TEXAS WATER DEVELOPMENT BOARD

REPORT 15

GROUND-WATER RESOURCES OF GAINES COUNTY, TEXAS

By

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United States Geological Survey

Prepared by the U.S. Geological Survey
in cooperation with the
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and the
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FOREWORD

On September 1, 1965 the Texas Water Commission (formerly, before February 1962, the State Board of Water Engineers) experienced a far-reaching realignment of functions and personnel, directed toward the increased emphasis needed for planning and developing Texas' water resources and for administering water rights.

Realigned and concentrated in the Texas Water Development Board were the investigative, planning, development, research, financing, and supporting functions, including the reports review and publication functions. The name Texas Water Commission was changed to Texas Water Rights Commission, and responsibility for functions relating to water-rights administration was vested therein.

For the reader's convenience, references in this report have been altered, where necessary, to reflect the current (post September 1, 1965) assignment of responsibility for the function mentioned. In other words credit for a function performed by the Texas Water Commission before the September 1, 1965 realignment generally will be given in this report either to the Water Development Board or to the Water Rights Commission, depending on which agency now has responsibility for that function.

Texas Water Development Board

John J. Vandertulip

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Chief Engineer

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ABSTRACT

Gaines County is in central West Texas on the High Plains of Texas, a part of the Great Plains physiographic province.

Rocks of Precambrian to Recent age underlie the county, but only the rocks of Triassic, Cretaceous, and Tertiary age contain ground water suitable for most purposes. No usable ground water is obtained from rocks older than Triassic; however, brine is produced with the oil from older rocks.

Ground water in Gaines County is obtained from three aquifers, the principal one being in the Ogallala Formation. In 1963, about 193,000 acre-feet of ground water was pumped, nearly all of which was from the Ogallala. About 182,000 acre-feet was used for irrigation. Small quantities were pumped from the Triassic and Cretaceous rocks, principally for irrigation and waterflooding.

Because of the low recharge rate, the water in storage in the Ogallala Formation is, in general, being depleted, even though water levels have risen in some areas. Since pumping for irrigation began in 1946, water levels in wells have declined in the western part of the county and have risen in the eastern part. The maximum decline was 35.7 feet and the maximum rise was 28.3 feet. The quantity of ground water estimated to be in storage in the county in 1964 was 8.5 million acre-feet, which would be enough to sustain nearly 50 years of pumping at the 1963 rate of pumping. Not all of the theoretically available water is practicably recoverable because as the saturated thickness and the quantity of water in storage decreases, the yields from wells also will decrease.

The chemical quality of the ground water varies widely. The Ogallala yields water suitable for irrigation and most other uses; the other aquifers yield water that is more mineralized. The disposal of oil-field brines (5,267,514 barrels or 679 acre-feet in 1961) into unlined surface pits has resulted in the contamination of the ground water in the Ogallala Formation in some places. Although this practice has been discontinued in many fields, the effects may be long lasting.

GROUND-WATER RESOURCES OF GAINES COUNTY, TEXAS

INTRODUCTION

Purpose and Scope

The investigation of the ground-water resources of Gaines County, started in September 1962, is a cooperative project of the U.S. Geological Survey, the Texas Water Development Board, and the Commissioner's Court of Gaines County. The purpose of the investigation was to evaluate and summarize the ground-water resources of the county. Specifically, the investigation included a determination of the thickness, character, and areal extent of the saturated zone of the Ogallala Formation, the principal aquifer; the quantity of water available to wells from that formation; the chemical quality of the ground water in the aquifers underlying the county; the capacity of the water-bearing beds to absorb, store, and transmit water; and the quantity of water being withdrawn and the effect the withdrawals have had on water levels. Special attention was given to determining the source or sources and the areal extent of the contamination of the ground-water supplies, principally by the disposal of oil-field brines into unlined surface pits.

The investigation included the following fieldwork:

1. Location of all municipal, industrial, and irrigation wells and a representative number of domestic and stock wells in areas where there were no large-capacity wells (Plate 1). Only those wells for which data are available are numbered and included in Table 2. The names of some of the well owners, as shown in the table, were taken from a landownership map of the county available at the time of the investigation; consequently, the owners' names in all instances may not be correct, owing to the rapid exchange of landownership.

2. Location of all surface pits used for disposal of oil-field brines (Figure 16).

3. Collection of electric, radioactivity, and drillers' logs of wells (Table 3) for correlation and evaluation of subsurface characteristics of the water-bearing units. All the electric and radioactivity logs used in this report have been placed in the permanent file of well logs maintained by the Texas Water Development Board.

4. Measurements of water levels in wells and compilation of available records of past fluctuations in water levels (Table 4).

5. Collection of samples of water from wells to determine the chemical quality of the water (Table 5) and samples of oil-field brines from oil wells and disposal pits or tanks (Table 6).

6. Inventory of present (1963) municipal, industrial, and irrigation pumpage, and an estimate of past pumpage.

The study was made under the immediate supervision of A. G. Winslow, district geologist of the U.S. Geological Survey in charge of ground-water investigations in Texas.

Location and General Features

Gaines County occupies a 1,479-square-mile area in central West Texas (Figure 1). The county is bounded on the north by Yoakum and Terry Counties, on the east by Dawson County, on the south by Andrews County, and on the west by the New Mexico State line. Seminole, the county seat, is near the center of the county and is about 80 miles southwest of Lubbock, Texas. According to the U.S. Bureau of the Census, the county had a population of 12,267 in 1960, of which 5,737 were in Seminole and 2,307 were in Seagraves.

Gaines County is on the High Plains of Texas, a part of the Great Plains physiographic province. The land surface is nearly level to gently rolling and, in general, slopes southeastward at about 13 feet per mile. The total relief in the county is about 750 feet, the altitude ranging from about 3,700 feet above sea level in the northwestern part of the county to 2,950 in the southeastern part. The general flatness of the surface is interrupted by many shallow dish-shaped depressions, several playa basins, sand dunes, and small stream valleys.

Surface drainage in Gaines County is poorly developed. Most of the surface runoff drains into depressions to form temporary shallow ponds or lakes. The larger depressions contain "alkali" or "saline" lakes, such as Cedar Lake and McKenzie Lake, except during prolonged periods of drought. In general, the "alkali" lakes are fed by ground water as well as by surface runoff from a small area.

Only a few stream valleys are recognizable in Gaines County. Seminole Draw and McKenzie Draw rise in Lea County, New Mexico, and cross the county from northwest to southeast. Monument Draw drains a small area in the southwestern corner of the county. The drainage areas of these intermittent streams are limited to narrow belts of sloping land adjacent to the valleys. Surface water accumulating in the draws generally flows for only a short distance before being lost by seepage or evapotranspiration, and only during rare periods of heavy rainfall does water flow out of the county in the draws.

Economic Development

The story of the economic growth of Gaines County is one of an abundance of oil, gas, fertile soil, and ground water. In the early 1900's, the raising of beef cattle was the principal source of income; later, dryland farming became important. In the early 1930's, oil and gas were discovered, and by the mid 1940's, irrigation farming began.

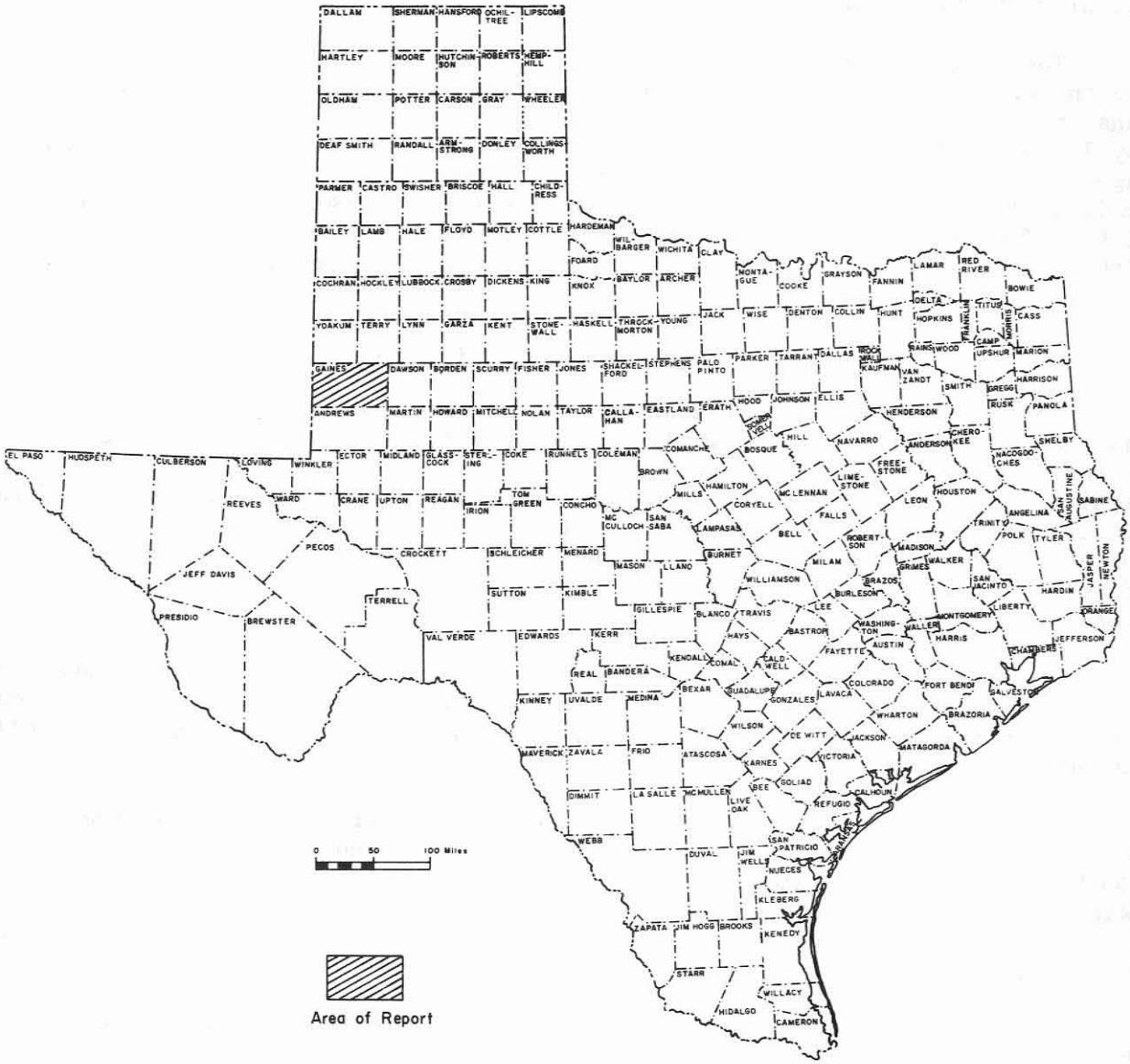


Figure 1

Map of Texas Showing Location of Gaines County

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

Oil was discovered in the Cedar Lake area in eastern Gaines County in 1933, and since that time, the production of oil and gas has been the most important source of income (about $89,000,000 in 1961). According to records of the Railroad Commission of Texas (1962), about 670 million barrels of oil had been produced to January 1, 1963; the production in 1962 was about 31 million barrels. The production of natural gas in 1962 amounted to 7,257,367 mcf (thousand cubic feet). Part of the natural gas is used in the production of carbon black, principally in the vicinity of Seagraves.

The extensive development of irrigation also has contributed substantially to the economic wealth of the county. The acreage devoted to irrigation farming has increased rapidly since 1946. In 1949, about 7,200 acres was irrigated, and by 1959, about 67,000 acres, or slightly more than 30 percent of the total acreage in cultivation, was under irrigation. According to an irrigation survey made by the Texas Agriculture Extension Service, 210,640 acres was irrigated in 1964, of which 100,000 acres was in grain sorghum and 78,240 acres in cotton. Other agricultural pursuits include stock farming and poultry production.

Previous Investigations

No detailed investigation of the ground-water resources of Gaines County had been made prior to this study; however, many reports on the geology and water resources of a large part of the Southern High Plains of Texas have presented data pertaining to the county. Special aspects of the geology of Gaines County also have been discussed in articles published in technical journals. However, very few of these reports have been concerned with the post-Permian formations, which are the only ones that are pertinent to the ground-water resources of the county.

The only hydrologic investigation specifically on Gaines County consisted of an inventory of wells in 1946 by Cromack. The report consisted of records of wells, drillers' logs, water analyses, and a map showing location of the wells inventoried.

Since 1937, the results of measurements of water levels in observation wells in Gaines County have been published in the annual reports of the U.S. Geological Survey on water levels and artesian pressures in the United States. Water-level measurements made in a large number of wells in Gaines County up to and including 1962 have been published also in bulletins of the Texas Water Commission.

The public water supplies of Seagraves and Seminole were described by Broadhurst and others in 1951 (p. 71-74).

The occurrence and development of ground water in the Southern High Plains of Texas were summarized by Cronin (1964). In his report, Cronin estimated the quantity of water potentially available for development in Gaines County. In addition, the report graphically shows the approximate saturated thickness of the Ogallala Formation in the county as of 1958. A reconnaissance ground-water study of the Colorado River Basin, which included Gaines County, was made by the Texas Water Commission and is pending publication.

Acknowledgments

The writers acknowledge their indebtedness to the many farmers and ranchers for supplying information about their wells and permitting access to their properties. Well-drilling contractors, especially Karr Pump and Pipe Supply, Seagraves; R. O. Parker Drilling Co., Seminole; and Ted Koonce, Sundown, generously supplied drillers' logs and well-completion data which facilitated the preparation of the report. Special thanks are extended to the Southwestern Public Service Co. for making available one of their wells for an aquifer test; the Pioneer Natural Gas Co. for contributing data used in estimating ground-water pumpage; Ed L. Reed, consulting ground-water hydrologist, Midland, for making available a topographic map of Gaines County; and the Gaines County Commissioner's Court for supplying office space. Appreciation is expressed also to the Soil Conservation Service, U.S. Department of Agriculture, for generously furnishing records on the fluctuations of water levels in wells (Table 4).

Well-Numbering System

The well-numbering system used in the report is one adopted by the Texas Water Development Board for use throughout the State and is based on latitude and longitude. Under this system, each 1-degree quadrangle in the State is given a number consisting of 2 digits. These are the first 2 digits appearing in the well number. Each 1-degree quadrangle is divided into 7½-minute quadrangles, which are also given 2-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each 7½-minute quadrangle is subdivided into 2½-minute quadrangles and given a single digit number from 1 to 9. This is the fifth digit of the well number. Finally, each well within a 2½-minute quadrangle is given a 2-digit number in the order in which it is inventoried, starting with 01. These are the last two digits of the well number. Thirty-two 7½-minute quadrangles are shown on the well location map of this report (Plate 1) and numbered in the northwest corner of each quadrangle. The 3-digit number shown with the well symbol contains the number of the 2½-minute quadrangle in which the well is located and the number of the well within that quadrangle. In addition to the 7-digit well number, a 2-letter prefix is used to identify the county. The prefix for Gaines County is KD.

An index of well numbers published previously and corresponding numbers in this report is shown in Table 1.

Climate

The climate of Gaines County is semiarid and is characterized by a wide range in temperature, low precipitation, and high evaporation.

Annual precipitation at Seminole during the period 1923-63 averaged 15.83 inches. The wettest year was 1941 with 37.63 inches, and the driest year was 1934 with only 6.57 inches (Figure 2). About 70 percent of the annual precipitation normally falls during the growing season April through September (Figure 3). Although the distribution of rainfall in time is advantageous for agriculture, the amount generally is insufficient and must be supplemented by irrigation from ground-water supplies. About one-third of the annual precipitation falls in showers of less than half an inch per day, an amount that contributes little or nothing to the recoverable water supply, and probably not more than 10 percent of the average annual precipitation falls in storms exceeding 2 inches per day.

Table 1.--Index of well numbers published previously and corresponding numbers used in this report

New number	Old* number	Cromack (1946)	New number	Old* number	Cromack (1946)	New number	Old* number	Cromack (1946)
KD-26-08-501	173	--	KD-27-06-705	--	55	KD-27-17-109	--	125
26-08-502	A- 16	13	27-06-901†	184	--	27-17-201	177	--
26-08-601	A- 41	--	27-06-906	--	58	27-17-301	192	--
26-08-801	174	--	27-07-401	183	--	27-17-801	204	--
26-08-802	166-A	--	27-09-201	--	19	27-18-101	182	--
26-08-808	166	--	27-09-301	167	--	27-18-128	--	118
26-16-501	E- 2	--	27-10-201	B- 2	--	27-18-201	181	--
26-16-601	202	--	27-10-202	B- 1	--	27-18-207	--	115
26-24-201	E- 6	--	27-10-801	178	--	27-18-408	--	117
26-24-301	E- 7	--	27-11-114	--	29	27-18-709	--	139
27-01-501	A- 54	--	27-11-301	B- 9	--	27-18-808	--	140
27-01-502	172	--	27-11-322	--	36	27-19-101	193	--
27-01-601	B- 3	--	27-11-412	--	112	27-19-301	--	7
27-01-701	175	--	27-11-701	171	--	27-19-302	--	6
27-01-705	--	16	27-11-808	--	109	27-19-513	--	106
27-01-904	--	21	27-11-809	--	110	27-19-601	6-A	6-A
27-02-501	168	--	27-11-810	--	111	27-19-602	--	5
27-02-701	169	--	27-11-901	--	8	27-19-802	--	142
27-03-501	188	--	27-12-101	--	10	27-20-106	--	97
27-03-615	--	32	27-12-201	191	1	27-20-407	--	98
27-03-701	170	--	27-12-401	--	9	27-20-801	--	151
27-03-721	--	30	27-12-906	--	94	27-21-101‡	180	--
27-04-404	--	33	27-12-907	--	95	27-21-201	--	90
27-04-501	190	--	27-13-101	206	--	27-21-202	--	91
27-04-502	--	12	27-13-301	187	--	27-21-601	--	80
27-04-506	--	42	27-13-601	179	--	27-21-602	--	77
27-04-513	--	44	27-13-607	--	63	27-21-603	--	78
27-04-613	--	45	27-13-801	--	87	27-21-904	--	154
27-04-719	--	11	27-13-901	--	88	27-22-203	--	65
27-05-401	185	--	27-14-302	--	61	27-22-403	--	81
27-05-601	186	--	27-14-901	--	67	27-22-404	--	79
27-05-921	--	54	27-17-101	176	--	27-22-801	--	160

Table 1.--Index of well numbers published previously and corresponding numbers used in this report--Continued

New number	Old* number	Cromack (1946)	New number	Old* number	Cromack (1946)	New number	Old* number	Cromack (1946)
KD-27-23-501	--	73	KD-27-26-106	--	138	KD-27-27-601	--	1
27-25-101	--	128	27-26-604	--	136	27-28-501	--	148
27-25-204	--	129	27-27-102	--	141	27-30-402	--	157
27-25-301	207	--	27-27-206	--	143	27-30-802	--	158
27-25-604	--	132	27-27-301	2	2	27-31-105	--	162

* Well number in bulletins of Texas Water Commission.
† Well number 27-06-601 in Texas Water Commission Bull. 6207.
‡ Well number 27-21-301 in Texas Water Commission Bull. 6207.

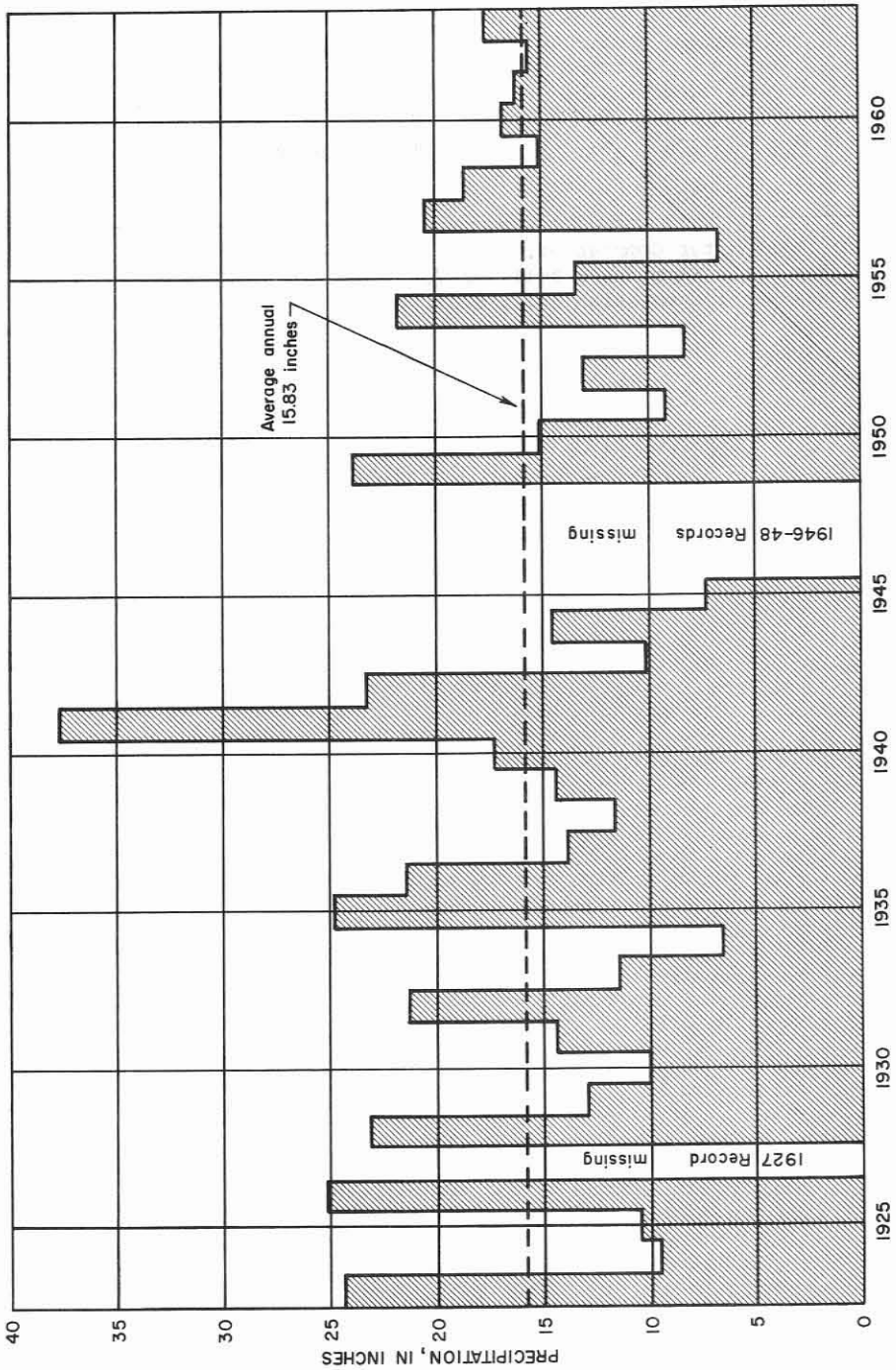
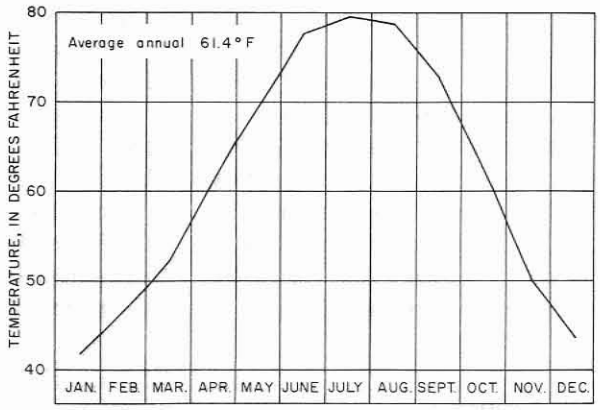


Figure 2

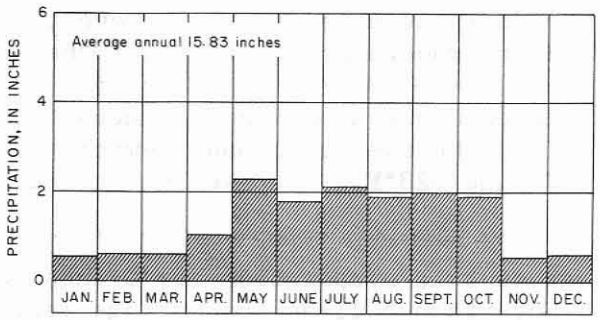
Annual Precipitation at Seminole, Texas

(From records of U.S. Weather Bureau)

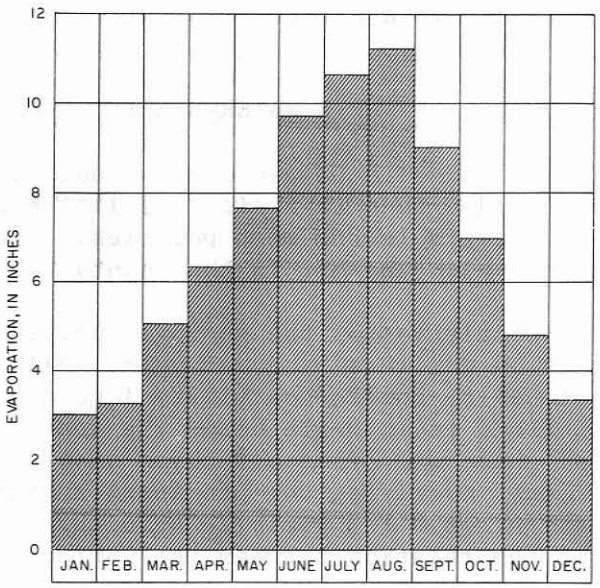
U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court



Average monthly temperature at Seminole, 1923-62



Average monthly precipitation at Seminole, 1923-63



Average monthly gross lake-surface evaporation in Gaines County, 1940-57
(From Lowry, 1960)

Figure 3

Average Monthly Temperature and Precipitation at Seminole and Evaporation in Gaines County, Texas

(From records of U.S. Weather Bureau and Lowry, 1960)

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

Since 1923, precipitation was below the annual average in 21 years and above it in 16. Precipitation at Seminole probably was below normal in the 4 years (1927 and 1946-48) for which data are not available. This assumption is based on records of the Weather Bureau station at Lamesa in Dawson County, about 40 miles east of Seminole. Precipitation was near or slightly below average from 1923 to 1939, well above average in 1940-42, and below average from 1943-63. During the period 1923-42, precipitation averaged 16.93 inches, whereas from 1943-63 it averaged 14.45 inches. Although the period 1943-63 might seem to be one of deficiency, analysis of the graph (Figure 2) shows that it can be divided into two parts--that is, for the period 1943-56, the annual precipitation was clearly less than the long-term average, and for the period 1957-63, it was greater.

Wide fluctuations in temperature are characteristic of the climate in Gaines County. Winters are characterized by frequent cold periods followed by rapid warming. Summers are hot and usually dry; however, low humidity and adequate wind circulation help to moderate the effect of the heat.

The average monthly temperature at Seminole ranges from 41.9°F in January to 79.5°F in July (Figure 3); the average annual temperature is 61.4°F and the recorded extremes are 113°F and -23°F. The average maximum temperature is 77.2°F.

The average annual gross lake evaporation for Gaines County is about 81 inches (Lowry, 1960), or more than 5 times the average yearly precipitation (Figure 3). The growing-season (April-September) evaporation of about 55 inches is similarly about 5 times the average concurrent precipitation.

GEOLOGIC UNITS AND THEIR WATER-BEARING PROPERTIES

The geologic units that underlie Gaines County range in age from Precambrian to Recent, but rocks older than Triassic have little significance regarding the occurrence of water suitable for most purposes. The older rocks are the source of the brine produced with the oil in the county.

The following brief description of the geologic units overlying the Permian rocks is based principally on drillers' logs of water wells, seismograph shotholes, stratigraphic test wells, and radioactivity logs of oil tests. In general, the electric logs of oil tests begin below the top of the Triassic rocks and the drillers' logs of these and other oil tests describe only in the most cursory fashion the sediments overlying the prominent anhydrite member of the Rustler Formation of Permian age. The geologic structure of the units above the Rustler Formation and the relation between the various units are shown in Figure 4.

Triassic Rocks

Triassic rocks do not crop out in Gaines County, but they underlie the surface at depths ranging from about 55 feet in the southern part of the county to 355 feet in the central part. They consist principally of sandstone, shale, silt, and conglomerate, and range in thickness from 1,500 feet to about 2,110 feet. However, these thicknesses are somewhat questionable because the contact

with the underlying Permian rocks is somewhat obscure. In fact, recent petrographic studies by Miller[1] strongly suggest that the lower 45 to 300 feet of rocks assigned to the Triassic and composed principally of red shale should be assigned to the Permian. For the purposes of this report, however, this lower red shale is considered as a part of the Triassic, probably equivalent to the Upper Triassic Tecovas Formation. The Santa Rosa Sandstone is the principal aquifer in the Triassic rocks. It is overlain by a series of shale and sandstone beds that probably are equivalent to the Upper Triassic Chinle Formation in New Mexico.

Santa Rosa Sandstone

The Upper Triassic Santa Rosa Sandstone (Figure 4), whose average thickness is about 235 feet, is a persistent massive sandstone interbedded with red shale and clay. It is readily identified in radioactivity logs by its low degree of natural radioactivity as compared to the adjoining clay and shale. The Santa Rosa dips east-northeastward from an altitude of about 2,340 feet above sea level (1,200 feet below land surface) in the southwest corner of the county to about 1,510 feet (1,600 feet below land surface) in the eastern part.

The Santa Rosa Sandstone yields water to seven wells in Gaines County. The wells, 1,760 to 1,880 feet deep, reportedly furnish small to moderate quantities (30 to 200 gpm--gallons per minute) of water that generally is considerably more highly mineralized than that in the Cretaceous rocks or Ogallala Formation. Six of the seven wells are in the eastern part of the county where the water is highly mineralized and generally is suitable only for some industrial uses, principally waterflooding. The chemical analyses (Table 5) indicate, however, that the mineralization of the water in the Santa Rosa decreases toward the area of outcrop in New Mexico. Two wells, KD-27-09-804 and KD-27-26-301, in the western half of the county yielded water that, although too highly mineralized for domestic or municipal supplies, was suitable for livestock and some industrial uses.

Chinle(?) Formation Equivalent

The Chinle(?) Formation equivalent, the uppermost formation of the Triassic rocks, ranges in thickness from about 1,050 to 1,600 feet. It consists principally of variegated soft shale and clay, although thin beds of sandstone of finer texture than those in the underlying Santa Rosa are common.

The Chinle(?) equivalent is known to furnish water to only one well (KD-27-29-502) in Gaines County. The water from this well is used for sanitary purposes and for lawn watering. The water is highly mineralized, being unsuitable for domestic or public supply use. Undoubtedly some water is obtained locally from the Chinle(?) equivalent where it is overlain directly by the Ogallala Formation; however, the Chinle(?) equivalent should not be considered a major source of water in the county.

1/ Miller, D. N., Jr., 1955, Petrology of the Pierce Canyon red beds, Delaware Basin, Texas and New Mexico: Univ. Texas Ph.D. thesis, unpublished.

Cretaceous Rocks

Rocks of Cretaceous age in Gaines County are exposed only along the western margins of Cedar and McKenzie Lakes but probably underlie all but the southern third of the county. Whether they underlie the heavily irrigated area in the northwestern part of the county could not be determined from the data available. However, based on the reported occurrence of Cretaceous rocks in adjoining areas in Yoakum County, Texas, and Lea County, New Mexico, Cretaceous rocks, if present, probably are thin. The approximate extent of the Cretaceous rocks in the subsurface in Gaines County is shown in Figure 11. In the southern part of the county, the Cretaceous rocks, if present, occur as more or less isolated remnants.

Few wells in Gaines County are logged accurately or completely; hence, it is difficult to distinguish the formations that comprise the Cretaceous rocks in the subsurface. Existing data from water wells and wells drilled for seismic exploration show that the Cretaceous rocks have a maximum thickness of about 140 feet and consist mainly of blue and yellow clay, gray shale, light-gray generally thin-bedded limestone, and minor amounts of fine white sand. In general, the uppermost part of the Cretaceous rocks consists of beds of blue and yellow clay and shale except in the eastern part of the county where the blue and yellow clay is overlain by a fairly thick section of thin-bedded light-gray limestone, in places highly fractured and cavernous. The lower part of the Cretaceous rocks generally consists of fine white sand, which may be equivalent to the Lower Cretaceous Paluxy Sand (Brand, 1953, p. 27-55).

Little information is available on the water-bearing properties of the Cretaceous rocks in Gaines County. In general, they are not considered as an important source of water except in places in the eastern part of the county. In these places, wells that penetrate the permeable zones in the limestone yield as much as 600 gpm. Locally, small quantities of water, probably less than 100 gpm, are obtained from the relatively unconsolidated fine sandstone in the lower part of the Cretaceous rocks. The water in the Cretaceous rocks is only slightly more mineralized than that in the Ogallala Formation at the same locality; however, the water is generally suitable for most purposes.

Tertiary Rocks

Ogallala Formation

The Tertiary rocks in Gaines County are represented by the Pliocene Ogallala Formation which underlies all the county except in Cedar and McKenzie Lakes where it has been removed by erosion. The Ogallala lies unconformably on the eroded surfaces of Triassic and Cretaceous rocks (Figure 5) and underlies a thin mantle of windblown sand and silt, sand dunes, and alluvium.

The Ogallala Formation consists of silt, clay, fine to coarse sand, gravel, and caliche; commonly the individual beds or lenses pinch out or grade both laterally and vertically into the finer or coarser material of another bed or lens. Most of the formation is unconsolidated, although near the top and locally within it, the sediments have been cemented with calcareous material. Drillers' logs of water wells in the western half of the county show that rock, probably sandstone, occurs in discontinuous beds in a northwest-trending belt that includes parts of quadrangles 27-09, 27-17, 27-18, 26-08, 26-16, and 26-24.

It is not possible to determine from most drillers' logs if the sand and gravel are clean or if silt and clay are associated with them. However, drillers report that, in general, the Ogallala in the southern part of the county, particularly in grids 27-25 and 27-26, contains considerable quantities of silt and clay in the lower part; consequently, most of the water is obtained from the upper part.

Caliche generally occurs in single or multiple layers in the uppermost part of the Ogallala Formation, although in some places it is absent. The caliche ranges from a soft white chalky or powdery material to a hard dense mass.

In general, the Ogallala Formation is thickest in the northwestern part of the county where Cretaceous rocks are absent or thin. In this area, the Ogallala has a maximum thickness of 310 feet. In the area west and southwest of Cedar Lake, the thickness is less than 50 feet, owing to the underlying relatively thick series of Cretaceous rocks.

The Ogallala is the major source of water in Gaines County as in most of the High Plains; it yields large quantities of water to wells for irrigation, public supply, domestic, stock, and industrial uses. Yields of wells range from a few gallons per minute from domestic and stock wells to as much as 1,600 gpm from irrigation wells. The water generally is of good chemical quality except that it is hard and the fluoride content is excessive locally.

Quaternary Rocks

Quaternary rocks, consisting of windblown sand, clay, silt, and gravel, mantle the Ogallala Formation in most of Gaines County. Clay and silt occur principally in the playa lakes and small depressions; coarse sand and gravel predominate in the valleys of Monument and Seminole Draws, and windblown sand mantles a large part of the county. Some of these materials may contain sufficient water for domestic and stock use, but as surficial materials, their principal function is that they determine the rate of infiltration and downward percolation of rainfall to the underlying Ogallala Formation. A mantle of sand and gravel facilitates recharge to the underlying ground-water reservoir; clay and silt retard or restrict recharge.

GROUND WATER

Occurrence of Ground Water

All the ground water used in Gaines County, except that produced with oil and a small amount from the Chinle(?) Formation equivalent, is obtained from three aquifers in the Ogallala Formation, the Cretaceous rocks, and the Santa Rosa Sandstone. A considerable number of wells, particularly in the eastern half of the county, obtain water from more than one aquifer, principally in the Ogallala Formation and the Cretaceous rocks. Where the Cretaceous rocks are absent, a few wells may obtain water from the Ogallala Formation and the sand beds in the upper part of the Chinle(?) Formation equivalent.

Ground water in the Ogallala Formation generally is unconfined, that is, under water-table conditions. However, owing to the lenticular character of the materials making up the formation, the water locally may be under sufficient

hydrostatic pressure to rise in the well a short distance above the top of the water-bearing bed.

Most of the water derived from the Cretaceous rocks occurs in fractures and solution channels in limestone, but some occurs in the sand in the lower part. In general, the water in these rocks is unconfined. The Cretaceous rocks underlie and are in direct hydraulic connection with the Ogallala Formation; hence, the two units actually are part of the same aquifer. Consequently, the water surface in wells in the Cretaceous rocks roughly coincides with the water surface in the Ogallala Formation. Figure 6 shows the approximate altitude of the water table in the Ogallala Formation in 1964. The map shows the altitudes of water levels in several wells that obtain water from the porous limestone in the eastern part of the county.

The water in the Santa Rosa Sandstone is confined between relatively impermeable sediments and rises in tightly cased wells above the top of the aquifer. Water thus confined is under artesian pressure, and the surface to which the water rises is the piezometric surface. In two wells (KD-27-06-501 and KD-27-06-502) that were screened in the Santa Rosa, the water levels were 909 and 819 feet below the land surface, whereas the top of the Santa Rosa was about 1,400 feet below the surface.

Recharge, Movement, and Discharge

The principal aquifer in Gaines County, the Ogallala Formation, is part of the extensive aquifer that underlies the Southern High Plains in Texas and New Mexico. Recharge to the Ogallala is by infiltration from precipitation in Gaines County and in part of the High Plains to the west and northwest, by seepage from depression ponds and streams, and by infiltration of irrigation water applied to the land in excess of the consumptive use of the crops. Most of the precipitation on the Plains is retained temporarily in the soil close to the land surface from which it evaporates or is transpired by plants, and only a small percentage of the water percolates downward, eventually reaching the water table. Hence, recharge occurs only when storms provide more than enough water to restore the soil moisture to field capacity.

Although the Ogallala Formation consists chiefly of permeable material, the surficial materials range widely in their ability to absorb precipitation and transmit it downward to the water table. By far the greatest opportunities for infiltration and penetration of rainfall are in the areas of sandy soils.

Recharge to the Ogallala Formation from precipitation is clearly recorded by fluctuations of water levels in wells in the eastern part of the county where soils are sandy. In this area, little or no runoff occurs because the highly permeable sand absorbs the water almost immediately. During the period 1937-38 to 1964, water levels in a large part of the eastern half of the county rose from slightly less than 1 foot to as much as 28.3 feet (Figure 7). Records are insufficient to determine to what extent the rises reflect recharge from the above-normal precipitation during the period 1941-42. Actually, the rises in water levels correspond to a period during which precipitation was below normal in 15 of the 27 years since 1937. It seems more likely, therefore, that the rises can be attributed, at least in a large part, to a change in land management. Prior to 1940, the area was devoted principally to grazing. The development of the land for cultivation included the eradication of mesquite trees, which apparently increased the opportunities for recharge and decreased the

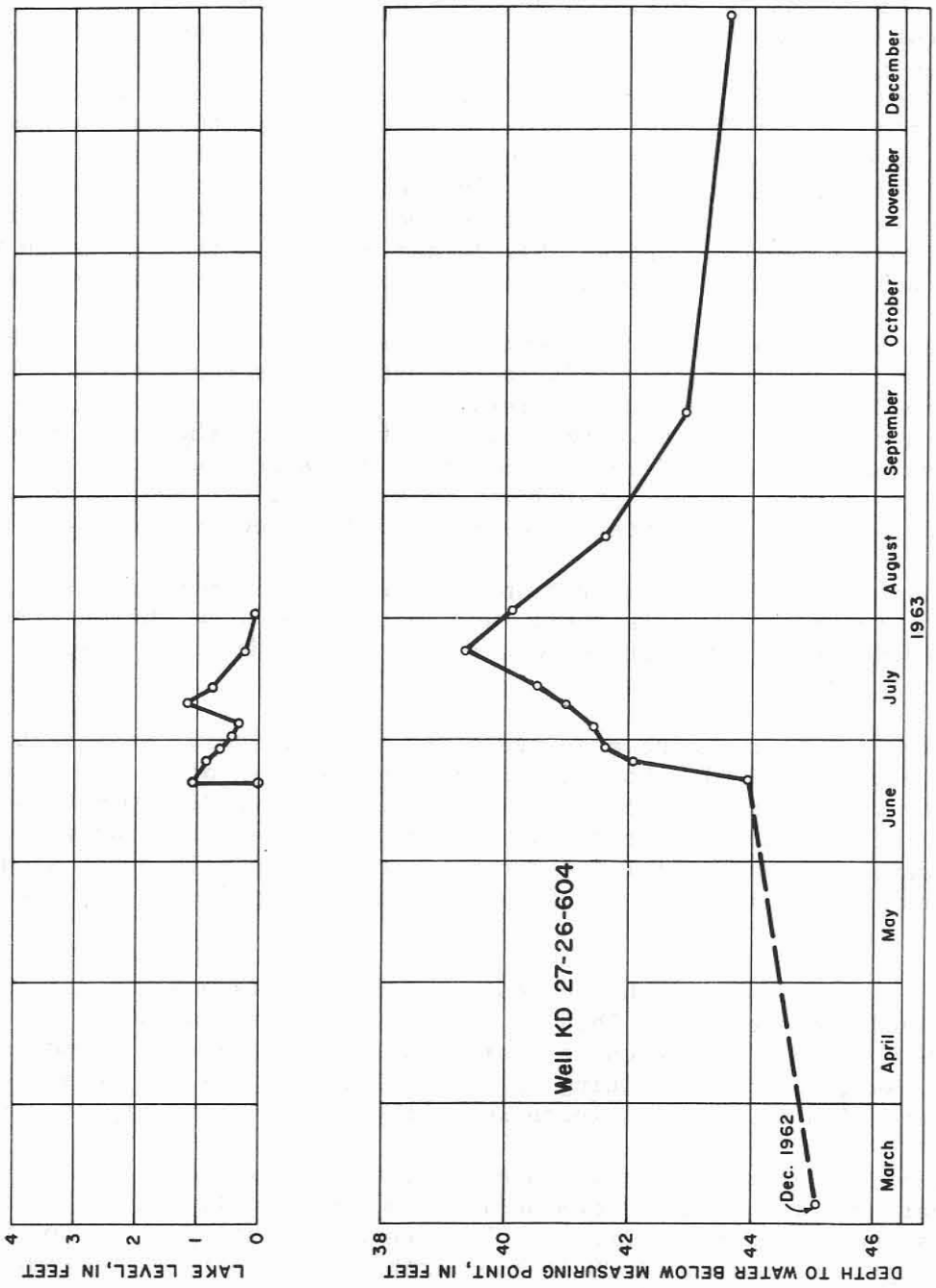


Figure 8

Relation Between Water Level in Well KD-27-26-604 and Water Level in Lake Nearby

U.S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

amount of water lost by evapotranspiration. The removal of the mesquite may be the dominant factor causing the rise in water levels because mesquite and, to a lesser extent, grasses, intercept large quantities of water that otherwise may percolate downward to the water table. In addition, land leveling, contour farming, and deep plowing probably have increased the opportunities for the infiltration of precipitation.

Figure 7 shows that the rises in water levels were not uniformly distributed through the eastern part of the county. About 5 miles west of McKenzie Lake, the large rises in water levels (28.3 feet in well KD-27-21-603 and 26.5 feet in well KD-27-13-901) are due largely to the wide variation in the water-bearing properties of the Cretaceous rocks. In this area, the Cretaceous rocks, which consist principally of limestone and shale, yield small quantities of water, and in some places, the yields of some wells have been insufficient even for stock watering. Consequently, a unit volume of water added to the ground-water reservoir will cause an appreciably larger rise in water levels in wells than the same unit volume in sediments that yield larger quantities of water.

The depression ponds also are a source of recharge to the Ogallala Formation, but the total quantity from this source probably is small chiefly because the adjacent sandy surficial materials retard or inhibit runoff into the ponds. Nevertheless, available data indicate that a large part of the water impounded in some depressions in Gaines County undoubtedly recharges the aquifer. Figure 8 shows a rapid rise in the water level in well KD-27-26-604, corresponding with a rise in the lake level after heavy rains had filled the nearby lake.

Recharge resulting from infiltration of streamflow is negligible in Gaines County. Runoff to the streams is small, and most of the time the streams are dry. Local residents report that the draws that cross the county flow water only after exceptionally heavy rains.

All the sources of recharge are intermittent and largely contingent on exceptionally heavy rainfall. For this reason and because of the great extent and variability in the recharge areas, direct quantitative determinations of recharge in Gaines County are virtually impossible with existing data. However, estimates of annual recharge of less than half an inch made in other areas in the High Plains (Theis, 1937, p. 564-568) are probably applicable in much of Gaines County.

One type of undesirable recharge results from the disposal of oil-field brines in unlined surface pits. This is shown by the rise in water level in well KD-27-09-303 (Table 4), which is near an unlined disposal pit and in an area of otherwise generally declining water levels. The well has been abandoned recently because of a substantial increase in the salt content of the water.

The part of the ground water in Gaines County that is derived from return flow of irrigation water is not known definitely, but locally it may be substantial. This is indicated by a comparison between the quantity of ground water pumped for irrigation in grid 26-08 in the northwestern part of the county and the volume of material unwatered. Since 1951, the total pumpage in this area amounted to about 195,400 acre-feet, and the total volume of material unwatered during the same period amounted to about 230,000 acre-feet. On this basis, therefore, the specific yield (ratio of the pumpage to the volume of material unwatered) amounts to 85 percent, which is several times greater than the 15 percent generally considered to be representative of the Ogallala Formation. If it is assumed that all the water pumped from grid 26-08 since 1951 was from storage

and that the specific yield of the water-bearing materials was about 15 percent, the volume of dewatered material would have amounted to 1,300,000 acre-feet. The difference, which amounts to about 150,000 acre-feet of water, probably can be attributed largely to the infiltration or return flow of irrigation water applied on the land surface and to a lesser extent to the increase in the quantity of water that moved into the area in response to an increase in the hydraulic gradient. It is estimated that about 40,000 acre-feet was underflow from adjacent areas, and that the rest, about 110,000 acre-feet or nearly 60 percent of the total water pumped, was derived from the return flow of irrigation water. Actually, the irrigation water that percolates back into the aquifer does not constitute an addition to the supply of ground water; rather it represents a return of a part of the discharge by wells. The substantial return flow of irrigation water has been noted to occur only in the northwestern part of the county where the water is conveyed across the land surface by ditches and furrows. Where sprinkler irrigation is practiced, the amount of water applied is significantly less; consequently, the percentage of return flow probably is negligible.

Figure 6 shows the configuration (shape and slope) of the water table in the Ogallala Formation in Gaines County. The figure shows that the water table slopes generally southeastward at the rate of about 13 feet per mile measured along a line extending from the northwest corner of the county to the southeast corner. The figure also shows that the slope conforms generally to the slope of the land surface. The irregularities in the slope of the water table indicate, in a general way, differences in the recharge-discharge relation of the Ogallala, in the permeability (capacity for transmitting water under hydraulic head), or thickness of the water-bearing material.

Ground water is discharged naturally from the Ogallala Formation principally by underflow out of the county to the east and southeast, but also by seeps and springs, by evapotranspiration in areas where the water table is at or near the land surface, and artificially through wells. However, it may be assumed that the ground water discharging naturally by subsurface movement out of the county is balanced approximately by movement of water into the county from the north and northwest.

The natural discharge of ground water by seeps and springs and evapotranspiration is restricted to Cedar and McKenzie Lakes where the land surface intersects the water table and in places in the valleys of Seminole and Monument Draws where the water table is at or near the surface. The intersection of the water table by the land surface at the lakes is indicated by the presence of seeps and small springs. The flow is rapidly consumed by evapotranspiration. Local residents report that water seldom stands in the lakes except for short periods after exceptionally heavy rainfall. The quantity of ground water discharged from the lakes and draws is not known, but it probably is small because of the small area involved.

Ground water is discharged also through wells, principally for irrigation, but also for public supply, domestic, stock, and industrial purposes. The quantity of water pumped in Gaines County during 1963 was about 193,000 acre-feet, nearly all of which was from the Ogallala Formation.

Development of Ground Water

The Indians and later the U.S. Army used water in Gaines County from the springs in Cedar Lake and from a large number of shallow dug wells along

Wordswell and Seminole Draws, ranging in depth from 4 to 15 feet. The wells later were used to water thousands of cattle (Strawn, 1880?, p. 2). As a result of the discovery of these sources of easily obtainable water and the elimination of Indian raids by the U.S. Army in the campaigns of 1871-72 and 1874-75, the area was opened for settlement. The first settlers found unexcelled conditions for grazing the Texas longhorn cattle, locating their ranch headquarters in the vicinity of the shallow dug wells. Because of frequent droughts, large-scale ranching gradually gave way to smaller operations, and the lure of free land under the Homestead Acts fostered settlement in the area.

Probably the first drilled wells to tap the water-bearing sands were installed between 1880 and 1890. These were small-diameter wells equipped with windmills. The first irrigation well of record (KD-27-18-809) was drilled in 1910 near Seminole. The well (Figure 9) was about 75 feet deep and had a low-lift centrifugal pump.

The development of ground water in Gaines County, principally for irrigation, proceeded at a very slow pace, and by the end of 1946 only three wells were in use. Drilling of wells increased in the next few years, owing mainly to the introduction of high-speed deep-well turbine pumps powered by small automobile engines with direct drive and also to the introduction of sprinkler-type irrigation in the sandy areas where row-type irrigation virtually was impossible. By the end of 1950, about 115 wells were in use, and at the end of 1955, as many as 419 wells were in operation. Since then, irrigation in Gaines County has increased at a phenomenal rate. The number of irrigation wells increased to nearly 1,050 in 1960, and the total number of wells (exclusive of domestic and stock wells) in operation in the county at the end of 1963 was about 1,693, of which 1,627 were irrigation wells, 13 public supply, and 53 industrial wells. Of the industrial wells, seven were in the Santa Rosa Sandstone.

In 1963, about 193,000 acre-feet of ground water was pumped for all uses, of which nearly 95 percent or 182,000 acre-feet was for irrigation (Figure 10). Most of the water pumped for irrigation was from the Ogallala Formation; an unknown but probably very small quantity was from the Cretaceous rocks that underlie parts of grids 27-14 and 27-22 in the eastern part of the county.

Of the 11,000 acre-feet of ground water pumped for all uses other than irrigation in 1963, about 5,100 acre-feet or 4.5 mgd (million gallons per day) was for industrial use, of which about 3,500 acre-feet or 3.1 mgd was for cooling purposes; the rest (1.4 mgd) was used in repressuring oil fields. Nearly all the water pumped for industrial use was fresh water from the Ogallala Formation; a small amount of water, probably not more than 100 acre-feet, came from seven wells tapping the Santa Rosa Sandstone. Water from these wells generally is of poor quality and unsatisfactory for human consumption.

The withdrawals of ground water for public supply in 1963 amounted to 1,182 acre-feet or 1.05 mgd, of which 880 acre-feet or 0.79 mgd was pumped for the city of Seminole and 303 acre-feet or 0.27 mgd for Seagraves.

It is estimated that approximately 5,000 acre-feet of water was pumped in 1963 for domestic and stock use.

Photograph courtesy of E. B. Baker Drilling Co.

Figure 9

Irrigation Well KD-27-18-809 Near Seminole, Texas

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

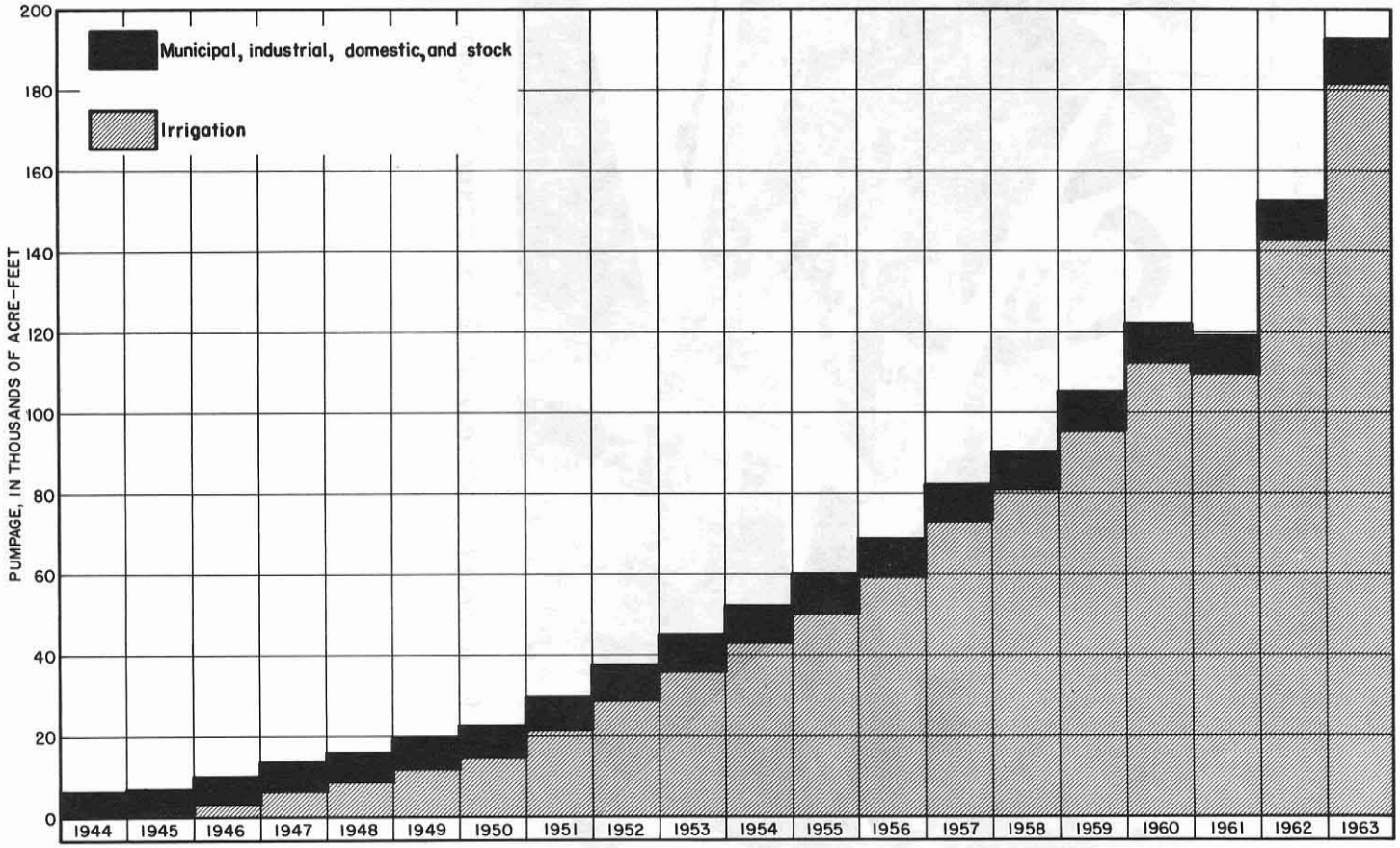


Figure 10

Annual Pumpage of Ground Water in Gaines County

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

Hydraulic Properties of the Water-Bearing Materials

Aquifer tests were made on a few wells in Gaines County to determine the coefficients of permeability, transmissibility, and storage which govern the ability of the aquifer to transmit and yield or store water. Owing to the lack of suitable wells and pumping schedules, however, testing of a representative sample of wells throughout the county was impossible.

The field coefficient of permeability is the flow of water, in gallons per day, at the prevailing temperature through a cross section of 1 square foot of the aquifer under unit hydraulic gradient.

The coefficient of transmissibility (T) is a similar measure for the entire thickness of the aquifer and is defined as the rate of flow of water, in gallons per day, at the prevailing water temperature through a vertical strip of the aquifer 1 foot wide extending the full height of the aquifer under a hydraulic gradient of 1 foot per foot. The volume of water that will flow each day through each foot of the aquifer is the product of the coefficient of transmissibility and the hydraulic gradient. The smaller the coefficient of transmissibility, the greater the hydraulic gradient must be for the water to move through the aquifer at a given rate.

The coefficient of storage (S) is the volume of water released from or taken into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. Under water-table conditions, the coefficient of storage is practically equal to the specific yield, which is the quantity of water that a formation will yield under the pull of gravity if it is first saturated and then allowed to drain, the ratio expressed in percentage of the volume of this water to the volume of the material drained.

The data from most of the aquifer tests in Gaines County are unsuitable for calculating aquifer coefficients due, in part, to the short periods of pumping. Similar tests in the Ogallala Formation near Amarillo, Texas (Moulder and Frazor, 1957, p. 12) indicated that short-duration tests may give apparent coefficients of transmissibility much higher than the true coefficients. The coefficients of transmissibility determined from tests in three wells in Gaines County that were pumped for periods from 3 days to several weeks ranged between 23,000 and 58,000 gpd (gallons per day) per foot; the field permeability determined from the tests ranged between 220 and 540 gpd per square foot, based on the thickness of the water-bearing material that contributed to the well. The results of these tests, however, are applicable only within a small area around the tested wells and should not be considered as representative of the Ogallala Formation in Gaines County.

The specific yield of the Ogallala Formation in Gaines County could not be determined from the aquifer tests. However, Cronin (1964, p. 7) reported that the specific yield of the Ogallala in the Southern High Plains is about 15 percent, and this figure is probably applicable to Gaines County.

The yields of wells screened in the Ogallala Formation also provide a general index of the permeability of the water-bearing materials; however, the yields also depend on the thickness of the water-bearing material screened, the efficiencies of the wells, and the allowable drawdown. Furthermore, some wells are not pumped at their maximum capacity and others would have higher yields if the wells were deeper.

The yields of a large number of irrigation wells and a few industrial and public supply wells are shown in Figure 11. The map shows that the yields of wells in the Ogallala Formation range over wide limits, the largest yields being generally in the northwestern part of the county. In this area, well yields as large as 1,600 gpm have been measured, although larger yields have been reported by several well owners. Near Seminole and in places in the eastern part of the county, the yields of many irrigation wells are less than 200 gpm and a few are less than 100 gpm. Where the yields are small, the wells commonly are drilled in multiples to provide sufficient water and pressure for irrigation by sprinkling.

The specific capacity of a well is the yield in gallons per minute per foot of drawdown, and generally it is a measure of the performance of a well; its value is affected by various factors such as partial penetration of the well, the size of the well, the type and amount of perforation in the casing, the time the well has been pumped, and the amount of development of the well. The specific capacities of 42 wells in the Ogallala Formation in Gaines County ranged from 1.7 gpm per foot in well KD-27-31-101 in the southeastern part of the county where the Ogallala is thin, to 64.4 gpm per foot in well KD-26-08-617 in the northwestern part where the aquifer is more than 150 feet thick. The specific capacities are useful in estimating the coefficients of transmissibility in areas where aquifer tests are not available. In general, high average specific capacities indicate high transmissibilities, and low specific capacities, low transmissibilities. In most cases, the various factors that affect the specific capacity of a well affect it adversely, so that the actual coefficient of transmissibility generally is greater than that computed from specific-capacity data. The relation of the specific capacities of wells to the coefficients of transmissibility is based on Theis' (1935, p. 519-524) nonleaky artesian aquifer formula as modified by Walton (1962, p. 12). Although the formula assumes certain conditions that are not entirely met in the field, it may be used to obtain rough estimates of the coefficient of transmissibility from specific-capacity data. Thus, based on the specific capacities of a large number of wells scattered throughout Gaines County, the coefficients of transmissibility ranged between 1,800 and 82,000 gpd per foot, and averaged about 30,000.

