TEXAS WATER DEVELOPMENT BOARD

REPORT 164

GROUND-WATER RESOURCES OF DONLEY COUNTY, TEXAS

By

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United States Geological Survey

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TEXAS WATER DEVELOPMENT BOARD

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TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd.)

TABLES

FIGURES

GROUND-WATER RESOURCES OF DONLEY COUNTY, TEXAS

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ABSTRACT

The principal source of ground water in Donley County is the Ogallala Formation. The Whitehorse Group supplies small quantities of water for livestock. The alluvium supplies small quantities for domestic use and irrigation.

In 1967, about 38,000 acre-feet of ground water was used in the county. Of this amount, 36,000 acre-feet was pumped for irrigation. Nearly all the water was from the Ogallala Formation. Recharge from precipitation on the outcrop of the Ogallala is estimated at 10,000 acre-feet per year. Water levels in the vicinity of Clarendon have declined as much as 20 feet since 1942 as a result of concentrated pumping for irrigation.

Water in the Ogallala Formation is a very hard, calcium bicarbonate water that generally contains less than 1,000 milligrams per liter dissolved solids. About 3 million acre-feet of fresh water is in storage in the Ogallala Formation, but only half of this amount is considered to be available to wells. Water in the Whitehorse Group is a highly mineralized, calcium plus sulfate water that is suitable only for livestock, supplemental irrigation, and some industrial uses. Water in the alluvium varies in quality according to the source of recharge.

GROUND-WATER RESOURCES OF DONLEY COUNTY, TEXAS

INTRODUCTION

Location, Population, and Economy of the Area

Donley County, an area of 909 square miles, is in the southeastern part of the Texas panhandle (Figure 1). The county is bordered by Gray on the north, Collingsworth on the east, Armstrong on the west, and Briscoe and Hall Counties on the south.

The county was created in 1876 and had a population of 2,756 in 1900. As a result of the expansion of ranching and farming, the population grew to 10,262 by 1930. The population has since decreased to an estimated 4,533 in 1967. The decline in population reflects the growth of large-scale ranching and farming practices and the consolidation of many small farms.

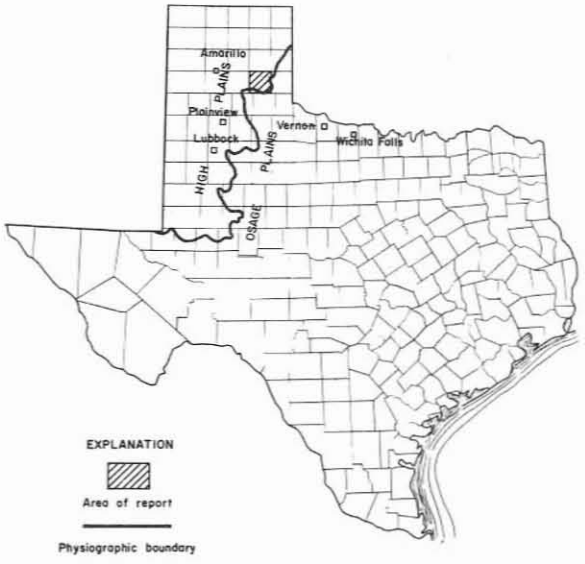

Figure 1.—Location of Donley County

Clarendon, which had an estimated population of 2,158 in 1967, is the county seat and major agricultural center. Ashtola, Giles, Hedley, Jericho, and Lelia Lake are among the smaller communities. In 1967, about 62 percent of population of the county lived in the cities.

Donley County derives its income principally from cattle ranching and farming. Agricultural businesses include cotton gins, meat packing plants, and fertilizer and farm and ranch implement sales. Gravel and sand quarrying and chicken hatcheries also contribute to the economy.

Irrigation farming was established in Donley County in the mid-1940's, and by 1967, about 21,270 acres of cropland were irrigated by 220 wells. Irrigated and nonirrigated crops in 1967 included about 5,000 acres of alfalfa, 17,000 acres of cotton, and 47,000 acres of grain sorghum. About 20 acres of peanuts, 1,000 acres of soybeans, and 50,000 acres of sweet sorghum were also grown. Other crops included vegetables, forage, and fruits.

During 1967, 141,000 acres in the county were used as cropland, and 440,000 acres were used for pasture and rangeland. In that year, about 35,000 acres of cropland were in conservation programs with the U.S. Agricultural Stabilization and Conservation Service, and about 342,000 acres of rangeland and 124,000 acres of cropland were in the basic conservation plan of the U.S. Soil Conservation Service.

Purpose and Scope of the Investigation

The Donley County ground-water investigation began in August 1967 as a cooperative project of the U.S. Geological Survey and the Texas Water Development Board. Its purpose was to obtain and interpret basic data concerning the occurrence, location, and quality of ground water in the county.

The investigation included an inventory of 679 wells, test holes, and springs, including all public supply, industrial, and irrigation wells, and a representative number of domestic supply and livestock wells (Table 7). The location of wells, test holes, and springs are shown in Figure 9. Data for subsurface studies were obtained from about 30 electrical logs and 1,500 drillers' logs. Thirteen selected drillers' logs are shown in Table 8.

Pumping tests were conducted to determine the hydraulic properties of the water-bearing rocks. A

pumpage inventory was made to determine the amount of ground water withdrawn.

Water-quality data were obtained from analyses of 226 samples collected from wells and springs during this and previous investigations (Table 9). The specific conductance of 87 samples was measured in the field to supplement the water-quality data (Table 7).

Previous Investigations

Previous investigations of the ground-water resources of Donley County were made by: Gould (1906), Christian (1942), George and Follett (1942), Ellis (1951), Baker and others (1963), Cronin (1964), and Guyton (1965). Other reports pertinent to the study area are included in the section "References Cited".

Physiography and Drainage

Donley County is in two physiographic provinces—the High Plains (Llano Estacado) of the Great Plains, and the Osage Plains of the Central Lowlands. Most of the county lies east of the Caprock Escarpment of the High Plains; Clarendon is about 17 miles east of the Caprock. The central and northwestern parts of the county are in the High Plains of Texas, and the eastern and southern parts are in the Osage Plains. The highest altitude, about 3,200 feet is in the northwest corner of the county; the lowest altitude, about 2,200 feet is in the southeast corner.

Most of the central and north-central parts of the county have a rolling topography covered by sandy soils. Small areas of thin windblown sand deposits are present in most of the county, but sand hills are common only in the central and east-central parts. The southern and eastern parts of the county have irregular topography with thinly developed soils.

Native grass, yucca, and mesquite abound in the uplands. Stubby cedar, scrub oak, sage brush, juniper, and mesquite grow on the lowlands. Cottonwood, hackberry, grass, yucca, sagebrush, wild grape, and plum are common in the stream valleys.

Donley County is in the Red River drainage basin of Texas. The county is drained by the Salt Fork Red River, its tributaries, and the tributaries of the Prairie Dog Town Fork Red River. The Salt Fork drains the north-central part of the county. The tributaries of the Prairie Dog Town Fork drain the southern part.

Climate

The climate of Donley County is semiarid. The average annual precipitation at Clarendon for the 14-year period 1954-67 was 20.74 inches. Approximately one-third of the annual rainfall occurs in May and June, and about 70 percent occurs during the growing season. The geographic distribution of rainfall varies considerably. Thunder and hailstorms accompanied with high-velocity southwesterly winds frequently occur in the late spring through early fall months.

The average monthly temperature at Clarendon for the 14-year period 1954-67 ranged from 96°F (36°C) in July to 26°F (-3°C) in January. The last spring frost occurs about April 9, and the first fall frost occurs about November 1. The average growing season is 206 days.

High summer temperatures, low humidity, and strong winds cause a high rate of evaporation in the county. The average gross lake evaporation rate is about 73 inches per year (Kane, 1967).

Well-Numbering System

The well-numbering system used in this report is a state-wide system adopted by the Texas Water Development Board.

Each one-degree quadrangle in the State is given a number consisting of two digits. These are the first two digits of the well number. The one-degree quadrangles are each divided into 7½-minute quadrangles which are given two-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, given a single digit from 1 to 9. This is the fifth digit of the well number. The wells within a 2½-minute quadrangle are given two-digit numbers as they are inventoried, starting with 01. These are the last two digits of the well number.

On the well-location map in this report (Figure 9), the 1-degree quadrangles are numbered in large bold numbers. The 7½-minute quadrangles are numbered in the northwest corners where possible. 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. A 2-letter prefix to the well number is used to identify each county. The prefix assigned to Donley County is JA.

Acknowledgments

The Brazos Exploration Service; Green Machinery Company, Inc.; Layne-Texas Company, Inc.; J. H. McCarty Water Well Service; L. P. Moore Drilling Company; Biggs and Mathews Consulting Engineers; W. F. Guyton and Associates; Freese, Nichols and Endress Consulting Engineers; Chevron Oil Company; Gulf Oil Corporation; Pan American Petroleum Company; Phillips Petroleum Corporation; Sunray DX Company;

and Yucca Petroleum Company provided most of the subsurface data used in this investigation.

Pumpage and well-completion data were obtained with the assistance of the Donley County Abstract Company, Donley County Water Control and Improvement District No. 1, Greenbelt Electric Cooperative, Greenbelt Municipal and Industrial Water Authority, Mustang Well Supply Corporation, U.S. Agricultural Stabilization and Conservation Service, U.S. Soil Conservation Service, and the municipal offices at Clarendon and Hedley.

GROUND-WATER HYDROLOGY

Geologic Units and Their Water-Bearing Properties

The geologic units that contain fresh to slightly saline water in Donley County are the Whitehorse Group of Permian age, the Ogallala Formation of Tertiary age, and the alluvium of Quaternary age. The lithology, thickness, and water-bearing properties of the geologic units are given in Table 1. The areal distribution of the units is shown on the geologic map (Figure 2). Their stratigraphic positions are shown on the hydrologic section A-A' (Figure 3).

The Blaine Formation, which yields water suitable for irrigation in counties east of Donley has not been tapped within the report area. The Blaine would probably yield small quantities of highly mineralized water, which would be unsuitable for most purposes.

Whitehorse Group

The Whitehorse Group consists of fine-grained red sandstone and shale, and white to brown gypsum, anhydrite, and dolomite. As used in this report, the Whitehorse may include the younger Cloud Chief and Quartermaster Formations. The thickness of the unit is not known, but is thought to range from about 200 to 500 feet.

In Donley County the Whitehorse Group yields small quantities of slightly saline water to windmills for livestock supply. However, in counties south and east of Donley the Whitehorse has been extensively developed for irrigation and public supply.

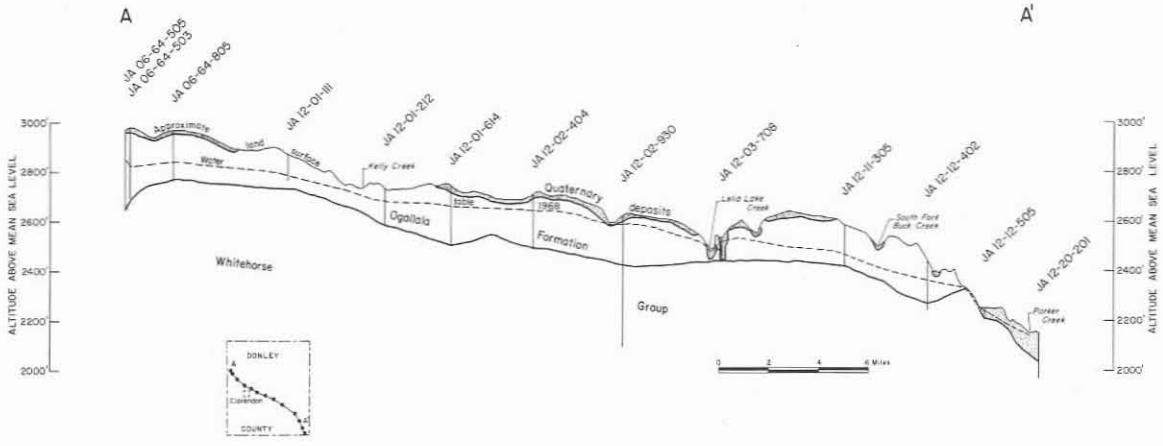

Figure 3.—Generalized Hydrologic Section A-A'

Ogallala Formation

The Ogallala Formation consists of clay, silt, fine to coarse sand, sandstone, and gravel. Caliche is commonly present as one or more layers in the upper part of the formation.

The Ogallala has a maximum thickness of about 750 feet in the northwestern part of the county. Elsewhere, the thickness normally ranges from 100 to 200 feet. The variations in thickness and the undulations of the base of the Ogallala are due primarily to the irregularly eroded surface upon which it was deposited. The approximate altitude of the base of the Ogallala is shown on Figure 4.

The Ogallala Formation is the principal source of fresh water in Donley County. The formation provides most of the water for domestic supply, livestock use, and irrigation, and nearly all of the water for municipal supply. Large-capacity wells tapping the Ogallala yield as

Table 1.—Geologic Units and Their Water-Bearing Properties

SYSTEM	SERIES	GEOLOGIC UNIT	ESTIMATED THICKNESS (FT)	LITHOLOGY	OCCURRENCE AND SURFACE EXPRESSION	WATER-BEARING PROPERTIES
Quaternary	Holocene	Windblown sand	0 - 50	Fine sand and silt.	Occurs along the banks of larger streams, as dunes, and as a thin cover on the plains in the northwest corner of the county.	Does not yield water to wells but transmits water to the underlying aquifers.
		Alluvium	0 - 200	Interfingering beds of clay, silt, sand, and gravel.	Occurs on the flood plains and banks of streams.	Yields small to moderate quantities of fresh to slightly saline water to wells and springs.
	Pleistocene	Playa deposits	0 - 50	Gray to brown clay and sandy silt.	Occurs in the depressions or playas of the high plains.	Does not yield water to wells but transmits water to the underlying aquifers.
		Windblown sand and dunes	0 - 25	Fine to medium sand and caliche nodules.	Occurs as a thin cover on the plains in the northwest corner of the county.	Does not yield water to wells but transmits water to the underlying aquifers.
Tertiary	Pliocene	Ogallala Formation	0 - 750	Clay, silt, fine to coarse sand, gravel, and caliche.	Forms the high plains in the central and northwestern part of the county.	Principal aquifer. Yields moderate to large quantities of fresh water to wells and springs.
Permian		Whitehorse Group	200 - 500 (?)	Very fine to fine, red sandstone and shale, white to brown gypsum, anhydrite and dolomite.	Forms the rolling hills of the Osage Plains in the eastern and southern part of the county.	Yields small quantities of slightly saline water to livestock wells.

Yield of wells: Small, less than 50 gpm (gallons per minute); moderate, 50 to 500 gpm; large, more than 500 gpm.
Quality of water: Fresh, less than 1,000 mg/l (milligrams per liter) dissolved solids; slightly saline, 1,000 to 3,000 mg/l; moderately saline, 3,000 to 10,000 mg/l; very saline, 10,000 to 35,000 mg/l; brine, more than 35,000 mg/l.

much as 1,300 gpm, but most wells yield less than 500 gpm.

Quaternary Alluvium

The water-bearing alluvial deposits in Donley County are floodplain and terrace deposits composed of interfingering beds of clay, silt, sand, and gravel which have a maximum thickness of about 200 feet.

The alluvium yields small to moderate (50 to 500 gpm) quantities of fresh to slightly saline water to wells and springs. Until 1967 a well field tapping alluvial deposits 3½ miles east of the community of Lelia Lake supplied the city of Clarendon and nearby communities. In 1967, nearly all of the water pumped from the alluvial deposits was used for domestic and livestock supply.

Source and Occurrence of Ground Water

The principal source of fresh ground water in Donley County is precipitation within the county and in adjoining areas to the north and west. Most of the precipitation runs off, evaporates, or is transpired by plants. Only a small part percolates through the soil and into the aquifers.

Water in the aquifers of Donley County occurs under two conditions—water table (unconfined), and artesian (confined). Under water table conditions, the water will not rise in wells above the level at which it is found in the formation. Under artesian conditions, the water rises to a level that is proportionate to the hydrostatic pressure.

The water in the Ogallala Formation and in the Quaternary alluvium generally is unconfined, but because of the lenticularity of the sediments, the water in some places may be under sufficient hydrostatic pressure to cause it to rise a few feet above the top of the water-bearing bed.

The water in the Whitehorse Group is under artesian pressure except in the outcrop area. In two wells that tap the Whitehorse (JA-11-08-901 and JA-11-16-301) the artesian pressure is sufficient to cause the wells to flow.

Recharge, Movement, and Discharge

Recharge is the addition of water to an aquifer by either natural or artificial means. Natural recharge results chiefly from infiltration of precipitation.

The amount of water that enters the aquifers by infiltration of precipitation depends upon the area of effective recharge (outcrop area), the permeability of the aquifer at the outcrop, and the amount and season of rainfall. Because most of the rainfall in Donley County occurs during the period of high evaporation and transpiration, recharge occurs only when storms provide enough water to saturate the soils. The most favorable areas for recharge are the areas in the sand dunes. Because of the high porosity and permeability of the sand, most of the precipitation is absorbed and very little runs off. However, a substantial part of the rainfall is subsequently lost to evapotranspiration, and only a small percentage eventually percolates to the water table.

The quantity of recharge to the Ogallala was not determined during this investigation. However, a reasonable estimate for recharge can be made by assuming that about one-half inch of the annual rainfall on the outcrop eventually reaches the water table. On this basis, and assuming an effective recharge area of 250,000 acres, the average recharge to the Ogallala Formation in Donley County is about 10,000 acre-feet per year, which is slightly more than one-fourth of the pumpage in 1967.

Ground water moves slowly, on the order of a few tens of feet per year, through the aquifers under the force of gravity from areas of recharge to areas of discharge. The general direction of ground-water movement (hydraulic gradient) is shown by the water-level contours in Figure 5, which shows the approximate altitude of selected water levels in wells principally in the Ogallala Formation, but to some extent in the Whitehorse Group and alluvium. The water moves east-southeastward, perpendicular to the water-level contours.

Ground water is discharged naturally by springs and seeps and artificially by flowing or pumped wells and by constructed seepage ponds.

Numerous springs and seeps occur in Donley County where the water table in the Ogallala Formation and alluvium intersects the land surface. Many springs occur along the contact between the Ogallala and the Whitehorse, but none were observed on the outcrop of the Whitehorse. Springs have also developed along the banks of the Salt Fork Red River, Whitefish and Lelia Lake Creeks, and along many of the tributaries of the Prairie Dog Town Fork Red River. Some seepage ponds are made by excavating to the water table. Such is the origin of many of the springs in the 05-51 and 05-59 quadrangles.

The quantity of ground water that is discharged into streams by seeps and springs is not known. Measurements of the base flow at the U.S. Geological Survey partial-record station Lelia Lake Creek near Hedley (Figure 9) show that spring discharge from the Ogallala Formation is substantial. During the 10-year period 1958-67, the average winter base flow at this station was 8.62 cubic feet per second or 6,240 acre-feet

per year. Most of the base flow was probably sustained by spring discharge.

The movement of water from one formation to another occurs in the southern part of the county, where water from the Ogallala moves into the Whitehorse; and in the central part of the county, where water from the Ogallala moves into the alluvium. These areas are indicated in Figure 5 by the configuration of the water-level contours.

Use of Ground Water

Until January 1968, nearly all the water used in Donley County was pumped from wells. During the early days of settlement in the late 1800's, hand-dug wells, springs, and spring-fed streams supplied water for domestic and livestock use. Most of the older wells were equipped with windmills and many have been abandoned. However, a few have been reworked and are now being operated with electric power.

Well JA-12-02-913, dug in 1914 by George Green, was probably the first irrigation well in the county. However, serious interest in irrigation did not develop until after World War II. In the mid-1940's, a few wells were drilled in the area between Clarendon and Ashtola. Since then there has been a continuing increase in irrigated farming in this and other areas within the county.

In 1967, about 230 irrigation wells were in use in Donley County. Most of the wells are equipped with vertical-shaft turbine pumps powered by natural gas or liquid petroleum engines. The yields of these wells generally range from 200 to 750 gpm, but some wells reportedly pump as much as 1,300 gpm.

Windmill wells, together with springflow, supply most of the water used for livestock in Donley County. Since 1938, the electric cooperatives have made power available in the rural areas. Consequently, most of the domestic wells are now equipped with submersible or jet pumps. The public-supply wells are generally equipped with turbine pumps powered by electricity or natural gas.

In January 1968, the Greenbelt Municipal and Industrial Water Authority began to supply treated water to the cities of Clarendon and Hedley from spring-fed Greenbelt Reservoir on the Salt Fork Red River near Clarendon (Figure 9). Other cities in the Texas Panhandle outside of Donley County are being supplied municipal water from this reservoir which has a 60,000 acre-foot capacity. Wells that formerly supplied water needs of the two cities are on reserve for emergency use. The Authority supplied about 620 acre-feet or 550,000 gpd (gallons per day) of water from the reservoir to users in Donley County in 1968.

In 1880, probably about 60,000 gpd of ground water was pumped in Donley County. The pumpage increased to an estimated 2.1 mgd (million gallons per day) in 1930. In 1967, about 34 mgd of water was pumped, most of which was for irrigation. Table 2 shows the municipal use of ground water during the period 1955-67, and Table 3 shows the use of ground water for irrigation, public supply, rural domestic supply, and livestock in 1967. These figures are based on records of the Texas Water Development Board population estimates, and irrigation and livestock surveys. Of the 38,000 acre-feet of ground water pumped in 1967, about 36,000 acre-feet, or 95 percent, was for irrigation. The Ogallala Formation was the principal source of the water pumped in 1967. Withdrawals from this aquifer are likely to increase in the future.

Changes in Water Levels

Changes in water levels in wells depend upon various factors, the most important of which are the discharges from wells and the natural recharge. The water levels measured in wells during the current and previous investigations are included in Table 7.

Seven wells in Donley County have been included in the Texas Water Development Board's observation well program. The water levels in these wells are shown in Table 4. Hydrographs of six of the wells are shown on Figure 6. All the observation wells are or were used for irrigation, are either in or on the fringe of the heavily pumped area northwest of Clarendon, and are completed in the Ogallala Formation.

The hydrographs (Figure 6) show that in general, water levels rose almost continuously from 1958 until at least 1961. The rise, which ranged from 3 feet in well JA-12-01-102 to as much as 13 feet in well JA-12-01-301, reflects the above normal rainfall in 1957, 1958, and 1960. The period from about 1962 to 1968 was one of generally declining water levels. In four of the six wells, the water levels were 1 to 15 feet lower in 1967 than in 1958.

In two wells, JA-12-01-102 and JA-11-08-201, water levels were measured in 1949 before large-scale development of ground water began. A comparison of these and the 1968 levels shows a net decline of only 3 to 4 feet, or about 0.15 and 0.2 feet per year, respectively. In the more heavily pumped parts of the irrigated areas, declines have been greater. A comparison of water levels measured in 1942 with those measured in nearby wells in 1968 indicates that the water table has declined as much as 20 feet in the vicinity of Clarendon and 11 feet in the irrigated area northwest of Clarendon. In the heavily developed areas near Hedley and in the southeastern part of the county, comparative water-level data are lacking. It is likely that in these areas declines have been less than in the other older-pumped areas.

Table 2.—Municipal Pumpage of Ground Water, 1955-67
(In Million Gallons Per Day)

COMMUNITY	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Clarendon	0.49	0.30	0.30	0.49	0.37	0.21	0.38	0.27	0.49	0.48	0.43	0.45	0.44
Hedley	.05	.06	.07	.05	–	.05	.06	.06	.07	.07	.07	.07	.07
Memphis[1/]	.39	.39	.32	.29	.29	.35	.35	.38	.42	.50	.44	.45	.44
Total	.93	.75	.69	.83	–	.61	.79	.71	.98	1.05	.94	.97	.95

1/ The water supply for the city of Memphis in Hall County is piped from wells in southeastern Donley County through a system that is operated by the Donley County Water Control and Improvement District Number 1.

