3.65	4.42	5.01	5.76	5.76	...
14	4.14	3.83	3.67	3.59	3.67	4.43	5.03	5.79	5.78	...
15	4.13	3.82	3.67	3.58	3.69	4.46	5.05	5.82	5.81	...
16	4.11	3.81	3.67	3.57	3.71	4.48	5.07	5.84	5.85	...
17	4.11	3.81	3.67	3.56	3.72	4.51	5.09	5.86	5.88	...
18	4.10	3.79	3.66	3.56	3.74	4.54	5.12	5.88	5.89	...
19	4.09	3.79	3.66	3.56	3.78	4.56	5.14	5.91	5.92	...
20	4.07	3.77	3.66	3.55	3.80	4.59	5.16	5.55	5.94	...
21	4.07	3.77	3.66	3.55	3.84	4.61	5.19	5.55	5.97	...
22	4.06	3.77	3.65	3.54	3.86	4.62	5.22	5.51	5.99	...
23	4.05	3.76	3.64	3.53	3.88	4.63	5.24	5.49	6.00	...
24	4.03	3.76	3.64	3.52	3.90	4.65	5.27	5.48	6.02	...
25	4.02	3.76	3.64	3.52	3.93	4.68	5.31	5.48	6.04	...
26	4.01	3.75	3.64	3.52	3.96	4.71	5.34	5.48	6.05	...
27	4.00	3.74	3.63	3.52	3.98	4.73	5.37	5.49	6.06	...
28	3.99	3.74	3.63	3.52	3.99	4.76	5.38	5.49	6.07	...
29	3.99		3.63	3.52	4.03	4.79	5.40	5.49	6.01	...
30	3.98		3.63	3.53	4.05	4.82	5.42	5.49	5.94	...
31	3.96		3.62		4.08		5.45	5.49		...

Part 5. Miscellaneous data concerning observation wells

4.9.6.444. Red Ball Camp. Measuring point beginning Sept. 5, 1945, top edge of 11-inch surface well casing, 0.64 foot below land-surface datum.

5.7.15.212. School. Measuring point beginning Jan. 25, 1945, top surface of concrete platform around well at north side of well, 0.40 foot above land-surface datum.

5.8.17.323. Brown. Measuring point beginning Jan. 25, 1945, lower edge of opening in north side of pump shell, 2.47 feet above land-surface datum.

7.8.9.444. Unknown. Well equipped with windmill prior to May 8, 1945. Measuring point beginning May 8, 1945, top edge of well casing, at land-surface datum.

7.8.10.244. Maxfield. Measuring point beginning Sept. 7, 1945, top inside edge of 8-inch well casing, 2.33 feet above land-surface datum.

7.8.12.433. Belknap. Formerly owned by W. A. Deatherage. Well equipped with windmill May 9, 1945. Measuring point beginning Sept. 7, 1945, top of 3- by 3-foot wooden platform, 0.50 foot above land-surface datum. Reference point had been destroyed. Possible discrepancy of a few tenths of a foot between preceding and succeeding record.

7.8.16.422. Ergood. Formerly owned by B. F. Strotman.

7.8.26.121. McCloskey. Water-stage recorder removed Oct. 10, 1945.

7.8.27.221. Wagner Estate. Water-stage recorder installed Dec. 6, 1945.

7.9.10.333. Price. Formerly owned by Mrs. Minnie Farnsworth.