On the basis of an average coefficient of transmissibility of 30,000 gpd per foot and a specific yield of 15 percent, the theoretical drawdown at different distances from a well discharging 1,000 gpm for different periods of pumping have been computed and are shown in Figure 12. The figure illustrates conditions in an extensive and homogeneous aquifer; however, the curves should be used with caution to insure that they are not used beyond the range of their validity. For example, in the northwestern part of the county where the aquifer is thickest and the coefficients of transmissibility may be as large as 80,000 gpd per foot, the actual drawdowns would be appreciably less than those indicated. Also, the drawdowns would be less because a considerable part of the water pumped for irrigation in the northwestern part of the county returns to the aquifer by percolation through the irrigated soil. On the other hand, in some parts of the county where the Ogallala Formation is thin, the drawdowns may be considerably greater than those shown on the figure.

Data regarding the hydraulic properties of the Cretaceous rocks in Gaines County are meager. In the eastern part of the county, a large number of wells produce water from limestone of Cretaceous age. The ability of the limestone to transmit water depends on the number, size, and degree of interconnection of the openings in the limestone. Wells that penetrate the most permeable zones, characterized by solution channels that permit almost unrestricted flow, have

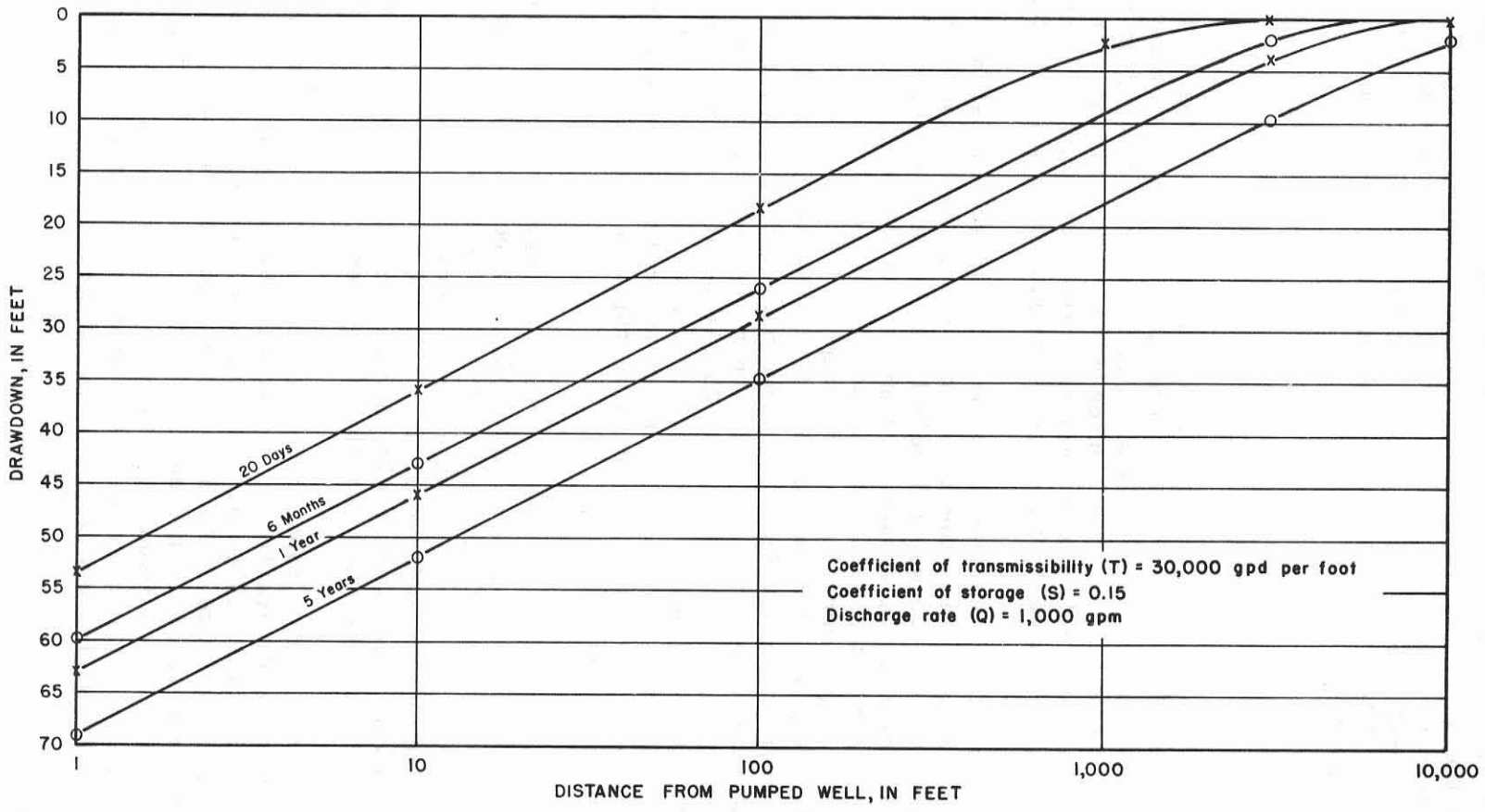


Figure 12

Theoretical Distance-Time-Drawdown Relation for an Infinite Aquifer Having the Hydraulic Characteristics Determined for the Ogallala Formation in Gaines County

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

comparatively high yields with small drawdown effects, hence large specific capacities and high coefficients of transmissibility. Some wells that had fairly large yields are close to wells that had low yields insufficient for irrigation, showing further the wide variation in the hydraulic properties of the limestone aquifer. Pumping tests made in four wells that tap the limestone indicated specific capacities ranging from 28.2 gpm per foot in well KD-27-14-701 to 160 gpm per foot in well KD-27-14-109. The yields of all the wells ranged from 150 to 646 gpm, and averaged 380 gpm.

Fluctuations of Water Levels

Water levels in wells rise or decline depending on various factors. The fluctuations of water levels indicate changes in the amount of water in storage in the aquifer, the magnitude of the change in storage depending on the degree of confinement of the water, and the causes of the fluctuations. The discharge from wells and recharge are the most important among the factors controlling the changes in water levels in wells tapping the Ogallala Formation in Gaines County.

The fluctuations of water levels in seven wells are illustrated by the hydrographs shown in Figure 13; the locations of the wells are shown in Plate 1. The hydrographs show that the water levels have changed in individual wells and from one area to another, the amount of change being dependent mainly on the proximity of the observation wells to the heavily pumped areas. This is shown clearly in a comparison of the hydrographs of wells KD-26-08-502 and KD-27-27-301 (Figure 13). The record of well KD-26-08-502, which is in an area of concentrated pumping for irrigation, shows very little decline of the water level during the period 1945-51, but since then the water level has declined at an average yearly rate of 2.3 feet. Well KD-27-27-301 is in the southern part of the county and near the edge of an irrigated area in which yields of wells are not large. The hydrograph shows that the water level was relatively stable during the entire period of record. In fact, the water level was slightly higher in 1964 than in 1937.

The hydrograph of well KD-27-01-601 shows the variation in decline due to changes in rates of nearby pumpage. The well, equipped with an automatic water-stage recorder, is in a well field operated by the Southwestern Public Service Co. During the period 1949-61, the water level declined in response to more or less continuous pumping for industrial use. In 1962, however, irrigation wells were drilled in and near the well field, and as a result of the increased pumping, the water level has declined sharply since then.

Well KD-27-13-601, which taps Cretaceous rocks, is near McKenzie Draw where geologic conditions are favorable for recharge. The hydrograph shows that the water level rose sharply in 1958 and has continued to rise since then although at a considerably slower rate. The sharp rise probably can be attributed, in part, to recharge from water in the nearby draw after the heavy rains of 1957 and 1958, and, in part, to a change in the rate of discharge. Prior to 1958, the well pumped fairly large quantities of water for irrigation; since then, the well has pumped only small amounts for domestic use.

Water levels have been measured periodically in 33 observation wells, principally in the eastern half of the county, since 1937; in about 20 wells in the southern and southwestern parts of the county since 1945; and in about 18 wells in the northwestern part since 1951. The records show that there was very little, if any, irrigation prior to 1946, and only about 150 wells were in use in

1951; hence, even though the periods of record are not the same, the changes in water levels shown in the observation wells are believed comparable and they may be considered as representative of the approximate net change in water levels in Gaines County since pumping for irrigation began (Figure 7). In general, Figure 7 shows that the water table declined in the western part of the county and rose in the eastern part. The maximum decline, 35.7 feet in well KD-26-08-620, was in the northwest part of the county. Two other centers of decline of smaller magnitude are shown about 13 miles west and 10 miles southwest of Seminole. In these areas, water levels declined maximums of 22.1 and 17.6 feet, respectively. In the eastern half of the county, with the exception of an area southeast of Seagraves and a small area about 20 miles southeast of Seminole, water levels rose as much as 28.3 feet (Figure 7). The largest rises were centered in an area encompassing approximately 50 square miles near McKenzie Lake. Rises of 19.7 and 17.5 feet were measured also in wells KD-27-23-501, 2 miles south of U.S. Highway 180 along the Gaines-Dawson county line, and in well KD-27-06-705, about 8 miles northwest of Cedar Lake. The significance of the rises in water levels in the eastern part of the county has been discussed in an earlier section of this report (pages 20 and 26).

Water in Storage

The volume of water stored in the Ogallala Formation underlying Gaines County may be computed as the product of the volume of saturated material and the porosity (the ratio, expressed in percentage of void space to total volume). The figure of the total quantity of water in storage is of little significance in itself because much of the water will be retained in the voids by forces of capillarity. Furthermore, it may be economically impracticable to recover large quantities of water from the lower part of the aquifer or in those parts of the aquifer where the zone of saturation is or becomes thin. The part of the water in storage that will be available to wells can be determined more practically by multiplying the specific yield by the volume of saturated materials. The volume of saturated materials can be estimated as follows.

The approximate saturated thickness of the Ogallala Formation in Gaines County is shown in Figure 14. In a large part of the county, the data are only approximate because most wells do not penetrate the entire thickness of the aquifer. In these areas, therefore, the saturated thickness is based on either the length of perforated or slotted casing or the thickness of saturated material penetrated by the well. Consequently, the saturated thicknesses shown on the map (Figure 14) probably are conservative; although in some wells, the casings may be slotted opposite water-bearing material in the Ogallala and in the Cretaceous rocks as well. Also, in places in the eastern part of the county, the Ogallala and the underlying Cretaceous rocks are hydraulically connected. In such places, the saturated thickness shown on the map includes only that part of the aquifer in the Ogallala although the Cretaceous rocks may contribute significantly to the well.

The map (Figure 14) shows that the aquifer is thickest in the western part of the county. In the heavily irrigated area in the northwestern part of the county, very few wells penetrate the entire thickness of the Ogallala. Available data (Table 2) show that one well, KD-26-08-606, reportedly penetrated at least 160 feet of saturated material, although most of the wells in that area penetrated only 75 to 85 feet of the aquifer. About 4 miles south of Farm Road 1757 and along the New Mexico-Texas state line where most wells only partially

penetrate the aquifer, the saturated thickness is at least 175 feet. Other thick sections are in the west-central and southwestern parts of the county.

The aquifer generally is thinner in the eastern half of the county; the map shows a fairly large area in which wells obtain water chiefly from the Cretaceous rocks. Within this area, it is possible that some ground water may be obtained from the Ogallala in places but the quantities probably would be small; in other places within the area, the Ogallala reportedly is not water bearing and water supplies are obtained only from the underlying Cretaceous or Triassic rocks.

Based on a specific yield of 15 percent, and calculations of the volume of saturated material as made from Figure 14, it is estimated that as of 1964 the Ogallala Formation in Gaines County contained on the order of 8.5 million acre-feet of water in storage that theoretically would be available to wells. Not all of the "theoretically available" water is practicably recoverable because as the saturated thickness and the quantity of water in storage decreases, the yields from wells also will decrease to a point where it may no longer be economical to pump water for irrigation. It is difficult to estimate how much of the 8.5 million acre-feet could be recovered, largely because it is difficult to predict the minimum rate of pumping that is economically feasible. Hughes (1964, p. 3) reported that in the Texas High Plains, low-capacity wells (less than 100 gpm) have been used effectively for irrigation.

Some of the water in storage underlies areas that presently are unsuited for farming and hence will not be used except for domestic and stock purposes; in other areas where the aquifer is thin, the supply for irrigation in effect may be exhausted in a few years. However, even in those areas where the ground water is depleted for irrigation use, sufficient water for domestic and stock purposes probably will be available in the aquifer.

The quantity of water in the Cretaceous rocks could not be determined principally because no data are available on the specific yield. However, the quantity probably is very small compared to that in the Ogallala.

Well Construction and Irrigation Practices

Most of the wells in Gaines County have been drilled by the percussion or cable-tool method in contrast to the rotary method of drilling in general use throughout most of the Southern High Plains. The use of the slower cable-tool method is due, at least in part, to the occurrence of layers of hard sandstone. The wells generally are finished with 14-inch casing slotted from the water table to the bottom, except in the western part of the county where, until recent years, some wells were completed with only a few feet of casing near the surface, the rest being uncased. The general practice in Gaines County has been to burn slots in the casing, and usually little effort is made to relate the width of the slot to the diameter of the sand particles. If the slots are too large, an excessive amount of sand enters the well, resulting in wear of pumps and casing and possibly eventual loss of the well by collapse of the walls. On the other hand, slots that are too small may cause excessive drawdowns, thereby reducing the specific capacities of the wells.

The early irrigation wells were equipped with belt-driven, low-lift centrifugal pumps powered with 1-cylinder oil- or kerosene-burning engines (Figure 9).

Since 1946, most wells have been equipped with high-speed turbine pumps powered by internal-combustion engines fueled with butane or natural gas, or by electric motors.

Water for irrigation in Gaines County is applied principally by sprinkler systems, except in the northwestern part of the county where the soils are relatively tight and the water is conveyed through unlined open ditches. According to Thaxton and Swanson (1956, p. 4), "...Sprinkler irrigation...is more efficient than the furrow method of application." This is clearly indicated by the duty of water during 1963. In quadrangle 26-08 where row-type irrigation is practiced, approximately 2 feet of water per acre was applied as compared to less than 1 foot of water per acre elsewhere. As mentioned previously, perhaps as much as one-half of the water pumped for irrigation in quadrangle 26-08 is excess to the needs of the plants and percolates downward to the water table. Bournes (1955, p. 12-13) reports that seepage losses from irrigation ditches in the Southern High Plains of Texas ranged from 1.7 to 47.8 percent and averaged 17.5 percent for every thousand feet of ditch. If the average figures can be applied to Gaines County and if the average ditch, including side furrows, totals about 3,000 feet in length, the net seepage loss in conveying the water amounts to about 45 percent of the water pumped.

Chemical Quality of the Ground Water

Precipitation, in the form of rain or snow, contains only small amounts of mineral matter. Once the water reaches the land surface, however, it dissolves mineral substances from the soil and rocks over and through which it moves. Thus, all the ground water in Gaines County naturally contains dissolved solids, the degree of mineralization determining its suitability for municipal, irrigation, and industrial uses.

Most state and municipal authorities have adopted the standards set by the U.S. Public Health Service (1962, p. 7-8) for drinking water used on common carriers in interstate commerce. The standards are designed to protect the traveling public and are useful in evaluating public-water supplies, although they may not be directly applicable in an area such as Gaines County where much of the water may exceed the standards in some constituents. Some of the major chemical standards adopted by the Public Health Service are shown in the following table:

Substance	Concentration (parts per million)
Chloride	250
Iron	0.3
Manganese	.05
Nitrate	45
Sulfate	250
Total dissolved solids	500

The optimum fluoride level of water used by a given community depends largely on climatic conditions (U.S. Public Health Service, 1962, p. 41).

According to the recommended control limits and based on the average maximum daily air temperature of 77.2°F at Seminole, the concentration of fluoride for a public supply in Gaines County should not average more than 1.0 ppm (parts per million) and the presence of fluoride in average concentrations greater than 1.6 ppm would be grounds for rejection of the supply by the Public Health Service.

The concentration of nitrate in water used for drinking is important because water containing more than 45 ppm may cause "blue-baby" disease when used for infant feeding (Maxcy, 1950, p. 271). Most nitrate compounds are readily soluble and may be easily dissolved from soils (in some cases from fertilizer) or from nitrogenous wastes; a high concentration of nitrate may indicate that the water has been contaminated by sewage and such water should be tested for harmful bacteria.

According to the U.S. Salinity Laboratory Staff (1954, p. 69-82), some of the principal factors that determine the quality of water for irrigation are the concentrations of dissolved solids, sodium, and boron. The relative importance of the dissolved constituents in irrigation water is dependent upon the degree to which they accumulate in the soil. Sodium is a significant factor in evaluating quality of irrigation water because a high SAR (sodium-adsorption ratio) of the water may cause the soil structure to break down. The RSC (residual sodium carbonate) is another factor used in assessing the quality of water for irrigation. According to Wilcox (1955, p. 11) water containing more than 2.5 epm (equivalents per million) RSC is not suitable for irrigation, 1.25 to 2.5 epm is marginal, and less than 1.25 epm probably is safe. Excessive RSC will cause the water to be alkaline, and the organic content of the soil will tend to dissolve.

Chemical requirements for industrial uses of water vary according to the industry, but they are fairly rigid where water is used in food, paper, or some chemical-process industries. The most common industrial uses of water in Gaines County are for cooling, boiler feed, and waterflooding of oil reservoirs. Excessive concentrations of dissolved solids are a problem in water used for cooling because they tend to accelerate corrosion (California State Water Pollution Control Board, 1963, p. 182). The use of water for boiler feed is dependent on very strict limits relative to the dissolved-solids content and silica because of the formation of scale in the boilers. High-pressure systems, operating at a pressure of more than 400 psi (pounds per square inch), require a dissolved-solids content of 50 ppm or less and a silica content of not more than 1 ppm; low-pressure systems, less than 150 psi, can use water having as much as 3,000 ppm dissolved solids and 40 ppm silica (Moore, 1940, p. 263). Where these standards are exceeded, it may be necessary to treat the water first.

During the investigation in Gaines County, 782 samples of water from wells and springs were collected, and the samples were analyzed by the Texas State Department of Health. The locations of all the wells sampled are shown in Plate 1. The results of the analyses are shown in Table 5 included with analyses of water obtained during previous investigations. The concentrations of the chemical constituents in the water (Table 5) are expressed in ppm (parts per million), which is the unit weight of a substance in a million unit weights of water. However, it is frequently more convenient for interpretative purposes to compare water in terms of equivalents per million, which is a measure of the reactive weights of the different constituents. The concentration of an ion in equivalents per million is determined by multiplying its concentration in parts per million by the reciprocal of the combining weight of the appropriate ion.

Of the water samples collected, 37 were from the Cretaceous rocks and 8 from the Santa Rosa Sandstone of Triassic age; the rest were from the Ogallala Formation, although some of these samples may represent a mixture of water from both the Ogallala Formation and the Cretaceous rocks. No analyses were made of water from the Permian rocks, except for samples of water produced with oil (Table 6). Electric logs of oil tests indicate that the water in the Permian rocks is highly mineralized and would be unsuitable for most uses.

Although parts of Gaines County now yield ground water that has been contaminated presumably by the disposal of oil-field brines or industrial wastes, it is desirable first to summarize the chemical character of the ground water in the various formations where it is unaffected by the works of man. This affords a basis for comparison of the native waters, those whose chemical character is natural to a particular water-bearing zone and locality. The chemical character of representative samples of uncontaminated water from the Ogallala Formation of Tertiary age, Cretaceous rocks, and the Santa Rosa Sandstone of Triassic age is shown graphically in Figure 15 in terms of the percentage equivalents per million (reacting values) of the anions and cations in solution. The diagram shows that the waters from the different aquifers are distinctive.

Ogallala Formation

Water from the Ogallala Formation in Gaines County has been used for municipal, irrigation, and industrial purposes for many years. Characteristically, it is very hard, high in silica content, contains sulfate slightly in excess of chloride, and in most places has objectionable concentrations of fluoride.

The dissolved-solids content ranges over wide limits, but in general, it increases eastward (Figure 16). In the western half of the county, the water contains generally less than 600 ppm dissolved solids, except in locally isolated areas. In the heavily irrigated area in the northwestern part of the county, the dissolved-solids content exceeds 600 ppm, owing presumably to the recirculation of irrigation water applied to the land surface in excess of the needs of the plants. Because much water is evaporated and transpired during irrigation, the residual water carries increased concentrations of soluble salts, and the effect of this water being recirculated is observed in the ground water in the area.

In several smaller areas, the dissolved-solids content exceeds 600 ppm. In these areas, the relatively high mineralization may be related to the return flow of residual irrigation water, or it may represent a mixture of water from both the Ogallala Formation and the Cretaceous rocks. Relatively highly mineralized water occurs along the lower reaches of Wordswell Draw and in Seminole Draw extending downstream from a point about 4½ miles above its confluence with Wordswell Draw (Figure 16). This mineralization is the result of the concentration of mineral content by evaporation and transpiration of water where the water table is or was at or near the surface in the bottoms of the draws.

In the eastern part of the county, the mineralization (dissolved-solids content) of uncontaminated water from the Ogallala ranges over rather wide limits. In about half of the area, the dissolved-solids content is more than 600 ppm, but less than 1,000 ppm. East of the 1,000 ppm contour line, the dissolved-solids content increases rapidly, undoubtedly due to the influence of the geology of the rocks underlying the Ogallala Formation. In much of this area, the Ogallala Formation is underlain by a fairly thick sequence of Cretaceous rocks.

These rocks are in direct hydraulic connection with the Ogallala, and the water from many of the wells in this area probably represents a mixture of water from both the Ogallala and the Cretaceous rocks.

The quality of the ground water in places in the eastern part of the county is also very closely related to the presence of Cedar and McKenzie Lakes. Owing to the absence of surface drainage from the lakes, water is rapidly evaporated, thereby concentrating the mineral content of the water in the basins. During periods of heavy rainfall, the salts that have been precipitated in the basin are redissolved and carried back into the ground-water reservoir. In general, highly mineralized water (more than 2,400 ppm dissolved solids) lies south and southeast of these lakes. North and northwest, or upgradient, of the lakes, the water is less highly mineralized.

The observed fluoride content in the water from the Ogallala ranged from 0.6 to 8.0 ppm and exceeded 1.6 ppm in about 90 percent of the samples. The concentration of fluoride for a public supply in Gaines County should not average more than 1.0 ppm.

Nitrate, which may indicate the presence of nitrogenous biological waste, is not a problem in Gaines County. Only three wells yielded water in which the nitrate exceeded the safe limits (45 ppm) for drinking water. Iron was determined in only 13 samples, of which 4 contained more than 0.3 ppm, the upper limit recommended by the U.S. Public Health Service.

Sulfate in excess of 250 ppm may produce a cathartic effect and chloride in excess of 250 ppm may impart a salty taste. In general, the sulfate and chloride contents of the uncontaminated water from the Ogallala are fairly low, commonly less than 250 ppm each; the chloride content is slightly less than the sulfate.

The fact that the water from the Ogallala Formation has been used successfully for many years suggests that the water meets the requirements for irrigation. The chemical-quality data show that where the dissolved-solids content is 1,000 ppm or less, the SAR is less than 3.5 and the water is medium to high in salinity hazard and low in sodium hazard. Where the dissolved-solids content ranges between 1,000 and 3,000 ppm, the SAR is less than 10 and the water is classed as high to very high in salinity hazard and low to high in sodium hazard. Generally, water having high to very high salinity hazard should be used on permeable soils having adequate drainage, and the crops should be very salt-tolerant.

Boron does not appear to be a problem in Gaines County. In 27 samples boron ranged from 0.1 to 1.2 ppm, which meets the limits established by Scofield (1936, p. 286) for boron-tolerant crops.

RSC (residual sodium carbonate) likewise is not a problem in the county. Of all the samples of water from wells in the Ogallala, only nine had RSC values greater than zero and none were more than 2.5.

Most of the water from the Ogallala used by industry is for cooling. The temperature of the water ranges from 63°F to 68°F. The silica content, which is an important property in the consideration of water for industrial use, ranged from 12 to 79 ppm; hence, the water from the Ogallala unless treated is undesirable for use in boilers operating at high pressures of more than 400 psi.

Cretaceous Rocks

Samples of water were collected for chemical analysis from 36 wells and 2 springs that are believed to obtain water from the Cretaceous rocks (Tables 2 and 5). Most of the wells are in the eastern part of the county (Plate 1), where the Cretaceous consists principally of limestone. The general chemical character of the water is shown in Figure 15.

In general, the water in the Cretaceous rocks is more highly mineralized than that in the Ogallala, the dissolved-solids content in the water from wells ranging from slightly less than 1,000 ppm to 7,630 ppm. The water is of the sodium-magnesium-sulfate type (Figure 15) in which sodium and magnesium are first and second in order of abundance among the cations but neither amounts to 50 percent of all the cations, in chemical equivalents. Sulfate is the predominant anion although it generally does not exceed 50 percent of the total anions and in a few samples sulfate and chloride were about equal. Table 5 shows that the sulfate content ranged from 256 to 2,740 ppm and chloride from 141 to 2,362 ppm. The fluoride content ranged from 3.7 to 10 ppm in 30 samples.

The high sulfate, chloride, fluoride, hardness, and dissolved-solids content precludes the use of water from the Cretaceous rocks for public supply, if water of better quality is available.

The principal use of the water is for irrigation. The salinity hazard, as measured by the total concentration of soluble salts, ranges from high to very high; however, the quantity of exchangeable sodium (alkali hazard) is low to medium. Of the 34 samples collected, only one determination of boron was made. This was 1.0 ppm in well KD-27-22-302. The RSC values for water from two wells were 0.09 and 1.08, both well within the limits recommended for irrigation.

Samples of water were collected in 1963 from two springs (KD-27-14-303 and KD-27-14-901) that issue from the Cretaceous rocks in Cedar Lake. The water from spring KD-27-14-303 is not typical of water from the Cretaceous rocks. The low sulfate to chloride ratio suggests that the water has been modified by the introduction of chloride, presumably from the disposal of oil-field brine into a nearby surface-water course. The mineralization of the water from spring KD-27-14-901, which seeps from Cretaceous rocks, apparently has increased markedly since 1938. However, the sample collected in 1963 was taken from a pond, and the increase in salt content probably is, at least partly, the result of concentration of the water by evaporation.

Santa Rosa Sandstone

Water from the Santa Rosa Sandstone of Triassic age is of the sodium sulfate type (Figure 15), in which the sodium content amounts to about 90 percent of all the cations in solution. The analyses of water samples from eight wells tapping the Santa Rosa (Table 5) indicate that the water is more mineralized in the eastern half of the county than in the western half. The samples from two wells in the western half of the county had dissolved-solids contents of 2,390 and 3,380 ppm; samples from six wells in the eastern half contained more than 6,600 ppm of dissolved solids. The water from the two wells in the western part of the county was soft to moderately hard (60 ppm or less to 120 ppm); the water from the wells in the eastern part was hard (more than 180 ppm). The high sulfate and dissolved-solids content precludes use of the water from the Santa Rosa for domestic or public supply, but it could be used for livestock, particularly

in the western half of the county, and for some industrial uses. According to Hem (1959, p. 241), a high proportion of sodium or magnesium and sulfate in highly mineralized waters make them undesirable for stock use. On this basis, the water from the Santa Rosa in the eastern part of the county may be unsatisfactory for livestock.

Only one well (KD-27-29-502) is known to obtain water from the Chinle(?) Formation equivalent. The water, which is used to irrigate a small lawn, is very hard and contained 2,840 ppm dissolved solids, 1,165 ppm sulfate, and 500 ppm chloride.

Contamination of the Ground Water

A considerable part of the economy of Gaines County is dependent on an adequate supply of water suitable for public supply and irrigation. In recent years, however, the chemical quality of the ground water from an annually increasing number of wells has shown marked degradation. The contamination of the fresh ground-water supplies in Gaines County is presumed to be chiefly from the infiltration of oil-field brine from unlined disposal pits. Figure 16 shows the locations of the pits that were in use or available for use at the time of the investigation and those that were formerly used. The pits from which samples of brine were collected are identified by numbers and the chemical analyses of samples from the pits are shown in Table 6.

According to the Texas Water Commission and Texas Water Pollution Control Board (1963, p. 352), 14,817,787 barrels (622,347,000 gallons, or about 1,910 acre-feet) of brine reportedly was produced in 1961 from 99 oil reservoirs in Gaines County. Of this amount, 9,290,079 barrels (390,183,318 gallons, or 1,197 acre-feet) or about 63 percent of the total was disposed of through injection wells, and 5,267,514 barrels (221,235,588 gallons, or about 679 acre-feet) or 35.5 percent was disposed of through unlined surface pits. The rest of the brine was disposed of in surface-water courses or by unknown methods.

Brine placed in the unlined surface pits either evaporates, overflows, or seeps into the ground, eventually percolating downward to the water table. The pits in the county range widely in size, but few of the pits observed had sufficient surface area to allow for appreciable evaporation. Although the average yearly potential evaporation rate from a free-water surface in Gaines County is more than 6 feet, it cannot be depended upon to dispose of the large quantities of brine continuously being produced. Actually the evaporation rate of the brine probably is considerably less than that of fresh water because of the presence of a film of oil on the brine in most of the pits. Other factors, such as the dissolved-solids content, may affect the evaporation rate also.

The ineffectiveness of brine disposal by evaporation is clearly demonstrated by Figure 17 which shows the cumulative volume of brine, allowance being made for rainfall and evaporation, discharged into a pit in the southeastern part of the county. The pit, dug in May 1959, is rectangular, has a capacity of 450,000 gallons, and when it is completely full, the free-water surface covers about 17,000 square feet. During the period January 1962 to November 1963, about 12 million gallons, or 36.7 acre-feet, of brine was discharged into the pit (about 520,000 gallons per month). The graph shows that even under ideal conditions of no seepage loss and an evaporation retardant-free brine surface the capacity of the pit would have been exceeded during its first month of operation; the operator of the pit, however, reported no overflow during this period.

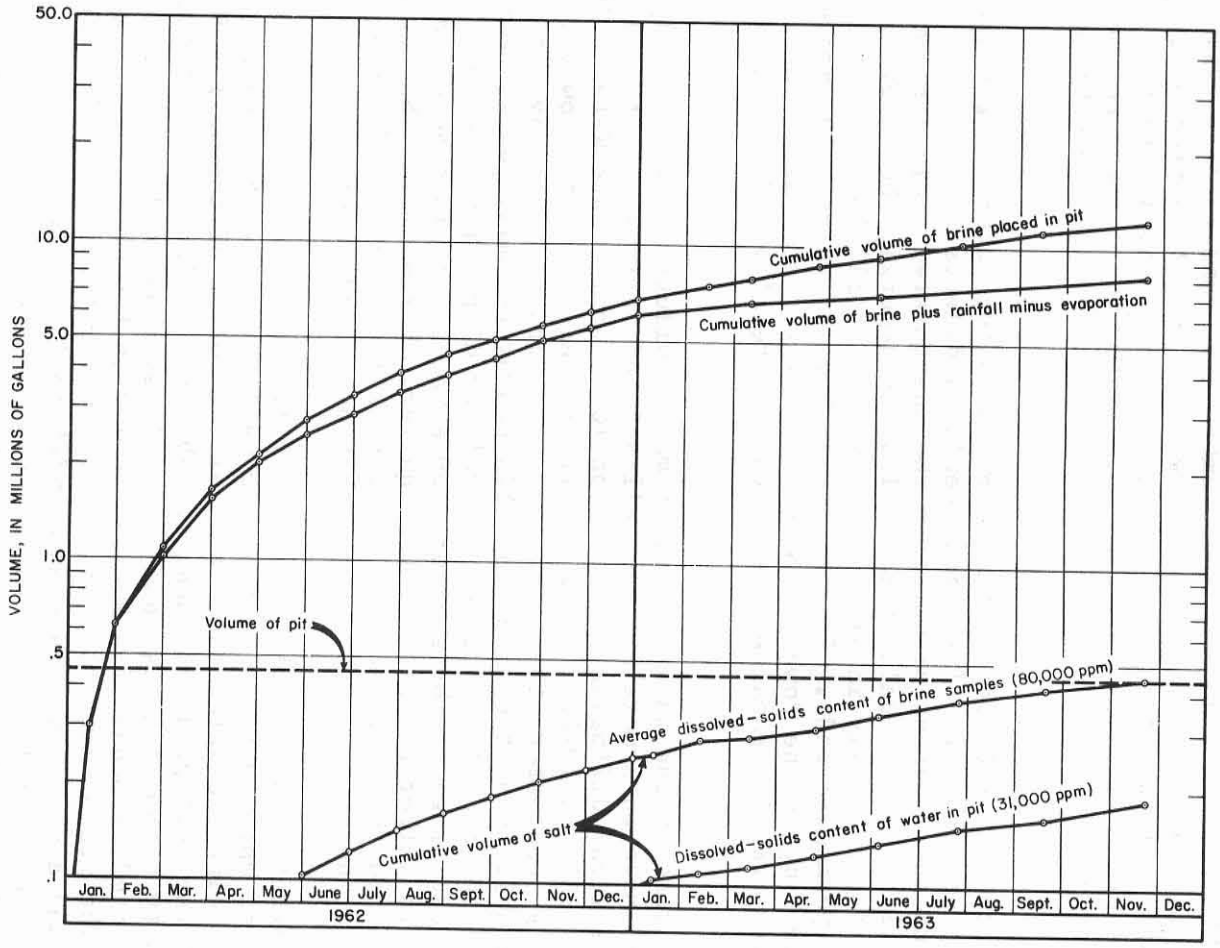


Figure 17

Graph Showing the Volume of a Pit in Gaines County, the Cumulative Volume of Brine Placed in Pit, and the Cumulative Salt Content of the Brine, January 1962 to November 1963

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

The absence of appreciable quantities of precipitates also indicates the ineffectiveness of disposal by evaporation. Chemical analysis of a sample of the brine discharged into the pit showed a dissolved-solids content of 31,000 ppm, or about 42 tons of salt per acre-foot of water, which is considerably less than the average of about 80,000 ppm, or about 110 tons per acre-foot, for the 66 brine samples collected in the county (Table 6). If it is assumed that evaporation was 100 percent effective, the precipitated salts, based on a density of 2.17, would have nearly half filled the pit; if the brine contained as much as 81,000 ppm, the precipitated salts would have nearly filled the pit by December 1963 (Figure 17). The pit was abandoned in November 1963, and in July 1964 a survey of the pit which was dry revealed no appreciable amount of precipitate, indicating that nearly all the brine placed in the pit had seeped into the ground. Whether the brine actually had reached the water table could not be determined because there were no nearby wells from which samples could be collected.

The rate at which the brine percolates downward to the water table depends principally upon the permeability of the intervening sediments. Actually, little is known about the movement of water in the unsaturated sediments, and quantitative predictions are virtually impossible. In general, the water does not move out from the pit equally in all directions and at all levels, but as fingers in the more permeable beds. In some areas, beds of relatively impermeable silt or clay may impede the downward movement of water and, as a consequence, the water may travel a considerable distance laterally before reaching the water table.

When the brine reaches the water table, it may be diluted, but generally the contaminant will move in a more or less well-defined streamline with a minimum of lateral or vertical diffusion and dilution (California State Water Pollution Control Board, 1963, p. 19-20). As a result and because of the low velocity of movement of ground water, the brine that is placed in a pit may not affect the chemical quality of the water in wells nearby for many years. Moreover, the lenses of sand and clay restrict the uniform dispersion of brine throughout the vertical range of the aquifer, hence variations in chemical quality can be expected in different parts of the aquifer. Furthermore, the brine will tend to move toward the bottom of the aquifer, with a minimum of mixing, because of its greater density, compared with that of ground water.

The effect of stratification due to density differences is illustrated in Figure 18. Samples of water were collected from well KD-27-18-106 at several intervals from just below the water table to near the bottom of the well. The owner reported that the well produced water suitable for irrigation until June 1962 when the salinity became too high and the well was abandoned. Samples of the water were collected by means of a Foerst sampler in November 1962 and again in November 1963. The graph shows that in 1962 the water from 65 to 105 feet below land surface had a specific conductance which indicated that the water was fresh; however, at a depth of 115 feet, the salinity of the water was much greater. Samples collected in 1963 showed a slight increase in the salinity of the water in the upper part of the aquifer and a decrease in the lower part.

Figure 19 shows the relationship among the duration of pumping, yield, and change in the electrical conductivity of the water in two contaminated wells. During the first few minutes of pumping well KD-27-19-411, the water discharged was highly mineralized (indicated by the high specific conductance). As pumping continued, the quality of the water improved steadily. After a prolonged period of pumping, however, the mineralization began to increase, and perhaps

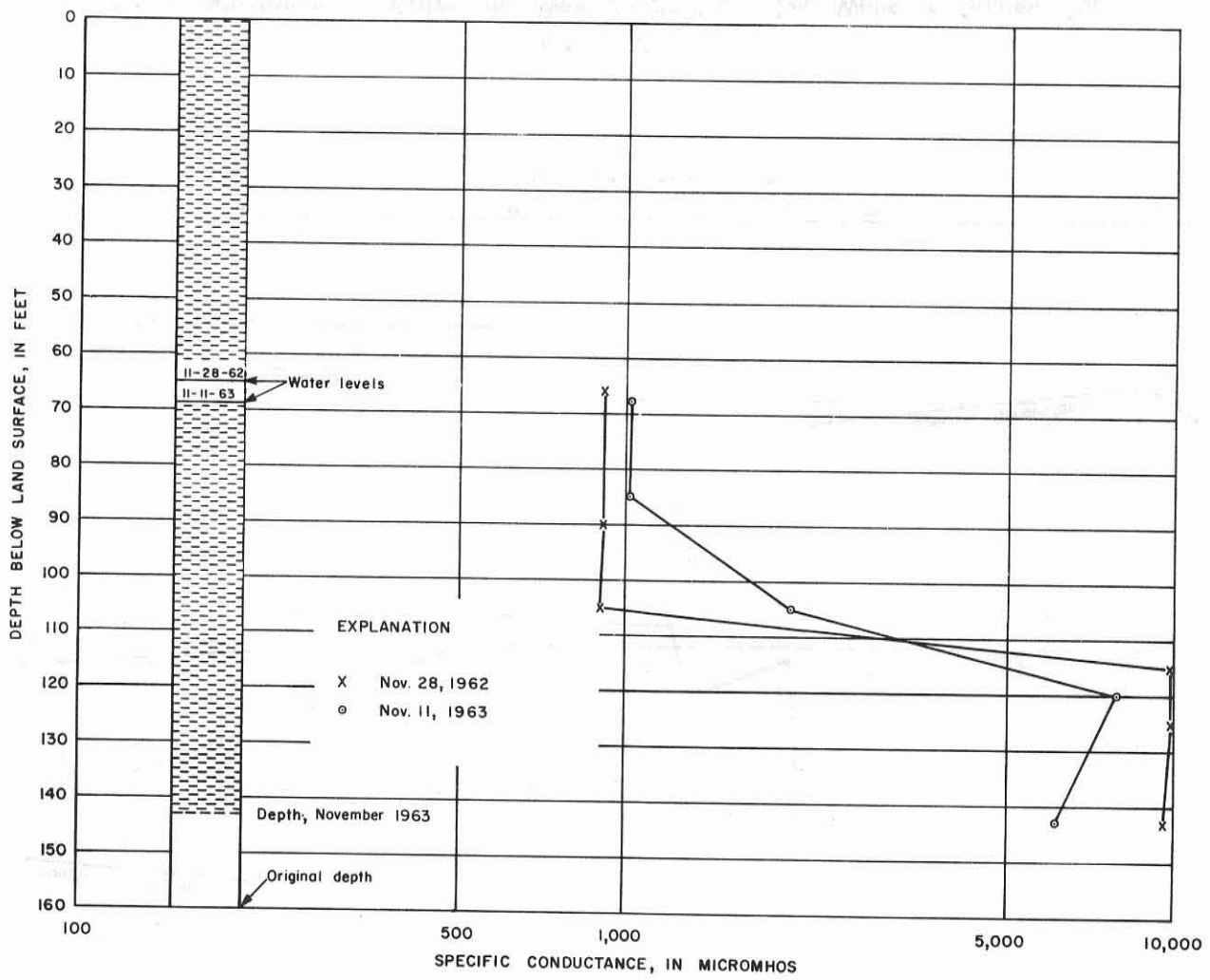


Figure 18

Specific Conductance of Water in Well KD-27-18-106, November 1962 and November 1963

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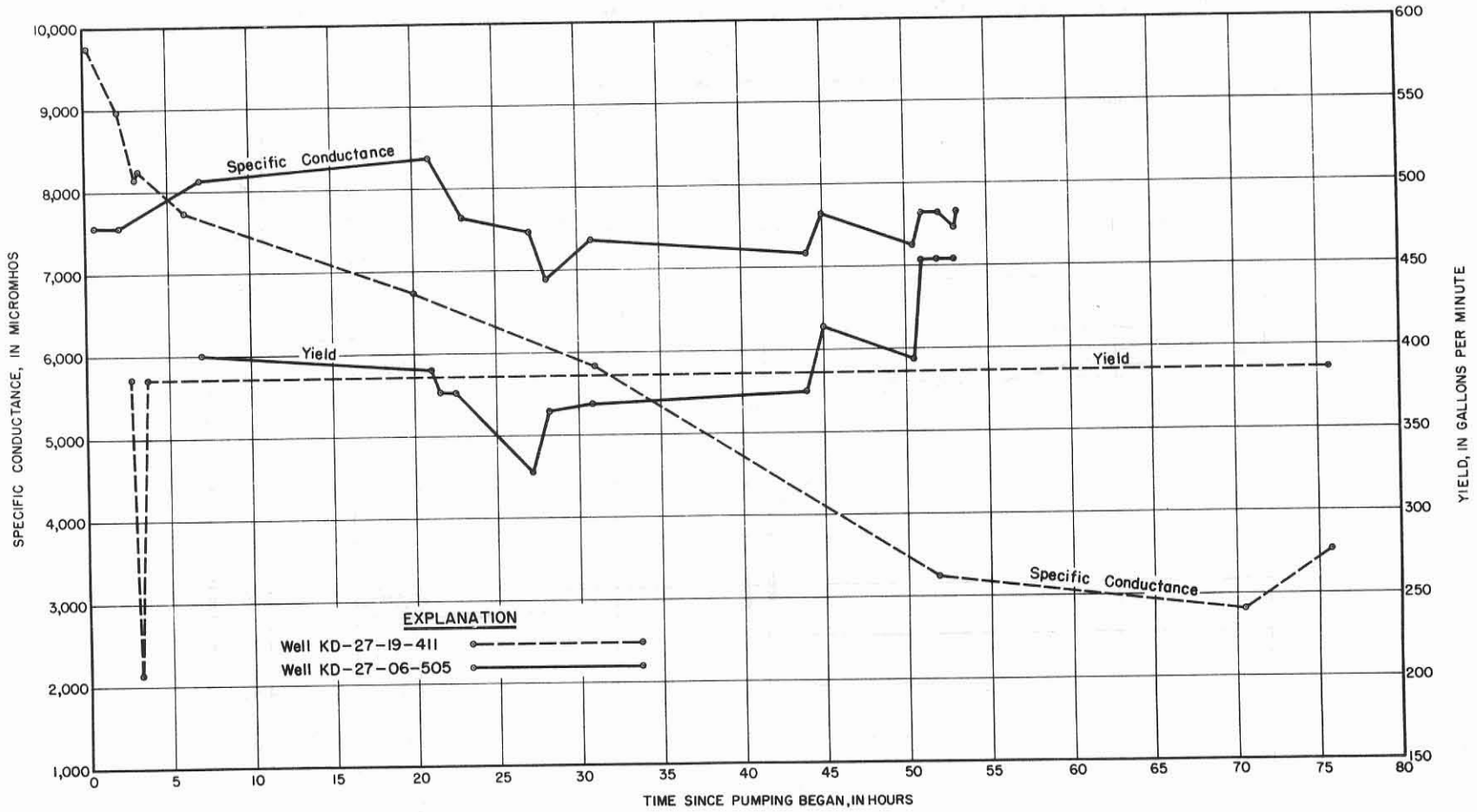

Figure 19

Specific Conductance of Water and Well Yields from Two Wells in Gaines County

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

ultimately reached the same degree of mineralization or higher than in the water pumped from the well during the first few minutes. These data suggest that the interface between the brine and fresh water may be at some distance from the well and that brine moves into the well only after prolonged periods of pumping.

The graph of well KD-27-06-505 (Figure 19) shows that the pumping rate of a well also may influence the way in which brine moves into a well. The sharp increase in mineralization accompanying an increase in pumpage indicates that water of higher salinity in the lower part of the aquifer may rise into the well as the head is lowered by pumping.

Several criteria are useful in determining whether a particular water sample has been contaminated by oil-field brine. The concentration of chloride probably is the most useful because it is easily determined, it does not take part in exchange reactions in the soils, and it is a major constituent of the oil-field brines produced in Gaines County, whereas the chloride content of the natural water is generally very low. Table 6 shows that the chloride concentration of all the samples of oil-field brines is much greater than that of the water from the Ogallala Formation (Table 5). Table 5 shows also that in samples of water from 31 wells and 1 spring that apparently have been contaminated, the chloride content ranged from 150 to 11,940 ppm. The other constituents, principally the cations, calcium, magnesium, and sodium plus potassium (calculated) may show wide differences in concentrations between fresh water and oil-field brines, but the concentrations of these ions are subject to modification by base-exchange reactions with soils. When base-exchange reactions occur, calcium or magnesium or both are substituted for part of the sodium; consequently, the contaminated water may contain more calcium and magnesium than the theoretical mixture of native water and oil-field brine.

The dissolved-solids content also is useful in the recognition of contamination by brine principally because it is readily determined and because of the very pronounced contrast in this property between fresh water and oil-field brine. The distribution and magnitude of contamination of the ground water in Gaines County is indicated in Figure 16. The map shows that the dissolved-solids content of water drawn from some wells in the vicinities of disposal pits is markedly higher than that from nearby wells. A high dissolved-solids content, however, is not conclusive evidence of contamination. For example, the relatively high mineralization of the water from wells KD-27-11-809 and KD-27-19-304 is not the result of the disposal of oil-field brines into nearby unlined surface pits but is due to the concentration by evaporation of the shallow ground water underlying the draws.

The ratio of sulfate to chloride, in equivalents per million, is a criterion of brine contamination in Gaines County. Figure 20 illustrates the relation of sulfate to chloride in waters from a representative number of wells that tap the three aquifers and in a representative number of brine samples. Most of the points representing samples of uncontaminated water from the three aquifers fell in a fairly narrow band in which the sulfate-chloride ratio was greater than 1 and generally less than 2 (Figure 20). The samples of water presumed to be contaminated, as well as the samples of oil-field brine, fall below the narrow band, the ratio of sulfate to chloride being less than 1.0. In general, any sample whose analysis plots between 1.0 and 0.5 should be suspected of contamination. The graph shows also six samples of presumably uncontaminated water that had sulfate-chloride ratios of less than 1.0. Actually, five of these samples are from wells in areas where oil is or has been produced; hence,

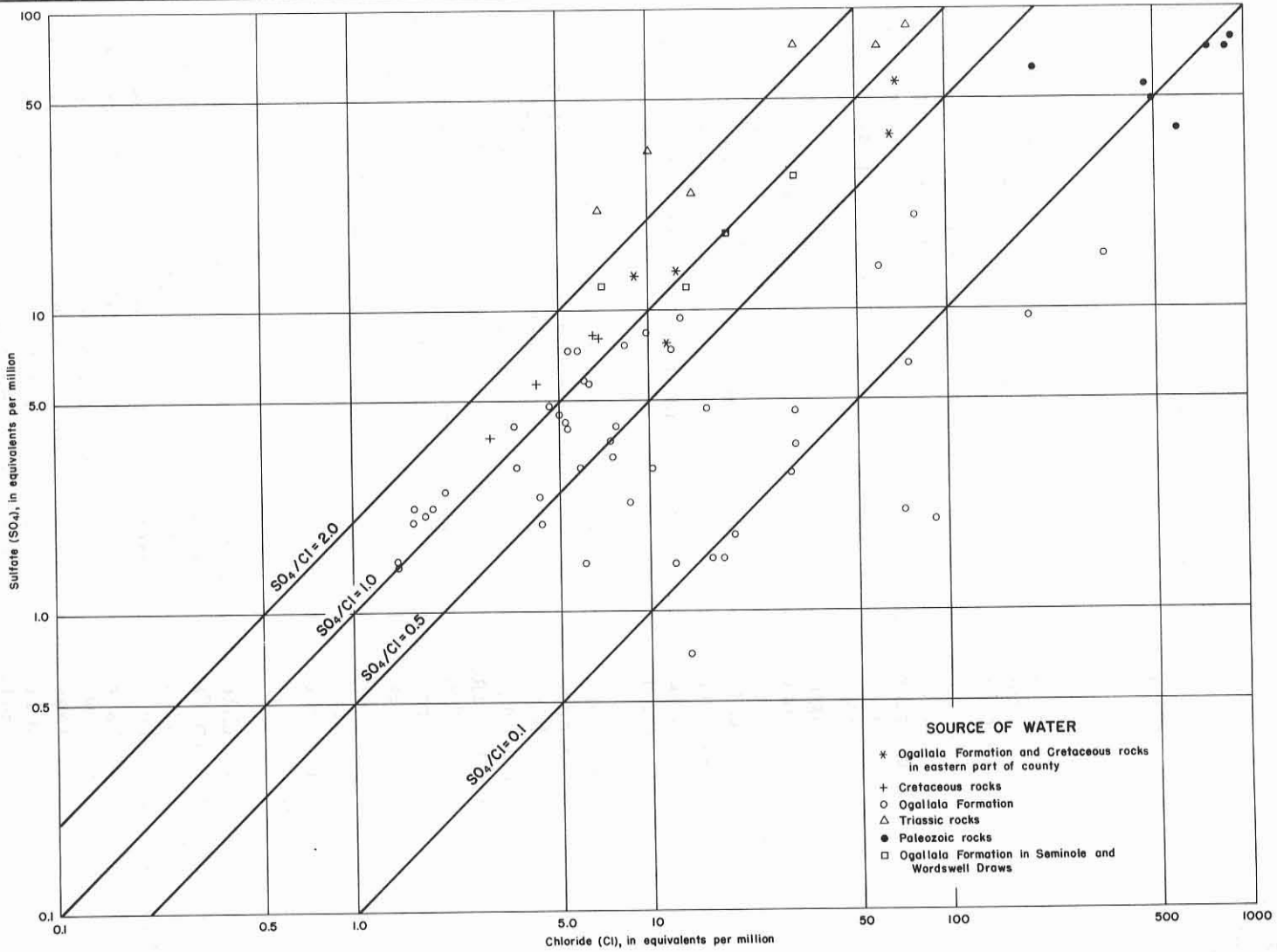

Figure 20

Relation of Sulfate to Chloride in Selected Wells in Gaines County

U. S. Geological Survey in cooperation with the Texas Water Development Board and the Gaines County Commissioner's Court

they may be slightly contaminated. The data show that contamination definitely is indicated if the sulfate to chloride ratio is less than 0.5.

The weight of the foregoing chemical evidence indicates the oil-field brines as the chief contaminant of ground water and the unlined surface-disposal pits as the likely source.

Chemical analyses of water from most of the wells presumed to be contaminated show that the water is unsatisfactory for human consumption because of the high chloride content. Moreover, the use of the contaminated water for irrigation may be doubtful or hazardous, owing to its very high salinity hazard. In fact, five irrigation wells that were reported by their users as having formerly yielded water of good quality, recently were abandoned because of an excessive increase in the salt concentration, and two wells--KD-27-18-901 (1963) and KD-27-27-404 (1962)--were abandoned when drilled because the water was of doubtful quality for irrigation. It is likely that the water in the latter wells has been contaminated as records show that nearby wells produce or have produced water of good quality.

The presumption of contamination by disposal of oil-field brines through unlined surface pits is not necessarily restricted to those wells shown in Figure 16, but is possible in other parts of the county where unlined disposal pits are or were used. In some areas of surface-disposal pits, wells are not available or are widely scattered and pump only small quantities of water for domestic or livestock use. Because of the slow movement of ground water in the Ogallala Formation and the gentle slope of the water table in most places, contamination which may have resulted from surface disposal of oil-field brines in these areas has not been detected.

As a result of rulings of State water pollution control agencies, most of the unlined surface pits used for the disposal of oil-field brines have been eliminated. Many of the pits not eliminated have been lined with impervious materials and in many fields brines formerly discharged into surface pits are now reinjected into subsurface formations. Nevertheless, the salt water that has percolated from these pits represents a potential source of contamination. When these wastes eventually reach the water table, they will be diluted so slowly that the effects of contamination may be long lasting.

Improperly or inadequately cased oil or gas wells also are potential sources of contamiation of the fresh ground-water supplies. The Oil and Gas Division of the Railroad Commission of Texas is responsible for seeing that oil and gas wells are properly constructed, and the Texas Water Development Board furnishes ground-water data to oil operators and to the Railroad Commission in order that all fresh water may be protected. Actually, the term "fresh water" is considered by the Surface Casing Program of the Texas Water Development Board to include water of usable quality. The term "usable" in itself is rather indefinite in that its qualitative limits differ from place to place in the State. In Gaines County, the term "water of usable quality" denotes water that may be of satisfactory quality for domestic, livestock, irrigation, or public-supply purposes or for some restricted industrial purposes. Thus, "water of usable quality" in Gaines County may contain as much as 4,000 ppm dissolved solids.

The Railroad Commission requires that strata containing usable water be protected by surface casing of new or reconditioned pipe and cement. The amount of protection required in Gaines County differs from place to place, but generally casing and cement is required to a depth of a few tens of feet below the top of

the Triassic rocks. In the western half of the county, the Water Development Board recommends the protection of the Santa Rosa Sandstone.

Whether inadequately cased oil wells have contributed to the depreciation of the ground water in the Ogallala could not be determined. Available data indicate that the piezometric surface of the brine in the oil-producing strata generally is below the top of the Triassic rocks; if this is true, the brine would not move up into the Ogallala Formation under normal conditions of pressure. However, in a few wells, the reservoir pressure is sufficient for the oil to flow to the surface. In these wells, contamination of the native water is possible if the wells are inadequately cased or if abandoned oil wells are improperly plugged. In the vicinity of a gas field northwest of Seminole, several irrigation wells reportedly pumped water containing natural gas, indicating that at least in this area the fresh-water sands may be protected inadequately and that the native water may be in the first stages of contamination.

In summary, the presumption of contamination by disposal of oil-field brines into unlined surface pits is based mainly on chemical analyses of water from wells near disposal pits. Actually, considerably more detailed investigations will be necessary for verification of each instance of contamination. Presumably the salt now in the water in the Ogallala Formation will become dispersed over an ever widening area affecting more wells than are shown in Figure 16. Samples of water should be collected as often as twice a year to trace changes in the extent and intensity of the contamination; for most of the wells so sampled, a determination of chloride probably is sufficient, although some analyses probably should be more comprehensive and should include the determination of some trace elements.

Pollution of the ground water in Gaines County has occurred locally because of the disposal of industrial wastes onto the land surface. Fluid nitrate-laden wastes from a plant that formerly manufactured explosives used in oil-field operations reportedly were discharged onto the land surface in McKenzie Draw less than 200 feet from well KD-27-11-601. The chemical quality of the water from the well prior to the start of plant operations is not known, but presumably the water was satisfactory for drinking purposes. The plant ceased operations in 1956 and the well was not used again until 1962. A sample of water from the well in May 1962 showed a nitrate content of 1,639 ppm. Despite the high nitrate concentration, the water was satisfactory for irrigating bermuda grass, but caused a reduction in crop yield when used to irrigate grain sorghum. Further sampling of the water in September 1962 and August 1963 showed that the nitrate content had decreased from 848 to 777 ppm. It is doubtful that the nitrate-laden water can practically be flushed from the area, or that the extension of the contamination can be arrested. Rather, even though the source of the contaminant may be eliminated, the industrial waste already accumulated in the soil was not removed and the nitrate presumably will disperse itself over a larger area probably for many years, assuming no large increase in pumping from the contaminated area.

Outlook for the Future

Although ground water is considered as a renewable resource, the rate at which it is renewed in West Texas is so slow as to preclude its consideration in determining the quantity that will be available for use in Gaines County.

In Gaines County and throughout the Southern High Plains, pumpage from the Ogallala Formation each year exceeds any quantity conceivably replaceable by natural recharge; consequently, the water in storage in the Ogallala is, in effect, being "mined." On the assumption that the total water stored in the Ogallala Formation in Gaines County is about 8.5 million acre-feet, the total supply would be enough to last for almost 50 years of pumping at the 1963 rate of 193,000 acre-feet a year. However, some of the water is not suitable for all purposes. Contamination of the ground-water supplies by the disposal of oilfield brines into unlined surface pits has rendered some of the ground water unsuitable for public supply or domestic use and locally for irrigation. Moreover, it is expected that contamination would continue for a long time, even if the sources of contamination were eliminated.

Doubtlessly, the water needs of the county will continue to increase. A substantial part of this increase will be contributed by the anticipated expansion of irrigation, and a part by the oil and gas industry, principally to repressure oil reservoirs. In an annually increasing number of oil wells the pressure or reservoir energy, which is the force that drives the oil from the formation into the wells, has declined, and in some fields the decline has been great enough so that pumping alone is no longer possible. Under such conditions, water is injected into the reservoir under pressure to force the residual oil into the well. Prior to 1963, most of the water for repressuring of the oil fields was derived from the Santa Rosa Sandstone. However, in 1963, fresh water from the Ogallala was used and it is expected that withdrawals from the Ogallala will increase several fold in the next few years. It is obvious, therefore, that with continued economic development, depletion of ground-water supplies by pumping from storage, and loss of water supplies by contamination, the problem of a water supply for the county will become more and more serious.

Thus, additional development of the ground-water resources in Gaines County should follow a program that will assure the most efficient use of the water presently available as well as best serve the needs of those dependent on an exhaustible supply.

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Table 2.--Records of wells and springs in Gaines County

All wells are drilled unless otherwise noted in remarks column.
Water level : Reported water levels given in feet; measured water levels given in feet and tenths.
Method of lift and type of power: C, cylinder; Cf, centrifugal; E, electric; G, gasoline, butane or Diesel engine; J, jet; N, none; Ng, natural gas; T, turbine; W, windmill. Number indicates horsepower.
Use of water : D, domestic; Ind, industrial; Irr, irrigation; N, none; P, public supply; S, stock.