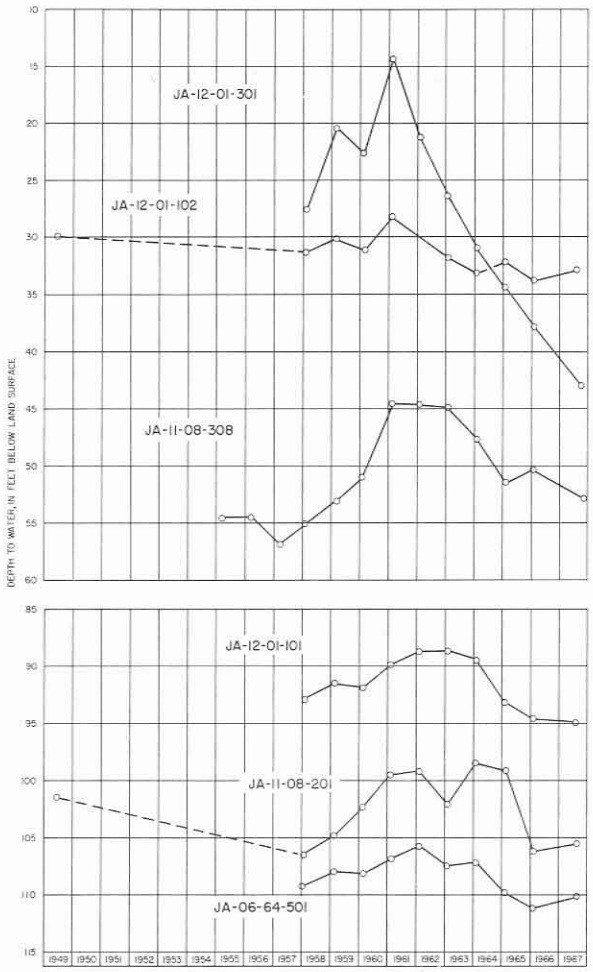

Figure 6.—Hydrographs of Water Levels in Selected Wells

Hydrologic Characteristics

The hydrologic characteristics that control the occurrence and movement of ground water in an aquifer are the hydraulic conductivity, transmissivity, and the storage coefficient.

The hydraulic conductivity is the rate of flow of water in gallons per day through a cross-sectional area of 1 square foot under a unit hydraulic gradient.

The transmissivity is the number of gallons of water that will move in one day through a vertical strip of the aquifer one foot wide and having the height of the aquifer when the hydraulic gradient is unity. It is the product of the hydraulic conductivity and the saturated thickness of the aquifer.

The storage coefficient is the volume of water an aquifer releases from or takes into storage per unit of surface area of the aquifer per unit of change in the component of head normal to that surface.

Little is known about the hydrologic characteristics of the aquifers in Donley County. Two aquifer tests were made during this investigation, both of which were in wells tapping the Ogallala Formation. The results of the tests show that the transmissivity and hydraulic conductivity ranged from 3,000 gpd per foot and 60 gpd per square foot in well JA-12-12-402 in the southeastern part of the county to 13,600 gpd per foot, and 160 gpd per square foot in well JA-12-09-302, about 7 miles south of Clarendon. Well JA-12-12-402 pumped 206 gpm for 26 hours and well JA-12-09-302 pumped 180 gpm for 37 hours. In the heavily pumped areas, where the saturated thickness is greater than in the wells tested, higher values of transmissivity might be expected, possibly as much as 20,000 gpd per foot.

The storage coefficient of the Ogallala Formation could not be determined from the aquifer tests. On the basis of the specific yield of the Ogallala Formation, obtained in the heavily irrigated part of the Southern High Plains, a value of about 15 percent is considered reasonable.

Specific capacities (yield in gallons per minute per foot of drawdown) and yields of wells are useful in estimating the ability of an aquifer to transmit water. In general, a high specific capacity indicates a high transmissivity and a low specific capacity indicates a low transmissivity. But well development, perforation space, and other factors affect the specific capacity.

Table 3.—Estimated Pumpage of Ground Water, 1967

USE	PUMPAGE BY AQUIFER, IN ACRE-FEET PER YEAR			TOTAL ACRE-FEET PER YEAR[1]	TOTAL (MGD)[1]
	WHITEHORSE GROUP	OGALLALA FORMATION	ALLUVIUM		
Irrigation	0	35,400	200	36,000	32.0
Public supply	0	1,070	0	1,100	.98
Rural domestic	0	7	361	370	.33
Livestock	114	211	39	360	.32
Industrial	0	0	0	0	0
Totals[1]	110	37,000	600	38,000	34.0

[1] Totals are given in two significant figures.

Tests made on 43 irrigation wells in the Ogallala show that the specific capacities ranged from 2 to 50 gpm per foot of drawdown and averaged 12 gpm per foot of drawdown. Yields of 125 irrigation wells ranged from 100 to 1,300 gpm and averaged about 500 gpm.

Hydrologic properties of the Whitehorse Group in the study area are not known, but on the basis of data obtained in adjacent counties, the specific capacity of the Whitehorse is considerably lower than that of the Ogallala or the alluvium.

Data reported by drillers show specific capacities of 4 and 10 gpm per foot in two public-supply wells pumping 200 and 530 gpm respectively from the Quaternary alluvium at Lelia Lake Creek.

Water in Storage

The volume of water stored in the Ogallala is the product of the volume of saturated material and the porosity (the ratio, expressed in percentage, of void spaces to total volume). This quantity is of little value in itself because only a small fraction, about 10 to 20 percent, would drain from the material and be available to wells. On the basis of an average saturated thickness of 50 feet, an area of 600 square miles, and a specific yield of 15 percent, about 3 million acre-feet of water in storage in the Ogallala Formation in Donley County is available to wells. If only one-half, or 1.5 million acre-feet, could be developed economically, the supply, without recharge would last about 40 years at the present (1967) rate of pumping (38,000 acre-feet).

CHEMICAL QUALITY OF GROUND WATER

The concentrations of the chemical constituents in water (Table 9) are expressed in milligrams per liter (mg/l), which is the unit weight of the constituent in milligrams in a volume of 1 liter of water, and is approximately equivalent to 1 part per million.

The source and significance of dissolved-mineral constituents and the properties of water are given in Table 5. A general classification of water based on dissolved-solids content (modified from Winslow and Kister, 1956) is as follows:

DESCRIPTION	DISSOLVED-SOLIDS CONTENT (MG/L)
Fresh	Less than 1,000
Slightly saline	1,000 to 3,000
Moderately saline	3,000 to 10,000
Very saline	10,000 to 35,000
Brine	More than 35,000

Relationship of Quality of Water to Use

The U.S. Public Health Service (1962) has established and periodically revises the standards for drinking water to be used on common carriers engaged in interstate commerce. The standards, which are designed to protect the traveling public, are useful in evaluating domestic and public water supplies. According to the standards, chemical constituents should not be present in a public water supply in excess of the concentrations listed in the following table:

SUBSTANCE	CONCENTRATION (MG/L)
Chloride (Cl)	250
Fluoride (F)	0.7*
Iron (Fe)	0.3
Nitrate (NO_3)	45
Sulfate (SO_4)	250
Dissolved solids	500

* Based on the annual average of maximum daily temperature at Clarendon. The significance of these and other constituents is given in Table 5.

Table 4.—Water Levels in Observation Wells

WELL	DATE OF MEASUREMENT	WATER LEVEL BELOW LAND SURFACE (FEET)
JA-06-64-501	Feb. 6, 1958	109.31
	Mar. 3, 1959	108.05
	Jan. 12, 1960	108.29
	Jan. 18, 1961	106.92
	Jan. 11, 1962	105.78
	Jan. 8, 1963	107.50
	Jan. 12, 1964	107.20
	Jan. 12, 1965	109.95
	Jan. 12, 1966	111.28
	Aug. 16, 1967	110.10
11-08-201	June 2, 1949	101.28
	Feb. 6, 1958	106.46
	Mar. 3, 1959	104.67
	Jan. 12, 1960	103.30
	Jan. 18, 1961	99.36
	Jan. 11, 1962	99.2
	Jan. 8, 1963	102.07
	Jan. 12, 1964	98.51
	Jan. 11, 1965	99.22
	Jan. 12, 1966	106.32
	Aug. 11, 1967	105.58
11-08-308	Feb. 15, 1955	54.49
	Feb. 23, 1956	54.41
	Feb. 22, 1957	56.78
	Feb. 6, 1958	55.08
	Mar. 3, 1959	53.00
	Jan. 12, 1960	51.01
	Jan. 18, 1961	44.60
	Jan. 11, 1962	44.73
	Jan. 8, 1963	44.90
	Jan. 12, 1964	47.77
	Jan. 11, 1965	51.50
	Jan. 12, 1966	50.29
	Nov. 28, 1967	52.78
12-01-101	Feb. 6, 1958	92.76
	Mar. 3, 1959	91.50
	Jan. 12, 1960	91.93
	Jan. 18, 1961	89.92
	Jan. 11, 1962	88.86
	Jan. 8, 1963	88.80
	Jan. 12, 1964	89.44
	Jan. 11, 1965	93.22
	Jan. 12, 1966	94.68
	Aug. 11, 1967	94.9
12-01-102	July 20, 1949	29.78
	Feb. 6, 1958	31.44
	Mar. 3, 1959	30.05
	Jan. 12, 1960	31.18
	Jan. 18, 1961	28.12
	Jan. 8, 1963	31.87
	Jan. 12, 1964	33.21
	Jan. 11, 1965	32.25
	Jan. 12, 1966	33.78
	Aug. 11, 1967	32.88
12-01-301	Feb. 6, 1958	27.55
	Mar. 3, 1959	20.42
	Jan. 12, 1960	22.69
	Feb. 16, 1961	14.40
	Jan. 11, 1962	21.23
	Jan. 8, 1963	26.31
	Jan. 12, 1964	30.90
	Jan. 11, 1965	34.32
	Jan. 12, 1966	37.82
	Oct. 24, 1967	42.8
12-02-607	Jan. 18, 1961	57.31
	Jan. 11, 1962	56.66
	Jan. 8, 1963	56.90
	Jan. 12, 1964	59.36
	Jan. 11, 1965	60.57
	Jan. 12, 1966	62.79
	Nov. 13, 1967	83.01

The quality of water requirements for industrial uses ranges widely, as almost every industry has different standards. In general, water used for industry may be placed in three categories—process water, cooling water, and boiler water. Process water is incorporated into or is in contact with the manufactured product. The quality requirements may therefore include physical and biological factors as well as chemical factors. Water for cooling and boiler uses should be noncorrosive and relatively free of scale-forming constituents.

Water for irrigation is evaluated according to dissolved-solids content, sodium adsorption ratio (SAR), residual sodium carbonate (RSC), and the concentrations of specific elements such as boron. Other factors, such as soil texture and composition, types of crops, irrigation practices, and climate must be considered.

Table 6 shows the relative tolerance of various crops to slightly saline water. A study by the Texas Agricultural Experiment Station (Gerard and others, 1960) concludes that with good management, highly mineralized water can be used for irrigation in sandy soils. Boyko (1967) presents controlled experiments to show that many plants can be irrigated with saline water if they are grown in sandy soils.

Water with a high SAR will cause the soil structure to break down by deflocculating the colloidal soil particles. Consequently, the soil can become plastic, thereby causing poor aeration and low water availability.

Excessive RSC will cause the water to be alkaline. The soil may become grayish-black, and the land areas so affected are called "black alkali". According to Wilcox (1955), water containing more than 2.5 me/l (milliequivalents per liter) RSC is not suitable for irrigation. Water containing 1.25 to 2.5 me/l is marginal, and water containing less than 1.25 me/l probably is safe.

Boron is essential to plant nutrition, but an excessive concentration will make water unsuitable for irrigation. Wilcox (1955) indicates that a boron concentration of as much as 1.0 mg/l is permissible for irrigating sensitive crops. Figure 7 is a diagram for the classification of irrigation waters.

Dissolved solids and sulfate content are important in evaluating water for livestock. A high proportion of sulfate in moderately saline water would make it undesirable for livestock. Hem (1959) gives the following dissolved solids tolerances for livestock from a 1950 Department of Agriculture study in Western Australia.

Table 5.—Source and Significance of Dissolved-Mineral Constituents and Properties of Water

CONSTITUENT OR PROPERTY	SOURCE OR CAUSE	SIGNIFICANCE
Silica (SiO_2)	Dissolved from practically all rocks and soils, commonly less than 30 mg/l. High concentrations, as much as 100 mg/l, generally occur in highly alkaline waters.	Forms hard scale in pipes and boilers. Carried over in steam of high pressure boilers to form deposits on blades of turbines. Inhibits deterioration of zeolite-type water softeners.
Iron (Fe)	Dissolved from practically all rocks and soils. May also be derived from iron pipes, pumps, and other equipment. More than 1 or 2 mg/l of iron in surface waters generally indicates acid wastes from mine drainage or other sources.	On exposure to air, iron in ground water oxidizes to reddish-brown precipitate. More than about 0.3 mg/l stains laundry and utensils reddish-brown. Objectionable for food processing, textile processing, beverages, ice manufacture, brewing, and other processes. U.S. Public Health Service (1962) drinking-water standards state that iron should not exceed 0.3 mg/l. Larger quantities cause unpleasant taste and favor growth of iron bacteria.
Calcium (Ca) and magnesium (Mg)	Dissolved from practically all soils and rocks, but especially from limestone, dolomite, and gypsum. Calcium and magnesium are found in large quantities in some brines. Magnesium is present in large quantities in sea water.	Cause most of the hardness and scale-forming properties of water; soap consuming (see hardness). Waters low in calcium and magnesium desired in electroplating, tanning, dyeing, and in textile manufacturing.
Sodium (Na) and potassium (K)	Dissolved from practically all rocks and soils. Found also in ancient brines, sea water, industrial brines, and sewage.	Large amounts, in combination with chloride, give a salty taste. Moderate quantities have little effect on the usefulness of water for most purposes. Sodium salts may cause foaming in steam boilers and a high sodium content may limit the use of water for irrigation.
Bicarbonate (HCO_3) and carbonate (CO_3)	Action of carbon dioxide in water on carbonate rocks such as limestone and dolomite.	Bicarbonate and carbonate produce alkalinity. Bicarbonates of calcium and magnesium decompose in steam boilers and hot water facilities to form scale and release corrosive carbon dioxide gas. In combination with calcium and magnesium, cause carbonate hardness.
Sulfate (SO_4)	Dissolved from rocks and soils containing gypsum, iron sulfides, and other sulfur compounds. Commonly present in mine waters and in some industrial wastes.	Sulfate in water containing calcium forms hard scale in steam boilers. In large amounts, sulfate in combination with other ions gives bitter taste to water. Some calcium sulfate is considered beneficial in the brewing process. U.S. Public Health Service (1962) drinking-water standards recommend that the sulfate content should not exceed 250 mg/l.
Chloride (Cl)	Dissolved from rocks and soils. Present in sewage and found in large amounts in ancient brines, sea water, and industrial brines.	In large amounts in combination with sodium, gives salty taste to drinking water. In large quantities, increases the corrosiveness of water. U.S. Public Health Service (1962) drinking-water standards recommend that the chloride content should not exceed 250 mg/l.
Fluoride (F)	Dissolved in small to minute quantities from most rocks and soils. Added to many waters by fluoridation of municipal supplies.	Fluoride in drinking water reduces the incidence of tooth decay when the water is consumed during the period of enamel calcification. However, it may cause mottling of the teeth, depending on the concentration of fluoride, the age of the child, amount of drinking water consumed, and susceptbility of the individual. (Maier, 1950)
Nitrate (NO_3)	Decaying organic matter, sewage, fertilizers, and nitrates in soil.	Concentration much greater than the local average may suggest pollution. U.S. Public Health Service (1962) drinking-water standards suggest a limit of 45 mg/l. Waters of high nitrate content have been reported to be the cause of methemoglobinemia (an often fatal disease in infants) and therefore should not be used in infant feeding. Nitrate has been shown to be helpful in reducing inter-crystalline cracking of boiler steel. It encourages growth of algae and other organisms which produce undesirable tastes and odors.
Dissolved solids	Chiefly mineral constituents dissolved from rocks and soils. Includes some water of crystallization.	U.S. Public Health Service (1962) drinking-water standards recommend that waters containing more than 500 mg/l dissolved solids not be used if other less mineralized supplies are available. Waters containing more than 1000 mg/l dissolved solids are unsuitable for many purposes.
Hardness as $CaCO_3$	In most waters nearly all the hardness is due to calcium and magnesium. All the metallic cations other than the alkali metals also cause hardness.	Consumes soap before a lather will form. Deposits soap curd on bathtubs. Hard water forms scale in boilers, water heaters, and pipes. Hardness equivalent to the bicarbonate and carbonate is called carbonate hardness. Any hardness in excess of this is called non-carbonate hardness. Waters of hardness as much as 60 ppm are considered soft; 61 to 120 mg/l, moderately hard; 121 to 180 mg/l, hard; more than 180 mg/l, very hard.
Specific conductance (micromhos at 25°C)	Mineral content of the water.	Indicates degree of mineralization. Specific conductance is a measure of the capacity of the water to conduct an electric current. Varies with concentration and degree of ionization of the constituents.
Hydrogen ion concentration (pH)	Acids, acid-generating salts, and free carbon dioxide lower the pH. Carbonates, bicarbonates, hydroxides, and phosphates, silicates, and borates raise the pH.	A pH of 7.0 indicates neutrality of a solution. Values higher than 7.0 denote increasing alkalinity; values lower than 7.0 indicate increasing acidity. pH is a measure of the activity of the hydrogen ions. Corrosiveness of water generally increases with decreasing pH. However, excessively alkaline waters may also attack metals.

Table 6.—Relative Tolerance of Various Crops to Slightly Saline Water[1/]

SENSITIVE	MODERATELY TOLERANT	TOLERANT	HIGHLY TOLERANT
	FIELD CROPS		
Cowpea	Sorghum (grain) Corn (field) Soybean	Cotton Rye (grain) Wheat (grain) Oats (grain)	Barley (grain)
	FORAGE CROPS		
		Wheatgrasses Sudangrass Alfalfa Rye (pasture) Wheat (pasture) Oats (pasture) Yellow sweetclover Blue grama Reed canary grass	Alkali secton Bermuda grass Barley (pasture) Blue panicgrass Saltgrass Rescue grass Canada wildrye Western whea wheatgrass Tall fescue
	VEGETABLE CROPS		
Lima bean Green bean Celery	Tomato Broccoli Cabbage Pepper Lettuce Sweet corn Onion Pea Watermelon Cantaloupe Squash	Gardenbeet Spinach Okra	Asparagus
	FRUIT CROPS		
Pear Apple Plum Apricot Peach Strawberry	Grape		

1/ Based on Bernstein (1958, p. 5), Lyerly and Longenecker (1962, p. 6), and data from the U.S. Soil Conservation Service.

ANIMAL	TOLERANCE (MG/L)	ANIMAL	TOLERANCE (MG/L)
Poultry	2,860	Cattle (dairy)	7,150
Pigs	4,290	Cattle (beef)	10,000
Horses	6,435	Adult Sheep	12,100

Quality of Water From the Aquifers

Whitehorse Group

The dissolved-solids content of water from the Whitehorse Group ranged from 1,430 mg/l to 3,220 mg/l; most of the samples contained more than 2,500 mg/l. The sulfate content ranged from 525 mg/l to 3,000 mg/l, and exceeded 1,500 mg/l in most of the samples. Field analyses of 32 water samples ranged from 2,200 to 4,000 micromhos specific conductance.

The high concentration of dissolved solids, sulfate, and hardness in water from the Whitehorse Group has restricted its use to livestock supply. Water from this aquifer has been used successfully to irrigate crops in adjoining counties. However, the availability of fresh water has made it unnecessary to use the slightly saline water in the Whitehorse for irrigation in Donley County.

Ogallala Formation

Water in the Ogallala Formation generally is fresh, very hard, high in silica content, and contains sulfate slightly in excess of chloride (Table 9 and Figure 8). Most of the water is suitable for all purposes with only minor treatment.

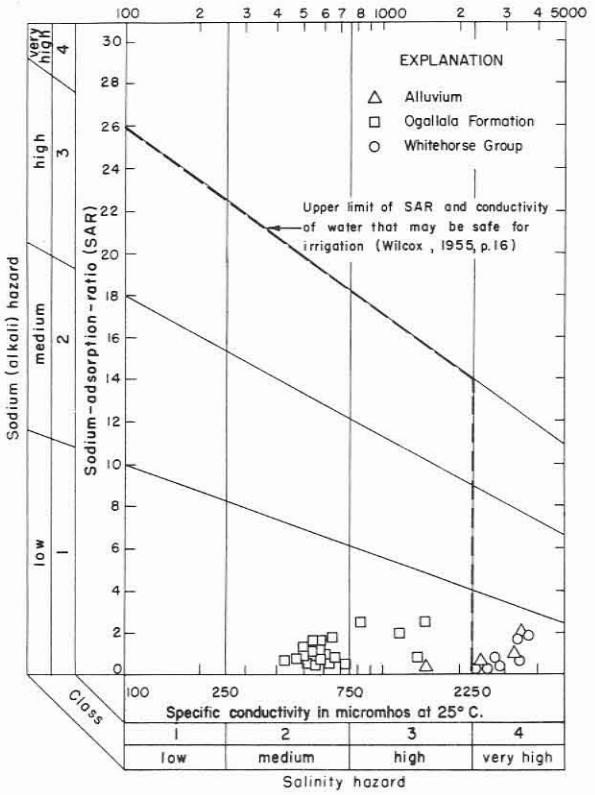

Figure 7.—Classification of Irrigation Waters

In samples collected during the current and previous investigations the dissolved solids ranged from 169 to 1,120 mg/l. Nearly 90 percent contained less than 500 mg/l which is the recommended limit for public supply. A few of the samples had concentrations of sulfate, chloride, flouride, and nitrate that exceeded the Public Health Service standards.

Water from the Ogallala Formation has been used successfully for irrigation for many years. The chemical-quality data show that the SAR or the sodium hazard is low, generally less than 4, and in most of the samples, the salinity hazard was medium. Neither boron nor RSC appears to be a problem in the Ogallala in Donley County.

Quaternary Alluvium

The quality of water in the alluvium depends upon whether the water is derived from direct infiltration or from other aquifers. Water that moves into the alluvium from the other aquifers generally has the same characteristics as the source; water from direct infiltration is usually fresh.

If water from the alluvium is used for domestic supply, particular attention should be given to the nitrate and bacterial content, as concentrations greater then the recommended limits may indicate pollution.

SUMMARY AND RECOMMENDATIONS

In Donley County, all of the water used for irrigation and most of the water used for livestock and domestic supply is pumped from wells, principally in the Ogallala Formation, but also in the Whitehorse Group and Quaternary alluvium. The Ogallala is the principal source of fresh ground water in the county. It is evident that the 1967 rate of pumping exceeds the natural rate of recharge to the aquifer. As a result, the water is essentially being mined.

The extent to which the water available in storage can meet the expected increased demands for water, principally for irrigation, was not determined. It will require more detailed studies related to: The hydrologic properties of the aquifers; natural recharge and discharge; the effect of pumping on the water table; and the changes in chemical quality due to pumping or the infiltration of irrigation water applied in excess of the crop needs.

The periodic collection of basic data, such as water levels, an inventory of pumpage, and the collection of water samples for quality studies, are necessary items for a detailed evaluation of the ground-water resources of the area. The available data were inadequate to accurately determine the thickness of the water-bearing beds in the Ogallala Formation. Where these data are lacking, a seismic program, which will determine the depth to the base of the aquifer, will be necessary. In conjuction with the seismic program, more detailed geologic mapping is needed.

The aquifers in Donley County are a part of an extensive hydrologic system. Further studies should include a detailed description of the flow system and the geologic framework. Such studies should be regional and should extend into adjoining areas.

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Table 7.--Records of Wells, Test Holes, and Springs

All wells are drilled and cased with iron or steel 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: E, electric; G, gasoline, natural gas, butane or diesel engine; J, jet; N, none; P, piston; S, submergible; T, turbine; W, windmill. Number indicates horsepower.
Use of water : E, domestic; Ind, industrial; I, irrigation; P, public supply; S, livestock; U, unused.
Water-bearing unit : Pw, Whitehorse Group; Qal, Alluvium; To, Ogallala Formation.

