TEXAS WATER DEVELOPMENT BOARD

REPORT 162

GROUND-WATER RESOURCES OF WASHINGTON COUNTY, TEXAS

By

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United States Geological Survey

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GROUND-WATER RESOURCES OF WASHINGTON COUNTY, TEXAS

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ABSTRACT

Large quantities of undeveloped fresh water, extending to depths as much as 1,200 feet below sea level occur in the Catahoula Sandstone, Jasper aquifer, Evangeline aquifer, and the alluvium of the Brazos River. In 1968, an estimated 3.2 mgd (million gallons per day) was pumped from the ground-water reservoir. Almost a third of this amount was pumped from a small area within the city of Brenham. Ground-water pumpage has not resulted in any major decline in water levels.

At least 8,500 acre-feet per year (7.6 mgd) of fresh ground water is being transmitted through the Catahoula Sandstone, the Jasper aquifer, and the Evangeline aquifer, and about 18,700 acre-feet per year (16.7 mgd) of fresh ground water is being rejected from the outcrops of these units. About 30,700 acre-feet per year (27.3 mgd) of fresh ground water probably could be withdrawn continuously from the aquifers. About 118,000 acre-feet per year (105.2 mgd) is available for development from the alluvium of the Brazos River.

In general, the chemical quality of the water is suitable for most uses, but about 83 percent of all samples analyzed for hardness were found to be very hard.

Nitrate concentrations in 23 of the samples analyzed exceeded 45 mg/l (milligrams per liter). Although water from the alluvium of the Brazos River is suitable for irrigation, it should be carefully checked before being considered for public supply and domestic use because it is subject to contamination.

It is recommended that the program for measuring water levels be expanded to include wells tapping the artesian aquifers. Annual inventories of pumpage and of new wells should be undertaken. A program for measuring the base flow of streams should be developed because one of the larger future sources of water is the recharge now being rejected in the outcrop areas.

GROUND-WATER RESOURCES OF WASHINGTON COUNTY, TEXAS

INTRODUCTION

Location and Extent of Area

Washington County is in south-central Texas on the West Gulf Coastal Plain (Figure 1). It is bounded by Fayette and Lee Counties on the west, by Burleson and Brazos Counties on the north, by Grimes and Waller Counties on the east, and by Austin County on the south. Brenham, the county seat, is 65 miles northwest of Houston. Washington County has an area of 611 square miles.

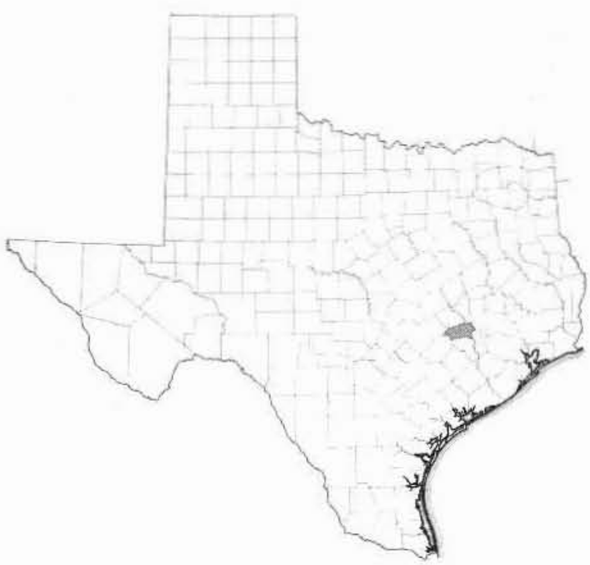

Figure 1.—Location of Washington County

Purpose and Scope of the Investigation

This investigation was a cooperative project of the United States Geological Survey and the Texas Water Development Board. Its purpose was to determine the occurrence, availability, dependability, quality, and quantity of ground water in Washington County. Special emphasis was placed on describing the sources of ground water suitable for public supply, industrial use, and irrigation.

The investigation included determination of the extent of sands containing fresh and slightly saline water, a study of the chemical quality of the water, estimates of the quantities of water being withdrawn and a study of the effects of these withdrawals on water levels in wells, determination of the hydraulic characteristics of the water-bearing sands, estimates of the quantities of water available for development, and determination of potential sources of contamination.

Methods of Investigation

The investigation, begun in June 1968, included the following items:

1. An inventory was made of all industrial, public supply, and irrigation wells and a representative number of domestic and livestock wells (Table 6). Locations of the wells, springs, and test holes are shown on Figure 19.

2. Electrical logs of oil and gas tests and water wells and drillers' logs of water wells (Table 7) were used to determine the thickness of fresh and slightly saline water-bearing sands (Figures 16 and 18), and the altitudes of the base of fresh water and the base of slightly saline water (Figures 15 and 17).

3. An inventory was made of the quantity of ground water withdrawn for public supply, industrial use, and irrigation, and estimates were made of the rural domestic and livestock use (Tables 4 and 5).

4. Altitudes of water wells were determined from topographic maps.

5. Climatological records were collected and compiled (Figures 2 and 3).

6. Measurements of water levels were made in wells and water-level records were compiled (Table 8 and Figures 8, 11, and 12).

7. Water samples were analyzed to determine the chemical quality of ground water (Table 9 and Figures 13 and 14).

8. Areas of recharge and discharge were delineated.

9. Aquifer tests were made to determine the hydraulic characteristics of the water-bearing sands (Table 3).

10. The hydrologic data were analyzed to determine the quantity and quality of ground water available for development.

11. Maps, charts, and graphs were prepared to correlate and illustrate the geologic and hydrologic data.

Previous Investigations

Taylor (1907) was the first to mention the presence of water wells in Washington County. Follett (1942) discussed briefly the geology and hydrology of a part of Washington County and in an additional study (1943) inventoried 245 wells.

Sundstrom, Hastings, and Broadhurst (1948, p. 275-276) published basic data on the public water supply of Brenham. Cronin and others (1963) made a reconnaissance study of ground water in the Brazos River basin which includes most of Washington County. Cronin and Wilson (1967) studied the water-bearing characteristics of the flood-plain alluvium along the Brazos River, including a part of Washington County.

Recent detailed investigations of ground-water resources of adjacent counties include: Lee County (Thompson, 1966); Fayette County (Rogers, 1967); and Austin and Waller Counties (Wilson, 1967).

Economic Development

From colonial times until about 1968, agriculture was the mainstay of the Washington County economy. At first corn, peas, and tobacco were grown. Later, as small holdings evolved into ranches and plantations, forage sorghums, oats, and cotton became important crops.

By 1968, the value of goods manufactured in Washington County exceeded farm income and the number of farms in operation continued to decline. In that year approximately three-fourths of all farm income came from livestock, predominately beef and dairy cattle; although hogs and poultry provided other important sources of revenue.

Through 1968, oil wells in Washington County had produced approximately 11,400,000 barrels of oil, most of which came from the Clay Creek and Brenham Fields.

The use of water for recreation is becoming increasingly important. Since 1967, Somerville Reservoir has attracted considerable attention for fishing, swimming, and boating. The reservoir stores 160,100 acre-feet of water and inundates about 11,460 acres in Washington, Lee, and Burleson Counties.

In 1960, the population of Washington County was 19,145. Brenham, which had a population of 7,740, is the county seat. Other communities include Burton, Chappell Hill, Gay Hill, Independence, and Washington.

Physiography, Drainage, and Climate

The land surface in Washington County is rolling to gently rolling. Locally along the Brazos River, nearly flat areas are as much as 4 miles wide. Altitudes range from about 150 feet above sea level in the extreme southeastern corner of the county to about 560 feet west of Burton.

In the southern and northeastern parts of the county, the drainage is primarily east and southeast to the Brazos River. In the northwestern part, the drainage is primarily northwest to Somerville Reservoir and Yegua Creek. The drainage is a prominent cuesta formed by the outcrop of the Oakville Sandstone.

Stream-gaging stations are maintained by the U.S. Geological Survey at five localities in Washington County (Figure 19). The station name, drainage areas, and periods of record are given in the following table (U.S. Geological Survey, 1968).

GAGING STATION	DRAINAGE AREA (SQ. MI.)	PERIOD OF RECORD
Yegua Creek near Somerville	1,008	1924-68
Brazos River at Washington	39,740	1965-68
New Year Creek near Chappell Hill 1/	167	1948, 1964-68
Brazos River near Hempstead	42,640	1938-68
Winkleman Creek near Brenham 1/	0.75	1966-68

1/ Partial-record station.

Washington County has a warm semihumid climate. Precipitation averages about 39 inches annually (Figures 2 and 3). The average annual gross lake-surface evaporation for the period 1940-65 was 54.6 inches (Kane, 1967).

The average annual temperature at Brenham (Figure 2) is about 68°F (20°C). Temperatures below freezing occur occasionally in the winter; temperatures above 100°F (38°C) are rare. The approximate dates of the first and last freezes are December 2 and

February 25, respectively (Orton, 1969). The average growing season is about 280 days.

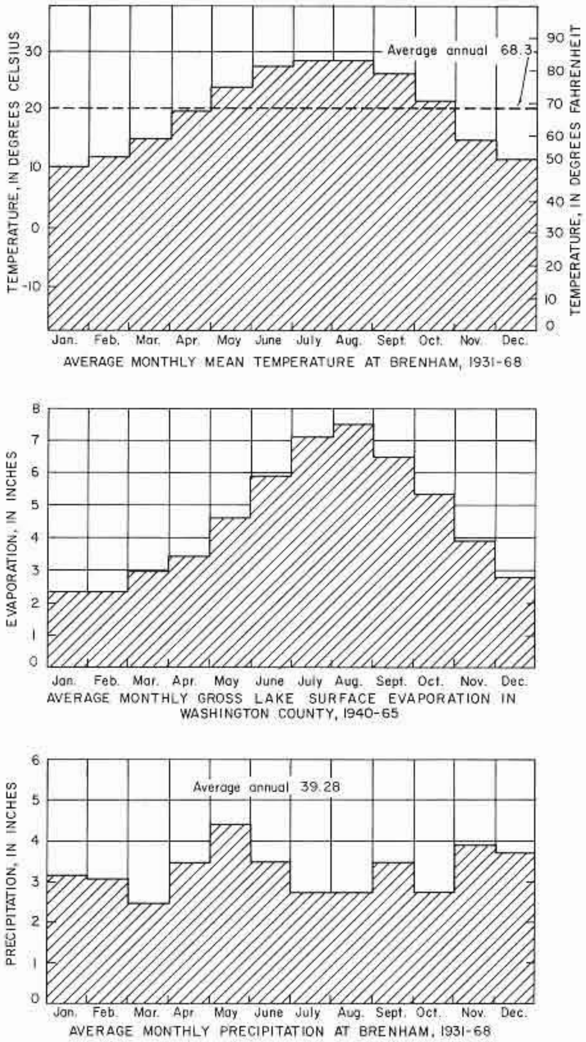

Figure 2.—Average Monthly Temperature, Gross Lake-Surface Evaporation, and Precipitation

Well-Numbering System

The well-numbering system used in this report was developed by the Texas Water Development Board for use throughout the State. Under this system, each 1-degree quadrangle is given a number consisting of two digits. These are the first two digits in the well number. Each 1-degree quadrangle is divided into 7½-minute quadrangles which are given 2-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each 7½-minute quadrangle is divided into 2½-minute quadrangles which are given a single digit number from one to nine. This is the fifth digit of the well number. Finally, each well within a 2½-minute quadrangle is given a 2-digit number in the order in which it was inventoried, starting with 01. These are the last two digits of the well number (Figure 4).

On the well-location map (Figure 19), only the last three digits of the well number are shown at each well location; the third and fourth digits are shown in the northwest corner of each 7½-minute quadrangle. All of Washington County is within the 1-degree quadrangle 59, therefore this number constitutes the first two digits of the numbers of all the wells in the county. This number (59) is not shown on the map.