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-26-08-501	D. W. Ashburn	Mick Fullingim	1955	158	10	--	70.7	Jan. 14, 1964	T,G	Irr	Pump set at 120 ft.
* 502	Roy Smith	Smith Machinery Co.	1945	150	--	3,669	32.9 54.2 64.5	Nov. 16, 1945 Feb. 8, 1951 Jan. 14, 1964	T,Ng	Irr	Pump set at 70 ft. Observation well.
503	C. E. Hilburn	Mick Fullingim	1951	160	--	--	--	--	T,Ng	Irr	Pump set at 85 ft. Estimated discharge 2,000 gpm.
* 504	D. W. Ashburn	do	1952	160	15, 10	--	--	--	T,Ng	Irr	Pump set at 90 ft. Reported discharge 1,400 gpm. Temp. 65°F.
505	C. E. Hilburn	do	1954	155?	--	--	--	--	T,Ng	Irr	Pump set at 90 ft.
506	do	do	1954	160	--	--	62.5 71.7 72.3	June 29, 1955 Nov. 20, 1962 Jan. 21, 1964	T,Ng	Irr	Estimated discharge about 1,400 gpm.
507	J. M. Newman	do	1952	175	15	--	--	--	T,Ng	Irr	Reported discharge 1,800 gpm.
* 508	Jerry Goff	do	1952	158	--	--	--	--	T,Ng	Irr	Estimated discharge about 1,800 gpm. Temp. 65°F.
509	C. E. Hilburn	do	1951	155	--	--	--	--	T,Ng	Irr	Reported discharge 2,000 gpm.
510	M. B. Nevell	--	1952	160	--	--	69.0 72.4	June 28, 1955 Jan. 21, 1964	T,Ng	Irr	Reported discharge 2,000 gpm. Temp. 69°F.
* 511	do	--	1952	160	--	--	68.5 72.5	June 28, 1955 Jan. 21, 1964	T,Ng	Irr	Reported discharge 2,000 gpm. Temp. 65°F.
* 512	do	--	1952	160	--	--	--	--	T,Ng	Irr	Reported to be used for irrigation in the future. Temp. 65°F.
513	do	Mick Fullingim	--	160	--	--	--	--	T,Ng	Irr	Reported discharge 2,000 gpm.
* 514	Preston Underhill	do	1952	150	--	--	--	--	T,Ng	Irr	Estimated discharge 1,800 gpm. Temp. 65°F.
515	M. B. Nevell	do	1952	160	--	--	54.9 67.6	June 28, 1955 Jan. 21, 1964	T,Ng	Irr	Reported discharge 2,000 gpm.
516	A. D. Crowder	-- Nordyke	--	120	--	--	--	--	T,G	--	Reported irrigated 80 acres in 1950 and 1951. Pump set about 80 ft.
517	Mrs. Emma Lawrence	do	1950	140	--	--	42	Dec. 1951	T,Ng	--	Reported irrigated 150 acres in 1951. Pump set at 80 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-26-08-518	Roy F. Smith	do	1950	140	--	--	--	--	T,Ng	--	Reported irrigated 140 to 150 acres in 1951. Pump set at 80 ft.
519	Joe F. Woosley	C. Tatum	1946	140	--	--	41.8 68.3	Oct. 7, 1949 Jan 21, 1964	T,G	--	Reported irrigated 100 acres in 1950-51. Pump set at 70 ft. 2/
520	D. W. Ashburn	Mick Fullingim	1952	160	16	--	63.8	Nov. 20, 1962	T,Ng	Irr	Pump set at 120 ft.
* 521	Joe F. Woosley	-- Nordyke	1951	140	--	--	28	1951	T,E, 30	Irr	Reported irrigated 100 acres in 1951. Pump set at 105 ft. Temp. 65°F. 2/
* 601	Willard Freeman	Mick Fullingim	1954	150	--	--	--	--	T,Ng	Irr	Estimated discharge 1,600 gpm. Reported drawdown 30 ft. after several hours pumping at 1,600 gpm. Observation well. Temp. 65°F.
602	Jerry Goff	-- Palmer	1952	162	--	--	--	--	T,Ng	Irr	Estimated discharge 1,800 gpm.
* 603	Verlon Hilburn	Mick Fullingim	1954	196	--	--	--	--	T,Ng	Irr	Reported discharge 2,400 gpm. Temp. 66°F.
* 604	do	do	1954	180	--	--	--	--	T,Ng	Irr	Reported discharge 1,000 gpm. Pump set at 125 ft.
* 605	do	--	--	162	--	--	78.7 88.9	July 12, 1955 Nov. 20, 1962	T,Ng	Irr	
606	do	Mick Fullingim	1955	240	--	--	--	--	T,Ng	Irr	
607	Preston Underhill	do	1952	--	--	--	64.2 71.9	July 13, 1955 Jan. 21, 1964	T,Ng	Irr	
* 608	Verlon Hilburn	do	1954	150	--	--	63.7 76.0	July 12, 1955 Jan. 21, 1964	T,Ng	Irr	Temp. 66°F.
609	L. H. Kinley	do	1950	150	--	--	--	--	T,Ng	Irr	Reported discharge 1,800 gpm.
610	Willard Freeman	do	1951	150	--	--	63.8 69.6	July 13, 1955 Jan. 21, 1964	T,Ng	--	Reported discharge 1,400 gpm. Pump set at 90 ft.
611	M. D. Collins	do	1952	150	--	--	--	--	T,Ng	Irr	Reported discharge 1,800 gpm.
612	M. M. Collins	do	1952	150	--	--	--	--	T,Ng	Irr	Reported discharge 1,800 gpm. Pump set at 90 ft.
613	C. B. Self	--	1946	150	16	--	42.6 66.6	Apr. 5, 1951 Jan. 21, 1964	T,Ng	--	Well now unused.
614	Frank Freeman	C. Parker	1949	128	--	--	--	--	T,Ng	Irr	Reported irrigated 155 acres in 1950-51.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-26-08-615	W. R. Belcher	--	1949	175	--	--	60	June 1955	T,Ng	Irr	Reported discharge 1,400 gpm. Reported irrigated 160 acres in 1950-51. Pump set at 90 ft.
* 616	Frank Freeman	--	1949	130	--	--	43.5 69.0 69.8	Apr. 5, 1951 Nov. 20, 1962 Jan. 24, 1964	T,Ng	Irr	Estimated discharge 1,750 gpm. Reported irrigated 145 acres in 1950-51. Pump set at 80 ft. Temp. 66°F.
* 617	L. R. McGehee	Johnny Stone	1949	150	--	--	71.9	July 12, 1955	T,Ng	Irr	Measured 142 ft drawdown after 6 hours at 915 gpm. Pump set at 70 ft. Temp. 65°F. 2/
618	C. R. McGehee	Mick Fullingim	1952	150	--	--	--	--	T,Ng	Irr	Pump set at 110 ft.
* 619	L. R. McGehee	Johnny Stone	1949	150	--	--	41.0	Apr. 10, 1951	T,Ng	Irr	Reported irrigated 155 acres in 1950-51. Pump set at 90 ft. in 1955. 2/
620	V. Hilburn	C. A. Aldridge	1949	150	--	--	35.7 70.9	Feb. 8, 1951 Jan. 21, 1964	T,E, 40	Irr	Estimated discharge 1,800 gpm. Reported irrigated 160 acres in 1950.
621	do	do	1949	150	--	--	36.2 68.1	Oct. 10, 1949 Jan. 21, 1964	T,Ng	Irr	Reported irrigated 160 acres in 1950. Pump set at 110 ft. 2/
622	do	-- Nordyke	1951	160	--	--	37.3 64.5	Apr. 10, 1951 Jan. 21, 1964	T,G, 30	Irr	Reported irrigated 80 acres in 1951. Pump set at 110 ft.
623	Norris Raymond	Johnny Stone	1949	150	--	--	--	--	T,Ng	Irr	Reported irrigated 155 acres in 1950. Pump set at 90 ft. in 1955.
* 801	Mrs. Emma Lawrence	-- Nordyke	1950	140	--	--	43.5 65.1	Apr. 5, 1951 Jan. 21, 1964	T,G	Irr	Reported irrigated 140 acres in 1951. Pump set at 80 ft. Observation well. Temp. 69°F.
* 802	Roy Smith	Smith Machine Co.	1946	150	--	--	64.5	Jan. 14, 1964	T,Ng	Irr	Reported irrigated 150 acres in 1950-51. Pump set at 70 ft. Temp. 65°F. 2/
803	Mrs. Emma Lawrence	Mick Fullingim	1952	135	10	--	55.4 58.2	June 28, 1955 Jan. 21, 1964	T,Ng	Irr	Pump set at 100 ft.
804	Roy Smith	do	1954	135	--	--	57.5	June 28, 1955	T,Ng	Irr	
805	Kyle Adams	do	1952	135	--	--	--	--	T,Ng	--	Estimated discharge 1,400 gpm. Pump set at 100 ft.
* 806	Roy F. Smith	-- Nordyke	1950	150	--	--	43.1	Apr. 5, 1951	T,Ng	--	Reported irrigated 140 acres in 1951. Pump set at 80 ft. Temp. 69°F.
807	Joe F. Woosley	Smith Machine Co.	1946	140	--	--	64.5	Jan. 21, 1964	T,Ng	Irr	Reported irrigated 160 acres in 1950-51. Pump set at 70 ft. 2/
808	Roy Smith	Mick Fullingim	1954	150	--	--	57.9 54.4	June 28, 1955 Jan. 25, 1956	T,Ng	--	Drilled for irrigation, but never used. Observation well.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-26-08-809	Roy Smith	-- Nordyke	1950	140	--	--	--	--	T,Ng	--	Reported irrigated about 150 acres in 1951. Pump set at 80 ft.
	901	F. W. Hancock	L. A. Higginbotham & Co.	1949	150	16	--	37.1 55.1	Apr. 10, 1951 Feb. 6, 1964	T,Ng	Irr	Reported irrigated 150 acres in 1950-51. Pump set at 70 ft.
	902	J. M. Coats	Parker Drilling Co.	1949	150	16	--	30	1950	T,G	Irr	Reported sufficient supply of water to irrigate about 200 acres. Pump set at 70 ft.
	903	do	C. Parker	1949	150	16	--	52.1 63.5	June 28, 1955 Jan. 24, 1964	T,Ng	Irr	Well unused.
	904	do	--	1946	150	--	--	--	--	T,G	Irr	Reported irrigated 120 acres in 1950-51. Pump set at 80 ft.
*	905	Mrs. J. M. Crow	--	1949	145	18	--	38.7 67.6	Oct. 7, 1949 Feb. 6, 1964	T,E, 50	Irr	Measured 24.1 ft drawdown after 30 hours at 1,303 gpm. 2/
*	906	Travis Pharr	-- Nordyke	1949	150	16	--	--	--	T,Ng	Irr	Reported irrigated 160 acres in 1950-51. Pump set at 80 ft. Temp. 67°F.
	907	do	Mick Fullingim	1956	160	--	--	--	--	T,Ng	--	
*	908	W. V. Lawrence	-- Nordyke	1951	150	16	--	35	1951	T,Ng	Irr	Reported irrigated 80 acres in 1951. Pump set at 80 ft. Temp. 65°F.
	909	do	Higginbotham Land Co.	1949	150	16	--	--	--	T,Ng	--	Reported irrigated 100 acres in 1950-51. Pump set at 80 ft.
*	910	Frank Freeman	Mick Fullingim	1948	160	--	--	--	--	T,Ng	Irr	Temp. 68°F.
	911	do	-- Nordyke	1949	160	--	--	--	--	T,E, 30	Irr	Reported irrigated 16 acres in 1950-51. Pump set at 80 ft. Well caved in 1949.
*	912	W. V. Lawrence	Higginbotham Land Co.	1949	150	16	--	43.6 60.5	Apr. 6, 1951 Jan. 21, 1964	T,E, 50	Irr	Reported irrigated 120 acres in 1950-51. Pump set at 80 ft. Temp. 65°F.
	913	Jackie McMillian	do	1949	150	16	--	--	--	T,E, 50	Irr	Reported irrigated 150 acres in 1950-51. Pump set at 70 ft.
	914	Higginbotham Cattle Co.	Parker Drilling Co.	1952	180	--	--	--	--	T,Ng	Irr	Reported discharge 2,000 gpm.
*	915	do	--	1946	140	--	--	--	--	T,Ng	Irr	Estimated discharge 2,000 gpm. Reported irrigated 142 acres in 1950-51. Pump set at 85 ft. Temp. 66°F.
	916	do	Parker Drilling Co.	1955	180	--	--	--	--	T,Ng	Irr	Reported discharge 2,000 gpm.
*	917	do	do	1962	180	--	--	--	--	T,Ng	Irr	Temp. 65°F.
	918	do	--	1958	180	--	--	71.9	Jan. 21, 1964	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*	KD-26-08-919	Higginbotham Cattle Co.	Parker Drilling Co.	1962	173	--	--	--	--	T,Ng	Irr	Temp. 66°F.
	16-201	Carmon Stafford	Abbott Bros.	1961	200	16	--	--	--	T,Ng	Irr	
	202	do	do	1961	200	14	--	--	--	T,Ng	Irr	
*	203	do	do	1962	200	16	--	--	--	T,Ng	Irr	Temp. 67°F.
	204	do	do	1961	200	14	--	--	--	T,Ng	Irr	
	205	Jerry Andrews	Hester Drilling Co.	1962	154	14	--	41.8	Jan. 25, 1963	T,Ng	Irr	
	206	Joe Brooks	do	1961	175	14	--	--	--	T,Ng	Irr	
*	207	Fred S. Barrett, Jr.	Mick Fullingim	1962	205	16	--	75.0	Jan. 6, 1964	T,Ng	Irr	Measured 10.5 ft of drawdown after 12 hours at 593 gpm.
*	208	do	do	1962	205	16	--	--	--	T,Ng	Irr	Temp. 66°F.
*	209	do	do	1961	205	16	--	57.0	Jan. 6, 1964	T,Ng	Irr	Measured 9.8 ft of drawdown after 12 hours at 519 gpm. Temp. 66°F.
	210	Higginbotham Cattle Co.	--	--	--	--	3,628	50.9	do	C,W	S	
	301	Jerry Andrews	Hester Drilling Co.	1962	139	14	--	--	--	T,Ng	Irr	
	302	Joe Brooks	do	1961	160	14	--	--	--	T,Ng	Irr	
*	303	Carmon Stafford	Abbott Bros.	1962	175	14	--	--	--	T,Ng	Irr	
*	304	do	do	1962	175	14	--	--	--	T,Ng	Irr	
*	305	do	do	1962	175	14	--	68.4	Jan. 6, 1964	T,Ng	Irr	Temp. 67°F.
*	306	do	do	1962	175	14	--	--	--	T,Ng	Irr	
	307	O. B. Whiteside	-- Boohne	1961	170	14	--	82.1	Jan. 6, 1964	T,Ng	Irr	Equipped with Valley sprinkler.
*	308	do	do	1961	170	14	--	--	--	T,Ng	Irr	Equipped with Valley sprinkler. Temp. 67°F.
*	309	Fred S. Barrett, Jr.	Mick Fullingim	1961	205	16	--	--	--	T,Ng	Irr	Temp. 66°F.
*	310	O. B. Whiteside	-- Boohne	1960	160	14	--	--	--	T,Ng	Irr	Unable to measure water level in 1964. Temp. 66°F.
	311	do	do	1960	160	14	--	--	--	T,Ng	Irr	
	312	do	do	1961	160	14	--	--	--	T,Ng	Irr	
*	501	O. D. Poole	--	--	--	--	--	74.9	Feb. 8, 1951	T,-	Irr	Reported discharge dropped off in summer of 1950. Observation well.
	502	Fred Barrett, Jr.	Parker Drilling Co.	1963	--	--	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-26-16-503	Fred Barrett, Jr.	Barker Drilling Co.	1963	--	--	--	--	--	T,Ng	Irr	
	504	do	do	1963	--	--	--	--	--	T,Ng	Irr	
*	505	Duncan & Conine	Mick Fullingim	--	150	6	--	57.8	Jan. 25, 1963	T,Ng	Irr	
*	506	do	do	1962	150	6	--	--	--	T,Ng	Irr	
	507	James Green	-- Starr	1960	170	--	--	--	--	T,Ng	Irr	
*	508	do	do	1960	170	--	--	57.3	Jan. 6, 1964	T,Ng	Irr	
	509	--	--	--	--	--	--	81.3	do	T,Ng	Irr	
	510	D. G. Chiles	-- Nordyke	1950	170	--	--	--	--	T,Ng 250	Irr	Pump set at 145 ft.
	601	A. L. Goode	--	--	--	--	3,584	45.9	Apr. 10, 1958	C,W	D,S	
	602	Fred Barrett, Jr.	Parker Drilling Co.	1963	--	--	--	--	--	T,Ng	Irr	
	603	do	Mick Fullingim	1960	205	16	--	54.8	Jan. 10, 1963	T,Ng	Irr	
*	604	do	do	1960	205	16	--	--	--	T,Ng	Irr	Temp. 66°F.
*	605	John W. Black	--	1951	180	24	--	57.1	Jan. 6, 1964	T,G	Irr	Measured 22 ft drawdown after 30 hours at 859 gpm.
	606	James Green	Parker Drilling Co.	--	--	--	--	--	--	T,Ng	Irr	
*	607	do	do	1960	--	--	--	--	--	T,Ng	Irr	
	608	D. V. Goode	do	1954	180	16	--	--	--	T,G	Irr	
*	801	Bill Cole	A. J. Nordyke	--	136	14	--	--	--	T,Ng	--	Pump set at 100 ft. Temp. 66°F. 1/
*	802	do	do	1951	150	16	--	68	May 1951	T,Ng	--	Reported irrigated 90 acres in 1951. Pump set at 114 ft.
	901	D. G. Chiles	Parker Drilling Co.	1957	180	14	--	--	--	T,G	Irr	
*	902	do	do	1955	180	--	--	51.1	Jan. 6, 1964	T,G	Irr	
	903	C. P. Roland	-- Nordyke	1949	137	--	--	60	Jan. 1951	T,Ng	Irr	Reported irrigated 50 acres in 1951. Pump set at 110 ft.
	904	do	do	1948	--	--	--	--	--	T,Ng	Irr	Reported irrigated 80 acres in 1951. Pump set at 100 ft.
	905	G. W. Jones	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 67°F.
*	906	do	--	--	--	--	--	54.7	Jan. 25, 1963	T,Ng	Irr	Temp. 66°F.
	24-201	V. G. Cook Estate	--	--	--	--	3,593	69.3	Feb. 8, 1951	T,G	N	Observation well.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-26-24-202	Bracken Estate	--	1954	--	--	--	62.0	Jan. 6, 1964	T,G	Irr	Temp. 66°F.
301	V. G. Cook	--	--	--	--	--	--	--	N	N	Abandoned.
* 302	J. W. B. Houston	-- Barton	1961	150	4	--	91.2	Jan. 6, 1964	T,G	Irr	Measured 5.8 ft of drawdown after 6 hours at 310 gpm Temp. 66°F.
* 303	Draper & Dupree	--	1964	--	--	--	67.8	do	T,Ng	Irr	Do.
* 304	Mrs. Victor G. Cook	--	1962	155	14	--	--	--	T,Ng	Irr	Pump set at 120 ft. Temp. 66°F.
305	do	--	--	155	14	--	--	--	T,Ng	Irr	
* 501	Phillips Pipeline Co.	Ed Burke	--	165	8	--	--	--	T,E, S	D,Ind	Estimated discharge 40 gpm. Pump set at 105 ft.
* 502	J. V. Hogg	-- Boohne	1959	120	16	--	54.5	Jan. 6, 1964	T,Ng	Irr	Measured 41 ft of drawdown after 6 days at 765 gpm. Pump set at 100 ft. Temp. 67°F.
* 503	do	do	1959	120	16	--	55.3	Jan. 10, 1963	T,Ng	Irr	Temp. 69°F.
* 504	Freeman & Moore	-- Stone	1960	140	16	--	--	--	--	Irr	Temp. 67°F.
505	do	do	1960	145	16	--	--	--	T,Ng	Irr	Reported not pumped until season of 1962.
506	Beckham & Norman	Parker Drilling Co.	1962	151	14	--	--	--	T,Ng	Irr	Casing perforated 58 ft.
* 601	Mrs. Victor G. Cook	--	1962	170	--	--	58.4	Jan. 6, 1964	T,Ng	Irr	Pump set at 110 ft.
602	do	--	--	155	14	--	--	--	T,Ng	Irr	
* 603	do	--	--	155	14	--	--	--	T,Ng	Irr	Temp. 67°F.
* 801	Jack Hamilton	Jack Guffey	1962	150	14	--	--	--	T,Ng	Irr	Casing perforated 90 ft. Temp. 67°F.
802	do	do	1962	150	14	--	52.5	Jan. 6, 1964	T,Ng	Irr	
* 901	G. R. Chandler	Steward & Stevenson	1959	140	--	--	--	--	T,Ng	Irr	
* 32-301	Lon Hill	-- Barton	1962	100	16	--	54.3	Jan. 7, 1964	T,G	Irr	Pump set at 75 ft. Temp. 68°F.
302	do	Parker Drilling Co.	1963	94	14	--	--	--	T,G	Irr	Casing perforated 20 ft. [1]
* 501	Hoot Greenwood	--	--	47	--	--	--	--	C,W	S	Estimated discharge 4 gpm. Temp. 66°F.
* 27-01-401	W. H. Wise	Mick Fullingim	1951	160	--	--	48.0 51.1	June 30, 1955 Jan. 21, 1964	T,G	Irr	Reported discharge 1,500 gpm. Pump set at 90 ft. Temp. 65°F.
* 402	do	-- Barton	1960	122	--	--	--	--	T,G	Irr	Pump set at 115 ft. Temp. 65°F.
403	M. M. Collins	--	1955	185	--	--	--	--	T,Ng	Irr	Reported discharge 1,200 gpm.
404	do	--	1955	150	--	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-01-405	J. D. Phipps	Johnny Sparks	1948	180	--	--	--	--	T,E, 50	Irr	Reported irrigated 80 acres in 1951. Pump set at 110 ft.
* 406	Wylie D. Freeman	Mick Fullingim	1955	150	--	--	48.3 56.6 58.6	July 13, 1955 Nov. 26, 1962 Jan. 24, 1964	T,G	Irr	Measured discharge 548 gpm. Has not been pumped for sometime, ditches dry and well partially sanded up. Temp. 68°F.
407	Virgil Phipps	--	1955	153	--	--	--	--	T,Ng	Irr	Estimated discharge 1,400 gpm.
* 408	do	Johnny Sparks	1948	180	--	--	--	--	T,Ng	Irr	Reported irrigated 70 acres in 1951. Pump set at 114 ft. Temp. 65°F.
409	--	J. H. Flippo	1951	--	--	--	--	--	T,Ng	Irr	
410	--	do	1950	--	--	--	--	--	T,Ng	Irr	Reported irrigated 120 acres in 1951. Measured discharge 718 gpm. Pump set at 110 ft.
* 411	J. R. Strain	Mick Fullingim	1953	180	6	--	60	1953	T,Ng	Irr	Measured discharge 1,009 gpm. Pump set at 140 ft. Temp. 66°F.
* 412	C. E. Hilburn	H. D. Hillard	1948	665	18	--	34.0 57.8	Feb. 8, 1951 Jan. 21, 1964	T,Ng	Irr	Estimated discharge 1,600 gpm. Pump set at 80 ft. Not pumped recently. Temp. 65°F.
* 413	W. H. Wise	Mick Fullingim	1952	160	--	--	--	--	T,Ng	Irr	Reported discharge 1,500 gpm. Temp. 65°F.
414	do	-- Barton	1954	150	--	--	--	--	T,Ng	Irr	Estimated discharge 1,200 gpm.
501	Virgil Phipps	J. H. Flippo	1951	196	16	--	--	--	T,Ng	--	Pump set at 114 ft.
* 502	-- Hill	do	1950	100	--	--	70.5 83.5	Feb. 8, 1951 Jan. 14, 1964	T,Ng	Irr	Measured discharge 802 gpm. Reported irrigated 168 acres in 1951. Temp. 66°F.
503	D. W. Ashburn	--	--	--	--	--	77.6	Sept. 11, 1962	T,Ng	--	
504	--	J. H. Flippo	1950	180	--	--	--	--	T,Ng	Irr	Reported irrigated 100 acres in 1951. Pump set at 110 ft.
* 505	Carlice Edwards	Dub Dulin	1957	147	--	--	--	--	T,Ng	Irr	Measured discharge 600 gpm. Temp. 66°F.
* 506	J. R. Strain	Johnny Sparks	1949	180	--	--	71.3 90.5	July 8, 1955 Jan. 21, 1964	T,Ng	Irr	Measured discharge 410 gpm. Reported irrigated 120 acres in 1951. Pump set at 110 ft. Temp. 66°F.
507	J. D. Phipps	do	1948	180	--	--	--	--	T,E, 50	Irr	Reported discharge 1,550 gpm. Reported irrigated 150 acres in 1950-51. Pump set at 110 ft.
* 508	do	do	1948	180	--	--	--	--	T,G	Irr	Measured discharge 650 gpm. Reported irrigated 80 acres in 1950-51. Pump set at 110 ft. Temp. 69°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-01-509	Southwestern Public Service Co.	D. L. McDonald	1954	183	14	--	60	1954	T,E	Ind	Reported discharge 350 gpm. Temp. 60°F.
* 510	do	do	1954	195	14	--	86.4	Nov. 20, 1962	T,E, 40	Ind	Measured 74.1 ft of drawdown after 21 days at 273 gpm. Temp. 69°F.
* 511	do	--	--	--	12	--	--	--	T,E, 40	Ind	Abandoned oil test; converted to water well. Reported discharge 600 gpm. Temp. 69°F.
512	do	D. L. McDonald	1952	192	--	--	--	--	T,E, 30	Ind	Reported discharge 150 gpm. Pump set at 165 ft.
* 513	do	do	1948	193	12	--	61	Oct. 1948	T,E	Ind	Measured discharge 500 gpm. Drawdown 25 ft. after pumping 24 hours. Temp. 68°F. 1/
* 514	E. J. Mitchell	Johnny Stone	1951	180	--	--	99.6 99.2	Jan. 16, 1963 Jan. 21, 1964	T,Ng	Irr	Reported irrigated 100 acres in 1951. Pump set at 110 ft. Temp. 66°F. 2/
515	J. M. Fields	--	1952?	135	15	--	--	--	T,G	Irr	Estimated discharge 1,400 gpm. Pump set at bottom.
516	-- Hill	Dub Dulin	1955	180	--	--	--	--	T,G	Irr	Pump set at 130 ft.
517	--	Johnny Spovies	1949	180	--	--	--	--	T,E, 50	Irr	Reported irrigated 100 acres in 1951. Pump set at 110 ft.
* 518	Virgil Phipps	J. H. Flippo	1950	180	--	--	--	--	T,G	Irr	Reported irrigated 80 acres in 1951. Pump set at 100 ft. Temp. 66°F.
519	-- Hill	Dub Dulin	1955	150	--	--	88.7	July 11, 1955	T,Ng	Irr	
* 520	Shell Oil Co.	Layne-Texas Co.	1956	312	18	--	83	1956	T,E, 30	Ind	Reported 15.5 ft of drawdown after 8 hours at 406 gpm. Temp. 70°F.
* 521	do	do	1950	280	10	3,606	63	Mar. 1950	T,E, 30	Ind	Reported discharge 300 gpm. Drawdown 62 ft. after 24-hours pumping about 300-310 gpm. Temp. 69°F.
522	do	do	1949	282	3	3,608	54 59.6 81.4	1949 July 15, 1955 Jan. 21, 1964	N	N	Test hole for Shell Oil Co. Observation well.
601	Southwestern Public Service Co.	D. L. McDonald	1948	143	10	--	63.1 84.4	Apr. 12, 1949 Dec. 31, 1963	--	--	Observation well.
* 602	do	George Taylor	1948	170	12	--	73	Aug. 1961	T,E, 20	Ind	Temp. 67°F.
* 603	do	do	1948	182	--	--	66	1948	T,E	Ind	Reported discharge 350 gpm in 1949. Temp. 69°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-01-604	Southwestern Public Service Co.	-- Willis	1947	151	17	--	51	1948	T,E, 120	Ind	Reported irrigated 80 acres in 1951. Pump set at 100 ft. Temp. 67°F.
* 605	do	D. L. McDonald	1948	184	12	--	65	June 1948	T,E	Ind	Reported discharge 265 gpm. Drawdown 81 ft. after 24-hours pumping at 350 gpm. Pump set at 155 ft. Temp. 69°F.
* 606	do	George Taylor	1948	200	14	--	--	--	T,E, 20	Ind	Reported discharge 20 gpm. Temp. 70°F.
607	Powell & Couch	--	1950	--	--	--	--	--	T,G	Irr	Pump set at 100 ft. Reported seldom used.
608	do	J. H. Flippo	1954	--	--	--	--	--	T,G	Irr	Pump set at 110 ft. Reported seldom used.
609	Odis Horner	Dave Anderson	1952	200	17	--	--	--	T,G	Irr	Reported discharge on test 1,250 gpm. Pump set at 140 ft.
610	-- Nobles	Parker Drilling Co.	1963	187	16	--	--	--	T,G	Irr	
611	do	Raymond Parker	1955	175	--	--	--	--	T,G	Irr	
* 612	Shell Oil Co.	Layne-Texas Co.	1950	290	10	3,603	65	Feb. 1950	T,E, 30	Ind	Reported discharge 310 gpm. Drawdown 91 ft. after 24-hours pumping 310 to 320 gpm. Used at gasoline refinery. Temp. 69°F.
* 701	Jack McMillian	--	--	--	--	--	43.1 51.1	June 30, 1955 Jan. 14, 1964	T,Ng	Irr	Reported to be used as irrigation well in future. Temp. 68°F.
702	do	H. D. Hillard	1948	164	18	--	32.4 50	Feb. 8, 1951 June 1955	T,Ng	Irr	Measured discharge 1,600 gpm. Drawdown 20 ft. after 20-minutes pumping at 2,100 gpm.
* 703	C. E. Hilburn	--	--	--	--	--	--	--	T,Ng	Irr	Measured discharge 1,165 gpm. Temp. 67°F.
704	J. R. Walker	--	1952	--	--	--	41.5 43.2	June 30, 1955 Jan. 21, 1964	T,E, 30	Irr	Reported discharge 900 gpm.
* 705	Higginbotham Cattle Co.	--	1910	60	6	--	32.7 37.5	July 7, 1955 Jan. 21, 1964	C,W	S	Well 16 in Gaines County 1946 report. Temp. 67°F.
* 901	Shell Oil Co.	Layne-Texas Co.	1950	267	10	--	54	Mar. 1950	T,E, 30	Ind	Reported discharge 320 gpm. Drawdown 40 ft. after ½-hour pumping 460 gpm. Temp. 68°F.
* 902	Higginbotham Cattle Co.	Parker Drilling Co.	1952	180	16	--	57.9	Jan. 22, 1964	T,Ng	Irr	Measured discharge 775 gpm.
* 903	do	do	1954	180	--	--	--	--	T,Ng	Irr	Measured discharge 820 gpm. Pump set at 120 ft. Temp. 68°F.
904	do	--	1931	90	8	3,573	55.4 68.0	Nov. 10, 1945 Feb. 6, 1964	N	N	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-01-905	Shell Oil Co.	Layne-Texas Co.	1949	292	3	3,569	56.2 56.9 65.0	May 17, 1955 July 15, 1955 Jan. 22, 1964	N	N	
02-401	Benny Miller	-- Lamb	1946	--	--	--	--	--	T,-	N	Pump set; covered with sand, unused for several years.
* 402	Pete Garcia	Pete Flippo	1950	177	17	--	--	--	T,Ng	Irr	Estimated discharge 1,000 gpm. Pump set at 150 ft. Temp. 66°F.
403	A. J. Noble	--	--	170	--	--	83.8 83.7 83.9	July 8, 1955 Dec. 20, 1962 Jan. 22, 1964	T,Ng	Irr	
* 501	W. M. Moore	-- Dolin	1954	168	16	--	76.9 73.1 74.4	Jan. 26, 1956 Nov. 30, 1962 Jan. 14, 1964	T,G	N	Observation well. Obstruction at 90 ft.
* 502	D. B. Black	D. Luling	1953	170	--	--	75	1955	T,Ng	Irr	Pump set at 135 ft. Temp. 66°F.
* 503	do	do	1953	170	--	--	75	1955	T,Ng	Irr	Do.
* 504	do	do	1953	170	--	--	--	--	T,G	Irr	Reported discharge 1,100 gpm. Pump set at 135 ft. Temp. 68°F.
505	do	Mick Fullingim	1962	160	18	--	--	--	T,Ng	Irr	
506	do	D. Luling	1953	170	--	--	75 111.3	1955 Feb. 6, 1964	T,Ng	Irr	Reported discharge 1,100 gpm. Pump set at 135 ft.
507	Olen Mathers Estate	Joe Skaggs	1951	165	16	--	70.6 102.1 104.2	Apr. 4, 1951 Jan. 9, 1963 Jan. 22, 1964	T,Ng	Irr	
601	Buff Ivey	J. H. Chumley	1962	151	10	--	--	--	T,G	Irr	
602	Olen Mathers Estate	J. H. Flippo	1952	150	16	--	--	--	T,G	Irr	
* 603	do	Mick Fullingim	1955	196	--	--	--	--	T,G	Irr	Pump set at 162 ft. Temp. 66°F.
* 604	do	Stewart & Stevenson	1956	170	16	--	--	--	T,Ng	Irr	Do.
605	do	J. B. Knight	1951	156	16	--	70	1951	--	Irr	Pump set at 120 ft.
* 606	Forest Savage	Mick Fullingim	1956	150	16	--	99.2	Jan. 3, 1963	T,Ng	Irr	
607	Willie C. Sweatt	Stewart & Stevenson	1955	185	16	--	--	--	T,Ng	Irr	Reported discharge 900 gpm. 1/
* 608	D. D. Dennison	--	1962	--	16	--	--	--	--	Irr	Reported on meter test 850 gpm. Temp. 68°F.
* 701	Roy W. Gibson	S. Garrett	1951	188	14	--	63.4 67.7	Jan. 26, 1956 Jan. 14, 1964	T,G	Irr	Observation well. Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-02-702	Roy W. Gibson	S. Garrett	1957	138	--	--	--	--	T,G	Irr	
* 703	R. L. Burnett	Western Pump & Supply Co.	1955	165	16	--	61.2	Jan. 22, 1964	T,Ng	Irr	Reported discharge 800 gpm. Drawdown 64½ ft. after 1-hour pumping 1,030 gpm. Pump set at 140 ft. Temp. 65°F.
704	do	-- Skaggs	1962	172	14	--	--	--	T,Ng	Irr	
* 705	do	do	1962	172	14	--	--	--	T,Ng	Irr	Temp. 66°F.
* 801	J. R. Cheyne	--	1955	160	16	--	80.6	Jan. 22, 1964	T,G	Irr	Pump set at 140 ft; reported pumps sand. Temp. 66°F.
802	Glen Hennington	--	--	160	16	--	--	--	T,G	Irr	Pump set at 120 ft.
* 803	J. R. Cheyne	J. H. Flippo	1963	182	16	--	--	--	T,G	Irr	Pump set at 120 ft. Temp. 67°F.
804	Thurman Skains	--	--	--	--	--	--	--	T,Ng	Irr	
805	do	--	--	--	--	--	98.9	Jan. 22, 1964	T,Ng	Irr	
* 806	Pat Hutchins	--	1962	--	--	--	--	--	T,Ng	Irr	Estimated discharge 600 gpm. Equipped with Valley sprinkler. Temp. 69°F.
807	Thurman Skains	H. D. White & Co.	1962	190	16	--	--	--	T,Ng	Irr	
808	do	do	1962	192	16	--	--	--	T,Ng	--	
* 809	do	do	1962	186	16	--	--	--	T,Ng	Irr	Temp. 67°F.
* 810	Tom Killiam	Ted Koonce	1961	172	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 901	M. B. Pate	J. C. Stone	1951	141	16	--	80.6	Jan. 22, 1964	--	Irr	Do.
902	C. M. Brown	--	--	145	16	--	77.8 87.2	June 29, 1955 Jan. 4, 1963	T,G	Irr	
903	do	--	1953	145	16	--	--	--	T,G	Irr	Pump set at 145 ft.
* 904	G. E. Cave	--	1955	168	--	--	105	1955	T,Ng	Irr	Pump set at 150 ft. Temp. 66°F.
* 905	J. E. Garnett	Ted Koonce	1959	182	14	--	103.3	Jan. 22, 1964	T,Ng	Irr	Temp. 66°F.
* 906	I. E. Dodd	Smith & Parker	1952	194	--	--	--	--	T,Ng	Irr	Reported red beds at 188 ft. Temp. 66°F.
907	Forest Savage	Smith Machinery Co.	1955	192	16	--	--	--	T,Ng	Irr	Pump set at 189 ft.
* 03-401	Grady Turner	J. H. Chumley	1963	152	16	--	--	--	T,Ng	Irr	Reported discharge 800 gpm. Pump set at 148 ft. Temp. 66°F.
402	Luther Kirk	--	--	--	--	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-03-403	Luther Kirk	--	--	--	--	--	--	--	T,Ng	Irr	
* 404	do	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 65°F.
405	do	--	--	--	--	--	104.6	Jan. 24, 1964	T,Ng	Irr	
* 406	do	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 65°F.
* 407	Don Nelson	L. D. Proctor	1957	178	16	--	102.6	Jan. 24, 1964	T,Ng	Irr	Temp. 67°F.
* 408	do	Karr Pump & Pipe Supply Co.	1958	168	16	--	--	--	T,Ng	Irr	Temp. 68°F.
409	Wm. L. Hibbitts	J. W. Flippo	1956	168	16	--	114	1956	--	Irr	Reported discharge 810 gpm. Pump set at 150 ft.
* 501	B. Fancher	--	1949	146	16	--	95.3 101.8	Jan. 26, 1956 Jan. 14, 1964	T,G	Irr	Observation well. Temp. 67°F.
* 502	George Shumake	Dave Anderson	1954	155	18	--	--	--	T,Ng	Irr	Temp. 66°F.
* 503	Frank Ratliff	--	1959	175	16	--	--	--	T,Ng	Irr	Pump set at 169 ft. Temp. 66°F.
* 504	Woody Smith	--	1959	166	16	--	--	--	T,Ng	Irr	Reported discharge 1,050 gpm. Pump set at 155 ft. Temp. 65°F.
505	Frank Ratliff, Jr.	--	1959	175	16	--	--	--	T,Ng	Irr	
506	do	F. B. Skaggs	1963	175	16	--	--	--	T,Ng	Irr	Pump set at 169 ft.
507	do	do	1959	175	16	--	108.0	Jan. 24, 1964	T,Ng	Irr	Do.
* 508	do	do	1963	165	14	--	--	--	T,Ng	Irr	Pump set at 169 ft. Temp. 66°F.
* 509	O. R. Trimble	--	1960	165	14	--	87.7	July 10, 1963	T,G	Irr	Temp. 66°F.
510	Criswell Bros.	W. F. Murphy Drilling Co.	1962	164	14	--	--	--	T,G	Irr	
* 511	Paul Morgan	Parker Drilling Co.	1957	165	14	--	--	--	T,Ng	Irr	Perforated 73 ft. Temp 65°F.
512	do	do	1960	147	14	--	--	--	T,Ng	Irr	Perforated 70 ft.
* 513	do	do	1962	165	14	--	109.7	Feb. 6, 1964	T,G	Irr	Perforated 60 ft. Temp. 65°F.
* 514	E. R. McBeath	--	1963	--	--	--	--	--	T,G	Irr	Temp. 66°F.
* 601	Jack Webb	Ted Koonce	1962	160	14	--	--	--	T,G	Irr	Do.
602	N. B. Fields	--	--	--	--	--	103.1	Feb. 6, 1964	T,G	Irr	
* 603	Mrs. -- Glenn	Parker Drilling Co.	1955	180	14	--	97.6	Jan. 24, 1964	T,G	Irr	Pump set at 165 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-03-604	Alton Billings	Ted Koonce	1960	166	14	--	101.9	Feb. 6, 1964	T,Ng	Irr	
* 605	J. H. McCullough	--	1953	160	16	--	--	--	T,Ng	Irr	Pump set at 150 ft. Temp. 65°F.
* 606	W. C. Gooding	Karr Pump & Pipe Supply Co.	1954	202	16	--	--	--	T,Ng	Irr	Temp. 66°F.
* 607	E. C. Harvey	--	--	199	--	--	132.5	Jan. 24, 1964	T,Ng	Irr	Temp. 65°F.
608	do	Ted Koonce	1962	199	--	--	--	--	T,Ng	Irr	
* 609	C. B. Knox	Joe Skaggs	1961	185	16	--	106.1	Jan. 24, 1964	T,Ng	Irr	Pump set at 165 ft. Temp. 70°F.
610	N. B. Fields	Karr Pump & Pipe Supply Co.	1959	180	16	--	--	--	T,Ng	Irr	Pump set at 170 ft.
611	do	do	1959	170	16	--	91.1	Jan. 24, 1964	T,Ng	Irr	Pump set at 160 ft.
* 612	do	Tricks Karr	1956	200	16	--	--	--	T,Ng	Irr	Pump set at 190 ft. Temp. 65°F.
613	Gilbert Bradley	Parker Drilling Co.	1959	185	14	--	--	--	T,Ng	Irr	Perforated 84 ft.
* 614	M. E. Peatree	Ted Koonce	1962	186	14	--	95.4	Jan. 24, 1964	T,Ng	Irr	Temp. 66°F. 1/
615	Jack Webb	--	1945	--	6	3,418	92.9	Nov. 6, 1945	C,W	N	
* 701	W. S. Wimberley	--	1953	140	16	3,448	76.8 86.0	Jan. 26, 1956 Jan. 14, 1964	T,-	Irr	Pump set at 135 ft. Observation well. Temp. 68°F.
* 702	S. J. Bruton	--	1953	207	14	--	--	--	T,G	Irr	Temp. 66°F.
703	John H. Guynes	C. L. Holder	1954	205	16	--	--	--	T,Ng	Irr	Perforated 40 ft.
704	Mrs. O. Bawcum	--	--	180	14	--	110.4	Jan. 24, 1964	T,Ng	Irr	
705	G. Goodpasture	J. H. Flippo	1955	146	16	--	--	--	T,Ng	Irr	Pump set at bottom.
* 706	do	Carl Johnson	1956	188	16	--	--	--	T,Ng	Irr	Temp. 66°F.
707	do	Pete Flippo	1955	145	16	--	91.8	Jan. 24, 1964	T,Ng	Irr	Pump set at 145 ft.
* 708	A. Moore	J. H. Flippo	1954	170	16	--	--	--	T,Ng	Irr	Temp. 66°F.
709	do	--	1962	150	14	--	--	--	T,Ng	Irr	
710	Sam Teague	--	1960	165	--	--	89.0	Jan. 24, 1964	T,Ng	Irr	
* 711	D. J. Bessire	J. H. Flippo	1962	173	--	--	75.4	do	T,E, 40	Irr	Pump set at 169 ft. Temp. 66°F.
* 712	W. S. Wimberley	--	1952	200	--	--	92.0 95.7	July 14, 1955 Jan. 24, 1964	T,Ng	Irr	Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-03-713	W. S. Wimberley	--	1954	--	16	--	--	--	T,Ng	Irr	Temp. 66°F.
* 714	S. W. Bailey	--	--	180	16	--	--	--	T,Ng	Irr	Do.
715	do	Joe Skaggs	1958	180	14	--	--	--	T,Ng	Irr	
716	Mrs. O. Bawcum	do	1957	180	14	--	--	--	T,Ng	Irr	
717	do	do	1955	180	14	--	--	--	T,Ng	Irr	
* 718	A. A. Bryan	Murphy Drilling Co.	1962	170	14	--	86.2	Jan. 24, 1964	T,Ng	Irr	Temp. 66°F.
* 719	do	--	1956	170	--	--	--	--	T,Ng	Irr	Pump set at 150 ft. Temp. 66°F.
720	S. W. Bailey	S. W. Bailey	1958	185	14	--	--	--	T,Ng	Irr	
721	Grady Goodpasture	--	1943	114	8	3,464	96.9	Nov. 6, 1945	N	N	
* 801	C. A. Moore	J. H. Flippo	1954	170	16	--	83.8 85.7	Jan. 16, 1963 Jan. 24, 1964	T,Ng	Irr	Temp. 67°F. 2/
* 802	Jim Ward	do	1954	170	16	--	86.4 88.7	Jan. 16, 1963 Jan. 24, 1964	T,Ng	Irr	Temp. 66°F. 2/
803	do	Murphy Drilling Co.	1962	170	14	--	--	--	T,Ng	Irr	
804	do	Grady Goodpasture	1961	170	14	--	--	--	T,Ng	Irr	
805	Beryle Crossland	Ted Koonce	1962	174	14	--	87.8	Jan. 24, 1964	T,Ng	Irr	
806	Cecil Dorman	--	1957	165	--	--	--	--	T,Ng	Irr	
807	do	Grady Goodpasture	1960	165	--	--	--	--	T,Ng	Irr	
808	Clyde Edwards	J. H. Flippo	1951	--	16	--	119.0 119.5	July 15, 1955 Jan. 24, 1964	T,G	Irr	
809	W. E. Berry, Jr.	Parker Drilling Co.	1962	173	14	--	--	--	T,Ng	Irr	
* 810	do	do	1962	182	14	--	86.2	Jan. 24, 1964	T,Ng	Irr	Temp. 66°F.
811	do	Grady Goodpasture	1959	178	14	--	--	--	T,Ng	Irr	
812	B. W. Edwards	J. H. Flippo	1958	158	16	--	--	--	T,Ng	Irr	Pump set at 145 ft.
* 813	Ribble & Walser	J. B. Knight	1960	170	12	--	--	--	T,G	Irr	
* 814	W. E. Berry, Jr.	Parker Drilling Co.	1960	185	14	--	--	--	T,Ng	Irr	Perforated 80 ft. Temp. 66°F.
815	do	do	1960	180	14	--	--	--	T,Ng	Irr	Perforated 100 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-03-901	W. L. Gary	-- Nordyke	1954	201	16	--	118.1 128.2	Jan. 26, 1956 Jan. 14, 1964	T,Ng	Irr	Pump set at 170 ft. Observation well. Temp. 69°F.
902	do	Ted Koonce	1963	204	14	--	--	--	T,Ng	Irr	
* 903	Jack Welch	do	1962	196	14	--	--	--	T,G	Irr	
904	do	Joe Skaggs	1951	190	--	--	--	--	T,Ng	Irr	
905	do	do	1954	190	--	--	--	--	--	Irr	
* 906	Tom Billings	--	--	180	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 907	Margaret Loe	J. H. Flippo	1956	191	16	--	120.8	Jan. 24, 1964	T,Ng	Irr	Do.
* 908	do	do	1955	196	16	--	--	--	T,Ng	Irr	Temp. 67°F.
* 909	Kenneth Hancock	--	1951	200	18	--	--	--	T,Ng	Irr	Pump set at 150 ft.
910	A. O. Petty	F. B. Skaggs	1953	167	16	--	--	--	T,G	Irr	
* 911	Troy Martin	J. H. Flippo	1955	197	16	--	100	1955	T,Ng	Irr	Reported discharge 800 gpm. Pump set at 190 ft.
912	Ruben Mills	Ted Koonce	1961	201	14	--	--	--	T,Ng	Irr	
* 913	do	do	1960	197	14	--	123.9	Jan. 24, 1964	T,Ng	Irr	Temp. 66°F.
914	V. W. Bates	J. H. Flippo	1956	185	14	--	--	--	T,Ng	Irr	
915	do	do	1956	186	14	--	--	--	T,Ng	Irr	
916	V. B. Hohn	--	1960	180	14	--	--	--	T,Ng	Irr	
* 917	do	Joe Skaggs	1957	180	14	--	--	--	T,Ng	Irr	
* 918	Bill Schroeder	J. H. Flippo	1953	193	16	--	--	--	T,Ng	Irr	Reported discharge 1,000 gpm. Temp. 66°F.
919	Ruben Mills	Ted Koonce	1960	196	14	--	--	--	T,Ng	Irr	
920	Ed McKee	Karr Pump & Pipe Supply Co.	1953	190	16	--	--	--	T,Ng	Irr	
921	do	Ted Koonce	1961	174	--	--	--	--	T,Ng	Irr	
922	Mrs. J. W. Wade	Wright & Thornton	1956	160	--	--	--	--	T,G	Irr	
04-401	E. C. Harvey	Ted Koonce	1962	195	14	--	112.8	Jan. 27, 1964	T,-	Irr	
* 402	Dale Hearn	do	1961	154	13	--	--	--	T,Ng	Irr	Temp. 69°F.
403	-- Jones	do	1960	157	--	--	79.5	Jan. 27, 1964	T,G	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-04-404	Columbian Carbon Co.	D. L. McDonald	1945	204	10	--	--	--	T,E, 10	D,Ind	Reported discharge 110 gpm.
* 501	John Flache	--	1955	--	--	--	65.9 77.6	Jan. 26, 1956 Jan. 14, 1964	T,G	Irr	Temp. 66°F.
502	Pacific & Santa Fe RR	--	--	--	--	--	73.2	June 25, 1937	N	N	Abandoned railroad well.
503	W. D. Alverson	--	1955	160	14	--	--	--	T,Ng	Irr	
* 504	City of Seagraves	Ted Koonce	1960	166	14	--	--	--	T,E	P	Casing slotted from 102 ft. to bottom.
* 505	do	J. H. Flippo	1949	168	16	--	--	--	T,E	P	Temp. 66°F.
* 506	do	W. A. Willis	1938	183	10	--	83.3	Aug. 9, 1938	T,E, 15	P	
* 507	do	J. H. Flippo	1953	--	--	--	--	--	T,E, 40	P	Reported discharge 600 gpm. Temp. 67°F.
508	Grady Goodpasture	Carl Johnson	1951	170	16	--	--	--	T,Ng	Irr	
* 509	Alton Billings	Ted Koonce	1960	166	14	--	72.7	Jan. 27, 1964	T,Ng	Irr	Temp. 67°F.
* 510	J. L. Brown	J. H. Chumley	1959	153	16	--	71.6	do	T,Ng	Irr	Pump set at 150 ft. Temp. 65°F.
* 511	Claude Reed	Grady Goodpasture	1960	164	16	--	--	--	T,Ng	Irr	Pump set at 160 ft. Temp. 65°F.
* 512	J. H. Flippo	J. H. Flippo	1956	160	16	--	94.3	Jan. 27, 1964	T,Ng	Irr	Pump set at 150 ft. Temp. 70°F.
513	D. Hearn	--	1921?	95	6	--	86.3 78.9	June 25, 1937 Feb. 11, 1964	C,W	S	
* 601	Claude Reed	J. H. Chumley	1963	174	14	--	--	--	T,Ng	Irr	Pump set at 150 ft. Temp. 65°F.
* 602	O. R. Perry	do	1952	230	16	--	--	--	T,Ng	Irr	Reported discharge 8 gpm. Temp. 66°F.
* 603	do	--	1958	230	16	--	127.0	Jan. 27, 1964	T,Ng	Irr	Temp. 66°F.
* 604	Earl Owens	-- Nordyke	1956	190	16	--	--	--	T,Ng	Irr	Pump set at 185 ft. Temp. 67°F.
605	J. H. Flippo	J. H. Flippo	1955	160	16	--	--	--	T,Ng	Irr	
606	do	do	1954	160	16	--	--	--	T,Ng	Irr	
607	Troy Martin	Grady Goodpasture	1959	170	16	--	--	--	T,Ng	Irr	
* 608	do	do	1960	170	16	--	--	--	T,Ng	Irr	Temp. 65°F.
609	do	do	1956	170	16	--	--	--	T,Ng	Irr	
* 610	R. R. Pelts	G & G Drilling Co.	1955	172	16	--	--	--	T,Ng	Irr	Reported discharge 8 gpm. Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-04-611	R. R. Pelts	--	1961	172	16	--	90.9	Jan. 27, 1964	T,Ng	Irr	Pump set at 166 ft. Temp. 66°F.
612	W. R. Stanley	--	--	110	--	--	--	--	T,Ng	Irr	Reported discharge 8 gpm. Pump set near bottom.
613	O. E. Perry	--	--	--	--	--	117.9 118.0	Aug. 18, 1938 Feb. 12, 1964	J,E	D	
* 701	T. E. Leverett	Eugene Riggs	1954	160	16	--	99.3	Jan. 27, 1964	T,Ng	Irr	
* 702	John D. Brown	Ted Koonce	1961	161	14	--	90.1	do	T,Ng	Irr	Temp. 65°F.
* 703	E. F. Riggs	J. H. Chumley	1957	150	16	--	95.0	Feb. 11, 1964	T,Ng	Irr	Temp. 66°F.
704	do	do	1962	150	14	--	--	--	T,Ng	Irr	
* 705	do	--	--	150	14	--	--	--	T,Ng	Irr	Temp. 66°F.
706	do	J. H. Chumley	1962	150	14	--	--	--	T,Ng	Irr	
* 707	Viola Browne	do	1959	160	14	--	--	--	T,Ng	Irr	Temp. 65°F.
708	Thad Patterson	Western Pump Co.	1961	187	--	--	--	--	T,Ng	Irr	
709	Dave Anderson	--	1952	150	--	--	--	--	T,Ng	Irr	
* 710	do	Joe Skaggs	1949	150	--	--	--	--	T,Ng	Irr	Pump set at 130 ft. Temp. 66°F.
711	Grady Goodpasture	Carl Johnson	1954	190	16	--	96.5	Jan. 27, 1964	T,Ng	Irr	
712	do	do	1959	168	16	--	87.5	Jan. 27, 1964	T,Ng	Irr	
713	do	do	1954	180	16	--	--	--	T,Ng	Irr	
714	do	do	1953	180	16	--	--	--	T,Ng	Irr	
* 715	do	do	1951	138	16	--	--	--	T,Ng	Irr	Temp. 66°F.
* 716	J. B. Cotten	Ted Koonce	1960	182	14	--	--	--	T,Ng	Irr	Temp. 65°F.
717	V. B. Hohn	--	--	180	14	--	--	--	T,Ng	Irr	Reported discharge 6 gpm.
718	J. B. Cotten	Ted Koonce	1962	172	14	--	--	--	T,G	Irr	
719	E. F. Riggs	--	1920	94	6	--	84.9	June 25, 1937	N	N	
801	-- Brown	--	1955	--	--	--	--	--	T,Ng	Irr	
802	John D. Browne	Ted Koonce	1961	165	14	--	--	--	T,Ng	Irr	1/
* 803	do	Karr Pump & Pipe Supply Co.	1954	178	16	--	116.3	Jan. 27, 1964	T,Ng	Irr	Temp. 66°F.

See footnotes at end of table.

Table 2.--Reports of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-04-804	J. H. McCullough	J. H. Chumley	1958	173	16	--	--	--	T,Ng	Irr	Pump set at 160 ft. Temp. 66°F.
* 805	do	--	1956	174	16	--	115.9	Jan. 27, 1964	T,Ng	Irr	Measured 27.9 ft of drawdown after 12 hours at 350 gpm. Pump set at 165 ft. Temp. 66°F.
* 806	Sam Teague	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
807	Grady Goodpasture	Carl Johnson	1954	168	16	--	--	--	T,Ng	Irr	
808	do	--	1950	170	16	--	--	--	T,Ng	Irr	
809	do	Carl Johnson	1954	168	16	--	--	--	T,Ng	Irr	
810	do	Lawrence Lusby	1950	196	16	--	--	--	T,Ng	Irr	Pump set at 148 ft.
811	do	Carl Johnson	1954	190	16	--	--	--	T,Ng	Irr	
* 812	do	do	1954	190	16	--	--	--	T,Ng	Irr	Temp. 66°F.
813	do	do	1953	201	16	--	--	--	T,Ng	Irr	
814	Robert Draper	--	--	--	--	--	117.0	Jan. 27, 1964	T,Ng	Irr	
* 815	M. M. Hanel	--	1953	123	16	--	94.6	do	T,G	Irr	Pump set at 120 ft. Temp. 66°F.
816	Troy S. Martin	Billington Implement Co.	1954	158	16	--	--	--	T,Ng	Irr	Estimated discharge 800 gpm. Pump set at 140 ft.
* 901	Edgar R. Reed	Karr Pump & Pipe Supply Co.	1958	214	14	--	104.5	Jan. 27, 1964	T,Ng	Irr	Estimated discharge 800 gpm. Pump set at 190 ft. Temp. 66°F.
902	H. R. Tankersley	J. B. Knight	1958	200	16	--	98.5	do	T,Ng	Irr	Pump set at 160 ft.
* 903	do	do	1962	200	16	--	--	--	T,Ng	Irr	Pump set at 170 ft. Temp. 66°F.
* 904	do	do	1961	200	16	--	--	--	T,Ng	Irr	Temp. 66°F.
* 905	J. E. Neeley	Cowboy Fuller	--	195	16	--	--	--	T,Ng	Irr	Temp. 65°F.
* 906	do	-- Skaggs	--	197	16	--	--	--	T,Ng	Irr	Temp. 66°F.
907	V. H. Williams	J. H. Chumley	1955	170	16	--	--	--	T,Ng	Irr	
908	do	-- Jones	1962	175	16	--	--	--	T,Ng	Irr	
909	do	Speed Murphy	1961	175	16	--	--	--	T,Ng	Irr	
* 910	do	J. B. Knight	1961	175	16	--	--	--	T,Ng	Irr	Temp. 66°F.
911	do	F. B. Skaggs	1962	166	14	--	--	--	T,Ng	Irr	
* 912	do	do	1951	145	16	--	--	--	T,Ng	Irr	Temp. 66°F.

See foornotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-04-913	J. E. Neeley	F. B. Skaggs	--	195	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 914	do	do	--	204	--	--	--	--	T,Ng	Irr	Do.
* 915	R. A. Noret	--	1955	189	--	--	98.0	Jan. 27, 1964	T,Ng	Irr	Do.
916	do	--	1962	155	14	--	--	--	T,Ng	Irr	Pump set at 155 ft.
* 917	do	--	1955	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 05-401	Harlan Miller	Wright & Thornton	1955	137	14	--	58.7 68.5	Jan. 25, 1952 Jan. 14, 1964	T,Ng	Irr	Pump set at 133 ft. Observation well. Temp. 68°F.
402	E. W. Cope	Jones & Pierson	1962	--	--	--	--	--	T,G	Irr	Pump set at 160 ft.
* 403	Carl Golden	Joe Skaggs	1958	145	14	--	89.2	Jan. 28, 1964	T,Ng	Irr	Pump set at 140 ft. Temp. 65°F.
* 404	W. S. Shrum, Sr.	do	1958	159	16	--	92.5	do	T,Ng	Irr	Pump set at 157 ft. Temp. 66°F.
* 405	R. F. Owens	--	1957	172	16	--	--	--	T,Ng	Irr	Temp. 66°F.
406	do	J. H. Chumley	1955	157	16	--	--	--	T,Ng	Irr	
407	do	Joe Skaggs	1962	172	16	--	--	--	T,Ng	Irr	
408	John Owens	Karr Pump & Pipe Supply Co.	1957	165	16	--	--	--	T,Ng	Irr	
* 409	M. R. Pemberton	--	1962	200	16	--	80.4	Jan. 28, 1964	T,Ng	Irr	Pump set at 160 ft. Temp. 65°F.
410	do	--	--	200	16	--	--	--	T,Ng	Irr	Pump set at 160 ft.
* 411	Gentry Hobbs	Joe Skaggs	1962	163	--	--	--	--	T,G	Irr	Temp. 66°F.
501	W. O. Fortenberry	do	--	260	16	--	--	--	T,Ng	Irr	Pump set at 250 ft.
* 502	do	do	1955	160	16	--	--	--	T,Ng	Irr	Pump set at 150 ft. Temp. 66°F.
503	do	do	1955	260	16	--	--	--	T,Ng	Irr	Pump set at 255 ft.
* 504	do	do	1955	260	16	--	--	--	T,Ng	Irr	Temp. 67°F.
* 505	W. J. Bullington	Wright Drilling Co.	1955	170	16	--	80.7	Jan. 28, 1964	T,Ng	Irr	Pump set at 140 ft.
506	Allen Byrd	do	1958	130	14	--	--	--	T,Ng	Irr	Pump set at 125 ft.
507	do	do	1952	130	14	--	--	--	T,G	Irr	Do.
* 508	W. J. Bullington	Geo. Wright	1957	170	16	--	71.6	Jan. 28, 1964	T,Ng	Irr	Pump set at 140 ft. Temp. 65°F.
509	do	Wright Drilling Co.	1953	170	16	--	--	--	T,Ng	Irr	Pump set at 140 ft.
510	do	do	1962	170	14	--	--	--	T,Ng	Irr	Do.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-05-511	W. J. Bullington	Wright Drilling Co.	1947	170	16	--	--	--	T,Ng	Irr	Pump set at 140 ft.
* 512	D. C. Floyd	J. H. Chumley	1960	130	16	--	--	--	T,G	Irr	Temp. 65°F.
513	do	--	--	120	16	--	--	--	T,Ng	Irr	
514	Allen Byrd	Wright Drilling Co.	1954	130	14	--	--	--	T,G	Irr	Pump set at 120 ft.
515	do	Geo. Nickles	1960	130	14	--	69.0	Jan. 28, 1964	T,G	Irr	Pump set at 128 ft.
* 516	C. J. Yocom	Geo. Wright	1956	152	16	--	--	--	T,G	Irr	Pump set at 130 ft.
517	Allen Byrd	do	1947	130	--	--	--	--	T,G	Irr	Pump set at 125 ft.
* 518	do	Joe Skaggs	1950	130	14	--	--	--	T,G	Irr	Pump set at 128 ft.
519	do	Wright Drilling Co.	1955	130	14	--	--	--	T,G	Irr	Pump set at 125 ft.
520	do	--	--	130	14	--	--	--	T,Ng	Irr	
* 521	Stanley Ancinik	Karr Pump & Pipe Supply Co.	1963	162	16	--	--	--	T,E	Irr	Temp. 66°F.
522	Mrs. Willie King	George Nickles	1960	130	14	--	--	--	T,G	Irr	
523	Allen Byrd	Wright Drilling Co.	1955	138	14	--	--	--	T,G	Irr	Pump set at 120 ft.
524	Bill Lotes	do	1957	130	14	--	--	--	T,G	Irr	
* 601	H. W. Allen	J. H. Flippo	1950	180	12	--	91.8 81.9	Jan. 25, 1952 Jan. 14, 1964	T,G	Irr	Pump set at 150 ft. Observation well. Temp. 71°F.
* 602	E. J. McAlister	George Wright	1957	142	--	--	89.6	Jan. 28, 1964	T,Ng	Irr	Pump set at 137 ft. Temp. 65°F.
* 603	L. L. Dent	George Nickles	1962	139	14	--	--	--	T,Ng	Irr	Pump set at 131 ft. Temp. 65°F.
604	Yarborough Estate	do	1963	157	14	--	--	--	T,G	Irr	
* 605	J. B. Smith	Karr Pump & Pipe Supply Co.	1955	160	14	--	64.5	Jan. 28, 1964	T,Ng	Irr	Pump set at 140 ft. Temp. 66°F.
606	H. W. Allen	George Nickles	1959	165	--	--	--	--	T,G	Irr	
607	do	do	1957	165	--	--	--	--	T,G	Irr	
608	do	--	1962	255	--	--	--	--	T,G	Irr	
609	O. B. Chessire	George Nickles	1963	152	14	--	--	--	T,G	Irr	
* 610	Vester Smith	Karr Pump & Pipe Supply Co.	1959	140	16	--	80.3	Jan. 28, 1964	T,Ng	Irr	Temp. 68°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-05-611	T. A. Hulse	J. B. Knight	1955	160	16	--	--	--	T,Ng	Irr	Pump set at 130 ft.
* 612	L. L. McKenzie	Karr Pump & Pipe Supply Co.	1960	130	14	--	--	--	T,G	Irr	Temp. 65°F.
* 613	Carl Williams	Jimmie Scooler	1957	165	--	--	--	--	T,Ng	Irr	
* 614	C. E. Fleming	Joe Skaggs	1962	116	16	--	65.6	Jan. 28, 1964	T,G	Irr	Pump set at 112 ft. Temp. 66°F.
* 615	L. D. Smith	do	1960	130	14	--	--	--	T,G	Irr	Temp. 64°F.
616	do	do	1960	126	12	--	--	--	T,G	Irr	Pumped only in 1962 season.
* 701	*Sam Teague*	*Western Pump & Supply Co.*	1955	165	--	--	69.7	Jan. 28, 1964	T,G	Irr	Temp. 65°F.
* 702	do	--	--	168	--	--	--	--	T,Ng	Irr	Do.
703	J. M. Teague	--	1961	170	--	--	--	--	T,Ng	Irr	
704	do	--	1957	170	16	--	62.9	Jan. 28, 1964	T,Ng	Irr	
705	J. R. Falkenberry	Geo. Wright	1957	164	16	--	--	--	T,Ng	Irr	
* 706	*Victor Smith*	*Ted Koonce*	1962	151	14	--	--	--	T,G	Irr	Temp. 67°F.
* 707	W. S. Shrum, Jr.	Ross Irrigation Co.	1957	145	14	--	70.5	Jan. 28, 1964	T,Ng	Irr	Pump set at 125 ft. Temp. 67°F.
708	Homer Kelly	Grady Goodpasture	1960	170	16	--	--	--	T,Ng	Irr	
709	N. B. Fields	--	1958	140	16	--	--	--	T,Ng	Irr	
710	do	--	1961	170	16	--	--	--	T,Ng	Irr	
711	Grady Goodpasture	*Carl Johnson*	1955	180	16	--	--	--	T,Ng	Irr	
712	do	do	1956	190	16	--	--	--	T,Ng	Irr	
713	do	do	1955	200	16	--	--	--	T,Ng	Irr	
714	do	do	1961	173	16	--	--	--	T,Ng	Irr	
* 715	N. B. Fields	Ted Koonce	1962	170	14	--	77.0	Jan. 28, 1964	T,Ng	Irr	Pump set at 100 ft. Temp. 65°F. y
* 801	J. S. Kniceley	J. H. Flippo	1953	146	--	--	85.2	*do*	T,Ng	Irr	*Pump set at* 138 ft. Temp. 65°F.
* 802	H. C. Doss	Carl Johnson	1955	188	16	--	--	--	T,Ng	Irr	Temp. 65°F.
* 803	William T. Curry	Parker Drilling Co.	1963	169	14	--	58.0	Jan. 28, 1964	T,Ng	Irr	Temp. 66°F.
* 804	J. D. Mills	J. H. Flippo	1952	159	16	--	--	--	T,Ng	Irr	Pump set at 149 ft. Temp. 65°F.
* 805	Grady Goodpasture	Carl Johnson	1955	190	16	--	--	--	T,Ng	Irr	Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-05-806	Grady Goodpasture	Carl Johnson	1955	190	16	--	--	--	T,Ng	Irr	
* 807	do	do	1955	190	16	--	--	--	T,Ng	Irr	Temp. 67°F.
808	do	do	1961	190	16	--	--	--	T,Ng	Irr	
* 809	J. S. Kniseley	J. H. Flippo	1953	150	--	--	--	--	T,Ng	Irr	Pump set at 146 ft. Temp. 65°F.
* 810	Charles Kersh	--	--	170	--	--	--	--	T,Ng	Irr	Temp. 65°F.
811	Douglas Floyd	Ted Koonce	1961	164	14	--	78	Dec. 1961	T,Ng	Irr	
* 812	B. Smith	J. H. Chumley	1962	211	14	--	--	--	T,Ng	Irr	Pump set at 185 ft. Temp. 67°F.
* 813	do	--	--	200	--	--	--	--	T,Ng	Irr	Old well. Temp. 67°F.
* 814	Stanley Ancinik	-- Williams	1960	218	16	--	93.7	Jan. 28, 1964	T,Ng	Irr	Temp. 67°F.
* 815	Doyle McCaslin	Parker Drilling Co.	1963	208	--	--	--	--	T,G	Irr	Pump set at 185 ft. Temp. 67°F.
901	L. C. Caffey	J. H. Flippo	1959	160	14	--	--	--	T,Ng	Irr	
902	J. D. Mills	do	1950	149	18	--	68.2 73.5 74.0	Dec. 28, 1955 Jan. 15, 1963 Jan. 28, 1964	T,Ng	Irr	
* 903	do	do	1957	163	16	--	--	--	T,Ng	Irr	Temp. 68°F.
904	H. L. Hill	Grady Goodpasture	1959	125	16	--	--	--	T,Ng	Irr	
* 905	do	Ross Irrigation Co.	1958	125	16	--	--	--	T,Ng	Irr	Temp. 66°F.
906	Charles Kersh	R. & H. Drilling Co.	1963	98	16	--	23.9	Jan. 28, 1964	T,G	Irr	
* 907	E. F. Halbrook	--	1951	122	14	--	46.2 47.4	Jan. 15, 1963 Jan. 28, 1964	T,Ng	Irr	Pump set at 135 ft. Temp. 65°F. 2/
* 908	Earl Cornett	--	1957	121	14	--	--	--	T,G	Irr	Temp. 69°F.
909	do	Geo. Nickles	1962	107	14	--	--	--	T,G	Irr	
910	E. I. Tate Estate	J. B. Knight	1957	--	--	--	52.3	Jan. 28, 1964	T,E	Irr	Pump set at 120 ft.
* 911	H. L. Hill	Ross Irrigation Co.	1963	110	16	--	--	--	T,Ng	Irr	Temp. 65°F.
* 912	do	do	1963	110	16	--	--	--	T,Ng	Irr	Do.
* 913	do	Grady Goodpasture	1959	110	16	--	--	--	T,Ng	Irr	Do.
* 914	do	do	1956	100	16	--	47.2	Jan. 28, 1964	T,E	Irr	Do.
* 915	do	do	1957	100	16	--	--	--	T,E	Irr	Do.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-05-916	H. L. Hill	Grady Goodpasture	1957	100	16	--	--	--	T,E, 15	Irr	
* 917	do	do	1959	100	16	--	--	--	T,E, 15	Irr	Temp. 65°F.
* 918	do	do	1959	100	16	--	--	--	T,E, 15	Irr	Do.
* 919	W. A. Freeman	J. H. Flippo	1958	250	16	--	52.7	Jan. 28, 1964	T,Ng	Irr	Do.
* 920	do	do	1961	250	16	--	--	--	T,Ng	Irr	Do.
921	E. F. Halbrook	J. M. Paine	1928	80	--	--	52.7	Aug. 17, 1938	N	N	Destroyed.
06-401	D. C. Floyd	-- Davis	1954	130	--	--	75.8	Jan. 2, 1963	T,Ng	Irr	
* 402	Jess Smith	--	1959	184	--	--	--	--	T,G	Irr	Temp. 66°F.
403	do	--	1956	126	--	--	52.8	Jan. 2, 1963	T,G	Irr	
* 404	W. C. Garren	--	1958	128	--	--	--	--	T,G	Irr	Temp. 67°F.
405	do	--	1958	128	--	--	--	--	T,E	Irr	
* 501	Amerada Petroleum Co.	Amerada Petroleum Co.	1956	1,880	8	--	909	Feb. 1963	T,E	Ind	Water from Santa Rosa Sandstone.
* 502	do	do	1956	1,880	8, 6	--	819	Feb. 1963	T,E	Ind	Casing: 8-in. to 1,443 ft; 6-in. from 1,443 ft to bottom. Reported discharge 157 gpm. Drawdown 271 ft after 2 hours pumping at 157 gpm. Water from Santa Rosa Sandstone. Temp. 85°F.
* 503	S. E. Blevins	George Nickles	1955	186	16	--	98.7	Feb. 5, 1963	T,Ng	Irr	Temp. 66°F.
* 504	Henry Newman	Melvin Newman	1956	188	16	--	91.1	do	T,Ng	Irr	Do.
* 505	O. P. Mercer	J. B. Knight	1961	166	16	--	114.9 101.3	Jan. 2, 1963 Feb. 15, 1963	T,Ng	N	Temp. 70°F. 1/
* 506	do	do	1959	147	16	--	104.7 88.1	Jan. 2, 1963 Feb. 4, 1963	T,Ng	Irr	Measured 29.8 ft of drawdown after 53 hours at 387 gpm.
* 507	do	do	1963	149	16	--	--	--	T,Ng	Irr	Temp. 65°F.
* 508	Calvin Young	do	1961	157	6	--	--	--	T,E	D	Estimated discharge 10 gpm. Temp. 68°F.
* 509	Henry Newman	F. B. Skaggs	1963	213	16	--	--	--	T,Ng	Irr	
510	S. E. Blevins	-- Clark	1962	181	16	--	--	--	T,Ng	Irr	
* 601	W. C. Young	Buddy Belts	1958	173	16	--	97.1	Feb. 3, 1963	T,Ng	Irr	Temp. 68°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-06-602	W. C. Young	-- Skaggs	1949	173	16	--	--	--	T,Ng	Irr	
* 603	A. E. Dickens	-- Eland	1957	167	16	--	92.4	Feb. 5, 1963	T,Ng	Irr	Reported discharge 282 gpm. Temp. 65°F.
* 604	W. R. Liles	-- Schooler	1952	160	16	--	110.2	do	T,Ng	Irr	Temp. 67°F.
605	Kay Kimbell	Lamesa Western	1962	150	14	--	--	--	T,G	Irr	
* 606	J. H. Jones	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
607	do	--	--	--	--	--	--	--	T,Ng	Irr	
* 608	do	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 609	do	--	--	--	--	--	--	--	T,Ng	Irr	
* 701	H. L. Hill	--	1954	100	16	--	53.2	Jan. 28, 1964	T,E	Irr	Reported discharge 100 gpm. Temp. 69°F.
* 702	do	Ross Irrigation Co.	1956	102	16	--	--	--	T,E, 15	Irr	Casing slotted from 65 ft to bottom. Reported discharge 300 gpm. Temp. 65°F.
* 703	do	-- Goodpasture	1958	100	16	--	--	--	T,E, 15	Irr	Casing slotted from 60 ft to bottom. Reported discharge 150 gpm. Temp. 65°F.
704	Arnold Smith	Karr Pump & Pipe Supply Co.	1962	125	--	--	51.0	Jan. 28, 1964	T,G	Irr	Water from the Cretaceous rocks.
705	Iva Dodson	--	--	82	--	--	72.8 55.3	Aug. 17, 1938 Feb. 12, 1964	C,E	D,S	
* 901	R. T. Bedwell	-- Flippo	1952	160	--	--	95.4 101.4	Jan. 25, 1956 Jan. 14, 1964	T,E, 50	Irr	Pump set at 120 ft. Observation well. Temp. 68°F.
902	do	-- McCarty	1962	200	12	--	--	--	T,E, 50	Irr	Pump set at 170 ft.
903	Mrs. E. C. Roberts	--	1954	140	--	--	92.6	Jan. 2, 1963	T,Ng	Irr	
* 904	Vernon Bingham	--	1960	120	--	--	73.4	Mar. 4, 1963	T,E, 15	Irr	Temp. 66°F.
* 905	do	George Wright	1963	110	12	--	--	--	T,E, 15	Irr	Temp. 65°F.
906	Ashmore School	--	--	112	--	--	98.0	Aug. 17, 1938	N	N	
* 07-401	W. Holladay	J. H. Flippo	1955	110	--	--	51.6 57.8	Jan. 25, 1952 Jan. 14, 1964	T,G	Irr	Observation well. Temp. 69°F.
402	do	Gates & Garrett	1960	125	16	--	--	--	T,G	Irr	
403	do	do	1961	125	16	--	--	--	T,G	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-07-701	J. P. Bingham	--	1961	160	--	--	--	--	T,E, 15	Irr	Temp. 66°F.
702	do	--	1963	160	--	--	--	--	T,E, 15	Irr	
* 703	Howard Sanford	--	1953	130	16	--	--	--	T,G	Irr	Pump set at 120 ft. Temp. 66°F.
* 704	H. E. Corbitt	James Busby	1962	181	16	--	107.3	Jan. 2, 1963	T,G	Irr	Pump set at 181 ft. Temp. 68°F.
* 09-101	Union Oil Co.	Dixon Drilling Co.	1952	104	7	--	67.9 70.0	July 8, 1955 Dec. 3, 1962	N	N	Unused.
* 102	do	do	1955	94	7	--	59.2 59.6	July 8, 1955 Dec. 3, 1962	N	N	Do.
* 103	Jess Treadwell	A. H. Boohne	1960	160	--	--	--	--	T,Ng	Irr	Temp. 67°F.
104	do	do	1960	160	--	--	--	--	T,Ng	Irr	
105	do	M. Fullingim	1961	160	--	--	--	--	T,Ng	Irr	
* 106	do	do	1961	160	--	--	--	--	T,Ng	Irr	Temp. 67°F.
* 201	Shell Oil Co.	--	1944	97	8	--	66.1 66.5	July 7, 1955 Jan. 10, 1964	C,W	D,Ind	Temp. 69°F.
202	Mrs. F. W. Howard	Parker Drilling Co.	1955	165	--	--	--	--	T,Ng	Irr	
* 301	E. L. Driver	J. H. Flippo	1954	135	--	--	61.7	Jan. 25, 1956	T,G	Irr	Pump set at 112 ft. Observation well. Temp. 67°F.
* 302	Wm. H. Pierson	--	1954	165	--	--	55.4	Nov. 27, 1962	N	Irr	Abandoned.
* 303	do	-- Nordyke	1951	131	--	--	60.3 58.8	Jan. 16, 1963 Jan. 10, 1964	T,Ng	N	Reported irrigated 200 acres in 1951. Pump set at 113 ft. Not used since 1963. Temp. 67°F. 2/
* 304	do	Mick Fullingim	1956	140	--	--	59.5 59.4	Jan. 16, 1963 Jan. 10, 1964	T,Ng	Irr	Temp. 68°F. 2/
* 305	Mrs. F. W. Howard	--	1957	190	--	--	--	--	T,Ng	Irr	Temp. 67°F.
* 306	do	--	1962	150	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 307	Bill Eady	Ted Koonce	1962	172	14	--	66.4	Jan. 16, 1963	T,G	N	Pump set at 100 ft. Temp. 68°F.
* 308	do	M. Fullingim	1963	150	14	--	63.2	Jan. 10, 1964	T,Ng	Irr	Measured 21.0 ft of drawdown after 7 weeks at 456 gpm. Replacement for well destroyed by pollution. Temp. 66°F.
* 309	do	--	1950	170	14	--	--	--	T,G	Irr	Pump set at 100 ft. Temp. 68°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
								Below land-surface datum (ft)	Date of measurement			
	KD-27-09-310	A. P. McGuire	Parker Drilling Co.	1963	145	14	--	--	--	T,Ng	Irr	
*	401	John Ancell	Stewart & Stevenson	1953	140	--	--	71.2	Jan. 10, 1964	T,G	Irr	Pump set at 120 ft. Measured 14.5 ft of drawdown after 48 hours at 441 gpm. Temp. 67°F.
*	402	Mrs. B. M. Ancell	--	1903	100	--	--	48.7 50.4	Apr. 10, 1958 Jan. 10, 1964	C,W	S	Estimated discharge 3 gpm. Temp. 69°F. 2/
*	403	J. V. Hogg	Jamie Pierson	1963	160	--	--	--	--	T,G	Irr	
*	404	do	do	1963	160	--	--	75.9	Jan. 10, 1964	T,G	Irr	Measured 15.7 ft of drawdown after 20 hours at 720 gpm. Temp. 66°F.
	405	do	do	1963	204	--	--	--	--	T,G	Irr	
	501	Mrs. F. W. Howard	Winthrop Pump Co.	1952	150	--	--	60.0	Jan. 10, 1964	T,Ng	Irr	
	502	Joe Johnson	M. Fullingim	1963	152	16	--	--	--	T,G	Irr	
*	503	do	do	1963	152	16	--	--	--	T,G	Irr	Temp. 67°F.
	504	do	do	1963	152	16	--	--	--	T,G	Irr	
	505	do	do	1963	152	16	--	--	--	T,G	Irr	
	506	do	do	1963	152	16	--	--	--	T,G	Irr	
*	601	P. D. Driver	Karr Pump & Pipe Supply Co.	1959	156	14	--	--	--	T,Ng	Irr	Pump set at 140 ft.
	602	Fred S. Barrett, Jr.	M. Fullingim	1959	150	16	--	78.9	Jan. 10, 1964	T,Ng	Irr	
*	603	do	do	1962	150	14	--	--	--	T,Ng	Irr	Temp. 66°F.
	604	do	do	1959	202	--	--	--	--	T,Ng	Irr	
	605	do	Parker Drilling Co.	1956	151	14	--	--	--	T,Ng	Irr	Perforated at 52 ft.
*	606	do	M. Fullingim	1959	150	16	--	--	--	T,Ng	Irr	Temp. 67°F.
*	607	do	Jimmy Pierson	1963	150	14	--	59.0	Jan. 10, 1964	T,Ng	Irr	Measured drawdown 50 ft after 24 hours pumping at 365 gpm. Temp. 67°F.
*	608	do	do	1963	150	14	--	--	--	T,Ng	Irr	Temp. 67°F.
*	609	Mrs. Mable Curry	--	--	--	--	--	71.4	June 7, 1963	C,W	S	Estimated discharge 3 gpm. Temp. 65°F.
	610	Bill Tilson	Ross Irrigation Co.	1962	170	14	--	71.5	Jan. 10, 1964	T,G	Irr	
*	611	F. S. Baldwin	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 67°F.
*	701	Barnett & Watkins	A & C Pump Co.	1963	182	16	--	--	--	T,Ng	Irr	Pump set at 179 ft. Temp. 67°F.
	801	Joe Johnson	M. Fullingim	1963	152	16	--	--	--	T,G	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-09-802	Joe Johnson	M. Fullingim	1963	152	16	--	--	--	T,G	Irr	
* 803	Mid-America Pipeline Co.	Parker Drilling Co.	1960	240	--	--	40	1960	T,E	Ind	Measured discharge 1,100 gpm.
* 804	do	Williams Bros. Construction Co.	--	7,300	--	--	600	June 1960	N	Ind	Used for disposal of salt water. Drill stem test 1,753 to 1,861 ft. Sampled in Santa Rosa Sandstone.
* 805	Sam Oliver	Sam Gadberry	1963	202	14	--	61.0	Jan. 10, 1964	--	Irr	Temp. 66°F.
806	do	do	1963	200	14	--	--	--	--	Irr	
807	W. J. McMurray	Parker Drilling Co.	1959	164	16	--	--	--	T,Ng	Irr	
808	do	do	1959	170	16	--	--	--	T,Ng	Irr	
* 809	do	do	1959	170	16	--	--	--	T,Ng	Irr	
810	C. Benson	do	1962	160	14	--	--	--	T,Ng	Irr	Casing perforated 70 ft.
* 811	do	do	1962	160	14	--	79.7	Jan. 10, 1964	T,Ng	Irr	Casing perforated 70 ft. Equipped with Valley sprinkler. Temp. 67°F.
901	W. M. Walker	do	1962	245	14	--	--	--	T,Ng	Irr	Casing perforated 81 ft. Equipped with Valley sprinkler.
* 902	do	do	1962	157	14	--	70.7	Jan. 10, 1964	T,Ng	Irr	Casing perforated 70 ft. Equipped with Valley sprinkler. Temp. 66°F.
10-101	L. H. Jones	-- Williams	1948	123	--	--	64	July 1955	T,G	Irr	Estimated discharge 1,000 gpm. Pump set at 113 ft.
* 102	do	Parker Drilling Co.	1962	151	14	--	--	--	T,G	Irr	Casing perforated 100 ft. Temp. 69°F.
103	do	--	1958	150	16	--	--	--	T,Ng	Irr	
* 104	Joe Lee Killian	--	1962	160	16	--	50.7	Jan. 10, 1964	T,Ng	Irr	Temp. 66°F.
* 105	A. P. McGuire	Parker Drilling Co.	1963	145	14	--	--	--	T,Ng	Irr	
106	do	do	1963	145	14	--	--	--	T,Ng	Irr	
* 107	do	do	1963	145	--	--	94.0	Jan. 10, 1964	T,Ng	Irr	Temp. 67°F.
* 108	N. H. Cromer	Stewart & Stevenson	1960	150	16	--	--	--	T,Ng	Irr	Temp. 66°F.
* 201	W. S. Wimberley	Raymond Parker	1950	168	16	--	76.7 88.2	Apr. 4, 1951 Jan. 14, 1964	T,G	Irr	Reported 320 acres to be irrigated by two wells. Pump set at 120 ft. Observation well. Temp. 67°F.
202	do	do	1950	168	--	--	68.1	Apr. 4, 1951	T,G	Irr	Pump set at 120 ft. Observation well.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-10-203	W. S. Wimberley	--	--	--	--	--	72.9	July 6, 1955	T,G	Irr	
204	Tom Killian	--	1961	200	--	--	--	--	T,Ng	Irr	
* 205	Bill Phinizy	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 70°F.
206	W. S. Wimberley	Raymond Parker	1950	191	16	--	80 85.0	Oct. 1950 Jan. 10, 1964	T,G	Irr	Reported discharge 2,000 gpm.
207	do	--	--	160	16	--	--	--	T,Ng	Irr	Pump set at 140 ft.
* 208	Joe Lee Killian	--	1963	175	16	--	--	--	T,Ng	Irr	Equipped with Valley sprinkler. Temp. 66°F.
209	do	--	1963	175	16	--	--	--	T,Ng	Irr	
210	N. H. Cromer	Stewart & Stevenson	1960	150	18	--	--	--	T,Ng	Irr	
301	W. S. Wimberley	-- Sparks	1947	120	18	--	--	--	T,Ng	Irr	
302	do	Raymond Parker	1945	191	16	--	78.0	Jan. 10, 1964	T,Ng	Irr	Reported irrigated 125 acres in 1950-51. Pump set at 110 ft.
303	do	do	1945	154	16	--	--	--	T,Ng	Irr	Reported irrigated 160 acres in 1950-51. Pump set at 100 ft.
* 304	Sam Teague	Gene Agnew	1961	163	14	--	--	--	T,Ng	Irr	
305	do	--	1960	--	--	--	--	--	T,Ng	Irr	Pump set at 130 ft.
306	do	Jack Guffey	1962	160	16	--	75.4	Jan. 10, 1964	T,Ng	Irr	1/
* 307	W. S. Wimberley	--	--	--	--	--	70.3	do	T,G	Irr	Temp. 66°F.
* 401	N. H. Cromer	Stewart & Stevenson	1960	150	16	--	--	--	T,Ng	Irr	
* 402	Fred S. Barrett, Jr.	Parker Drilling Co.	1957	221	14	--	--	--	T,Ng	Irr	Temp. 67°F.
403	do	do	1958	238	14	--	--	--	T,Ng	Irr	
* 404	do	J. H. Flippo	1953	215	16	--	81.6	Jan. 13, 1964	T,Ng	Irr	Temp. 66°F.
405	do	do	1953	215	--	--	--	--	T,Ng	D,Irr	
406	I. O. Hughlett	--	1955	185	--	--	--	--	T,Ng	Irr	
* 407	do	--	1955	185	--	--	69.3	Jan. 13, 1964	T,Ng	Irr	Temp. 66°F.
* 408	do	--	1957	185	--	--	--	--	T,Ng	Irr	Do.
* 409	J. A. Winn	Karr Pump & Pipe Supply Co.	1957	167	16	--	--	--	T,G	Irr	Temp. 67°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-10-410	Carrol Kolb	-- Jones	1962	156	14	--	--	--	T,Ng	Irr	
* 411	Jones Bros.	--	1957	145	14	--	--	--	T,G	Irr	
501	N. H. Cromer	Stewart & Stevenson	1960	200	16	--	--	--	T,Ng	Irr	
502	I. O. Hughlett	--	1957	185	--	--	--	--	T,Ng	Irr	
503	Charles Nance	Parker Drilling Co.	1957	150	14	--	65.9	Jan. 13, 1964	T,Ng	Irr	
504	C. T. Beckham	Stewart & Stevenson	1954	95	--	--	--	--	T,Ng	Irr	Pump set at 90 ft.
* 505	do	Sparks & Parker	1946	240	12	--	65.1	Jan. 13, 1964	T,G	Irr	Estimated discharge 900 gpm. Temp. 66°F.
506	Carrol Kolb	-- Jones	1962	218	16	--	62.8	do	T,G	Irr	
507	do	do	1962	160	16	--	--	--	T,G	Irr	
508	Charles Nance	Parker Drilling Co.	1957	160	--	--	--	--	T,Ng	Irr	
* 509	do	Gay Block	1957	160	--	--	--	--	T,Ng	Irr	
510	do	Parker Drilling Co.	1960	150	14	--	--	--	T,Ng	Irr	
* 511	do	--	1959	150	14	--	77.4	Jan. 13, 1964	T,Ng	Irr	Temp. 67°F.
* 512	K. K. Whittaker	-- Jones	1961	230	16	--	--	--	T,G	Irr	Temp. 66°F.
* 513	J. M. Teague	--	--	--	--	--	--	--	T,Ng	Irr	
514	do	J. C. Williamson	1950	111	--	--	--	--	T,Ng	Irr	Reported irrigated 100 acres in 1951. Pump set at 108 ft.
* 515	do	do	1949	154	--	--	74.0	Jan. 13, 1964	T,Ng	Irr	Temp. 66°F.
516	Larry Moore	Hester Drilling Co.	1962	230	16	--	--	--	T,G	Irr	
517	do	do	1962	228	16	--	71.8	Jan. 16, 1964	T,G	Irr	Reported some blue clay from 170 to 175 ft; and sand and gravel from 175 ft to bottom.
* 518	J. M. Teague	--	--	--	--	--	75.4	Jan. 13, 1964	T,Ng	Irr	
519	W. S. Wimberley	Murphy Drilling Co.	1962	151	14	--	--	--	T,Ng	Irr	
520	Charles Nance	Jamie Pierson	1963	180	14	--	--	--	T,Ng	Irr	
* 601	W. S. Wimberley	Karr Pump & Pipe Supply Co.	1958	160	14	--	--	--	T,Ng	Irr	Temp. 66°F.
602	do	do	1962	140	14	--	67.0	Jan. 13, 1964	T,Ng	Irr	
* 603	do	do	1958	200	14	--	--	--	T,Ng	Irr	Pump set at 110 ft. Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-10-604	Charlie Garner	J. H. Chumley	1958	145	14	--	--	--	T,G	Irr	Temp. 67°F.
605	do	Parker Drilling Co.	1960	214	14	--	99.2	Jan. 13, 1964	T,G	Irr	Casing perforated 78 ft.
* 606	Charlie Cope	R. O. Parker	1956	154	14	--	--	--	T,Ng	Irr	Casing perforated 55 ft. Temp. 66°F.
607	do	do	1959	150	14	--	--	--	T,Ng	Irr	Casing perforated 70 ft.
701	Carl Williams	--	--	--	--	--	70.3	Jan. 16, 1964	T,Ng	Irr	
* 702	Nance-Holt	Jamie Pierson	1964	218	14	--	--	--	T,Ng	Irr	Temp. 64°F.
* 703	Grady King	J. C. Williamson	1950	160	--	--	71.3	Jan. 16, 1964	T,Ng	Irr	Reported irrigated 100 acres in 1951. Pump set at 130 ft. Temp. 67°F.
* 704	Charles Therwhanger	Jamie Pierson	1963	210	16, 12	--	--	--	T,Ng	Irr	Casing: 16-in. to 170 ft, 12-in. from 170 ft to bottom. Pump set at 202 ft. Temp. 64°F.
705	Toy King	Parker Drilling Co.	1961	160	14	--	--	--	T,Ng	Irr	
* 706	do	J. C. Williamson	1947	160	14	--	--	--	T,Ng	Irr	Temp. 69°F.
707	do	Parker Drilling Co.	1959	160	14	--	--	--	T,G	Irr	Estimated discharge 100 gpm. Pump set at 140 ft.
708	S. J. Johnson	--	1957	137	14	--	--	--	T,Ng	Irr	
* 709	do	--	1958?	145	14	--	92.4	Jan. 16, 1964	T,Ng	Irr	Temp. 67°F.
710	Delbert Jeffries	Bruce Story	1951	170	--	--	--	--	T,Ng	Irr	
* 711	do	do	1959	170	14	--	106.7	Jan. 16, 1964	T,Ng	Irr	Pump set at 165 ft.
* 801	Ray Garrett	-- Nordyke	1949	150	--	--	62.0	Feb. 1, 1956	T,-	Irr	Observation well. Temp. 68°F.
802	do	Parker Drilling Co.	1962	225	14	--	--	--	T,Ng	Irr	Casing perforated 88 ft.
* 803	Charles Therwhanger	-- Jones	1962	230	16	--	--	--	T,G	Irr	Temp. 67°F.
804	D. A. Cook	J. H. Flippo	1951	135	--	--	--	--	T,Ng	Irr	
805	do	Parker Drilling Co.	1956	157	14	--	--	--	T,Ng	Irr	Pump set at 135 ft.
* 806	do	do	1960	203	14	--	79.2	Jan. 16, 1964	T,Ng	Irr	Temp. 67°F.
807	Leonard Sheets	E. L. Hester	1961	220	12	--	71.1	do	T,Ng	Irr	Temp. 69°F.
808	Cities Service Petroleum Co.	Layne-Texas Co. & Johnnie Sparks	1954	175	8	--	98	1959	T,E, 10	Ind	Reported discharge 200 gpm.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-10-809	Cities Service Petroleum Co.	Layne-Texas Co. & -- Nordyke	1954	167	8	--	--	--	T,E	Ind	Temp. 71°F.
810	Richard Patterson	--	1961	175	--	--	--	--	T,Ng	Irr	
* 811	Lloyd Coffman	Pierson & Jones	1962	220	14	--	--	--	T,Ng	Irr	Temp. 67°F.
* 812	Joe Brooks	R. O. Parker	1961	222	14	--	85.8	Jan. 16, 1964	T,G	Irr	Casing perforated 120 ft. Temp. 69°F.
* 901	Charlie Cope	J. C. Williamson	1949	138	14	--	--	--	T,Ng	Irr	Pump set at 128 ft. Temp. 65°F.
902	do	Parker Drilling Co.	1956	129	14	--	--	--	T,Ng	Irr	Cased from 73 ft to bottom.
903	Roscoe Robinson	J. H. Flippo	1956	152	14	--	--	--	T,Ng	Irr	
* 904	do	-- Luzby	1961	152	14	--	89.2	Jan. 16, 1964	T,Ng	Irr	Temp. 65°F.
* 905	E. D. Marion	--	--	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
906	do	--	--	--	--	--	--	--	T,Ng	Irr	
907	do	--	--	--	--	--	--	--	T,Ng	Irr	
908	McKinney Bros.	Parker Drilling Co.	1956	142	--	--	70.6	Jan. 16, 1964	T,Ng	Irr	
909	do	M. Fullingim	1962	--	--	--	--	--	T,Ng	Irr	
* 910	John Upton	--	1954	165	--	--	--	--	T,G	Irr	Temp. 66°F.
911	do	--	1960	165	14	--	66.5	Jan. 16, 1964	T,G	Irr	
912	Sam Teague	Parker Drilling Co.	1950	226	14	--	69.1	do	T,Ng 160	Irr	Reported irrigated 120 acres in 1950.
* 913	do	do	1957	220	16	--	--	--	T,Ng	Irr	Pump set at 218 ft. Temp. 66°F.
* 914	do	do	1953	117	--	--	67	1953	T,Ng	Irr	Pump set at 112 ft. Temp. 65°F.
915	do	Ross Irrigation Co.	1955	155	16	--	--	--	T,Ng	Irr	Pump set at 152 ft.
916	Paul Morgan	R. O. Parker	1950	135	--	--	50	1950	T,Ng, 160	Irr	Reported irrigated 120 acres in 1950-51. Pump set at 104 ft.
917	do	do	1962	168	14	--	68.4	Jan. 16, 1964	T,Ng	Irr	Casing perforated 70 ft.
918	Charlie Cope	--	1953	--	--	--	68.5	Jan. 16, 1964	T,Ng	Irr	
11-101	S. W. Bailey	S. W. Bailey	1960	185	14	--	--	--	T,Ng	Irr	
102	W. E. Berry, Jr.	Murphy Drilling Co.	1957	172	14	--	--	--	T,Ng	Irr	
103	do	Parker Drilling Co.	1962	158	14	--	--	--	T,Ng	Irr	Casing perforated 60 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-11-104	W. S. Wimberley	--	--	166	--	--	50.1 71.3	July 1, 1955 Jan. 17, 1964	T,Ng	Irr	
105	Vaughn Bates	Parker Drilling Co.	1962	158	14	--	--	--	T,Ng	Irr	Casing perforated 90 ft.
106	do	--	--	160	--	--	--	--	T,Ng	Irr	
* 107	Grady Goodpasture	J. H. Flippo	1955	169	16	--	--	--	T,G	Irr	Reported water from 130 to 166 ft. Temp. 67°F.
108	do	do	1955	141	--	--	91.7 95.6	July 12, 1955 Jan. 17, 1964	T,G	Irr	Reported water sand from 123 ft to bottom.
* 109	do	do	1955	146	16	--	78.8	Jan. 17, 1964	T,G	Irr	Reported water sand from 126 ft to bottom. Temp. 66°F.
110	do	do	1955	149	16	--	--	--	T,Ng	Irr	
* 111	do	do	1955	149	16	--	--	--	T,Ng	Irr	Reported water sand at 28 ft. Temp. 67°F.
112	R. E. Matthews	T. G. Stewart	1961	226	14	--	--	--	T,G	Irr	
* 113	do	Parker Drilling Co.	1959	246	14	--	120.5	Jan. 17, 1964	T,G	Irr	Casing perforated 80 ft. Temp. 67°F.
114	W. S. Johnson	--	1921	87	6	--	70.5 73.7	Nov. 6, 1945 Feb. 6, 1964	C,W	D,S	
201	W. E. Berry, Jr.	Parker Drilling Co.	1962	164	14	--	--	--	T,Ng	Irr	Casing perforated 80 ft.
202	do	do	1962	186	14	--	94.7	Jan. 17, 1964	T,Ng	Irr	Casing perforated 95 ft.
301	-- Hicks	--	--	--	16	--	98.7	Apr. 17, 1951	N	N	Abandoned.
302	Grady Goodpasture	Carl Johnson	1959	170	16	--	--	--	T,Ng	Irr	
* 303	do	do	1959	180	16	--	--	--	T,Ng	Irr	Temp. 65°F.
304	John Smith	W. M. Wilson	1963	185	14	--	--	--	T,Ng	Irr	
305	W. J. McMurray	Parker Drilling Co.	1956	212	--	--	--	--	T,Ng	Irr	
* 306	do	do	1953	180	14	--	122.8	Jan. 17, 1964	T,Ng	Irr	Pump set at 170 ft. Temp. 65°F.
307	Kenneth Rhea	--	1955	130	16	--	108.6	do	T,Ng	Irr	Measured 8.8 ft of drawdown after several days at 178 gpm.
* 308	Clive Sartin	Ted Koonce	1961	160	14	--	97.2	Jan. 17, 1964	T,Ng	Irr	Measured 25.3 ft of drawdown after 1 week at 229 gpm. Temp. 66°F.
* 309	Claudia Jordan	Karr Pump & Pipe Supply Co.	1961	162	14	--	93.6	do	T,Ng	Irr	Measured 22.7 ft of drawdown after 48 hours at 247 gpm. Temp. 67°F.
310	J. C. Sartin	do	1961	186	14	--	--	--	T,Ng	Irr	
311	L. W. Ables	do	1955	164	16	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-11-312	L. W. Ables	J. H. Chumley	1961	147	14	--	95.3	Jan. 17, 1964	T,Ng	Irr	Temp. 67°F.
313	do	Karr Pump & Pipe Supply Co.	1955	146	16	--	--	--	T,Ng	Irr	Reported discharge 600 gpm.
* 314	Delmon Ellison	Johnny Stone	1953	160	16	--	104.3	Jan. 17, 1964	T,Ng	Irr	Temp. 67°F.
315	do	do	1951	196	16	--	--	--	T,Ng	Irr	
* 316	C. P. Wallace	J. H. Chumley	1955	150	16	--	--	--	T,Ng	Irr	Temp. 67°F.
317	do	Ted Koonce	1963	150	16	--	78.8	Jan. 17, 1964	T,Ng	Irr	
318	Gaines County Park	Parker Drilling Co.	1956	--	--	--	--	--	T,E, 5	P	Estimated discharge 50 gpm.
* 319	do	do	1956	--	--	--	--	--	T,E, 25	P,Irr	Estimated discharge 100 gpm. Temp. 68°F.
320	do	do	1956	--	--	--	--	--	T,E, 15	P,Irr	Reported irrigates 80 acres of grass with 4 wells. Estimated discharge 100 gpm. Pump set at 185 ft.
* 321	do	do	1957	238	--	--	--	--	T,E, 15	P,Irr	Estimated discharge 125 gpm. Temp. 65°F.
322	Texas Highway Dept.	Bill Hester	--	106	7	--	78.9 91.4 91.2	Aug. 18, 1938 Mar. 5, 1963 June 27, 1963	N	N	Destroyed for construction of highway in 1963.
* 401	Charlie Garner	-- Sparks	1946	132	10	--	80.5 78.9	Apr. 1, 1947 May 23, 1963	T,G	N	Reported discharge 300 gpm.
* 402	do	--	--	75	6	--	--	--	C,W,E	D,S	Estimated discharge 10 gpm. Pump set at 66 ft. Temp. 69°F.
403	G. F. Lytle	H. Boohne	1960	145	14	--	--	--	T,G	Irr	
* 404	David Franklin	Murphy Drilling Co.	1962	135	12	--	--	--	T,G	Irr	Temp. 67°F.
* 405	do	do	1962	175	12	--	--	--	T,G	Irr	Do.
406	do	do	1962	135	12	--	102.2	Jan. 17, 1964	T,G	Irr	
* 407	John Upton	-- Stewart	1962	220	13	--	--	--	T,Ng	Irr	Temp. 68°F.
408	J. O. Franklin	Murphy Drilling Co.	--	135	12	--	--	--	T,Ng	Irr	
* 409	do	do	1961	132	12	--	--	--	T,Ng	Irr	Temp. 67°F.
410	do	Parker Drilling Co.	1942	135	8	--	--	--	T,Ng	Irr	
* 411	C. L. Payton	--	1962	175	--	--	--	--	T,Ng	Irr	Temp. 67°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-11-412	David Franklin	--	1944	116	6	--	101.3 100.0	Nov. 8, 1945 Apr. 10, 1958	N	N	
	501	Bernie Holt	-- Hester	1961	190	16	--	--	--	T,Ng	Irr	
	502	do	J. H. Chumley	1958	135	14	--	72.7	Jan. 17, 1964	T,Ng	Irr	
*	503	do	Parker Drilling Co.	1959	138	14	--	--	--	T,Ng	Irr	Temp. 68°F.
*	601	Bill Cox	--	1932	127	7	--	--	--	T,E, 5	Irr	Reported discharge 60 gpm. Drilled and used for industry until 1956.
*	602	P. Florence	Parker Drilling Co.	1959	153	14	--	86.8	Jan. 17, 1964	T,Ng	Irr	Casing perforated 71 ft. Temp. 68°F.
	603	do	do	1959	134	14	--	--	--	T,Ng	Irr	Casing perforated 40 ft.
	604	do	do	1959	115	14	--	--	--	T,Ng	Irr	Casing perforated 50 ft.
*	701	D. F. Lamb	--	1948	207	12	--	83.0 88.4	Jan. 26, 1956 Jan. 14, 1964	T,G	Irr	Pump set at 145 ft. Observation well. Temp. 69°F.
	702	Bernie Holt	--	1955	138	12	--	--	--	T,Ng	Irr	
*	703	do	--	1955	138	12	--	--	--	T,Ng	Irr	Temp. 67°F.
	704	Paul Morgan	Parker Drilling Co.	1959	140	15	--	--	--	T,-	Irr	Casing perforated 28 ft.
	705	Bolan & Hill	do	1950	135	--	--	50	1950	T,G, 160	Irr	Pump set at 104 ft.
*	706	Hackney & Nelson	John Hill	1952	150	--	--	--	--	T,Ng	Irr	Pump set at 140 ft. Temp 67°F.
	801	R. E. Matthews	Parker Drilling Co.	1959	200	14	--	--	--	T,G	Irr	Casing perforated 90 ft.
*	802	do	do	1961	160	14	--	102.9	Jan. 17, 1964	N	N	Reported unused since end of 1963 season.
	803	do	do	1963	268	--	--	--	--	T,G	Irr	Casing perforated 30 ft. 1/
	804	Columbian Carbon Co.	D. L. McDonald	1945	122	10	--	--	--	N	Ind	
*	805	do	Wright & Thornton	1956	140	6	--	83	1956	T,E, 5	Ind	Estimated discharge 25 gpm. Temp. 70°F.
*	806	do	D. L. McDonald	1945	192	10	--	--	--	T,E, 5	Ind	Estimated discharge 25 gpm. Pump set at 177 ft. Temp. 70°F.
*	807	do	do	1945	108	8	--	--	--	T,E, 5	Ind	Estimated discharge 25 gpm. Temp. 70°F.
	808	Phillips Petroleum Co.	do	1944	241	12	--	68	Feb. 1944	T,E, 10	Ind	Reported discharge 143 gpm.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-11-809	Phillips Petroleum Co.	D. L. McDonald	1944	197	12	--	67	1945	T,E, 15	Ind	Temp. 67°F.
810	do	do	1945	200	14	--	--	--	T,E	Ind	Reported discharge 60 gpm. Drawdown 21 ft after 48-hours pumping at 60 gpm.
901	Thos. S. Riley	--	1917	85	6	--	79.0 74.6 82.2	June 25, 1937 Jan. 25, 1938 Jan. 15, 1964	N	N	
902	Gus Bettis	--	1960	135	14	--	65.4	Jan. 17, 1964	T,Ng	Irr	
* 903	do	Jamie Pierson	1962	210	14	--	--	--	T,Ng	Irr	Temp. 66°F.
* 904	L. F. McGee	--	1960	140	--	--	60.4	Jan. 17, 1964	T,Ng	Irr	Temp. 65°F.
905	Carl Taylor	Parker Drilling Co.	1961	134	14	--	--	--	T,Ng	Irr	Casing perforated 72 ft.
906	do	Jamie Pierson	1962	205	14	--	--	--	T,Ng	Irr	
* 907	do	do	1962	225	14	--	--	--	T,Ng	Irr	Temp. 66°F.
908	Forest Combs	Parker Drilling Co.	1958	130	14	--	--	--	T,G	Irr	
* 909	do	do	1958	130	14	--	72.9	Jan. 17, 1964	T,Ng	Irr	Temp. 65°F.
910	Max Entrekin	do	1962	143	14	--	--	--	T,Ng	Irr	Casing perforated 60 ft.
* 911	do	do	1960	137	14	--	--	--	T,Ng	Irr	Casing perforated 55 ft. Temp 69°F.
912	do	do	1950	124	14	--	--	--	T,Ng	Irr	
* 913	do	do	1960	124	14	--	--	--	T,Ng	Irr	Casing perforated 35 ft. Temp. 66°F.
* 914	Gaines County Memorial Cemetery	Mesa Irrigation Co.	1962	145	12	--	--	--	T,E, 7½	Irr	Temp. 64°F.
12-101	Delmon Ellison	--	1920	--	6	--	80.8	June 25, 1937	N	N	Abandoned.
* 102	do	J. H. Chumley	1962	165	14	--	85.4	Jan. 20, 1964	T,Ng	Irr	Measured discharge 402 gpm, May 21, 1963. Temp. 66°F.
* 103	do	do	1963	165	14	--	--	--	T,Ng	Irr	Measured discharge 290 gpm, May 21, 1963. Temp. 66°F.
104	Doyle Sewell	--	1962	150	--	--	--	--	T,G	Irr	
* 201	Carl Williams	--	1955	150	16	--	79.6	Jan. 26, 1956	T,G	Irr	Measured discharge 181 gpm, Aug. 16, 1962. Observation well. Temp. 68°F.
* 202	J. O. Franklin	Grady Goodpasture	1959	165	16	--	--	--	T,Ng	Irr	Temp. 65°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-12-203	J. H. Stennett	Murphy Drilling Co.	1960	165	16	--	78.3	Jan. 20, 1964	T,G	Irr	
	204	J. O. Franklin	Grady Goodpasture	1959	185	16	--	--	--	T,Ng	Irr	
*	205	Woody McKenzie	--	1962	160	16	--	--	--	T,Ng	Irr	Temp. 65°F.
	206	do	--	1957	156	14	--	--	--	T,Ng	Irr	
*	207	H. J. Whitaker	-- Jones	1961	128	16	--	89.4	Jan. 20, 1964	T,G	Irr	Temp. 65°F.
*	208	Wright Boyd	Joe Skaggs	1958	170	14	--	--	--	T,Ng	Irr	Do.
	209	do	do	1955	170	14	--	--	--	T,Ng	Irr	
*	210	Carl Williams	--	1956	156	--	--	--	--	T,G	Irr	
	211	do	--	1953	185	--	--	--	--	N	Irr	Reported crooked hole.
*	301	J. E. Neeley	Cowboy Fuller	--	190	--	--	--	--	T,Ng	Irr	Temp. 66°F.
	302	R. A. Noret	--	1962	155	14	--	--	--	--	Irr	Reported not used since 1962.
	303	Wright Boyd	Joe Skaggs	1958	170	14	--	--	--	T,Ng	Irr	
*	304	do	do	1956	170	14	--	101.1	Jan. 20, 1964	T,Ng	Irr	Measured discharge 600 gpm, Nov. 16, 1962. Temp. 69°F.
	305	Carl Williams	--	1954	220	--	--	--	--	T,Ng	Irr	
*	306	Roy Wicker	Ross Irrigation Co.	1956	160	16	--	106.5 108.0	Jan. 22, 1963 Jan. 29, 1964	T,Ng	Irr	Measured drawdown 19.00 ft after 1 week pumping 160 gpm. Temp. 66°F.
	307	do	do	1955	178	16	--	99.0 101.2	Jan. 22, 1963 Jan. 29, 1964	T,Ng	Irr	
*	308	J. M. Teague	do	1961	236	16	--	94.1 96.7	Jan. 22, 1963 Jan. 29, 1964	T,Ng	Irr	Measured discharge 229 gpm, Feb. 25, 1963. Drawdown 25.35 ft after 1 week pumping 229 gpm. Temp. 66°F. 1/
	309	do	do	1957	208	16	--	86.7 89.0	Jan. 22, 1963 Jan. 29, 1964	T,Ng	Irr	
	310	do	do	1955	165	16	--	90.9 92.7	Jan. 22, 1963 Jan. 29, 1964	T,Ng	Irr	
*	311	Mrs. Della Stewart	--	1953	180	16	--	--	--	T,Ng	Irr	Temp. 67°F.
	312	Andy Williams	Karr Pump & Pipe Supply Co.	1961	160	14	--	--	--	T,Ng	Irr	Pump set at 158 ft.
	313	J. W. Cornett	do	1962	135	14	--	77.9	Jan. 20, 1964	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-12-401	S. H. Gilbreath	--	--	--	6	3,333	67.0	June 25, 1937	N	N	Old well.
402	Mrs. W. C. Bennett	Hester Drilling Co.	1963	--	10	3,326	55.0	Mar. 5, 1963	T,G	Irr	Measured 11.9 ft of drawdown after 48 hours at 208 gpm, July 31, 1963.
* 403	do	Parker Drilling Co.	1952	85	8	--	--	--	J,E	D,S	Estimated discharge 5 gpm. Temp. 72°F.
601	Andy Williams	J. H. Flippo	1957	168	14	--	--	--	T,Ng	Irr	Reported discharge 375 gpm. Pump set at 158 ft.
* 602	Cecil C. Bales	Parker Drilling Co.	1951	145	16	--	100 108.2	1951 Jan. 20, 1964	T,Ng	Irr	Pump set at 130 ft. Temp. 67°F.
603	do	Ted Koonce	1961	158	14	--	--	--	T,Ng	Irr	1/
* 604	do	do	1961	177	--	--	--	--	T,Ng	Irr	Measured discharge 211 gpm, July 2, 1963. Temp. 66°F. 1/
701	B. C. Ward	Jamie Pierson	1959	220	14	--	72.2	Jan. 20, 1964	T,Ng	Irr	Measured 22.2 ft of drawdown after 19 hours at 351 gpm.
* 702	do	do	1959	200	14	--	--	--	T,Ng	Irr	Temp. 66°F.
* 703	do	do	--	--	--	--	--	--	T,Ng	Irr	Temp. 67°F.
704	Seth P. Waltz	Parker Drilling Co.	1962	181	14	--	--	--	T,Ng	Irr	Perforated 82 ft.
705	Jim Lacey	do	1959	220	14	--	--	--	T,Ng	Irr	
706	do	H. Boohne	1956	170	14	--	--	--	T,Ng	Irr	
* 707	Mrs. D. Langham	Parker Drilling Co.	1959	154	14	--	--	--	T,G	Irr	Perforated 65 ft.
* 708	L. R. Nutt	--	1958	125	--	--	--	--	T,Ng	Irr	Temp. 66°F.
* 709	Max Entrekin	Parker Drilling Co.	1962	194	14	--	73.3	Jan. 11, 1963	--	Irr	Perforated 120 ft. Temp. 67°F.
* 710	Charles Long	--	1958?	125	16	--	--	--	T,Ng	Irr	Temp. 67°F.
* 711	do	Jamie Pierson	1962	203	16	--	--	--	T,Ng	Irr	Do.
712	do	--	1958?	125	16	--	--	--	T,Ng	Irr	
713	do	--	1958?	125	16	--	--	--	T,Ng	Irr	
* 714	Uewell Scott	Parker Drilling Co.	1957	212	14	--	57.0	Jan. 20, 1964	T,G	Irr	Pump set at 200 ft. Temp. 66°F.
* 901	Helen Hearn	Ted Koonce	1960	157	14	--	91.1	do	T,Ng	Irr	Measured discharge 210 gpm, July 2, 1963. Reported water at 85 ft. 1/
902	do	Bruce Story	1963	155	14	--	--	--	T,Ng	Irr	
903	do	Ted Koonce	1960	160	14	--	--	--	T,Ng	Irr	1/