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-05-49-501	Andrew Brown	--	154	--	To	3,208	317.6 311.7 311.0	Mar. 11, 1959 Jan. 29, 1960 Jan. 5, 1961	T,G	I	Reported discharge 900 gpm.
502	T. E. Jones	--	--	--	To	3,206	371.5	Oct. 2, 1968	T	I	Reported discharge 700 gpm.
* 503	J. W. Helm Estate	1929	360	5	To	3,204	320.2	May 7, 1942	P,W	S	
504	Ralph Britten well 2	1967	697	16	To	3,206	319.5	Oct. 27, 1954	T,G	I	Shutter screen from 377 to 697 ft. Reported discharge 800 gpm.
505	Ralph Britten well 1	1962	645	16	To	3,206	--	--	T,G, 250	I	Shutter screen from 389 to 645 ft. Reported discharge 600 gpm.
601	Hermesmeyer Brothers	1965	113	7	To	3,199	--	--	P,W	S	Slotted from 105 to 113 ft.
602	Bill Brawley	--	420	--	To	3,196	--	--	T,G	I	
603	T. E. Jones	--	--	--	To	3,188	376.5	Oct. 2, 1968	T	I	Reported discharge 700 gpm.
604	Billy Jones	--	--	--	To	3,184	--	--	T	I	
* 701	Clay Immon	old	220	5	To	3,177	202.4 202.0	May 7, 1942 June 22, 1949	P,W	S	
* 702	Jack Roach Ranch	1938	227	5	To	3,202	--	--	P,W	S	
703	T. L. Roach & Son	1965	290	7	To	3,195	205	Oct. 1965	P,W	D	Pumped 35 gpm.
704	T. G. Fields well 1	1966	608	16	To	3,218	290	Feb. 1966	T,G, 165	I	Shutter screen from 384 to 608 ft. Reportedly pumped 900 gpm with 110 ft drawdown in 24 hours Feb. 1966. Pump set at 450 ft.
705	T. G. Fields well 2	1967	615	16	To	3,223	--	--	T,G, 155	I	Shutter screen from 391 to 615 ft.
706	Craig Lamb	1966	643	16	To	3,215	--	--	T,G	I	Shutter screen from 403 to 643 ft. Pump set at 450 ft.
707	Andrew Brown	--	--	--	To	3,215	339.8	Oct. 3, 1968	T,G, 150	I	Reported discharge 900 gpm.
801	Lloyd Littlefield	1956	644	16	To	3,206	303.6	Jan. 10, 1958	T,G, 225	I	Shutter screen from 420 to 644 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
	JA-05-49-802	Arthur Brown	--	--	--	To	3,212	--	--	T	I	
	803	Andrew Brown	--	--	--	To	3,211	--	--	T	I	
	804	--	--	258	8	To	3,167	228.8	Oct. 30, 1954	P,W	S	
	901	J. R. Godby	1964	154	7	To	2,998	65	Oct. 1964	P,W	S	1/
	902	Johnson Brothers	1966	148	7	To	3,171	107	Nov. 1966	P,W	D	Slotted from 138 to 148 ft. Gravel packed. Reportedly pumped 25 gpm with 10 ft drawdown in 8 hours. Pump set at 120 ft.
*	903	Hermesmeyer Brothers	1946	220	--	To	3,172	190.0	Sept. 7, 1949	N	U	Destroyed well.
	904	Billy Jones	--	--	--	To	3,187	--	--	T	I	
*	50-401	J. T. Trew Ranch	--	--	6	To	3,083	--	--	P,W	S	
*	501	Humble Pipeline Co.	1926	200	6	To	3,166	173.2 176.5	May 7, 1942 June 22, 1949	--	U	Destroyed well.
*	502	J. T. Trew Ranch	--	155	8	To	3,126	140.5	May 18, 1968	P,W	S	Measured field conductance of water at 400 micromhos, May 18, 1968.
*	901	do.	old	178	5	To	2,992	169.2 170.6	Sept. 21, 1949 May 18, 1968	P,W	S	Old well. Measured field conductance of water at 450 micromhos, May 18, 1968.
	902	Jess W. Finley well 1	1967	140	12	To	2,911	95 80	Aug. 1967 Apr. 1968	T,40	I	Slotted from 90 to 140 ft. Cemented from 0 to 5 ft. Reported discharge 500 gpm, Apr. 3, 1968. Pump set at 130 ft.
	903	Jesse R. Grogan well 2	1963	260	16	To	2,893	--	--	T,G, 70	I	
	904	Jesse R. Grogan well 1	1963	148	16	To	2,878	--	--	T,G, 30	I	
*	905	J. T. Trew Ranch	--	120	6	To	3,047	--	--	P,W	S	Measured field conductance of water at 400 micromhos, May 18, 1968.
	906	Jess W. Finley well 2	1967	144	13	To	2,902	96	Oct. 1967	T	I	Slotted from 85 to 140 ft. Cemented from 0 to 5 ft. Gravel packed. Reported discharge 162 gpm with 24 ft drawdown in 36 hours. Pump set at 130 ft.
	51-701	F. R. Crisp	1965	63	7	To	2,925	--	--	P,W	S	Slotted from 53 to 63 ft.
	702	Thomas D'Spain	--	Spring	--	To	2,770	+	Mar. 6, 1968	Flows	S	Measured discharge 31 gpm, field conductance of water at 650 micromhos, Mar. 6, 1968.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-05-51-703	Thomas D'Spain	--	Spring	--	To	2,775	+	Mar. 6, 1968	Flows	S	Estimated flow less than 2 gpm, Mar. 6, 1968.
704	do.	--	Spring	--	To	2,680	+	do.	Flows	S	Do.
705	do.	--	Spring	--	To	2,680	+	do.	Flows	S	Estimated flow less than 2 gpm, Mar. 6, 1968. Measured field conductance of water 600 micromhos, Mar. 6, 1968.
706	do.	--	Spring	--	To	2,690	+	do.	Flows	S	Measured discharge 78 gpm, field conductance 600 micromhos, Mar. 6, 1968.
707	do.	--	Spring	--	To	2,689	+	do.	Flows	S	Measured discharge 78 gpm, field conductance 490 micromhos, Mar. 6, 1968.
* 708	do.	--	Spring	--	To	2,689	+	do.	Flows	S	Do.
709	Frank Hommel	--	140	--	Pw	2,671	2.0	do.	--	U	Seismic test hole. Field conductance 2,900 micromhos, Mar. 6, 1968. Open hole.
710	W. O. Hommel	1948	90	12	To	2,835	25	1948	T,G	I	Perforations from 30 to 90 ft. Pump set at 80 ft. Reported discharge 300 gpm.
* 711	do.	--	--	--	To	2,835	--	--	N	U	Unused windmill well.
* 712	Will Yake	old	--	5	To	2,855	129.2 129.1	May 6, 1942 June 22, 1949	P,W	U	Unused well.
* 713	Thomas D'Spain	old	127	--	Pw	2,882	124.8	Sept. 21, 1949	N	U	Destroyed windmill well.
714	Mrs. S. R. Armstrong	--	--	--	To	2,832	--	--	T	I	
501	Don E. Crockett	1965	--	--	To	2,859	131.0	Oct. 2, 1968	T	I	Reported discharge 600 gpm, Jan. 1968.
* 701	Joe H. McMurtry	1931	--	6	Qal	2,715	36.3	May 6, 1942	N	U	Destroyed windmill well.
* 57-201	Castlebury Bros.	--	--	--	To	2,967	108.5	July 29, 1949	P,W	S	
* 301	J. J. Helm	--	165	--	To	2,980	131.0	Aug. 23, 1949	P,W	S	
401	Jack Roach Ranch	1938	85	6	To	2,931	64.7 67.8	June 11, 1941 June 22, 1949	P,W	S	
* 402	do.	1938	115	5	To	2,937	95.8	Nov. 30, 1949	P,W	S	
* 501	Fontayne Elmore	old	74	4	To	2,875	61.4	May 27, 1941	N	U	Destroyed windmill well.
* 502	Jack C. Thomas	1949	136	7	To	2,929	91.8	Sept. 21, 1949	P,W	S	Reported 1,000 gpm, irrigation well capacity.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-05-57-503	L. L. Wood	--	81	4	To	2,855	58.3 60.2	May 27, 1941 June 22, 1949	N	U	Destroyed windmill well.
* 504	Jim Peggram	1930	132	4	To	2,842	81.4 67.3	May 27, 1941 June 22, 1949	P,W	S	Reported water level 65 ft when drilled.
505	Bill Littlefield	1940	88	3	To	2,790	28.1 22.9	Mar. 4, 1941 June 22, 1949	N	U	Seismic test hole.
506	Clarendon Country Club	1947	247	--	To	2,785	22.9	Sept. 21, 1949	N	U	Destroyed well.
507	Fontayne Elmore	--	Spring	--	To	2,777	+	Apr. 9, 1968	Flows	S	Measured discharge 14 gpm on Mar. 11, 1941.
508	--	1941	25	--	To	2,770	8.8	Mar. 13, 1941	N	U	WPA test hole 17. Open hole. 4/
509	--	1941	28	--	To	2,770	20.7	Apr. 1, 1941	N	U	WPA test hole 18. Open hole. 4/
510	--	1941	18	--	To	2,798	7.5	Mar. 14, 1941	N	U	WPA test hole 20. Open hole. 4/
601	Mrs. W. E. Bray	1959	148	9	To	2,887	--	--	N	U	Uncompleted irrigation well because of small quantity of water.
602	William M. Porter	1964	112	7	To	2,803	45	Sept. 1964	S,E 1	S	Gravel packed. Discharge 15 gpm. Pump set at 70 ft. 1/
603	A. B. Pool	1956	188	16	To	2,776	39.8	Mar. 16, 1968	P,E	I	Perforations from 112 to 188 ft. Reported discharge 395 gpm.
* 604	do.	1956	152	12	To	2,766	--	--	T,G	I	Perforations from 40 to 51 and 123 to 152 ft. Field conductance 650 micromhos, Apr. 10, 1968.
* 605	L. L. Johnson	old	--	5	To	2,866	95.1 95.0 89.0	May 7, 1942 June 22, 1949 May 18, 1968	N	U	
* 606	--	1926	130	5	To	2,840	--	--	N	U	Destroyed windmill well.
607	Goldstein Community	--	79	5	To	2,817	59.9 55.4	Nov. 30, 1949 May 18, 1968	N	U	
608	Mrs. W. E. Bray	1926	80	--	To	2,804	58.0	Aug. 23, 1949	N	U	Destroyed windmill well.
609	--	1941	33	--	To	2,781	24.8	Apr. 1, 1941	--	U	WPA test hole 27. Open hole. 4/
610	--	1941	24	--	To	2,750	14.0	do.	--	U	WPA test hole 28. Open hole. 4/

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-05-57-611	--	1941	44	--	To	2,772	43.5	Mar. 4, 1941	--	U	WPA test hole 30. Open hole. 4/
	612	Coleman-Huffman well 1	1961	4,793	--	--	2,842	--	--	--	U	Oil test. 2/
	701	C. E. Jackson	1965	170	16	To	2,856	81.6	Oct. 30, 1967	T	I	
	801	Sherwood Shores IX	--	Spring	--	To	2,690	+	Mar. 16, 1968	Flows	U	Estimated flow 200 gpm, March 16, 1968.
*	802	--	1920	82	5	To	2,709	62.7 62.2	May 1, 1942 July 11, 1949	P,W	S	
*	901	Sherwood Shores IX	1967	130	7	To	2,773	88.2	Oct. 5, 1967	S,E, 1	P	Perforations from 101 to 130 ft. Discharge 22 gpm, Oct. 5, 1967.
	902	--	--	52	8	To	2,760	48.7	Oct. 4, 1967	P,E	U	
	903	--	--	53	8	To	2,705	50.4	do.	N	U	Abandoned windmill well.
	904	Sherwood Shores IX	--	Spring	--	To	2,690	+	Mar. 16, 1968	Flows	U	Estimated discharge 100 gpm, March 16, 1968.
*	905	Harry Blair	1947	221	--	To	2,699	58.6	Sept. 7, 1949	N	U	Destroyed windmill well.
*	906	Forrest E. Sawyer	--	Spring	--	To	2,608	+	Mar. 8, 1968	Flows	S	Discharge 18 gpm on Mar. 3, 1941.
	907	--	1941	35	--	Qal	2,595	22.4	Feb. 27, 1941	N	U	WPA test hole 62. Open hole. 4/
	908	--	1941	21	--	Qal	2,588	20.5	do.	N	U	WPA test hole 63. Open hole. 4/
*	909	Sherwood Shores IX	1967	100	--	To	--	--	--	S,E	P	
*	58-301	Thomas D'Spain	1952	50	10	To	2,780	26.0	Jan. 4, 1968	T,G, 20	S	Perforations from 40 to 50 ft. Formerly used for irrigation. Reportedly pumped 100 gpm.
	302	do.	1952	80	10	To	2,792	38.0	do.	N	U	Originally 130 ft deep, filled up to 80 feet with sand; well abandoned.
*	501	Joe H. McMurtry	--	25	--	To	2,641	21.7	Sept. 7, 1949	P,W	S	
	601	do.	1941	90	8	Qal	2,598	15.2	Sept. 28, 1967	P,W	S	Discharge 1 gpm, Sept. 28, 1967.
	602	do.	1938	120	7	To	2,658	85	Sept. 1967	P,W	S	Perforations from 100 to 120 ft.
	603	B. Van James	1957	100	8	To	2,575	15	do.	P,W	S	Perforations from 90 to 100 ft.
	801	Pete Bromley	1966	145	7	To	2,519	80	July 1966	P,W	S	Reportedly pumped 15 gpm with 20 ft drawdown in 3 hours.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-05-59-101	Thomas D'Spain	1952	50	10	To	2,780	36.2	Jan. 4, 1968	S,E, 3	D	Perforations from 30 to 50 ft. Reported discharge 85 gpm. Measured field conductance of water at 1,500 micromhos Jan. 4, 1968.
102	do.	1952	22	16	To	2,743	+	Jan. 4, 1967	Flows	S	Field conductance 1,000 micromhos, Mar. 6, 1968.
103	do.	--	Spring	--	To	2,770	+	Mar. 6, 1968	Flows	S	Estimated flow 5 gpm.
104	do.	--	Spring	--	To	2,775	+	do.	Flows	S	Do.
105	do.	--	Spring	--	To	2,701	+	do.	Flows	S	Do.
106	do.	--	Spring	--	To	2,719	+	do.	Flows	S	Do.
107	do.	--	Spring	--	To	2,715	+	do.	Flows	S	Do.
* 108	S. S. Carpenter	1941	120	6	To	2,761	111.4 110.3	May 6, 1942 June 22, 1949	P,W	S	
201	R. O. Ranch	1920	15	6	Qal	2,562	9.2	Sept. 29, 1967	P,W	S	
* 301	--	1912	--	55	To	2,639	52.5 55.0	May 6, 1942 June 23, 1949	N	U	Destroyed windmill well.
* 401	Joe H. McMurtry	--	120	66	To	2,692	100	Sept. 1967	P,W	D	Discharge 2 gpm, Sept. 28, 1967.
* 402	B. Van James	1951	140	88	To	2,715	116.9	Sept. 28, 1967	P,W	D	Perforations from 125 to 140 ft.
* 403	R. O. Ranch	1967	93	77	To	2,695	71.6	Sept. 29, 1967	S,E, 3/4	D	Perforations from 86 to 93 ft. Reported discharge 25 gpm with drawdown of 10 ft in 72 hours.
404	do.	1941	175	44	To	2,772	165	Sept. 1967	P,W	S	Measured field conductance of water at 850 micromhos Jan. 4, 1968.
405	J. B. Leonard	1956	175	88	To	2,793	168.4	Jan. 4, 1968	S,E, 1	D	Perforations from 167 to 175 ft.
406	Gleenwood School	--	--	6	To	2,713	94.6 94.0	May 6, 1942 June 22, 1949	N	U	Destroyed windmill well.
* 407	--	1918	--	4	To	2,672	114.3	May 6, 1942	N	U	Do.
501	R. O. Ranch	1940	50	6	Pw	2,695	32.0	Sept. 29, 1967	P,W	S	Gypsum scale on pipes.
601	do.	1958	60	7	Qal	2,451	38.2	do.	P,W	S	
701	Joe H. McMurtry	1941	120	8	To	2,651	110	Sept. 1967	P,W	S	Discharge 2 gpm, Sept. 28, 1967.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-05-59-702	Pan American Oil Co.	1939	190	--	--	2,445	--	--	--	U	Seismic test. Open hole. 1/
801	R. O. Ranch	1940	Spring	--	To	2,485	--	+	Flows	S	Estimated flow 1/4 gpm, Sept. 29, 1967. Enclosed with concrete.
901	do.	1932	10	7	Pw	2,388	7.1	do.	P,W	S	
902	do.	1939	40	8	Qal	2,325	20	Sept. 1967	P,W	S	Originally 70 feet deep.
60-101	G. F. Miller	1965	108	16	To	2,502	20 27.7	Aug. 1966 Oct. 2, 1968	T,G, 30	I	Slots from 38 to 108 ft. Gravel packed. Reported discharge 600 gpm with 60 ft drawdown, Aug. 1, 1966.
* 102	--	1902	--	6	To	2,526	41.9 45.3	May 6, 1942 June 23, 1949	N	U	Destroyed windmill well.
* 401	--	--	7	--	Qal	2,404	6.0	Sept. 21, 1949	P,W	S	
402	--	1948	130	--	Qal	2,365	61.6	Dec. 8, 1949	P,W	S	
403	Sitter Ranch	--	--	--	Qal	2,372	--	--	T,G	I	Twenty sand points. Reported discharge 240 gpm, Jan. 30, 1965.
* 701	--	1938	45	4	Qal	2,330	41.1	May 6, 1942	N	U	Destroyed windmill well.
* 801	--	old	--	--	Pw	2,419	80.6 89.3	May 6, 1942 June 23, 1949	P,W	S	Concrete curb.
* 06-56-501	Cecil L. Culver	old	300	6	To	3,260	290.8 283.0	Sept. 7, 1949 Oct. 29, 1954	P,W	S	Old well.
502	Eldred James well 1	1957	520	16	To	3,239	--	--	N	U	Well sanded and destroyed. Shutter screen from 296 to 520 ft. Gravel packed.
503	Eldred James well 2	1957	505	16	To	3,237	--	--	T	I	Shutter screen from 337 to 505 ft. Gravel packed. Reported discharge 600 gpm.
504	Eldred James well 3	1956	490	16	To	3,219	--	--	T,100	I	Shutter screen from 362 to 490 ft. Reported discharge 600 gpm.
505	Hermesmeyer Brothers	1968	--	--	To	3,250	308.1	Oct. 3, 1968	T	I	
506	do.	1968	--	--	To	3,250	--	--	T	I	
601	B. Van James	--	--	6	To	3,233	269.3	Oct. 30, 1954	P,W	S	
602	Walter Fraizer	1965	619	16	To	3,233	--	--	T	I	Reported discharge 800 gpm.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-06-56-801	Mrs. L. Angel	1900	300	4	To	3,232	276.6	June 4, 1941	P,W	S	
802	Melvin Asberry well 2	1967	480	16	To	3,258	--	--	T,G	I	Perforations from 360 to 480 ft. Reported discharge 800 gpm.
803	Melvin Asberry well 1	1963	620	16	To	3,252	--	--	T,G	I	Perforations from 470 to 620 ft. Reported discharge 800 gpm. 1/
804	Roy A. Clark well 1	1956	685	16	To	3,245	--	--	N	U	Well sanded and destroyed. Shutter screen from 421 to 685 ft. Gravel packed.
805	Roy A. Clark well 2	1957	705	16	To	3,243	--	--	T,G, 150	I	Shutter screen from 353 to 705 ft. Gravel packed. Reported discharge 800 gpm.
* 901	Richard E. Brown	1910	300	6	To	3,231	291.2	Sept. 7, 1949	P,W	S	
902	do.	--	--	--	To	3,226	306.0	Oct. 3, 1968	T	I	Reported discharge 800 gpm, Jan. 30, 1968.
64-501	Hall S. Hardin	1953	254	16	To	2,980	109.31 110.10	Feb. 6, 1958 Aug. 16, 1957	T,G	I	Pump set at 210 ft. Reported discharge 500 gpm, Aug. 16, 1967. 3/
502	do.	1964	256	16	To	2,985	118.9	Oct. 27, 1967	T,E	I	
503	Warren Hardin	1967	287	16	To	2,981	158.2	do.	T,E, 50	I	Shutter screen from 163 to 287 ft. Green Belt Electric Coop. reported discharge 600 gpm with 60 ft drawdown in 24 hrs, May 11, 1967.
504	Hall S. Hardin	1956	237	16	To	2,960	100 107.8	Dec. 1956 Nov. 1, 1967	T,G, 75	I	Shutter screen from 141 to 237 ft. Reported discharge 500 gpm, Dec. 13, 1956.
505	Warren Hardin	1957	326	16	To	2,970	114.6	Nov. 1, 1967	T,G, 75	I	Shutter screen from 110 to 326 ft. 1/
* 506	S. J. Ranch	--	85	--	To	2,910	72.6	Sept. 28, 1949	N	U	Destroyed windmill well.
507	S. G. Evans	1910	200	5	To	2,955	101.7 97.33	May 5, 1942 June 22, 1949	N	U	Do.
801	Hall S. Hardin	1953	218	16	To	2,953	128.2	Oct. 27, 1967	T,G	I	
802	H. Slayton Mahaffey	1940	130	7	To	2,912	76.5	Nov. 1, 1967	S,E, 1/2	D	
803	do.	1955	184	16	To	2,945	95.6	do.	P,W	S	Reportedly used as 70 gpm irrigation well with turbine, and converted to windmill well for livestock because of poor water quality.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-06-64-804	H. A. Graham	1966	219	16	To	2,942	94.8	Nov. 1, 1967	T,G, 90	I	Shutter screen from 155 to 219 ft.
805	Doyce Graham	1965	202	16	To	2,972	123.6	do.	T,G, 75	I	Shutter screen from 106 to 202 ft. Reported discharge 400 gpm, Nov. 1, 1967.
806	do.	1966	160	7	To	2,970	--	--	P,W	D	Perforations from 146 to 160 ft.
* 807	Memphis Cotton Co.	--	105	5	To	2,916	90	--	N	U	Destroyed.
808	Helen Meadows	old	97	5	To	2,915	72.6 68.5	May 5, 1942 July 11, 1949	--	U	Destroyed windmill well.
* 809	H. A. Graham	1912	--	5	To	2,959	110.8	May 5, 1942	--	U	Do.
* 810	Grady Henson	old	--	5	To	2,972	113.2 109.5	May 5, 1942 June 23, 1949	--	U	Do.
901	Warren Hardin	1964	133	7	To	2,920	85	July 1964	J,E, 1		Pump set 106 ft. Reported yield 25 gpm, July 7, 1964.
* 902	H. Slayton Mahaffey	1956	174	16	To	2,910	97.3	Nov. 1, 1967	T,G, 30	I	Shutter screen from 78 to 174 ft. Field conductance 600 micromhos, April 10, 1968. Discharge 663 gpm, April 11, 1968.
903	Warren Hardin	1957	135	16	To	2,914	92.7	do.	T,E, 20	I	Shutter screen from 63 to 135 ft.
* 904	--	old	--	--	To	2,882	62.7	May 5, 1942	N	U	Destroyed windmill well. Concrete curb.
* 11-08-201	Green Brothers	1948	207	16	To	2,930	101.3 105.6	June 2, 1949 Aug. 11, 1967	T,G	I	Perforated. Pump set at 165 ft. Reported pumped 1,300 gpm, with 25 ft. drawdown in 72 hours, 1948.3/
202	J. A. Ranch	1964	192	16	To	2,932	100.0	Nov. 28, 1967	T,G	I	Perforations from 96 to 192 ft.
* 301	C. B. Morris	1948	150	16	To	2,882	53.6 60.5	June 24, 1949 Aug. 11, 1967	T,G	I	Perforations from 75 to 150 ft. Pump set at 136 ft. Discharge 630 gpm, Aug. 25, 1949.
302	do.	1935	140	--	To	2,890	66.8 61.9	May 4, 1942 May 7, 1949	N	U	Destroyed well.
303	Horrace A. Green	1956	178	16	To	2,914	50 73.2	Nov. 1956 Nov. 1, 1967	T,G, 75	I	Shutter screen from 82 to 178 ft. Discharge 396 gpm, July 21, 1959.
304	John White	1958	132	16	To	2,880	80 78	1958 Nov. 16, 1967	T,G, 75	I	Shutter screen from 68 to 132 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-11-08-305	J. B. Lane	1965	202	16	To	2,910	81.6	Nov. 27, 1967	T,G, 75	I	Shutter screen from 106 to 202 ft. 1/
	306	W. D. Higgins	1965	147	7	To	2,899	70	Mar. 1965	J,E, 3/4	D	Reported discharge 25 gpm, Mar. 9, 1965.
	307	J. B. Lane	1953	137	7	To	2,897	58.4	Nov. 27, 1967	S,E, 3/4	D	Perforations from 102 to 137 ft.
*	308	Van S. Knox	1955	166	16	To	2,883	54.5 52.8	Feb. 15, 1955 Nov. 28, 1967	T,G, 50	I	Perforations from 55 to 166 ft. Reported discharge 550 gpm. 3/
	309	Horrace A. Green	1957	155	16	To	2,882	60.5	Nov. 1, 1967	T,G, 75	I	Discharge 364 gpm, Aug. 21, 1967.
*	310	--	--	62	5	To	2,987	57.0 53.1	May 5, 1942 July 21, 1949	N	U	Destroyed windmill well.
	311	--	old	--	5	To	2,870	63.4 58.4	May 5, 1942 July 21, 1949	J,E	D	
*	501	Mrs. Harry Long	old	69	--	To	2,774	58.9	Sept. 7, 1949	P,W	S	
	601	E. W. Anglin	1964	230	16	To	2,916	--	--	T,G 60	I	Shutter screen from 166 to 230 ft.
	602	do.	1963	155	16	To	2,899	--	--	N	U	Insufficient.
*	603	--	1925	144	--	To	2,920	105.1	Sept. 7, 1949	N	U	Destroyed windmill well.
*	901	J. A. Ranch-Shelton lease	--	34	8	Pw	2,479	+	Mar. 25, 1968	Flows	S	Discharge 3/4 gpm, Mar. 25, 1968.
*	16-201	J. A. Ranch	--	10	8	Qal	2,409	8.4	Mar. 26, 1968	P,W	S	Gypsum crystals on discharge pipe. Discharge 2 1/2 gpm, field conductance 2,800 micromhos, Mar. 26, 1968.
	202	J. A. Ranch-Farley lease	--	21	8	Pw	2,388	18.5	Mar. 27, 1968	P,W	S	Gypsum crystals on discharge pipe. Discharge 1/4 gpm, field conductance 2,400 micromhos, Mar. 27, 1968.
*	301	J. A. Ranch-Shelton lease	1947	98	8	Pw	2,435	+	Mar. 25, 1968	Flows	S	Gypsum crystals on discharge pipe. Discharge 1/2 gpm, field conductance 3,500 micromhos, Mar. 25, 1968. Originally 160 ft deep.
*	501	J. A. Ranch-Farley lease	--	140	8	Pw	2,555	136.9	Mar. 27, 1968	P,W	S	Gypsum crystal on discharge pipe. Discharge 2 1/2 gpm, field conductance 2,900 micromhos, Mar. 27, 1968.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-11-16-502	J. A. Ranch-Farley lease	--	189	8	Pw	2,545	171.7	Mar. 27, 1968	P,W	S	Discharge 3 1/2 gpm, field conductance 3,000 micromhos, Mar. 27, 1968.
	503	J. A. Ranch-Robinson lease	--	121	8	Pw	2,525	115.7	do.	P,W	S	Gypsum crystals on discharge pipe.
*	504	J. A. Ranch	--	156	--	Pw	2,542	128.6	Sept. 7, 1949	P,W	S	Reported gypy water.
	601	J. A. Ranch-Robinson lease	--	15	8	Pw	2,360	8.6	Mar. 25, 1968	P,W	S	Gypsum crystals on discharge pipe. Field conductance 3,000 micromhos, Mar. 25, 1968.
*	602	do.	--	10	8	Qal	2,349	3.2 7.1	Sept. 7, 1949 Mar. 25, 1968	P,W	S	Reported gypy water. Discharge 1/4 gpm, field conductance 2,300 micromhos, Mar. 25, 1968.
	603	J. A. Ranch	--	32	8	Qal	2,386	26.9	Mar. 25, 1968	P,W	S	Discharge 1 1/4 gpm, field conductance 1,800 micromhos, Mar. 25, 1968.
	701	J. A. Ranch-Robinson lease	--	88	8	Pw	2,481	--	--	P,W	S	Discharge 3 1/2 gpm, field conductance 3,200 micromhos, Mar. 25, 1968.
*	801	do.	--	--	8	Pw	2,471	--	--	P,W	S	Discharge 1 1/2 gpm, field conductance 2,400 micromhos, Mar. 25, 1968.
*	802	do.	1908	80	8	Pw	2,418	--	--	P,W	D	Gypsum crystal on discharge pipe. Discharge 2 1/2 gpm, field conductance 2,700 micromhos, Mar. 25, 1968. Water not used for drinking, used to wash equipment.
	803	do.	--	167	8	Pw	2,400	96.0	Mar. 25, 1968	P,W	S	Gypsum crystals on discharge pipe. Measured discharge 1 1/4 gpm, and field conductance of water at 3,000 micromhos, March 25, 1968.
	804	do.	--	18	6	Qal	2,450	5.7	do.	P,W	S	Gypsum crystals on discharge pipe. Measured discharge 4 1/2 gpm, and field conductance of water at 1,300 micromhos on March 25, 1968.
*	901	do.	--	31	6	Qal	2,350	13.9	do.	P,W	S	Measured discharge 2 1/2 gpm, and field conductance of water at 1,700 micromhos on March 25, 1968.
	12-01-101	Warren Hardin	1956	175	16	To	2,861	92.8 94.9	Feb. 6, 1958 Aug. 11, 1967	T,G	I	Reported discharge 560 gpm, Aug. 11, 1967. Perforations from 80 to 175 feet. 3/