In addition to the 7-digit well number, a two-letter prefix is used to identify the county. The prefixes for Washington and adjacent counties are as follows: Washington, YY; Austin, AP; Brazos, BJ; Burleson, BS; Fayette, JT; Grimes, KW; Lee, RZ; and Waller, YW.

As an example, well YY-59-53-501 (owned by the Old Brazos Forge) is in Washington County (YY), in the 1-degree quadrangle number 59, in the 7½-minute quadrangle 53, in the 2½-minute quadrangle 5, and was the first well (01) inventoried in that 2½-minute quadrangle.

The well numbers used by Follett (1943) and the corresponding numbers used in this report are given in Table 1.

Acknowledgments

Appreciation is expressed to those who contributed data and helped with the preparation of this report. Particular thanks are due to officials of Shell Oil Company; the city of Brenham; and the staff of the Soil Conservation Service in Brenham.

Drillers of water wells generously supplied drillers' logs, electrical logs, and well completion data. Property owners granted access to their lands, wells, and records.

Mr. and Mrs. Verde Pomykal, Pomykal Drilling Company; Travis Voelkel, Beaumier Iron Works; Donald Wilder, The Old Brazos Forge; George Blackburn, Brenham Cotton Mills; and Colonel H. R. Matthews, Chappell Hill Water Supply Corporation are among the many individuals from whom help is gratefully acknowledged.

Definitions of Terms

Many of the following definitions have been taken or adapted from Meinzer (1923a) and the American Geological Institute (1960).

Acre-foot.—The volume of water required to cover 1 acre to a depth of 1 foot (43,560 cubic feet), or 325,851

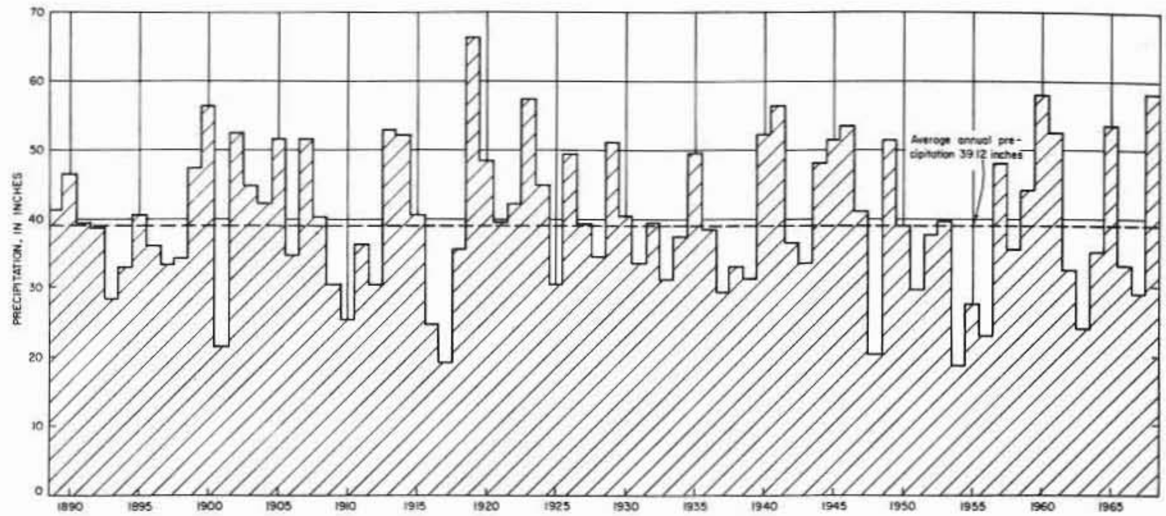

Figure 3.—Annual Precipitation at Brenham, 1889-1968

gallons. The term is commonly used in measuring volume of water in storage in an aquifer or surface reservoir or volume of water used.

Aquifer.—A formation, group of formations, or part of a formation that is water bearing.

Aquifer test, pumping test.—This test consists of measuring at specific intervals, the discharge and water level of the well being pumped, and the water levels in nearby observation wells. Formulas have been developed to show the relationship of the yield of a well, the shape and extent of the cone of depression, and the properties of the aquifer (such as the specific yield, porosity, and coefficients of permeability, transmissibility, and storage).

Aquifer test, recovery test.—This test consists of measuring at specific intervals the water levels in the previously pumped well and the observation wells (see definition: "Aquifer test, pumping test"). Measurements are begun shortly after the pump is stopped and are continued until the water levels rise to (or recover) their positions previous to the start of the test.

Artesian aquifer, confined aquifer.—Artesian (confined) water occurs where an aquifer is overlain by rock of lower permeability (for example, clay) that confines the water under pressure greater than atmospheric pressure. The water level in an artesian well will rise above the top of the aquifer. The well may or may not flow.

Artesian well.—One in which the water level rises above the top of the aquifer, whether or not the water flows at the land surface.

Cone of depression.—Depression of the water table or piezometric surface surrounding a discharging well; more or less the shape of an inverted cone.

Drawdown.—The lowering of the water table or piezometric surface caused by pumping (or artesian flow). In most instances, drawdown is the difference, in feet, between the static level and the pumping level.

Electrical log.—A graphic log showing the relationship of the electrical properties of the rocks and their fluid content when penetrated by a well. The electrical properties are natural potentials and resistivities to induced electrical currents. Sometimes the properties are modified by the presence of the drilling mud.

Evapotranspiration.—Water withdrawn by evaporation from a land area, a water surface, moist soil, or the water table; and the water consumed by transpiration of plants.

Hydraulic gradient.—The slope of the water table or piezometric surface, usually given in feet per mile.

Hydrologic cycle.—The cyclic phenomena through which water passes, commencing as atmospheric water vapor, changing into liquid or solid form as precipitation, then along or into the ground, and finally again returning to the form of atmospheric water vapor by means of evaporation and transpiration.

Milliequivalent per liter (me/l).—An expression of the concentration of chemical substances in terms of the reacting values of electrically charged particles, or ions, in solution. One me/l of a positively charged ion (such as sodium) will react with 1 me/l of a negatively charged ion (such as chloride):

$$\text{me/l} = \frac{\text{concentration of an ion in milligrams per liter}}{\text{combining weight of the ion}}$$

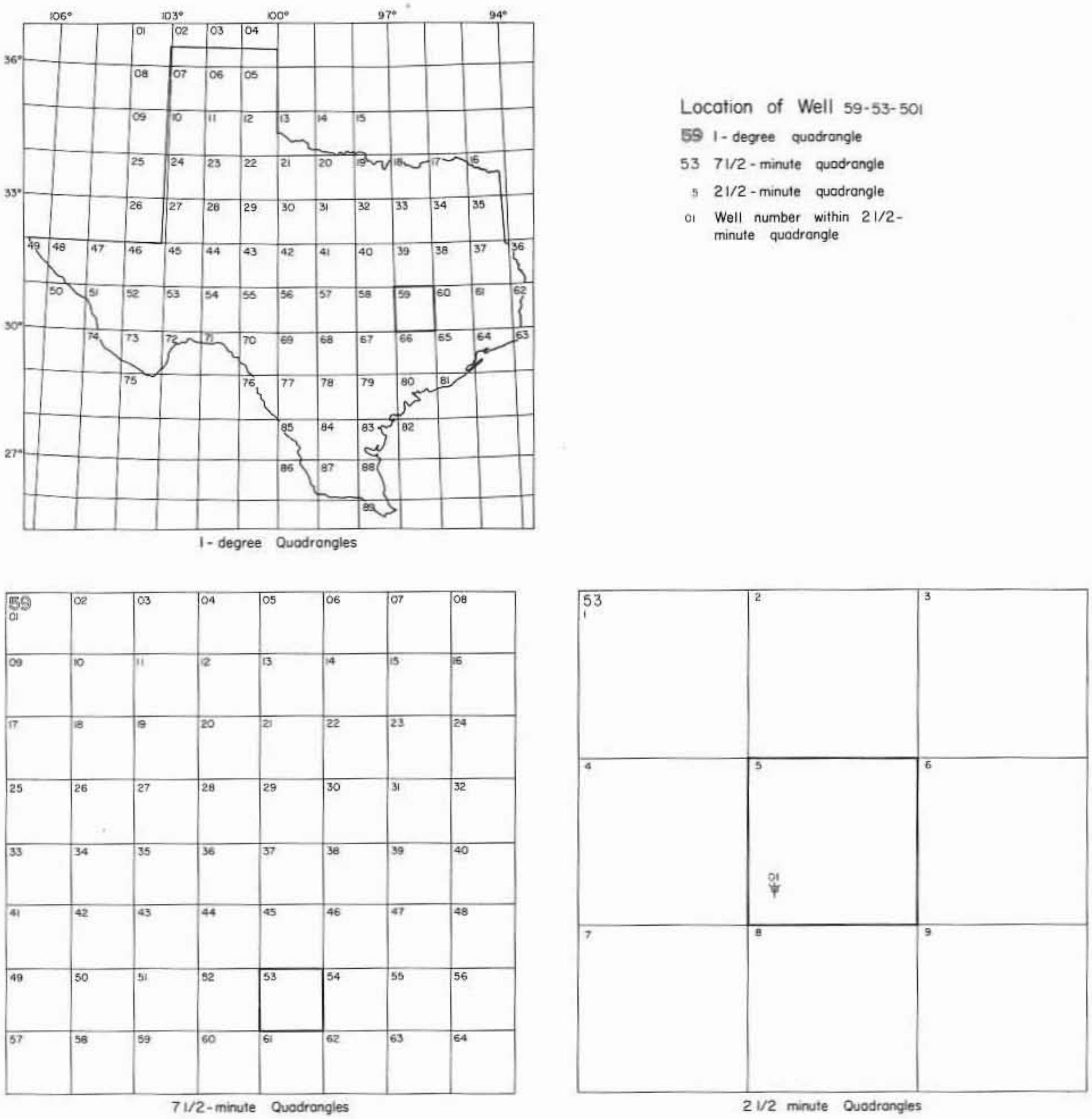

Figure 4
Well-Numbering System

Table 1.—Well Numbers Used by Follett (1943) and Corresponding Well Numbers Used in This Report

OLD NUMBER	NEW NUMBER	OLD NUMBER	NEW NUMBER	OLD NUMBER	NEW NUMBER
1	YY-59-43-101	77	YY-59-46-409	162	YY-59-62-108
3	59-44-706	79	59-46-408	164	59-62-101
5	59-44-804	83	59-46-201	167	59-54-701
6	59-44-902	84	59-46-304	170	59-62-202
8	59-45-702	85	59-46-305	171	59-62-201
9	59-44-905	89	59-47-402	173	59-62-204
13	59-52-304	90	59-47-401	176	59-62-203
15	59-52-102	94	59-46-803	177	59-62-308
16	59-52-404	97	59-46-704	180	59-62-307
18	59-51-605	98	59-46-705	184	59-63-104
19	59-51-103	99	59-46-706	188	59-63-105
20	59-51-202	100	59-54-203	191	59-55-806
22	59-51-602	101	59-54-202	192	59-55-809
24	59-51-805	103	59-53-306	196	59-54-912
25	59-51-902	107	59-45-802	197	59-54-910
27	59-52-505	110	59-53-205	198	59-54-901
28	59-52-504	111	59-53-102	200	59-54-801
30	59-52-801	113	59-53-206	201	59-54-908
32	59-52-802	115	59-53-207	202	59-54-906
33	59-52-804	120	59-53-702	203	59-55-704
35	59-52-905	121	59-53-811	204	59-55-907
36	59-52-906	122	59-53-602	205	59-55-507
37	59-52-907	123	59-54-405	210	59-55-101
38	59-52-501	124	59-53-923	212	59-47-704
40	59-52-603	125	59-53-918	216	59-47-503
41	59-52-607	126	59-53-914	218	59-47-101
42	59-52-606	127	59-53-901	219	59-47-202
43	59-52-901	128	59-53-902	221	59-47-203
44	59-60-202	129	59-53-903	222	59-47-301
49	59-60-105	130	59-53-904	223	59-47-302
50	59-60-103	131	59-53-905	224	59-47-605
51	59-60-101	132	59-53-906	225	59-47-607
52	59-60-109	133	59-53-912	226	59-47-610
54	59-60-108	134	59-53-907	227	59-47-609
55	59-60-505	135	59-53-913	229	59-45-504
56	59-60-204	136	59-53-925	230	59-47-806
58	59-60-605	140	59-53-926	231	59-47-807
59	59-60-604	141	59-61-206	233	59-55-202
60	59-60-603	142	59-53-810	234	59-55-304
62	59-45-502	144	59-61-204	235	59-55-305
63	59-45-804	146	59-61-101	236	59-47-902
66	59-45-803	152	59-61-409	237	59-48-705
67	59-45-605	155	59-61-410	238	59-47-904
68	59-45-608	157	59-61-503	241	59-47-905
74	59-45-607	161	59-61-304	243	59-48-701
				244	59-48-702

Milligrams per liter (mg/l).—One milligram per liter represents one milligram of solute in one liter of solution. For water containing less than 7,000 mg/l dissolved solids, 1 milligram per liter is equivalent to 1 part per million.