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
								Below land-surface datum (ft)	Date of measurement			
	KD-27-12-904	Helen Hearn	J. H. Flippo	1958	155	--	--	--	--	T,Ng	Irr	
*	905	do	do	1957	155	--	--	75.5	Jan. 20, 1964	T,Ng	Irr	Measured 16.4 ft of drawdown after 16 hours at 406 gpm, Apr. 2, 1963. Temp. 65°F.
	906	C. P. Montgomery	Bob Cook	1945	1,111	--	3,250	84.7 85.7 81.7 82.3	Nov. 16, 1945 Apr. 11, 1958 Jan. 11, 1963 Jan. 20, 1964	J,E	D,S	
	907	H. J. Whitaker	--	1941	--	--	--	85.2 76.7	Nov. 16, 1945 Jan. 20, 1964	N	N	
*	13-101	Mrs. H. R. Jeffries	Karr Pump & Pipe Supply Co.	1957	125	16	--	74.6 75.0	Apr. 11, 1958 Jan. 14, 1964	T,G	Irr	Measured discharge 182 gpm, Aug. 16, 1962.
	102	Smith Bros.	Ted Koonce	1963	160	14	--	--	--	T,G	Irr	
	103	A. R. Faulkenberry	J. H. Chumley	1958	150	16	--	--	--	T,Ng	Irr	
*	104	do	J. H. Flippo	1949	140	16	--	--	--	T,Ng	Irr	Temp. 65°F.
*	105	N. B. Fields	J. H. Chumley	1958	140	14	--	--	--	T,Ng	Irr	Temp. 67°F.
	106	Bill Oates	--	--	--	--	--	93.9 94.1	Jan. 15, 1963 Jan. 20, 1964	T,G	Irr	2/
*	107	M. G. Regan	--	--	150	16	--	--	--	T,Ng	Irr	Temp. 66°F.
	108	do	--	1957	150	16	--	--	--	T,Ng	Irr	Measured discharge 111 gpm, July 17, 1962.
	109	Charlie McConal	Spud Murphy	1957	160	16	--	--	--	T,G	Irr	Measured discharge 236 gpm, Aug. 24, 1962. Pump set at 135 ft.
*	110	do	do	1962	160	16	3,285	71.5	July 17, 1962	T,G	Irr	Measured discharge 247 gpm, Aug. 24, 1962. Temp. 68°F.
	111	do	do	1957	160	16	--	--	--	T,G	Irr	Measured discharge 233 gpm, Aug. 24, 1962.
*	112	do	do	1957	160	16	--	--	--	T,G	Irr	Measured discharge 133 gpm, Aug. 6, 1963. Temp. 66°F.
*	113	do	do	1962	160	14	--	--	--	T,G	Irr	Measured discharge 161 gpm, Aug. 6, 1963. Temp. 66°F.
	114	do	do	1962	160	14	--	--	--	T,G	Irr	Pump set at 135 ft.
	201	M. G. Regan	--	--	148	16	--	--	--	T,Ng	Irr	
*	202	do	--	1957	265	16	--	--	--	T,G	Irr	Temp. 66°F.
	203	Doyle McCaslin	-- Stone	1959	225	--	--	--	--	T,Ng	Irr	Pump set at 195 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-13-204	Freeman Estate	--	1957	160	--	--	--	--	T,Ng	Irr	Measured discharge 580 gpm, Aug. 6, 1963. Pump set at 147 ft. Temp. 65°F.
205	Robert Howard	--	--	--	--	3,270	91.1 90.9	Jan. 15, 1963 Jan. 20, 1964	T,Ng	Irr	2/
206	Earl Layman	--	1958	150	16	3,250	52.5	Jan. 20, 1964	T,Ng	Irr	
* 207	do	--	1956	150	16	--	--	--	T,Ng	Irr	Temp. 65°F.
208	do	--	1958	154	16	--	--	--	T,Ng	Irr	
209	do	--	1957	218	14	--	--	--	T,Ng	Irr	
* 210	do	--	1959	215	14	--	--	--	T,Ng	Irr	
* 211	do	--	1959	232	16	--	52.7	Jan. 20, 1964	T,Ng	Irr	Measured discharge 267 gpm, July 16, 1963. Temp. 65°F.
212	T. O. Hunt	Karr Pump & Pipe Supply Co.	1957	145	16	--	--	--	T,Ng	Irr	Measured discharge 198 gpm, July 18, 1962.
* 213	do	do	1959	145	16	--	--	--	T,Ng	Irr	Measured discharge 307 gpm, July 18, 1962. Temp. 67°F.
214	E. L. Lumpkin	J. B. Knight	--	116	14	--	--	--	N	N	Reported never pumped, Jan. 20, 1964.
215	do	-- Skaggs	1962	132	14	3,240	63.8	Jan. 20, 1964	T,G	Irr	Measured discharge 193 gpm, Aug. 16, 1962.
* 216	H. R. Cope	--	--	130	14	--	--	--	T,Ng	Irr	Temp. 66°F.
217	do	--	1963	130	14	--	--	--	T,Ng	Irr	
218	T. O. Hunt	Tricks Karr	1958	140	16	--	--	--	T,G	Irr	
219	do	do	1956	140	16	--	--	--	T,G	Irr	
220	do	Murphy Drilling Co.	1962	141	14	--	--	--	T,Ng	Irr	Measured discharge 346 gpm, July 18, 1962. 1/
* 301	Vernon Parks	-- Singleton	1956	99	14	3,161	32.0 33.7	Jan. 25, 1956 Jan. 14, 1964	T,E	Irr	Measured discharge 243 gpm, July 13, 1962. Observation well. Water from the Cretaceous rocks. Temp. 69°F.
* 302	J. D. Mills	Karr Pump & Pipe Supply Co.	1963	155	14	--	--	--	T,Ng	Irr	
* 303	do	J. H. Flippo	1958	160	14	--	--	--	T,Ng	Irr	Measured discharge 216 gpm, Aug. 24, 1962. Temp. 68°F.
304	do	do	1956	160	14	--	--	--	T,Ng	Irr	Measured discharge 161 gpm, Aug. 24, 1962.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-13-305	Tom O. Hunt	Karr Pump & Pipe Supply Co.	1959	80	16	--	--	--	T,G	Irr	Temp. 66°F.
306	do	do	1958	108	16	--	35	1958	T,G	Irr	Pump set at 65 ft. Reported lower part of well caved in.
* 307	Howard Brooks	J. H. Flippo	1956	160	16	--	57.6	Jan. 20, 1964	T,Ng	Irr	Measured discharge 457 gpm, Aug. 6, 1963. Temp. 66°F.
308	Kay Kimble	Karr Pump & Pipe Supply Co.	1963	--	--	--	--	--	T,Ng	Irr	
309	do	J. H. Flippo	1957	140	16	--	--	--	T,Ng	Irr	Pump set at 130 ft.
310	Jess Smith	Karr Pump & Pipe Supply Co.	1962	145	16	--	--	--	T,Ng	Irr	
* 311	do	do	1958	145	16	--	--	--	T,Ng	Irr	Temp. 65°F.
312	do	do	1959	145	16	--	--	--	T,Ng	Irr	
* 313	Tom O. Hunt	Murphy Drilling Co.	1963	100	--	--	--	--	T,G	Irr	Pump set at 95 ft.
* 401	Keith Young	Karr Pump & Pipe Supply Co.	1961	162	14	--	71.9	Mar. 6, 1963	T,G	Irr	Measured discharge 170 gpm, Sept. 23, 1962. Temp. 68°F. 1/
* 501	H. R. Cope	--	--	130	14	--	--	--	T,Ng	Irr	Temp. 65°F.
* 502	Savoy Tennyson	-- Skaggs	1963	119	--	--	--	--	--	Irr	Do.
* 503	do	do	1962	120	16	3,220	48.4	Nov. 30, 1962	N	N	Abandoned because of high chloride content in water.
* 601	-- Hardberger	Parker Drilling Co.	1951	100	--	--	51.2 42.0	Feb. 1, 1956 Jan. 14, 1964	T,G	D	Observation well. Water from the Cretaceous rocks. Temp. 71°F.
* 602	Arlis Cline	--	--	--	--	3,195	41.0	Jan. 20, 1964	T,E, 20	Irr	Temp. 66°F.
* 603	John Upton	William Sawyer	1958	160	14	--	--	--	T,G	Irr	Reported not pumped until 1963. Temp. 65°F.
604	Bill McMurray	Pete Flippo	1950	145	12	3,170?	22.5 30.7	Aug. 16, 1950 Jan. 20, 1964	T,G	Irr	Reported discharge 750 gpm. Pump set at 140 ft. Temp. 65°F.
605	-- Hardberger	Parker Drilling Co.	1963	79	14	3,174?	32.3	Jan. 20, 1964	T,E, 15	Irr	Perforated 24 ft. 1/
606	do	do	1963	105	14	--	--	--	N	N	Reported insufficient supply of water. Perforated 65 ft. 1/

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-13-607	W. P. Sawyer	-- Parkison	1912	60	--	--	36.1 30.0	Aug. 9, 1938 Mar. 6, 1963	C,W	D,S	
* 701	Hackney & Nelson	Ross Irrigation Co.	1957	145	14	--	--	--	T,Ng	Irr	
702	do	do	1958	145	14	--	--	--	T,Ng	Irr	
* 703	do	J. M. Carruth	1951	170	14	--	--	--	T,Ng	Irr	Temp. 66°F.
704	do	Ross Irrigation Co.	1962	145	14	--	--	--	T,Ng	Irr	
* 705	W. G. Bacon	J. M. Carruth	1959	--	--	--	--	--	T,Ng	Irr	Temp. 67°F.
706	do	do	1960	103	14	--	--	--	T,Ng	Irr	
707	do	do	1961	135	14	--	--	--	T,Ng	Irr	
* 708	J. M. Carruth	do	1951	110	--	3,215	63.4	Jan. 20, 1964	T,Ng	Irr	Pump set at 84 ft. Temp. 65°F.
* 709	W. J. Beckham	--	1956	120	--	--	--	--	T,-	Irr	Pump set at 110 ft. Temp. 66°F.
* 710	do	--	1953	155	--	3,212	55.4	Jan. 20, 1964	T,Ng	Irr	Pump set at 140 ft. Temp. 66°F.
801	Roy Sherman	--	1900?	80	7	3,190?	55.5 53.8	Aug. 9, 1938 Feb. 13, 1964	C,W	D,S	
901	Ida Thompson	--	--	168	--	3,175?	110.3 83.8	Aug. 9, 1938 Feb. 13, 1964	C,-	N	Water from the Cretaceous rocks.
* 14-101	Fred Young	--	1952	75	16	--	--	--	T,Ng	Irr	Measured discharge 566 gpm, Aug. 23, 1962. Water from the Cretaceous rocks. Temp. 65°F.
102	do	Karr Pump & Pipe Supply Co.	1956	75	--	--	--	--	T,Ng	Irr	Measured discharge 237 gpm, Aug. 23, 1962. Water from the Cretaceous rocks.
* 103	do	Parker Drilling Co.	1962	60	--	--	--	--	T,Ng	Irr	Measured discharge 380 gpm, Aug. 23, 1962. Water from the Cretaceous rocks. Temp. 67°F.
* 104	Frank Young	-- Wright	1954	65	--	--	--	--	T,G	Irr	Measured discharge 240 gpm, Aug. 23, 1962. Water from the Cretaceous rocks. Temp. 64°F.
105	do	R. O. Parker	1955	65	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks.
106	do	William Sawyer	1956	65	--	--	23.6	Mar. 11, 1963	T,G	Irr	Measured discharge 511 gpm, Aug. 23, 1962. Water from the Cretaceous rocks.
107	Toy King	Parker Drilling Co.	1963	80	--	--	25.0	do	T,E	Irr	Water from the Cretaceous rocks.
108	do	do	1963	88	14	--	--	--	T,G	Irr	Water from the Cretaceous rocks. 1/

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-14-109	D. N. Hunt	Karr Pump & Pipe Supply Co.	1953	70	--	--	24.8 26.0	Jan. 15, 1963 Jan. 20, 1964	T,G	Irr	Measured discharge 640 gpm, Mar. 13, 1963. Water from the Cretaceous rocks. Pumping test Mar. 13, 1963. Temp. 65°F. 2/
110	do	do	1954	60	--	--	27.0	Jan. 20, 1964	T,E	Irr	Water from the Cretaceous rocks. 2/
* 111	M. J. Strube	do	1951	70	--	--	28.3 28.8	Jan. 15, 1963 Jan. 20, 1964	T,G	Irr	Measured discharge 338 gpm, July 18, 1962. Water from the Cretaceous rocks. Temp. 64°F. 2/
112	-- Savoy	--	--	--	--	--	--	--	T,E, 15	Irr	Measured discharge 234 gpm, July 18, 1962. Water from the Cretaceous rocks.
* 113	Billy Sanderson	-- Murphy	1960	74	--	--	--	--	T,G	Irr	Measured discharge 295 gpm, Aug. 15, 1962. Water from the Cretaceous rocks. Temp. 68°F.
* 201	Morris Sanderson	Jess Williams	1951	70	--	--	26.5	Jan. 15, 1963	T,G	Irr	Measured discharge 253 gpm, Mar. 18, 1963. Water from the Cretaceous rocks. Temp. 65°F.
* 301	--	--	--	--	4	--	35.1	Jan. 2, 1963	C,W	S	Estimated discharge 4 gpm. Water from the Cretaceous rocks. Temp. 66°F.
* 302	Thomas S. Riley	--	--	42	8	--	.5 3.1	Sept. 2, 1963 Sept. 30, 1963	C,W	S	Estimated discharge 2 gpm. Temp. 64°F.
* 303	Thornton Lomax, Jr.	--	--	Spring	--	--	+	--	Flows	N	Estimated flow 0.1 gpm. Known as Cedar Lake.
* 401	-- Hardberger	J. C. Williamson	--	130	--	--	--	--	T,Ng	Irr	Water from the Cretaceous rocks. Temp. 65°F.
* 402	do	Parker Drilling Co.	1963	157	--	--	--	--	T,E, 15	Irr	Do.
* 403	Charles L. Rogers	Murphy Drilling Co.	1962	70	14	--	--	--	T,E, 20	Irr	Measured discharge 626 gpm, July 18, 1962. Water from the Cretaceous rocks. Temp. 65°F.
* 404	A. W. Biggerstaff	--	1962	100	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks. Temp. 64°F.
405	K. K. Whitaker	Pierson & Jones	1962	130	--	--	--	--	T,E	Irr	Water from the Cretaceous rocks.
406	do	do	1962	130	--	--	--	--	T,E	Irr	Do.
* 407	Norma Medlin	Joe Skaggs	1953	60	--	--	23.8	Jan. 15, 1963	T,G	Irr	Water from the Cretaceous rocks. Temp. 69°F.
408	do	do	1955	60	--	--	26.2	Mar. 8, 1963	T,Ng	Irr	Measured discharge 420 gpm, July 18, 1962. Water from the Cretaceous rocks.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-14-409	Norma Medlin	William Sawyer	1957	60	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks.
*	410	do	Joe Skaggs	1955	60	--	--	23	1955	T,Ng	Irr	Measured discharge 646 gpm, July 17, 1963. Water from the Cretaceous rocks. Temp. 66°F.
	411	A. D. Bishop	Karr Pump & Pipe Supply Co.	--	100	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks.
*	412	do	--	1951	100	--	--	29.8	Mar. 19, 1964	T,G	Irr	Water from the Cretaceous rocks. Temp. 65°F.
	413	J. W. Good	Parker Drilling Co.	1955	101	14	--	--	--	T,G	Irr	Water from the cretaceous rocks.
*	701	K. K. Whitaker	--	1959	40	--	--	19.7 19.4	Jan. 15, 1963 Jan. 20, 1964	T,G	Irr	Reported discharge 413 gpm, Aug. 5, 1963. Water from the Cretaceous rocks. Temp. 65°F.
*	702	do	-- Jones	1962	61	16	--	--	--	T,G	Irr	Water from the Cretaceous rocks. Temp. 66°F.
*	801	D. H. Bolch	--	--	--	16	3,104	34.1	Jan. 15, 1963	T,E, 7½	S,Irr	Do.
*	802	K. K. Whitaker	--	1954	165	--	--	15.7	Jan. 20, 1964	T,G	Irr	Pump set at 160 ft. Water from the Cretaceous rocks. Temp. 66°F.
*	803	do	--	1955	40	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks. Temp. 65°F.
*	901	Cedar Lake	--	--	Spring	--	--	+	--	Flows	--	Estimated flow 1 gpm. Water from the Cretaceous rocks.
*	902	K. K. Whitaker	--	--	--	--	3,099	65.3	Jan. 15, 1963	C,W	S	Water from the Cretaceous rocks. Old well. Temp. 66°F.
	15-101	--	--	--	--	--	--	32.4 31.7	Apr. 11, 1958 Jan. 15, 1963	C,W	S	Water from Santa Rosa Sandstone.
*	102	Pan American-Moncrief	Pan American Petroleum Co.	1960	1,850	--	--	--	--	T,E, 75	Ind	Do.
*	103	do	do	1961	1,850	--	--	--	--	T,E, 50	Ind	
*	401	do	do	1958	1,850	--	--	--	--	T,E, 50	Ind	Reported discharge 67 gpm. Water from Santa Rosa Sandstone.
*	402	do	do	1961	1,850	--	--	--	--	T,E, 100	Ind	Water from Santa Rosa Sandstone. Temp. 83°F.
*	701	Will Ed Harris	--	--	--	--	--	--	--	T,E	S	Estimated discharge 25 gpm. Water from the Cretaceous rocks. Temp. 70°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*	KD-27-17-101	Draper & Dupree	-- Pamerly	--	--	--	3,538	81.6	Feb. 1, 1956	T,G	Irr	Measured discharge 590 gpm, Aug. 27, 1962. Observation well. Temp. 68°F.
	102	Herbert Hicks	--	1963	174	14	--	--	--	T,Ng	Irr	Reported sand at 174 ft.
*	103	do	Western Pump Co.	1962	207	14	--	--	--	T,Ng	Irr	Measured discharge 758 gpm, Mar. 18, 1963. Temp. 65°F.
	104	E. W. Cope	-- Luzby	1957	190	14	--	--	--	T,Ng	Irr	
*	105	do	do	1957	190	14	3,540	56.9	Jan. 6, 1964	T,Ng	Irr	Temp. 66°F.
*	106	Hardberger and others	do	1957	183	14	--	--	--	T,Ng	Irr	Do.
	107	do	do	1957	176	14	--	--	--	T,Ng	Irr	
*	108	Berl Ancell	Parker Drilling Co.	1964	140	--	--	83.1	Jan. 6, 1964	T,Ng	Irr	Measured 20.4 ft of drawdown after 6 days at 656 gpm, Aug. 7, 1963.
	109	Marion Bowers	--	1943	63	--	3,543	51.5 60.0	Oct. 25, 1945 Jan. 6, 1964	T,E	D,S	
	201	T. B. Fulkerson	--	1951	135	--	--	--	--	N	N	Abandoned in August 1962.
*	202	do	Parker Drilling Co.	1960	135	16	3,485?	78.6	Jan. 8, 1964	T,Ng	Irr	Measured discharge 490 gpm, July 11, 1962. Temp. 68°F.
*	203	do	--	1951	146	--	--	--	--	T,G	Irr	Reported irrigated 120 acres in 1951. Pump set at 120 ft. Temp. 66°F.
	204	do	Parker Drilling Co.	1960	144	--	--	--	--	T,Ng	Irr	
	205	do	Stewart & Stevenson	1955	150	--	--	--	--	T,Ng	Irr	
	206	do	Parker Drilling Co.	1962	150	14	--	--	--	T,Ng	Irr	Perforated 60 ft.
	207	do	Stewart & Stevenson	1962	128	--	--	--	--	T,Ng	Irr	
*	208	do	--	1958	150	--	--	--	--	T,Ng	Irr	Measured discharge 366 gpm, June 4, 1963.
	209	do	Stewart & Stevenson	--	150	--	--	--	--	T,Ng	Irr	
	210	Berl Ancell	Parker Drilling Co.	1960	140	16	--	--	--	T,-	Irr	
*	211	W. J. McMurray	do	1959	165	16	--	94.9	Jan. 8, 1964	T,Ng	Irr	Temp. 67°F.
	301	W. M. Walker	J. H. Flippo	1951	120	16	3,495	50	1951	T,G	Irr	Reported discharge 1,900 gpm, Apr. 19, 1951. Pump set at 115 ft. Temp. 65°F.
	302	do	J. C. Williamson	1949	120	16	--	50	1949	T,G	Irr	Reported irrigated 140 acres in 1950-51.
*	303	do	Parker Drilling Co.	1962	156	14	3,480	78.6	Jan. 8, 1964	T,Ng	Irr	Measured 15.2 ft of drawdown after 6 hours at 895 gpm, Sept. 4, 1963.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
								Below land-surface datum (ft)	Date of measurement			
	KD-27-17-304	W. M. Walker	J. C. Williamson	1949	120	--	--	50	1949	T,G	Irr	Measured discharge 935 gpm, Sept. 4, 1963. Pump set at 100 ft. Reported irrigated 140 acres in 1950-51.
	305	do	do	1949	146	14	--	50	1949	T,G	Irr	Measured discharge 715 gpm, Apr. 13, 1951. Pump set at 90 ft. Reported irrigated 140 acres in 1950-51.
*	306	do	J. H. Flippo	1951	120	16	--	58.1	Apr. 19, 1951	T,G	Irr	Measured discharge 1,920 gpm, Apr. 19, 1951. Pump set at 90 ft with 10 ft of tail pipe. Reported irrigated 120 acres in 1951. Temp. 66°F.
	307	--Williams	Parker Drilling Co.	1962	152	14	--	93.1	Jan. 8, 1964	T,Ng	Irr	Measured discharge 200 gpm, July 25, 1962.
	308	E. G. Williams	do	1951	150	16	--	76.9	Apr. 12, 1951	T,Ng	Irr	Measured discharge 194 gpm, July 25, 1962. Reported irrigated 120 acres in 1951. Pumping level 91.8 ft after pumping 12 hours.
	309	do	do	1949	150	16	--	--	--	T,Ng	Irr	Reported irrigated 140 acres in 1950-51. Pump set at 110 ft.
	310	C. R. Cope	do	1952	130	14	--	--	--	T,Ng	Irr	Measured discharge 620 gpm, July 25, 1962.
*	401	E. W. Cope	-- Luzby	1959	190	14	--	--	--	T,Ng	Irr	Temp. 66°F.
	402	Hardbergers & others	do	1958	180	14	--	--	--	T,Ng	Irr	
	403	do	do	1958	185	16	--	96.9	Jan. 6, 1964	T,Ng	Irr	
	404	do	do	1960	172	16	--	--	--	T,Ng	Irr	
*	405	do	do	1960	167	16	--	--	--	T,Ng	Irr	Temp. 66°F.
*	406	do	Jamie Pierson	1963	211	16	--	79.0	Jan. 6, 1964	T,Ng	Irr	Temp. 67°F.
	407	do	do	1963	203	16	--	--	--	T,Ng	Irr	
	408	W. G. White	Parker Drilling Co.	1959	216	14	--	--	--	T,Ng	Irr	Perforated 120 ft.
	409	do	do	1959	228	14	--	--	--	T,Ng	Irr	Perforated 110 ft.
	410	do	do	1960	233	14	--	--	--	T,Ng	Irr	Perforated 120 ft.
	411	do	do	1960	225	14	--	--	--	--	--	Do.
	412	Hardberger & others	-- Luzby	1960	176	14	--	102.6	Jan. 6, 1964	T,Ng	Irr	
	413	do	do	1960	193	16	--	--	--	T,Ng	Irr	
	414	do	do	1960	237	16	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-17-415	W. G. White	Jamie Pierson	1960	180	14	--	--	--	T,Ng	Irr	
*	416	do	Parker Drilling Co.	1959	150	14	3,530	81.8	Jan. 7, 1964	T,Ng	Irr	Measured 26.1 ft of drawdown after 1 week at 604 gpm, July 9, 1963. Perforated 75 ft. Temp. 66°F.
	417	do	do	1959	175	14	--	--	--	T,Ng	Irr	Perforated 81 ft.
*	418	do	do	1959	150	14	--	70.1	Jan. 7, 1964	T,Ng	Irr	Perforated 80 ft. Temp. 67°F.
	419	do	do	1959	150	14	--	--	--	T,Ng	Irr	Perforated 75 ft.
	501	Jack Bailey	--	--	160	--	--	75.2	Jan. 7, 1964	T,Ng	Irr	
	502	C. L. Russell	Parker Drilling Co.	1957	175	14	--	--	--	T,Ng	Irr	Perforated 96 ft.
*	503	do	do	1957	175	14	--	--	--	T,Ng	Irr	Perforated 96 ft. Temp. 60°F.
*	504	O. L. Harris	--	--	150	--	3,510?	75.9	Jan. 8, 1964	T,Ng	Irr	Measured discharge 322 gpm, June 12, 1963.
	505	Jack Bailey	Harold Price	1963	217	16	--	--	--	T,Ng	Irr	Perforated 130 ft. 1/
*	506	do	do	1963	212	16	--	--	--	T,Ng	Irr	Measured discharge 282 gpm, June 10, 1963. Perforated 140 ft. 1/
*	507	do	Ross Irrigation Co.	1962	190	16	--	--	--	T,Ng	Irr	Measured discharge 622 gpm, June 10, 1963. Temp. 66°F.
	508	do	Harold Price	1963	205	16	--	--	--	T,Ng	Irr	Perforated 110 ft. 1/
*	509	do	-- Stewart	1962	200	16	--	--	--	T,Ng	Irr	Temp. 65°F.
	510	do	Harold Price	1963	215	16	--	--	--	T,Ng	Irr	1/
*	601	Ben Brown	Parker Drilling Co.	1954	150	--	3,490	81.4 82.0	Jan. 16, 1963 Jan. 8, 1964	T,Ng	Irr	Measured 20.4 ft of drawdown after 36 hours at 374 gpm. Pump set at 145 ft. Temp. 65°F.
	602	do	do	1959	169	14	--	--	--	T,Ng	Irr	Pump set at 165 ft. Perforated 100 ft.
	603	C. L. Russell	do	1959	190	14	--	--	--	T,Ng	Irr	Perforated 112 ft.
*	604	C. R. Cope	-- Baker	1962	215	14	--	67.1	Jan. 8, 1964	T,G	Irr	Measured discharge 1,144 gpm, Sept. 12, 1962. Temp. 69°F.
*	605	James R. Dunn	J. H. Flippo	1955	160	14	--	76.7	do	T,Ng	Irr	Pump set at 140 ft. Temp. 65°F.
	606	do	do	1955	160	14	--	--	--	T,Ng	Irr	Pump set at 145 ft.
	607	do	--	1953	135	14	--	--	--	T,Ng	Irr	Pump set at 135 ft.
	608	J. M. T. Development Co.	Ross Irrigation Co.	1962	200	16	--	75.8	Jan. 7, 1964	T,Ng	Irr	
	609	do	do	1962	200	16	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-17-610	J. M. T. Development Co.	Ross Irrigation Co.	1962	200	16	--	--	--	T,Ng	Irr	
	611	do	Harold Price	1962	201	--	--	--	--	T,Ng	Irr	1/
*	801	do	--	1953	165	16	3,480	61.3 72.7	Apr. 10, 1958 Jan. 10, 1963	N	N	Replaced in spring of 1963 by a new well 500 yards north. Temp. 69°F.
	802	do	Harold Price	1963	212	16	3,500	77.0	Jan. 7, 1964	T,Ng	Irr	Perforated 142 ft. Replaced well KD-27-17-801. 1/
	803	do	do	1963	185	16	3,520	--	--	T,Ng	Irr	1/
	804	do	Ross Irrigation Co.	1962	200	16	--	--	--	T,Ng	Irr	
	805	do	do	1962	200	16	--	--	--	T,Ng	Irr	
*	806	do	Harold Price	1963	203	16	--	--	--	T,Ng	Irr	Perforated 114 ft. 1/
	807	do	do	1963	192	16	--	--	--	T,Ng	Irr	1/
*	808	-- Hill	do	--	225	--	--	--	--	T,Ng	Irr	Measured discharge 480 gpm, June 12, 1963. Well deepened in spring of 1963 from 164 ft to 225 ft. Temp. 67°F.
*	809	H. T. Briscoe	Ross Irrigation Co.	1960	212	14	--	--	--	T,Ng	Irr	Temp. 67°F.
	810	do	do	1960	212	14	--	86.5	Jan. 7, 1964	T,Ng	Irr	
	901	J. M. T. Development Co.	Harold Price	1963	195	16	3,490	76.6	do	T,Ng	Irr	Perforated 120 ft. 1/
	902	do	do	1963	198	16	--	--	--	T,Ng	Irr	1/
*	903	do	do	1963	207	16	--	--	--	T,Ng	Irr	Perforated 105 ft. 1/
*	904	do	do	1963	197	16	--	--	--	T,Ng	Irr	Perforated 115 ft. 1/
*	905	do	do	1962	204	16	3,480	83.0	Jan. 7, 1964	T,Ng	Irr	Measured discharge 572 gpm, May 2, 1963. Perforated 130 ft. 1/
*	906	do	do	1963	202	16	--	--	--	T,Ng	Irr	1/
	907	do	do	1963	195	16	--	--	--	T,Ng	Irr	Perforated 132 ft.
	908	do	do	1963	202	16	--	--	--	T,Ng	Irr	Perforated 138 ft.
*	909	Seminole Irrigated Farms	Stewart & Stevenson	1959	175	16	--	58.9 66.3	July 2, 1960 Jan. 7, 1964	T,Ng	Irr	Measured discharge 957 gpm, July 11, 1963. Temp. 66°F.
	910	do	do	1959	175	16	--	48.3 54.2	July 2, 1960 Jan. 7, 1964	T,Ng	Irr	
*	911	do	-- Jones	1962	195	14	--	55.3	Jan. 7, 1964	T,Ng	Irr	Pump set at 184 ft.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-17-912	Seminole Irrigated Farms	Parker Drilling Co.	1963	198	14	--	--	--	T,Ng	Irr	Perforated 100 ft.
913	do	Stewart & Stevenson	1959	175	16	3,460	49.9 65.5	July 2, 1960 Jan. 7, 1964	T,Ng	Irr	
914	do	do	1959	174	16	3,450	49.9 55.3	July 2, 1960 Jan. 7, 1964	T,Ng	Irr	
915	do	do	1959	174	16	3,445	59.9 65.6	July 2, 1960 Jan. 7, 1964	T,Ng	Irr	Reported discharge on test 1,100 gpm. Reported drawdown 43.22 ft after 24 hours pumping 1,100 gpm.
* 916	J. L. Newsom	--	1962	179	14	--	--	--	T,G	Irr	Measured discharge 474 gpm, May 2, 1963. Temp. 67°F.
18-101	Lee Jones	Parker Drilling Co.	1951	110	--	3,480	78.0 83.9	Feb. 2, 1956 Jan. 14, 1964	T,Ng	Irr	Pump set at 100 ft. Observation well.
102	do	J. E. Barton	1946	117	12	--	73	May 1946	T,Ng	Irr	Reported discharge 650 gpm. Irrigated 8 acres in 1946. No irrigation in 1947.
* 103	do	Parker Drilling Co.	1954	157	--	--	72	1956	T,Ng	Irr	Temp. 65°F.
* 104	Joe Anderson	do	1956	117	14	--	--	--	T,Ng	Irr	Measured discharge 271 gpm, July 24, 1962. Temp. 67°F.
* 105	do	do	1962	170	14	--	67	Nov. 1963	T,Ng	Irr	Measured discharge 496 gpm, July 24, 1962. Perforated 90 ft. Temp. 69°F.
106	do	do	1962	159	14	--	64.0 67.7	Nov. 28, 1962 Nov. 11, 1963	N	N	Abandoned because of salt water.
* 107	Delbert Jeffries	Bruce Story	1960	170	14	--	69.2	Jan. 9, 1964	T,Ng	Irr	Measured discharge 438 gpm, July 24, 1962. Temp. 64°F.
108	Orvil Stewart	--	1956	140	14	--	--	--	T,Ng	Irr	Perforated 83 ft.
* 109	do	Parker Drilling Co.	1960	160	14	--	--	--	T,Ng	Irr	Measured discharge 406 gpm, July 24, 1962. Temp. 66°F.
110	Richard Patterson	L. Tatum	1961	175	--	--	--	--	T,Ng	Irr	
111	Harry Houston	-- Jones	1962	--	--	--	--	--	T,Ng	Irr	Measured discharge 388 gpm, Nov. 16, 1962.
* 112	do	--	1955	--	--	3,440	80.0 84.1	Jan. 16, 1963 Jan. 9, 1964	T,Ng	Irr	Measured discharge 556 gpm, Nov. 16, 1962. Temp. 70°F. 2/
113	J. C. Davis	--	1955	150	18	--	--	--	T,Ng	Irr	Reported not pumped until 1960.
* 114	do	--	1955	150	18	--	--	--	T,Ng	Irr	
115	do	--	1955	150	18	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-18-116	L. M. Browning	Joe Skaggs	1962	165	17	--	--	--	T,G	Irr	Measured discharge 625 gpm, Jan. 29, 1963. Temp. 68°F.
117	do	F. B. Skaggs	1963	158	14	--	83.5	Jan. 9, 1964	T,G	Irr	1/
118	H. T. Richardson	Parker Drilling Co.	1952	126	14	--	--	--	T,Ng	Irr	
* 119	do	do	1947	113	14	--	--	--	T,Ng	Irr	Measured discharge 260 gpm, Sept. 12, 1962. Temp. 70°F.
* 120	do	do	1954	132	14	--	--	--	T,Ng	Irr	Pump set at 120 ft. Temp. 67°F.
121	O. R. Cope	do	1949	130	14	--	--	--	T,Ng	Irr	Pump set at 120 ft.
122	Travis Pharr	M. Fullingim	1961	150	16	--	--	--	T,G	Irr	Measured discharge 416 gpm, July 25, 1962. Pump set at 140 ft.
* 123	Hunt & Wood	-- Lively	1959	135	16	--	--	--	T,Ng	Irr	Measured discharge 546 gpm, Sept. 20, 1962. Temp. 69°F.
* 124	do	do	1959	142	14	--	--	--	T,Ng	Irr	Measured discharge 511 gpm, Sept. 20, 1962. Temp. 70°F.
* 125	do	Hester Drilling Co.	1956	130	14	--	--	--	T,Ng	Irr	Measured discharge 432 gpm, Apr. 9, 1963. Temp. 67°F.
* 126	do	do	1957	126	14	--	91.2	Jan. 9, 1964	T,Ng	Irr	Measured discharge 572 gpm, Sept. 20, 1962. Temp. 69°F.
* 127	H. L. Thomason	-- Shadox	1956	130	16	--	--	--	T,Ng	Irr	Measured discharge 516 gpm, July 24, 1962. Temp. 66°F.
128	Lee Jones	-- Barton	1945	110	10	--	74.0	Oct. 23, 1945	N	N	
* 201	J. C. Davis	--	1955	150	18	--	68.9 76.6	Feb. 2, 1956 Jan. 14, 1964	T,-	Irr	Pump set at 120 ft. Observation well. Temp. 66°F.
202	do	--	1955	150	18	--	--	--	T,Ng	Irr	
203	do	--	1955	150	18	--	--	--	T,Ng	Irr	
* 204	Finley Moore	-- Price	1962	242	14	--	--	--	T,Ng	Irr	Temp. 66°F.
* 205	Lloyd Coffman	--	1951	143	14	--	--	--	T,Ng	Irr	Temp. 70°F.
206	do	A. H. Boohne	1959	110	14	--	--	--	T,G	Irr	
207	H. D. Vaughn	--	1942	80	--	3,418	68.0 73.7	Oct. 25, 1945 Feb. 6, 1964	C,W	D,S	
* 301	J. W. McNew	A. C. Pump Co.	1958	200	16	--	--	--	T,Ng	Irr	Measured discharge 210 gpm, Apr. 9, 1963. Temp. 67°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-18-302	Wayne Bryant	-- Nordyke	1950	135	--	--	66.6	Jan. 9, 1964	T,Ng	Irr	Measured discharge 436 gpm, Aug. 9, 1962. Reported sprinkler system used.
* 303	do	Parker Drilling Co.	1962	160	16	--	--	--	T,Ng	Irr	Measured discharge 501 gpm, Aug. 9, 1962. Pump set at 145 ft. Perforated 100 ft. Temp. 66°F.
* 304	H. E. Dickerson	Williams Well Service	1960	200	16	--	--	--	T,Ng	Irr	Measured discharge 232 gpm, Nov. 29, 1962. Temp. 70°F.
305	Andy Robertson	Parker Drilling Co.	1960	190	14	--	68.7	Jan. 9, 1964	T,Ng	Irr	Measured discharge 458 gpm, August 1962. Pump set at 170 ft.
* 306	Bernie Holt	-- Hester	1950	206	16	--	--	--	T,Ng	Irr	Measured discharge 384 gpm, Aug. 3, 1962. Temp. 69°F.
307	do	do	1951	160	16	--	--	--	T,Ng	Irr	Measured discharge 212 gpm, Aug. 3, 1962.
308	do	do	1951	160	16	--	--	--	T,Ng	Irr	Measured discharge 316 gpm, Aug. 3, 1962. Pump set at 153 ft.
309	do	do	1955	160	16	--	--	--	T,Ng	Irr	Measured discharge 204 gpm, Aug. 3, 1962.
* 401	H. T. Richardson	Parker Drilling Co.	1961	140	14	--	57.0	Jan. 9, 1964	T,G	Irr	Measured discharge 483 gpm, Mar. 26, 1963. Perforated 65 ft. Temp. 65°F.
402	H. L. Thomason	-- Shadox	1957	129	16	--	--	--	T,Ng	Irr	Measured discharge 593 gpm, July 24, 1962.
403	do	-- Stewart	1962	155	14	--	--	--	T,Ng	Irr	
* 404	Jim Ferguson	--	1960	188	14	--	--	--	T,E,G	D,Irr	Pump set at 130 ft. Perforated 48 ft. Temp. 65°F.
* 405	Hughes Smith	Parker Drilling Co.	1962	165	12	3,420	58.5	Jan. 9, 1964	T,G	Irr	1/
406	M. O. Wolam	Jack Guffey	1963	160	14	--	--	--	T,G	Irr	Perforated 74 ft.
* 407	do	--	1961	146	--	--	64.1	Jan. 9, 1964	T,G	Irr	Pump set at 120 ft. Temp. 67°F.
408	J. A. Sparks	Eubank Bros.	1906	81	6	3,422	58.3 60.7	Oct. 29, 1945 Feb. 12, 1964	C,W	D,S	
* 501	Jim Ferguson	Parker Drilling Co.	1960	192	14	3,430	65.7 66.8	July 9, 1963 Jan. 9, 1964	T,G	Irr	Measured 11.0 ft of drawdown after 24 hours at 290 gpm. Pump set at 150 ft. Perforated 106 ft. Temp. 67°F.
502	Hughes Smith	Ivey Waters	1961	185	16	--	--	--	T,G	Irr	
* 503	Glenn Hillman	--	1960	200	16	--	--	--	T,Ng	Irr	Measured discharge 397 gpm, Aug. 3, 1962. Temp. 70°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-18-504	Glenn Hillman	--	1959	148	16	3,420	63.7 82.1	July 2, 1960 Jan. 9, 1964	T,G	Irr	Measured discharge 315 gpm, Aug. 3, 1962.
505	do	B. B. Baker	1962	195	16	--	--	--	T,Ng	Irr	Measured discharge 327 gpm, Aug. 3, 1962.
* 506	Kenneth Bass	--	1958	130	16	3,420	63.1 71.3	Apr. 23, 1962 Jan. 9, 1964	T,Ng	Irr	Reported 26.7 ft of drawdown after 7 days at 1,193 gpm, May 10, 1963.
* 507	do	Parker Drilling Co.	1961	195	14	--	--	--	T,G	Irr	Measured discharge 460 gpm, Aug. 3, 1962. Pump set at 140 ft. Perforated 80 ft. Temp. 70°F.
* 508	Johnnie Clark	Hester Drilling Co.	1961	163	16	--	--	--	T,G	Irr	Measured discharge 496 gpm, Aug. 13, 1962. Temp. 69°F.
* 509	H. D. Vaughn	B. B. Baker	1962	213	14	--	--	--	T,Ng	Irr	Measured discharge 452 gpm, Aug. 24, 1962. Pump set at 195 ft. Temp. 67°F.
510	Bill Lyles	Parker Drilling Co.	1963	180	14	--	66.5	Jan. 8, 1964	T,Ng	Irr	
* 511	Gaines Farm & Ranch Corp.	-- Stewart	1962	115	16	--	--	--	T,Ng	Irr	Measured discharge 274 gpm, Mar. 28, 1963. Reported not pumped until 1963. Temp. 67°F.
* 512	do	do	1962	115	16	--	--	--	T,Ng	Irr	Measured discharge 388 gpm, Mar. 28, 1963. Temp. 67°F.
* 513	do	do	1962	115	16	3,410	72.1	Jan. 9, 1964	T,G	Irr	Measured discharge 371 gpm, Aug. 24, 1962. Temp. 67°F.
* 514	do	do	1962	115	16	--	--	--	T,G	Irr	Measured discharge 490 gpm, Aug. 29, 1962. Temp. 67°F.
* 515	El Paso Natural Gas Co.	--	1958	60	--	--	--	--	T,E	D,Ind	Temp. 67°F.
* 601	Hughes Smith	Ivey Waters	1961	236	16	3,380	64.7	Jan. 9, 1964	T,Ng	Irr	
602	C. P. Montgomery	Parker Drilling Co.	1960	202	14	--	--	--	T,Ng	Irr	Measured discharge 251 gpm, July 24, 1962. Pump set at 197 ft.
* 603	do	-- Conditt	1960	166	16	--	44.6 61.4	July 2, 1960 Jan. 9, 1964	T,Ng	Irr	Measured discharge 394 gpm, July 24, 1962. Pump set at 125 ft. Temp. 67°F.
* 604	John Upton	--	1960	200	14	--	--	--	T,Ng	Irr	Measured discharge 576 gpm, Aug. 21, 1963. Temp. 67°F.
605	do	--	1960	200	14	--	--	--	T,Ng	Irr	Reported not pumped in 1963.
606	Melvin Brown	Raymond Mayfield	1962	114	16	--	--	--	T,Ng	Irr	
* 607	do	-- Conditt	1959	154	16	--	--	--	T,Ng	Irr	Measured discharge 253 gpm, Sept. 12, 1962. Temp. 70°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-18-608	Melvin Brown	F. B. Baker	1962	153	16	--	--	--	T,Ng	Irr	Pump set at 106 ft.
*	609	Roy B. Davis	--	1961	150	--	--	82.5	Jan. 9, 1964	T,-	Irr	Measured 21.1 ft of drawdown after 4 days at 370 gpm. Pump set at 120 ft. Temp. 66°F.
*	610	E. Austin	M. Fullingim	1961	185	--	--	--	--	T,E	Irr	Reported pump installed in fall of 1962.
*	701	Sterling Emmons	Stewart & Stevenson	1959	170	16	--	42.6 43.0	July 2, 1960 Mar. 26, 1963	N	N	Reported never pumped, June 1963.
*	702	Seminole Irrigated Farms	do	1959	--	16	--	--	--	N	N	Temp. 67°F.
	703	Hanslick Farms	do	1959	182	16	--	50.9	July 2, 1960	N	N	
*	704	Sam C. Jenkins	Parker Drilling Co.	1962	169	14	--	--	--	T,Ng	Irr	Measured discharge 378 gpm, Aug. 29, 1962. Perforated 61 ft. Temp. 67°F.
	705	do	-- Nordyke	1951	160	--	--	--	--	T,Ng	Irr	Measured discharge 474 gpm, Aug. 29, 1962. Reported irrigated 130 acres in 1951. Pump set at 109 ft.
*	706	do	Parker Drilling Co.	1959	173	14	--	--	--	T,Ng	Irr	Measured discharge 426 gpm, Aug. 29, 1962. Temp. 66°F.
*	707	do	do	1957	178	14	--	--	--	T,Ng	Irr	Measured discharge 540 gpm, Aug. 29, 1962. Temp. 66°F.
*	708	do	do	1957	173	14	--	75.5	Jan. 9, 1964	T,Ng	Irr	Measured discharge 474 gpm, Aug. 29, 1962. Perforated 85 ft. Temp. 67°F.
	709	T. K. Sparks	--	--	74	6	--	71.2 64.2	Feb. 6, 1964 Oct. 29, 1964	C,W	D,S	
*	801	U. S. Smelting, Mining, & Refining Co.	U. S. Smelting, Mining, & Refining Co.	1962	--	14	3,400	52.8	Nov. 29, 1962	N	N	Reported tested for salt.
*	802	do	do	1962	132	14	--	58.2 58.8	Nov. 29, 1962 Nov. 18, 1963	N	N	
*	803	Norman Ledbetter	--	--	115	16	3,390	67.7 52.3	July 2, 1960 Jan. 9, 1964	T,Ng	Irr	Measured discharge 628 gpm, Aug. 9, 1962. Temp. 69°F.
	804	Bill Lyles	Parker Drilling Co.	1963	164	14	3,400	--	--	T,Ng	Irr	
	805	do	do	1963	165	16	--	--	--	T,Ng	Irr	Pump set at 160 ft.
*	806	Weems & Tucker	Ross Irrigation Co.	1962	113	14	--	--	--	T,Ng	Irr	Measured discharge 530 gpm, Aug. 29, 1962. Temp. 67°F.
*	807	Sam C. Jenkins	Johnny Sparks	1950	179	--	--	55	1950	T,G	Irr	Measured discharge 618 gpm, Aug. 29, 1962. Pump set at 135 ft. Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-18-808	Sterling Emmons	Eubank Bros.	--	67	8	--	59.0	Oct. 29, 1945	C,W	N	Old well.
	809	--Eubanks	--	1910	75	--	--	--	--	N	N	Dug 20 ft, drilled 75 ft, with centrifugal pump in bottom. Abandoned.
*	901	Bill Lyles	Parker Drilling Co.	1963	149	--	3,390	77.4	Sept. 26, 1963	N	N	Discharge on test 178 gpm, Sept. 6, 1963. Abandoned. Temp. 66°F.
	902	do	do	1963	157	--	--	--	--	T,G	Irr	Reported discharge 500 gpm.
*	19-101	Wayne Bryant	-- Nordyke	1951	159	--	3,379	65.6 80.3	Apr. 19, 1951 Jan. 14, 1964	T,G	Irr	Measured discharge 417 gpm, Aug. 1, 1962. Reported irrigated 120 acres in 1951. Observation well. Temp. 69°F.
	102	do	--	1953	125	16	--	--	--	T,Ng	Irr	Measured discharge 544 gpm, Aug. 1, 1962. Pump set at 110 ft.
*	103	do	Parker Drilling Co.	1956	135	14	--	--	--	T,Ng	Irr	Measured discharge 269 gpm, Aug. 9, 1962. Pump set at 135 ft. Perforated 57 ft. Temp. 60°F.
*	104	Hackney & Nelson	--	1955	120	14	--	--	--	T,Ng	Irr	Measured discharge 401 gpm, June 5, 1963. Pump set at bottom.
*	105	do	Parker Drilling Co.	1956	150	14	--	--	--	T,Ng	Irr	Measured discharge 473 gpm, Aug. 3, 1962. Pump set at 140 ft.
*	106	Walter A. Koemel	Johnny Stone	1955	125	16	3,380	66.1 67.7	Jan. 16, 1963 Jan. 9, 1964	T,-	Irr	Measured discharge 712 gpm, Aug. 21, 1962. Pump set at 120 ft. Temp. 67°F. 2/
	107	F. E. Belt	Parker Drilling Co.	1950	115	--	3,380	71.9 69.5	Jan. 16, 1963 Jan. 9, 1964	T,G	Irr	2/
	108	W. D. Milam	Blackie Bennett	1949	139	16	--	--	--	T,G	Irr	Estimated discharge 900 gpm. Irrigated 50 acres of cotton in 1950-51.
	109	Alvis Holt	Johnny Stone	1948	130	16	--	55	1948	T,G	Irr	Reported irrigated 100 acres in 1950-51. Pump set at 110 ft.
	110	Marvin Holt	C. P. Guess	1949	130	16	--	60	1949	T,G	Irr	Measured discharge 600 gpm, Apr. 18, 1951. Reported irrigated 75 acres in 1950-51.
*	111	Seminole School Farm	Parker Drilling Co.	1956	140	14	3,360	64.2	Feb. 6, 1964	T,E	Irr	Measured 17.8 ft of drawdown after 6 hours at 410 gpm. Perforated 60 ft. Temp. 68°F.
	112	E. Hobbs	J. H. Flippo	1951	160	--	--	--	--	T,G	Irr	Measured discharge 398 gpm, Aug. 3, 1962. Reported irrigated 100 acres in 1951.
*	113	do	Parker Drilling Co.	1951	160	--	3,355	59.8 62.1	Jan. 16, 1963 Jan. 9, 1964	T,G	Irr	Measured discharge 364 gpm, Aug. 3, 1962. Temp. 66°F. 2/