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-01-102	C. E. Reynolds	1948	88	16	To	2,776	29.8 32.9	July 20, 1949 Aug. 11, 1967	T,G	U	Unused irrigation well. Reported discharge 325 gpm with 26 ft drawdown in 22 hours. 3/
103	Hall S. Hardin well 1	1948	141	16	To	2,860	72.4	July 20, 1949	T,G	I	Casing slotted from 90 to 141 ft. Pump set at 131 ft. Reported discharge 420 gpm, Aug. 7, 1949.
104	Mrs. Raymond Waldrop	1957	165	16	To	2,867	65.5 88.3	Nov. 3, 1960 Aug. 15, 1967	T,G, 50	I	Shutter screen from 45 to 165 ft. Pump set at 155 ft.
105	Hall S. Hardin	1953	138	16	To	2,858	71.1	Oct. 27, 1967	T,E	I	
106	do.	1958	178	16	To	2,847	--	--	T,G	I	
107	C. E. Reynolds	1954	118	16	To	2,790	44.5	Oct. 30, 1967	T,G, 50	I	
108	Jiggs Mann	1957	110	16	To	2,805	--	--	T,G	I	
109	S. Reynolds	1949	112	16	To	2,803	48.8	Oct. 30, 1967	T,G	I	
110	R. O. Tolbert	1966	80	13	To	2,825	40.8	do.	T	I	Slots from 30 to 80 ft.
111	C. E. Jackson	1955	133	16	To	2,868	82.5	do.	T,G, 55	I	
112	do.	--	138	4	To	2,855	72.8	do.	J,E, 1	D	Open hole from 118 to 138 ft.
113	R. O. Tolbert	1963	90	16	To	2,819	46.0	do.	T,G, 75	I	Perforations from 26 to 90 ft.
114	John H. Jones	1964	143	14	To	2,858	53.5	do.	T,G, 55	I	Perforations from 103 to 143 ft.
115	Bruce Johnson	1956	82	16	To	2,775	--	--	T,G, 30	I	Shutter screen from 18 to 82 ft.
116	Warren Hardin	1956	155	16	To	2,852	91.32	Nov. 1, 1967	T,G, 55	I	
117	Lloyd Risley	1963	92	16	To	2,812	45.0	Nov. 14, 1967	T,G, 30	I	Perforations from 28 to 92 ft. Discharge 420 gpm, March 21, 1967.
* 118	Guy Sibley	1957	144	16	To	2,852	48.8	do.	T,G, 30	I	Shutter screen from 48 to 144 ft. Conductance 525 micromhos, Apr. 11, 1968.
119	Donald Odom	1964	148	16	To	2,906	97.1	Nov. 16, 1967	T,G, 50	I	Shutter screen from 84 to 148 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-01-120	Donald Odom	1956	144	16	To	2,874	80.0	Nov. 16, 1967	T,G, 36	I	Shutter screen from 96 to 114 ft.
121	Earnest W. Barbee well 1	1964	175	16	To	2,855	--	--	T,G	I	Shutter screen from 79 to 175 ft.
122	Earnest W. Barbee well 2	1965	153	16	To	2,865	85	Mar. 1965	T,G	I	Reported discharge 250 gpm with drawdown of 35 ft in 36 hours, Mar. 3, 1965.
123	Lloyd Risley	1963	86	16	To	2,826	37.7	Nov. 14, 1967	T,G, 50	I	Perforations from 22 to 86 ft. Discharge 340 gpm, March 26, 1968.
124	Jiggs Mann	1963	90	16	To	2,803	60.0	1963	T,G	I	Reported discharge 250 gpm, 1963.
125	Odell Osburn	--	--	--	To	2,831	--	--	--	I	
126	do.	1964	125	16	To	2,833	--	--	T	I	Perforations from 61 to 125 ft.
127	Jack Land	1964	109	16	To	2,825	--	--	T,G, 36	I	Shutter screen from 45 to 109 ft.
128	Eldon Lyles	1965	131	7	To	2,866	55	May 1965	S,E, 3/4	D	Pump set at 106 ft. Pumped 30 gpm with drawdown of 5 ft in 2 hours, May 18, 1965.
129	Pete Land	1967	130	7	To	2,860	85	June 1967	S,E, 3/4	D	Pumping level 196 ft.
* 130	--	1906	115	5	To	2,795	59.4 56.8	May 5, 1942 July 20, 1949	N	U	Destroyed windmill well.
201	Frank J. Hommel	1962	147	16	To	2,788	78	1962	T,G	I	Perforations from 87 to 147 ft. Reported pumped 385 gpm when drilled.
202	do.	1955	100	14	To	2,744	--	--	T,E	I	Weak well. Reported discharge 200 gpm.
203	do.	1964	145	16	To	2,762	74.2	Nov. 16, 1967	T	I	Perforations from 100 to 145 ft. Reported discharge 500 gpm.
204	C. E. Reynolds	1964	95	16	To	2,773	48.6	Oct. 30, 1967	T,G, 30	I	
205	do.	--	24	4	To	2,748	16.9	do.	P,E, 1/3	D	
206	Lloyd Risley	1964	144	16	To	2,767	79.1	Nov. 14, 1967	T,G, 50	I	Shutter screen from 80 to 114 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-01-207	Dennison F. Cook	1957	110	16	To	2,718	--	--	T,G	I	Perforations from 70 to 110 ft. Reported discharge 1,300 gpm.
208	Earl Shields	1964	140	16	To	2,729	--	--	T,G, 75	I	Perforations from 44 to 140 ft. Reported discharge 500 gpm.
209	Clyde Martin	1966	173	16	To	2,723	40.1	Nov. 15, 1967	T,G, 75	I	Shutter screen from 109 to 173 ft.
210	Marva Lee Mays	1957	150	14	To	2,728	45.4	do.	T,G, 55	I	Perforations from 110 to 150 ft.
211	do.	1964	150	16	To	2,733	53.2	do.	T,G, 50	I	Do.
212	Kerr Estate	1963	150	16	To	2,732	49.2	Nov. 16, 1967	T,G, 50	I	Perforations from 86 to 150 ft. Discharge 335 gpm, Mar. 4, 1968.
213	do.	1955	187	16	To	2,736	41.4	do.	T,G, 50	I	Discharge 490 gpm, Mar. 4, 1968.
214	Hugh Sanders	1956	138	16	To	2,730	40 42.1	Dec. 1956 Nov. 1967	T,G	I	Shutter screen from 66 to 138 ft.
215	Kerr Estate	1924	80	5	To	2,758	62.9	May 5, 1942	N	U	Destroyed windmill well.
* 216	--	1917	72	--	To	2,769	63.8 62.4	do. July 20, 1949	N	U	Destroyed windmill well. Red bed at 110 ft.
* 217	--	--	28	5	To	2,720	--	--	N	U	Destroyed windmill well. Originally 70 ft. deep.
301	Don Robinson	1957	160	16	To	2,721	27.6 42.8	Feb. 6, 1958 Oct. 24, 1967	T,G	I	Pumped 460 gpm with 33 ft drawdown in 24 hours. 3/
302	Olace Hicks	1952	80	8	To	2,718	28.7 57.5	Nov. 3, 1960 Aug. 15, 1967	J,E, 5	D	Originally used as low capacity irrigation well.
303	do.	1963	162	12	To	2,715	32	Dec. 17, 1964	T,G, 50	I	Perforations from 66 to 162 ft. Gravel packed. Discharge 450 gpm with 83 ft drawdown, Dec. 17, 1964.
304	Don Robinson	1957	170	16	To	2,721	--	--	T,G	I	
* 305	Forrest E. Sawyer	1963	108	12	To	2,711	38.9	Oct. 24, 1967	T,G, 40	I	Perforations from 38 to 108 ft. Discharge 210 gpm, conductance 450 micromhos, Apr. 10, 1968.
306	Edward Sawyer	1963	152	16	To	2,715	46.8	Oct. 25, 1967	T,G, 60	I	Perforations from 52 to 152 ft. Gravel packed.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-01-307	Edward Sawyer	1960	160	12	To	2,716	--	--	T,E	I	
308	Mrs. Lois Robinson	1964	172	16	To	2,743	--	--	T,G	I	Perforations from 108 to 172 ft. Gravel packed.
309	Dennison F. Cook	1964	190	10	To	2,720	--	--	T,G, 50	I	Perforations from 150 to 190 ft. Reported discharge 500 gpm.
310	do.	1965	157	16	To	2,727	--	--	T,G, 75	I	Perforations from 61 to 157 ft. Reported discharge 800 gpm.
311	Edward Sawyer	1962	140	7	To	2,735	120.0	Oct. 4, 1967	P,E	U	Abandoned windmill well.
312	do.	1966	188	7	To	2,710	71	May 1966	S,E, 1 1/2	S	Slots from 166 to 188 ft. Cemented from 0 to 10 ft. Gravel packed. Discharge 40 gpm when drilled. Pumps set at 105 ft.
313	Mrs. Lois Robinson	1964	176	16	To	2,743	--	--	S,E	D	Shutter screen from 80 to 176 ft. Originally drilled for irrigation, insufficient water, completed for domestic use.
* 314	Forrest E. Sawyer	old	--	--	To	2,706	46.4	May 9, 1942	N	U	Destroyed windmill well.
* 315	Robert Sawyer	--	144	--	To	2,772	117.0	Sept. 7, 1949	P,W	U	Unused windmill well.
316	--	--	30	5	To	2,709	24.0 25.7	May 1, 1942 July 20, 1949	N	U	Destroyed windmill well.
* 317	--	--	87	5	To	2,719	45.7 47.3	May 1, 1942 July 18, 1949	N	U	Do.
318	--	--	65	5	To	2,725	55.6 55.8	May 1, 1942 July 17, 1949	N	U	Do.
* 401	Lesker D. Christie	1936	160	4	To	2,852	122.0 119.9	May 4, 1942 July 20, 1949	P,E	D	Pump set at 145 ft.
402	do.	1957	189	16	To	2,848	111.2	Nov. 14, 1967	T,E 7 1/2	I	Perforations from 159 to 189 ft.
403	W. B. Edens	--	174	16	To	2,879	63.8	Oct. 30, 1967	T,G 55	I	
* 404	W. Thornberry Ranch	--	190	6	To	2,872	153.0 153.9	May 4, 1942 July 20, 1949	N	U	Destroyed windmill well.
405	--	1917	--	6	To	2,812	29.1 28.6	May 4, 1942 July 20, 1949	N	U	Do.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-01-501	Tom M. Shadle	1957	180	12	To	2,866	143.9 153.9	Nov. 3, 1960 Aug. 10, 1967	T,G	I	Pump set at 180 ft. Perforations from 160 to 180 ft. Reported discharge 325 gpm, Aug. 10, 1967.
502	do.	1964	205	16	To	2,858	162.6	Nov. 14, 1967	T,G	I	Perforations from 165 to 205 ft.
503	do.	1917	205	5	To	2,859	141.6 139.9	May 5, 1942 July 21, 1949	S,E	D	Discharge 3 gpm.
504	John Knorpp	1950	160	16	To	2,748	--	--	T,G	I	Depth originally 204 ft.
505	Mrs. H. D. Bugbee	1967	145	7	To	2,772	123	July 1967	P,W	D	Pump set at 136 ft. Reported discharge, 20 gpm with 5 ft drawdown, July 16, 1967.
506	Lloyd Risley	1964	148	8	To	2,823	--	--	S,E	D	Perforations from 126 to 148 ft.
* 507	--	1906	76	8	To	2,753	65.0 70.8	May 1, 1942 July 20, 1949	N	U	Destroyed windmill well. Originally 115 ft deep.
* 508	Civil Aeronautics Authority	1940	200	--	To	2,868	120	1940	N	U	Destroyed electric well.
509	Tom M. Shadle	1927	190	6	To	2,885	170.4 172.4	May 4, 1942 July 21, 1949	N	U	Destroyed windmill well.
510	--	1910	166	6	To	2,873	156.8 156.2	May 4, 1942 July 21, 1949	N	U	Do.
* 511	--	1920	130	6	To	2,818	117.0 114.0	May 4, 1942 July 19, 1949	N	U	Do.
512	--	1922	180	5	To	2,835	125.6	May 4, 1942	N	U	Do.
* 601	City of Clarendon well 4	1945	202	16	To	2,729	30 62.4 60.1	1945 Nov. 30, 1949 Jan. 3, 1968	T,E, 20	P	Perforations from 142 to 202 ft. Reported discharge 225 gpm with 53 ft drawdown. Well used as standby.
* 602	City of Clarendon well 5	1946	172	16	To	2,723	60 53.4	1946 Jan. 3, 1968	T,E, 40	P	Reported discharge 130 gpm. Well used as standby.
* 603	City of Clarendon well 1	1927	240	8	To	2,728	60 69.7 53.8	Nov. 1927 Nov. 30, 1949 Jan. 3, 1968	T,E, 10	P	Gravel packed and perforated. Reported discharge 200 gpm with 60 ft drawdown in 24 hours. Well used as standby.
* 604	City of Clarendon well 3	1945	165	8	To	2,724	65	1945	N	U	Perforations from 145 to 165 ft. Well plugged and abandoned in 1954.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-01-605	City of Clarendon well 2	1929	302	24,8	To	2,721	60 62	Aug. 1929 Nov. 30, 1949	T,E, 60	P	Perforations from 108 to 122 ft. Gravel packed. Reported discharge 225 gpm. Well used as standby. 1/
* 606	City of Clarendon well 6	1951	185	16	To	2,718	40	June 1951	T,E	P	Perforations from 175 to 185 ft. Well used as standby.
* 607	City of Clarendon	1911	102	36	To	2,722	62 44.8	1911 Jan. 3, 1968	T,E, 5	P	Reported discharge 50 gpm with 25 ft drawdown when drilled.
* 608	do.	1887	89	36	To	2,723	45.3	Jan. 3, 1968	T,E, 5	P	Reported discharge 50 gpm. Well used as standby.
609	W. G. Tims	1953	130	16	To	2,745	39.6	Nov. 28, 1967	T,E, 40	I	Reported discharge 300 gpm with 30 ft drawdown, May 23, 1967.
610	Mrs. Lois Robinson	1964	120	16	To	2,720	--	--	T,G, 40	I	Perforations from 56 to 120 ft. Gravel packed.
611	Claude Moore	1964	143	16	To	2,719	66.6	Oct. 24, 1967	T,G, 42	I	Shutter screen from 47 to 143 ft.
612	Earnest Kent	1965	140	16	To	2,701	43.6	do.	N	U	Perforated from 62 to 140 ft. Unused irrigation well. Reported discharge 600 gpm with 25 ft drawdown in 48 hours.
613	R. M. Fedric	1957	170	16	To	2,722	51.3	do.	T,G	I	Perforated. Reported discharge 450 gpm, Oct. 24, 1967.
614	Dale Robinson	1965	228	16	To	2,740	77.9	do.	T,G	I	Shutter screen from 100 to 228 ft. Reported discharge 530 gpm with 26 ft drawdown.
615	Phelps Estate	1966	201	16	To	2,730	--	--	T	I	Pump set at 190 ft. Shutter screen from 106 to 201 ft.
616	W. K. Hardin	1965	122	7	To	2,738	--	--	--	D	Perforations from 82 to 122 ft. Gravel packed.
617	Nolie Simmons Estate	1967	177	7	To	2,841	152	July 1967	P,W	D	Perforated. Pump set at 167 ft. Reported discharge 12 gpm.
* 618	--	old	--	5	To	2,718	44.9 47.2	May 9, 1942 July 19, 1947	N	U	Destroyed windmill well.
* 619	--	1924	135	--	To	2,717	--	--	N	U	Do.
* 620	Clarendon High School	1967	138	16	To	2,760	115	July 1967	S,E, 7 1/2	P,I	Perforated. Water level 115 ft. Reported discharge 150 gpm with 3 ft drawdown in 26 hours.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-01-621	Clarendon College well 2	1967	165	16	To	2,810	87	Sept. 1967	S,E	P,I	Perforations from 92 to 165 ft. Gravel packed.
* 622	Clarendon College well 1	1967	162	16	To	2,796	90	do.	S,E, 7 1/2	P,I	Perforations from 80 to 162 ft. Gravel packed. Reported discharge 132 gpm with 13 ft drawdown in 38 hours. Conductance 700 micromhos, May 13, 1968.
801	Luke H. Skelton	1963	256	16	To	2,913	--	--	P,W	S	Perforations 128 to 256 ft. Originally drilled for irrigation.
802	F. O. Hodges	1963	214	16	To	2,911	--	--	N	U	Well abandoned.
* 803	W. Thornberry Ranch	--	200	5	To	2,865	185.1 185.3	May 4, 1942 July 20, 1949	P,W	S	
* 804	--	old	219	--	To	2,906	187.0 187.5	May 8, 1942 July 20, 1949	N	U	Destroyed windmill well.
901	William J. Greene, Sr.	1957	220	16	To	2,844	--	--	T,G, 60	I	Shutter screen from 100 to 220 ft.
902	Frank Thompson	1963	198	16	To	2,830	158.3	Oct. 24, 1967	T,G, 54	I	Perforations from 70 to 198 ft.
* 903	Finnis N. Fox	1964	190	16	To	2,818	114.0	do.	T,G, 42	I	Shutter screen from 94 to 190 ft.
904	William J. Greene, Sr.	1966	232	7	To	2,866	165	Sept. 1966	S,E	S	Reported discharge 25 gpm, 1966. 25 gpm, 1966.
905	Finnis N. Fox	1967	170	7	To	2,821	--	--	S,E	D	Perforations from 150 to 170 ft.
906	--	--	170	6	To	2,865	167.8	Mar. 19, 1968	P,W	S	
* 907	Harry Blair	old	--	--	To	2,832	139.8	May 9, 1942	N	U	Destroyed windmill well.
908	--	old	198	5	To	2,890	189.5 191.8	May 8, 1942 July 19, 1949	P,W	S	
* 909	--	1891	220	4	To	2,856	180 149	Mar. 1941 Aug. 19, 1949	P,W	S	
02-101	Clifton Phillips	1966	201	16	To	2,723	95.8	Oct. 6, 1967	T,G	I	Shutter screen from 106 to 201 ft. Pump set at 190 ft.
102	Earl Hamilton	1963	188	16	To	2,722	--	--	T,G, 100	I	Perforations from 58 to 188 ft. Gravel packed.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-02-103	Wayne Riggs	1968	81	14	To	2,651	40	Jan. 1968	S,E, 1 1/2	D	Perforations from 17 to 81 ft. Gravel packed.
* 104	Forrest E. Sawyer	--	52	5	To	2,680	16.8 16.4	May 9, 1941 July 19, 1949	P,W	U	
105	do.	--	86	5	To	2,732	72.4 72.3	May 9, 1941 July 19, 1949	N	U	Destroyed windmill well.
201	Don Hillis	1957	180	16	To	2,692	50.9	Oct. 6, 1967	T,G, 42	I	Shutter screen from 60 to 180 ft.
202	Hall S. Hardin	--	--	--	To	2,639	59.4	Nov. 10, 1967	T,G, 75	I	Reported discharge 980 gpm with 47 ft drawdown.
203	do.	1964	250	16	To	2,629	72.4	do.	T,G, 65	I	Shutter screen from 125 to 250 ft. Gravel packed. Reported discharge 500 gpm with 25 ft drawdown.
204	do.	1964	120	7	To	2,633	--	--	S,E, 1	S	
205	Emmett Brown	1966	110	8	To	2,594	--	--	N	U	Unused irrigation well. Low capacity. Slots from 78 to 110 ft.
* 206	Pete Bromley	1930	101	5	To	2,659	65.6 66.0	May 28, 1941 July 19, 1949	P,W	S	
207	do.	1929	19	4	To	2,508	9.6 12.0	May 28, 1941 July 19, 1949	P,W	S	
208	Midway School-School Dist. No. 4	--	106	4	To	2,618	50.3 49.6	May 28, 1941 July 19, 1949	N	U	Destroyed windmill well.
209	--	1932	139	5	To	2,650	45.2 43.7	May 28, 1941 July 19, 1949	P,W	S	
* 301	Will P. Chamberlain	1923	100	6	To	2,580	85.1	Sept. 28, 1967	P,W	D	Slotted.
302	L. L. Luttrell	1957	120	16	To	2,583	76.6	Nov. 3, 1960	T,G	I	Perforations from 70 to 120 ft. Pump set at 100 ft. Reported discharge 250 gpm, Red bed at 120 ft.
303	Will P. Chamberlain	--	Spring	--	To	2,490	+	Jan. 4, 1968	Flows	S	Discharge 200 gpm, and spring conductance 400 micromhos, Jan. 4, 1968.
* 304	L. L. Luttrell	--	Spring	--	To	2,490	+	do.	Flows	S	Discharge 222 gpm, and spring conductance 625 micromhos, Jan. 4, 1968.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-02-305	--	old	90	--	To	2,655	73.8	Aug. 24, 1949	P,W	S	
* 401	F. O. Naylor	1907	69	--	To	2,705	51.1	do.	P,E, 3/4	D	Used as windmill well before 1962.
402	F. O. Naylor test well 1	1967	55	4	To	2,730	25.8	Sept. 25, 1967	--	U	Water test hole. Open hole 0 to 55 ft.
403	F. O. Naylor test well 2	1967	35	4	To	2,732	23.4	do.	--	U	Water test hole. Open hole 0 to 35 ft.
404	F. O. Naylor test well 3	1967	220	4	To	2,715	68.6	Sept. 27, 1967	--	U	Water test hole. Open hole 0 to 220 ft.
* 405	J. N. Riley	1925	98	4	To	2,682	20.3	do.	J,E, 1	D	Open hole 68 to 98 ft.
406	C. A. Morgan	1963	190	16	To	2,725	49.9	Oct. 6, 1967	T,G	I	Perforations from 50 to 190 ft. Gravel packed.
407	Dick Shelton	--	150	16	To	2,728	50	July 1965	T	I	600 gpm with 57 ft drawdown, July 6, 1965.
408	Truett Behrens	1967	182	16	To	2,688	21.5	Dec. 1, 1967	T,G, 30	I	Perforations from 30 to 60 and 142 to 182 ft. Red bed at 182 ft.
409	Household Supply Co.	1963	108	9	To	2,738	--	--	N	U	
501	Frank Hardin	1957	266	16	To	2,696	57.2 63.7	Nov. 10, 1960 Aug. 29, 1967	T,G, 102	I	Shutter screen from 50 to 266 ft. Pump set at 170 ft. Reported discharge 800 gpm. 1/
502	--	--	30	2	To	2,705	--	--	P,W	U	Well dry, Sept. 27, 1967.
503	Glenn Williams	1949	92	6	To	2,678	60.0 58.5	1949 Sept. 27, 1967	J,E, 1	--	Perforations from 70 to 92 ft.
504	do.	old	30	4	To	2,677	--	--	P,W	U	Well dry, Sept. 27, 1967.
505	Marvin Jones	old	112	8	To	2,701	61.0 56.2	May 28, 1941 July 19, 1949	J,E	D	
506	J. M. MacAlister	old	100	8	To	2,684	49.0	Nov. 1967	P,W	D	Open hole from 35 to 100 ft. Conductance 525 micromhos, Nov. 10, 1967.
507	H. L. Riley	1957	215	16	To	2,705	70.2	Nov. 10, 1967	T,G, 75	I	Reported discharge 560 gpm, Dec. 18, 1967. Shutter screen from 120 to 240 ft.
508	P. C. Longan	1956	240	16	To	2,698	59.1	do.	T,G, 70	I	Perforations from 120 to 240 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-02-509	William J. Lowe	1965	231	16	To	2,705	122.0	Feb. 1965	T,G, 90	I	Perforated and gravel packed. Reported discharge 750 gpm with 86 ft drawdown in 36 hours.
510	Kinch Leathers	1964	149	7	To	2,653	35	Oct. 1964	S,E	D	Reported discharge 30 gpm with 5 ft drawdown in 2 hours.
* 511	--	old	96	4	To	2,714	57.0	Nov. 29, 1949	P,W	S	
* 601	--	old	30	6	To	2,638	29.8 29.4	July 29, 1949 Sept. 25, 1967	P,W	U	Originally drilled to 55 ft.
602	--	--	75	2	To	2,656	52.3	Sept. 25, 1967	P,W	U	Abandoned windmill.
603	--	--	27	6	To	2,634	24.3	Sept. 27, 1967	P,W	S	Discharge 3/4 gpm, Sept. 27, 1967.
604	D. E. Leathers	1957	192	16	To	2,663	46.4	Sept. 13, 1967	T,G, 48	I	Shutter screen from 72 to 192 ft.
605	Jerry Shields	1966	140	16	To	2,648	45.0	Nov. 10, 1967	T,G, 50	I	Pump set at 140 ft. Perforations from 80 to 140 ft. Reported discharge 780 gpm. Pumps sand. Originally drilled to 180 ft.
606	Coleman Shields	1966	160	16	To	2,642	50.3	Nov. 13, 1967	T,G, 50	I	Perforations from 100 to 161 ft. Reported discharge 725 gpm.
* 607	Mrs. Gene Martin	1956	--	16	To	2,643	57.3 83.0	Jan. 18, 1961 Nov. 13, 1967	T,G, 75	I	Gravel packed. Conductance 500 micromhos, Apr. 12, 1968. 3/
608	Johnny E. Leathers	1964	192	16	To	2,638	--	--	T,G, 54	I	Shutter screen from 64 to 192 ft.
701	Earnest W. Barbee	1954	263	16	To	2,843	152.7	Feb. 16, 1961	N	U	Found dry to 190 ft, Aug. 30, 1967. Red bed at 230 ft.
702	do.	1965	252	14	To	2,843	168	Apr. 1965	T,G, 50	I	Perforations from 0 to 252 ft. Gravel packed. Reported discharge 300 gpm with 22 ft drawdown in 10 hours.
703	do.	1957	255	16	To	2,840	--	--	T,G	I	Perforations. Pumping level 238 ft, Aug. 30, 1967.
704	do.	1958	250	16	To	2,840	--	--	T,G	I	Perforations.
705	B. F. Dorman	1964	232	16	To	2,840	--	--	T,G, 30	I	Perforations from 160 to 232 ft.
706	Roy Thomason	1964	139	7	To	2,758	--	--	P,W	S	Perforations. Reported discharge 15 gpm, when drilled.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-02-707	--	old	108	5	To	2,752	61.8	Sept. 7, 1949	P,W	S	
801	Heckle Stark	1957	160	16	To	2,640	12.04	Nov. 17, 1960	T,G, 42	I	Shutter screen from 40 to 160 ft. Discharge 750 gpm, 1958.
802	James A. Shields	1955	100	16	To	2,613	+ 1.0	Nov. 2, 1960	T,E, 7 1/2	I	Perforated. Reported discharge 100 gpm with 13 ft drawdown in 10 hours.
803	James D. Riley	1964	121	16	To	2,635	40.5	Nov. 17, 1967	T,G, 75	I	Shutter screen from 57 to 121 ft.
804	Heckle Stark	1965	171	16	To	2,669	19.5	do.	T,G, 75	I	Shutter screen from 107 to 171 ft.
* 805	do.	--	32	6	To	2,671	23.0	Apr. 3, 1941	N	U	Destroyed windmill well.
* 806	--	1941	75	--	To	2,665	72.9	May 1, 1941	N	U	WPA test hole 149. Open hole. 4/
* 807	--	1941	57	--	To	2,680	53.7	Apr. 4, 1941	N	U	WPA test hole 151. Open hole. 4/
* 808	--	1941	32	--	To	2,680	14.3	Apr. 21, 1941	N	U	WPA test hole 154. Open hole. 4/
* 809	--	1941	38	--	To	2,680	20.4	do.	N	U	WPA test hole 155. Open hole. 4/
810	Heckle Stark	--	--	5	To	2,691	23.5	Apr. 3, 1941	N	U	Destroyed.
811	--	--	44	5	To	2,621	24.0	do.	N	U	Do.
901	Elmer Dishman	1965	105	16	To	2,581	13.8	Oct. 11, 1967	T,G	I	Perforated.
902	Ronald D. Castner	1965	102	16	To	2,580	--	--	T,G	I	Perforated. Gravel packed.
903	James A. Shields	1954	119	16	To	2,578	14	--	T,G	I	Perforations from 79 to 119 ft. Pump set at 80 ft. Reported discharge 650 gpm with 46 ft drawdown drilled.
904	Bill Poole	1956	140	16	To	2,618	65.4	Oct. 9, 1967	T,G	I	Perforated.
905	J. Leo Smith	1957	165	16	To	2,638	--	--	T,G, 48	I	Shutter screen from 45 to 165 ft. Reported discharge 430 gpm, May 6, 1964.
906	W. A. Armes	1964	82	16	To	2,548	4.0	Oct. 11, 1967	T,G, 40	I	Perforations from 18 to 82 ft. Gravel packed.
907	Quinn L. Aten	1964	116	16	To	2,560	11.7	do.	T,G 42	I	Perforations from 44 to 116 ft. Gravel packed.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-02-908	J. L. Butler well 2	1957	70	16	To	2,590	19.8	Oct. 11, 1967	T,G, 18	I	Shutter screen from 22 to 70 ft.
909	Lamar D. Aten	1962	196	16	To	2,638	--	--	T,G, 48	I	Shutter screen from 76 to 196 ft.
910	Arthur Shields	1967	156	16	To	2,598	15.9	Nov. 13, 1967	S,E, 15	I	Perforations from 116 to 156 ft. Gravel packed.
911	Earl Shields	1964	138	7	To	2,581	75	July 1964	S,E	D	Perforated. Gravel packed. Reported discharge 15 gpm with 10 ft drawdown in 3 hours.
912	Lamar D. Aten	1964	64	16	To	2,645	--	--	N	U	Shutter screen from 32 to 64 ft. Gravel packed. Unused irrigation well.
913	James A. Shields	1914	60	--	To	2,579	20	1914	N	U	Reported discharge 800 gpm when drilled.
914	Quinn L. Aten	1964	204	16	To	2,556	--	--	N	U	Formerly used for irrigation. Perforated from 54 to 204 ft. Gravel packed.
915	James A. Shields	1964	151	7	To	2,586	--	--	S,E	D	Reported discharge 45 gpm at pumping level 35 ft in 2 hours.
* 916	School District No. 2	1906	30	--	To	2,588	18	Feb. 1941	N	U	Destroyed.
917	--	1929	94	6	To	2,585	43.0 40.6	Apr. 30, 1941 July 18, 1949	N	U	Destroyed windmill well.
* 918	--	--	100	6	Pw	2,581	--	--	N	U	Do.
* 919	--	1929	22	5	To	2,585	16.0 15.0	May 7, 1941 July 18, 1949	N	U	Destroyed hand and bucket well.
920	--	--	17	6	To	2,582	4.2 4.8	May 7, 1941 July 18, 1949	N	U	Do.
* 921	--	old	21	5	To	2,589	16.1 14.6	May 8, 1941 July 18, 1949	N	U	Do.
* 922	--	--	19	6	To	2,590	9.9 8.5	May 9, 1941 July 18, 1949	N	U	Destroyed windmill well.
* 923	Memphis Cotton Oil Co.	1926	60	4	To	2,586	--	--	N	U	Destroyed steam-lift well.
* 924	--	--	--	--	To	2,602	--	--	N	U	Caved in, destroyed, windmill well.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-02-925	--	--	106	5	To	2,652	48.5 45.1	May 7, 1941 July 19, 1945	N	U	Destroyed windmill well.
* 926	--	1941	26	--	Qal	2,545	3.2	Apr. 7, 1941	N	U	WPA test hole 166. Open hole. 4/
* 927	--	1941	17	--	Qal	2,545	3.8	Apr. 8, 1941	N	U	WPA test hole 167. Open hole. 4/
928	--	1941	24	--	Qal	2,545	2.8	Apr. 5, 1941	N	U	WPA test hole 168. Open hole. 4/
929	Willard Knox	1929	130	--	To	2,590	50	1949	N	U	Destroyed public supply well. Water level 50 ft, 1949.
930	Inman Oil Test well 1	1920	3,605	13	--	2,631	--	--	N	U	Oil test.
03-101	R. O. Ranch	--	13	4	Qal	2,395	10.6	Sept. 28, 1967	P,W	S	
102	U. G. Swinney	1967	75	7	To	2,564	47.2	Nov. 30, 1967	P,W	S	Perforations from 60 to 75 ft.
* 103	Will P. Chamberlain	--	Spring	--	To	2,450	+	Dec. 29, 1967	Flows	S	Discharge 135 gpm, Dec. 29, 1967, field conductance 500 micromhos, temperature 45°F, Dec. 29, 1967. Dry in 1900. Spring developed as seep in 1914, and flowed 300 gpm in 1919.
104	Will P. Chamberlain	--	Spring	--	To	2,450	+	do.	Flows	S	Estimated flow less than 1 gpm, field conductance 300 micromhos, Dec. 29, 1967. Spring developed in 1919 and watered 125 steers that year.
105	do.	--	Spring	--	To	2,450	+	do.	Flows	S	Estimated flow 2 gpm, field conductance 450 micromhos, Dec. 29, 1967. Spring developed in 1918.
106	do.	1967	8	9	Qal	2,408	2.2	do.	P,W	S	Open end. Field conductance 725 micromhos, Dec. 29, 1967. Aluminum casing.
107	do.	1900	54	4	To	2,465	28.9	do.	N	U	Unused windmill well. Originally 100 ft deep. Used until 1962.
* 108	--	1922	100	4	To	2,490	--	--	N	U	Destroyed windmill well.
109	Rhodes and Gould	--	Spring	--	To	2,450	+	Feb. 27, 1966	Flows	I	Discharge 175 gpm, Feb. 27, 1966.
201	--	1900	63	5	To	2,442	60.0 59.6	May 28, 1941 June 22, 1949	P,W	S	Dug well.
* 202	--	1920	109	5	To	2,498	71.5 67.8	May 12, 1942 July 20, 1949	N	U	Destroyed windmill well. Perforations from 89 to 109 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-03-203	Fairview School, School District No. 3	1915	127	4	To	2,489	85.5 80.2	May 12, 1941 July 20, 1949	N	U	Destroyed windmill well.
204	--	1910	93	5	To	2,465	67.0 62.7	May 14, 1941 July 22, 1949	N	U	Do.
* 205	--	1941	58	--	To	2,415	56.0	Apr. 25, 1941	--	U	WPA test hole 237. 4/
301	--	--	158	5	To	2,461	87.1 77.4	May 16, 1941 July 20, 1949	P,W	S	
302	--	1910	150	4	To	2,425	77.0	May 28, 1941	N	U	Destroyed windmill well.
* 401	Kim K. Day	1967	120	16	To	2,569	48.0	Sept. 25, 1967	S,E, 10	I	Shutter screen from 52 to 120 ft. Reported discharge 150 gpm.
402	Rhodes and Gould	1966	65	16	To	2,545	--	--	S,E	I	Perforations from 10 to 65 ft. Gravel packed. Reported discharge. Reported discharge 275 gpm, Apr. 12, 1967.
403	Beck Atkinson well 2	1963	142	16	To	2,615	55	Jan. 1967	T,G, 48	I	Perforations from 46 to 142 ft. Reported discharge 600 gpm with 31 ft drawdown, Jan. 16, 1967.
* 404	Kim K. Day	1917	73	4	To	2,565	47.0 57.3	July 29, 1949 Sept. 25, 1967	N	U	Abandoned windmill well.
405	Beck Atkinson well 3	1964	144	16	To	2,611	68	Jan. 1967	T	I	Shutter screen from 48 to 144 ft. Gravel packed. Reported discharge 425 gpm with 40 ft drawdown, Jan. 16, 1967.
406	Beck Atkinson well 1	1963	160	16	To	2,610	--	--	T,G, 48	U	Unused irrigation well. Shutter screen from 96 to 160 ft.
* 407	--	--	136	--	Pw	2,518	81.8	Aug. 24, 1949	N	U	Destroyed windmill well.
408	Rhodes and Gould	1967	148	16	To	2,619	52.4	Nov. 13, 1967	T,G	I	Shutter screen from 52 to 148 ft. Reported discharge 375 gpm, Feb. 14, 1968.
* 409	--	--	--	--	To	2,643	57.4	July 29, 1949	P,W	S	
501	T. E. Naylor	1967	165	16	To	2,523	101.9	Nov. 13, 1967	T,G, 70	I	Perforations from 45 to 165 ft.
502	J. R. Hall well 3	1965	145	16	To	2,505	--	--	T,G	I	Slots from 49 to 145 ft. Gravel packed. 1/
503	J. R. Hall well 1	1965	146	16	To	2,506	110.8	Nov. 13, 1967	T,G	I	Slots from 66 to 146 ft. Gravel packed. Reported discharge 200 gpm when drilled.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-03-504	L. D. Patton	1957	139	16	To	2,501	101.0	Dec. 14, 1967	T,G, 75	I	Shutter screen from 67 to 139 ft.
505	A. J. Rowell	1956	172	16	To	2,535	80 77.3	Oct. 1966 Dec. 14, 1967	T,G, 75	I	Perforations from 100 to 172 ft. Discharge 450 gpm with 20 ft drawdown, Oct. 7, 1966.
* 506	J. R. Hall	1903	120	6	To	2,515	100.6 93.8	May 14, 1941 July 20, 1949	P,W	U	Unused windmill well. Originally drilled to 140 ft.
601	J. R. Hall well 2	1965	129	16	To	2,505	103.7	Nov. 13, 1967	T,G	I	Slots from 49 to 129 ft. Gravel packed. Reported discharge 425 gpm when drilled.
602	C. L. Taylor	1965	211	16	To	2,519	98.2	Dec. 14, 1967	T,G	I	Perforated from 151 to 211 ft.
* 603	--	--	130	4	To	2,469	--	--	P,W	S	
604	--	1910	105	6	To	2,508	84.4 76.1	May 15, 1941 July 24, 1949	P,W	S	
605	--	--	202	4	To	2,535	129.3	May 15, 1941	N	U	Destroyed windmill well.
701	Hollis Bannister	1957	79	16	To	2,572	23.2 27.3 29.5	Nov. 2, 1960 Jan. 6, 1965 Oct. 11, 1967	T,G	I	Shutter screen from 31 to 79 ft. Gravel packed. Reported discharge 450 gpm.
702	do.	1965	76	16	To	2,542	24.5	Oct. 11, 1967	T,G	I	Shutter screen from 27 to 76 ft. Reported discharge 200 gpm.
703	do.	1966	123	14	To	2,569	40.3	do.	T,G	I	Perforations from 43 to 123 ft.
704	W. R. Christal	1964	76	16	To	2,545	18.5 17.0	Jan. 7, 1965 Oct. 11, 1967	T,G, 42	I	Perforations from 28 to 76 ft. Gravel packed. Reported discharge 500 gpm.
705	do.	1957	153	16	To	2,574	59.0 65.3	Jan. 17, 1965 Oct. 11, 1967	T,G, 36	I	Shutter screen from 33 to 153 ft. Reported discharge 500 gpm with 11 ft drawdown, and discharge 700 gpm with 28 ft drawdown. Soil Conservation Service measured discharge 455 gpm, with 28 ft drawdown, Mar. 20, 1958.
706	Jerry Shields	1964	90	16	To	2,612	56.7	Nov. 13, 1967	T,G	I	Perforations from 45 to 90 ft. Reported discharge 475 gpm, Nov. 13, 1967.
707	Greenbelt Water Authority	1965	50	2	Qal	2,530	--	--	T,E, 50	U	Unused public supply.
* 708	Greenbelt Water Authority well 2	1966	91	16	Qal	2,530	4.2	Jan. 19, 1968	T,E, 7 1/2	U	Unused public supply. Slots from 51 to 91 ft. Gravel packed. Pump set at 80 ft. Reported discharge 275 gpm.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-03-709	Greenbelt Water Authority well 1	1966	102	16	Qal	2,531	4.9	Jan. 19, 1968	T,E, 10	U	Unused public supply well. Slots from 62 to 102 ft. Gravel packed. Pump set at 89 ft. Reported discharge 530 gpm with drawdown of 51 ft in 1 1/3 hours.
* 710	Greenbelt Water Authority well 3	1966	135	16	Qal	2,534	7.7	do.	T,E, 7 1/2	U	Unused public supply well. Slots from 55 to 135 ft. Gravel packed. Reported discharge 200 gpm with 60 ft drawdown in 24 hours.
711	Roy Lee Helms	1966	104	16	To	2,545	25.6	do.	T,G, 30	I	Perforations from 16 to 104 ft. Gravel packed.
* 712	--	--	37	--	To	2,525	36.6	July 29, 1929	N	U	Destroyed windmill well. Plugged to 37 ft in 1965. Originally 56 ft deep.
* 713	--	1918	--	--	To	2,560	59.9 57.8	do. Jan. 6, 1965	N	U	Destroyed windmill well.
714	--	--	--	4	To	2,580	34.2	do.	N	U	Unused windmill well.
715	--Leathers	--	--	6	To	2,555	38.2	Jan. 7, 1965	P,W	S	
* 801	--Adamson	old	152	6	To	2,592	82.5 111.6 113.7	Aug. 24, 1949 Jan. 6, 1965 Dec. 14, 1967	N	U	Destroyed windmill well.
802	--	--	48	4	To	2,586	43.9 48.0	Jan. 6, 1965 Jan. 19, 1968	N	U	Abandoned windmill well.
803	--	--	62	4	To	2,632	61.9	do.	N	U	Do.
804	--Adamson	--	180	6	To	2,582	74.7	Jan. 6, 1965	P,W	U	Unused windmill well.
805	--	--	--	--	To	2,613	55.3	do.	P,W	U	Do.
901	Clyde Hoggard	1964	240	16	To	2,588	86.7	do.	T,G	I	Perforations. Reported discharge 450 gpm.
902	--	--	60	4	To	2,503	40.2	May 15, 1941	N	U	Destroyed windmill well.
903	--	--	--	6	To	2,595	64.8	Jan. 6, 1965	P,W	D	
* 04-101	--	old	66	--	To	2,360	40.7	Aug. 24, 1949	N	U	Destroyed windmill well.
201	W. H. (Bill) Cook well 1	1956	94	16	To	2,253	30	Apr. 1965	T	I	Shutter screen from 46 to 94 ft.
202	W. H. (Bill) Cook well 2	1956	95	16	To	2,248	30	Feb. 1956	T	I	Shutter screen from 47 to 95 ft. Gravel packed. 1/