Permeability, coefficient of.—A measure of the capacity of an aquifer to transmit water. The rate of flow in gallons per day through a cross-sectional area of 1 square foot under a hydraulic gradient of 1 foot per foot and at a temperature of 16 °C (60 °F).

Potentiometric surface.—An imaginary surface that everywhere coincides with the static level of the water in the aquifer. The surface to which the water from a given aquifer will rise under its full head.

Porosity.—The ratio of the aggregate volume of interstices (openings) in a rock or soil to its total volume, usually stated as a percentage.

Rejected recharge.—The natural discharge of ground water in the recharge area of an aquifer by springs and seeps. Rejection of recharge occurs when the rate of recharge exceeds the rate of transmission in the aquifer.

Salinity of water.—Modified from a general classification of water based on dissolved-solids content by Winslow and Kister (1956, p. 5): Fresh water, less than 1,000 mg/l (milligrams per liter); slightly saline water, 1,000 to 3,000 mg/l; moderately saline water, 3,000 to 10,000 mg/l; very saline water, 10,000 to 35,000 mg/l; and brine, more than 35,000 mg/l.

Specific capacity.—The rate of yield of a well per unit of drawdown, usually expressed as gallons per minute per foot of drawdown. If the yield is 250 gpm and the drawdown is 10 feet, the specific capacity is 25 gpm/ft.

Specific yield.—The quantity of water that an aquifer will yield by gravity if it is first saturated and then allowed to drain; the ratio expressed in percentage of the volume of water drained to volume of the aquifer that is drained.

Storage coefficient.—The volume of water that an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. Storage coefficients of artesian aquifers may range from about 0.00001 to 0.001; those of water-table aquifers may range from about 0.05 to 0.30.

Transmissibility.—The rate of flow of water in gallons per day through a vertical strip of the aquifer 1 foot wide extending through the vertical thickness of the aquifer at a hydraulic gradient of 1 foot per foot and at the prevailing temperature of the water. The transmissibility from a pumping test is reported for the part of the aquifer tapped by the well.

Transmission capacity of an aquifer.—The quantity of water that can be transmitted through a given width of an aquifer at a given hydraulic gradient, usually expressed in acre-feet per year or million gallons per day.

Water-table aquifer (unconfined aquifer).—An aquifer in which the water is unconfined; the upper surface of the zone of saturation is under atmospheric pressure only and the water is free to rise or fall in response to the changes in the volume of water in storage. A well penetrating an aquifer under water-table conditions becomes filled with water to the level of the water table.

Yield of a well.—The rate of discharge, commonly expressed as gallons per minute, gallons per hour, or gallons per day. In this report, yields are classified as: Small, less than 50 gpm (gallons per minute); moderate, 50 to 500 gpm; and large, more than 500 gpm.

GEOLOGIC AND HYDROLOGIC UNITS AND THEIR WATER-BEARING PROPERTIES

General Stratigraphy and Structure

Geological units relating to the occurrence of fresh and slightly saline ground water in Washington County range in age from Eocene to Holocene. The thicknesses, lithologic characteristics, age, and water-bearing properties of the formations and their correlation with hydrologic units are given in Table 2. The outcrops are shown on Figure 5. The units consist of about 6,000 feet of alternating beds of sand, silt, and clay or shale. Lesser amounts of limestone, tuff, lignite, gravel, gypsum, and volcanic ash are found.

All formations except the alluvial deposits crop out in belts that trend generally northeast-southwest and dip to the southeast (Figure 5). Dips increase with depth, creating wedge-shaped units that thicken Gulfward. For example, the top of the Sparta Sand dips at a rate of about 200 feet per mile; beds at the base of the Evangeline aquifer dip about 40 feet per mile. Faults are common, but they probably have little effect on the occurrence and movement of ground water.

The salt domes that underlie the Clay Creek and Brenham oilfields (Figure 19) disrupt the regional stratigraphy and structure and bring salt, anhydrite, gypsum, and limestone beds in contact with many of the water-bearing units. The quality of the ground water in the vicinity of the domes is probably affected by circulation through these disrupted beds.

More detailed discussions of the geology of Washington County are included in the publications of Deussen (1914 and 1924); Sellards, Adkins, and Plummer (1932); Doering (1935); Ellisor (1944); the Houston Geological Society (1954); Bernard and LeBlanc (1965); and Thompson (1966).

The units that yield fresh to slightly saline water to wells in Washington County are, from oldest to youngest: The Jackson Group of Eocene age; the Catahoula Sandstone, Jasper aquifer, and Burkeville aquiclude of Miocene age; the Evangeline aquifer of Miocene and Pliocene age; and the alluvium of the Brazos River of Pleistocene and Holocene age. The Carrizo Sand, Queen City Sand, and Sparta Sand of the Claiborne Group would probably yield small to moderate amounts of slightly saline water in northwestern Washington County (Thompson, 1966, Figure 7; and Rogers, 1967, Figure 6). The other units in the geologic section (Table 2) are not known to yield water to wells in Washington County. The stratigraphic correlations of the units are shown in Figures 20 and 21.

Claiborne Group

The formations in the Claiborne Group are the oldest units that are hydrologically significant in relation to the occurrence of fresh to slightly saline water in Washington County. The group is not exposed in Washington County, but crops out in the adjacent counties to the north.

Carrizo Sand

The Carrizo Sand is a continental sequence of predominately sand and some shale that unconformably overlies the Wilcox Group (Eocene). The formation ranges from 170 to 465 feet in thickness in Lee County (Thompson, 1966, p. 20). Thickness in Washington County was not determined. At the surface, the Carrizo is a highly permeable, fine- to medium-grained, well

Table 2.—Physical Characteristics and Water-Bearing Properties of the Hydrologic Units

SYSTEM	SERIES	GEOLOGIC UNIT		HYDROLOGIC UNIT	MAXIMUM THICKNESS (FT)	GENERAL COMPOSITION	WATER-BEARING PROPERTIES AND DISTRIBUTION OF SUPPLY
Quaternary	Holocene Pleistocene	Alluvium		Alluvium of the Brazos River	75	Red-brown to brown clay and silt; commonly overlying lighter-colored fine to coarse sand and gravel. Present beneath the flood plain of the Brazos River; in places forms isolated terraces.	Yields small to large amounts of fresh water to wells on the flood plain of the Brazos River.
Tertiary	Pliocene	Goliad Sand		Evangeline aquifer	550	Interbedded sand and clay; in places black chert grains in whitish sand give a salt and pepper effect.	Yields moderate amounts of fresh water.
	Miocene	Fleming Formation		Burkeville aquiclude	200	Predominately clay; contains some thin beds of sand.	Yields small amounts of fresh water.
				Jasper aquifer	1,300	Alternating beds of sand and clay, includes massive beds of gray to brown sand interbedded with gray clay.	Yields moderate to large amounts of fresh to slightly saline water.
		Catahoula Sandstone		Catahoula Sandatone	800	Alternating beds of gray clay, tuff, and sandstone. Lower sandstones may be hard, white, and opaline.	Yields small to moderate amounts of fresh water.
	Eocene	Jackson Group		Jackson Group	1,400	Predominately a terrestial shale; contains clay, volcanic ash, sandstone, and limestone.	Yields small to moderate amounts of water.
		Claiborne Group	Yegua Formation	Yegua Formation	1,300	Interbedded sand and carbonaceous clay, sandy clay, and silt; contains lignite and volcanic ash.	Not known to contain fresh to slightly saline water in Washington County.
			Cook Mountain Formation	Cook Mountain Formation	570	Predominately fossiliferous shale containing a 50-75 foot thick sand bed near the middle of the formation. Contains thin lenses of limestone, glauconitic sandstone and gypsum.	Not known to contain fresh or slightly saline water in Washington County.
			Sparta Sand	Sparta Sand	280	Fine to medium sand containing some brown lignitic shale. In places shale beds divide massive sand into an upper and lower unit.	Not known to yield water to wells in Washington County. May yield moderate amounts of slightly saline water in northwestern part of county.
			Weches Greensand	Weches Greensand	110	Predominately fossiliferous glauconitic shale; some sandstone and thin fossiliferous limestone.	Not known to contain fresh or slightly saline water in Washington County.
			Queen City Sand	Queen City Sand	500	Massive to thin-bedded, ferruginous and slightly lignitic sandstone interbedded with gray or brown, silty, lignitic shale.	Not known to yield water to wells in Washington County. May yield small amounts of slightly saline water.
			Reklaw Formation	Reklaw Formation	270[1]	Gray to brown shale in upper part and glauconitic sandstone interbedded with shale in lower part. The sandstone is fine- to coarse-grained and highly ferruginous.	Not known to contain fresh or slightly saline water in Washington County.
			Carrizo Sand	Carrizo Sand	465[1]	Massive, friable, commonly cross-bedded, well sorted, fine- to medium-grained, light-gray sandstone. Contains increasing amounts of shale downdip.	Not known to yield water to wells in Washington County. May yield small amounts of slightly saline water.

1/ In Lee County.

sorted sandstone containing a small amount of shale. Downdip, the proportion of shale to sand increases progressively. According to Thompson (1966, Figure 7) and Rogers (1967, Figure 6), the Carrizo contains slightly saline water in an area of about 20 square miles in the western part of Washington County. In this area, the Carrizo occurs at a depth of nearly 3,000 feet, and because part of the unit contains saline water, the Carrizo should not be considered as a source of usable water in Washington County.

Reklaw Formation

The Reklaw Formation, which overlies the Carrizo Sand, consists of gray to brown shale in the upper part and glauconitic sandstone interbedded with shale in the lower part. The sandstone is fine to coarse grained and is highly ferruginous. In Lee County (Thompson, 1966), the Reklaw attains a thickness of 150 to 270 feet, is highly faulted in places, and yields only small quantities of water. The Reklaw does not contain fresh or slightly saline water in Washington County.

Queen City Sand

The Queen City Sand conformably overlies the Reklaw Formation. The formation consists of about 500 feet of massive- to thin-bedded, ferruginous, and slightly lignitic sandstone interbedded with gray or brown, silty, lignitic shale. Rogers (1967, Figure 7) shows that slightly saline water probably occurs in the Queen City Sand in the extreme western tip of Washington County. Although the Queen City Sand may yield small amounts of slightly saline water, the depth of its occurrence (more than 2,000 feet) and small areal extent preclude its consideration as a source of water in Washington County.

Weches Greensand

The Weches Greensand disconformably overlies the Queen City Sand (Stenzel, 1938; p. 109-110). The Weches, which is about 110 feet thick, consists predominantly of fossiliferous glauconitic shale containing some sandstone and thin beds of fossiliferous limestone. The Weches Greensand does not contain fresh or slightly saline water in Washington County.

Sparta Sand

The Sparta Sand conformably overlies the Weches Greensand. Most of the Sparta consists of continental deposits of fine to medium, stratified, loose sand. Some individual beds are moderately crossbedded and separated by thin layers of brown lignitic shale. In places, a lignitic shale divides the Sparta into an upper and lower unit.