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-19-114	E. Hobbs	J. H. Flippo	1951	160	16	3,355	75.3	Jan. 9, 1964	T,G	Irr	Measured discharge 900 gpm, Apr. 18, 1951. Reported irrigated 80 acres in 1951. Temp. 66°F.
* 115	Mrs. D. F. Weeks	-- Crews	1950	130	16	--	54	1950	T,G	Irr	Measured discharge 198 gpm, Aug. 3, 1962. Reported irrigated 120 acres in 1950-51. Temp. 67°F.
116	do	Parker Drilling Co.	1948	125	16	3,340	71.9	Dec. 6, 1962	T,G	Irr	Measured discharge 186 gpm, Aug. 3, 1962. Pump set at 90 ft.
* 117	City of Seminole	-- White	1955	185	13	--	--	--	T,E, 40	P	Temp. 64°F.
* 201	D. L. Nolen	J. C. Fuqua	1948	100	16	3,340	55.7 71.4	Apr. 18, 1951 Jan. 9, 1964	T,G	Irr	Pump set at 87 ft. Reported irrigated 100 acres in 1950-51. Reported sprinkler system used. Temp. 65°F.
* 202	do	--	1955	140	--	--	--	--	T,G	Irr	Temp. 66°F.
* 203	do	Parker Drilling Co.	1957	100	14	--	--	--	T,Ng	Irr	
* 204	Phillips Petroleum Co.	D. L. McDonald	1946	127	10	--	--	--	T,E	D,Ind	Temp. 69°F.
205	do	do	--	134	10	--	--	--	T,E	Ind	
206	Carl Arms	Johnny Stone	1948	140	16	--	--	--	T,G	Irr	Reported irrigated 80 acres in 1950-51. Pump set at 110 ft.
* 207	E. W. Cope	Parker Drilling Co.	1954	110	--	--	--	--	T,G	Irr	Temp. 67°F.
* 208	do	do	1954	110	--	--	--	--	T,G	Irr	Temp. 66°F.
301	J. M. Parker	--	--	--	--	3,300	43.6 37.8	June 25, 1937 Jan. 15, 1964	T,E	N	Old well.
302	Mrs. G. Jones	--	--	--	--	3,310	56.5 52.0	June 25, 1937 Jan. 25, 1938	--	N	Do.
* 303	Richard Stone	Stone Drilling Co.	1955	170	6	--	--	--	T,E	Irr	Temp. 66°F.
* 304	Jack Rhea	C. Cruz	1960	98	8	--	49	1962	J,E	D,S	Estimated discharge 20 gpm. Pump set at 93 ft. Perforated 86 to 98 ft. Temp. 69°F.
* 305	C. T. Beckham	Parker Drilling Co.	1962	188	--	--	--	--	T,E, 20	Irr	Measured discharge 161 gpm, Mar. 29, 1963. Temp. 66°F.
306	do	do	1963	150	--	--	--	--	T,E, 20	Irr	Measured discharge 155 gpm, Mar. 29, 1963.
* 307	do	do	1962	147	10	--	--	--	T,E, 20	Irr	Measured discharge 151 gpm, Mar. 29, 1963. Perforated 94 ft. Temp. 66°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-19-401	Harvey Gatewood	M. Fullingim	1960	140	16	--	--	--	T,Ng	Irr	Measured discharge 336 gpm, July 24, 1962. Pump set at 135 ft. Temp. 69°F.
* 402	do	do	1960	150	16	--	--	--	T,Ng	Irr	Pump set at 149 ft. Temp. 69°F.
* 403	City of Seminole	Parker Drilling Co.	--	110	14	--	--	--	T,E, 15	P	Measured 9.0 ft of drawdown after 7 hours at 122 gpm. Temp. 70°F.
* 404	do	do	1962	182	14	--	--	--	T,E, 30	P	Perforated 40 ft. Temp. 69°F.
* 405	do	do	1954	185	14	--	--	--	T,E, 30	P	Temp. 69°F.
* 406	do	do	1959	197	14	--	--	--	T,E, 25	P	Temp. 64°F.
* 407	do	do	1954	180	13	--	--	--	T,E, 30	P	Temp. 70°F.
* 408	do	do	1956	184	14	--	--	--	T,E, 40	P	Do.
* 409	do	do	1959	210	14	--	75	1959	T,E, 40	P	Perforated 89 ft. Temp. 70°F.
* 410	do	do	1962	196	14	--	--	--	T,E, 30	P	Perforated 130 ft. Temp. 70°F.
* 411	H. R. Crutcher	do	1960	124	14	3,350	64.7	Jan. 9, 1964	T,G	Irr	Measured 16.6 ft of drawdown after 76 hours at 386 gpm. Perforated 83 ft. Not pumped until April 1963. Temp. 66°F.
* 412	Roy Jeanis	-- Conditt	1960	130	14	--	--	--	T,G	Irr	Temp. 67°F.
* 413	E. O. Nelson	Parker Drilling Co.	1961	174	--	--	--	--	T,G	Irr	Measured discharge 285 gpm, Apr. 10, 1963. Temp. 67°F.
* 414	do	do	1956	155	14	--	--	--	T,G	Irr	Measured discharge 313 gpm, Apr. 16, 1963. Perforated 51 ft. Temp. 66°F.
* 415	Leroy Johnson	do	1962	165	14	--	--	--	T,G	Irr	Perforated 30 ft. Temp. 67°F.
416	do	do	1959	165	14	--	--	--	T,G	Irr	Measured discharge 547 gpm, Aug. 7, 1962.
417	Gordon Cobb	--	1953	120	--	--	--	--	T,G	Irr	Measured discharge 157 gpm, Aug. 7, 1962. Pump set at 105 ft.
* 418	do	Parker Drilling Co.	1958	165	14	3,334	63.6	Jan. 9, 1964	T,G	Irr	Pump set at 135 ft. Temp. 70°F.
* 419	do	do	1959	50	14	--	--	--	T,G	Irr	Measured discharge 190 gpm, Apr. 4, 1963. Temp. 64°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-19-420	Gordon Cobb	Parker Drilling Co.	1963	83	14	--	--	--	T,G	Irr	Perforated 42 ft.
	501	L. G. Miller	Johnny Stone	1952	190	--	--	67.4 67.8	Jan. 16, 1963 Jan. 9, 1964	T,G	Irr	Pump set at 110 ft. 2/
*	502	do	do	1957	180	16	--	57.7	Jan. 16, 1963	T,-	Irr	Measured 25.3 ft of drawdown after 9 hours at 151 gpm. Pump set at 174 ft. Not pumped until March 1960.
	503	C. Fincher	Parker Drilling Co.	1957	172	14	--	--	--	T,G	Irr	
	504	do	do	1956	99	--	--	--	--	T,E	Irr	Measured discharge 106 gpm, Aug. 7, 1962.
*	505	R. E. Oliver, Jr.	Bruce Story	1959	160	14	--	--	--	T,G	Irr	Measured discharge 131 gpm, May 3, 1963. Pump set at 104 ft. Temp. 67°F.
*	506	do	-- Stone	1951	120	--	--	--	--	T,G	Irr	Measured discharge 124 gpm, May 3, 1963. Pump set at 92 ft. Temp. 67°F.
*	507	A. L. Booc	Parker Drilling Co.	1957	192	14	--	68.6	Jan. 9, 1964	T,G	Irr	Measured discharge 215 gpm, Aug. 7, 1962. Temp. 69°F.
*	508	do	do	1957	193	14	--	--	--	T,G	Irr	Measured discharge 190 gpm, Aug. 7, 1962. Temp. 67°F.
*	509	A. W. Fincher	do	1959	177	14	--	--	--	T,G	Irr	Perforated 53 ft. Temp. 67°F.
	510	do	do	1956	181	--	--	--	--	T,G	Irr	
	511	do	do	1962	171	11	--	--	--	T,E	Irr	Perforated 81 ft.
*	512	A. J. Williams	--	1956	87	--	3,310	24.5	Feb. 27, 1963	T,G	Irr	Reported discharge 156 gpm, Mar. 4, 1963. Temp. 65°F.
	513	Arvil Fincher	--	1940	74	4	3,330	50.3	Oct. 29, 1945	J,E	D,S	
*	601	Ron Stanley	Amerada Petroleum Co.	1937	160	5	3,276	88.2	Jan. 14, 1964	T,E	S	Estimated discharge 10 gpm. Observation well. Temp. 69°F.
	602	E. L. Allison	--	--	95	--	3,270	44.2 44.9	Jan. 25, 1938 Jan. 15, 1964	C,W	S	Old well.
	603	--	--	--	--	6	3,249	15.3	Sept. 26, 1963	C,W	N	
*	701	R. D. Spence	Parker Drilling Co.	1961	100	10	--	--	--	T,E,15	Irr	Measured discharge 222 gpm, Sept. 17, 1962. Temp. 70°F.
*	702	do	do	1956	101	18	3,330	61.5	Jan. 9, 1964	T,G	Irr	Temp. 67°F.
	703	do	do	1956	160	14	--	--	--	T,G	Irr	Perforated 65 ft.
	704	do	do	1956	156	--	--	--	--	T,G	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-19-705	A. P. McGuire	Parker Drilling Co.	1963	178	14	3,325	61.0	Jan. 9, 1964	T,G	Irr	Perforated 112 ft. 1/
706	do	do	1963	170	14	--	--	--	T,G	Irr	Perforated 110 ft.
* 707	Bob Malone	do	1963	175	14	--	59.4	Jan. 9, 1964	T,G	Irr	Temp. 65°F.
708	F. L. Wood	Shorty Carruth	1959	175	16	--	--	--	T,E	Irr	Measured discharge 181 gpm, Aug. 6, 1962. Pump set at 170 ft.
* 709	J. W. Satterwhite	J. H. Chumley	--	140	14	--	--	--	T,E, S	Irr	Measured discharge 59 gpm, Mar. 29, 1963. Pump set at 140 ft. Temp. 66°F.
710	Tankersley Bros.	--	1963	175	10	3,331	50.1	Jan. 9, 1964	T,G	Irr	
* 711	do	--	1963	175	10	--	--	--	T,G	Irr	Temp. 67°F.
* 801	L. B. Miers	Parker Drilling Co.	1959	150	--	3,290	49.9	Jan. 9, 1964	T,E, 25	Irr	Measured discharge 167 gpm, Apr. 5, 1963. Temp. 66°F.
802	do	--	1942	80	6	--	44.9 49.5	Nov. 16, 1945 Jan. 9, 1964	C,W	D,S	
803	Alene Browning	Parker Drilling Co.	1959	160	16	--	--	--	T,G	Irr	Measured discharge 375 gpm, Aug. 6, 1962.
* 901	David Ridens	Lonnie Montgomery	1948	110	12	3,249	30.4 31.9	Apr. 9, 1951 Jan. 9, 1964	T,G	Irr	Measured discharge 216 gpm, July 26, 1962. Pump set at 105 ft. Temp. 65°F.
* 902	do	Parker Drilling Co.	1959	120	--	--	--	--	T,G	Irr	
* 903	do	L. V. Hester	1953	135	--	--	--	--	T,E, 10	Irr	Measured discharge 76 gpm, July 26, 1962. Temp. 66°F.
904	do	Parker Drilling Co.	1962	160	14	--	--	--	T,G	Irr	Perforated 65 ft.
905	do	L. V. Hester	1954	120	--	--	--	--	T,E	Irr	
* 906	do	Johnny Sparks	1950	153	14	--	35	1950	T,G	Irr	Measured discharge 228 gpm, July 26, 1962. Pump set at 93 ft. Reported irrigated 35 acres in 1951. Temp. 69°F.
907	I. W. Wescott	A. H. Booe	1959	148	--	--	38.5	Jan. 9, 1964	T,G	Irr	Measured discharge 85 gpm. Pump set at 140 ft. Temp. 67°F.
908	do	Stone Drilling Co.	1955	146	14	--	--	--	T,E, 7½	Irr	Pump set at 110 ft.
20-101	Carrol Kolb	-- Stone	1960	112	10	--	--	--	N	N	
102	do	James Beasey	1959	152	--	--	--	--	N	N	
* 103	do	do	1961	149	16	3,265	49.2	Oct. 31, 1962	N	Irr	
104	do	do	--	151	--	--	--	--	N	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
☆ KD-27-20-105	L. T. Jeter	--	1956	165	--	3,265	44.1	Dec. 18, 1963	T,E, 15	Irr	Measured discharge 156 gpm, June 3, 1963. Reported not pumped until 1959. Temp. 67°F.
106	Mrs. Ida Thompson	--	--	96	--	3,278	85.4 73.3	Dec. 17, 1963 Jan. 13, 1964	C,W	S	
201	B. G. Elam	Bruce Story	1957	115	--	--	--	--	T,G	Irr	
☆ 202	do	--	1948	--	--	--	--	--	T,G	Irr	Temp. 66°F.
☆ 203	Jackie Gillispie	Joe Stringer	1962	141	10	--	--	--	T,E, 7½	Irr	Measured discharge 183 gpm, Oct. 3, 1962. Temp. 64°F.
* 204	C. A. Eiland	--	1963	140	--	--	--	--	T,G	Irr	Measured discharge 173 gpm, Apr. 17, 1963. Temp. 67°F.
301	Consley & Aweas	Parker Drilling Co.	1959	116	16	3,245	74.8	Dec. 18, 1963	T,Ng	Irr	Pump set at 110 ft.
302	do	do	1957	115	--	--	--	--	T,Ng	Irr	
☆ 303	do	do	1962	110	14	--	--	--	T,G	Irr	Measured discharge 405 gpm, Sept. 19, 1962. Perforated 34 ft. Temp. 68°F.
304	do	do	1956	120	--	--	--	--	T,Ng	Irr	
☆ 401	A. C. Ward	do	1957	130	16	3,255	62.3	Dec. 18, 1963	T,E, 60	Irr	Measured discharge 636 gpm, Aug. 7, 1962. Pump set at 125 ft. Temp. 71°F.
402	do	-- Jeeter	1961	136	16	--	--	--	T,G, 50	Irr	Measured discharge 226 gpm, Aug. 7, 1962. Pump set at 122 ft.
403	do	Parker Drilling Co.	1958	149	--	--	--	--	T,E, 30	Irr	Measured discharge 138 gpm, Aug. 7, 1962. Pump set at 136 ft. Perforated 90 ft.
404	do	do	1959	100	14	--	--	--	T,E, 25	Irr	Measured discharge 203 gpm, Aug. 7, 1962. Pump set at 92 ft. Perforated 50 ft.
* 405	do	do	1960	190	12	--	--	--	T,E, 30	Irr	Measured discharge 147 gpm, Aug. 19, 1962. Pump set at 120 ft. Temp. 70°F.
☆ 406	W. H. Wescott	A. H. Booe	1960	145	16	3,250	30.8	Dec. 18, 1963	T,E, 7½	Irr	Measured discharge 112 gpm, Aug. 7, 1962. Pump set at 135 ft. Temp. 69°F.
407	Eugene O'Daniel	--Rydar	1915?	76	--	3,271	52.0 49.7	Aug. 16, 1938 Mar. 11, 1964	C,W	D,S	
☆ 501	C. T. Wescott	Hester Drilling Co.	1962	--	--	3,228	39.5	Dec. 18, 1963	T,E, 3	Irr	Temp. 69°F.
* 502	do	do	1962	85	--	--	--	--	T,E, 7½	Irr	Do.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-20-503	E. T. O'Daniel Estate	Frank Stringer	1959	135	8	3,240	--	--	T,E	Irr	
*	601	Fred Farrar	Parker Drilling Co.	1962	117	--	3,224	49.8	Dec. 18, 1963	T,G	Irr	Temp. 67°F. 1/
*	801	James Stanley	--	--	104	--	3,220	50.4 39.0	Aug. 16, 1938 Jan. 29, 1964	T,E	D,S	Temp. 72°F. 2/
*	21-101	W. M. Smith	J. M. Carruth	1952	110	16	3,181	55.9 67.1	Feb. 2, 1956 Jan. 14, 1964	T,G	Irr	Pump set at 76 ft. Annual observation well. Published erroneously as well 21-301 in Bulletin 6207. Temp. 69°F.
*	102	do	do	1953	110	16	--	--	--	T,Ng	Irr	
	103	do	do	1951	110	16	--	--	--	T,Ng	Irr	
	104	W. G. Bacon	do	1960	126	14	--	--	--	T,Ng	Irr	Reported not pumped until 1962.
*	105	Robert Jameson	Parker Drilling Co.	1962	178	14	--	--	--	T,Ng	Irr	Perforated 65 ft. Temp. 66°F.
	106	W. G. Bacon	J. M. Carruth	1960	107	14	--	--	--	T,Ng	Irr	
*	107	Robert Jameson	Parker Drilling Co.	1959	140	14	--	--	--	T,Ng	Irr	Temp. 66°F.
	108	do	do	1960	164	14	--	--	--	T,Ng	Irr	Perforated 60 ft.
	109	do	do	1963	138	14	--	--	--	T,Ng	Irr	Perforated 48 ft.
	110	H. H. McLeod	do	1961	112	14	3,210	60.6	Dec. 18, 1963	T,Ng	Irr	Perforated 50 ft.
	111	do	do	1962	114	14	--	--	--	T,Ng	Irr	
*	112	do	do	1962	105	14	--	--	--	T,Ng	Irr	Perforated 48 ft. Temp. 66°F.
*	113	R. E. Jameson	do	1959	132	14	--	--	--	T,Ng	Irr	Perforated 65 ft.
	114	do	J. M. Carruth	1954	120	14	--	--	--	T,Ng	Irr	
*	115	do	Parker Drilling Co.	1959	126	14	--	--	--	T,Ng	Irr	Perforated 58 ft. Temp. 66°F.
	116	do	do	1954	120	14	--	--	--	T,Ng	Irr	
	117	do	--	1955	120	14	--	--	--	T,Ng	Irr	
	118	do	--	1953	120	16	--	--	--	T,Ng	Irr	
*	119	do	Parker Drilling Co.	1963	145	14	--	--	--	T,Ng	Irr	Measured discharge 208 gpm, July 12, 1963. Perforated 70 ft. 1/
	120	do	do	1960	172	14	--	--	--	T,Ng	Irr	Perforated 102 ft.
*	121	do	J. M. Carruth	1954	120	14	--	--	--	T,Ng	Irr	
	122	do	do	1954	120	14	--	--	--	T,Ng	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
KD-27-21-123	John Randolph	Murphy Drilling Co.	1963	135	14	--	--	--	T,G	Irr	
* 124	do	Parker Drilling Co.	1958	132	14	--	73.4	Dec. 18, 1963	T,G	Irr	Pump set at 110 ft. Perforated 57 ft. Temp. 66°F.
125	W. E. Wright	J. M. Carruth	1955	125	12	--	--	--	T,G	Irr	Pump set at 114 ft.
* 126	do	do	1960	125	12	--	73.4	Dec. 18, 1963	T,G	Irr	Pump set at 117 ft. Temp. 67°F.
* 201	Raymond C. Golden	--	1929	94?	--	--	66.7	Jan. 29, 1964	C,W	D,S	Estimated discharge 4 gpm. Water from the Cretaceous rocks. Temp. 69°F. 2/
202	J. P. Puckett	--	--	--	--	--	65.4 60.2	Aug. 4, 1938 Jan. 13, 1964	C,W	N	
* 601	Jim Golden	--	--	120	--	3,130	44.0 39.1	July 13, 1962 Aug. 18, 1962	C,W	D,S	Estimated discharge 2 gpm. Water from the Cretaceous rocks.
602	L. C. Houston	--	1930	80	--	3,133	107.3 48.1	Aug. 10, 1938 Jan. 29, 1964	C,E	S	Water from the Cretaceous rocks.
603	Jack S. Birge	--	--	114	--	3,129	72.5 44.1 44.3	Aug. 4, 1938 Dec. 16, 1963 Jan. 29, 1964	T,E	D,S	Old well. Water from the Cretaceous rocks.
* 701	Bob Moffatt	Buck Hogan	1959	193	--	3,170	89.9	July 13, 1962	T,E	D	Reported quit irrigating due to crop, and not from shortage of water. Temp. 69°F.
* 702	J. E. Garland Estate	A. Henderson	1948	135	--	--	--	--	T,E	D,S	
* 703	R. M. E. Hughes	Parker Drilling Co.	1957	169	14	3,150	99.3	Dec. 16, 1963	T,Ng	Irr	Measured discharge 166 gpm, July 24, 1963. Perforated 40 ft. Temp. 67°F.
* 901	Roe BaVousette	--	--	--	--	3,150	71.1 68.7	July 13, 1962 Jan. 29, 1964	T,E	Irr	Reported discharge 25 gpm. Temp. 69°F. 2/
902	do	-- Hopkins	1960	110	6	3,140	73.4 71.6	July 13, 1962 Jan. 29, 1964	T,E	D	Unused at present. Water from the Cretaceous rocks. 2/
* 903	do	--	--	--	--	3,135	78.8 77.2	July 13, 1962 Jan. 29, 1964	C,E	D	Estimated discharge 4 gpm. Water from the Cretaceous rocks. Temp. 71°F. 2/
904	R. C. Pattie	Walter Henderson	1927	100	--	3,134	84.1 65.7	Aug. 10, 1938 Jan. 29, 1964	N	N	Water from the Cretaceous rocks. 2/
22-101	Dalmont Ranch	--	--	--	--	3,130	40.3	Nov. 9, 1962	C,W	S	Estimated discharge 4 gpm. Water from the Cretaceous rocks. Temp. 68°F.
* 201	K. K. Whitaker	--	--	162	--	--	--	--	T,E, I	D,S	Water from the Cretaceous rocks.
* 202	D. J. Bolch Estate	--	--	80	--	--	--	--	T,E	D,S	Water from the Cretaceous rocks. Temp. 68°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-22-203	D. J. Bolch Estate	--	--	--	--	3,090	56.8 59.9	Aug. 12, 1938 Feb. 13, 1964	C,W	S	Water from the Cretaceous rocks.
	301	Luther Lee	Joe Stringer	1961	145	6	3,063	63.6	Sept. 19, 1962	T,E	S	Estimated discharge 50 gpm. Water from the Cretaceous rocks.
*	302	Trice Lee	--	1949	126	--	--	--	--	T,E	D,S, Irr	Estimated discharge 80 gpm. Water from the Cretaceous rocks. Temp. 69°F.
	401	Richard Patterson	-- Jeeter	1962	114	10	3,150	99.9	Nov. 9, 1962	T,G	Irr	Water from the Cretaceous rocks.
*	402	do	do	1962	140	--	--	--	--	T,G	Irr	Water from the Cretaceous rocks. Temp. 67°F.
	403	Dalmont Ranch	--	--	120	5	3,100	54.4 37.0	Aug. 4, 1938 Jan. 29, 1964	C,W	D,S	Water from the Cretaceous rocks. Old well.
	404	do	--	1915	97	6	--	57.6 39.0 39.8	Aug. 4, 1938 Nov. 9, 1962 Jan. 13, 1964	C,W	S	Water from the Cretaceous rocks.
*	601	A. C. Ward	--	--	128	--	3,100	--	--	T,E	S	Estimated discharge 10 gpm. Old well. Water from the Cretaceous rocks. Temp. 70°F.
*	602	do	-- Jeeter	1962	80	10	3,104	67.7	Oct. 24, 1962	C,W	S	Estimated discharge 3 gpm. Water from the Cretaceous rocks. Temp. 70°F.
	801	K. K. Whitaker	--	--	93	6	3,065	86.8	Aug. 10, 1938	N	N	
	901	Harold Sheets	--	--	80	4	--	--	--	C,W	S	Pump set at 45 ft.
*	23-401	Frank Perucca	--	1941	114	7	3,070	63.8	June 11, 1963	T,E	D,S	Estimated discharge 15 gpm. Temp. 66°F.
	501	Jack Warren	--	1923	90	--	3,010	83.6 63.9	Aug. 10, 1938 Nov. 1, 1962	N	N	Destroyed in 1963.
*	25-101	L. E. Robinson	--	--	77	6	3,500	58.7	Jan. 13, 1964	C,W	S	Estimated discharge 4 gpm. Temp. 68°F. 2/
	201	Sam C. Jenkins	--	1957	225	14	3,470	--	--	T,Ng	Irr	Measured discharge 504 gpm, Apr. 3, 1963. Perforated 121 ft.
	202	do	Parker Drilling Co.	1962	177	14	--	82.2	Dec. 26, 1963	T,Ng	Irr	Perforated 110 ft.
	203	do	do	1957	188	14	--	--	--	T,Ng	Irr	
	204	Hugh O. Wolfe	--	--	--	--	3,475	60.1 70.7	Oct. 30, 1945 Dec. 26, 1963	C,W	S	Old well.
*	301	Sam C. Jenkins	Parker Drilling Co.	1956	185	16	3,470	78.5	Jan. 21, 1959	T,Ng	Irr	Measured discharge 430 gpm, Aug. 21, 1962. Pump set at 140 ft. Observation well. Temp. 69°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-25-302	Sam C. Jenkins	Parker Drilling Co.	1956	166	14	--	--	--	T,G	Irr	Measured discharge 399 gpm, Apr. 3, 1963. Temp. 66°F.
303	do	Abbot Bros.	1951	150	--	--	--	--	T,Ng	Irr	Pump set at 120 ft.
* 304	do	Parker Drilling Co.	1960	172	14	3,470	71.6	Dec. 26, 1963	T,G	Irr	Perforated 100 ft. Temp. 66°F.
* 305	do	do	1963	186	14	--	--	--	T,G	Irr	Temp. 66°F. 1/
* 306	do	do	1956	155	--	--	--	--	T,Ng	Irr	Temp. 67°F.
* 307	do	--	1951	--	--	--	--	--	T,Ng	Irr	Temp. 66°F.
308	do	Parker Drilling Co.	1956	165	--	--	--	--	T,Ng	Irr	
* 309	-- Blackstock	--	1962	181	14	3,450	61.4	Dec. 26, 1963	T,G	Irr	Measured discharge 450 gpm, May 2, 1963.
310	do	--	1962	185	14	--	--	--	T,G	Irr	
311	J. L. Newsom	--	1962	185	14	--	--	--	T,G	Irr	
312	Brinson Ranch	--	1962	200	--	3,430	79.3 83.6	Nov. 29, 1962 Dec. 26, 1963	T,G	Irr	Reported discharge 1,100 gpm.
313	do	Jack Guffey	1963	246	14	3,420	85.9	Dec. 26, 1963	T,G	Irr	
* 314	do	--	--	244	--	--	--	--	T,G	Irr	Reported discharge 1,500 gpm. Temp. 66°F.
315	do	--	--	261	--	--	--	--	T,G	Irr	Reported discharge 1,300 gpm.
* 316	do	--	--	217	--	3,433	86.4 91.8	Nov. 29, 1962 Dec. 26, 1963	T,G	Irr	Reported discharge 1,500 gpm. Temp. 65°F.
317	do	--	--	242	--	3,412	74.7 77.0	Nov. 29, 1962 Dec. 26, 1963	T,G	Irr	Reported discharge 1,400 gpm.
* 401	Will Terry	--	1947	150	8	3,456	45.3 44.6	Apr. 10, 1958 Jan. 13, 1964	C,W	D	Estimated discharge 3 gpm. 2/
* 501	James L. Jones	John Stone	1963	107	16	3,440	50.1	Oct. 15, 1963	T,G	Irr	Measured 34 ft of drawdown after 8 hours at 250 gpm. Perforated 40 ft. Temp. 66°F.
601	Brinson Ranch	--	--	202	--	--	--	--	T,G	Irr	Reported discharge 1,100 gpm.
602	do	--	--	225	--	3,420	71.9 80.5 79.2	Nov. 29, 1962 Dec. 26, 1963 Jan. 13, 1964	T,G	Irr	Reported discharge 1,100 gpm. Pump set at 170 ft.
603	do	Jack Guffey	1963	235	--	--	--	--	T,G	Irr	
604	do	--	--	--	--	3,419	82.3 86.3	Oct. 30, 1945 Jan. 13, 1964	C,W	D,S	Old well. 2/

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-26-101	T. R. Sparks	--	--	130	--	3,400	80.1	Dec. 26, 1963	T,Ng	Irr	
*	102	G. M. Newsom	--	--	135	7	--	65.9	Oct. 9, 1962	N	N	
*	103	Mutual Farms	--	--	130	14	3,410	71.1	Nov. 21, 1963	N	N	
*	104	Gordon Newsom Farms	Parker Drilling Co.	1960	142	12	3,390	83.4	Dec. 26, 1963	T,Ng	Irr	Measured discharge 636 gpm. Perforated 54 ft.
	105	do	--	1951?	--	--	--	89.6	Dec. 26, 1963	T,Ng	Irr	
	106	do	--	--	85	5	--	73.8	Oct. 31, 1945	J,E	D,S	Old well.
*	201	National Water Corp.	Jack Guffey	1963	180	12	--	--	--	T,E, 20	Ind	Temp. 63°F.
	202	Wristen Ranch	--	--	--	--	3,341	56.3	Nov. 7, 1957	C,W	S	Observation well. 2/
*	301	Humble Oil & Refining Co.	Sharp Drilling Co.	1962	1,760	10	--	--	--	T,E	Ind	Reported discharge 251 gpm. Pump set at 1,570 ft. Water from Santa Rosa Sandstone. Temp. 83°F.
	302	Billy Hardberger	Parker Drilling Co.	1963	134	14	3,345	53.3	Jan. 7, 1964	N	N	1/
*	401	Cecil Hickerson	--	--	180	--	3,390	86.1	Dec. 26, 1963	T,G	Irr	Temp. 66°F.
	501	John Enloe	Parker Drilling Co.	1959	177	14	3,356	76.2	do	T,G	Irr	Perforated 114 ft.
*	502	National Water Corp.	Jack Guffey	1963	181	12	3,370	--	--	T,E, 20	Ind	Temp. 63°F.
*	503	do	Dixon Pump & Drilling Co.	1963	175	12	3,372	--	--	T,E, 20	Ind	Measured discharge 238 gpm, Oct. 7, 1963. Temp. 63°F.
*	504	do	Jack Guffey	1963	173	12	3,375	--	--	T,E, 20	Ind	Temp. 64°F.
	505	do	do	1963	173	12	3,377	--	--	T,E, 20	Ind	
*	506	do	Sam Gadberry	1963	154	12	3,378	--	--	T,E, 20	Ind	Measured discharge 244 gpm, Oct. 7, 1963. Temp. 64°F.
	507	do	Dixon Pump & Drilling Co.	1963	180	12	3,380	--	--	T,E, 20	Ind	Temp. 64°F.
*	508	do	Sam Gadberry	1963	186	12	3,383	--	--	T,E, 20	Ind	
*	509	do	Dixon Pump & Drilling Co.	1963	209	12	--	--	--	T,E, 20	Ind	Temp. 63°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-26-510	National Water Corp.	Dixon Pump & Drilling Co.	1963	220	12	3,383	--	--	T,E, 30	Ind	Measured discharge 320 gpm, Oct. 7, 1963. Temp. 64°F.
511	do	Sam Gadberry	1963	232	12	3,384	--	--	T,E, 30	Ind	
* 512	do	do	1963	248	12	3,385	--	--	T,E, 50	Ind	Temp. 64°F.
513	do	Dixon Pump & Drilling Co.	1963	233	12	3,385	--	--	T,E, 30	Ind	
* 514	do	Jack Guffey	1963	237	12	3,380	--	--	T,E, 30	Ind	Measured discharge 406 gpm, Oct. 7, 1963. Temp. 64°F.
* 515	do	do	1963	232	12	3,375	--	--	T,E, 30	Ind	Temp. 64°F.
516	do	Dixon Pump & Drilling Co.	1963	235	12	3,380	98.2	July 12, 1963	--	Ind	
* 517	do	do	1963	225	12	3,383	--	--	T,E, 30	Ind	Temp. 64°F. 1/
518	do	--	1963	220	12	3,383	--	--	T,E, 30	Ind	
* 601	do	Jack Guffey	1963	215	12	3,375	--	--	T,E, 30	Ind	Temp. 64°F.
602	do	do	1963	208	12	3,375	--	--	T,E, 30	Ind	
* 603	do	Dixon Pump & Drilling Co.	1963	206	12	3,377	--	--	T,E	Ind	Measured discharge 408 gpm, Oct. 7, 1963. Temp. 64°F.
* 604	Hugh Wristen	--	--	--	--	3,286	39.1 42.6	Nov. 1, 1945 Dec. 27, 1963	C,W	S	Temp. 65°F. 2/
* 605	J. A. Benthalt	--	1958	200	14	--	63.0	Dec. 26, 1963	T,G	Irr	Measured discharge 244 gpm, Sept. 14, 1962. Temp. 68°F.
* 701	Dennis Nix	--	--	--	--	3,356	101.7 96.7	Nov. 7, 1957 Jan. 13, 1964	C,W	S	Estimated discharge 3 gpm. Temp. 70°F.
901	J. A. Benthalt	--	1957	200	14	--	--	--	T,G	Irr	
* 27-101	Earnest Blount	Ross Irrigation Co.	1963	120	14	3,340	44.3	Dec. 24, 1963	T,G	Irr	Measured discharge 125 gpm, May 8, 1963. Temp. 67°F.
* 102	M. S. Doss, et al.	--	--	63	6	--	--	--	C,W	S	Temp. 69°F.
* 103	Robert Russell	-- Stone	1963	137	12	--	--	--	T,G	Irr	Measured discharge 317 gpm, Apr. 22, 1963. Temp. 67°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level		Method of lift	Use of water	Remarks
							Below land-surface datum (ft)	Date of measurement			
* KD-27-27-104	Robert Russell	--	1960	120	16	3,307	68.9	Dec. 23, 1963	T,G	Irr	Measured 21.7 ft of drawdown after 2 days at 202 gpm. Temp. 67°F.
* 201	Newell Bowen	-- Boohne	1954	--	--	3,290	91.4 81.2	Jan. 14, 1960 Jan. 15, 1964	T,Ng	Irr	Measured discharge 307 gpm, Aug. 6, 1962. Observation well. Temp. 69°F.
202	do	--	1955	--	--	--	--	--	T,Ng	Irr	Measured discharge 287 gpm, Aug. 6, 1962.
203	L. G. Miller	Parker Drilling Co.	1958	160	16	--	--	--	T,G	Irr	
204	John C. Barron	Jack Guffey	1963	163	14	--	--	--	T,G	Irr	Measured discharge 422 gpm, Apr. 5, 1963. Perforated 83 ft. Temp. 67°F.
205	do	Parker Drilling Co.	1960	186	14	3,300	59.4	Dec. 24, 1963	T,G	Irr	Perforated 80 ft.
206	H. R. Cope	--	--	113	6	3,295	78.3	Nov. 1, 1945	N	N	
* 301	C. Thompson	--	1937	97	8	3,252	56.2 55.0	June 26, 1937 Jan. 14, 1964	N	N	
* 302	Doughty L. Miller	Parker Drilling Co.	1962	160	--	--	62.2	Dec. 24, 1963	T,G	Irr	Measured discharge 107 gpm, Aug. 20, 1962. Temp. 69°F.
* 303	W. A. Jackson	do	1963	176	14	--	--	--	T,G	Irr	Temp. 67°F.
* 401	Leon Lawson	--	1949	180	--	3,310	70.7	Dec. 23, 1963	T,Ng	Irr	
* 402	G. R. Wall, Jr.	--	1955	174	12	--	--	--	T,G	Irr	Measured discharge 323 gpm, Apr. 16, 1962. Temp. 67°F.
* 403	G. R. Wall	Hester Drilling Co.	1962	212	--	3,320	80.2	Dec. 24, 1963	T,G	Irr	Measured 54.3 ft of drawdown after 24 hours at 224 gpm. Temp. 67°F.
* 404	G. R. Wall, Jr.	do	1962	166	--	--	86.0	Nov. 27, 1962	N	N	Drilled for irrigation. Abandoned.
* 405	Charles McLaurin	--	--	120	--	--	--	--	T,E	D	Temp. 68°F.
406	J. A. Benthall	--	1962	200	14	--	--	--	T,G	Irr	Measured discharge 426 gpm, Apr. 16, 1963.
* 407	do	--	1957	200	14	3,350	93.4	Dec. 24, 1963	T,G	Irr	Measured 55.2 ft of drawdown after 28 hours at 341 gpm. Temp. 67°F.
408	W. H. Thomas	Harold Price	1962	--	14	3,330	79.9	Dec. 23, 1963	T,G	Irr	
* 501	O. B. Smith	Mick Fullingim	1955	212	14	3,290	93.1	do	T,G	Irr	Temp. 68°F.
502	H. R. Cope	--	--	--	--	3,297	100.5	do	T,G	Irr	
503	Raymond Anderson	Stewart & Stevenson	1960	200	--	--	--	--	T,G	Irr	Pump set at 195 ft.
504	do	Parker Drilling Co.	1958	200	--	--	--	--	T,G	Irr	

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

	Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
	KD-27-27-505	Raymond Anderson	Stewart & Stevenson	1960	200	--	--	--	--	T,G	Irr	Pump set at 195 ft.
*	506	do	Parker Drilling Co.	1957	202	14	3,300	99.0	Dec. 24, 1963	T,G	Irr	Temp. 67°F.
*	507	do	Shorty Hester	1956	200	--	--	--	--	T,G	Irr	Measured discharge 333 gpm, Apr. 22, 1963. Pump set at 195 ft. Temp. 67°F.
	508	do	Stewart & Stevenson	1962	235	--	3,300	108.5	Dec. 24, 1963	T,G	Irr	Measured discharge 448 gpm, Aug. 6, 1962. Pump set at 230 ft.
*	509	do	do	1962	235	--	--	--	--	T,G	Irr	Measured discharge 238 gpm, Aug. 6, 1962. Temp. 69°F.
*	510	Arvel Fleming	-- Williams	1961	165	14	--	--	--	T,G	Irr	Measured discharge 495 gpm, Nov. 27, 1962. Temp. 71°F.
*	511	do	Parker Drilling Co.	1962	180	10	3,283	94.3	Dec. 24, 1963	T,G	Irr	Perforated 75 ft. Temp. 67°F.
	512	O. B. Smith	-- Hillard	1963	229	14	3,300	106.2	do	T,G	Irr	
	513	do	--	1959	225	14	3,290	114.8	do	T,G	Irr	
*	514	do	--	1962	227	10	3,280	103.2	do	T,G	Irr	Measured discharge 478 gpm, Nov. 27, 1962. Temp. 70°F.
*	515	C. F. Ford	Parker Drilling Co.	1960	187	16	--	--	--	T,G	Irr	Temp. 71°F.
*	516	B. G. Elam	do	1962	162	14	3,280	87.1	Dec. 24, 1963	T,Ng	Irr	Measured discharge 160 gpm, Nov. 27, 1962. Perforated 70 ft. Temp. 70°F.
	601	J. C. Simmons	--	--	65	6	3,209	46.0	Jan. 25, 1938	N	N	Old well.
	602	W. M. Smith	--	--	--	--	3,249	73.5	Dec. 24, 1963	N	Irr	Reported crooked hole.
	603	Darrell Jackson	--	1958	176	14	--	--	--	T,G	Irr	Measured discharge 309 gpm, Aug. 6, 1962.
*	604	L. G. Howell	Hester Drilling Co.	1956	170	14	--	--	--	T,G	Irr	Measured discharge 351 gpm, Aug. 1, 1962. Pump set at 151 ft. Temp. 69°F.
	605	Henry Kriegel	Stone & Parker	1951	185	--	3,270	100.1 101.7	Apr. 11, 1951 Dec. 24, 1963	T,G	Irr	Measured discharge 284 gpm, Aug. 6, 1962.
	606	C. E. Ford	Parker Drilling Co.	1958	223	16	--	--	--	T,G	Irr	Measured discharge 255 gpm, Aug. 6, 1962.
*	607	C. Cobb	--	--	100?	6	--	--	--	T,E	D,S	Estimated discharge 5 gpm. Temp. 72°F.
*	608	do	J. H. Flippo	1957	150	14	--	--	--	T,G	Irr	Measured discharge 234 gpm, Aug. 6, 1962. Temp. 69°F.
	609	Henry Kriegel	do	1955	120	14	--	76.4	Dec. 24, 1963	T,G	Irr	Measured discharge 605 gpm, Aug. 6, 1962.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
KD-27-27-701	Mack Ross	Ross Irrigation Co.	1959	200	12	3,320	93.3	Dec. 23, 1963	T,E, 60	Irr	Measured discharge 551 gpm, Aug. 5, 1963. Temp. 67°F.
702	do	do	1963	200	16	--	--	--	T,G	Irr	
703	W. H. Thomas	Harold Price	1962	185	14	--	84.5	Dec. 23, 1963	T,G	Irr	Measured 35.6 ft of drawdown after 24 hours at 192 gpm. 1/
28-101	J. W. Archer	M. Fullingim	1961	156	16	--	50.3	Nov. 8, 1962	T,G	Irr	Measured 50.3 ft of drawdown after 24 hours at 440 gpm. Temp. 67°F.
102	--	--	--	--	--	--	54.6	do	T,G	Irr	
301	Scharbauer Ranch	--	1959	100?	6	--	67.9	Dec. 4, 1962	T,E	D	Estimated discharge 10 gpm. Temp. 69°F.
501	do	--	--	120	--	3,189	59.5 55.7	Aug. 16, 1938 Dec. 19, 1963	C,W	S	Old well.
601	L. W. Montgomery	L. W. Montgomery	1958	100	--	--	--	--	T,E, 7½	Irr	Measured discharge 126 gpm, Aug. 1, 1962. Temp. 69°F.
602	do	Bruce Story	1961	100	--	--	--	--	N	Irr	Casing: 10-in. from 55 ft to bottom.
603	do	do	1961	100	--	3,190	52.9	Dec. 19, 1963	T,E, 7½	Irr	
701	Ben Kieth	W. W. Parmerly	1951	123	16	--	52.5 55.0	Apr. 11, 1951 Nov. 8, 1962	--	Irr	Measured discharge 134 gpm, Apr. 16, 1963. Temp. 67°F.
902	C. R. Cope	Jesse James	1962	116	14	3,160	43.3	Dec. 19, 1963	T,G	Irr	Measured discharge 171 gpm, Apr. 17, 1963. Pump set at 80 ft. Temp. 67°F.
29-301	Terrell County Schools	--	--	--	--	3,112	62.0	Nov. 8, 1962	C,W	S	Estimated discharge 4 gpm. Temp. 69°F.
401	R. E. Whitaker	--	1947	120	--	3,158	64.3 61.6	Apr. 11, 1958 Jan. 29, 1964	C,W	S	
501	Robert Draper	--	--	190	--	--	102.3	Nov. 8, 1962	T,G	Irr	
502	Federal Aviation Agency	Parker Drilling Co.	1962	310	--	--	--	--	J,E	D	Supplies water for lawn and rest room. Water from upper Triassic rocks. 1/
901	George D. Norman	do	1960	200	12	3,068	61.9 73.5	Feb. 26, 1960 Dec. 19, 1963	T,Ng	Irr	Reported discharge 450 gpm. Pump set at 190 ft. Perforated from 80 to 130 ft. Temp. 66°F.
902	do	--	1961	--	--	--	--	--	T,Ng	Irr	Temp. 67°F.
903	do	-- Wheeler	1961	200	--	--	--	--	T,Ng	Irr	Measured discharge 264 gpm, Aug. 20, 1962. Temp. 67°F.
904	do	--	1960	205	14	3,054	74.6	Dec. 19, 1963	T,Ng	Irr	Reported discharge 700 gpm, Aug. 20, 1962. Perforated 90 to 200 ft. Temp. 69°F.

See footnotes at end of table.

Table 2.--Records of wells and springs in Gaines County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
* KD-27-30-101	A. P. McGuire	Hall & Stewart Drilling Co.	1952	95	10	3,117	75.4	Sept. 17, 1962	T,E	D,S	Estimated discharge 10 gpm. Temp. 74°F.
* 401	H. Giesecke Estate	--	--	--	8	3,057	69.3	Oct. 24, 1962	C,W	S	Estimated discharge 4 gpm. Temp. 69°F.
* 402	H. C. Shumaker Estate	--	--	57	7	3,024	36.4	Nov. 8, 1962	C,W	S	Estimated discharge 3 gpm. Temp. 68°F.
701	G. E. Newton	Parker Drilling Co.	1951	125	14	3,030?	47.0	Dec. 19, 1963	T,Ng	Irr	Measured discharge 135 gpm, Aug. 20, 1962.
* 702	do	do	1953	110	14	--	43.7	do	T,Ng	Irr	Measured discharge 195 gpm, Aug. 20, 1962. Temp. 70°F.
703	do	do	1955	130	12	--	--	--	T,Ng	Irr	
* 801	R. S. Brennand, Jr.	do	1952	84	6	3,042	67.0 66.9	Oct. 24, 1962 Dec. 19, 1963	C,W	S	Estimated discharge 4 gpm.
802	do	--	1938	16	--	--	13.7 13.0	Aug. 15, 1938 Dec. 23, 1963	N	N	Dug well.
* 31-101	Verdie Welty	Jesse James	1962	130	14	2,990	75.1	Jan. 14, 1963	T,G	Irr	Measured 33.3 ft of drawdown after 48 hours at 55 gpm. Temp. 67°F.
* 102	Estes Bros.	--	1951	150	8	2,981	115.4	Apr. 17, 1963	T,G	Irr	Temp. 67°F.
103	do	H. H. Dozier	1960	150	10	--	--	--	T,G	Irr	
* 104	do	do	1960	150	12	--	--	--	T,G	Irr	Measured discharge 286 gpm, Apr. 17, 1963. Temp. 68°F.
105	do	-- Lovejoy	1916	120	--	--	107.5 112.1 106.4	Aug. 15, 1938 May 20, 1963 Feb. 13, 1964	C,G	S	
* 201	Harold Sheets	Hester Drilling Co.	1963	120	--	--	--	--	T,G	Irr	Temp. 67°F.
* 401	Estes Bros.	H. H. Dozier	--	153	12	2,990	105.0 103.6	Jan. 14, 1963 Dec. 16, 1963	T,G	Irr	Measured 42 ft of drawdown after several days at 132 gpm.
* 402	Maurice Archer	Jesse James	1962	167	10	--	108.5 109.6	Jan. 14, 1963 Dec. 16, 1963	T,G	Irr	Pump set at 160 ft. Temp. 66°F.
* 403	W. G. Cozart	-- Doshier	1962	170	10	--	--	--	T,G	Irr	Measured discharge 119 gpm, Apr. 17, 1963. Temp. 67°F.
801	Estes Bros.	--	--	--	--	2,933	86.8	Jan. 3, 1964	C,W	S	

* For analyses of water from wells in Gaines County see Table 5.
1/ For drillers' logs of wells in Gaines County see Table 3.
2/ For water-level measurements of wells in Gaines County see Table 4.

Table 3.--Drillers' logs of wells in Gaines County

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well KD-26-16-801					
Owner: Bill Cole. Driller: A. J. Nordyke.					
Topsoil	3	3	Sandrock	11	78
Caliche	16	19	Sand, water	12	90
Rock	4	23	Sandrock	90	115
Sandrock	28	51	Sand, water	21	136
Sand, water	16	67			
Well KD-26-32-302					
Owner: Lon Hill. Driller: Parker Drilling Co.					
Topsoil	5	5	Sand	4	70
Caliche	24	29	Rock	13	83
Packsand	18	47	Clay, yellow	3	86
Sandrock	5	52	Limerock	6	92
Sand, tight	8	60	Clay, sandy	2	94
Rock	6	66			
Well KD-27-01-513					
Owner: Southwestern Public Service Co. Driller: D. L. McDonald.					
Sand and Clay	5	5	Sand, soft, fine	38	104
Caliche and Clay	16	21	Sandrock, hard	2	106
Caliche, hard	7	28	Sand, streaks of sandrock	60	166
Sand and sandrock	23	51	Rock, hard	5	171
Sand	5	56	Sand and gravel	5	176
Rock, hard	6	62	Clay, yellow	11	187
Sand, streaks of sandrock	4	66	Clay, blue	6	193

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well KD-27-02-607

Owner: Willie C. Sweatt. Driller: Stewart & Stevenson.

Topsoil	2	2	Rock	4	113
Clay	26	28	Sand	25	138
Caliche	32	60	Rock, hard	2	140
Rock	10	70	Sand	2	142
Sand and boulders	3	73	Rock, hard	2	144
Rock, hard	2	75	Sand, water	21	165
Sand, dry	25	100	Clay, sandy	15	180
Sand, water	9	109	Clay, blue	5	185

Well KD-27-03-614

Owner: M. E. Peatree. Driller: Ted Koonce.

Soil	3	3	Sand	3	104
Caliche	25	28	Rock	4	108
Sand	32	60	Sand	3	111
Rock	6	66	Rock	4	115
Sand	23	89	Sand	3	118
Rock	2	91	Rock	6	124
Sand	3	94	Sand and clay, yellow	62	186
Rock	7	101			

Well KD-27-04-802

Owner: John D. Browne. Driller: Ted Koonce.

Clay	5	5	Sand	25	55
Clay, sandy	25	30	Rock	3	58

(Continued on next page)

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well KD-27-04-802--Continued					
Sand	29	87	Rock	10	125
Rock	3	90	Sand	1	126
Sand	8	98	Rock	6	132
Rock	6	104	Sand	32	164
Sand	11	115	Clay, yellow	1	165
Well KD-27-05-715					
Owner: N. B. Fields. Driller: Ted Koonce.					
Soil	8	8	Sand	7	111
Caliche	22	30	Rock	3	114
Clay, sandy	17	47	Sand	4	118
Rock	2	49	Rock	10	128
Sand, dry	41	90	Sand	35	163
Sand, hard	10	100	Clay, white, sandy	7	170
Rock	4	104			
Well KD-27-06-505					
Owner: O. P. Mercer. Driller: J. B. Knight.					
Soil	4	4	Clay, sandy, hard streaks	30	105
Caliche, hard	6	10	Sand, water	5	110
Clay, sandy	10	20	Clay, sandy	5	115
Caliche, rock, and sandstone	28	48	Sand, water	45	160
Sandstone, hard	14	62	Clay, brown	6	166
Sandstone, broken	13	75			

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well KD-27-10-306

Owner: Sam Teague. Driller: Jack Guffey.

Caliche	45	45	Shale	3	143
Limerock	4	49	Sand	9	152
Sand	52	101	Rock	3	155
Limerock	5	106	Shale	5	160
Sand	34	140			

Well KD-27-11-803

Owner: R. E. Matthews. Driller: Parker Drilling Co.

Topsoil	7	7	Clay, yellow	11	168
Caliche	12	19	Sand, sticky	7	175
Packsand	89	108	Sand, red	4	179
Rock	2	110	Clay, red	2	181
Water seep	5	115	Clay, sandy	7	188
Rock	1	116	Sand, white	10	198
Sand, water	18	134	Sand, yellow	14	212
Rock	3	137	Clay, red (water)	3	215
Clay, sandy	3	140	Clay, sandy	51	266
Rock	17	157	Red beds	2	268

Well KD-27-12-308

Owner: J. M. Teague. Driller: Ross Irrigation Co.

Soil	4	4	Sand	40	70
Clay	11	15	Rock	5	75
Caliche	15	30	Sandstone	15	90

(Continued on next page)

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well KD-27-12-308--Continued					
Clay, sandy	5	95	Lime, gray	45	217
Rock, hard	29	124	Sand and gravel	3	220
Sand, water	23	147	Shale, blue	7	227
Clay, yellow	12	159	Sand, white	6	233
Lime, gray	10	169	Red beds	3	236
Shale, blue	3	172			
Well KD-27-12-903					
Owner: Helen Hearn. Driller: Ted Koonce.					
Clay, red	6	6	Sand, water	5	85
Clay, sandy	3	9	Rock	13	98
Caliche	21	30	Sand	46	144
Sand	44	74	Rock	13	157
Rock	6	80	Clay, blue	3	160
Well KD-27-13-220					
Owner: T. O. Hunt. Driller: Murphy Drilling Co.					
Topsoil	8	8	Rock, hard	14	106
Caliche	23	31	Sand, water	29	135
Sand, dry	28	59	Clay, sandy	4	139
Sandrock	29	88	Clay, yellow	2	141
Sand, water	4	92			

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well KD-27-14-108

Owner: Toy King. Driller: Parker Drilling Co.

Topsoil	7	7	Sand, sticky	19	68
Caliche	7	14	Sand	13	81
Packsand	14	28	Clay, blue	7	88
Water seep	21	49			

Well KD-27-17-802

Owner: J.M.T. Development Co. Driller: Harold Price.

Surface	2	2	Rock	5	109
Rock	2	4	Sand	30	139
Sand	6	10	Clay	6	145
Rock	5	15	Rock	6	151
Clay, sandy	7	22	Sand	24	175
Lime, white	6	28	Clay, red	1	176
Clay, sandy	9	37	Sand and gravel	12	188
Rock	28	65	Clay, blue	5	193
Sand	11	76	Shale	17	210
Rock	4	80	Red beds	2	212
Sand	24	104			

Well KD-27-18-405

Owner: Hughes Smith. Driller: Parker Drilling Co.

Topsoil	4	4	Sand	15	39
Caliche	15	19	Rock	5	44
Rock	5	24	Sand, sticky	24	68

(Continued on next page)

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well KD-27-18-405--Continued					
Rock	3	71	Sand and shell rock	6	119
Sand	14	85	Sand, yellow	21	140
Rock	2	87	Rock	4	144
Sand	7	94	Sand, brown, and small gravel	14	158
Rock	2	96	Clay, white	4	162
Clay, sandy	9	105	Red beds	3	165
Rock	8	113			
Well KD-27-19-705					
Owner: A. P. McGuire. Driller: Parker Drilling Co.					
Topsoil	6	6	Clay, yellow	8	126
Caliche	11	17	Sand	14	140
Packsand	38	55	Sand, yellow	26	166
Sandrock	6	61	Sand, sticky	9	175
Sand, water	32	93	Red beds	3	178
Rock	25	118			
Well KD-27-20-601					
Owner: Fred Farrar. Driller: Parker Drilling Co.					
Surface soil	3	3	Clay, sandy	6	100
Caliche	43	46	Sand, white	8	108
Sand, brown	12	58	Clay, sandy	3	111
Sandrock	6	64	Clay, red	3	114
Sand, sticky	2	66	Clay, blue	1	115
Limerock	12	78	Clay, red	2	117
Clay	16	94			

Table 3.--Drillers' logs of wells in Gaines County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

Well KD-27-21-119

Owner: R. E. Jameson. Driller: Parker Drilling Co.

Topsoil	9	9	Sand, sticky	9	121
Caliche	5	14	Sand, tight	20	141
Packsand	49	63	Clay, red	4	145
Sand, water	49	112			

Well KD-27-25-305

Owner: Sam C. Jenkins. Driller: Parker Drilling Co.

Topsoil	4	4	Sand	32	116
Caliche	19	23	Rock, hard	8	124
Packsand	22	45	Clay, sandy	13	137
Rock	2	47	Sand and gravel	12	149
Sand, dry	19	66	Clay	1	150
Rock, hard	4	70	Sand	31	181
Sand, water	13	83	Clay, red	5	186
Rock	1	84			

Well KD-27-26-302

Owner: Billy Hardberger. Driller: Parker Drilling Co.

Topsoil	14	14	Rock	13	75
Caliche	12	26	Sand and gravel	37	112
Packsand	32	58	Sand, yellow	12	124
Water seep	4	62	Red beds	10	134

Table 3.--Drillers' logs of wells in Gaines County--Continued

Thickness (feet)	Depth (feet)	Thickness (feet)	Depth (feet)

Well KD-27-26-517

Owner: National Water Corp. Driller: Dixon Pump & Drilling Co.

Sand---------- 5	5	Sand, gravel, and some clay, small to medium irregular shaped--- 32	165
Caliche---------- 30	35		
Sand and caliche ledges---------- 45	80	Sand, loose, with medium gravel, and red clay---------- 18	183
Sand and ledges------- 15	95		
Sand and soft sandstone---------- 15	110	Gravel, medium to large; sand, clean---------- 37	220
Sandstone and sandy clay ledges--------- 15	125	Red beds---------- 5	225
Sandstone with clay ledges---------- 8	133		

Well KD-27-27-403

Owner: G. R. Wall. Driller: Hester Drilling Co.

Topsoil---------- 5	5	Sand, water---------- 5	85
Sand, seep---------- 5	10	Rock---------- 5	90
Caliche---------- 5	15	Sand, water, sugar sand---------- 26	116
Caliche and gravel---- 5	20	Rock---------- 4	120
Caliche, rock chunks---------- 12	32	Sand, brown, water--- 17	137
Clay, rock chunks----- 15	47	Red beds---------- 3	140
Sand, dry---------- 12	59	Sand, water---------- 27	167
Rock---------- 5	64	Red beds---------- 2	169
Sand, water---------- 10	74	Sand, clay, and red beds---------- 43	212
Rock---------- 6	80		

Table 3.--Drillers' logs of wells in Gaines County--Continued

Thickness (feet)	Depth (feet)	Thickness (feet)	Depth (feet)

Well KD-27-27-703

Owner: W. H. Thomas. Driller: Harold Price.

Surface---------- 3	3	Rock---------- 3	107
Clay, red---------- 13	16	Sand and gravel------ 42	149
Caliche---------- 24	40	Clay, sandy--------- 6	155
Clay, sandy---------- 35	75	Clay, red---------- 2	157
Sand, dry---------- 8	83	Sand and gravel------ 23	180
Sand, water---------- 1	84	Red beds---------- 5	185
Limerock---------- 20	104		

Well KD-27-29-502

Owner: Federal Aviation Agency. Driller: Parker Drilling Co.

Surface---------- 2	2	Clay, sandy--------- 15	190
Clay, red---------- 17	19	Red beds---------- 12	202
Rock---------- 4	23	Rock---------- 2	204
Clay, red, sandy----- 28	51	Sand, dry---------- 24	228
Rock---------- 2	53	Red beds---------- 5	233
Clay, sandy---------- 15	68	Sand, dry---------- 12	245
Rock, hard---------- 11	79	Red beds---------- 15	260
Red beds---------- 16	95	Sand, dry---------- 17	277
Shale, gray, sandy---- 40	135	Rock---------- 3	280
Red beds---------- 28	163	Sand, dry---------- 6	286
Sand, dry---------- 7	170	Red beds---------- 16	302
Red beds---------- 5	175	Sand---------- 8	310

Table 4.--Water levels in wells in Gaines County

Date	Water level	Date	Water level	Date	Water level
Well KD-26-08-519					
Owner: Joe F. Woosley.					
Oct. 7, 1949	41.8	Feb. 15, 1955	55.5	Jan. 20, 1959	65.4
Jan. 5, 1950	38.4	Jan. 6, 1956	58.9	Jan. 16, 1963	67.55
Apr. 5, 1951	46.8	Jan. 8, 1957	63.0	Jan. 21, 1964	68.30
Feb. 10, 1954	53.5	Jan. 17, 1958	62.3		
Well KD-26-08-521					
Owner: Joe F. Woosley.					
Feb. 15, 1955	57.9	Jan. 17, 1958	64.4	Jan. 21, 1964	69.34
Jan. 6, 1956	61.3	Jan. 20, 1959	69.1		
Jan. 8, 1957	62.8	Jan. 16, 1963	69.30		
Well KD-26-08-617					
Owner: L. R. McGehee.					
July 12, 1955	71.9	Jan. 17, 1958	59.0	Jan. 21, 1964	68.32
Jan. 10, 1956	61.1	Jan. 20, 1959	63.3		
Jan. 27, 1957	58.5	Jan. 16, 1963	66.78		
Well KD-26-08-619					
Owner: L. R. McGehee.					
Oct. 10, 1949	34.1	Jan. 14, 1955	48.6	Jan. 17, 1958	57.0
Apr. 10, 1951	41.09	Jan. 10, 1956	56.1	Jan. 16, 1963	63.10
Dec. 1, 1952	43.3	Jan. 27, 1957	56.0	Jan. 21, 1964	64.50

NOTE: Water levels reported to nearest tenth (0.1) measured by the Soil Conservation Service of the U.S. Department of Agriculture; all others measured by the U.S. Geological Survey.

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-26-08-621

Owner: V. Hilburn.

Oct. 10, 1949	36.2	Feb. 10, 1954	49.8	Jan. 31, 1958	63.8
Apr. 10, 1951	40.2	Jan. 14, 1955	57.2	Jan. 20, 1959	63.7
Dec. 30, 1952	44.8	Jan. 20, 1956	55.5	Jan. 16, 1963	65.45
Sept.30, 1953	56.1	Jan. 28, 1957	59.2	Jan. 21, 1964	68.13

Well KD-26-08-802

Owner: Roy Smith.

Oct. 7, 1949	45.2	Jan. 14, 1955	53.2	Jan. 14, 1964	64.53
Jan. 5, 1953	48.9	Jan. 25, 1956	56.9		

Well KD-26-08-807

Owner: Joe F. Woosley.

Oct. 7, 1949	42.7	Jan. 6, 1956	61.3	Jan. 16, 1963	68.30
Jan. 5, 1953	47.6	Jan. 8, 1957	59.0	Jan. 21, 1964	64.50
Feb. 10, 1954	51.9	Jan. 11, 1958	59.0		
Feb. 15, 1955	56.0	Jan. 20, 1959	62.8		

Well KD-26-08-905

Owner: Mrs. J. M. Crow.

Oct. 7, 1949	38.7	Jan. 6, 1956	55.7	Jan. 20, 1959	60.5
Feb. 8, 1951	40.3	Jan. 9, 1957	59.0	Jan. 16, 1963	65.77
Feb. 15, 1955	57.6	Jan. 17, 1958	59.0	Feb. 6, 1964	67.62

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-01-514

Owner: E. J. Mitchell.

Jan. 14, 1955	85.1	Jan. 28, 1958	90.8	Jan. 21, 1964	99.25
Jan. 7, 1956	87.1	Jan. 16, 1963	99.60		

Well KD-27-03-801

Owner: C. A. Moore.

Feb. 17, 1955	70.5	Jan. 27, 1957	81.5	Jan. 24, 1964	85.70
Jan. 4, 1956	80.0	Jan. 16, 1963	83.80		

Well KD-27-03-802

Owner: Jim Ward.

Feb. 17, 1955	77.0	Jan. 27, 1957	86.8	Jan. 16, 1963	86.48
Jan. 4, 1956	83.1	Jan. 30, 1958	87.0	Jan. 24, 1964	88.72

Well KD-27-05-907

Owner: E. F. Halbrook.

Jan. 7, 1955	44.1	Jan. 20, 1958	41.5	Jan. 15, 1963	46.24
Dec. 28, 1955	44.5	Jan. 21, 1959	44.8	Jan. 28, 1964	47.40

Well KD-27-09-303

Owner: William H. Pierson.

Jan. 14, 1955	64.1	Jan. 17, 1958	59.5	July 15, 1963	60.35
Jan. 6, 1956	64.9	Jan. 19, 1959	60.5	Jan. 10, 1964	58.80
Jan. 24, 1957	64.5	Jan. 16, 1963	60.32		

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-09-304

Owner: William H. Pierson.

Jan. 29, 1957	59.1	Jan. 19, 1959	59.5	Jan. 10, 1964	59.45
Jan. 17, 1958	59.0	Jan. 16, 1963	59.54		

Well KD-27-09-402

Owner: Mrs. B. M. Ancell.

Apr. 10, 1958	48.75	Sept.14, 1962	51.04	Feb. 14, 1963	52.24
July 11, 1962	51.40	Oct. 12	51.56	Jan. 10, 1964	50.40
Aug. 8	51.18	Dec. 12	51.64		

Well KD-27-13-106

Owner: Bill Oates.

Jan. 16, 1953	86.9	Jan. 23, 1958	85.8	Jan. 15, 1963	93.96
Jan. 7, 1955	87.8	Jan. 14, 1959	85.9	Jan. 20, 1964	94.12

Well KD-27-13-205

Owner: Robert Howard.

Mar. 25, 1955	88.8	Jan. 22, 1958	91.0	Jan. 20, 1964	90.90
Dec. 28	88.1	Jan. 14, 1959	92.5		
Feb. 4, 1956	92.2	Jan. 15, 1963	91.15		

Well KD-27-14-109

Owner: D. N. Hunt.

Feb. 13, 1955	21.9	Jan. 22, 1958	24.1	Jan. 20, 1964	26.00
Feb. 18, 1957	22.9	Jan. 15, 1963	24.86		

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-14-110

Owner: D. N. Hunt.

Feb. 13, 1955	23.0	Feb. 18, 1957	24.0	Jan. 15, 1963	25.88
Dec. 18	23.9	Jan. 22, 1958	23.9	Jan. 20, 1964	27.00

Well KD-27-14-111

Owner: M. J. Strube.

Feb. 13, 1955	24.6	Feb. 18, 1957	28.5	Jan. 15, 1963	28.34
Dec. 28	25.1	Jan. 22, 1958	27.8	Jan. 20, 1964	28.80

Well KD-27-18-112

Owner: Harry Houston.

Dec. 30, 1955	69.5	Jan. 15, 1958	76.2	Jan. 9, 1964	84.10
Jan. 29, 1957	75.1	Jan. 16, 1963	80.06		

Well KD-27-19-106

Owner: Walter A. Koemel.

Jan. 17, 1956	59.0	Jan. 24, 1958	62.1	Jan. 16, 1963	66.19
Jan. 29, 1957	59.2	Jan. 16, 1959	61.5	Jan. 9, 1964	67.74

Well KD-27-19-107

Owner: F. E. Belt.

Jan. 6, 1955	62.8	Jan. 17, 1958	61.5	Jan. 16, 1963	71.97
Jan. 29, 1957	64.1	Jan. 16, 1959	62.1	Jan. 9, 1964	69.52

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level
Well KD-27-19-113					
Owner: E. Hobbs.					
Jan. 4, 1956	54.0	Jan. 17, 1958	53.3	Jan. 16, 1963	59.88
Jan. 29, 1957	53.7	Jan. 16, 1959	56.0	Jan. 9, 1964	62.11
Well KD-27-19-501					
Owner: L. G. Miller.					
Jan. 16, 1955	60.1	Jan. 24, 1958	64.8	Jan. 16, 1963	67.40
Jan. 25, 1957	65.2	Jan. 14, 1959	65.0	Jan. 9, 1964	67.86
Well KD-27-20-801					
Owner: James Stanley.					
Aug. 16, 1938	50.0	Oct. 16, 1962	38.48	June 18, 1963	39.23
Apr. 11, 1958	40.50	Nov. 14	38.62	Jan. 29, 1964	39.07
July 12, 1962	39.22	Dec. 13	38.20		
Sept.17	38.24	Jan. 11, 1963	38.46		
Well KD-27-21-201					
Owner: Raymond C. Golden.					
Apr. 11, 1958	63.80	Nov. 14, 1962	66.89	Apr. 25, 1963	66.81
July 13, 1962	74.50	Dec. 13	66.89	July 24	66.73
Aug. 15	67.37	Jan. 11, 1963	66.90	Nov. 20	66.69
Sept.17	77.76	Feb. 15	67.51	Jan. 29, 1964	66.76
Oct. 16	67.08	Mar. 11	66.77		

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-21-901

Owner: Roe Bavousette.

July 13, 1962	71.19	Jan. 11, 1963	70.40	Sept.16, 1963	69.58
Aug. 15	71.15	Feb. 15	70.28	Nov. 20	69.10
Sept.17	70.97	Mar. 11	70.13	Jan. 29, 1964	68.70
Oct. 16	70.97	Apr. 25	70.13		
Dec. 13	70.28	July 24	69.82		

Well KD-27-21-902

Owner: Roe Bavousette.

July 13, 1962	73.48	Dec. 13, 1962	72.87	Sept.16, 1963	72.35
Aug. 15	73.45	Jan. 11, 1963	73.12	Nov. 20	71.87
Oct. 16	73.39	Apr. 25	72.80	Jan. 29, 1964	71.67
Nov. 14	72.94	July 24	72.47		

Well KD-27-21-903

Owner: Roe Bavousette.

July 13, 1962	78.82	Dec. 13, 1962	78.40	June 3, 1963	77.84
Aug. 15	78.80	Jan. 11, 1963	78.49	July 24	77.25
Sept.17	78.64	Feb. 15	78.26	Sept.10	77.67
Oct. 16	78.72	Mar. 11	78.07	Nov. 20	77.30
Nov. 14	78.46	Apr. 25	78.00	Jan. 29, 1964	77.20

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-21-904

Owner: R. C. Pattie.

Aug. 10, 1938	84.14	Feb. 15, 1963	66.23	Sept.16, 1963	66.03
Oct. 24, 1962	66.40	Mar. 11	66.10	Nov. 20	65.84
Nov. 14	66.35	Apr. 25	66.37	Jan. 29, 1964	65.75
Dec. 13	66.34	June 3	66.13		
Jan. 11, 1963	66.39	July 24	66.05		

Well KD-27-25-101

Owner: L. E. Robinson.

Oct. 30, 1945	56.0	Sept.14, 1962	58.50	Feb. 14, 1963	59.20
Apr. 10, 1958	57.70	Oct. 16	60.10	Jan. 13, 1964	58.73
July 11, 1962	59.50	Nov. 15	58.58		
Aug. 9	58.48	Dec. 12	58.56		

Well KD-27-25-401

Owner: Will Terry.

Apr. 10, 1958	45.30	Sept.14, 1962	45.10	Jan. 13, 1964	44.63
July 11, 1962	48.40	Dec. 12	52.05		

Well KD-27-25-604

Owner: Brinson Ranch.

Oct. 30, 1945	82.4	Aug. 9, 1962	92.47	July 1, 1963	85.44
Apr. 10, 1958	82.92	Sept. 14	92.38	Jan. 13, 1964	86.34
July 12, 1962	91.18	Dec. 12	95.35		

Table 4.--Water levels in wells in Gaines County--Continued

Date	Water level	Date	Water level	Date	Water level

Well KD-27-26-202

Owner: Wristen Ranch.

Nov. 7, 1957	56.3	Oct. 16, 1962	53.79	June 19, 1963	53.84
July 12, 1962	53.63	Nov. 15	53.85	Jan. 13, 1964	54.27
Aug. 9	53.75	Dec. 12	53.82		
Sept.14	53.80	Jan. 10, 1963	53.80		

Well KD-27-26-604

Owner: Hugh Wristen.

Nov. 1, 1945	39.1	Sept.14, 1962	42.59	July 22, 1963	38.32
Apr. 10, 1958	40.30	Oct. 16	42.62	Dec. 27	42.68
July 12, 1962	42.27	Dec. 12	43.53		
Aug. 9	42.45	June 19, 1963	41.94		

Well KD-27-26-701

Owner: Dennis Nix.

Nov. 7, 1957	101.70	Sept.14, 1962	96.50	Feb. 14, 1963	96.64
July 12, 1962	96.89	Oct. 16	98.14	Jan. 13, 1964	96.74
Aug. 9	96.75	Dec. 12	96.00		

Well KD-27-29-401

Owner: R. E. Whitaker.

Apr. 11, 1958	64.30	Nov. 14, 1962	61.91	June 18, 1963	61.87
July 12, 1962	62.19	Dec. 13	61.90	Nov. 20	61.64
Aug. 9	62.12	Feb. 14, 1963	61.85	Jan. 29, 1964	61.60
Oct. 16	62.14	Apr. 25	61.84		

Table 5.--Chemical analyses of water from wells and springs in Gaines County

(Analyses given are in parts per million, except specific conductance, pH, and sodium-adsorption ratio; sodium and potassium are calculated as sodium unless otherwise noted.)