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-04-203	J. A. Long well 1	1957	108	16	To	2,285	--	--	N	U	Sanded-in, destroyed irrigation well. Shutter screen from 12 to 108 ft. Gravel packed.
204	J. A. Long well 2	1957	146	16	To	2,331	--	--	N	U	Sanded-in, destroyed irrigation well. Shutter screen from 20 to 146 ft.
301	--	--	50	6	Qal	2,249	27.9 22.7	May 15, 1941 July 20, 1949	P,W	S	
* 501	--	old	95	--	To	2,422	34.5	Aug. 24, 1949	P,W	S	
502	Mrs. R. H. Couch	1957	193	16	To	2,295	--	--	T,G, 45	I	Shutter screen from 49 to 193 ft. Gravel packed.
601	--	--	103	4	To	2,345	78.7 71.2	May 15, 1941 July 20, 1949	N	U	Destroyed windmill well.
602	--	--	89	5	To	2,367	61.9 52.4	May 15, 1941 July 20, 1949	P,W	S	
* 603	--	1910	--	6	To	2,385	--	--	N	U	Destroyed windmill well.
701	W. C. Tooke	1967	88	7	To	2,489	--	--	P,W	S	Perforations from 65 to 88 ft.
702	--	--	27	4	To	2,458	9.0 5.9	May 15, 1941 July 24, 1949	N	U	Destroyed windmill well.
703	--	--	70	6	To	2,465	52.6 49.6	May 15, 1941 July 24, 1949	N	U	Do.
801	Claude W. Caison	1958	134	6	Pw	2,460	106.7	June 7, 1967	P,W	S	Perforations. Field conductance 2,200 micromhos, June 7, 1967.
802	--	1930	95	--	To	2,458	73.0	May 15, 1941	N	U	Destroyed windmill well. Open hole.
803	--	--	149	--	To	2,472	128.8	do.	N	U	Destroyed windmill well.
09-101	J. A. Ranch	--	60	6	To	2,742	25.8	Mar. 19, 1968	P,W	S	Field conductance 370 micromhos, Mar. 19, 1968.
* 102	do.	--	100	6	To	2,765	97.5 100.1	1940 July 20, 1949	P,W	S	Field conductance 320 micromhos, Mar. 19, 1968.
201	J. A. Ranch-Sandy Camp	--	40	8	Pw	2,595	--	--	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,600 micromhos, Mar. 19, 1968.
202	J. A. Ranch	--	61	6	To	2,734	57.6	Mar. 19, 1968	P,W	S	Field conductance 320 micromhos, Mar. 19, 1968.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
	JA-12-09-203	J. A. Ranch	--	18	8	Qal	2,600	15.6	Mar. 19, 1968	P,W	S	Field conductance 1,250 micromhos, Mar. 19, 1968.
	204	do.	--	44	8	To	2,600	43.3	Mar. 25, 1968	P,W	S	Field conductance 1,950 micromhos, Mar. 25, 1968.
*	301	H. H. Mann	1917	154	4	To	2,819	149.7	Dec. 19, 1967	P,W	D	
*	302	Brice-Lesley Water Supply Corp.	1967	260	6	To	2,830	173.0	Dec. 20, 1967	T,E	P	Wire-wrapped screen from 228 to 238 ft. Gravel packed. Cemented from 0 to 174 ft. Discharge 180 gpm with 22 ft drawdown in 24 hours, Jan. 18, 1968. Field conductance 600 micromhos, Jan. 18, 1968. 2/
	303	J. A. Ranch-Sandy Camp	--	53	6	To	2,681	--	--	P,W	S	Discharge 3/4 gpm. Field conductance 340 micromhos, Mar. 18, 1968.
	304	do.	--	30	6	To	2,618	--	--	P,W	D	Field conductance 450 micromhos, Mar. 18, 1968.
	305	do.	--	Spring	--	To	2,570	+	Mar. 19, 1968	Flows	S	Estimated discharge 60 gpm, field conductance 550 micromhos, Mar. 19, 1968.
	401	J. A. Ranch	--	152	8	Pw	2,606	139.2	do.	P,W	S	Gypsum crystals on discharge pipe and pump column.
*	402	do.	1962	157	8	Pw	2,481	154.3	do.	P,W	S	Gypsum crystals on discharge pipe. Discharge 3 1/2 gpm, field conductance 3,100 micromhos, May 19, 1968.
	403	do.	--	152	8	Pw	2,462	148.0	do.	P,W	S	Discharge 5 1/2 gpm, field conductance 2,700 micromhos, May 19, 1968.
	404	do.	--	162	8	Pw	2,523	158.7	Mar. 25, 1968	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,900 micromhos, Mar. 25, 1968.
	501	J. A. Ranch-Sandy Camp	--	12	6	Qal	2,395	--	--	P,W	S	Field conductance 1,500 micromhos, Mar. 18, 1968.
	502	J. A. Ranch	--	--	8	Pw	2,534	--	--	P,W	S	Field conductance 2,600 micromhos, Mar. 25, 1968.
*	601	Bitter Creek Ranch, West	--	45	8	Pw	2,625	--	--	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,900 micromhos, Dec. 19, 1967.
*	602	do.	--	--	6	Pw	2,519	60.0	Dec. 19, 1967	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,400 micromhos, Dec. 19, 1967.
	603	J. A. Ranch-Sandy Camp	1962	220	6	Pw	2,715	--	--	P,W	S	Field conductance 2,500 micromhos, Mar. 18, 1968.
	604	do.	--	--	6	Pw	2,585	--	--	P,W	S	Gypsum crystals on discharge pipe. Discharge 1 1/4 gpm, field conductance 2,500 micromhos, Mar. 18, 1968.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-09-701	J. A. Ranch	--	20	16	Qal	2,252	2.3	Mar. 19, 1968	P,W	S	Field conductance 3,300 micromhos, Mar. 19, 1968.
801	J. A. Ranch-Sandy Camp	--	--	6	Pw	2,438	--	--	P,W	S	Gypsum crystals on discharge pipe. Discharge 1 1/4 gpm, field conductance 2,900 micromhos, Mar. 18, 1968.
802	do.	--	25	6	Pw	2,277	14.4	Mar. 18, 1968	P,W	S	Gypsum crystals on discharge pipe. Discharge 3/4 gpm, field conductance 2,700 micromhos, Mar. 18, 1968.
803	do.	--	132	8	Pw	2,420	117.6	do.	P,W	S	Gypsum crystals on discharge pipe. Field conductance 3,000 micromhos, Mar. 18, 1968.
* 901	Bitter Creek Ranch, West	--	--	6	Pw	2,440	--	--	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,700 micromhos, Dec. 19, 1967. Estimated discharge 5 gpm, Dec. 19, 1967.
* 902	do.	--	--	6	Pw	2,398	--	--	P,W	S	Gypsum crystals on discharge pipe. Field conductance 3,000 micromhos, Dec. 19, 1967.
903	J. A. Ranch-Sandy Camp	--	100	8	Pw	2,545	98.6	Mar. 18, 1968	P,W	S	Gypsum crystals on discharge pipe. Field conductance 4,000 micromhos, Mar. 18, 1968.
904	do.	--	--	8	Pw	2,430	--	--	P,W	S	Gypsum crystals on discharge pipe. Discharge 2 gpm, field conductance 3,100 micromhos, Mar. 18, 1968.
* 905	--	1928	42	4	Pw	2,325	36.3	May 8, 1942	P,W	S	Reported gypy water.
10-101	Ernest W. Barbee	1957	256	16	To	2,842	--	--	T,G	I	Perforated.
102	H. A. Harrison, Sr.	1965	196	16	To	2,810	149 144.9	Feb. 1967 Oct. 10, 1967	T,E	I	Shutter screen from 100 to 196 ft. Reported discharge 300 gpm with 17 ft drawdown in 24 hours, Feb. 28, 1967.
103	Dennis Lindley	1957	194	16	To	2,761	100 115.2	Jan. 31, 1966 Nov. 17, 1967	T,G, 75	I	Shutter screen from 98 to 194 ft. Reported discharge 230 gpm with 20 ft drawdown, Jan. 31, 1966.
* 104	Bitter Creek Ranch, West	1943	255	8	To	2,880	--	--	S,E, 1 1/2	D	Perforations. Pump set at 245 ft.
105	Odis Caraway	1958	125	7	To	2,801	--	--	S,E	S	Perforations from 120 to 125 ft.
106	Phelps Estate	1963	238	16	To	2,830	--	--	T,G, 60	I	Perforations from 110 to 238 ft. Reported discharge 225 gpm.
107	Price Webb	1965	190	--	To	2,813	--	--	P,W	S	