In Washington County, the Sparta averages about 200 feet in thickness and has a maximum thickness of 280 feet. The formation dips at an average rate of approximately 175 feet per mile, but northeast of the Clay Creek oilfield, the dip of the Sparta steepens to as much as 500 feet per mile. The structural configuration of the top of the unit and the approximate downdip limits of slightly saline water are shown on Figure 6.

Some wells produce water from the Sparta Sand in adjacent Lee and Fayette Counties where the formation is capable of yielding moderate to large amounts of fresh to slightly saline water. In Washington County, no water is being produced from the Sparta, but the aquifer is capable of yielding at least moderate quantities of slightly saline water in the northwestern part of the county.

Cook Mountain Formation

The Cook Mountain Formation consists predominately of fossiliferous shale containing lignite and thin lenses of limestone, glauconitic sandstone, and gypsum. The Spiller Sand Member of Stenzel (1938), which consists of about 50 to 75 feet of gray or brown sand, occurs near the middle of formation (Stenzel, 1940). The Cook Mountain averages about 500 feet in thickness in the county but has an observed maximum of about 570 feet. The unit is not known to contain fresh or slightly saline water in Washington County.

Yegua Formation

The Yegua Formation consists of alternating beds of sand and carbonaceous clay, sandy clay, and silt. Thin beds of lignite and volcanic ash are also present. Although a few persistent sand beds occur, most beds are not traceable over long distances. The Yegua ranges from 800 to 1,300 feet in thickness. It is not known to contain fresh or slightly saline water in Washington County.

Jackson Group

The Jackson Group is a series of predominantly terrestrial shales that conformably overlie the Yegua Formation. Some of the shale is lignitic and glauconitic and contains bentonitic clay, volcanic ash, and some interbedded lenses of limestone (Renick, 1936, p. 33-34).

The Jackson crops out in a 7-mile-wide band in southeastern Lee and northwestern Washington Counties. Electrical logs indicate that the Jackson has a maximum thickness of about 1,400 feet in the southeastern part of the county. The unit is capable of yielding small to moderate amounts of fresh to slightly saline water to wells on the outcrop and in areas a short distance downdip.

Catahoula Sandstone

The Catahoula Sandstone is a series of alternating beds of gray clay, tuff, and sandstone that unconformably overlie the Jackson Group. Sandstones in the lower part may be hard, white, and opaline.

The Catahoula crops out in a ½- to 4-mile-wide band in northern Washington County. Near the outcrop, the unit has a thickness of about 300 feet. In the southeastern part of the county, the thickness increases to a maximum of about 800 feet. The Catahoula is capable of yielding moderate amounts of fresh to slightly saline water to wells on the outcrop and in areas as much as 10 to 15 miles downdip.

Jasper Aquifer

The Jasper aquifer, which is equivalent to the lower part of the Fleming Formation of Miocene age (Table 2), is composed of alternating beds of sand and clay that unconformably overlie the Catahoula Sandstone. The unit includes massive, gray to brown, crossbedded sands interbedded with gray clay.

The Jasper crops out in the central part of the county (Figure 5). The thickness of the formation near the outcrop is about 800 feet, but it thickens rapidly down-dip and reaches a maximum thickness of about 1,300 feet near the Austin-Waller-Washington County line. The Jasper is capable of yielding moderate to large amounts of fresh to slightly saline water and is the most highly developed hydrologic unit in the county.

The approximate altitude of the base of the Jasper aquifer is shown on Figure 7. The dip averages about 80 feet a mile; but locally steepens to as much as 200 feet a mile.

Burkeville Aquiclude

The Burkeville aquiclude consists generally of a massive clay that overlies the Jasper and separates it from the Evangeline aquifer. In Washington County down-dip from the outcrop, it ranges in thickness from about 120 to 200 feet. Although basically a confining layer, the Burkeville contains some thin beds of sand which locally yield small amounts of fresh water.

Evangeline Aquifer

The Evangeline aquifer is a sequence of alternating clays and sands above the Burkeville aquiclude. In places, black chert grains in the whitish sands produce a salt and pepper effect. The Evangeline includes the upper part of the Fleming Formation of Miocene age and the alternating sands and clays of the Goliad Sand of Pliocene age. The Evangeline has a maximum thickness of approximately 550 feet in extreme southeastern Washington County, where the Evangeline yields moderate amounts of fresh water to wells. The approximate altitude of the base of the Evangeline is shown in Figure 6.

Alluvium of the Brazos River

Generally, the alluvial deposits are composed of red-brown to brown clay and silt, fine to coarse sand, and gravel. These sediments lense, interfinger, and grade laterally or vertically into finer or coarser materials. Normally, the finer grained materials predominate in the upper part of the alluvium; the coarser grained materials, such as gravel, occur in the lower part.

Alluvial deposits occur in Washington County as flood plain alluvium and terrace deposits (Cronin and Wilson, 1967). The terrace materials exist as remnants that cap hilltops or stand as isolated bodies above the flood plain. None of the terrace deposits are hydrologically significant in Washington County.

The flood plain alluvium, which consists of sand, gravel, silt, and clay, contains abundant fresh water. These deposits, which rest unconformably on the truncated surfaces of the older bedrock units, attain a maximum thickness of about 75 feet. In places, the alluvium contains extensive gravel beds that are 30 to 40 feet thick.

In addition to the alluvium deposited along the Brazos River, alluvium is also present along Yegua Creek, Jackson Creek, Red Gully, Caney Creek, and Mill Creek. The tributary stream alluvium is in hydrologic continuity with and thus is assigned to the alluvium of the Brazos River.

A more complete discussion of the alluvium of the Brazos River can be found in Cronin and Wilson (1967) and Cronin and others (1963).

GROUND-WATER HYDROLOGY

The general principles of ground-water hydrology as they apply to Washington County are discussed in this section of the report. For additional information, the reader is referred to: Baldwin and McGuinness (1963), Leopold and Langbein (1960), Meinzer (1923a, p. 2-142; 1923b), and Todd (1959, p. 14-114).

Source and Occurrence of Ground Water

Precipitation within the county and in adjoining areas to the north and northwest is the main source of groundwater in Washington County. Most precipitation runs off as streamflow; part is evaporated at the land surface, transpired by plants or retained by capillary

forces in the soil. Only a small amount migrates downward until it reaches the saturated zone, the upper surface of which is the water table.

Water-bearing units are of two types: Water-table, or unconfined aquifers; and artesian, or confined aquifers. Water-table conditions occur where the upper surface of the saturated zone is under atmospheric pressure, and the water is free to rise or fall in response to changes in the volume of water in storage. A well penetrating an aquifer under water-table conditions becomes filled with water only to the level of the water table. In Washington County, water-table conditions occur in the outcrops of the aquifers.

Artesian systems occur downdip from the outcrops where an aquifer is overlain by less permeable material. Here, water is confined at a pressure greater than atmospheric pressure. A well penetrating an aquifer under artesian conditions becomes filled with water to a level that is proportional to the hydrostatic pressure. If the pressure head is high enough, water may rise to an altitude greater than that of the land surface and the well will flow. Flowing wells are still common in Washington County, especially at lower elevations.

The level or surface to which water will rise in artesian wells is called the potentiometric surface. Although the term water table and potentiometric surface are synonymous in the outcrop areas, the term potentiometric surface as used in this report applies only in artesian areas. The altitude of the potentiometric surface for the Jasper aquifer is shown in Figure 8.

Recharge, Movement, and Discharge of Ground Water

Recharge is the addition of water to an aquifer by natural or artificial processes. Natural recharge in Washington County results mainly from infiltration of precipitation and to a lesser degree from streamflow on the outcrops of the aquifers. The amount of water being recharged to the Catahoula Sandstone and Jasper and Evangeline aquifers is estimated in the section of this report on "availability of ground water". Cronin and Wilson (1967, p. 35) indicate that recharge to the alluvium of the Brazos River is principally by precipitation on the flood plain but also occurs through infiltration from streams, underflow from the alluvium along tributary streams, and from flood waters. Cronin and Wilson (1967, p. 44) estimated the annual recharge to be about 5.3 inches in Burleson County; and Wilson (1967, p. 34) estimated the recharge to be approximately 2.3 inches a year in Austin and Waller Counties. Data were not available to calculate recharge to the alluvium in Washington County. However, it is probably about the same as in Austin and Waller Counties.

Ground water moves slowly through the aquifers under the force of gravity from areas of recharge to areas of discharge. The initial direction of movement is downward from the surface of the outcrop into the saturated zone; then water moves in a nearly horizontal direction down the hydraulic gradient.

Water moves at right angles to the water-level contours as shown, for example, on Figure 8. The rate of movement is partly dependent on the hydraulic gradient, which is indicated by the spacing of the contours. The contour interval (usually expressed in feet) divided by the distance between contours (usually expressed in miles) is the hydraulic gradient. If the interval is 10 feet and the contours are 1 mile apart, the hydraulic gradient is 10 feet per mile.

The altitude of water levels in wells screened in the Jasper aquifer is shown in Figure 8. Based on a gradient of 7 feet per mile, a coefficient of permeability of 175 gpd/ft^2 (gallons per day per square foot) and a porosity of 30 percent, water in the Jasper aquifer is moving south-southeast at an estimated average rate of about 90 feet per year. Locally, as along the Brazos River and Mill Creek, the regional direction of movement is interrupted by discharge from flowing wells. In these areas, the direction of movement is easterly toward the points of discharge.

Ground water is discharged artificially by flowing or pumped wells. It is discharged naturally by springs and seeps where the water table intersects the land surface and by evapotranspiration where the water table is near the land surface.

The natural discharge of ground water to streams in the outcrop area is considered as "rejected recharge". The recharge is "rejected" because the water table is at the level of the streambeds and because the recharge rate at the outcrop exceeds the capacity of the aquifers to transmit the water. Greater withdrawals from an aquifer by wells in and near the recharge area would lower water levels in the outcrop and therefore salvage some of the rejected recharge. All of the rejected recharge would be salvaged if the water table were lowered below the level of the streambeds. Greater withdrawals downdip, in the artesian part of the aquifer, would also lower the water level in the outcrop and salvage the rejected recharge because these withdrawals would increase the hydraulic gradient and therefore increase the transmission capacity of the aquifer.

Some information about the amount of rejected recharge issuing from the Evangeline and Jasper aquifers is available from measurements of base flow in Mill Creek. Mill Creek drains approximately 377 square miles of the outcrop area in Washington and Austin Counties. During the 1968 water year (October, 1967 through September, 1968), this stream had a base flow of about 14,000 acre-feet. This represents about 0.7 inch of infiltration. Based on an outcrop area of 500 square miles for the Catahoula, Evangeline, and Jasper aquifers, and a recharge rate of 0.7 inch per year, about 18,700 acre-feet of water is being rejected annually. This

amount is probably greater than average because 1968 was a year of exceptionally high rainfall.

Hydraulic Characteristics of the Hydrologic Units

Hydraulic Principles

As water is discharged from a well, the level of the potentiometric surface is lowered at and around the well, and a new hydraulic gradient is established. The potentiometric surface assumes the shape of an inverted cone, called a cone of depression. The lateral extent and depth of the cone of depression is dependent on the properties of the aquifer and the rate and period of discharge of the well. The properties of the aquifer that are most important are thickness, coefficient of permeability, and storage coefficient. The permeability and storage coefficient may be computed from relationships between time, change in water levels, and rate of discharge, which are determined by aquifer tests.

Aquifer Tests

Results of aquifer tests, made in 10 wells in Washington County, are summarized in Table 3. Data from these tests were analyzed by the Theis nonequilibrium method as modified by Cooper and Jacob (1946, p. 526-534) and the Theis recovery method (Wenzel, 1942, p. 94-97). Coefficients of transmissibility and permeability were computed for wells tapping the Jackson Group, the Catahoula Sandstone, and the Jasper aquifer. Permeability was computed by dividing the transmissibility by the sand thickness open to each well. Storage coefficients were determined by tests in three wells penetrating the Jasper aquifer at Brenham.