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-26-08-502	145	Nov. 16, 1945	--	--	46	20	50	128	122	49	--	5.9	--	454	197	--	--	--
502	150	Sept. 13, 1962	58	--	72	20	44	221	104	43	1.5	5.6	--	457	260	1.19	675	7.3
504	160	Apr. 23, 1963	58	--	73	16	36	210	90	40	1.6	4.5	--	422	249	1.0	648	7.4
508	158	do	58	--	32	23	45	210	109	68	1.6	4.5	--	494	299	1.13	765	7.6
511	160	do	60	--	82	26	45	205	132	67	1.4	5.5	--	520	310	1.13	798	7.5
512	160	do	60	--	74	17	35	211	107	35	1.7	4	--	438	254	1.04	650	7.4
514	150	do	58	--	74	16	37	215	89	43	1.7	5	--	430	253	1.01	660	7.5
521	140	do	58	--	98	35	71	206	199	113	1.7	11	--	688	389	1.57	1,070	7.5
601	150	Aug. 1, 1963	54	--	80	23	64	209	163	66	3.0	7	--	563	293	1.63	850	7.4
603	196	Apr. 23, 1963	60	--	62	22	72	223	86	86	1.7	3	--	503	243	1.99	795	7.6
604	180	do	64	--	82	26	48	210	102	89	1.7	4.5	--	520	311	1.18	800	7.9
605	162	do	60	--	78	22	59	215	84	98	1.6	3	--	512	285	1.53	820	7.6
608	150	Aug. 19, 1963	60	--	73	23	37	216	81	61	1.1	3.5	--	446	278	1.0	710	7.5
616	130	Apr. 23, 1963	60	--	79	25	58	220	140	58	2.3	7	--	537	295	1.46	790	7.6
617	150	Apr. 8, 1963	60	--	105	29	52	201	152	107	2.0	5.5	--	612	382	1.16	965	7.5
619	150	do	60	--	98	27	58	209	185	76	1.9	8	--	617	357	1.34	910	7.4
801	140	Aug. 17, 1962	62	--	84	24	59	197	144	73	1.55	5.5	--	550	308	1.47	826	7.5
802	150	Apr. 23, 1963	50	--	57	25	76	232	168	76	2.0	13	--	617	319	1.87	--	7.5
806	150	Nov. 23, 1962	51	--	85	22	52	204	127	77	4.0	11	--	529	303	1.29	834	7.5
905	145	Apr. 23, 1963	60	--	79	27	58	215	129	72	1.7	8	--	541	309	1.45	835	7.5
906	150	Oct. 11, 1962	63	--	108	30	55	206	184	107	1.3	9	--	658	392	1.21	867	7.5
908	150	Apr. 23, 1963	62	--	73	25	50	216	121	50	2.0	9	--	504	287	1.28	762	7.5
910	160	Oct. 11, 1962	62	--	75	26	56	225	146	53	1.3	6	--	536	293	1.43	773	7.6
912	150	Apr. 23, 1963	62	--	147	46	83	196	328	168	1.7	11	--	943	560	1.52	1,400	7.0
915	140	Apr. 8, 1963	62	--	85	31	65	218	159	80	2.0	11	--	602	339	1.54	934	7.4
917	180	Apr. 23, 1963	62	--	69	21	43	205	109	49	2.0	7	--	463	260	1.16	705	7.5
919	173	do	60	--	82	25	53	215	137	70	2.0	5.5	--	541	306	1.32	822	7.6

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-26-16-203	200	Mar. 21, 1963	60	--	63	22	50	214	93	53	2.0	4	0.30	452	250	1.37	710	7.5
207	205	May 7, 1963	64	--	54	23	68	210	114	55	2.3	2.5	--	486	228	1.97	746	7.6
208	205	do	60	--	60	26	45	207	98	54	2.0	2	--	450	258	1.22	676	7.4
209	205	do	6.6	--	56	23	43	209	86	47	1.7	3	--	429	234	1.19	645	7.6
303	175	June 5, 1963	58	--	53	25	45	214	83	44	1.2	5.5	--	420	234	1.27	650	7.7
305	175	May 7, 1963	62	--	60	21	34	207	72	39	2.0	7	--	399	235	.97	617	7.5
306	175	June 5, 1963	55	--	61	23	40	212	83	44	.6	8	--	419	247	1.11	656	7.6
308	170	Mar. 21, 1963	54	--	62	22	39	226	68	38	2.3	8	--	404	243	1.08	632	7.6
309	205	May 7, 1963	62	--	62	25	47	209	99	49	2.0	5	--	454	258	1.29	697	7.6
310	160	Jan. 25, 1963	56	--	61	24	39	304	91	42	1.0	6.5	--	471	250	1.06	650	7.8
501	--	Aug. 27, 1962	62	--	69	21	44	199	83	69	1.3	4.1	.15	451	259	1.2	685	7.5
505	150	Aug. 7, 1963	60	--	59	20	49	207	102	45	2.6	1.5	--	441	228	1.42	650	7.5
506	150	May 7, 1963	64	--	53	20	59	209	94	47	2.0	5	--	447	216	1.72	678	7.6
508	170	do	64	--	52	23	48	215	83	42	2.0	5	--	425	225	1.36	650	7.5
604	205	do	58	--	62	24	46	206	98	53	2.2	5	--	449	252	1.24	699	7.5
605	180	do	60	--	61	21	51	215	91	48	2.0	5	--	445	238	1.43	685	7.4
607	--	do	66	--	52	24	59	223	95	46	2.6	2.5	--	457	228	1.7	702	7.5
801	135	Jan. 25, 1963	62	--	71	25	47	216	85	71	1.0	7.5	--	476	280	1.21	770	7.6
902	120	Aug. 7, 1963	56	--	57	24	48	210	90	51	2.9	2.0	--	434	243	1.30	670	7.5
905	--	do	58	--	68	32	60	220	125	88	3.1	5.5	--	548	303	1.49	855	7.6
906	--	do	58	--	98	36	81	207	151	163	3.0	.1	--	699	392	1.77	1,120	7.6
24-202	--	May 9, 1963	66	--	74	23	44	193	97	77	1.7	7.0	--	485	282	1.1	746	7.6
302	150	June 10, 1963	60	--	63	20	36	206	81	38	1.2	7.0	--	407	240	1.0	620	7.7
303	--	June 12, 1963	59	--	87	37	63	211	145	113	2.0	11	--	621	367	1.4	974	7.6
304	155	July 3, 1963	58	--	60	24	30	207	72	39	2.0	8	--	395	245	.8	608	7.7
501	165	Oct. 12, 1962	55	--	61	17	44	217	64	44	1.3	5.3	--	399	221	1.3	611	7.8
502	120	May 7, 1963	64	--	52	26	46	211	88	53	1.9	5	--	439	236	1.3	672	7.5
503	120	Sept. 20, 1962	68	--	59	18	44	220	65	42	1.3	3.4	--	408	222	1.3	593	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-26-24-504	140	May 7, 1963	62	--	62	17	38	211	69	42	1.9	5	--	401	225	1.1	605	7.7
601	170	June 12, 1963	50	--	59	19	43	203	71	44	1.4	10	--	397	224	1.4	610	7.5
603	155	do	47	--	57	19	44	201	68	44	1.9	12	--	392	218	1.3	601	7.5
801	150	May 9, 1963	60	--	55	21	41	220	64	42	2.4	4	--	397	223	1.2	626	7.7
901	140	do	58	--	68	12	43	221	63	41	2.7	3	--	399	218	1.3	620	7.4
32-301	100	Aug. 15, 1963	79	--	50	28	59	255	76	48	2.6	< .4	--	468	240	1.6	700	7.2
501	47	Oct. 30, 1962	63	--	61	35	80	337	81	66	4.0	11	--	567	297	2.1	865	7.3
27-01-401	160	Apr. 24, 1963	60	--	86	26	69	218	125	74	1.9	8	--	557	320	1.7	913	7.4
402	122	do	60	--	116	35	140	218	274	181	2.4	4	--	919	431	2.9	1,420	7.5
406	130	Sept. 13, 1962	60	--	66	22	46	222	96	55	1.7	5.8	--	461	257	1.2	688	7.6
408	180	Apr. 24, 1963	60	--	105	38	87	206	194	145	2.0	8	--	740	418	1.8	1,150	7.4
411	180	do	56	--	63	27	50	218	86	72	2.0	1	--	464	268	1.3	745	7.6
412	165	do	56	--	83	23	64	218	150	67	1.7	1	--	553	301	1.6	852	7.6
413	160	do	60	--	75	23	56	224	102	76	1.9	5	--	509	281	1.5	793	7.3
502	100?	do	62	--	117	47	63	212	207	167	1.7	7	--	776	487	1.1	1,200	7.6
505	147	Aug. 22, 1962	66	--	61	26	48	236	88	50	1.4	5.1	--	462	260	1.3	692	7.6
506	180	Aug. 1, 1963	58	--	75	32	53	224	106	83	1.7	9	--	528	317	1.3	820	7.6
508	180	Aug. 22, 1962	62	--	120	53	91	204	239	210	1.3	5.8	--	882	516	1.7	1,400	7.5
509	183	Sept. 11, 1962	62	--	71	27	57	240	109	66	1.3	5.3	--	517	288	1.5	775	7.6
510	195	Nov. 30, 1962	60	--	67	27	44	229	94	57	2.0	6	--	470	282	1.1	730	7.8
511	--	Oct. 23, 1962	61	--	62	28	47	232	89	50	1.7	5.3	--	458	268	1.2	700	7.5
513	193	Jan. 3, 1963	60	--	70	25	45	232	92	62	1.5	5.5	--	475	280	1.2	750	7.5
514	180	Apr. 24, 1963	64	--	71	31	50	227	100	78	1.6	5.5	--	513	307	1.2	806	7.7
518	180	do	64	--	88	36	58	227	139	111	1.7	3	--	613	368	1.3	965	7.5
520	312	July 15, 1960	58	--	54	25	48	240	74	41	1.7	7.7	--	427	238	1.4	647	7.3
520	--	Oct. 23, 1962	63	--	54	25	52	240	75	41	1.5	6	--	435	237	1.5	646	7.6
521	280	do	61	--	61	31	37	237	85	42	1.7	4.9	--	440	278	1.0	666	7.3
602	170	Jan. 3, 1963	58	--	92	43	64	222	197	125	1.0	5.5	--	694	408	1.4	1,090	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-01-603	182	Oct. 23, 1962	55	--	62	30	57	231	111	60	3.7	4.7	--	470	280	1.5	710	7.4
604	151	Jan. 3, 1963	60	--	95	40	83	229	192	136	2.0	4.3	--	724	403	1.8	1,180	7.8
605	184	Oct. 23, 1962	62	--	65	33	58	233	113	66	2.0	5.3	--	519	295	1.5	780	7.7
606	200	do	63	--	62	35	46	233	98	65	2.0	4.9	--	491	298	1.2	735	7.6
612	290	do	59	--	59	29	41	236	79	40	1.7	6.5	--	431	266	1.1	680	7.5
701	--	Oct. 11, 1962	66	--	100	33	48	211	186	87	1.5	8	--	634	384	1.1	928	7.5
703	--	Sept. 13, 1962	58	--	93	35	80	227	230	83	1.7	6.0	--	699	374	1.8	1,020	7.4
705	60	Nov. 16, 1945	--	--	--	--	--	156	130	149	--	8.7	--	--	285	--	--	--
705	60	Jan. 3, 1963	67	--	78	27	41	215	109	74	1.8	7	--	511	306	1.0	805	7.5
901	267	Nov. 19, 1962	60	--	57	25	43	232	69	38	2.0	6.5	--	414	244	1.2	660	7.6
902	--	Sept. 13, 1962	60	--	73	36	50	231	115	92	2.0	6	0.40	548	330	1.2	855	7.5
903	--	do	64	--	66	31	49	226	108	70	1.7	7	--	508	295	1.2	770	7.8
02-402	177	Aug. 1, 1963	51	--	80	43	74	223	162	113	3.0	4.0	--	640	379	1.6	1,000	7.6
[a] 501	168	Nov. 30, 1962	55	--	61	29	68	228	136	77	3.0	3.4	--	544	296	1.8	869	7.3
502	170	Apr. 8, 1963	58	--	74	47	64	231	153	109	3.1	4.5	--	627	378	1.4	988	7.7
503	170	do	58	--	75	49	62	229	161	119	3.1	4.5	--	645	386	1.4	1,005	7.6
504	170	Sept. 13, 1962	60	--	65	41	52	229	135	84	2.7	4.9	.40	557	331	1.2	838	7.8
603	196	Aug. 19, 1963	51	--	111	77	81	204	261	218	2.8	9	--	911	590	1.4	1,470	7.4
604	170	do	54	--	57	46	60	249	108	92	3.3	1.5	--	545	329	1.4	876	7.6
606	150	Jan. 3, 1963	56	--	57	38	46	242	104	66	3.0	4.0	--	493	297	1.2	800	7.6
608	--	Jan. 4, 1963	56	--	46	39	51	184	113	69	6.0	4.3	--	475	276	1.3	792	7.7
701	188	July 1, 1963	56	--	78	40	59	224	137	103	3.0	5.5	--	592	361	1.3	925	7.5
703	165	do	56	--	60	28	42	232	79	51	3.3	5.5	--	439	263	1.1	686	7.5
705	172	do	56	--	60	27	36	223	87	43	2.9	5.0	--	427	262	1.0	646	7.5
801	160	Aug. 1, 1963	54	--	61	36	53	232	111	70	4.6	3	--	507	298	1.3	780	7.5
803	182	do	48	--	55	32	43	222	82	65	4.4	2.0	--	440	270	1.1	720	7.4
806	--	Oct. 2, 1962	60	--	50	31	43	265	62	45	3	8	--	432	253	1.2	646	7.8
809	186	June 5, 1963	55	--	58	35	46	234	81	73	2.6	5	--	471	288	1.2	760	7.5

[a] Sampled at 89 ft with Foerst sampler.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-02-810	172	July 1, 1963	54	--	54	28	41	234	80	40	3.3	5.5	--	421	248	1.1	642	7.6
901	141	Aug. 1, 1963	51	--	51	36	51	255	79	65	5.3	3.5	--	467	275	1.3	740	7.5
904	168	do	50	--	53	37	49	242	78	65	3.4	3.0	--	457	285	1.3	746	7.6
905	182	July 1, 1963	50	--	52	37	52	233	95	67	3.6	3.0	--	475	282	1.4	755	7.5
906	194	do	51	--	60	45	66	242	137	88	3.6	5.0	--	575	333	1.6	895	7.3
03-401	--	July 19, 1963	50	--	39	38	83	262	94	70	5.4	2.0	--	510	252	2.3	835	7.8
404	--	Aug. 12, 1963	52	--	46	47	69	260	92	95	4.8	1.5	--	535	307	1.7	878	7.8
406	--	do	50	--	46	51	70	256	123	103	4.8	< .4	--	574	326	1.7	915	7.3
407	178	Apr. 9, 1963	56	--	50	54	68	266	124	102	5.7	2	--	593	347	1.6	954	7.5
408	168	Oct. 11, 1962	54	--	51	54	65	284	119	82	5	1.6	--	572	349	1.5	884	7.6
501	146	Aug. 16, 1962	52	--	52	50	68	243	122	93	4.5	1.2	0.25	563	336	1.6	889	7.6
502	155	Aug. 12, 1963	50	--	57	47	72	239	151	99	4.3	1	--	599	336	1.7	937	7.7
503	175	July 16, 1963	50	--	46	38	75	257	98	71	5.0	.1	--	509	270	2.0	813	7.4
504	166	July 10, 1963	47	--	41	43	88	264	129	74	5.6	2.0	--	560	280	2.3	900	7.8
508	175	July 16, 1963	52	--	41	35	79	266	90	64	5.6	< .4	--	498	247	2.2	804	7.3
509	165	Aug. 14, 1963	47	--	83	109	134	235	401	221	5.2	3	--	1,120	660	2.3	1,740	7.4
511	165	Aug. 12, 1963	49	--	59	69	121	264	290	131	5.2	< .4	--	854	432	2.5	1,270	7.5
513	165	do	50	--	50	61	74	237	151	124	4.8	< .4	--	632	373	1.7	1,020	7.8
514	--	do	54	--	51	54	54	246	139	75	4.8	< .4	--	552	351	1.3	882	7.7
601	160	July 12, 1963	50	--	54	49	72	240	144	89	4.6	3.0	--	584	335	1.7	926	7.8
603	180	do	50	--	47	70	85	279	180	110	4.9	5.0	--	689	403	1.8	1,080	7.9
605	160?	July 23, 1963	46	--	48	51	82	279	152	69	5.0	2.0	--	592	329	2.0	920	7.4
606	202	July 19, 1963	54	--	55	67	87	264	204	108	4.6	4.0	--	714	411	1.9	1,110	7.8
607	199	July 15, 1963	47	--	45	61	75	278	127	101	5.1	.5	--	598	363	1.7	974	7.8
609	185	Sept. 18, 1962	54	--	48	60	62	253	170	88	5.0	2.2	--	613	365	1.4	935	7.5
612	200	Aug. 13, 1963	54	--	56	59	106	282	240	91	5.2	< .4	--	750	382	2.4	1,090	7.6
614	186	July 8, 1963	52	--	68	78	108	264	282	134	5.1	< .4	--	857	490	2.1	1,310	7.8
701	140	Aug. 16, 1962	54	--	49	44	58	280	77	69	4.0	2.7	--	496	304	1.4	778	7.8

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-03-702	207	July 10, 1963	52	--	46	45	61	242	94	75	3.9	4.0	--	500	297	1.5	800	7.8
706	188	July 15, 1963	60	--	50	51	67	254	107	102	4.4	3.0	--	569	335	1.6	912	7.8
708	170	Apr. 9, 1963	56	--	61	68	77	257	161	145	5.0	4.5	--	704	430	1.6	1,140	7.6
711	173	July 10, 1963	50	--	47	38	45	259	56	59	4.0	5.0	--	431	273	1.2	710	7.8
712	200	Aug. 12, 1963	52	--	46	45	54	248	81	75	4.1	3.0	--	482	301	1.3	784	7.9
713	--	do	52	--	54	48	62	268	90	98	4.3	3.5	--	544	333	1.5	900	7.9
714	180	do	52	--	44	41	53	260	72	65	4.3	1.5	--	461	278	1.4	752	7.9
718	170	May 3, 1963	54	--	47	44	52	278	76	70	4.3	4	--	488	298	1.3	790	7.5
719	170	Aug. 14, 1963	51	--	49	39	54	275	66	62	4.1	3	--	463	283	1.4	740	7.5
801	170	Apr. 9, 1963	56	--	50	55	67	272	133	92	5.7	2.5	--	595	252	1.5	955	7.7
802	170	Aug. 13, 1963	50	--	60	66	72	266	163	128	5.2	1	--	676	422	1.5	1,080	7.5
810	182	do	51	--	43	42	52	264	80	63	4.8	2	--	468	279	1.4	742	7.5
813	170	do	51	--	52	54	63	265	152	78	4.8	1	--	586	351	1.5	902	7.6
814	185	do	51	--	44	40	56	288	71	53	4.1	2	--	463	275	1.5	728	7.7
901	201	Aug. 16, 1962	52	--	40	46	60	267	77	82	4.9	2.2	--	495	289	1.5	797	7.7
903	196	July 11, 1963	48	--	50	61	55	239	154	87	5.0	4.0	--	582	377	1.2	931	7.9
906	180	July 15, 1963	50	--	49	60	61	244	156	82	5.0	< .4	--	583	369	1.4	923	7.3
907	176	May 13, 1963	50	--	53	65	64	235	209	91	4.8	1.5	--	654	398	1.4	994	7.6
908	196	Aug. 13, 1963	52	--	59	73	64	243	192	120	4.8	2.0	--	687	445	1.3	1,080	7.6
909	200	July 13, 1963	50	--	56	68	74	245	187	118	5.6	1.0	--	681	421	1.6	1,080	7.5
911	197	July 12, 1963	50	--	84	97	86	238	249	227	5.0	2.0	--	917	610	1.5	1,490	7.9
913	197	Aug. 13, 1963	51	--	64	65	75	257	137	163	4.7	1.5	--	687	426	1.6	1,120	7.7
917	180	July 13, 1963	50	--	47	61	66	257	143	94	5.3	2.5	--	595	370	1.5	929	7.6
918	185	Aug. 13, 1963	54	--	42	42	61	271	79	59	5.2	5	--	480	276	1.6	772	7.7
04-402	154	Nov. 30, 1962	51	--	57	83	83	251	278	120	4.0	2.2	--	801	484	1.6	1,260	7.4
404	204	Nov. 6, 1945	--	--	72	75	57	251	247	103	--	2.8	--	781	488	--	--	--
404	204	Oct. 22, 1962	59	--	63	76	79	262	230	124	4.0	5.1	--	769	471	1.6	1,130	7.6
501	--	July 23, 1963	44	--	72	106	114	234	332	202	5.1	4.5	--	995	610	2.0	1,550	7.8

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-04-504	166	Dec. 5, 1962	50	--	52	70	77	251	216	106	5.0	<0.4	--	699	416	1.6	1,140	7.5
505	168	June 27, 1963	47	--	51	77	91	266	219	128	5.4	5.5	--	755	445	1.9	1,300	8.1
506	183	Oct. 24, 1945	--	--	60	87	90	262	249	142	5.2	2.8	--	851	507	--	--	--
506	183	Dec. 5, 1962	51	--	57	89	88	282	250	146	5.0	10	--	834	508	1.7	1,350	7.6
507	--	Mar. 28, 1963	52	--	50	84	84	273	225	126	4.9	12	--	772	471	1.7	1,040	7.8
509	166	July 23, 1963	44	--	43	66	84	262	163	116	4.9	2.0	--	652	377	1.9	1,050	7.5
510	153	do	48	--	45	67	79	260	170	105	5.3	4.5	--	652	385	1.8	1,078	7.9
511	174	do	48	--	43	63	83	293	161	84	5.0	6.0	--	637	366	1.9	1,030	7.8
512	160	Nov. 16, 1962	50	--	63	97	98	255	251	202	4.0	7	--	897	556	1.8	1,500	7.7
601	164	July 23, 1963	46	--	46	79	86	267	210	124	5.0	3.0	--	730	439	1.8	1,190	8.0
602	230	July 22, 1963	42	--	37	80	90	268	193	131	5.0	2.0	--	712	421	1.9	1,200	7.8
603	230	do	44	--	47	78	91	262	190	145	4.9	4.0	--	733	438	1.9	1,230	7.8
604	190	do	38	--	37	88	91	288	219	132	5.3	< .4	--	752	454	1.9	1,220	7.8
608	170	July 18, 1963	46	--	51	102	105	273	288	173	3.6	2.5	--	906	550	2.0	1,440	7.7
610	172	July 17, 1963	44	--	39	83	86	299	199	111	4.7	2.5	--	717	436	1.8	1,150	7.8
611	172	do	46	--	37	88	88	299	199	126	4.9	3.0	--	739	455	1.8	1,200	7.7
701	160	July 19, 1963	50	--	57	78	95	248	289	108	5.0	3.0	--	807	463	1.9	1,200	7.8
702	161	July 20, 1963	48	--	70	94	88	244	325	131	4.7	1.0	--	882	560	1.6	1,340	7.8
703	150	July 23, 1963	44	--	55	74	68	244	190	120	5.3	2.0	--	681	441	1.4	1,080	7.8
705	150	July 22, 1963	44	--	56	75	66	238	162	149	5.1	2.5	--	677	448	1.3	1,110	7.8
707	160	July 20, 1963	50	--	64	86	75	232	204	182	4.7	2.5	--	783	510	1.4	1,300	7.9
710	150	do	50	--	77	112	81	226	259	229	4.9	5.0	--	929	650	1.4	1,540	7.9
715	138	July 17, 1963	50	--	59	67	67	251	146	127	5.0	3.0	--	647	419	1.4	1,080	7.9
716	182	do	46	--	66	82	76	238	179	181	4.9	2.5	--	755	499	1.5	1,250	7.7
803	178	do	50	--	58	82	76	250	214	140	5.7	2.5	--	751	479	1.5	897	7.7
804	173	July 15, 1963	48	--	50	75	75	264	173	121	4.7	< .4	--	677	432	1.6	1,100	7.4
805	174	do	50	--	51	76	70	275	176	121	5.1	1.0	--	685	438	1.5	1,100	7.4
806	--	do	48	--	46	70	69	281	156	95	5.0	2.5	--	630	400	1.5	1,020	7.8

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-04-812	190	July 15, 1963	50	--	90	119	112	227	388	239	5.0	<0.4	--	1,110	710	2.4	1,740	7.2
815	123	July 17, 1963	50	--	71	82	66	253	190	161	4.9	1.0	--	750	520	1.3	1,250	7.5
901	214	July 18, 1963	47	--	50	73	79	267	182	126	5.1	2.5	--	696	424	1.7	1,120	7.7
903	200	July 19, 1963	44	--	48	89	87	267	181	168	4.7	4.0	--	757	485	1.7	1,240	7.8
904	200	do	48	--	43	79	86	275	179	133	4.7	3.0	--	711	432	1.8	1,140	7.9
905	195	July 18, 1963	50	--	50	71	71	282	182	90	5.0	2.5	--	661	419	1.5	1,020	7.8
906	197	do	50	--	58	58	80	278	199	138	5.3	2.5	--	750	473	1.6	1,210	7.9
910	175	July 19, 1963	52	--	54	80	80	282	219	107	5.3	3.0	--	739	462	2.3	1,160	7.8
912	145	do	51	--	52	83	81	285	225	118	5.3	4.5	--	760	469	1.6	1,180	7.7
913	195	July 17, 1963	48	--	56	76	74	267	187	120	5.6	4.5	--	705	451	1.5	1,120	7.7
914	204	do	48	--	64	85	72	256	202	154	4.9	2.0	--	758	510	1.4	1,230	7.4
915	189	July 19, 1963	50	--	60	77	72	265	193	125	5.4	2.5	--	715	466	1.4	1,160	7.4
917	--	do	56	--	54	78	81	287	219	98	5.3	2.5	--	735	454	1.6	1,140	7.7
05-401	137	Aug. 16, 1962	54	--	53	77	97	301	205	135	4.9	< .4	--	774	450	2.0	1,190	7.5
403	145	Aug. 6, 1963	50	--	58	75	80	296	160	141	8.0	< .4	--	718	452	1.6	1,160	7.5
404	159	do	51	--	73	125	116	271	350	266	5.4	5	--	1,120	700	1.9	1,760	7.5
405	172	Aug. 14, 1963	50	--	56	85	102	296	239	167	4.1	< .4	--	848	491	2.0	1,310	7.6
409	200	Aug. 6, 1963	47	--	48	95	86	289	227	155	5.4	3.5	--	809	510	3.4	1,370	7.5
411	163	Aug. 7, 1963	48	--	57	86	88	265	253	144	6.8	< .4	--	813	496	1.7	1,300	7.6
502	160	Aug. 6, 1963	50	--	37	54	87	301	142	66	6.1	9	--	599	315	2.1	945	7.8
504	260	do	45	--	42	55	77	283	154	72	5.0	3.5	--	592	330	1.8	928	7.5
505	170	do	47	--	70	104	114	243	296	248	5.3	< .4	--	1,000	600	2.0	1,600	7.2
508	170	Aug. 9, 1963	50	--	34	50	80	307	119	55	5.5	10	--	554	288	2.0	860	7.8
512	130	Aug. 6, 1963	52	--	40	50	83	288	146	66	7.0	1.5	--	588	305	2.1	920	7.7
516	152	Aug. 9, 1963	39	--	39	58	273	281	290	298	4.1	< .4	--	1,140	335	6.5	1,800	8.1
518	130	do	50	--	89	128	164	239	348	395	4.3	5	--	1,300	750	2.6	2,060	7.1
521	162	Aug. 6, 1963	46	--	67	100	115	288	302	196	5.6	1.5	--	975	580	2.1	1,550	7.6
601	180?	Aug. 15, 1962	57	--	36	51	132	305	141	128	5.0	< .4	--	700	300	3.3	1,090	7.5

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-05-601	180?	July 24, 1963	46	--	34	52	135	296	138	123	5.4	<0.4	--	679	295	3.4	1,110	7.8
602	142	do	41	--	39	78	108	276	144	183	4.6	1.0	--	735	417	2.3	1,240	7.9
603	139	do	46	--	69	115	114	239	272	280	4.4	2.5	--	1,020	650	2.0	1,670	7.5
605	160	May 8, 1963	45	--	54	75	306	281	428	312	4.3	11	--	1,370	443	6.3	2,160	7.6
610	140	Aug. 23, 1962	54	--	47	60	131	284	182	152	4.8	1.6	0.66	772	364	3.0	1,200	7.5
612	130?	Aug. 6, 1963	47	--	63	89	116	292	300	165	5.0	8	--	937	520	2.2	1,410	7.4
613	165	May 8, 1963	52	--	52	78	120	292	216	170	4.9	2.5	--	839	452	2.4	1,350	7.7
614	116	Mar. 4, 1963	53	--	58	83	144	306	262	195	5.3	3	--	953	485	2.8	1,500	7.5
615	130	July 24, 1963	46	--	50	79	142	307	219	184	4.6	3.0	--	847	448	2.9	1,430	7.7
701	168?	Aug. 8, 1963	45	--	37	75	82	320	166	108	4.7	< .4	--	675	400	1.8	1,080	7.5
702	168?	do	51	--	42	86	90	312	207	133	4.7	2	--	770	459	1.8	1,200	7.9
706	151	Aug. 7, 1963	52	--	43	77	86	299	190	113	6.1	3.0	--	717	423	1.8	1,140	7.7
707	145	do	51	--	65	98	103	273	273	183	5.0	8	--	920	570	1.9	1,410	7.7
715	170	do	51	--	59	82	91	287	228	154	4.8	2	--	813	483	1.8	1,250	7.9
801	146	Aug. 10, 1963	43	--	56	104	101	299	303	170	4.7	< .4	--	929	560	1.8	1,480	7.5
802	188	Aug. 7, 1963	47	--	55	83	102	304	267	121	5.0	10	--	840	478	2.0	1,260	7.7
803	169	May 20, 1963	50	--	61	97	112	272	240	213	4.7	14	--	926	550	2.1	1,500	7.8
804	159	Aug. 8, 1963	41	--	74	112	114	285	297	251	4.5	4	--	1,040	640	2.0	1,650	7.6
805	190	Aug. 7, 1963	47	--	42	74	90	336	182	99	4.7	< .4	--	703	407	1.9	1,090	7.8
807	190	do	50	--	46	83	90	307	216	128	4.8	1	--	770	453	3.2	1,180	7.9
809	150?	Aug. 10, 1963	45	--	53	105	118	338	304	158	4.7	< .4	--	979	560	2.2	1,500	7.4
810	170	Aug. 7, 1963	50	--	60	119	121	320	315	229	4.8	1	--	1,060	640	2.1	1,650	7.5
812	211	May 8, 1963	58	--	82	56	72	288	194	115	4.7	4	--	728	436	1.5	1,140	7.7
813	200	do	56	--	46	79	83	303	182	124	4.7	2.5	--	726	440	1.7	1,160	7.5
814	218	Aug. 9, 1963	50	--	40	77	83	318	162	107	4.8	1	--	681	415	1.8	1,100	7.5
815	208	do	52	--	39	68	79	327	166	84	4.7	1.5	--	654	371	1.8	1,080	7.9
903	163	Aug. 24, 1962	52	--	70	113	113	294	308	193	4.4	6	--	1,000	640	1.9	1,550	7.6
905	125	Aug. 8, 1963	52	--	68	132	145	309	396	236	4.5	16	--	1,200	710	2.4	1,850	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-05-907	150	May 8, 1963	56	--	71	118	166	318	464	203	5.3	18	--	1,260	660	2.8	1,910	7.6
908	--	Nov. 26, 1962	50	--	64	98	159	272	329	221	1.0	10.5	--	1,070	563	2.9	1,740	7.5
911	110	Aug. 8, 1963	51	--	71	112	138	318	353	205	5.3	< .4	--	1,090	640	2.4	1,700	7.6
912	110	do	53	--	97	166	177	326	590	312	4.5	5	--	1,560	920	2.5	2,260	7.5
913	110	do	51	--	71	130	140	321	399	241	4.8	1.5	--	1,170	710	2.3	1,810	7.6
914	100	do	56	--	82	134	167	311	415	293	4.8	3	--	1,300	760	2.6	2,000	7.5
915	100	do	51	--	84	134	164	309	427	283	4.8	4	--	1,300	760	2.6	1,980	7.6
917	100	do	56	--	91	116	170	301	407	304	4.8	< .4	--	1,300	700	2.0	1,950	7.5
918	100	do	51	--	62	90	123	325	253	201	4.8	< .4	--	945	530	2.3	1,500	7.5
919	250	Aug. 9, 1963	47	--	44	94	108	342	242	129	5.2	3	--	840	496	2.1	1,330	7.6
920	250	do	50	--	42	91	106	343	230	117	4.5	< .4	--	810	477	2.1	1,320	7.8
06-402	184	Aug. 19, 1963	47	--	40	67	162	331	210	173	5.3	< .4	--	866	374	3.6	1,430	7.7
404	128	July 19, 1963	50	--	47	74	152	317	232	163	5.4	11	--	890	419	3.2	1,400	7.5
501	1,880	Aug. 29, 1963	12	--	112	74	3,500	334	4,220	2,660	3.1	< .4	--	10,750	590	63	>12,000	8.0
502	--	Oct. 26, 1962	16	--	100	44	3,242	395	3,506	2,415	1.7	< .4	--	9,520	430	65	11,400	7.7
503	186	Apr. 22, 1963	56	--	45	84	140	315	233	186	5.0	2.5	--	905	458	2.8	1,480	7.5
504	188	do	58	--	50	81	159	301	242	184	5.4	1	--	927	455	3.2	1,540	7.6
505	161	Aug. 15, 1962	52	--	174	221	306	297	143	1,101	4.3	< .4	--	2,150	1,343	3.6	3,700	7.5
505	166	Feb. 4, 1963	54	--	314	451	698	272	323	2,620	4.5	< .4	--	4,600	2,630	5.9	7,660	7.6
506	147	Aug. 15, 1962	54	--	69	113	200	323	365	295	4.8	5.1	--	1,260	638	3.4	1,940	7.6
507	149	Apr. 22, 1963	50	--	43	88	142	323	138	259	4.9	< .4	--	883	468	2.9	1,540	7.8
507	149	Aug. 30, 1963	49	--	37	81	166	326	156	256	5.2	< .4	--	910	425	3.5	1,590	7.7
508	157	Nov. 2, 1962	55	--	63	141	253	447	402	345	6.0	4.2	--	1,490	738	4.1	2,280	7.5
509	213	Apr. 22, 1963	49	--	41	75	175	331	250	193	5.4	< .4	--	950	407	3.8	1,560	7.5
601	173	Aug. 23, 1962	52	--	45	83	135	316	316	219	4.8	< .4	0.66	884	453	2.8	1,400	7.5
603	167	Apr. 22, 1963	56	--	57	96	162	304	303	224	5.1	1	--	1,050	540	3.0	1,740	7.8
604	160	Feb. 6, 1963	24	--	49	79	116	311	184	190	5.0	4.2	--	803	446	2.4	1,380	7.7
606	--	July 19, 1963	50	--	46	76	153	311	265	160	5.4	.5	--	907	427	3.2	1,450	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-06-608	--	July 19, 1963	45	--	45	80	119	318	184	176	5.4	3.0	--	813	442	2.5	1,350	7.7
609	--	do	50	--	49	78	155	310	276	164	5.7	2.0	--	932	443	3.2	1,460	7.8
701	100	Nov. 26, 1962	55	--	124	162	268	295	645	450	4.5	11.5	--	1,870	978	3.7	2,840	7.5
702	102	July 12, 1963	51	--	109	157	263	290	580	436	5.4	9.0	--	1,750	920	3.8	2,650	7.6
703	100	do	52	--	131	209	305	316	710	580	5.3	5.0	--	2,150	1,108	3.9	3,200	7.6
901	160	Aug. 23, 1962	41	--	71	113	177	328	375	240	5.2	< .4	--	1,180	641	3.0	1,820	7.2
904	120	July 19, 1963	36	--	93	114	215	316	403	343	6.5	8	--	1,370	700	3.5	2,180	7.5
905	--	Apr. 22, 1963	35	--	175	305	960	305	650	2,100	6.0	8	--	4,390	1,690	10	7,050	7.5
07-401	110	Aug. 15, 1962	57	--	28	46	128	360	131	55	6.0	11	--	639	259	3.5	971	7.7
701	160	Feb. 19, 1963	42	--	46	83	141	336	207	175	5.6	< .4	--	865	456	2.9	1,430	7.7
703	130	July 19, 1963	39	--	59	124	187	278	415	306	5.1	< .4	--	1,270	660	3.2	2,040	7.0
704	181	Aug. 24, 1962	52	--	55	76	150	308	245	160	4.9	1.6	0.67	895	451	3.1	1,440	7.6
09-101	104	Dec. 3, 1962	59	--	76	26	58	243	127	62	2.0	4.4	--	534	294	1.5	816	7.2
102	94	do	71	--	61	29	60	345	65	66	3.0	< .4	--	525	270	1.6	850	7.4
103	160	July 15, 1963	62	--	61	21	35	205	68	42	2.6	5.0	--	396	237	1.0	605	7.4
106	160	do	56	--	62	23	52	212	101	49	1.9	7.0	--	455	250	1.4	698	7.8
201	97	Nov. 10, 1945	--	--	--	--	--	226	[a] 80	68	--	5.6	--	--	315	--	--	--
201	97	Oct. 29, 1962	63	--	83	33	79	232	140	109	2.0	6	--	629	342	1.9	960	7.5
301	135	Aug. 17, 1962	56	--	75	33	51	215	146	64	2.5	2.4	--	536	322	1.2	810	7.2
302	165	Nov. 27, 1962	59	--	71	27	47	221	110	60	2.0	10	--	495	287	1.2	770	7.6
303	131	Aug. 17, 1962	62	--	224	74	475	203	174	1,080	1.5	5.8	--	2,200	864	7.0	3,670	7.1
304	140	do	60	--	92	35	51	199	138	118	1.9	5.5	--	599	375	1.1	920	7.6
305	190	Apr. 8, 1963	62	--	80	35	61	216	134	104	2.6	7	--	590	343	1.4	935	7.5
306	150	May 2, 1963	58	--	57	23	57	221	91	50	2.6	8	--	455	238	1.6	710	7.5
307	176	Aug. 17, 1962	58	--	181	69	521	232	143	1,050	2.1	4.0	--	2,140	738	8.3	3,600	7.3
308	150	Aug. 28, 1963	58	--	73	33	69	224	123	99	2.2	3.5	--	570	318	1.7	919	7.4
309	170	Aug. 17, 1962	60	--	62	27	64	223	99	62	2.3	8	--	494	265	1.7	752	7.5
401	140	Aug. 7, 1963	60	--	62	24	54	210	114	55	3.1	3.5	--	478	252	1.5	725	7.4

[a] By turbidity.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-09-402	100	Sept. 14, 1962	62	--	76	49	115	277	184	144	2.8	14	--	783	390	2.5	1,190	7.5
403	--	Aug. 7, 1963	62	--	58	26	63	204	108	71	3.3	1.5	--	492	251	1.8	770	7.6
404	--	Aug. 6, 1963	58	--	49	22	61	227	85	43	3.4	3.0	--	435	214	1.8	680	7.5
503	--	Aug. 7, 1963	50	--	51	25	46	227	75	37	3.3	5.5	--	405	228	1.3	638	7.4
601	156	Apr. 9, 1963	60	--	65	26	54	223	107	56	2.9	7	--	487	270	1.4	745	7.5
603	150	Apr. 8, 1963	60	--	57	27	55	234	89	50	2.7	5.5	--	461	252	1.5	719	7.5
606	150	do	62	--	66	29	56	233	119	61	2.4	8	--	518	283	1.3	785	7.5
607	150	Jan. 29, 1963	71	--	65	32	39	223	109	52	2.0	7.5	--	488	296	1.0	750	7.8
608	150	June 5, 1963	55	--	54	29	49	232	95	45	1.4	8	--	450	254	1.3	704	7.5
609	--	June 7, 1963	53	--	106	65	142	256	275	225	2.7	19	--	1,010	530	2.7	1,600	7.6
611	--	Apr. 9, 1963	54	--	61	31	59	232	101	63	3.1	7	--	492	277	1.5	780	7.7
701	182	July 19, 1963	56	--	49	26	44	212	85	42	2.2	3.0	--	412	232	1.3	625	7.4
803	240	May 24, 1960	60	--	68	31	71	220	162	69	--	4.8	--	574	297	1.8	878	7.2
804	1,863	June 1, 1960	10	--	16	8.2	1,140	375	1,650	368	1.6	2.0	--	3,380	74	58	4,800	7.9
805	202	Aug. 7, 1963	58	--	63	30	46	223	123	48	4.0	3.0	--	485	281	1.2	730	7.5
809	170	Aug. 6, 1963	54	--	65	32	52	219	138	60	3.7	2.0	--	515	295	1.3	775	7.6
811	160	Jan. 29, 1963	58	--	59	30	41	211	91	55	2.0	5.3	--	445	270	1.1	720	7.8
902	157	July 9, 1963	54	--	64	34	50	227	124	62	2.7	4.0	--	505	300	1.2	778	7.3
10-102	151	Aug. 17, 1962	58	--	136	68	106	207	354	189	2.3	5.1	0.3	1,020	619	1.8	1,500	7.5
104	160	June 14, 1963	56	--	56	39	43	215	102	66	2.6	5	--	475	300	1.1	745	7.6
105	145	Aug. 1, 1963	56	--	60	25	44	214	90	51	3.9	7	--	441	253	1.0	685	7.7
107	145	do	58	--	66	27	41	214	115	51	3.7	5.5	--	471	276	1.1	700	7.7
108	150	June 14, 1963	54	--	70	36	46	228	124	74	2.7	8	--	526	324	1.1	824	7.8
201	168	Apr. 9, 1963	60	--	79	43	77	226	163	130	3.6	6	--	672	375	1.7	1,060	7.5
205	--	Nov. 30, 1962	57	--	54	29	39	233	60	45	3.0	3.4	--	405	254	1.1	660	7.6
208	175	June 14, 1963	56	--	54	27	43	217	84	40	2.6	9	--	420	248	1.2	645	7.8
304	--	July 2, 1963	54	--	57	34	40	259	80	50	3.7	5.0	--	450	283	1.0	702	7.4
307	--	July 1, 1963	54	--	52	31	38	244	67	46	3.7	5.5	--	416	253	1.0	655	7.5

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-10-401	150	June 14, 1963	56	--	78	35	59	210	118	111	2.0	7	--	569	337	1.4	900	7.6
402	221	Apr. 8, 1963	60	--	97	38	83	229	145	205	2.6	6	--	758	441	1.7	1,200	7.4
404	215	do	56	--	69	34	62	226	117	80	2.6	9	--	540	310	1.5	870	7.6
407	185	Apr. 9, 1963	58	--	60	37	54	233	108	67	3.1	5.5	--	508	301	1.3	791	7.5
408	185	do	56	--	76	44	86	233	185	113	3.4	8	--	686	372	1.9	1,080	7.6
409	167	Apr. 24, 1963	58	--	77	39	69	231	127	118	2.6	7	--	611	353	1.6	978	7.6
411	145	Aug. 1, 1963	51	--	62	36	70	240	120	72	3.1	8	--	540	304	1.7	850	7.5
505	240	June 14, 1963	56	--	107	53	91	238	226	163	3.3	8	--	824	485	1.8	1,250	7.5
509	160	July 2, 1963	54	--	55	31	54	231	101	55	3.0	9.0	--	476	262	1.5	740	7.7
511	150	do	56	--	76	46	68	232	161	100	3.3	8	--	632	378	1.8	985	7.6
512	230	Apr. 8, 1963	56	--	56	30	48	228	84	48	2.9	8	--	444	261	1.3	707	7.3
513	--	June 14, 1963	52	--	76	43	76	235	173	101	2.7	7	--	646	366	1.8	1,090?	7.6
515	154	do	54	--	101	56	91	215	232	168	2.7	12	--	821	482	1.8	1,290	7.4
518	--	do	54	--	122	66	133	218	351	202	2.4	13	--	1,050	580	2.4	1,600	7.5
601	160	Apr. 9, 1963	56	--	56	31	46	244	78	45	3.7	8	--	443	267	1.2	705	7.6
603	200	Apr. 4, 1963	58	--	86	49	97	251	217	121	4.0	4.5	--	759	414	2.0	1,160	7.4
604	145	July 23, 1963	52	--	60	39	53	251	86	71	3.9	5.0	--	492	311	1.3	815	7.8
606	154	June 14, 1963	56	--	81	45	70	226	154	122	2.6	9	--	650	385	1.5	1,030	7.6
702	218	Feb. 26, 1964	65	--	53	29	57	227	98	52	3.7	5	--	475	253	--	733	7.5
703	160	Apr. 9, 1963	54	--	74	44	101	237	139	158	3.6	5.5	--	695	367	2.3	1,150	7.7
704	210	Oct. 31, 1963	50	--	57	34	53	238	105	66	3.3	10	--	495	283	1.4	780	7.5
706	160	Aug. 17, 1962	56	--	74	46	57	234	118	124	2.8	5.8	--	599	376	1.3	968	7.3
709	145	Apr. 24, 1963	54	--	54	34	53	235	100	58	3.1	9	--	481	272	1.4	760	7.6
711	--	Nov. 20, 1962	53	--	59	34	48	238	99	52	4.0	9	--	475	285	1.2	765	7.5
801	150	Aug. 17, 1962	56	--	79	53	76	234	150	148	3.0	5.1	--	685	413	1.6	1,080	7.5
803	230	Apr. 24, 1963	54	--	56	36	50	229	98	64	3.1	7	--	481	285	1.3	775	7.5
806	203	Aug. 1, 1963	51	--	54	38	63	256	86	72	3.6	8	--	500	294	1.6	812	7.6
807	220	Oct. 2, 1962	56	--	49	33	51	243	77	53	3.3	11	0.1	453	258	1.4	703	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-10-809	167	Oct. 22, 1962	59	--	50	34	55	250	77	55	3.5	9	--	466	265	1.5	695	7.6
811	220	Apr. 23, 1963	56	--	93	4	45	240	69	48	3.3	7	--	443	252	1.2	660	7.6
812	222	Sept. 13, 1962	58	--	46	34	56	250	77	51	3.5	8	0.33	456	253	1.5	697	7.5
901	138	June 14, 1963	53	--	85	47	81	228	189	124	2.7	8	--	701	407	1.7	1,100	7.7
904	152	July 2, 1963	51	--	63	39	61	234	123	83	3.4	8.0	--	546	317	1.5	865	7.6
905	--	June 14, 1963	56	--	68	41	71	238	139	94	2.9	10	--	599	338	1.7	930	7.6
910	165	Aug. 1, 1963	51	--	64	53	71	243	134	115	4.1	8	--	620	375	1.6	980	7.7
913	--	July 2, 1963	51	--	58	41	65	251	110	82	4.0	7.0	--	542	311	1.6	860	7.5
914	117	do	50	--	60	40	67	244	113	81	4.1	7	--	542	315	2.0	877	7.7
11-107	167	May 3, 1963	56	--	54	45	57	289	90	72	4.3	2	--	523	322	1.4	849	7.3
109	146	do	56	--	93	74	66	239	164	217	3.6	5	--	797	540	1.2	1,350	7.5
111	149	do	56	--	56	52	60	279	98	103	4.4	4	--	570	354	1.4	920	7.5
113	246	do	54	--	50	35	73	261	86	76	3.7	4	--	509	267	2.0	815	7.3
303	180	July 22, 1963	48	--	47	51	61	285	81	79	5.4	2.5	--	515	324	1.5	845	7.8
306	180	do	50	--	45	52	76	298	121	69	5.3	3.0	--	569	324	1.8	924	7.9
308	160	Mar. 28, 1963	58	--	42	47	64	279	103	58	6.0	4	--	518	295	1.6	810	7.6
309	162	do	56	--	55	47	63	283	92	82	4.9	4	--	542	333	1.5	885	7.7
312	147	July 19, 1963	50	--	49	51	71	285	131	64	5.6	3.0	--	565	333	1.7	892	7.7
314	160	do	51	--	50	54	78	300	137	73	5.1	4.5	--	600	346	1.8	930	7.6
316	150	July 22, 1963	50	--	73	76	119	307	251	155	4.9	5.0	--	884	495	2.2	1,380	7.8
319	--	Sept. 14, 1962	38	--	29	26	137	320	108	61	3.5	2.7	--	562	178	4.5	863	7.6
321	238	June 27, 1963	51	--	76	78	102	261	228	179	5.0	9.0	--	857	510	2.0	1,350	7.6
[a] 401	132	May 23, 1963	52	--	94	71	90	212	208	210	3.0	20	--	852	530	1.7	1,390	7.5
402	75	Oct. 2, 1962	56	--	56	40	82	261	125	81	4.3	35	--	608	304	1.9	904	7.6
402	75	May 23, 1963	56	--	58	43	89	256	142	86	3.3	24	--	627	320	2.2	969	7.6
404	135	May 3, 1963	64	--	62	41	52	262	94	81	4.6	2	--	529	322	1.3	834	7.5
405	125	do	60	--	54	37	58	253	82	74	4.6	1	--	494	287	1.5	785	7.4
407	220	Aug. 9, 1963	48	--	44	34	68	254	97	61	3.8	3.5	--	483	250	1.9	753	7.6

[a] Sampled at 92 ft with Foerst sampler.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-11-409	132	June 5, 1963	53	--	87	63	121	233	258	179	3.3	8	--	887	477	2.4	1,400	7.5
411	175	May 2, 1963	58	--	54	40	61	272	100	64	3.7	2.5	--	516	300	1.5	832	7.1
503	138	Aug. 16, 1962	69	--	50	39	50	270	70	58	4.3	2.7	--	476	284	1.3	730	7.6
601	125	May 24, 1962	--	0.77	460	606	118	947	1,450	32	5.0	1,639	--	4,780	3,675	.9	8,800	2.2
601	127	Sept. 19, 1962	72	--	216	265	94	559	523	37	5.0	848	--	2,340	1,632	1.0	3,000	6.7
601	127	Aug. 16, 1963	75	--	224	258	74	530	570	32	6.0	777	--	2,280	1,620	.8	2,950	6.7
602	153	Sept. 19, 1962	54	--	55	61	70	328	109	117	5.3	2.9	--	635	387	1.6	1,020	7.4
701	207	Aug. 16, 1962	57	--	78	60	113	294	179	165	3.5	< .4	--	800	441	2.3	1,250	7.2
703	138	Apr. 9, 1963	54	--	67	52	85	257	127	145	4.7	2.5	--	662	382	1.9	1,110	7.6
706	150	June 5, 1963	60	--	81	59	78	228	140	179	3.0	9	--	721	446	1.6	1,180	7.6
802	160	May 2, 1963	52	--	58	41	99	275	158	89	4.6	4.5	--	640	313	2.4	1,030	7.8
805	140	Oct. 23, 1962	65	0.41	141	117	177	265	354	423	3.5	11	--	1,420	834	2.7	2,050	7.6
806	192	do	67	1.14	128	104	138	255	366	278	3.5	15	--	1,220	749	3.4	1,750	7.5
807	108	do	69	.67	126	101	124	255	375	260	3.5	15	--	1,200	732	2.0	1,700	7.5
809	197	Nov. 3, 1945	--	--	--	--	--	242	360	180	--	5.1	--	--	578	--	--	--
809	197	May 23, 1963	72	--	118	113	207	345	415	329	4.0	7	--	1,440	760	3.3	2,150	7.6
903	210	July 23, 1963	50	--	54	55	77	288	110	116	4.7	2.5	--	610	362	1.8	985	7.7
904	140	May 21, 1963	60	--	48	37	75	284	101	63	4.9	4.5	--	532	272	2.0	817	7.7
907	225	July 23, 1963	54	--	50	41	52	267	79	61	4.1	2.5	--	474	293	1.3	754	7.7
909	130	Mar. 28, 1963	60	--	47	41	76	289	89	72	5.1	3	--	535	288	1.9	875	7.6
911	137	Sept. 19, 1962	58	--	43	41	76	289	97	61	4.9	3.2	--	526	275	2.0	815	7.6
913	124	May 21, 1963	58	--	43	48	80	287	113	75	4.9	7	--	570	302	2.0	899	7.8
914	145	Feb. 14, 1964	58	--	45	39	79	278	108	65	5.4	6.5	--	542	222	2.1	883	7.7
12-102	165	May 21, 1963	53	--	32	54	65	282	99	66	5.0	4	--	517	302	1.6	835	7.7
103	165	do	52	--	36	46	55	278	84	49	4.7	4	--	467	278	1.4	748	7.6
201	150	Aug. 16, 1962	58	--	56	82	67	271	179	133	4.0	2.2	0.3	714	480	1.3	1,150	7.6
202	165	July 22, 1963	51	--	47	68	69	128	123	133	5.3	4.0	--	627	398	1.5	1,040	7.7
207	160	do	48	--	44	61	66	268	100	108	5.1	2.5	--	566	360	1.5	935	7.8

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-12-207	128	July 22, 1963	50	--	50	69	65	259	144	121	4.9	1.0	--	631	406	1.4	1,020	7.7
208	170	do	54	--	53	71	69	249	173	123	4.9	3.0	--	674	422	1.4	1,060	7.7
210	156	Nov. 11, 1963	50	--	42	55	57	287	99	84	4.7	3.0	--	534	329	1.4	895	7.6
301	190	July 18, 1963	50	--	79	112	94	234	309	213	4.9	9	--	986	660	1.6	1,600	7.6
304	170	Nov. 16, 1962	53	--	52	67	60	255	148	114	5.0	2.7	--	627	405	1.3	1,060	7.4
306	160	Feb. 25, 1963	28	--	51	68	62	261	163	112	5.0	4.9	--	622	408	1.3	1,030	7.6
308	236	do	62	--	51	72	72	267	187	127	5.0	4.2	--	711	424	1.5	1,110	7.7
311	180	July 22, 1963	48	--	77	112	77	250	196	274	4.1	3.0	--	913	650	1.3	1,590	7.5
403	85	Sept. 19, 1962	60	--	70	92	145	245	245	275	4.0	3.8	--	1,020	553	2.7	1,630	7.5
602	145	May 20, 1963	50	--	51	74	71	266	153	136	4.6	5	--	675	432	1.5	1,030	7.9
604	177	July 2, 1963	51	--	50	63	69	271	148	108	4.4	3.0	--	629	385	1.5	1,000	7.7
702	200	Aug. 2, 1963	58	--	50	50	69	295	86	82	5.1	2.5	--	547	329	1.7	880	7.7
703	--	July 23, 1963	58	--	66	65	88	289	161	132	5.0	5.0	--	723	430	1.8	1,140	7.7
707	154	do	54	--	56	53	60	272	123	85	4.9	2.0	--	572	358	1.4	932	7.7
708	125	do	50	--	47	46	121	299	132	122	4.4	5.0	--	674	308	3.0	1,060	7.8
709	194	May 21, 1963	53	--	42	40	84	288	99	70	4.7	6	--	541	267	2.2	845	7.7
710	125	do	58	--	83	82	108	261	180	261	4.6	5	--	911	544	2.0	1,500	7.6
711	203	do	60	--	80	69	100	239	238	162	4.7	6	--	837	484	2.0	1,300	7.3
714	212	July 24, 1963	54	--	49	50	68	282	110	77	4.7	4.5	--	555	326	1.6	1,080	7.9
901	157	July 2, 1963	62	--	47	64	99	314	182	96	4.9	< .4	--	709	377	2.2	1,160	7.6
905	155	Apr. 2, 1963	64	--	56	70	79	295	149	131	5.0	2.5	--	700	427	1.7	1,100	7.7
13-101	125	Aug. 16, 1962	56	--	90	132	108	269	303	308	4.1	< .4	--	1,130	769	1.7	1,770	7.5
104	140	July 16, 1963	52	--	65	99	94	284	245	185	4.7	2.5	--	886	570	1.7	1,420	7.6
105	140	do	52	--	66	100	97	289	272	176	4.9	2.0	--	911	570	1.8	1,440	7.3
107	150	do	52	--	68	107	112	268	303	200	4.6	< .4	--	979	610	2.0	1,550	7.3
110	160	Aug. 24, 1962	55	--	52	73	75	277	184	106	5.2	< .4	0.3	686	430	1.6	1,080	7.6
112	160	Aug. 6, 1963	50	--	55	73	77	278	194	117	7.3	2.0	--	712	436	1.6	1,140	7.7
113	160	do	54	--	48	73	83	282	193	118	7.0	1.5	--	717	419	1.8	1,130	7.6

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-13-202	265	July 16, 1963	50	--	63	107	109	285	284	197	4.7	<0.4	--	955	600	1.9	1,510	7.3
204	160	Aug. 6, 1963	51	--	46	83	101	331	215	114	5.4	1.0	--	779	455	2.1	1,210	7.6
207	150	July 16, 1963	50	--	61	115	123	326	300	200	4.6	5.5	--	1,020	620	2.1	1,600	7.6
210	215	do	54	--	63	109	125	298	330	181	4.0	9	--	1,020	600	2.2	1,580	7.2
211	232	do	54	--	66	102	129	299	284	213	4.7	< .4	--	999	590	2.3	1,580	7.2
213	145	do	52	--	86	145	139	273	320	359	4.3	4.5	--	1,240	810	2.1	2,010	7.4
216	180	do	50	--	74	108	120	284	289	226	4.9	< .4	--	1,010	630	2.1	1,600	7.4
301	99	Aug. 15, 1962	62	--	55	115	181	378	365	215	4.5	3.3	--	1,190	609	3.2	1,750	7.6
302	155	July 16, 1963	54	--	41	78	113	381	181	101	5.7	3.0	--	764	420	2.4	1,200	7.7
303	160	Aug. 24, 1962	57	--	88	148	168	315	444	342	4.5	3.5	--	1,410	827	2.5	2,100	7.6
305	80	May 20, 1963	50	--	109	225	213	320	660	492	4.1	10	--	1,920	1,190	2.7	2,860	7.7
307	160	Aug. 6, 1963	54	--	80	124	127	312	327	274	6.1	7	--	1,150	710	2.1	1,840	7.8
311	145	do	56	--	62	118	144	379	303	194	5.4	2.5	--	1,070	640	2.5	1,680	7.7
313	100	May 20, 1963	51	--	72	141	167	354	445	244	5.1	13	--	1,310	760	2.6	1,950	7.9
401	160	Aug. 23, 1962	53	--	54	72	64	273	156	132	4.7	1.6	0.30	671	429	1.3	1,070	7.5
501	130	July 16, 1963	54	--	72	117	131	299	300	256	4.9	3.0	--	1,090	660	2.2	1,720	7.5
502	119	Aug. 6, 1963	56	--	65	99	120	303	276	183	5.4	< .4	--	954	570	2.2	1,500	7.5
[a] 503	120	Nov. 30, 1962	65	--	660	680	2,530	233	815	6,500	4.0	< .4	--	11,400	4,450	16	>12,000	7.0
[b] 503	120	do	41	--	1,000	960	5,170	737	716	11,940	3.0	< .4	--	20,200	6,460	28	>12,000	7.4
601	80	Sept. 18, 1962	80	--	99	121	190	376	407	315	5.0	16	--	1,420	746	3.0	2,100	7.5
602	--	Aug. 6, 1963	52	--	124	195	215	334	670	441	6.3	3.0	--	1,870	1,110	2.8	2,750	7.6
603	160	do	66	--	110	116	202	266	381	410	4.9	3.0	--	1,420	750	3.2	2,300	7.6
701	145	do	54	--	54	78	124	323	194	164	4.7	1.0	--	832	456	2.6	1,350	7.8
703	170	July 12, 1963	52	--	49	66	153	321	207	172	4.4	2.5	--	863	392	3.4	1,370	7.7
705	--	Aug. 6, 1963	56	--	73	114	131	306	326	231	6.1	10	--	1,100	650	2.2	1,740	7.4
708	110	July 16, 1963	54	--	66	87	160	294	292	224	4.6	< .4	--	1,030	520	3.0	1,640	7.4
709	120	Aug. 6, 1963	54	--	56	75	106	305	138	192	6.1	3.5	--	780	447	2.2	1,320	7.5
710	155	Apr. 2, 1963	53	--	50	76	135	309	185	176	4.7	11	--	863	436	2.8	1,400	7.6