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-10-108	H. A. Harrison, Sr.	1968	226	16	To	2,818	--	--	N	U	Caved-in, destroyed irrigation well. Perforations from 130 to 226 ft. Reported discharge 230 gpm, Feb. 1968.
* 109	do.	1968	227	16	To	2,818	160.3	May 16, 1968	T,E	I	Perforated. Gravel packed. Reported discharge 260 gpm, field conductance 500 micromhos, May 16, 1968.
* 110	--	--	--	5	To	2,830	--	--	N	U	Destroyed windmill well.
* 111	--	1930	--	5	To	2,823	154.7 151.9	May 8, 1942 July 20, 1949	N	U	Do.
* 112	H. A. Harrison, Sr.	1925	190	--	To	2,800	145.6	May 8, 1942	J,E	D	
201	J. N. Weaver	1957	210	16	To	2,759	100	Feb. 1961	T,G	I	Reported discharge 700 gpm in 1961. Red bed at 200 ft.
202	do.	1966	127	16	To	2,725	76.7	Oct. 10, 1967	T,G	I	Shutter screen. Gravel packed.
203	H. A. Harrison, Sr.	1967	206	16	To	2,750	118.0	do.	T,G	I	Perforations from 98 to 206 ft.
* 204	--	old	95	--	To	2,727	83.8	Aug. 25, 1949	P,W	S	
* 205	--	1917	112	--	To	2,762	96.6 91.5	May 8, 1942 July 24, 1949	P,W	S	
301	Gerald Noble	1957	128	16	To	2,598	7.2	Feb. 16, 1961	T,G	I	Shutter screen from 31 to 128 ft. Reported discharge 490 gpm, Dec. 18. 1964. 1/
302	Lacy Noble	1957	212	16	To	2,637	28.8	Oct. 11, 1967	T,G, 42	I	Shutter screen from 116 to 212 ft.
303	W. O. Elliott	1957	153	16	To	2,701	95.1	Oct. 9, 1967	T,G, 36	I	Perforations from 23 to 153 ft.
304	do.	1964	131	16	To	2,658	42.3	do.	T,G	I	Perforations from 35 to 131 ft.
305	Mrs. B. Anderson	1956	160	16	To	2,619	32.6	do.	T,G	I	Shutter screen from 40 to 160 ft.
306	J. L. Butler well 1	1957	134	16	To	2,628	35	Jan. 1957	T,G, 30	I	Shutter screen from 38 to 134 ft. Reported discharge 585 gpm, Feb. 6, 1968.
307	Jay W. Helms	1952	90	16	To	2,617	42.8	Nov. 20, 1967	T,G, 50	I	Perforated.
308	Gerald Noble	1956	130	16	To	2,593	18 11.0	Nov. 1964 Nov. 20, 1967	T,G, 30	I	Perforated. Reported discharge 445 gpm with 22 ft drawdown, Nov. 19, 1964.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-10-309	Gerald Noble	1965	160	16	To	2,603	12 16.6	Feb. 1965 Nov. 20, 1967	T,G, 30	I	Open hole from 148 to 160 ft.
310	Doc Rodgers	1953	130	16	To	2,614	--	--	T,G	I	Perforated.
311	Gerald Noble	1957	104	16	To	2,608	--	--	N	U	Destroyed irrigation well. Shutter screen from 56 to 104 ft.
* 312	--	--	57	5	To	2,656	43.3 39.6	May 7, 1941 July 19, 1949	P,W	S	
313	--	1905	18	5	Qal	2,598	12 3.8	1941 July 19, 1949	N	U	Caved-in, destroyed windmill well.
314	--	--	18	5	Qal	2,600	13.1	May 7, 1941	N	U	Destroyed windmill well.
315	George C. Shields	--	--	--	To	2,650	--	--	T	I	
* 401	Bitter Creek Ranch, West	1929	120	4	To	2,763	119.7 111.6	Aug. 25, 1949 Dec. 19, 1957	P,W	S	Originally 137 ft deep. Field conductance 340 micromhos, Dec. 19, 1967.
* 402	do.	--	Spring	--	To	2,619	+	Dec. 19, 1967	Flows	S	Discharge 23 gpm, water temperature 49°F on Dec. 19, 1967.
403	do.	--	Spring	--	To	2,619	+	do.	Flows	S	Discharge 81 gpm, field conductance 300 micromhos, Dec. 19, 1967.
404	do.	--	Spring	--	To	2,619	+	do.	Flows	S	Discharge 56 gpm, field conductance 380 micromhos, Dec. 19, 1967.
405	Bitter Creek Ranch, East	--	Spring	--	To	2,619	+	Mar. 5, 1968	Flows	S	Discharge 3 gpm, field conductance 280 micromhos, Mar. 5, 1968.
501	H. C. Shaw, Jr. well 1	1959	175	14	To	2,695	82.4	Oct. 10, 1967	T,G, 50	I	Shutter screen from 55 to 175 ft.
502	H. C. Shaw, Jr. well 2	1963	173	16	To	2,705	88.3	do.	T,G, 54	I	Perforations from 77 to 173 ft.
503	H. C. Shaw, Jr. well 3	--	204	16	To	2,715	--	--	T,G, 70	I	Perforations from 76 to 204 ft.
504	Delmar Koontz well 1	1965	144	16	To	2,705	88.9	Oct. 9, 1967	T,G, 36	I	Shutter screen from 48 to 144 ft.
505	Clifton Phillips	1965	220	16	To	2,760	136.4	Dec. 21, 1967	T,G	I	Shutter screen from 100 to 220 ft.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-10-506	Henry Hastey, Jr.	1957	174	16	To	2,733	121.6	Dec. 27, 1967	T,G, 60	I	Shutter screen from 54 to 174 ft.
507	Homer Hardin	1963	188	16	To	2,765	--	--	T,G	I	Perforations from 92 to 188 ft.
508	Bitter Creek Ranch, East	--	66	8	To	2,560	21.5	Mar. 5, 1968	P,W	S	Field conductance 400 micromhos, Mar. 5, 1968.
509	do.	--	Spring	--	To	2,539	+	do.	Flows	S	Estimated 11 gpm, field conductance 220 micromhos, Mar. 5, 1968.
510	do.	--	Spring	--	To	2,595	+	do.	Flows	S	Estimated discharge 6 gpm, field conductance 350 micromhos, March 5, 1968.
601	H. C. Shaw, Jr.	1956	150	12	To	2,678	81.4 89.1	Feb. 16, 1961 Aug. 30, 1967	T,G	I	Perforated.
602	do.	1964	172	16	To	2,670	100 83.1	Mar. 1965 Aug. 30, 1967	T,G, 60	I	Perforations from 76 to 172 ft. Reported discharge 440 gpm with 30 ft drawdown, Mar. 22, 1965.
603	do.	1955	201	14	To	2,694	--	--	T,G	I	Perforations. No opening in pump base.
604	Delmar Koontz well 2	1965	114	16	To	2,718	70.2	Oct. 9, 1967	T,G, 30	I	Shutter screen from 50 to 114 ft.
* 605	Bitter Creek Ranch, East	--	Spring	--	To	2,559	+	Mar. 5, 1968	Flows	D	Spring developed in concrete within wooden spring house. Used as swimming pool. Discharge 775 gpm, field conductance 500 micromhos, Mar. 5, 1968.
606	do.	1955	32	4	To	2,582	18.8	do.	J,E, 1/2	U	
607	do.	--	175	8	To	2,642	69.1	do.	S,E	D	
608	do.	--	Spring	--	To	2,559	+	do.	Flows	S	Field conductance 1,650 micromhos, Mar. 5, 1968.
609	do.	--	Spring	--	To	2,538	+	do.	Flows	S	Field conductance 680 micromhos, Mar. 5, 1968.
610	do.	--	182	7	To	2,722	180.4	do.	P,W	S	Field conductance 400 micromhos, Mar. 5, 1968.
* 611	H. C. Shaw	1927	132	--	To	2,642	128	1949	N	U	Destroyed windmill well.
* 701	Bitter Creek Ranch, West	--	54	4	Pw	2,350	51.7	Dec. 21, 1967	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,900 micromhos, water temperature 64°F. Estimated discharge 3 gpm, Dec. 21, 1967.
702	do.	--	--	6	Pw	2,430	39.0	do.	P,W	S	Field conductance 3,000 micromhos, Dec. 21, 1967.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-12-10-703	Bitter Creek Ranch, West	--	80	6	Pw	2,440	--	--	P,G	S	Field conductance 2,800 micromhos, Dec. 21, 1967.
	801	Bitter Creek Ranch, East	1965	169	7	Pw	2,385	--	--	P,W	S	Perforations from 149 to 169 ft.
	802	do.	--	153	8	Pw	2,475	133.4	Mar. 5, 1968	P,W	S	Gypsum crystals on discharge pipe. Field conductance 3,000 micromhos, Mar. 5, 1968.
	803	do.	--	25	8	Pw	2,350	14.9	do.	P,W	S	Gypsum crystals on discharge pipe. Field conductance 2,800 micromhos, Mar. 5, 1968.
	901	do.	--	190	8	Pw	2,582	--	--	P,W	S	
	11-101	C. C. Ayers	1927	130	6	To	2,700	128.6	Jan. 24, 1968	P,W	S	
*	102	--	old	193	6	To	2,719	143.6 155.7	Aug. 25, 1949 Jan. 24, 1968	P,W	D	
	103	C. C. Ayers	--	121	6	To	2,689	102.8	Jan. 24, 1968	P,W	S	
	104	--	--	--	4	To	2,730	151.6	Jan. 7, 1965	N	U	Unused windmill well.
	105	Pan American Oil Co.	1939	201	--	--	2,670	--	--	N	U	Seismic test.
*	201	City of Hedley well 1	1926	115	6	To	2,602	57	1926	J,E,3	P	Perforations from 98 to 112 ft. Reported discharge 30 gpm, 1926. Standby well.
*	202	City of Hedley well 2	1926	100	8	To	2,602	--	--	S,E	P	Reported discharge 30 gpm. Standby well.
*	203	City of Hedley well 3	1959	122	12	To	2,603	55.2	Jan. 6, 1965	T,E,10	P	Slotted. Reported discharge 240 gpm, standby well.
	204	City of Hedley well 4	1962	104	12	To	2,602	40.0 42.8 49.4	1962 Jan. 6, 1965 Dec. 14, 1967	T,E,5	D	Perforations from 70 to 100 ft. Gravel packed. Reported discharge 150 gpm with 70 ft drawdown. Standby well.
	205	L. D. Moore	1957	215	16	To	2,676	156.0	Feb. 16, 1961	T,G	I	Shutter screen from 67 to 215 ft. Reported discharge 400 gpm.
	206	John H. Hill	1964	200	16	To	2,701	101.1	Dec. 18, 1968	T,G,30	I	Perforated.
	207	Wilson Estate	1957	195	16	To	2,675	82.4 86.2	Feb. 16, 1961 Jan. 6, 1965	T,G,48	I	Shutter screen from 99 to 195 ft. Reported discharge 600 gpm. 1/
*	208	A. T. Simmons Estate	1922	56	6	To	2,725	--	--	N	U	Originally 80 ft deep. Gypy water. Destroyed windmill.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-11-209	--	1922	167	--	To	2,635	121.0	Aug. 25, 1949	N	U	Destroyed windmill well.
* 210	City of Hedley well 3b	1947	115	8	To	2,603	--	--	N	U	Sanded-up, destroyed public supply well.
211	--	--	--	6	To	2,710	169.4	Jan. 6, 1965	P,W	D	
212	Cap Morris Gravel Company	--	123	16	To	2,640	62.0	do.	T,G	Ind	Perforated. Used to wash gravel. Reported discharge 550 gpm.
301	Finnis L. Hill	1964	235	16	To	2,600	128.2	Dec. 18, 1967	T,G, 75	I	Shutter screen from 139 to 235 ft.
302	Harold White	1955	213	16	To	2,596	103.4 159.7	Nov. 2, 1960 Dec. 18, 1967	T,G, 75	I	Perforations from 150 to 213 ft. Pump set at 135 ft.
303	Herlie Moorman	1955	144	14	To	2,592	103.4 116.2	Nov. 2, 1960 Dec. 18, 1967	T,G, 50	I	Perforations from 104 to 144 ft. Pump set at 135 ft.
304	James George	1965	120	16	To	2,500	--	--	T,G, 50	I	Perforations from 80 to 120 ft.
305	Tom Price	1967	168	16	To	2,584	116	Oct. 1967	T,G, 75	I	Perforations from 85 to 168 ft. Pump set at 154 ft. Reported discharge 350 gpm with drawdown 16 ft in 51 hours.
306	Finnis L. Hill	1960	217	14	To	2,608	--	--	N	U	Caved-in, destroyed irrigation well. Open hole from 96 to 217 ft.
* 307	--	1942	140	5	To	2,538	--	--	N	U	Destroyed windmill well.
* 308	--	--	195	5	To	2,600	--	--	N	U	Do.
309	--	--	200	6	To	2,625	115.6	Jan. 7, 1965	P,W	D	
401	Jay W. Helms	1965	236	16	To	2,742	190.9	Nov. 20, 1967	T,G, 75	I	Slots from 131 to 236 ft. Gravel packed.
402	Baker and Higgins	1963	120	16	To	2,538	--	--	T,G, 30	I	Perforations from 45 to 120 ft. Gravel packed.
* 403	Baker and Higgins Well 279 in 1942 report	1915	196	10	To	2,750	183.6	Nov. 29, 1949	P,W	S	Reported slightly gypy.
501	F. A. Finch Estate	1963	100	16	To	2,721	--	--	T,G	I	Perforated. Gravel packed.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-12-11-502	Indian Creek Ranch	--	Spring	--	To	2,449	+	Mar. 22, 1941	Flows	S	Reported discharge 3 gpm in 1941. Flow decreases in summer.
	503	do.	--	Spring	--	To	2,420	+	do.	Flows	S	Reported discharge 3 gpm in 1941.
	504	do.	--	Spring	--	To	2,420	+	do.	Flows	S	Do.
*	505	do.	--	Spring	--	Qal	2,400	+	Mar. 21, 1941	Flows	S	Discharge 3¼ gpm, Mar. 21, 1949. Discharge 6½ gpm, May 24, 1943. Flows into pipeline for distribution.
	506	F. A. Finch Estate	--	--	--	To	2,432	--	--	T	I	Reported discharge 150 gpm, Apr. 23, 1968.
	507	A. T. Simmons Estate	1948	216	16	To	2,720	145 R	1948	N	U	Destroyed irrigation well. Reported discharge 350 gpm. Perforations from 206 to 216 ft.
*	601	--	--	186	5	To	1,670	--	--	N	U	Destroyed windmill well.
	602	Indian Creek Ranch	--	Spring	--	To	2,495	+	Mar. 21, 1941	Flows	S	Reported discharge 1 gpm in 1941. Water piped to tank.
*	603	do.	--	Spring	--	To	2,470	+	May 24, 1943	Flows	S	Reported discharge 1 gpm, May 24, 1943. Flows decreases in summer.
	604	do.	--	Spring	--	Qal	2,330	+	Mar. 22, 1941	Flows	S	Windmill raises water to pipeline. Reported discharge 2 gpm in 1941.
	605	do.	--	Spring	--	Qal	2,280	+	do.	Flows	S	Reported discharge 3 gpm in 1941. Water piped to tank.
	606	do.	--	Spring	--	To	2,400	+	Apr. 24, 1968	Flows	S	
	701	do.	--	Spring	--	To	2,460	+	do.	Flows	S	
	702	do.	--	Spring	--	Qal	2,380	+	do.	Flows	S	
	801	do.	--	Spring	--	To	2,480	+	Mar. 21, 1941	Flows	S	Reported discharge 2 gpm in 1941. Water piped to tank.
	802	do.	--	Spring	--	Qal	2,299	+	Mar. 22, 1941	Flows	S	Hole 8 ft deep. Discharge 1 gpm in 1941. Flow decreases in summer.
*	901	Troy Broome	--	Spring	--	Qal	2,220	+	May 21, 1943	Flows	S	Estimated discharge 15 to 25 gpm in 1943. Dry during dry seasons.
	902	Indian Creek Ranch	--	Spring	--	Qal	2,260	+	Apr. 24, 1968	Flows	S	
	903	Troy Broome well 1	1944	2,298	12	--	2,274	--	--	N	U	Oil test.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
JA-12-12-101	J.T. "Red" Hill	1964	155	16	To	2,508	80	--	T,G, 70	I	Shutter screen from 91 to 155 ft. Reported discharge 380 gpm with 30 ft drawdown.
102	Billy Thompson well 1	1958	180	16	To	2,585	--	--	T,G	I	Perforated.
103	Billy Thompson well 2	1959	180	16	To	2,595	--	--	T,G	I	Do.
104	Booths Ward	1964	217	16	To	2,561	152.2	Jan. 6, 1965	T,G, 70	I	Perforations from 89 to 217 ft. Reported discharge 850 gpm.
* 105	--	1919	157	--	To	2,582	148.0	Aug. 25, 1949	N	U	Destroyed windmill well. Estimated discharge 1 gpm, May 20, 1943.
* 106	--	1890	106	5	To	2,470	--	--	N	U	Destroyed windmill well.
* 107	--	1895	130	4	To	2,495	--	--	N	U	Do.
* 108	--	1949	110	6	To	2,497	71.5	Aug. 25, 1949	N	U	Do.
* 201	--	old	119	--	To	2,345	118.5	do.	P,W	S	
* 401	Donley County Water Control and Improvement District No. 1, Well 27	1952	180	12	To	2,481	97.0	Jan. 5, 1968	T,G, 30	P	Shutter screen from 125 to 175 ft. Gravel packed. Reported discharge 170 gpm with 34 ft drawdown, Dec. 1960.
* 402	Donley County Water Control and Improvement District No. 1, Well 28	1963	200	12	To	2,445	70 75.3	May 10, 1963 Jan. 8, 1968	T,G, 30	P	Shutter screen from 142 to 182 ft. Gravel packed. Reported discharge 285 gpm with 56 ft drawdown in 24 hrs. when drilled, and 206 gpm with 40 ft drawdown in 26 hrs., Jan. 8, 1968. Field conductance 550 micromhos, Jan. 8, 1968. 1/
* 403	Donley County Water Control and Improvement District No. 1 well 21	1952	165	12	To	2,426	55.0 61.0	-- Jan. 5, 1968	T,G, 30	P	Shutter screen from 110 to 160 ft. Gravel packed. Pump set at 130 ft. Reported discharge 235 gpm with 63 ft drawdown when drilled.
* 404	Donley County Water Control and Improvement District No. 1 well 18	1946	138	16	To	2,420	46.8	Jan. 5, 1968	N	U	Unused public supply well. Shutter screen from 45 to 65 ft and 108 to 138 ft. Gravel packed. Pumped 155 gpm for 8 hrs with 17 ft drawdown when drilled.
* 405	Donley County Water Control and Improvement District No. 1 well 12	1946	162	16	To	2,450	66.0 74.5	July 8, 1946 Jan. 5, 1968	T,G, 15	P	Shutter screen from 82 to 92 ft and 131 to 158 ft. Gravel packed. Pump set at 140 ft. Pumped 195 gpm for 8 hrs with 14 ft drawdown when drilled.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-12-406	Donley County Water Control and Improvement District No. 1 well 9	1944	73	16	To	2,425	44.2	Jan. 5, 1968	T,G	U	Unused public supply well. Shutter screen from 56 to 73 ft. Gravel packed.
* 407	Donley County Water Control and Improvement District No. 1	--	Spring	--	To	2,390	+	do.	Flows	P	Discharge 45 gpm, field conductance 400 micromhos, Jan. 5, 1968.
* 408	do.	--	Spring	--	To	2,355	+	do.	Flows	P	Discharge 140 gpm, field conductance 825 micromhos, Jan. 5, 1968.
* 409	--	old	105	4	To	2,470	92	July 1949	N	U	Destroyed windmill well.
* 410	--	1900	56	6	To	2,450	32 R	1943	N	U	Do.
* 411	Giles Public School	old	131	5	To	2,419	82.8	May 20, 1943	N	U	Do.
412	--	--	15	6	Qal	2,375	8.1 9.5	May 16, 1941 June 23, 1949	N	U	Sanded-up, destroyed bucket and pulley well.
* 413	Parker Spring	--	Spring	--	To	2,375	+	May 19, 1943	Flows	S	Estimated discharge 5 gpm, May 19, 1943. Flow decreases in dry seasons.
* 414	Texas State Highway Department	--	Spring	--	To	2,380	+	May 20, 1943	Flows	P	Developed in 1935. Completed by concrete pipe. Discharge estimated 3 gpm, May 20, 1943.
* 415	Donley County Water Control and Improvement District Southeast field	1907 1910	12-15	--	Qal, To	2,360	--	--	N	U	Destroyed public supply well. Field of 9 wells. Brick curbs and casings.
* 416	Fort Worth and Denver City Railroad-Giles Station	1947	235	10	To	2,392	--	--	N	U	Destroyed industrial well. Perforated 96 to 231 ft, gravel packed. Supplied boiler.
* 417	do.	old	12	--	Qal	2,378	6.8	May 19, 1943	N	U	Destroyed industrial well. Supplied boiler.
* 418	Donley County Water Control and Improvement District Northwest field	1930-1940	12-18	--	Qal, To	2,410	--	--	N	U	Destroyed public supply well. Field of 16 wells. Brick curbs and casing.
* 419	Donley County Water Control and Improvement District Southwest field	--	15-25	40-60	Qal, To	2,360	--	--	N	U	Destroyed public supply well. Dug well. Field of 15 wells.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
							BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
* JA-12-12-420	--	1941	32	--	To	2,398	--	--	N	U	WPA test hole 299. Open hole. 4/
421	Texas State Highway Department	--	9	--	To	2,382	0.4	Apr. 17, 1941	N	U	Destroyed public supply well.
* 422	Donley County Water Control and Improvement District No. 1	1945	43	16	To	2,545	11.0	June 21, 1945	N	U	Destroyed public supply well. Shutter screen from 10 to 40 ft. Gravel packed. Pumped 20 gpm for 8 hrs with 24 ft drawdown, July 24, 1945.
* 501	Buck Creek Spring	--	Spring	--	Qal	2,360	+	May 20, 1943	Flows	S	Estimated discharge 5 gpm, May 20, 1943.
* 502	--	--	100	6	Pw	2,362	84.6	May 17, 1941	P,W	S	High mineral content. Pipes covered with crystals.
* 503	--	1905	148	6	To	2,416	--	--	P,W	S	Bitter taste. Brown precipitate on discharge pipe.
504	--	--	38	--	Pw	2,362	33.2 33.4	Apr. 17, 1941 July 24, 1949	N	U	Destroyed hand well.
* 505	--	1941	47	--	Qal	2,250	30.4	Apr. 15, 1941	N	U	WPA test hole 309. Open hole. 4/
506	--	1925	13	36	Qal	2,378	7.9	Apr. 16, 1941	N	U	Destroyed hand well. Dug well.
* 701	Troy Broome	--	35	6	Pw	2,220	--	--	N	U	Destroyed windmill well. Brown precipitate on pipes.
* 702	--	old	135	5	To	2,290	--	--	--	U	Caved-in, destroyed windmill well.
* 703	--	1900	88	5	Qal	2,265	40.1	May 21, 1943	N	U	Destroyed windmill well.
* 704	Reed Estate	--	71	7	Qal	2,165	40.2	Oct. 15, 1943	P,W	S	
801	Ace Gailey well 2	1958	120	12	Qal	2,165	--	--	T,G, 60	I	Perforated.
802	Ace Gailey well 1	1956	120	12	Qal	2,182	--	--	T,G, 20	I	Do.
803	--	--	174	5	Qal	2,225	125.8	Apr. 17, 1941	P,W	S	
* 804	--	1915	76	5	Qal	2,231	68.5	do.	N	U	Destroyed windmill well.
805	--	1948	75	--	Qal	2,228	64.9	June 24, 1949	P,W	S	
* 806	Hendrick Estate	--	57	6	Qal	2,160	33.6	Sept. 20, 1943	P,W	S	
* 807	Hendrick Estate well E	1943	105	4	Qal	2,159	43	Oct. 2, 1943	N	U	City of Memphis test hole.