No tests were made in the other aquifers in Washington County. Thompson (1966, p. 36-41) shows that the Sparta Sand in Lee County has a transmissibility of about 14,000 gpd per foot and a storage coefficient of 0.0004.

Rogers (1967, p. 36) made tests in three wells in the Yegua in Fayette County and obtained values for transmissibility that range from 1,663 to 5,900 gpd per foot. Permeability ranged from 11 to 18 gpd per square foot.

In Washington County, the transmissibility of the Jackson Group screened by well YY-59-44-705 was 400 gpd per foot. The permeability, based on 10 feet of sand, was 40 gpd per square foot.

Transmissibility of the Catahoula Sandstone at well YY-59-51-607 was 4,500 gpd per foot; permeability was 225 gpd per square foot. The transmissibility is within the range (4,200 to 5,290 gpd per foot) that Rogers (1967) determined for the Catahoula Sandstone in Fayette County.

Transmissibilities of the Jasper aquifer ranged from 186 to 14,200 gpd per foot. The highest transmissibilities were determined in wells YY-59-53-901, 902, and 903. Although the sand thickness screened by these wells is not known, the permeability of the Jasper is probably more than 175 gpd per foot. The storage coefficient, based on interference tests, is about 0.001 near these three wells.

Because 1968 was the second wettest year on record, few irrigation wells were pumped; therefore, it was not practical to run tests in the alluvium of the Brazos River. However, Cronin and Wilson (1967) determined a storage coefficient of about 0.15 and an average transmissibility of about 42,000 gpd per foot for the alluvium. Transmissibilities ranged from 7,300 to 208,000 gpd per foot. Based on transmissibilities as calculated from 351 specific capacities, 21 percent of the values were below 20,000 gpd per foot; 18 percent were above 60,000; and the remaining 61 percent were between 20,000 and 60,000 gpd per foot.

The theoretical relationship between drawdown of water levels and the distance from the center of pumping for various transmissibilities is shown on Figure 9. These calculations, which are useful for predicting future drawdown caused by pumping, are based on the withdrawal of 1 mgd (million gallons per day) for 1 year from an aquifer with the transmissibilities and storage coefficients as shown. The relationship of drawdown to transmissibility is shown on Figure 9. For example, if the transmissibility and storage coefficient are 10,000 gpd per foot and 0.003, respectively, the drawdown will be about 40 feet at a distance of 5,000 feet from a well or group of wells discharging 1 mgd for 1 year. If the coefficient of transmissibility is decreased to 5,000 gpd per foot, the drawdown would be about 68 feet.

The relationship of drawdown to time and distance for distances up to 100,000 feet from a pumping well is shown on Figure 10. Construction of this graph is based upon a transmissibility of 10,000 gpd per foot, a storage coefficient of 0.0003, a pumping rate of 500 gpm and distance to the recharge area of 7 miles. Under these conditions, the drawdown would be about 33 feet at a point 1,000 feet from the pumping well after 30 days of continuous pumping. At this point, the maximum drawdown of approximately 48 feet would be reached after 10.5 years of continuous pumping. Beyond that, no additional drawdown will occur, providing adequate recharge is available.

Pumping from closely spaced wells would cause intersecting cones of depression; thereby causing additional lowering of the potentiometric surface. Intersecting cones of depression, or interference between wells, will result in lower pumping levels, increased

Table 3.—Hydraulic Properties From Aquifer Tests

AQUIFER AND WELL	DATE OF TEST	COEFFICIENT OF TRANSMISSIBILITY (GPD PER FT.)	COEFFICIENT OF PERMEABILITY (GPD PER SQ. FT.)	STORAGE COEFFICIENT	REMARKS	SPECIFIC CAPACITY	THICKNESS OF SAND
Jackson Group YY-59-44-705	Nov. 20, 1968	400	40	—	Recovery	—	10
Catahoula Sandstone YY-59-51-607	Oct. 17, 1968	4,500	225	—	Recovery	—	20
Jasper Aquifer/Catahoula Sandstone YY-59-53-201	Nov. 21, 1964	20,900	104	—	Drawdown	—	200
Jasper Aquifer YY-59-46-802	Nov. 16, 1962	1,900	24	—	Recovery	—	83
YY-59-52-702	Oct. 17, 1968	7,900	168	—	Recovery	—	47
YY-59-53-901	Nov. 19, 1942	14,200 13,000	— —	1.0×10^{-3} 3/ 1.2×10^{-3} 3/	Drawdown Recovery	6.85 1/ —	— —
YY-59-53-902	Nov. 19, 1942	13,600	—	1.3×10^{-3} 3/	Recovery	7.75 1/	—
YY-59-53-903	Nov. 11, 1942	13,500	—	7.2×10^{-4} /	Recovery	9.15 1/	—
YY-59-53-916	April 1968	2,800	12	—	Recovery	3.74 2/	235
YY-59-54-902	July 1968	186	6	—	Recovery	.23 3/	30

1/ From 24-hour recovery.
2/ From 100-minute recovery.
3/ From 270-minute recovery.

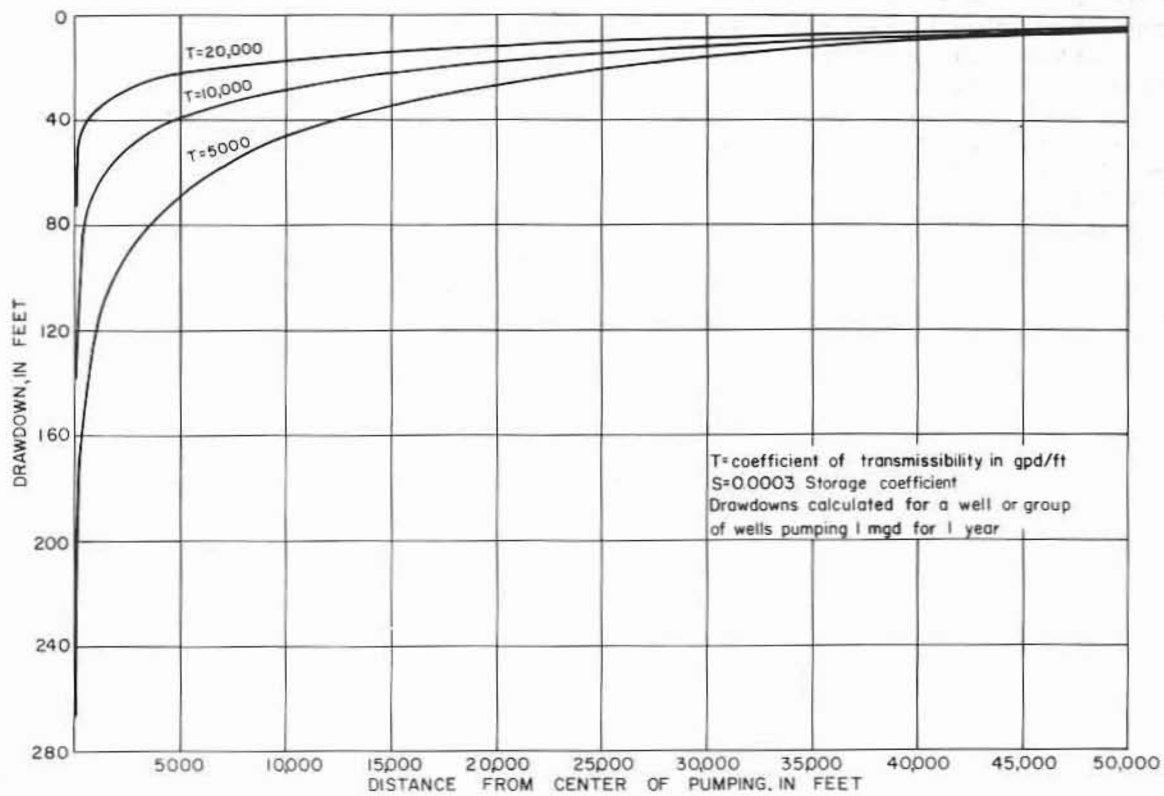

Figure 9.—Relationship of Drawdown to Transmissibility

pumping costs, and may cause serious declines in well yields. If pumping continues and the pumping level is lowered below the top of the aquifer, that part of the aquifer will become dewatered. Consequently, the yield of the well will decrease in proportion to the reduction in thickness of the saturated part of the aquifer. Many of these problems can be alleviated by using aquifer tests to determine the proper spacing of wells to minimize interference.

Use of Ground Water

During the early settlement of Washington County, ground water was developed mainly for domestic supply and livestock use. Water was drawn from shallow dug wells, natural and developed springs and ponds, and from streams. In towns such as Brenham, rain water was collected from roof gutters and stored with ground water in cisterns (Hasskarl, 1958, p. 32). Several of the dug wells inventoried in this study date back to the ante-bellum period. One of these (well YY-59-47-802) has been in continuous use since 1850. Deussen (1914, p. 96) reported that each plantation along the Brazos River in Washington County had one or more flowing artesian wells.

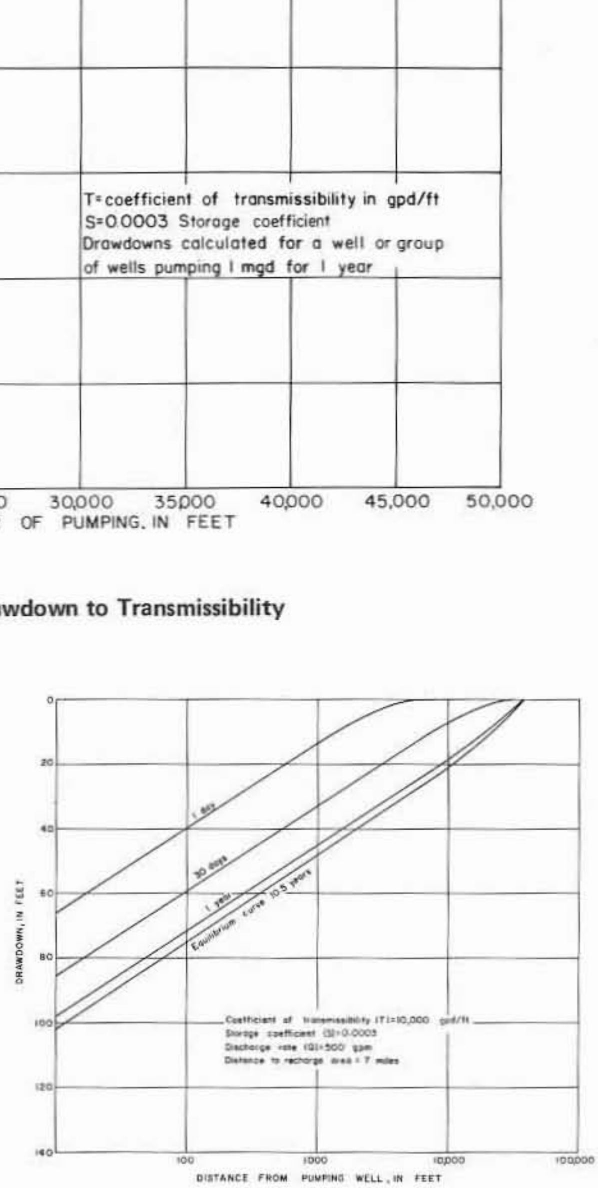

Figure 10.—Relationship of Drawdown to Time and Distance

Brenham's first public water-supply system was built in 1884 and operated by a private corporation (Hasskarl, 1958, p. 32) until 1894, when it was sold to the city. The original "spring well reservoir" (spring

YY-59-53-912), built in 1884, is still in use today. It is an oval-shaped, brick-lined pit about 28 feet deep, 40 feet wide, and 75 feet long. During the summer of 1968, the spring was used as an auxiliary water supply source.

The use of ground water for all purposes in Washington County in 1968 was approximately 3,200,000 gpd. About 327,000 gpd, used chiefly for stock and recreation, was discharged from flowing wells.