[a] Sampled at 65 ft with Foerst sampler. [b] Sampled at 109 ft with Foerst sampler.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-14-101	75	Aug. 6, 1963	50	--	54	122	212	388	396	234	4.6	19	--	1,280	640	3.7	1,970	7.8
103	60	Aug. 23, 1962	62	--	67	129	62	412	412	250	4.8	9.7	0.96	1,200	710	3.3	2,000	7.5
104	65	Aug. 6, 1963	45	--	83	177	324	357	620	455	7.8	16	--	1,900	930	4.6	2,800	7.7
109	70	Mar. 14, 1963	49	--	57	117	215	357	390	245	5.1	2.5	--	1,260	620	3.8	2,000	7.7
111	38	Aug. 5, 1963	38	--	54	109	212	336	403	231	6.8	27	--	1,250	580	3.8	1,920	7.5
113	74	Aug. 15, 1962	48	--	56	76	190	327	317	160	5.2	13	--	1,026	450	3.9	1,600	7.6
201	70	Aug. 5, 1963	39	--	42	78	186	326	326	141	10.0	33	--	1,020	425	3.9	1,560	7.7
301	--	Jan. 11, 1963	54	--	75	131	319	361	650	335	4.0	3.8	--	1,750	727	5.1	2,640	7.7
302	42	Aug. 13, 1938	--	--	64	52	267	403	300	220	--	--	--	1,101	372	--	--	--
302	42	Sept. 30, 1963	35	--	44	64	334	392	358	296	4.1	< .4	--	1,330	375	7.4	2,150	7.6
303	Spring	Jan. 2, 1963	--	--	601	1,289	7,500	995	5,571	11,549	3.0	< .4	--	27,000	6,800	40	712,000	8.2
401	130	Aug. 5, 1963	58	--	78	123	213	306	451	309	5.7	12	--	1,400	700	3.5	2,130	7.6
402	157	July 17, 1963	51	--	59	79	195	309	317	212	4.7	16	--	1,080	470	3.9	1,660	7.9
403	70	May 20, 1963	47	--	47	93	144	317	277	160	6.0	39	--	969	497	2.8	1,510	7.8
404	100	July 16, 1963	36	--	36	79	245	282	453	181	5.3	9	--	1,190	413	5.2	1,860	7.5
407	60	Aug. 15, 1962	51	--	51	77	163	320	256	159	5.3	18	--	937	442	2.4	1,450	7.5
410	60	do	56	--	47	75	189 22	280	328	188	5.0	14	--	1,070	426	3.9	1,650	7.9
410	60	July 17, 1963	47	--	51	83	186	134	342	202	5.1	18	--	1,070	468	3.5	1,690	7.6
412	100	Aug. 5, 1963	44	--	35	69	221	303	340	173	5.7	17	--	1,050	372	4.9	1,670	7.7
701	40	do	56	--	182	238	550	326	1,050	870	6.7	48	--	3,160	1,430	6.3	4,600	7.4
702	61	do	60	--	271	322	800	311	1,670	1,250	6.7	42	--	4,570	2,000	7.8	6,200	7.4
801	--	do	18	--	33	57	630	450	800	367	5.4	< .4	--	2,130	315	15	3,250	7.8
802	165	do	36	--	109	139	449	362	780	520	5.8	21	--	2,240	840	6.7	3,310	7.5
803	40	do	62	--	217	290	750	354	1,430	1,070	6.7	25	--	4,030	1,730	7.8	5,580	7.2
901	Spring	Aug. 11, 1938	--	--	143	276	1,592	732	2,666	1,100	8.5	--	--	6,146	1,490	--	--	--
901	Spring	Jan. 2, 1963	--	--	601	900	5,170	301	11,050	3,670	3.0	< .4	--	21,600	5,205	31	712,000	7.7
902	--	July 17, 1963	54	--	420	378	1,680	206	2,740	2,240	4.1	11	--	7,630	2,600	14	9,670	7.3
15-102	1,850	Oct. 26, 1962	17	--	94	46	3,030	417	3,700	2,090	1.5	< .4	--	9,180	422	64	9,700	7.5

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-15-103	1,850	Oct. 26, 1962	15	--	71	30	2,780	456	3,150	1,720	2.0	<0.4	--	7,990	302	70	8,500	7.6
401	1,850	do	19	--	59	30	2,410	477	3,700	1,130	2.0	< .4	--	7,590	271	64	8,050	7.7
402	1,850	do	19	--	53	32	2,230	468	2,990	1,050	2.0	< .4	--	6,610	264	61	7,380	7.7
701	--	Oct. 1, 1962	21	--	94	157	1,200	458	1,654	940	3.7	< .4	--	4,300	880	18	5,420	7.6
17-101	--	Aug. 27, 1962	60	--	97	39	102	216	199	158	1.9	6.0	0.20	769	403	2.2	1,160	7.5
103	207	Mar. 18, 1963	66	--	49	23	48	232	68	34	2.7	2	.25	406	217	1.4	610	7.2
105	190	July 15, 1963	58	--	58	23	39	198	74	48	2.4	5.0	--	404	241	1.1	608	7.4
106	183	do	54	--	93	36	74	215	182	112	2.4	7.0	--	666	382	1.6	1,020	7.5
108	140	Aug. 7, 1963	58	--	60	27	41	224	91	48	4.3	5.0	--	444	264	1.1	686	7.8
202	135	Sept. 12, 1962	66	--	68	27	48	213	96	72	2.8	8	.45	493	280	1.2	750	7.6
203	146	June 12, 1963	56	--	73	24	64	210	119	83	2.3	10	--	533	282	1.7	821	7.6
208	150	June 4, 1963	56	--	60	23	43	214	82	46	1.4	13	--	429	246	1.2	665	7.5
211	165	Aug. 7, 1963	54	--	57	26	44	222	76	47	3.9	3.5	--	420	248	1.2	675	7.6
301	120	July 1, 1963	54	--	60	38	42	223	115	59	3.4	7	--	488	308	1.1	765	7.5
303	156	do	60	--	64	37	43	223	119	66	3.0	3.0	--	505	311	1.0	781	7.5
306	120	Mar. 26, 1963	66	--	73	41	52	209	139	92	3.3	4	--	573	349	1.2	886	7.5
401	190	July 15, 1963	48	--	56	18	39	192	73	37	1.6	3.0	--	370	211	1.2	575	7.4
405	167	July 10, 1963	50	--	54	20	42	210	62	42	1.4	9	--	383	217	1.2	592	7.5
406	211	do	51	--	60	18	40	209	59	45	1.7	5.5	--	383	223	1.2	592	7.6
416	150	July 9, 1963	54	--	63	25	46	223	97	55	2.3	< .4	--	453	261	1.2	698	7.2
418	150	Aug. 16, 1963	56	--	57	23	51	214	73	55	2.3	4	--	426	236	1.4	665	7.3
503	175	do	56	--	65	21	51	204	79	68	2.0	6	--	448	251	1.4	703	7.5
504	--	June 12, 1963	59	--	53	25	37	204	66	45	2.7	9	--	396	234	1.1	610	7.6
506	212	June 10, 1963	51	--	53	18	45	216	59	37	1.7	14	--	385	206	1.4	595	7.7
507	190	do	53	--	48	21	45	217	56	37	2.4	10	--	379	204	1.4	600	7.8
509	200	July 1, 1963	51	--	52	23	52	221	73	38	2.7	9	--	409	224	1.5	653	7.6
601	150	Apr. 3, 1963	58	--	67	31	45	214	88	71	2.8	8	--	475	294	1.1	765	7.7
604	215	Sept. 12, 1962	62	--	90	52	86	215	230	146	2.7	6.0	--	781	438	1.8	1,150	7.6

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-17-605	160	May 2, 1963	58	--	63	26	46	207	82	71	3.3	7	--	458	264	1.2	735	7.5
801	165	Aug. 21, 1962	57	--	118	50	95	221	216	183	2.5	6	--	836	503	1.8	1,280	7.5
806	203	Aug. 16, 1963	56	--	52	17	46	217	56	33	2.6	7	--	376	201	1.4	564	7.6
808	--	June 12, 1963	53	--	51	23	43	228	57	35	2.4	9	--	385	222	1.2	605	7.6
809	212	July 11, 1963	52	--	58	22	39	226	63	37	2.6	7	--	392	237	1.1	614	7.5
903	207	June 12, 1963	53	--	52	19	50	220	60	36	2.6	11	--	391	207	1.5	595	7.6
904	197	do	53	--	58	22	54	216	71	60	2.4	10	--	436	237	1.6	692	7.7
905	190	May 2, 1963	58	--	50	22	42	227	60	36	3.3	7	--	390	217	1.2	600	7.5
906	202	June 12, 1963	53	--	50	23	46	227	60	35	2.3	12	--	393	219	1.3	600	7.9
909	125	July 11, 1963	54	--	53	24	49	88	180	45	3.6	< .4	--	452	231	1.4	656	6.5
911	195	June 6, 1963	58	--	54	27	40	218	67	47	2.7	9	--	411	247	1.1	650	7.6
912	198	do	55	--	59	28	43	222	81	50	2.7	11	--	438	260	1.4	688	7.6
914	--	Oct. 16, 1962	53	--	50	25	49	236	62	43	3.5	9	--	411	230	1.4	660	7.6
916	179	May 2, 1963	56	--	49	28	43	242	63	39	3.0	8	--	408	237	1.2	636	7.4
18-103	157	Aug. 16, 1956	60	0.02	66	35	51 3.6	226	125	72	2.8	6.7	--	547	308	1.3	829	7.9
103	157	Aug. 26, 1963	56	--	95	59	72	212	199	165	2.8	5	--	757	479	1.4	1,210	7.6
104	117	Mar. 26, 1963	56	--	91	62	94	229	198	190	3.0	5.5	--	813	483	1.9	1,340	7.5
105	170	Aug. 17, 1962	60	--	64	38	53	220	121	74	2.9	4.7	--	525	316	1.3	808	7.6
[a] 106	159	Nov. 28, 1962	60	--	71	41	60	218	138	101	3.0	4.2	--	585	347	1.4	940	7.5
[b] 106	159	do	55	--	597	350	1,000	222	1,000	2,750	3.0	< .4	--	5,864	293	8.0	8,740	7.1
[c] 106	159	Nov. 11, 1963	54	--	281	168	1,270	262	920	2,130	3.0	2.0	--	4,960	1,390	15	7,720	7.4
106	159	Mar. 17, 1964	63	--	114	59	353	240	300	560	3.9	9	--	1,590	530	--	2,550	7.5
107	170	July 9, 1963	52	--	58	38	46	233	97	62	3.3	4.5	--	475	301	1.2	744	7.3
109	160	Apr. 24, 1963	58	--	74	49	69	239	175	102	3.4	4.5	--	653	387	1.5	1,030	7.3
112	--	Nov. 16, 1962	55	--	73	45	61	220	150	104	3.0	6	--	605	366	1.4	973	7.7
114	150	June 14, 1963	53	--	55	32	53	227	90	61	3.0	7	--	466	269	1.4	735	7.7
116	165	Jan. 29, 1963	66	--	61	34	39	211	108	66	3.0	4.4	--	485	294	1.0	760	7.6

[a] Sampled at 85 ft with Foerst sampler. [b] Sampled at 143 ft with Foerst sampler. [c] Sampled at 143 ft with Foerst sampler.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-18-119	113	Sept. 12, 1962	68	--	101	59	69	210	202	182	2.7	6	--	793	495	1.4	1,200	7.6
120	132	June 13, 1963	60	--	100	57	79	220	193	179	2.0	7	--	785	482	1.7	1,270	7.5
123	135	Sept. 20, 1962	66	--	67	43	80	216	115	150	3.1	6	--	636	344	1.9	1,000	7.7
124	142	do	60	--	52	33	48	214	88	58	3.3	4.7	--	452	265	1.3	697	7.6
125	130	Apr. 9, 1963	60	--	75	48	56	211	154	121	3.4	4	--	625	385	1.3	1,020	7.0
126	126	Sept. 20, 1962	62	--	57	38	53	223	93	83	3.3	4.2	--	504	299	1.3	775	7.6
127	130	Apr. 24, 1963	62	--	57	44	51	217	111	100	3.3	4.5	--	540	322	1.2	873	7.6
201	150	July 2, 1963	54	--	58	34	56	253	91	60	3.6	5.5	--	486	284	1.4	769	7.4
204	242	Aug. 28, 1963	56	--	55	40	47	228	105	69	3.1	3.5	--	491	302	1.2	786	7.6
205	143	Sept. 13, 1962	60	--	51	34	42	239	77	60	3.3	8	--	453	269	1.1	695	7.8
301	200	Apr. 9, 1963	52	--	57	42	58	238	101	89	4.1	7	--	527	317	1.4	861	7.6
303	160	Apr. 24, 1963	56	--	47	36	49	251	73	62	4.0	8	--	458	266	1.3	735	7.6
304	200	Nov. 29, 1962	50	--	51	34	55	242	82	68	4.0	7	--	470	266	1.5	761	7.5
306	206	Aug. 17, 1962	56	--	55	41	57	249	79	85	3.8	5.8	--	505	306	1.5	801	7.5
401	140	Mar. 26, 1963	60	--	65	35	57	216	125	77	3.0	3	--	530	306	1.4	842	7.3
404	188	July 9, 1963	54	--	56	38	46	216	94	79	3.1	2.0	--	478	297	1.1	760	7.2
405	165	do	56	--	58	33	58	215	99	87	3.0	5.0	--	505	280	1.5	794	7.4
407	146	July 11, 1963	56	--	70	37	57	209	131	92	3.0	< .4	--	549	328	1.4	856	7.2
501	192	May 10, 1963	62	--	147	87	540	227	223	1,070	3.4	5	--	2,250	720	8.7	3,870	7.3
503	200	Aug. 17, 1962	60	--	49	34	49	214	77	64	3.2	7.0	--	448	265	1.3	692	7.5
506	130	May 10, 1963	58	--	74	46	160	220	111	304	3.6	4.5	--	869	375	3.6	1,550	7.6
507	196	Aug. 17, 1962	60	--	52	34	49	218	82	68	3.2	3.3	--	458	268	1.3	703	7.8
508	163	do	62	--	64	38	74	228	103	115	2.7	3.5	--	574	315	1.8	906	7.5
509	213	Mar. 28, 1963	60	--	49	32	53	224	78	63	3.9	4.5	--	453	252	1.4	712	7.6
511	115	do	56	--	54	26	49	234	63	45	3.3	18	--	429	242	1.4	668	7.5
512	115	do	58	--	50	30	48	232	72	47	3.7	5	--	428	247	1.3	670	7.8
513	115	do	64	--	67	40	82	222	94	153	3.0	5.5	--	617	331	2.0	1,030	7.6
514	115	do	60	--	52	30	49	227	74	54	3.7	4.5	--	438	255	1.3	700	7.6

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-18-515	60	Oct. 22, 1962	34	--	58	33	57	239	91	65	3.5	11	--	471	280	1.5	764	7.6
601	236	Aug. 15, 1963	58	--	53	36	53	236	82	71	3.0	2.0	--	474	279	1.4	764	7.5
603	166	do	56	--	56	39	62	234	98	85	2.8	< .4	--	513	298	1.6	828	7.9
604	200	Aug. 21, 1963	58	--	49	35	44	223	80	63	3.3	3	--	446	266	1.2	720	7.5
607	154	Sept. 12, 1962	66	--	48	35	40	243	65	61	3.7	4.9	--	443	264	1.1	690	7.6
609	150	Feb. 22, 1963	67	--	54	31	48	229	78	61	3.5	6.3	--	462	262	1.3	707	7.7
610	185	Dec. 3, 1963	51	--	48	34	44	221	73	67	3.5	5.0	--	435	258	1.2	725	7.7
701	170	May 24, 1963	58	--	52	24	44	222	67	40	2.6	8	--	405	228	1.3	630	7.7
702	--	June 6, 1963	55	--	55	26	44	216	71	50	2.3	10	--	420	245	1.2	668	7.7
704	169	Aug. 15, 1963	60	--	57	22	45	212	68	49	2.4	5.5	--	413	234	1.3	645	7.7
706	173	do	60	--	112	58	123	220	280	216	2.8	10	--	968	520	2.4	1,510	7.5
707	178	do	58	--	77	37	61	211	121	105	2.8	10	--	575	346	1.4	915	7.3
708	173	May 2, 1963	60	--	57	30	51	221	83	66	3.0	7	--	466	266	1.4	749	7.4
801	140	Nov. 29, 1962	28	--	57	27	50	260	66	51	3.0	< .4	--	410	252	1.2	703	7.6
[a] 802	132	do	61	--	57	21	71	261	81	55	3.0	2.7	--	480	230	2.1	765	7.2
[b] 802	132	do	61	--	99	45	298	222	72	563	3.0	6	--	1,260	431	6.4	2,290	7.4
803	--	Aug. 17, 1962	62	--	112	54	179	232	81	423	3.0	4.0	0.36	1,030	500	3.4	1,770	7.5
803	115	Aug. 5, 1963	60	--	138	57	268	232	71	620	3.4	4.0	--	1,330	580	4.9	2,370	7.5
806	113	do	60	--	56	28	50	234	69	59	3.4	4.5	--	445	257	1.4	705	7.5
807	179	Apr. 2, 1963	62	--	91	43	86	223	176	142	3.3	11	--	724	404	1.9	1,150	7.3
901	149	Sept. 6, 1963	62	--	247	121	1,200	231	114	2,530	3.1	1.3	--	4,280	1,120	15.6	7,390	7.5
19-101	120	Aug. 17, 1962	60	--	58	51	59	254	106	90	3.9	6	--	559	354	1.4	885	7.6
103	135	Apr. 24, 1963	56	--	51	43	56	254	98	77	3.9	7	--	517	305	1.4	835	7.6
104	120	June 5, 1963	53	--	59	45	76	253	124	99	3.3	7	--	590	333	1.8	949	7.5
105	150	do	55	--	80	62	81	237	166	165	3.4	7	--	736	456	1.6	1,190	7.5
106	125	Mar. 26, 1963	58	--	51	40	63	257	103	67	4.4	9	--	521	291	1.6	818	7.6
111	140	Sept. 20, 1961	60	--	80	68	63	245	158	180	4.0	7	--	741	481	1.3	1,180	7.5
113	160	Apr. 23, 1963	60	--	46	38	57	255	88	58	4.1	8	--	484	269	1.5	256	7.7

[a] Sampled at 70 ft with Foerst sampler. [b] Sampled at 100 ft with Foerst sampler.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-19-114	160	May 6, 1963	58	--	44	39	55	256	76	58	4.1	10	--	470	269	1.5	740	7.5
115	130	Mar. 28, 1963	60	--	65	51	65	256	120	102	4.4	5.5	--	599	372	1.5	994	7.5
117	185	Oct. 23, 1962	59	0.12	55	46	62	260	88	93	4.0	8	--	543	325	1.5	836	7.6
[a] 117	185	Oct. 7, 1963	54	--	50	45	60	256	99	80	4.8	7	--	526	309	1.5	874	7.6
201	100	May 6, 1963	62	--	160	29	77	240	216	178	4.4	10	--	854	520	1.5	1,350	7.3
202	140	do	62	--	77	71	76	239	159	191	4.4	8	--	766	483	1.5	1,270	7.5
203	100	do	62	--	58	47	63	254	105	98	4.7	7	--	570	338	1.5	931	7.6
204	127	Oct. 22, 1962	53	--	53	47	131	284	158	132	4.3	9.5	--	728	327	3.2	1,100	7.6
207	110	May 6, 1963	60	--	50	48	63	260	108	75	4.7	7	--	544	320	1.5	875	7.4
208	110	do	60	--	73	65	72	239	165	154	4.6	10	--	722	450	1.5	1,180	7.5
303	170	May 8, 1963	80	--	270	195	232	174	630	830	4.1	25	--	2,350	1,490	2.6	3,590	7.3
304	98	Aug. 17, 1962	70	--	231	212	342	343	1,059	496	4.3	21.5	--	2,600	--	3.9	3,430	7.3
305	188	Mar. 29, 1963	64	--	54	47	91	278	125	102	5.6	4.5	--	630	329	2.2	1,000	7.8
307	147	Mar. 24, 1963	49	--	50	35	115	293	124	86	4.9	4.5	--	610	266	3.1	975	7.6
401	140	Aug. 27, 1962	59	--	46	31	58	259	64	51	4.0	3.3	0.15	443	244	1.6	678	7.7
402	150	do	60	--	84	62	253	249	83	483	3.8	5.5	.30	1,160	467	5.1	1,960	7.6
403	110	Dec. 6, 1962	59	--	70	58	65	245	133	144	4.0	8	--	662	415	1.4	1,120	7.5
404	182	Oct. 23, 1962	65	.10	47	36	56	268	60	56	4.3	7	--	463	263	1.5	695	7.6
405	185	Nov. 1, 1962	67	.14	46	37	52	262	65	55	4.0	8	--	463	264	1.4	690	7.6
406	197	Oct. 30, 1962	63	.10	49	39	56	260	73	70	4.0	8	--	490	283	1.4	760	7.6
[b] 406	197	Oct. 7, 1963	51	--	54	37	57	264	80	72	4.8	11	--	497	286	1.5	805	7.4
407	180	Oct. 23, 1962	59	.14	71	57	92	253	69	214	4.0	5.5	--	696	410	2.0	1,130	7.6
407	180	May 6, 1963	62	--	56	42	68	259	73	108	4.6	7	--	548	311	1.7	892	7.5
[c] 407	180	Oct. 7, 1963	51	--	54	38	65	264	67	97	5.1	7	--	514	294	1.7	874	7.7
408	184	Oct. 23, 1962	59	.16	106	84	138	247	69	424	4.0	3.8	--	1,010	610	2.4	1,650	7.5
408	184	May 3, 1963	54	--	68	55	95	257	81	212	4.0	5	--	699	393	2.1	1,200	7.5
[d] 408	184	Oct. 7, 1963	56	--	55	46	76	264	70	135	5.1	6	--	579	326	1.8	986	7.8
409	210	Oct. 30, 1962	61	.08	55	44	59	254	71	103	4.0	5.6	--	528	317	1.4	810	7.4

Arsenic: [a] 0.015 ppm; [b] 0.014 ppm; [c] 0.013 ppm; [d] 0.012 ppm.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-19-410	190	Oct. 23, 1962	63	2.05	49	40	55	255	63	78	4.0	9	--	486	287	1.4	743	7.6
[a] 410	196	Oct. 7, 1963	51	--	48	38	54	259	68	69	4.8	7	--	467	276	1.4	775	7.7
411	124	May 6, 1963	69	--	343	207	1,380	234	98	3,160	4.3	8	--	5,380	1,700	14.5	8,980	7.2
412	130	May 2, 1963	60	--	48	36	57	256	79	62	3.0	7	--	478	268	1.5	771	7.6
413	174	May 8, 1963	60	--	52	40	65	266	75	92	5.1	< .4	--	520	295	1.7	867	7.4
414	155	Apr. 16, 1963	64	--	53	44	67	256	70	113	4.7	3	--	545	315	1.6	900	7.4
415	165	do	60	--	46	39	67	265	96	64	4.1	8	--	514	274	1.7	815	7.6
418	165	Dec. 3, 1962	63	--	51	37	58	261	77	70	4.5	8	--	497	279	1.5	800	7.7
419	30	Apr. 4, 1963	62	--	52	47	91	287	134	85	5.1	9	--	626	324	2.2	986	7.9
502	180	Jan. 30, 1963	75	--	53	43	58	253	84	87	4.7	7.0	--	536	308	1.4	839	7.6
505	160	May 3, 1963	64	--	46	37	49	276	68	48	4.9	5	--	458	266	1.9	727	7.4
506	120	do	66	--	44	38	49	273	63	50	4.9	8	--	457	266	1.3	720	7.5
507	210	Aug. 27, 1962	61	--	44	36	51	262	65	47	4.7	4.9	--	443	258	1.4	680	7.5
508	193	May 3, 1963	66	--	46	36	50	261	65	53	4.7	7	--	456	258	1.3	720	7.4
509	177	June 28, 1963	51	--	44	36	60	264	74	43	5.1	8	--	451	--	1.6	738	7.8
512	87	Mar. 4, 1963	62	--	71	57	72	270	161	102	4.9	17	--	680	409	1.5	1,080	7.6
601	160	Sept. 17, 1962	68	--	60	49	86	276	156	101	4.7	4.4	--	665	350	2.0	1,000	7.7
701	100	do	64	--	57	43	75	253	121	92	4.0	4.7	--	585	317	1.8	892	7.5
702	101	May 3, 1963	64	--	59	41	50	244	77	89	4.3	6	--	510	315	1.2	831	7.5
707	175	July 22, 1963	60	--	42	35	49	250	60	49	4.7	5.0	--	428	247	1.3	675	7.6
709	140	Mar. 29, 1963	58	--	58	38	56	246	75	87	4.9	3	--	501	301	1.4	815	7.8
711	175	Apr. 22, 1963	68	--	50	34	55	246	89	61	4	4.5	--	487	265	1.5	754	7.6
801	150	Apr. 5, 1963	64	--	53	45	83	253	119	97	5.4	5.5	--	596	317	2.0	945	7.9
901	110	May 3, 1963	58	--	158	52	304	381	570	253	6.0	9	--	1,600	610	5.3	2,350	7.5
902	120	do	66	--	57	49	78	287	125	93	5.0	6	--	619	343	1.8	975	7.5
903	135	do	68	--	51	39	77	285	106	76	5.1	4	--	566	289	2.0	884	7.5
906	150	Aug. 20, 1962	60	--	174	169	450	295	874	661	4.8	8	1.07	2,550	1,130	5.8	3,510	7.5
907	148	Aug. 19, 1963	58	--	89	144	324	294	570	485	5.2	1	--	1,820	810	4.9	2,730	7.4

Arsenic: [a] 0.015 ppm.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
[a] KD-27-20-103	149	Oct. 31, 1962	72	--	90	85	134	277	199	290	5.0	5.3	--	1,020	574	2.4	1,600	7.6
105	165	June 3, 1963	60	--	57	60	128	275	210	146	4.4	4	--	804	387	2.8	1,250	7.4
202	--	Apr. 1, 1963	58	--	45	45	120	299	136	98	4.9	2.5	--	656	296	3.0	1,250	7.5
203	141	Oct. 3, 1962	74	--	56	50	101	301	138	118	5.3	3.4	--	694	346	2.4	1,060	7.8
204	140	Apr. 17, 1963	51	--	54	62	104	288	181	136	4.7	5	--	739	390	2.3	1,200	7.5
303	--	Sept. 19, 1962	66	--	82	103	110	289	245	276	4.0	4.2	--	1,030	625	1.9	1,650	7.6
401	130	do	56	--	43	40	87	273	113	77	4.5	4.4	--	559	270	2.4	855	7.5
405	190	do	78	--	135	129	258	325	449	452	4.3	17	--	1,680	865	3.8	2,480	7.5
406	145	Aug. 20, 1962	77	--	70	67	105	280	199	160	4.4	2.4	--	823	450	2.2	1,250	7.7
501	--	Nov. 2, 1962	70	--	48	48	121	288	144	120	2.3	3.4	--	699	319	3.0	1,000	7.6
502	85	Nov. 1, 1962	70	--	57	62	95	233	187	132	4.0	8.5	--	731	396	2.1	1,100	7.6
601	117	July 24, 1963	50	--	46	46	127	271	175	105	4.3	5.5	--	692	351	3.1	1,070	7.8
801	104	Aug. 16, 1938	--	--	213	143	557	268	1,078	690	--	[b]	--	2,828	1,118	--	--	--
801	104	Sept. 17, 1962	64	--	231	225	845	282	1,351	1,109	4.0	4.2	--	3,970	1,502	9.6	5,350	7.4
21-101	110	Aug. 15, 1962	59	--	70	99	157	309	275	263	4.1	< .4	--	1,080	583	2.8	1,660	7.5
105	178	July 12, 1963	56	--	43	60	97	326	146	84	5.4	2.0	--	653	352	2.2	1,020	7.7
107	140	do	52	--	49	74	45	298	210	136	5.0	< .4	--	718	426	2.4	1,230	7.5
112	105	Apr. 2, 1963	62	--	91	124	218	277	312	438	4.9	5.5	--	1,390	740	3.5	2,300	7.8
113	132	July 12, 1963	58	--	57	71	132	303	228	155	4.4	2.0	--	856	434	2.8	1,340	7.7
115	126	do	56	--	85	115	207	296	385	323	4.4	9	--	1,330	680	3.5	2,050	7.4
119	120	do	56	--	44	55	98	312	134	97	5.0	< .4	--	643	336	2.3	985	7.8
121	120	do	60	--	82	98	140	295	296	250	4.7	2.5	--	1,080	610	2.5	1,690	7.4
124	132	July 17, 1963	64	--	59	65	99	299	155	143	5.0	< .4	--	737	414	2.1	1,170	7.5
126	125	Apr. 17, 1963	70	--	32	92	108	293	216	167	4.6	5	--	840	459	2.2	1,370	7.6
201	94	Aug. 4, 1938	--	--	--	--	--	342	242	152	--	[b]	--	869	--	--	--	--
201	94	Nov. 1, 1962	65	--	68	99	142	329	268	220	4.8	10	--	1,040	578	2.6	1,650	7.5
601	104	Aug. 4, 1938	--	--	38	35	365	458	372	176	4.7	[b]	--	1,232	242	--	--	--
601	120	Oct. 24, 1962	70	--	108	126	374	423	650	335	4.5	48	--	1,920	788	5.8	2,480	7.5

[a] Sampled at 140 ft with Foerst sampler. [b] Less than 20 ppm.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-21-701	--	Oct. 4, 1962	60	--	56	80	128	331	161	216	5	1.8	--	871	467	2.6	1,390	7.7
702	135	Dec. 18, 1963	56	--	42	27	118	307	120	58	5.2	3	--	580	215	1.1	930	7.8
703	169	July 24, 1963	54	--	56	69	135	338	199	152	5.4	1.0	--	837	422	2.9	1,300	7.7
901	--	Nov. 16, 1962	61	--	74	85	174	356	308	193	5.5	7.5	--	1,080	533	3.3	1,720	7.6
903	--	Sept. 17, 1962	56	--	56	100	283	359	396	305	5.3	4.2	--	1,380	550	5.2	2,060	7.6
22-201	162	Dec. 6, 1962	16	--	4	12	423	498	250	200	3.0	< .4	--	1,150	59	24	1,950	8.3
202	80	do	57	--	114	148	362	293	692	440	4.5	26.5	--	1,990	893	5.3	3,050	7.6
302	126	Sept. 19, 1962	52	--	493	46	910	286	1,325	1,146	4.3	9	1.0	4,120	1,420	11	5,360	7.6
402	140	Apr. 17, 1963	39	--	55	91	283	382	401	290	5	3.5	--	1,150	510	5.5	2,160	7.6
601	128	Oct. 24, 1962	63	--	675	452	943	216	1,812	2,362	2.0	70	--	6,480	3,543	7.0	6,770	7.1
602	80	do	36	--	586	211	613	218	1,300	1,440	1.0	34	--	4,330	2,330	5.5	5,000	7.3
23-401	114	June 11, 1963	59	--	44	44	167	375	187	87	4.3	24	--	801	293	4.2	1,250	7.7
25-101	77	Oct. 23, 1945	--	--	59	33	56	280	85	59	--	4.1	--	516	282	--	--	--
101	77	Oct. 30, 1962	78	--	53	30	63	275	74	49	3.5	3.8	--	489	254	1.7	706	7.6
301	185	Aug. 21, 1962	64	--	59	27	57	239	72	61	2.8	3.3	--	463	257	1.6	705	7.6
302	--	Apr. 3, 1963	58	--	57	24	55	238	68	55	3.1	3	--	440	242	1.5	690	7.8
304	172	June 10, 1963	56	--	55	25	50	234	69	51	2.7	10	--	433	238	1.4	676	7.7
305	--	do	56	--	54	25	52	239	73	50	2.6	7	--	560	235	1.1	678	7.6
306	155	May 2, 1963	66	--	66	37	76	245	113	103	3.3	5	--	590	315	1.9	940	7.5
307	--	do	62	--	72	46	82	260	144	118	3.6	5	--	790	367	1.8	1,050	7.6
309	181	do	58	--	58	29	49	248	76	59	3.1	2	--	456	265	1.3	730	7.3
314	--	July 3, 1963	57	--	45	24	85	256	77	68	3.3	3.0	--	482	214	2.5	777	7.8
316	--	July 1, 1963	56	--	45	32	66	266	82	47	4.7	2.0	--	465	244	1.8	720	7.8
401	150	Sept. 14, 1962	56	--	76	26	124	246	180	118	2.5	7	--	710	295	3.1	1,090	7.3
501	107	Apr. 3, 1963	60	--	44	30	81	261	88	59	5.1	1	--	496	234	2.3	788	7.9
26-102	--	Oct. 9, 1962	58	--	68	46	79	275	121	110	3.5	11	--	631	355	1.8	1,040	7.6
103	130	Nov. 21, 1963	56	--	110	51	147	244	95	365	3.2	5.5	--	953	486	2.9	1,730	7.4
104	142	Aug. 2, 1963	54	--	48	29	48	251	52	44	3.9	7	--	408	241	1.3	655	7.7

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-26-201	180	Oct. 7, 1963	51	--	46	29	55	238	68	52	4.3	11	--	433	234	1.6	703	7.7
301	1,760	Oct. 25, 1962	19	0.02	14	5	815	508	1,042	240	2.0	< .4	1.2	2,390	55	48	3,100	8.0
401	180	Aug. 2, 1963	58	--	46	31	59	255	74	58	3.9	3.0	--	457	242	1.7	718	7.6
502	181	Oct. 7, 1963	51	--	43	30	55	238	67	50	4.4	12	--	429	230	1.6	694	7.6
503	175	do	47	--	42	36	65	261	71	61	4.9	8	--	463	252	1.8	770	7.6
504	173	do	50	--	43	38	68	268	75	63	5.2	10	--	484	263	1.8	790	7.6
506	154	do	50	--	43	32	64	260	73	51	4.8	7	--	453	237	1.8	735	7.4
507	180	do	47	--	45	32	65	256	71	55	4.8	9	--	455	242	1.8	756	7.5
508	186	Dec. 3, 1963	50	--	38	33	59	260	68	50	4.1	11	--	441	232	1.7	715	7.7
509	209	Oct. 7, 1963	50	--	43	32	58	254	67	50	4.6	8	--	438	238	1.6	715	7.5
510	220	do	50	--	41	33	57	250	68	49	5.4	9	--	435	238	1.6	700	7.6
512	248	do	51	--	45	35	72	278	81	58	5.6	7	--	491	256	1.9	786	7.5
514	237	do	47	--	43	36	72	276	86	63	5.4	8	--	496	254	2.0	800	7.6
515	232	do	50	--	44	38	72	265	92	70	5.6	6	--	507	268	1.9	833	7.6
517	225	do	54	--	46	35	75	293	84	62	5.6	4	--	510	258	2.0	829	7.6
601	215	do	50	--	45	39	74	262	108	71	5.6	5	--	527	274	1.9	855	7.4
603	206	do	50	--	41	38	65	266	84	60	5.6	7	--	481	257	1.8	782	7.6
604	56	Nov. 1, 1945	--	--	--	--	--	330	[a] 115	95	--	43	--	--	[b] 555	--	--	--
604	--	Jan. 10, 1963	71	--	62	64	59	395	143	45	8.0	12	--	658	421	1.3	1,050	7.7
605	200	Sept. 14, 1962	52	--	46	38	80	262	92	83	4.3	9	.33	533	274	2.1	845	7.6
701	--	do	64	--	30	41	88	321	92	53	5.0	1.8	--	532	242	2.5	812	7.7
27-101	120	May 8, 1963	68	--	73	51	83	244	86	196	3.4	5	--	686	393	1.8	1,150	7.5
102	63	Nov. 1, 1945	--	--	--	--	--	284	[a] 80	78	--	5.3	--	--	[b] 420	--	--	--
102	63	Oct. 9, 1962	78	--	160	112	210	256	232	590	3.3	9	--	1,520	859	3.1	2,500	7.6
103	137	Apr. 22, 1963	77	--	49	34	55	262	75	54	4.1	6.5	--	484	261	1.5	736	7.6
104	120	do	77	--	130	91	239	244	86	680	4	6	--	1,430	700	3.9	2,600	7.5
201	--	Aug. 20, 1962	62	--	44	32	61	262	68	51	4.3	3.5	--	455	243	1.7	700	7.5
204	163	Apr. 5, 1963	58	--	49	33	58	265	63	61	4.7	< .4	--	455	259	1.6	744	7.5

[a] By turbidity. [b] Determined by soap method.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
[a] KD-27-27-301	--	Oct. 9, 1962	66	--	105	79	102	270	199	266	4.3	<0.4	--	954	586	1.8	1,510	7.4
302	160	Aug. 20, 1962	60	--	71	65	94	267	173	163	5.0	4.9	--	767	445	1.9	1,190	7.5
303	176	Aug. 23, 1963	50	--	37	35	64	278	67	44	5.0	5.0	--	444	237	1.9	707	7.9
401	180	do	68	--	47	37	64	253	78	75	4.6	5.5	--	501	269	1.7	787	7.8
402	174	Apr. 16, 1963	56	--	39	39	66	282	75	55	4	7	--	480	259	1.8	755	7.6
403	212	do	60	--	48	32	60	273	69	52	4.6	8	--	468	252	1.6	744	7.4
[b] 404	166	Nov. 27, 1962	57	--	882	612	2,538	189	442	6,554	2.5	1.6	--	11,200	4,715	16.0	>12,000	7.2
405	120	Apr. 8, 1963	60	--	42	43	68	278	89	61	5.3	7	--	512	280	1.8	795	7.5
407	200	Apr. 16, 1963	56	--	49	38	71	261	96	75	5	5.5	--	524	279	1.8	838	7.6
501	212	July 23, 1963	60	--	40	32	60	250	71	48	4.1	9	--	447	232	1.7	700	7.8
506	202	Apr. 22, 1963	68	--	46	31	60	254	74	55	4.4	6	--	469	242	1.7	721	7.5
507	200	do	64	--	46	34	61	254	89	55	4.7	5.5	--	483	254	1.7	753	7.6
509	235	do	70	--	43	32	53	251	73	51	3.7	5.5	--	452	238	1.5	698	7.9
510	165	Nov. 27, 1962	57	--	42	36	59	272	66	46	5.0	5.8	--	461	250	1.6	728	7.8
511	180	June 21, 1963	56	--	41	36	67	279	71	50	5.3	5.5	--	469	249	1.8	744	7.8
514	--	Nov. 27, 1962	61	--	39	29	62	255	66	39	5.0	6.5	--	433	217	1.8	680	7.6
515	187	Aug. 28, 1962	63	--	27	40	59	256	61	46	4.0	6.5	--	432	230	1.5	691	7.6
516	164	Nov. 27, 1962	61	--	36	31	76	275	72	46	5.0	8	--	470	216	2.2	740	7.7
604	170	Aug. 20, 1962	60	--	38	34	70	283	73	50	4.8	3.0	--	472	234	2.0	722	7.5
607	100	Nov. 1, 1945	--	--	--	--	--	247	[c] 90	50	--	5.2	--	--	[d] 300	--	--	--
607	100	Dec. 7, 1962	63	--	51	37	62	261	78	69	4.0	6	--	498	281	1.6	810	7.7
608	150	Aug. 20, 1962	62	--	51	40	65	256	92	80	4.4	3.8	0.30	524	290	1.7	821	7.4
701	200	Apr. 5, 1963	52	--	38	41	68	266	88	63	5.6	4.5	--	491	262	1.8	801	7.7
703	185	Aug. 20, 1963	51	--	27	47	78	276	105	61	4.7	7	--	516	261	2.1	845	7.7
28-101	156	Aug. 23, 1963	58	--	47	42	69	276	80	78	5.0	2	--	517	289	1.8	840	7.6
301	100	Dec. 4, 1962	43	--	46	30	146	345	167	70	2.0	7	--	681	240	4.1	1,090	7.6
601	100	Aug. 20, 1962	75	--	65	62	102	274	193	132	5.0	< .4	--	779	416	2.1	1,180	7.3
701	123	Apr. 16, 1963	60	--	43	40	63	273	89	62	4.6	6	--	502	273	1.7	795	7.4

[a] Sampled at 90 ft with Foerst sampler. [b] Sampled at 105 ft with Foerst sampler. [c] By turbidity. [d] Determined by soap method.

Table 5.--Chemical analyses of water from wells and springs in Gaines County--Continued

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
KD-27-28-902	116	Apr. 16, 1963	70	--	61	47	102	275	259	83	5	4	--	776	386	2.3	1,160	7.5
29-301	--	Dec. 4, 1962	71	--	103	184	676	622	817	720	5.5	4.3	--	2,890	1,012	9.2	4,340	7.5
501	--	do	55	--	42	45	152	371	190	70	4.5	3.1	--	744	290	3.9	1,170	7.7
502	310	Jan. 28, 1963	14	--	92	86	763	432	1,165	500	2.0	< .4	--	2,840	583	14	4,100	7.6
901	--	Aug. 16, 1963	68	--	63	70	160	293	380	109	4.3	< .4	--	998	447	3.3	1,490	7.3
902	--	do	54	--	52	65	121	265	303	83	4.8	3	--	815	399	2.6	1,250	7.7
903	200	do	64	--	124	65	178	255	510	128	4.8	< .4	--	1,120	580	3.2	1,690	7.4
904	1,960	Aug. 20, 1962	64	--	68	71	149	282	308	160	3.1	1.9	--	964	462	3.0	1,410	7.6
30-101	95	Sept. 17, 1962	48	--	46	56	279	425	280	200	5.8	3.4	--	1,130	344	6.6	1,750	7.5
401	--	Oct. 24, 1962	70	--	82	59	199	289	259	228	4.5	8	--	1,050	446	4.1	1,550	7.5
402	57	Aug. 15, 1938	--	--	114	96	614	647	756	440	--	90	--	2,428	679	--	--	--
402	57	June 13, 1963	60	--	81	106	993	540	580	424	5.4	112	--	2,130	630	8.5	3,100	7.7
702	110	Aug. 20, 1962	64	--	47	61	137	289	205	140	3.8	2.9	0.55	803	368	3.1	1,230	7.6
801	84	Oct. 24, 1962	61	--	533	182	435	254	1,231	970	1.7	39	--	3,580	2,078	4.2	4,110	7.5
31-101	130	Apr. 17, 1963	58	--	97	166	390	266	680	620	4	2.5	--	2,150	930	5.6	3,380	7.5
102	150	May 20, 1963	47	--	135	226	510	249	910	880	3.7	9	--	2,840	1,260	6.3	4,210	7.8
104	--	Apr. 17, 1963	54	--	68	292	510	253	960	930	3.7	7	--	2,750	1,360	6.0	4,500	7.5
201	120	Aug. 6, 1963	51	--	64	120	350	275	482	484	8.8	7	--	1,700	650	6.0	2,650	7.4
401	153	July 12, 1963	50	--	172	277	560	240	1,080	1,080	4.0	< .4	--	3,340	1,570	6.2	4,850	7.1
402	167	Apr. 17, 1963	50	--	140	237	530	248	940	960	4.1	2.5	--	2,980	1,320	6.4	4,550	7.4
403	170	do	51	--	137	249	510	244	940	960	4.1	4.5	--	2,980	1,360	6.0	4,550	7.3

Table 6.--Chemical analyses of oil-field brines in Gaines County

(Analyses given are in parts per million except specific conductance, pH, and sodium adsorption ratio)

Tank or pit no.	Oil field	Operator	Reservoir rock	Depth to top of producing zone	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
1	Jones Ranch Field	Socony Mobil Oil Co.	Devonian	11,200	Oct. 11, 1962	1,720	365	15,170	676	1,695	25,830	3.3	<0.4	--	45,100	5,800	93	>12,000	7.3
2	Ralph Lowe	Mobil and Atlantic C Lease	do	11,200	do	1,700	353	12,850	607	1,815	22,890	3.5	< .4	--	39,900	5,700	115	>12,000	7.4
3	North Russell	Atlantic Refining Co.	Permian	5,900	Oct. 26, 1962	14,450	3,280	40,600	227	980	95,500	3.0	< .4	--	115,000	49,600	79	>12,000	6.4
4	do	Socony Mobil Oil Co.	Devonian	11,125	Oct. 29, 1962	2,004	401	13,173	746	2,065	22,680	--	< .4	--	40,700	6,650	70	>12,000	7.3
5	Wasson Field	King, Wasson, and Dye	San Andres Limestone Permian	4,900	Oct. 11, 1962	5,972	4,475	46,830	138	1,937	94,800	3.5	< .4	--	154,000	33,300	110	>12,000	6.5
6	do	Amerada Petroleum Corp.	do	4,900	Oct. 2, 1962	1,680	462	16,460	996	3,590	26,460	--	< .4	--	49,100	6,100	91	>12,000	7.2
7	do	do	Clear Fork Group	6,900	Nov. 26, 1962	22,500	5,980	56,030	33	524	143,550	4.0	< .4	--	229,000	80,830	86	>12,000	5.5
8	ODC Field	Pan American Petroleum Corp.	Pennsylvanian	--	Oct. 11, 1962	5,892	1,350	61,843	67	1,069	112,452	--	< .4	--	182,000	20,250	186	>12,000	6.5
9	South Seagraves Field	Husky Oil Co.	Devonian	13,054	do	1,010	255	7,426	236	1,513	12,810	1.7	< .4	--	23,100	3,570	54	>12,000	7.0
10	Seagraves Field	Union Texas Natural Gas Corp.	(Silurian) Devonian	13,034	do	1,515	258	10,575	807	2,058	17,702	--	< .4	--	32,600	5,250	64	>12,000	7.0
11	West Seagraves Field	Oil Development Co. of Texas	Strawn Group Pennsylvanian	11,454	do	16,954	3,757	71,774	32	354	154,345	3.3	< .4	--	247,000	57,750	92	>12,000	6.1
12	Adair Field	Amerada Petroleum Corp.	San Andres Limestone Permian	4,874	Oct. 5, 1962	2,104	693	17,955	1,058	3,606	30,869	--	< .4	--	55,700	8,100	87	>12,000	8.2
13	do	Paul F. Rutledge	do	4,874	Oct. 26, 1962	1,600	630	16,230	231	2,950	27,060	1.0	< .4	--	48,600	66	87	>12,000	6.8
14	Welch Field	Cities Service Petroleum Co.	do	5,000	do	661	243	6,138	614	575	10,353	9.0	< .4	--	18,200	2,650	52	>12,000	7.3
15	Tex-Pac Field	Texaco Inc.	Clear Fork Group Permian	7,848	Oct. 29, 1962	13,630	4,350	35,560	300	1,160	91,850	--	< .4	--	147,000	51,900	68	>12,000	6.6
16	Carter-New Mexico Field	Great Wooten Drilling Co.	San Andres Limestone Permian	5,180	Oct. 12, 1962	1,140	329	5,014	1,535	3,264	7,952	--	< .4	--	18,500	4,200	34	>12,000	7.3
17	Brown Field	Union Oil Co. of California	Glorieta Sandstone Permian	6,030	Oct. 29, 1962	2,550	4,660	48,700	378	1,690	91,400	2.5	< .4	--	149,000	25,500	143	>12,000	6.9

Table 6.--Chemical analyses of oil-field brines in Gaines County--Continued

Tank or pit no.	Oil field	Operator	Reservoir rock	Depth to top of producing zone	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
18	Brown Field	Union Oil Co. of California	Wichita Group	8,018	Oct. 24, 1962	1,844	523	8,759	1,480	2,642	16,233	--	<0.4	--	30,700	6,750	46	>12,000	7.2
19	North Russell Field	Texaco Inc.	Devonian	11,125	Oct. 29, 1962	1,603	401	12,645	350	1,873	20,992	2.7	< .4	--	37,700	5,650	73	>12,000	7.2
20	Alsabrook Field	O. D. Alsabrook	Wolfcamp Formation Permian	9,125	do	1,920	377	11,890	1,004	2,720	20,500	1.5	< .4	--	37,900	6,350	65	>12,000	7.0
21	do	do	Devonian	11,135	do	1,640	330	10,990	890	2,050	19,110	--	< .4	--	34,600	5,450	65	>12,000	7.6
22	West Seminole Field	Cities Service Production Co.	Leonard Formation Permian	8,750	Oct. 8, 1962	840	231	4,439	287	2,157	7,455	--	< .4	--	15,300	3,045	35	>12,000	7.2
23	do	Socony Mobil Oil Co.	Wolfcamp Formation Permian	9,042	do	1,134	359	4,899	1,204	2,752	8,201	--	< .4	--	17,900	4,305	32	>12,000	7.0
24	do	Cities Service Production Co.	San Andres Limestone Permian	5,042	Oct. 2, 1962	1,563	766	19,470	672	3,792	31,920	--	< .4	10.5	57,800	7,050	101	>12,000	7.4
25	do	do	Devonian	11,044	do	4,288	2,043	14,710	631	1,715	35,280	--	< .4	10.5	58,300	19,100	46	>12,000	6.8
26	do	Sinclair Oil Co.	San Andres Limestone Permian	5,042	Oct. 8, 1962	1,470	677	13,869	282	3,992	23,537	1.3	< .4	8.1	43,700	6,450	72	>12,000	7.3
27	O.D.C. Field	Garthay Land Co.	do	5,375	Oct. 11, 1962	1,768	508	13,748	1,580	3,607	22,469	--	< .4	--	42,900	6,500	74	>12,000	7.4
28	Bain Field	Ashmem and Hillard no. 3, Ltd.	Devonian	11,628	Oct. 2, 1962	1,557	356	9,932	823	2,330	17,114	--	< .4	--	31,700	5,350	44	>12,000	6.8
29	Seminole Field	Amerada Petroleum Corp.	San Andres Limestone Permian	5,032	Oct. 30, 1962	2,630	25,400	44,400	535	1,650	145,600	3.0	< .4	--	220,000	--	58	>12,000	6.6
30	do	do	do	5,032	Oct. 2, 1962	762	1,338	10,140	371	1,149	19,950	--	< .4	--	33,600	7,400	51	>12,000	7.7
31	G-M-K Field	Producing Properties, Inc.	do	5,500?	Oct. 3, 1962	1,768	642	14,438	1,216	3,994	24,569	--	< .4	--	46,000	7,050	75	>12,000	7.5
32	Howland Field	Roden Oil Co.	Pennsylvanian	10,010	June 25, 1963	14,200	2,810	80,500	66	242	152,300	5.4	< .4	--	250,000	47,000	161	>12,000	6.4
33	Cedar Lake Field	Tex-State Oil Co.	San Andres Limestone Permian	4,800	Oct. 26, 1962	1,800	620	18,100	220	3,030	30,750	1.0	< .4	--	54,400	70	94	>12,000	7.0
34	do	Pan-Am-Mon Cedar Lake unit	do	4,800	do	2,180	790	25,500	1,150	4,200	42,410	--	< .4	--	75,600	8,700	119	>12,000	7.1
35	NE end of Cedar Lake	do	do	4,800	do	2,060	790	22,760	1,105	3,980	37,000	--	< .4	--	67,100	8,400	109	>12,000	7.1

Table 6.--Chemical analyses of oil-field brines in Gaines County--Continued

Tank or pit no.	Oil field	Operator	Reservoir rock	Depth to top of producing zone	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
36	East Hobbs Field	Ralph Lowe	Clear Fork Group Permian	6,390	Oct. 12, 1962	2,320	793	19,274	966	3,408	34,045	--	<0.4	--	60,300	9,050	88	>12,000	7.7
37	do	do	San Andres Limestone Permian	44,181	do	160	171	4,784	2,190	279	6,781	--	< .4	--	13,300	1,100	61	>12,000	8.5
38	SE Hobbs Field	Signal Oil & Gas Co.	Glorieta Sandstone	5,928	Oct. 30, 1962	982	778	16,599	1,616	5,139	24,184	--	< .4	--	48,500	5,650	96	>12,000	6.5
39	North Riley Field	Ralph Lowe	Lower Part of Clear Fork Group Permian	6,930	Oct. 8, 1962	1,218	410	4,163	1,792	3,024	6,887	--	< .4	--	16,600	4,725	27	>12,000	7.1
40	do	W. H. Hunt Trust Estate	do	6,930	do	842	485	6,230	328	2,844	10,206	0.4	< .4	--	20,800	4,095	42	>12,000	7.3
41	do	Ralph Lowe	do	6,930	do	1,008	436	10,097	343	1,734	17,995	.5	< .4	8.1	31,400	4,305	67	>12,000	7.4
42	do	Great Expectations Oil Co.	do	6,930	Oct. 9, 1962	6,613	1,629	44,210	438	1,695	85,990	1.9	< .4	--	140,600	23,200	126	>12,000	6.8
43	North Jenkins Field	Humble Oil & Refining Co.	Canyon Group Pennsylvanian	8,450	Oct. 8, 1962	1,600	695	13,662	489	776	24,815	.6	< .4	13.8	41,800	6,850	72	>12,000	7.7
44	North Riley Field	U.S. Smeltering, Refining & Minerals	Lower Part of Clear Fork Group Permian	6,930	do	10,240	3,953	51,520	179	1,301	109,148	1.7	< .4	--	176,000	41,800	109	>12,000	6.3
45	Robertson North Field	D. W. St. Clair	Clear Fork Group	7,070	Oct. 2, 1963	586	1,960	47,200	383	2,154	85,200	4.9	< .4	--	137,000	22,700	134	>12,000	6.8
46	Southwest Seminole Field	Socony Mobil Co.	Pennsylvanian	10,337	Oct. 8, 1962	6,640	1,769	53,544	183	1,532	94,927	1.7	< .4	37	159,000	23,850	156	>12,000	6.9
47	do	Tenneco Oil Co.	San Andres Limestone Permian	5,032	Oct. 3, 1962	1,531	530	11,587	600	2,996	20,054	--	< .4	--	37,000	6,000	65	>12,000	7.8
48	East Seminole Field	Texaco, Inc.	do	5,406	Jan. 7, 1963	1,380	438	9,200	1,072	3,630	15,500	--	< .4	--	30,700	5,255	55	>12,000	8.0
49	Pan American Petroleum Co.	Honolulu, et al.	Strawn Group Pennsylvanian	10,998	Oct. 4, 1962	34,348	2,189	12,920	31	317	89,079	--	< .4	--	139,000	747,000	18	>12,000	5.4
50	Toby-Jo Field	Texaco, Inc.	Wolfcamp Formation Permian	9,160	do	4,670	1,666	49,270	391	1,331	88,860	1.7	< .4	--	146,000	18,500	158	>12,000	6.9

Table 6.--Chemical analyses of oil-field brines in Gaines County--Continued

Tank or pit no.	Oil field	Operator	Reservoir rock	Depth to top of producing zone	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Sodium adsorption ratio (SAR)	Specific conductance (micromhos at 25°C)	pH
51	Kay Field	Atlantic Refining Co.	Wolfcamp Formation Permian	10,316	Oct. 10, 1962	8,740	1,818	66,746	117	554	125,386	2.5	<0.4	--	203,000	29,300	169	>12,000	6.3
52	North Amrow Field	Jack L. Hamon Oil Co.	Strawn Group Pennsylvanian	11,310	Oct. 4, 1962	7,900	1,867	55,844	122	444	102,560	4.0	< .4	--	169,000	27,400	148	>12,000	6.4
53	Champmon Field	Champlin Oil & Refining Co.	Devonian	12,735	Oct. 10, 1962	1,512	329	9,775	849	1,889	17,395	--	< .4	--	31,300	5,150	59	>12,000	6.4
54	Tex-Mex Field	E. P. Hitchcock & Son	San Andres Limestone Permian	4,305	Oct. 30, 1962	3,206	1,240	28,692	522	373	50,814	--	< .4	--	84,600	--	109	>12,000	9.0
55	Jenkins Field	Texaco, Inc.	do	4,543	Oct. 9, 1962	1,904	632	18,970	803	3,671	30,790	--	< .4	8.1	56,400	--	96	>12,000	7.7
56	Robertson Field	H. Black Drilling Co.	Upper Part of Clear Fork Group Permian	6,320	do	1,182	331	6,440	175	79	13,230	--	< .4	--	21,300	4,309	43	>12,000	6.9
57	Flanagan Field	Shell Oil Co.	do	6,420	do	3,246	912	30,920	409	3,026	55,120	--	< .4	31	93,400	11,850	123	>12,000	7.5
58	Harris Field	McCulloch Oil Corp. of California	Glorieta Sandstone Permian	5,965	do	2,325	730	24,830	531	3,207	40,870	--	< .4	--	72,200	8,800	115	>12,000	7.6
59	Bottenfield Field	Texaco, Inc.	Wolfcamp Formation Permian	9,206	Oct. 4, 1962	5,130	1,873	45,014	229	1,856	85,992	2	< .4	--	140,000	20,500	137	>12,000	6.8
60	North Means Field	Texas Pacific Coal & Oil Co.	Queen Formation Permian	4,166	Nov. 28, 1962	1,280	985	13,790	105	817	25,460	4.0	< .4	--	42,400	7,260	70	>12,000	6.7
61	do	J. C. Barnes Oil Co.	do	4,166	Nov. 1, 1962	4,269	5,885	36,715	0	1,393	81,558	4.0	< .4	--	130,000	34,850	66	>12,000	4.3
62	Nolley Field	Socony Mobil Oil, Inc.	Wolfcamp Formation Permian	9,261	Oct. 4, 1962	7,315	2,079	55,567	254	918	102,530	.8	< .4	--	169,000	268	147	>12,000	6.8
63	Amrow Field	Cities Service Petroleum Co.	Devonian	12,672	do	968	255	6,644	738	1,190	11,583	--	< .4	--	21,000	3,465	49	>12,000	7.1
64	do	Amerada Petroleum Corp.	do	12,680	Oct. 10, 1962	1,554	492	9,292	782	2,016	17,040	--	< .4	--	30,800	5,900	53	>12,000	7.2
65	Glasco Field	Marathon Oil Co.	do	12,550	do	1,380	366	10,626	788	2,036	17,892	--	< .4	--	32,700	4,935	62	>12,000	6.9
66	Chilton Field	Socony Mobil Oil Co., Inc.	Pennsylvanian	11,334	Jan. 11, 1963	3,126	340	27,080	273	720	48,850	--	< .4	--	80,300	9,200	123	>12,000	6.6
67	Sewer disposal	City of Seagraves	--	--	May 27, 1963	78	62	142	510	114	163	4.0	< .4	--	876	450	2.9	1,500	7.3
68	do	City of Seminole	--	--	Sept. 19, 1962	34	25	120	242	79	126	2.3	2.0	--	507	186	3.8	897	7.9