See footnotes at end of table.

Table 7.--Records of Wells, Test Holes, and Springs--Continued

	WELL	OWNER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN)	WATER BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
	JA-12-12-808	--	--	65	36	Qal	2,152	52.5	Oct. 14, 1943	N	U	Destroyed hand and piston well.
*	809	--	--	54	36	Qal	2,176	48.7	Oct. 15, 1943	N	U	Destroyed windmill well.
*	810	--	--	45	6	Qal	2,220	--	--	N	U	Destroyed windmill well. Brown precipitate on pipes.
*	20-201	Seth Thompson well A	1943	147	6	Qal	2,142	49	May 1943	--	U	City of Memphis test hole.

* For chemical analyses of water from springs, test holes, and wells, see Table 9.
1/ For driller's logs of test holes and wells, see Table 8.
2/ For electric logs of test holes, see files of Texas Water Development Board or U.S. Geological Survey, Austin, Texas.
3/ For multiple water levels in wells, see Table 4.
4/ Logs of test holes drilled by the Works Progress Administration are given in Christian's report (1942).

Table 8.—Drillers' Logs of Wells and Test Holes

Well JA-05-49-901

Owner: J. R. Godby
Driller: L. P. Moore Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Surface	4	4
Clay, hard, brown	31	35
Sand, brown, water	4	39
Caliche, brown	52	91
Clay, light	26	117
Sand and gravel, water	9	126
Clay, hard, pink	23	149
Red bed	5	154

Well JA-05-57-602

Owner: William M. Porter
Driller: L. P. Moore Drilling Co.

Surface	3	3
Sand, red, and clay	5	8
Caliche	18	26
Caliche and sand, mixed	19	45
Water, sand, good	4	49
Clay, light, and sand	8	57
Water sand	22	79
Clay, pink, and sand	31	110
Red beds	2	112

Well JA-05-59-702

Owner: Pan American Oil Co.
Driller: —

Surface	4	4
Clay, sandy	15	19
Sand and gravel	13	32
Clay, sandy, and red sand	38	70
Red beds	12	82
Gypsum	8	90
Red beds	92	182
Gypsum	8	190

Well JA-06-56-803

Owner: Melvin Asberry Well 1
Driller: Green Machinery Co., Inc.

Top soil	4	4

Well JA-06-56-803—Continued

Caliche and clay	21	25
Clay	15	40
Sandrock, streaks of fine sand and layers of sandy clay	85	125
Sand, loose, fine, and sand rock	50	175
Sand, loose, coarse and fine gravel	40	215
Clay, sandy, and sand rock	60	275
Sandrock and streaks of fine sand	15	290
Clay, sandy, sandrock, and streaks of fine, loose sand	25	315
Sand, loose, fine, sandrock, and streaks of clay	80	395
Sand, loose, coarse, and fine gravel	190	585
Shale and rock	25	610
Red beds and rock layers	10	620

Well JA-06-64-505

Owner: Warren Hardin
Driller: Green Machinery Co., Inc.

Top soil	4	4
Caliche	14	18
Rock	23	41
Clay	22	63
Sand	13	76
Clay	9	85
Clay, sandy	27	112
Sand	13	125
Clay	4	129
Sand	9	138
Clay	12	150
Clay, sandy	12	162
Sand, red	36	198
Clay	11	209
Sand and gravel	114	323
Red beds	3	326

Well JA-11-08-305

Owner: J. B. Lane
Driller: Green Machinery Co., Inc.

Top soil	3	3

Table 8.—Drillers' Logs of Wells and Test Holes—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well JA-11-08-305—Continued		
Caliche and clay	4	7
Sand, light, and sandrock	8	15
Sand, loose, coarse, and gravel, fine	25	40
Clay, sandy, and sandrock	118	158
Sand, loose, medium, and gravel	38	196
Gravel	3	199
Red beds	3	202
Well JA-12-01-605		
Owner: City of Clarendon Well 2 Driller: —		
Surface soil	4	4
Sand and clay	46	50
Sand	4	54
Clay and caliche	26	80
Water sand	5	85
Clay	23	108
Sand and silt	12	120
Sand, coarse, and gravel	2	122
Red beds	180	302
Well JA-12-02-501		
Owner: Frank Hardin Driller: Green Machinery Co., Inc.		
Top soil and sand	10	10
Clay	20	30
Sand, loose, fine	15	45
Clay and rock ledges	7	52
Sand, loose, fine, and gravel, small	16	68
Clay, sandy, and rock ledges	17	85
Sand, loose, medium coarse, and gravel	15	100
Clay and sandrock ledges	6	106
Clay, blue	9	115
Clay, white, sandy, and sandrock ledges	20	135
Gravel, packed, coarse	7	142
Clay, sandy, and sandrock	23	165
Sand, light, coarse, and gravel	8	173

	THICKNESS (FEET)	DEPTH (FEET)
Well JA-12-02-501—Continued		
Sand, coarse, gravel with layers of sandrock	26	199
Rock	4	203
Sand, loose, coarse, and gravel	27	230
Clay and sandrock	7	237
Sand, loose, coarse, and gravel	26	263
Red beds	3	266
Well JA-12-03-502		
Owner: J. R. Hall Well 3 Driller: Green Machinery Co., Inc.		
Top soil	3	3
Sand, loose, medium, and rock	45	48
Sand, loose, medium, and gravel	7	55
Clay	7	62
Sand, loose, medium, and gravel	38	100
Clay	4	104
Sand, loose, medium, and gravel	16	120
Clay	12	132
Sand, loose, coarse, and gravel	5	137
Red beds	8	145
Well JA-12-04-202		
Owner: W. H. (Bill) Cook Well 2 Driller: Green Machinery Co., Inc.		
Top soil	5	5
Clay, sandy	8	13
Sand and gravel	24	37
Clay, gray	3	40
Gravel	21	61
Clay, red	4	65
Sand and gravel	11	76
Clay, red	2	78
Sand and gravel	14	92
Red beds	3	95
Well JA-12-10-301		
Owner: Gerald Noble Driller: Green Machinery Co., Inc.		
Sand and top soil	12	12
Clay	8	20

Table 8.—Drillers' Logs of Wells and Test Holes—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well JA-12-10-301—Continued		
Sand, loose, fine	15	35
Clay	13	48
Sand, loose, medium coarse, and sandrock	14	62
Clay	9	71
Sand, loose, coarse, and gravel	20	91
Clay, red and blue	8	99
Sand, loose, coarse, and gravel	17	116
Rock	2	118
Red beds and blue clay	10	128
Well JA-12-11-207		
Owner: Wilson Estate Driller: Green Machinery Co., Inc.		
Top soil	10	10
Gravel	28	38
Clay	24	62
Gravel	14	76
Clay and sand streaks	42	118
Sand and gravel	24	142
Clay and sand streaks	34	176
Well JA-12-11-207—Continued		
Sand and some gravel	12	188
Red beds and clay	7	195
Well JA-12-12-402		
Owner: Donley County Water Control and Improvement District No. 1, Well 8 Driller: Layne-Texas Co.		
Surface soil	4	4
Sand, rock, and boulders	3	7
Clay, caliche, and sand	35	42
Clay, sandy, and caliche	22	64
Clay, brown	28	92
Clay, soft and sandy	8	100
Sand, coarse, and gravel	14	114
Clay, grayish brown	15	129
Clay, soft yellow, sandy	5	134
Sand, coarse, and small gravel	20	154
Sand, loose, and gravel	26	180
Sand, hard cemented, and gravel	2	182
Red beds	18	200

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs

Water-bearing unit: Pw, Whitehorse Group; Qal, Alluvium; To, Ogallala Formation.

(Analyses given are in milligrams per liter except specific conductance, percent sodium, SAR, RSC, and pH.)

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-05-49-503	360	To	May 7, 1942	--	--	46	23	* 12	--	262	10	6.0	--	3.0	--	229	209	--	--	--	--	--
701	220	To	do.	--	--	56	17	* 9.4	--	256	7.0	5.5	1.6	--	--	225	211	--	--	--	--	--
702	227	To	June 11, 1941	--	--	40	7.1	* 18	--	189	5.0	5.0	.6	--	--	169	129	--	--	--	--	--
903	220	To	Sept. 7, 1949	26	--	56	11	5.3	--	207	8.6	9.0	--	5.8	--	226	185	--	--	--	378	5.8
50-401	--	To	May 18, 1968	29	--	56	18	13	3.8	257	11	15	.8	2.4	--	275	214	11	0.4	0.00	462	8.0
501	200	To	May 7, 1942	--	--	67	18	* 2.5	--	214	25	31	--	--	--	251	241	--	--	--	--	--
502	155	To	May 18, 1968	27	--	67	12	20	4.0	248	23	28	.5	4.6	--	308	216	16	.6	.00	524	7.5
901	178	To	Sept. 21, 1949	28	--	70	4.0	* 18	--	256	9.1	8.0	--	.8	--	264	191	--	--	--	429	7.8
905	120	To	May 18, 1968	22	--	42	9.3	48	1.9	248	13	12	1.1	15	--	286	143	42	1.7	1.20	479	7.6
51-708	Spring	To	Mar. 6, 1968	24	--	70	9.1	24	1.7	258	20	19	.8	.0	--	296	212	20	.7	.00	480	7.4
711	--	To	Sept. 21, 1949	28	--	62	8.1	15	--	227	14	11	.8	1.8	0.17	252	188	--	--	--	414	7.9
712	--	To	May 6, 1942	--	--	55	8.0	* 16	--	232	5.0	5.0	.6	--	--	206	170	--	--	--	--	--
713	127	Pw	Sept. 21, 1949	44	--	588	61	* 74	--	99	1,600	94	--	1.5	--	2,510	1,720	--	--	--	2,650	7.7
52-701	--	Qal	May 6, 1942	--	--	86	15	* .7	--	256	59	5.5	--	--	--	293	279	--	--	--	--	--
57-201	--	To	July 29, 1949	30	--	68	6.3	* 20	--	234	17	20	--	1.0	--	299	196	--	--	--	484	8.0
301	165	To	Aug. 23, 1949	36	--	58	26	* 12	--	302	12	11	--	1.0	--	305	252	--	--	--	518	8.1
402	115	To	Nov. 30, 1949	32	--	53	18	* 14	--	249	19	6.2	--	3.8	--	268	206	--	--	--	422	8.0
501	74	To	May 27, 1941	--	--	34	16	* 23	--	207	12	12	--	--	--	199	150	--	--	--	--	--
502	136	To	Sept. 21, 1949	24	--	60	16	14	--	224	11	34	.8	.5	.05	277	216	--	--	--	474	8.1
504	132	To	May 27, 1941	--	--	50	22	* 29	--	250	51	12	1.0	--	--	288	213	--	--	--	--	--
604	123-152	To	Apr. 10, 1968	25	--	80	12	93	4.0	300	110	34	1.8	53	.17	561	249	44	2.6	.00	864	7.7
605	--	To	May 7, 1942	--	--	66	12	* 27	--	244	30	28	.4	--	--	283	212	--	--	--	--	--
606	130	To	Mar. 8, 1941	--	--	56	20	* 28	--	244	39	28	.7	--	--	292	222	--	--	--	--	--
802	82	To	May 1, 1942	--	--	60	6.8	* 13	--	207	11	9.0	--	--	--	218	179	--	--	--	--	--
901	101-130	To	Oct. 4, 1967	30	--	162	29	130	5.2	228	352	160	.5	22	--	1,100	524	35	2.5	.00	1,460	8.0
905	221	To	Sept. 7, 1949	36	--	146	39	*118	--	194	202	286	--	12	--	935	525	--	--	--	1,550	7.8
906	Spring	To	Mar. 4, 1941	--	--	70	19	* 42	--	214	51	80	.6	--	--	368	252	--	--	--	--	--
1/ 909	100	To	May 7, 1968	--	0.06	162	28	136	--	221	389	162	.8	20	--	1,120	520	--	--	--	1,892	7.5
58-301	40-50	To	Jan. 4, 1968	--	--	--	--	--	--	278	194	188	--	--	--	--	546	--	--	.00	1,350	7.2
501	25	To	Sept. 7, 1949	31	--	51	16	* 17	--	220	17	14	--	1.8	--	268	193	--	--	--	428	8.4
59-101	30-50	To	Jan. 4, 1968	27	--	222	18	54	1.3	170	144	310	.4	22	--	883	628	16	.9	.00	1,520	7.2
108	120	To	May 6, 1942	--	--	105	10	* 16	--	238	20	88	--	--	--	356	306	--	--	--	--	--

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-05-59-301	--	To	May 6, 1942	--	--	48	21	* 13	--	244	11	16	--	--	--	232	208	--	--	--	--	--
401	120	To	Sept. 28, 1967	25	--	65	7.9	47	2.0	256	30	14	0.6	42	--	360	194	34	1.5	0.31	559	7.8
402	125-140	To	do.	26	--	83	15	38	2.0	230	118	24	.6	8.7	--	428	268	23	1.0	.00	656	7.4
403	86-93	To	Sept. 29, 1967	27	--	137	12	90	3.5	341	165	53	.3	70	--	726	392	33	2.0	.00	1,080	7.1
407	--	To	May 6, 1942	--	--	66	5.6	* 50	--	275	41	17	.8	--	--	318	188	--	--	--	--	--
60-102	--	To	do.	--	--	156	97	* 24	--	275	462	94	.0	--	--	971	790	--	--	--	--	--
401	7	Qal	Sept. 21, 1949	34	--	408	121	* 77	--	222	1,380	46	--	.0	--	2,180	1,520	--	--	--	2,420	7.9
701	45	Qal	May 6, 1942	--	--	650	196	*151	--	128	2,310	173	.0	--	--	3,547	2,431	--	--	--	--	--
801	--	Pw	do.	--	--	606	89	* 72	--	55	1,884	16	1.2	--	--	2,700	1,880	--	--	--	--	--
06-56-501	300	To	Sept. 7, 1949	32	--	27	24	* 18	--	127	14	6.0	--	4.2	--	251	166	--	--	--	406	8.2
801	300	To	June 4, 1941	--	--	45	18	* 15	--	232	12	10	.6	--	--	221	186	--	--	--	--	--
901	300	To	Sept. 7, 1949	34	--	45	13	* 23	--	229	9.2	11	--	4.8	--	261	166	--	--	--	407	7.8
64-506	85	To	Sept. 28, 1949	28	--	88	16	* 63	--	254	102	66	.6	19	--	520	286	--	--	--	830	8.0
807	105	To	Apr. 2, 1941	--	--	82	14	* 21	--	262	39	38	--	--	--	323	264	--	--	--	--	--
809	--	To	May 5, 1942	--	--	59	18	* 6.2	--	220	7.0	14	--	34	--	246	221	--	--	--	--	--
810	--	To	do.	--	--	66	--	* 20	--	238	8.0	9.5	.4	--	--	227	177	--	--	--	--	--
902	78-174	To	Apr. 10, 1968	29	--	66	9.5	46	2.6	225	50	38	.5	12	0.09	365	204	33	1.4	.00	596	7.5
904	--	To	May 5, 1942	--	--	96	6.8	* 47	--	299	59	44	.1	--	--	402	269	--	--	--	--	--
11-08-201	207	To	Aug. 25, 1949	39	--	28	12	* 26	--	152	15	20	--	7.5	--	222	119	--	--	--	353	7.9
301	75-150	To	do.	38	--	20	11	* 35	--	162	20	12	--	4.2	--	220	95	--	--	--	358	7.9
308	55-166	To	Apr. 10, 1968	28	--	67	7.3	40	3.0	294	20	8.3	.5	12	.05	331	197	30	1.2	.88	535	7.4
310	62	To	May 5, 1942	--	--	116	3.2	* 44	--	293	20	24	--	127	--	302	--	--	--	--	--	--
501	69	To	Sept. 7, 1949	28	--	52	14	* 13	--	219	11	12	--	9.3	--	252	187	--	--	--	412	7.9
603	144	To	do.	30	--	69	8.7	* 37	--	234	52	20	--	19	--	351	208	--	--	--	544	7.9
901	34	Pw	Mar. 25, 1968	11	--	555	143	154	6.2	35	2,050	112	.4	1.7	--	3,050	1,970	14	1.5	.00	3,300	6.9
16-201	10	Qal	Mar. 26, 1968	26	--	608	68	98	4.7	126	1,590	208	.7	.4	--	2,670	1,800	11	1.0	.00	3,020	7.3
301	98	Pw	Mar. 25, 1968	10	--	545	161	192	8.2	35	2,170	118	.2	2.5	--	3,220	2,020	17	1.9	.00	3,470	7.0
501	140	Pw	Mar. 27, 1968	47	--	545	150	33	4.1	82	1,790	106	.8	2.7	--	2,720	1,980	4	.3	.00	2,910	7.2
504	156	Pw	Sept. 7, 1949	39	--	526	142	* 61	--	89	1,790	64	--	3.8	--	2,670	1,900	--	--	--	2,810	7.7
602	10	Qal	do.	42	--	356	82	*165	--	201	1,300	45	--	3.8	--	2,090	1,230	--	--	--	2,310	7.8
602	10	Qal	Mar. 25, 1968	38	--	378	130	66	2.7	192	1,360	38	.8	.3	--	2,110	1,480	9	.7	.00	2,370	7.6
801	--	Pw	do.	51	--	495	94	13	3.0	140	1,470	12	.2	2.3	--	2,210	1,620	2	.1	.00	2,350	7.2
802	80	Pw	do.	58	--	600	97	25	3.2	152	1,700	14	.4	8.8	--	2,580	1,900	3	.2	.00	2,660	7.3
901	31	Qal	do.	41	--	295	75	27	3.2	156	940	14	.8	2.5	--	1,480	1,040	5	.4	.00	1,720	7.2