In 1968, there were 11 public suppliers in Washington County producing a total of about 970,000 gpd (Table 4). Brenham, the largest, supplied 913,000 gpd. Average daily per capita consumption of water in the city of Brenham has risen from 38 gallons in 1930 to 91 gallons in 1960. Per capita consumption in 1968 was about 100 gallons a day. Other public suppliers include: Burton Water Supply Corporation, Chappell Hill Water Supply Corporation, Oak Hill Acres, and Rocky Creek Manor.

Rural domestic and livestock consumption exceeded the combined total of all other uses (Table 5). In 1968, rural domestic and stock use was estimated to be 1,790,000 gpd; irrigation use about 310,000 gpd; and industrial use about 170,000 gpd.

Table 4.—Water Used for Public Supply, 1930-68

(Millions of Gallons Per Day)

	1930	1940	1950	1960	1965	1966	1967	1968
Brenham	0.230	0.351	0.607	0.702	0.976	1.017	1.012	0.913
Burton	—	—	—	—	—	.006	.010	.022
Chappell Hill	—	—	—	—	—	—	.001*	.005
Miscellaneous	—	—	—	—	—	.015*	.027*	.030*
Total	0.230	0.351	0.607	0.702	0.976	1.038	1.050	0.970

*Estimated

Changes in Water Levels

Measurements of water levels to determine the effects of development were made in 217 wells during the course of the study. In addition, measurements made prior to the study were tabulated. Water-level data for wells are given in Tables 6 and 8 as follows: Four or more measurements, Table 8; less than four measurements, Table 6. In addition to the tabulations, hydrographs of selected wells were prepared to show changes in water levels. The hydrographs of wells tapping the Jasper and Evangeline aquifers are given in Figure 11. The hydrographs of wells tapping the alluvium of the Brazos River are given in Figure 12. The altitudes of water levels in wells screened in the Jasper aquifer, based on measurements made in late 1968 and early 1969, are shown on Figure 8.

Records show that water levels in wells at most places in Washington County have not changed greatly because only small amounts of water have been pumped. The largest water-level declines have occurred in the vicinity of Brenham where relatively large quantities of ground water have been produced. Records from well YY-59-53-921 (tapping the Jasper aquifer in the city of Brenham) show a water-level decline of about 33 feet from 1941 to 1968 (Table 6). Records from well YY-59-61-101 (Figure 11) about 6 miles southwest of Brenham, show a decline of about 39 feet from 1940 to 1968. These are the largest changes in water levels that have occurred in Washington County. The declines in these areas contrast with those in wells tapping the Brazos River alluvium where there has been practically no net decline during the period of record (Figure 12).

Table 5.—Estimated Ground-Water Usage, 1967-68

USE	1967 (MGD)	1967 (ACRE-FEET)	1968 (MGD)	1968 (ACRE-FEET)
Industrial	0.16	179	0.17	191
Irrigation	.40	448	.31	348
Public supply	1.05	1,177	.97	1,087
Rural domestic and livestock	1.95	2,186	1.79	2,007
Total*	3.60	4,000	3.20	3,600

* Figures are approximate because some pumpage is estimated; totals are rounded to two significant figures.

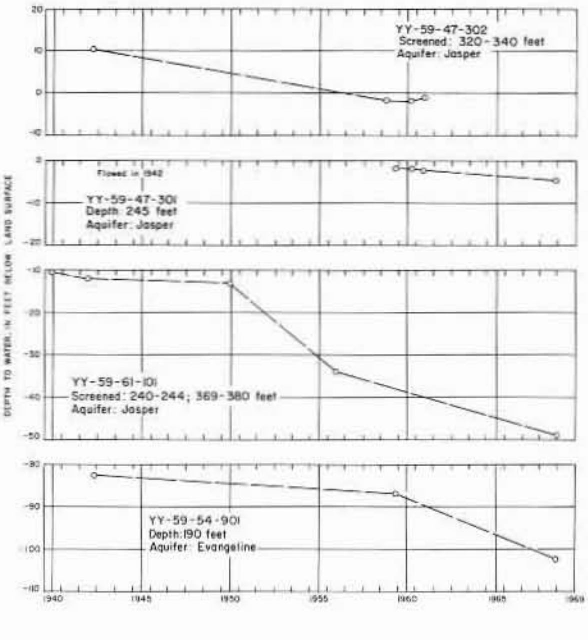

Figure 11.—Water-Level Changes in Wells Tapping the Jasper and Evangeline Aquifers

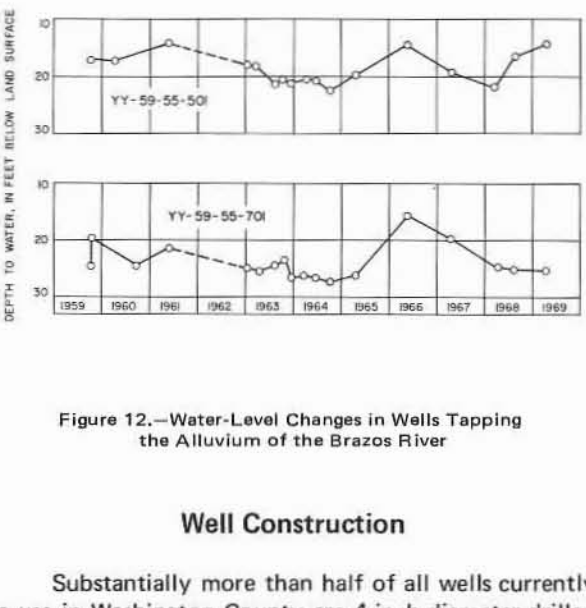

Figure 12.—Water-Level Changes in Wells Tapping the Alluvium of the Brazos River

Well Construction

Substantially more than half of all wells currently in use in Washington County are 4-inch-diameter drilled wells in which submersible pumps are installed. Normally, these are completed with a single screen placed at the bottom of the well. Sometimes a wire wrapped screen is used. More frequently, however, the last joint of pipe is slotted or perforated and gravel packed.

Dug wells were common in the county until about 1945 and in places they continue to be used. Generally, these are 24 inches or larger in diameter and are walled with rock or concrete.

Larger capacity wells are used for irrigation, public supply, and industrial purposes. Usually these are drilled by the hydraulic-rotary or reverse-rotary method. First a test hole (about 6 inches in diameter) is drilled and logged for depth and thickness of sand intervals. Water samples and formation samples may be collected for use in determining water quality and aquifer characteristics. If the test-hole log and other data collected indicate that enough water-bearing sands are present, the test hole is then reamed out to make the well.

Construction practices for municipal or industrial wells usually differ from those used for irrigation wells. The upper part of the test hole of a municipal or industrial well is usually reamed out to 14 to 30 inches in diameter, and a slightly smaller surface casing is set and cemented in place to form the pump pit. The remaining part of the test hole is then reamed to a diameter slightly less than that of the surface casing. Next, the hole is under-reamed to approximately 30 to 36 inches in diameter in the sections to be screened. Eight- to 12-inch diameter wire-wrapped screens and blank casing are installed; the annular space between the screen or casing and the wall of the hole is filled with sorted gravel. This gravel pack stabilizes the hole and provides a transfer media for water moving from the sand beds into the well, thus increasing the effective diameter.

The test hole for an irrigation well is usually reamed the entire depth of the well, and a complete string of slotted casing and surface casing is installed. The space between the casing and the wall of the hole is filled with gravel from the bottom of the well to the surface. Casing used in the irrigation wells in the alluvium along the Brazos is slotted from the water level to the bottom of the well and enclosed in a gravel pack. After completion, the wells are developed and tested for several hours using large-capacity test pumps.

Large-capacity wells are usually fitted with deep-well turbine pumps powered by internal combustion engines or electric motors. Fawcett (1963, p. 16) discusses methods used for construction of such wells in the Houston area.

QUALITY OF GROUND WATER

Chemical-Quality Standards and Suitability for Use

The chemical constituents in ground water originate principally from the soil and rocks through which the water has passed. Consequently, the chemical character of the water reflects, in a general way, the nature of the geologic formations which have been in contact with the water. Usually ground water is free from contamination by organic matter, but the dissolved-mineral content increases with depth. General discussions relating to the quality of ground water are included in reports by Swenson and Baldwin (1965) and Hem (1959).

The suitability of a water supply depends partly upon the chemical quality of the water and the limitations imposed by the contemplated use. For many uses, the dissolved-solids content places a major limitation on the suitability of the water. A general classification of water, according to dissolved-solids content, is as follows (modified after Winslow and Kister, 1956, p. 5).

DESCRIPTION	DISSOLVED-SOLIDS CONTENT (MILLIGRAMS PER LITER)
Fresh	Less than 1,000
Slightly saline	1,000 - 3,000
Moderately saline	3,000 - 10,000
Very saline	10,000 - 35,000
Brine	More than 35,000

Certain water-quality standards have been established or suggested for public, industrial, and irrigation supplies. Water for public use should be free of color, turbidity, and harmful micro-organisms and should have no unpleasant odor or taste.

The standards for evaluating water used on common carriers in interstate commerce have been published by the United States Public Health Service (U.S. Public Health Service, 1962, p. 7-8). The recommended limits for some constituents are:

SUBSTANCE	CONCENTRATION (MILLIGRAMS PER LITER)
Chloride (Cl)	250
Fluoride (F)	1.0 *
Iron (Fe)	.3
Manganese (Mn)	.05
Nitrate (NO_3)	45
Sulfate (SO_4)	250
Dissolved solids	500

* According to the U.S. Public Health Service (1962, p. 41), the optimum fluoride level for a given community depends upon climatic conditions because the amount of water (and consequently the amount of fluoride) ingested is primarily influenced by air temperature. Based on an annual average of maximum daily air temperature of 78.9° F (26°C) at Brenham, the optimum amount of fluoride is 0.8 mg/l; the upper limit is 1.0 mg/l. Consumption of fluoride in excess of the recommended amounts may cause mottling of teeth; while the consumption of fluoride in optimum amounts may reduce the rate of dental caries in children by 65 percent (Dean, Arnold, and Elvove, 1942, p. 1155-1179; Dean and others, 1941, p. 761-792).

Although concentrations of chemical constituents exceeding the recommended limits are objectionable, these limits may be exceeded in areas where more suitable water is not available. Some of the more common constituents in drinking water are objectionable only when they are present in such high concentrations as to be noticeable to the taste. Chloride concentrations of less than 250 mg/l are usually not detectably salty by taste. However, water with a chloride content of about 400 mg/l tastes salty to most people (Lockhart, Tucker, and Merritt, 1955).

Excessive concentrations of iron and manganese in water cause reddish-brown and gray deposits that stain plumbing fixtures and laundry. Of the 43 water samples analyzed for iron in Washington County, 10 contained more than the 0.3 mg/l limit recommended by the U.S. Public Health Service. Of the 13 samples analyzed for manganese, only one contained more than the 0.05 mg/l limit.

A concentration of nitrate in excess of 45 mg/l in drinking water is potentially dangerous. Maxcy (1950, p. 271) correlated the consumption of high nitrate water with the incidence of infant cyanosis ("blue baby" disease), a form of asphyxia caused by a loss of oxygen in the blood. Of the 175 samples analyzed for nitrate, 23 samples, most of which were from shallow wells, exceeded the recommended limit of 45 mg/l. Well YY-59-52-302 had the highest nitrate concentration (443 mg/l). Another well YY-59-63-102 had a nitrate content of 386 mg/l.

Sulfate concentrations in excess of 250 mg/l may have a laxative effect on those persons unaccustomed to water high in sulfate. However, most individuals become acclimated to use of these waters in a short time. Only seven of the 215 samples exceeded the recommended limit of 250 mg/l sulfate.

Calcium and magnesium are the principal constituents causing hardness of water, which is objectionable because of increased soap consumption and the formation of scale. The following is a commonly used classification of water based on hardness:

HARDNESS RANGE (MG/L)	CLASSIFICATION
60 or less	Soft
61 - 120	Moderately hard
121 - 180	Hard
More than 180	Very hard

Approximately 83 percent of the more than 200 samples analyzed for hardness in Washington County were very hard.

The quality requirements for industrial water supplies vary widely. For some uses, such as single-pass cooling, chemical quality is not particularly critical, but for other processes, such as the manufacture of high-grade paper, small concentrations of certain chemical constituents would seriously affect the quality of the product. Detailed information on industrial standards are contained in the report of the California State Water Quality Control Board (1963).

The suitability of water for many industrial applications depends on corrosiveness and scale-forming potential of the water. Large concentrations of dissolved solids, chloride, and sulfate; small concentrations of calcium; and either a low or high pH usually are conducive to corrosion. Based on these properties or constituents, the corrosive potential of most of the water samples collected from Washington County is not excessive.

Although some calcium hardness may be desirable for the prevention of corrosion, excessive hardness is objectionable for most industrial applications because it contributes to the formation of scale where water is heated, evaporated, or treated with alkaline materials. The accumulation of scale increases cost for fuel, repairs, and replacements, and lowers the quality of many wet-processed products. Ground water in most of Washington County is very hard and will require softening for some industrial applications.

The suitability of water for irrigation depends primarily upon the chemical quality of the water, type and permeability of the soil, rainfall, and type of crop. The most important chemical characteristics that determine the suitability of water for irrigation are: (1) The proportion of sodium to other cations (an index of the sodium hazard); (2) total concentration of soluble salts (an index of the salinity hazard); (3) RSC (residual sodium carbonate); and (4) the concentration of boron.

A system of judging the quality of water used for irrigation in a semiarid climate was proposed by the U.S. Salinity Laboratory Staff (1954, p. 69-82). This classification is based on the salinity hazard as measured by the electrical conductivity of water and the sodium hazard as measured by the SAR (sodium-adsorption ratio). Wilcox (1955, p. 15) states that the system of classification of irrigation waters proposed by the Salinity Laboratory Staff ". . . is not directly applicable to supplemental waters used in areas of relatively high rainfall". He indicates (p. 16) that water can be used safely for supplemental irrigation if the conductivity is as much as 2,250 micromhos per centimeter at 25°C and the SAR is below 14. Water having SAR greater than 14 can be used if the conductivity is less than 2,250 micromhos. Conductivity and SAR data for water from selected wells in Washington County (Figure 13) indicate that most of the water can be used safely for supplemental irrigation of most crops.

Water with excessive RSC (residual sodium carbonate) is strongly alkaline and will dissolve organic material from the soil. Soils deteriorated in this way may become grayish black and are referred to as "black alkali". Laboratory and field studies, according to Wilcox (1955, p. 11), show that water containing more than 2.5 me/l (milliequivalents per liter) RSC is not suitable for irrigation. Water containing from 1.25 to 2.5 me/l is marginal, and water containing less than 1.25 me/l is probably safe. Based on RSC data in Table 9, most of the ground water available in Washington County is suitable for irrigation.

An excessive boron content also renders water unsuitable for irrigation. Wilcox (1955, p. 11) indicates that a boron concentration of as much as 1.0 mg/l is permissible for irrigating sensitive crops, as much as 2.0 mg/l is permissible for semitolerant crops, and as much as 3.0 mg/l is permissible for tolerant crops. Analyses of 16 samples (Table 9) indicate that the boron content of ground water in Washington County usually is low; only one sample (from well YY-59-44-705) contained more than 1.0 mg/l.

To provide information on the presence of pesticidal contamination, pesticide analyses were made on five samples of ground water. The water was analyzed for nine insecticides and three herbicides recommended for monitoring by the Subcommittee on Pesticide Monitoring of the Federal Committee on Pest Control (Green and Love, 1967, p. 13-16). Samples were taken from three wells that ranged from 10 to 70 feet in depth. Two samples were collected from one spring used as an auxiliary public supply source by the city of Brenham.

Samples of water from the wells contained no insecticides or herbicides. Spring YY-59-53-912 when sampled in the rain on January 2, 1969 contained 0.14 μg/l (micrograms per liter) Silvex; 0.25 μg/l 2, 4-D; and 0.14 μg/l 2, 4-5-T. The combined concentrations of these herbicides were well within the 100 μg/l permissible limit for public water supplies (National Technical Advisory Committee to the Secretary of the Interior, 1968). No herbicides were found when the spring was resampled in dry weather on February 11, 1969.

Quality of the Water in the Hydrologic Units

The chemical quality of the ground water in Washington County is suitable for most types of uses or can be made suitable with a minimum of treatment. Less than 10 percent of the samples analyzed for dissolved solids contained more than 1,000 mg/l (Table 9). In general, the water is very hard (more than 180 mg/l of hardness) and is slightly alkaline (has a pH of more than 7). Some of the water contains excessive nitrate, sulfate, and iron. Excessive nitrate occurred in water from shallow wells; excessive sulfate in water from the Jackson Group. Excessive iron can occur of any particular hydrologic unit.

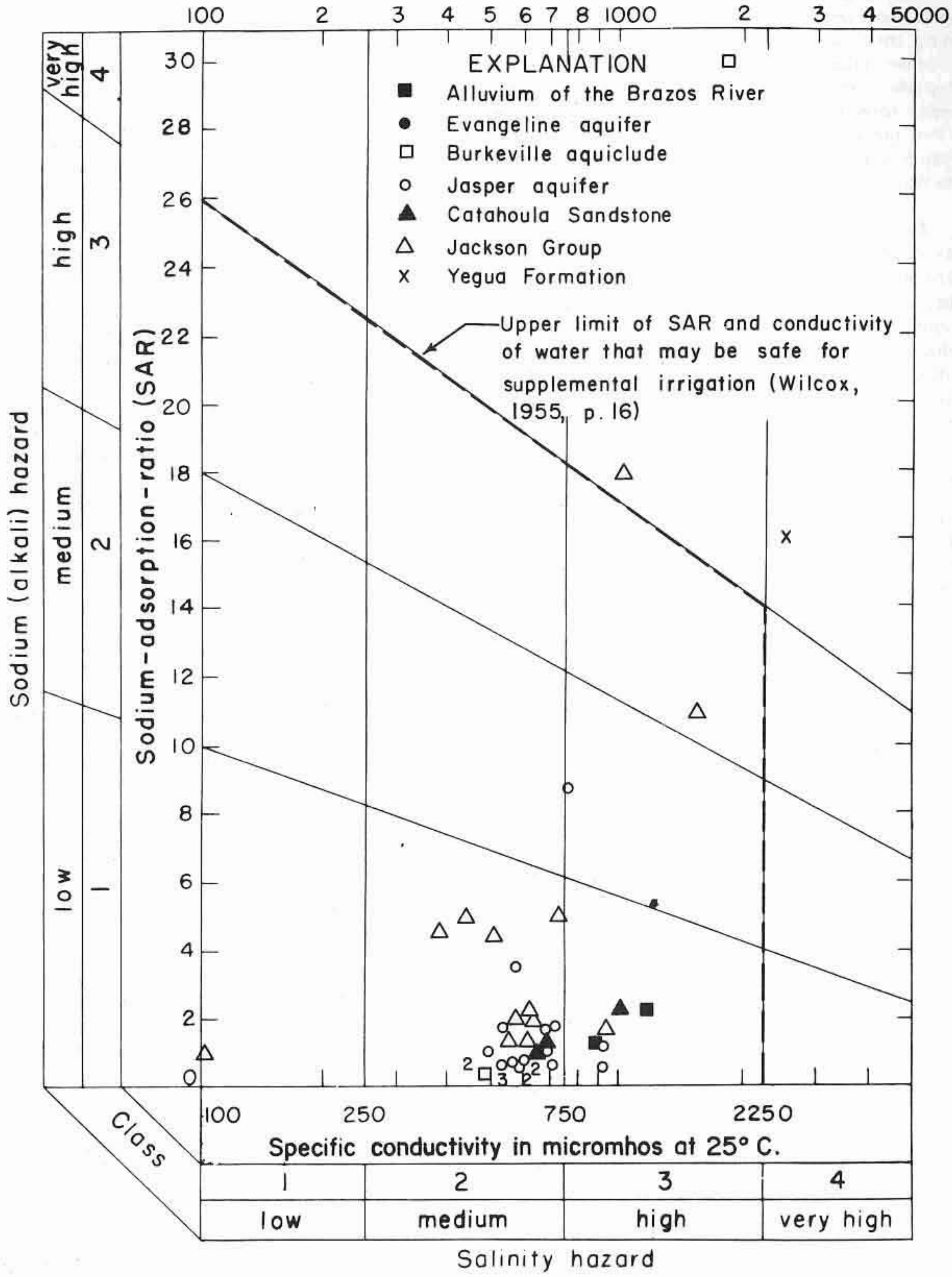

Figure 13.—Classification of Irrigation Water

A generalized portrayal of the chemical quality of ground water in Washington County is shown on Figure 14, which shows the concentrations of dissolved solids, chloride, sulfate, and hardness occurring in the water of selected wells and springs.

Jackson Group

Water from the Jackson Group varies widely in chemical content. The samples collected contain dissolved solids ranging from 66 to 4,998 mg/l. Seven of the 23 wells sampled yield water with a dissolved solids content in excess of 1,000 mg/l. Five wells produce water with a pH of less than 7. One of these, a dug well 45 feet deep (YY-59-44-704), yields water with a pH of 6.2. Although the concentrations of most dissolved constituents in the water from this well are low, (Table 9), the water has a bitter taste and locally is called "alum water".

Catahoula Sandstone

Water in the Catahoula Sandstone is generally of better quality than that from the Jackson, but not quite as good as water from the overlying Jasper aquifer. In Washington County, water in the Catahoula Sandstone ranges from moderately hard to very hard. Calcium is usually the predominate cation; either chloride or bicarbonate is the principal anion. In the outcrop and for four or five miles downdip, dissolved solids average about 500 mg/l.

Jasper and Evangeline Aquifers

Water from these aquifers is typically a calcium bicarbonate type. The concentration of dissolved solids usually ranges from about 300 to 500 mg/l. Characteristically, the water is very hard. The water usually has a pH greater than 7 and contains less sulfate than is found in the underlying aquifers. Iron and manganese may cause problems in the Jasper aquifer in Washington County. Iron content in the Jasper ranges from none to 4.5 mg/l, averaging 0.52 mg/l. Water from the Jasper and Evangeline aquifers usually is suitable for public supply and irrigation, and many types of industry.

Alluvium of the Brazos River

Samples from only three wells tapping the Brazos River alluvium exclusively were collected; many of the wells tap not only the alluvium but also underlying aquifers. The dissolved-solids content in the three samples ranged from 303 to 691 mg/l; the hardness ranged from 233 to 411 mg/l, and the chloride from 29 to 201 mg/l.

In adjacent Brazos and Burleson Counties, Cronin and Wilson (1967, p. 195-198) show analyses of water from 68 wells tapping the alluvium. Water from these wells is of a calcium bicarbonate type that has an average hardness of about 500 mg/l; and contains dissolved solids ranging from 208 to 2,217 mg/l. Iron exceeded the recommended limit of 0.3 mg/l in about 75 percent of the 54 samples analyzed. These analyses are probably representative of the quality of water in the alluvium in Washington County.

These data indicate that water from the alluvium of the Brazos River is suitable for irrigation of most crops. In Washington County it is used primarily for supplementary row-crop irrigation. Because water from the alluvium of the Brazos River is subject to contamination, it should be carefully checked before being considered for public supply or domestic use.

Protection of Ground Water

A potential source of contamination of ground water exists in the possible movement of brines from the underlying salt-water bearing formations through improperly cased oil wells or improperly plugged oil tests. In Washington County, however, no instances of such contamination have been reported. The Oil and Gas Division of the Texas Railroad Commission is responsible for protection of ground water. At their request, the Texas Water Development Board makes recommendations for the depth to which water-bearing formations are to be protected.

Field rules published by the Railroad Commission for Washington County show that ground water should be protected to a depth of 1,600 feet in the abandoned Arthur Harvey Wilcox field. The base of fresh water at the field (Figure 15) is about 700 feet below land surface. Field rules have not been established for the other fields in the county.