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-12-01-102	88	To	Aug. 25, 1949	39	--	107	14	*128	--	144	209	184	--	17	--	806	324	--	--	--	1,260	7.7
118	48-144	To	Apr. 11, 1968	29	--	68	11	43	2.6	282	38	14	0.5	14	0.08	359	214	30	1.3	0.33	578	7.7
130	115	To	May 5, 1942	--	--	53	8.0	* 54	--	275	26	10	--	20	--	306	165	--	--	--	--	--
216	72	To	do.	--	--	68	13	* 72	--	317	48	38	--	--	--	414	223	--	--	--	--	--
217	28	To	May 1, 1942	--	--	70	26	* 63	--	288	36	58	--	78	--	473	282	--	--	--	--	--
305	38-108	To	Apr. 10, 1968	29	--	69	22	25	4.0	244	60	38	.6	4.5	.07	372	262	17	.7	.00	615	7.6
314	--	To	May 9, 1942	--	--	77	17	* 32	--	293	48	28	.4	--	--	346	260	--	--	--	--	--
315	144	To	Sept. 7, 1949	25	--	64	15	* 16	--	235	27	23	.6	2.0	--	291	221	--	--	--	485	7.7
317	87	To	May 1, 1942	--	--	94	13	* 14	--	220	48	60	.5	--	--	342	288	--	--	--	--	--
401	160	To	May 4, 1942	--	--	72	14	* 19	--	244	30	33	--	--	--	291	239	--	--	--	--	--
404	190	To	do.	--	--	80	15	* 16	--	220	22	65	--	--	--	311	264	--	--	--	--	--
507	76	To	May 1, 1942	--	--	92	11	* 8.5	--	250	44	26	--	--	--	315	277	--	--	--	--	--
508	200	To	May 4, 1942	--	--	70	13	* 13	--	250	33	11	--	--	--	266	228	--	--	--	--	--
511	130	To	do.	--	--	54	6.8	* 60	--	256	30	36	.3	--	--	314	164	--	--	--	--	--
† 12-01-601 602,603,605, 606,607,608	--	To	May 1964	--	0.04	92	9.0	20	--	221	29	30	.2	33	--	483	268	--	--	--	651	7.5
1/ 601	142-202	To	June 1946	29	.10	84	16	17	--	210	46	32	.1	13	--	390	276	--	--	--	--	7.8
603	240	To	Feb. 17, 1941	--	--	83	6.6	* 30	--	268	27	27	.2	--	--	323	234	--	--	--	--	--
1/ 603	240	To	Jan. 1944	48	.45	95	9.0	4.0	--	208	26	34	.4	18	--	370	274	--	--	--	--	7.2
603	240	To	Jan. 3, 1968	29	.13	89	8.9	18	2.4	260	25	31	.1	20	.03	351	258	13	.5	.00	568	7.3
1/ 604	145-165	To	June 1946	27	.08	94	12	20	--	210	45	43	.1	12	--	404	284	--	--	--	--	7.8
605	108-122	To	Feb. 17, 1941	--	--	71	9.2	* 14	--	238	13	15	.0	20	--	259	216	--	--	--	--	--
1/ 605	108-122	To	Jan. 1944	35	.02	93	6.0	6.0	--	230	14	18	.4	16	--	319	257	--	--	--	--	7.3
1/ 606	175-185	To	June 1951	94	2.6	61	12	205	--	300	210	82	.2	16	--	850	202	--	--	--	--	7.4
1/ 606	175-185	To	Oct. 1959	--	.12	87	11	18	--	242	21	25	.1	8.0	--	351	263	--	--	--	585	7.4
607	102	To	Nov. 17, 1960	32	.04	80	7.4	24	2.4	272	24	15	.3	18	--	342	230	18	.7	--	540	7.3
618	--	To	May 9, 1942	--	--	79	8.0	* 23	--	293	7	16	--	--	--	289	230	--	--	--	--	--
619	135	To	June 10, 1949	46	--	114	11	* 56	--	264	79	104	--	8.3	--	585	330	--	--	--	899	8.0
620	138	To	May 13, 1968	26	--	76	6.8	28	2.1	224	29	36	.3	14	.05	328	218	22	.8	.00	551	7.5
622	80-162	To	do.	26	--	98	12	35	2.0	198	78	86	.3	4.7	.05	439	294	20	.9	.00	746	7.2
803	200	To	May 4, 1942	--	--	64	14	* 18	--	220	26	35	--	--	--	269	219	--	--	--	--	--
804	219	To	May 8, 1942	--	--	108	21	* 7.7	--	177	59	115	.2	--	--	405	358	--	--	--	--	--
903	94-190	To	Apr. 17, 1968	27	--	77	7.6	30	2.4	222	51	27	.3	17	.05	348	224	22	.9	.00	558	7.1
907	--	To	May 9, 1942	--	--	56	9.0	* 25	--	220	23	17	--	--	--	241	176	--	--	--	--	--

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-12-01-909	220	To	May 8, 1942	--	--	69	9.2	* 33.5	--	214	26	10	0.1	--	--	225	211	--	--	--	--	--
02-104	52	To	May 9, 1941	--	--	--	--	--	--	262	31	6.0	--	--	--	268	--	--	--	--	--	--
206	101	To	May 28, 1941	--	--	74	16	* 20	--	275	23	31	.3	--	--	299	250	--	--	--	--	--
301	100	To	Sept. 29, 1967	55	--	51	14	41	3.0	284	19	10	.3	10	--	343	184	32	1.3	0.96	504	7.6
304	Spring	To	Jan. 4, 1968	--	--	--	--	--	--	265	47	32	--	--	--	--	255	--	--	.00	596	7.8
305	90	To	Aug. 24, 1949	42	--	66	6.3	* 30	--	276	10	12	--	3.8	--	308	190	--	--	--	490	8.0
401	69	To	do.	32	--	103	7.6	* 93	--	276	162	54	--	25	--	632	288	--	--	--	961	8.0
405	68-98	To	Sept. 28, 1967	30	--	84	7.8	32	1.8	278	22	19	.4	38	0.02	372	242	22	.9	.00	588	7.3
511	96	To	Nov. 29, 1949	37	--	105	8.5	* 46	--	283	110	32	--	6.3	--	488	297	--	--	--	696	7.9
601	55	To	July 29, 1949	29	--	73	9.4	* 55	--	295	31	18	--	50	--	416	220	--	--	--	657	7.7
607	--	To	Apr. 12, 1968	32	--	79	12	29	3.0	284	29	22	.3	16	.06	362	246	20	.8	.00	578	7.5
707	108	To	Sept. 7, 1949	32	--	82	7.6	* 34	--	256	23	34	--	33	--	390	236	--	--	--	620	7.9
805	32	To	Feb. 19, 1941	--	--	108	12	* 57	--	366	39	24	--	82	--	502	317	--	--	--	--	--
806	75	To	May 10, 1941	--	--	138	5.8	* 92	--	250	144	152	--	--	--	655	369	--	--	--	--	--
807	57	To	do.	--	--	--	--	--	--	195	27	21	--	--	--	231	--	--	--	--	--	--
808	32	To	Apr. 21, 1941	--	--	35	26	*116	--	415	51	32	3.6	--	--	468	196	--	--	--	--	--
809	38	To	do.	--	--	154	20	*158	--	232	260	248	--	--	--	954	468	--	--	--	--	--
916	30	To	Feb. 19, 1941	--	--	72	13	* 29	--	275	31	28	.2	--	--	308	233	--	--	--	--	--
918	100	Pw	May 7, 1941	--	--	310	29	*130	--	311	525	240	.0	43	--	1,430	893	--	--	--	--	--
919	22	To	do.	--	--	--	--	--	--	305	31	19	--	--	--	324	--	--	--	--	--	--
921	21	To	do.	--	--	--	--	--	--	268	25	7.0	--	--	--	266	--	--	--	--	--	--
922	19	To	May 8, 1941	--	--	199	25	* 87	--	323	237	163	.2	60	--	930	601	--	--	--	--	--
923	60	To	Feb. 19, 1941	--	--	72	14	* 13	--	256	27	20	.2	--	--	272	239	--	--	--	--	--
924	--	To	May 7, 1941	--	--	24	30	* 9.7	--	226	13	4.0	--	--	--	192	183	--	--	--	--	--
926	26	Qal	do.	--	--	406	102	*329	--	427	750	720	.7	--	--	2,518	1,433	--	--	--	--	--
927	17	Qal	do.	--	--	141	25	*101	--	464	124	110	--	--	--	741	455	--	--	--	--	--
03-103	Spring	To	Dec. 29, 1967	--	--	--	--	--	--	300	24	11	--	--	--	--	228	--	--	.36	526	7.5
108	100	To	May 28, 1941	--	--	--	--	--	--	244	20	16	--	--	--	253	--	--	--	--	--	--
202	89-109	To	May 12, 1941	--	--	57	12	* 11	--	207	31	10	.3	20	--	223	192	--	--	--	--	--
205	58	To	May 16, 1941	--	--	57	3.4	* 46	--	195	27	48	.4	--	--	277	157	--	--	--	--	--
401	52-120	To	Apr. 12, 1968	33	--	89	11	34	2.5	314	24	14	.4	41	.03	403	267	22	.9	.00	626	7.5
404	73	To	July 29, 1949	36	--	86	14	* 49	--	327	41	35	--	24	--	453	272	--	--	--	738	7.6
407	136	Pw	Aug. 24, 1949	34	--	446	64	* 42	--	43	1,340	25	1.2	2.0	--	1,980	1,380	--	--	--	2,180	7.8
409	--	To	July 29, 1949	33	--	70	12	* 36	--	283	33	20	--	8.8	--	360	224	--	--	--	588	7.7

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-12-03-506	120	To	May 13, 1941	--	--	57	12	* 11	--	207	31	10	0.3	--	--	223	192	--	--	--	--	--
603	130	To	May 16, 1941	--	--	80	14	* 33	--	220	132	10	.0	--	--	377	259	--	--	--	--	--
1/ 708	51-91	Qal	June 27, 1966	--	--	190	31	27	--	207	384	54	.4	12	--	910	600	--	--	--	1,472	7.5
1/ 709	62-102	Qal	do.	--	--	146	17	35	--	239	182	73	.3	16	--	710	434	--	--	--	1,100	7.4
1/ 710	55-135	Qal	do.	--	0.04	196	32	27	--	206	401	49	.5	11	--	920	620	--	--	--	1,520	7.4
712	56	To	July 29, 1949	34	--	56	11	* 66	--	240	85	19	--	17	--	412	182	--	--	--	616	8.1
713	--	To	do.	28	--	90	9.4	* 35	--	237	39	50	--	22	--	431	263	--	--	--	683	8.5
801	152	To	Aug. 24, 1949	38	--	75	8.5	* 15	--	268	11	10	--	12	--	314	222	--	--	--	508	8.0
04-101	66	To	do.	39	--	42	25	* 18	--	184	50	30	--	2.0	--	305	208	--	--	--	482	7.9
501	95	To	do.	54	--	114	13	* 72	--	294	111	80	.0	32	--	668	338	--	--	--	981	7.9
603	--	To	May 15, 1941	--	--	--	--	--	--	256	25	38	--	--	--	305	--	--	--	--	--	--
09-102	100	To	Sept. 7, 1949	26	--	61	10	5.9	--	200	25	11	--	1.2	--	238	193	--	--	--	398	7.7
301	154	To	Dec. 19, 1967	--	--	--	--	--	--	272	45	41	--	--	--	--	270	--	--	--	630	7.9
2/ 302	228-238	To	Jan. 11, 1968	--	--	75	13	26	3.0	170	75	54	.4	--	--	451	240	--	--	--	--	7.6
302	228-238	To	Jan. 18, 1968	26	.12	110	9.2	22	2.3	236	78	57	.2	8.5	0.03	429	312	13	0.5	0.00	703	7.4
402	157	Pw	Mar. 19, 1968	23	--	550	186	87	5.2	92	2,090	62	.4	1.9	--	3,050	2,140	8	.8	.00	3,200	7.1
601	45	Pw	Dec. 19, 1967	--	--	--	--	--	--	49	1,810	23	--	--	--	--	1,900	--	--	.00	2,680	--
602	--	Pw	do.	--	--	--	--	--	--	115	1,560	6.0	--	--	--	--	1,780	--	--	.00	2,410	--
701	20	Qal	Mar. 19, 1968	25	--	532	112	189	5.5	162	1,620	282	.7	1.1	--	2,850	1,790	19	1.9	.00	3,350	7.1
901	--	Pw	Dec. 19, 1967	--	--	--	--	--	--	304	1,590	6.5	--	--	--	--	1,940	--	--	.00	2,610	7.4
902	--	Pw	do.	24	--	580	146	30	3.7	98	1,860	47	.4	5.0	--	2,740	2,050	3	.3	.00	2,800	7.6
905	42	Pw	May 8, 1942	--	--	594	177	*103	--	183	2,151	32	.7	--	--	3,148	2,214	--	--	--	--	--
10-104	255	To	Dec. 19, 1967	26	--	65	4.8	14	1.6	185	23	25	.3	1.2	--	252	182	14	.5	.00	406	7.7
109	227	To	May 16, 1968	28	--	77	9.6		32	250	44	29	.4	16	.05	362	232	23	.9	.00	613	7.3
110	--	To	Apr. 3, 1941	--	--	64	6.8	* 11	--	232	10	8.0	--	--	--	214	189	--	--	--	--	--
111	--	To	May 8, 1942	--	--	58	5.6	* 3.2	--	171	15	14	--	--	--	180	168	--	--	--	--	--
112	190	To	do.	--	--	56	11	* 56	--	256	30	46	.4	--	--	328	187	--	--	--	--	--
204	95	To	Aug. 25, 1949	24	--	36	6.6	* 56	--	160	37	24	--	45	--	328	117	--	--	--	616	7.8
205	112	To	May 8, 1942	--	--	88	5.6	* 89	--	299	100	61	.3	--	--	491	243	--	--	--	--	--
312	57	To	May 7, 1941	--	--	--	--	--	--	256	14	10	--	--	--	245	--	--	--	--	--	--
401	137	To	Aug. 25, 1949	26	--	56	7.2	* 11	--	204	13	8.0	1.0	--	--	223	169	--	--	--	376	7.9
402	Spring	To	Dec. 19, 1967	23	--	80	7.8	18	3.6	252	12	36	.5	.2	--	305	232	14	.5	.00	507	7.8
605	Spring	To	Mar. 5, 1968	27	--	75	5.8	26	1.8	242	21	17	.2	24	--	317	211	21	.8	.00	499	7.4
611	132	To	Aug. 5, 1949	24	--	84	7.0	9.2	--	212	9.6	17	--	62	--	338	238	--	--	--	521	7.9

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
								Na	K													
JA-12-10-701	54	Pw	Dec. 21, 1967	--	--	--	--	--	--	172	1,800	16	--	--	--	--	2,070	--	--	0.00	2,760	7.4
11-102	193	To	Aug. 25, 1949	32	--	84	4.4	* 50	--	314	32	31	--	3.2	--	392	228	--	--	--	640	8.0
† 11-201 and 202	--	To	Mar. 1955	--	0.05	57	15	60	--	255	31	18	1.2	27	--	378	204	--	--	--	--	7.7
201	98-112	To	Dec. 13, 1960	30	.00	68	7.8	51	1.8	307	26	11	1.5	27	0.06	375	202	35	1.6	--	602	7.2
202	100	To	June 13, 1941	--	--	--	--	--	--	329	35	12	--	--	--	338	--	--	--	--	--	--
202	100	To	May 19, 1943	13	.15	72	9.5	* 53	--	320	31	13	1.6	20	--	383	218	--	--	--	--	8.4
203	122	To	Dec. 14, 1967	28	.01	64	6.8	39	1.8	268	18	7.8	1.0	26	.04	324	188	31	1.2	.64	515	7.7
208	56	To	May 19, 1943	--	--	95	21	*114	--	329	122	92	--	57	--	663	324	--	--	--	--	--
209	167	To	Aug. 25, 1949	32	--	66	19	1.3	--	226	11	20	--	25	--	305	243	--	--	--	513	8.0
210	115	To	Apr. 26, 1948	31	.05	70	9.2	50	3.2	309	28	14	1.4	24	.22	381	212	--	--	--	600	7.7
307	140	To	May 24, 1943	--	--	--	--	--	--	268	27	13	--	--	--	--	--	--	--	--	--	--
308	195	To	do.	--	--	74	7.1	* 42	--	270	45	17	--	14	--	332	214	--	--	--	--	--
403	196	To	Nov. 29, 1949	29	--	76	6.3	* 22	--	248	26	23	--	1.8	--	308	216	--	--	--	495	7.6
505	Spring	Qal	Mar. 21, 1941	--	--	55	--	* 30	--	226	12	9.0	.4	--	--	219	146	--	--	--	--	--
505	Spring	Qal	May 24, 1943	--	--	62	5.9	* 23	--	232	21	11	--	1.0	--	238	179	--	--	--	--	--
601	186	To	do.	--	--	--	--	--	--	252	75	9.0	--	--	--	--	--	--	--	--	--	--
603	Spring	To	do.	--	--	--	--	--	--	218	8.0	8.0	--	--	--	--	--	--	--	--	--	--
901	Spring	Qal	May 21, 1943	--	--	--	--	--	--	182	3,000	57	--	--	--	--	--	--	--	--	--	--
12-105	157	To	Aug. 25, 1949	38	--	84	23	* 16	--	214	35	89	--	1.8	--	466	304	--	--	--	725	7.9
106	106	To	May 20, 1943	--	--	--	--	--	--	250	26	20	--	--	--	--	--	--	--	--	--	--
107	130	To	do.	--	--	--	--	--	--	279	50	42	--	--	--	--	--	--	--	--	--	--
108	110	To	Aug. 25, 1949	34	--	76	9.8	* 15	--	208	25	32	--	27	--	336	230	--	--	--	527	7.9
201	119	To	do.	36	--	42	19	* 21	--	222	18	18	--	2.0	--	265	183	--	--	--	443	7.9
† 12-12-401, 403, 404, 405, 406	--	To	May 1959	--	.04	70	12	17	--	201	18	16	.3	3.9	--	304	225	--	--	--	506	7.3
† 12-12-401, 402,403,404, 405,406	--	To	Jan. 1964	--	--	69	8.0	16	--	203	14	13	.6	8.0	--	377	205	--	--	--	478	7.6
402	142-182	To	Jan. 5, 1968	30	.00	75	12	17	1.8	248	24	27	.5	6.6	.04	316	236	13	.5	0.00	520	7.6
1/ 404	108-138	To	June 1947	25	.10	69	9.0	22	--	205	22	20	.2	1.7	--	276	209	--	--	--	--	8.1
404	108-138	To	Dec. 12, 1960	30	.00	68	6.3	8.6	1.1	232	8.4	7.5	.4	10	.04	254	196	9	.3	--	412	6.9
405	131-158	To	Aug. 24, 1949	33	--	32	9.8	* 15	--	138	16	12	--	8.0	--	198	120	--	--	--	342	8.0
† 12-12-406, 407, 408	--	To	Feb. 1946	23	.12	71	9.0	19	--	205	23	18	.4	2.0	--	290	214	--	--	--	--	7.4
1/ 406	56-73	To	Oct. 1948	21	.13	68	8.0	29	--	210	25	21	.3	.9	--	316	203	--	--	--	--	7.6

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells, Test Holes, and Springs--Continued

	WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM * AND POTASSIUM		BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
									Na	K													
	JA-12-12-407	Spring	To	Jan. 5, 1968	--	--	63	8.6	--	--	232	18	14	--	3.2	--	--	193	--	--	0.00	437	7.8
	408	Spring	To	do.	--	--	125	15	--	--	462	40	26	--	.0	--	--	374	--	--	.10	809	7.7
	409	105	To	May 24, 1943	--	--	--	--	--	--	312	80	14	--	--	--	--	--	--	--	--	--	--
	410	56	To	May 19, 1943	--	--	75	6.9	* 12	--	263	9.7	9.0	--	4.5	--	247	216	--	--	--	--	--
	411	131	To	May 20, 1943	--	--	38	33	* 11	--	220	21	37	--	.5	--	249	230	--	--	--	--	--
	413	Spring	To	May 19, 1943	--	--	73	9.2	* 34	--	285	30	15	--	9.0	--	311	220	--	--	--	--	--
	414	Spring	To	Apr. 17, 1941	--	--	56	16	* 30	--	268	13	25	0.6	--	--	273	205	--	--	--	--	--
	414	Spring	To	May 20, 1943	--	--	94	20	* 47	--	448	11	28	--	.0	--	421	316	--	--	--	--	--
†	12-12-415, 418 and 419	--	Qal,To	do.	26	0.12	73	10	* 19	--	260	20	17	.6	5.0	--	309	223	--	--	--	--	8.4
2/	416	96-231	To	Oct. 6, 1945	--	--	--	--	--	--	154	16	46	--	--	--	285	170	--	--	--	--	--
	417	12	Qal	May 19, 1943	12	.45	93	20	* 27	--	292	64	42	1.0	7.2	--	441	314	--	--	--	--	8.1
	420	32	To	Apr. 19, 1941	--	--	56	8.3	* 12	--	207	14	12	--	--	--	204	175	--	--	--	--	--
1/	422	10-40	To	June 1947	35	.15	154	89	57	--	308	380	107	1.4	--	--	1,086	750	--	--	--	--	8.4
	501	Spring	Qal	May 20, 1943	--	--	--	--	--	--	263	260	121	--	--	--	--	--	--	--	--	--	--
	502	100	Pw	Apr. 17, 1941	--	--	576	91	*112	--	146	1,827	24	.9	--	--	2,703	1,816	--	--	--	--	--
	503	148	To	May 20, 1943	--	--	--	--	--	--	208	40	64	--	--	--	--	--	--	--	--	--	--
	505	47	Qal	Apr. 15, 1941	--	--	183	98	* 14	--	122	669	66	.5	--	--	1,091	860	--	--	--	--	--
	701	35	Pw	May 21, 1943	--	--	--	--	--	--	48	3,000	43	--	--	--	--	--	--	--	--	--	--
	702	135	To	do.	--	--	--	--	--	--	172	135	13	--	--	--	--	--	--	--	--	--	--
	703	88	Qal	do.	--	--	--	--	--	--	307	1,100	150	--	--	--	--	--	--	--	--	--	--
	704	71	Qal	Oct. 15, 1943	--	--	80	68	* 53	--	308	213	64	--	36	--	666	479	--	--	--	--	--
	804	76	Qal	Apr. 17, 1941	--	--	46	54	* 69	--	336	74	96	.5	--	--	504	338	--	--	--	--	--
	806	57	Qal	Sept. 20, 1943	--	--	55	25	* 27	--	285	22	29	--	2.0	--	300	240	--	--	--	--	--
	807	20-54	Qal	Oct. 2, 1943	18	.05	78	22	* 39	--	220	144	26	.9	.2	--	470	285	--	--	--	--	--
	809	54	Qal	Oct. 11, 1943	--	--	63	19	* 14	--	242	17	20	--	26	--	278	235	--	--	--	--	--
	810	45	Qal	May 21, 1943	--	--	--	--	--	--	350	60	36	--	--	--	--	--	--	--	--	--	--
	20-201	50-85	Qal	Sept. 23, 1943	44	.04	60	34	* 21	--	245	103	18	.5	1.2	--	417	290	--	--	--	--	--
	201	85-126	Qal	Sept. 22, 1943	31	.05	78	39	* 28	--	198	180	29	.8	.2	--	555	355	--	--	--	--	--

* Sodium and potassium calculated as sodium (Na).
† Composite sample.
1/ Analysis by Texas State Department of Health, Austin, Texas.
2/ Analysis by Chicago, Burlington & Quincy Railroad Company, Aurora, Illinois.