Another potential source of contamination is the infiltration of oilfield brine from disposal pits on the outcrops of the aquifers. In 1967, brine production in Washington County was 627,597 barrels, or 26,359,074 gallons. Of this, 624,012 barrels (26,208,504 gallons), were used for water flood injection into the Sparta Sand and Queen City Sand in Clay Creek oilfield. The remainder, about half of one percent or 3,585 barrels (150,570 gallons), was disposed of in unlined surface pits (Texas Water Development Board, 1967). There are no reported cases of contamination from pits in Washington County; however, because of the slow rate of ground-water movement, any contamination resulting from brine disposal may not be detected for years.

Contamination may also occur by the infiltration of industrial effluents and sewage in the shallow parts of the aquifers.

AVAILABILITY OF GROUND WATER

Fresh water in varying amounts and at varying depths is available throughout Washington County. The approximate altitude of the base of fresh water (less than 1,000 mg/l dissolved solids) as determined from electrical logs of oil and gas tests and a study of chemical analyses is shown in Figure 15. The base of fresh water ranges from about sea level in the north-central part of the county to about 1,200 feet below sea level in the southeastern part. At a few places, there may be little or no fresh water. One of these places is in northwestern Washington County along the outcrop of the Jackson Group.

The approximate total thickness of sand containing fresh water is shown on Figure 16. Nearly all of the fresh water is in the Catahoula Sandstone and the Jasper and Evangeline aquifers. Thicknesses range from less than 100 feet in the northwestern part of the county to over 400 feet in the southeastern part. Figure 16 also shows the areas where more than 20 feet of saturated alluvium occurs.

Based on an average sand thickness of 175 feet and assuming a porosity of 30 percent, about 18 million acre-feet of fresh water is in storage in the Catahoula Sandstone, the Jasper aquifer, and Evangeline aquifer. However, only a small amount of this can be economically produced because of the depth at which most of the water occurs and because the sands cannot be completely drained. Based on an average sand thickness of 100 feet and a specific yield of 15 percent, about 5 million acre-feet of fresh water is available for development at a depth of less than 400 feet.

Based on a porosity of 30 percent, about 236,000 acre-feet of fresh water is stored in the alluvium of the Brazos River in Washington County. Cronin and Wilson (1967, p. 73) estimated that about 118,000 acre-feet of fresh water (one half the amount in storage) was available for development.

The millions of gallons of fresh ground water in Washington County is in transient storage—that is, it is moving through the aquifers in a southeasterly or easterly direction. Calculations of the amount of water moving through the aquifers are based on transmissibility, hydraulic gradient, and aquifer width. The transmissibility of the fresh water section is about 31,000 gpd per foot (permeability of 175 gpd per foot times the average sand thickness of 175 feet). On the basis of a hydraulic gradient in 1968 of 7 feet per mile and an aquifer width of 35 miles, fresh water was moving through the county at the rate of about 7.6 mgd, or 8,500 acre-feet per year. This is equivalent to about 0.3-inch of recharge from rainfall on the outcrops of the aquifers.

Water levels have declined only a small amount and the amount of water in storage has changed very little. Therefore, a good estimate of the amount of recharge that is occurring is the sum of the amount moving through the aquifer and the amount being withdrawn. Using this criterion, recharge in 1968 was about 12,000 acre-feet, or about 0.5 inch of recharge from rainfall on the outcrops of the aquifers.

The maximum amount of water that could be pumped perennially would be the total recharge (including rejected recharge). In 1968, this was about 30,700 acre-feet (27.3 mgd) or about 1.2 inches of recharge from rainfall on the outcrops.

Another method of estimating ground-water availability is by determination of the transmission capacity for a particular gradient and to assume a set of discharge conditions. For example, it may be assumed that wells completely penetrating the fresh-water bearing section (not including the alluvium) are installed in a line trending east-northeasterly across the county through Brenham. It is assumed these wells are pumped so that water levels are lowered to 400 feet below land surface.

Recharge is assumed to occur along a line about 9 miles north-northwest of and parallel to the line of wells. It is further assumed that enough recharge is available on the outcrop to provide the water being pumped, that water levels along the outcrop remain at a constant level, and that the hydraulic gradient between the lines of recharge and discharge is a straight line. Under these conditions, about 67,000 acre-feet (60 mgd) would be transmitted to the line of wells. This is equivalent to about 2.5 inches of recharge. This greatly exceeds the estimated total recharge rate of 27 mgd. However, because of water in storage, a withdrawal rate much greater than 27 mgd could be maintained for many years before water levels would decline to as much as 400 feet below land surface.

Slightly saline water (1,000 to 3,000 mg/l dissolved solids) underlies the fresh water throughout Washington County. Much of this water is suitable for many purposes. The approximate altitude of the base of slightly saline water is shown in Figure 17. In the Clay Creek Oil Field area, the altitude of the base of slightly saline water rises to about sea level; elsewhere, it ranges from about 500 to 3,500 feet below sea level.

The thickness of sands containing slightly saline water is shown in Figure 18. The thickness ranges from about 45 to 200 feet.

About 5.9 million acre-feet of slightly saline water is in storage in Washington County. This quantity, however, is not significant so far as availability is concerned because of the great depth at which the water occurs.

RECOMMENDATIONS FOR FURTHER STUDIES

One of the important sources of water for the future in Washington County is the recharge that is being rejected into and which forms the base flow of streams. Additional surface water stream gaging stations should be established to gather quantitative data on this important water resource.

A continuing program for the collection of hydrologic data should be established as further ground-water developments occur. Such a program should keep pace with development on a continuing basis. The program should include measuring water levels in wells tapping the artesian aquifers in addition to the current observation well program. It should also monitor water quality. Annual inventories of the amount of ground water pumped should be continued. As a part of the pumpage inventory, an inventory of new wells should be added. It is especially important to obtain records of the larger capacity wells as they are drilled. As feasible, additional aquifer tests should be made to determine the hydraulic properties of the aquifers.

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Table 6.--Records of Wells, Springs, and Test Holes

All wells are drilled unless otherwise noted in remarks column.

Water level : Reported water levels given in feet; measured water levels given in feet and tenths.

Method of lift and type of power: A, airlift; B, bucket; C, centrifugal; E, electric; G, gasoline; Ng, natural or LP gas; H, hand; J, jet; N, none; P, piston; S, submergible; T, turbine; W, windmill. Number indicates horsepower.

Use of water : D, domestic; Irr, irrigation; Ind, industrial; P, public supply; S, stock; U, unused.

Water-bearing unit : Qal, alluvium of the Brazos River; Ev, Evangeline aquifer; B, Burkeville aquiclude; J, Jasper aquifer; Tcs, Catahoula Sandstone; Tj, Jackson Group; Ty, Yegua Formation.

WELL	OWNER	DRILLER	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			
YY-59-39-805	Harry Moore	--	--	437	2	Tcs	200	+2.1	Nov. 26, 1968	Flows	U	Unused.
* 43-801	A. H. Kuehn	Walter E. Rinn	1932	125	4	Tj	259	--	--	P,W	S	
902	Nellie Taplin	L. D. Arrington	1962	265	4	Tj	286	43.3	Sept. 9, 1968	--	D	
903	A. Eberhardt	do.	1951	170	--	Tj	302	--	--	P,E,3/4	U	
* 904	do.	--	1920	70	6	Tj	309	--	--	J,E,1/2	D	Bored well, concrete casing.
905	C. Ferris Estate	--McClemon	1904	15	30	Tj	278	5.2	Oct. 9, 1968	B,H	D	Dug well, concrete casing.
* 906	Arthur Wilson	G. Brinkman	1965	306	2	Tj	273	60	1965	J,E,1/2	D	Screen from 296 to 306 ft.
907	--Carroll	B & D Drilling Co.	1954	200	3	Tj	272	--	--	J,E,1/2	S	Casing slotted from 179 to 200 ft.
44-601	Corps of Engineers	Pomykal Drilling Co.	1965	535	6	Tj	258	36.5	Aug. 22, 1968	--	U	Industrial well, used during construction of Somerville Reservoir. Slotted from 509 to 535 ft. 2/
* 602	Marineland Inc.	Beaumier Iron Works	1968	400	4	Tj	288	60.0	do.	S,E,5	P	Casing slotted from 385 to 400 ft. 2/
603	Cedar Oaks Estate	Pomykal Drilling Co.	1968	184	4	Tj	285	53.4	Dec. 16, 1968	S,E,3/4	D	Casing slotted from 164 to 184 ft.
604	Tom Robbin	do.	1965	201	4	Tj	268	42	Nov. 1965	S,E,1/3	D	Casing slotted from 170 to 201 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-44-701	Deep Water Association	Pomykal Drilling Co.	1967	212	4	Tj	265	26.6	July 26, 1968	S,E,5	P	Test hole 812 ft; plugged back to 212 ft. Casing slotted from 191 to 212 ft. 2/
702	F. W. Broesche	G. Brinkman	1962	158	4	Tj	275	45.9	do.	--	D	
703	Harold Rabalais	Pomykal Drilling Co.	1968	635	--	Tj	278	--	--	N	U	Test hole, abandoned. 2/
* 704	Corps of Engineers	--	1900	45	32	Tj	269	4.1	Sept. 18, 1968	N	U	Dug well, brick curb; acid water, pH 6.2 at site of old plantation; abandoned after civil war.
* 705	Harold Rabalais	G. Brinkman	1968	453	4	Tj	270	39.2	Nov. 20, 1968	S,E,3	P	Measured discharge 39 gpm on Nov. 20, 1968. 2/
* 706	G. W. Fischer	--	--	101	8	Tj	305	45.6	Nov. 11, 1942	--	U	Bored well, tile curb. Old well.
* 801	Ralph Johnston	Pomykal Drilling Co.	1964	500	10	Tj	315	85	May 1964	T,E,10	P	Casing slotted from 238 to 290 ft; and from 445 to 500 ft. Reported drawdown 65 ft. at 700 gpm, March 1964. Originally drilled for irrigation well. 2/
802	Rocky Creek Park	do.	1967	330	6	Tj	275	40	Nov. 1968	S,E,5	D	Casing slotted from 267 to 330 ft.
* 803	J. T. Johnson Estate	Beaumier Iron Works	1955	315	4	Tj	328	81.8	July 26, 1968	S,E,3/4	D	Casing slotted from 305 to 315 ft.
* 804	Malke Estate	--	--	45	24	Tj	284	43.6	Nov. 11, 1942	N	U	Dug well; concrete casing. Unused. Old well.
805	R. Nienstedt	Siegert Water Wells	1963	208	4	Tj	322	66.3	Nov. 20, 1968	S,E,3	D	

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
YY-59-44-806	L. C. Landua	A. B. Conklin	1960	316	4	Tj	360	96.0	Nov. 20, 1968	S,E	D	Casing slotted from 296 to 316 ft. Old well reported "too lignitic". Old well drilled deeper.
* 807	R. O. Leachman	Pomykal Drilling Co.	1968	547	4	Tj	358	134.3	Dec. 16, 1968	S,E,1	S	Casing slotted from 521 to 547 ft.
901	--Boerninghaus well 1	Roy Perkins	1951	1,433	--	--	393	--	--	--	--	Oil test. 1/
* 902	Charlesville School	--	--	15	34	Tj	335	10.0	Nov. 11, 1942	--	U	Dug well, concrete curb. Unused.
903	W. S. Houston	Pomykal Drilling Co.	1968	328	4	Tj	339	76	Apr. 1968	S,E,3	P	Casing slotted from 303 to 328 ft.
904	J. Dahlmann	do.	1967	335	4	Tcs	485	170	Sept. 1967	S,E,1	D	Casing slotted from 313 to 335 ft. Pump set at 291 ft. 2/
* 905	T. Pelkemeyer	--	1880	94	24	Tcs	398	10	Sept. 1942	N	U	Dug well, tile curb.
45-402	Emil Nerienz	--	1860	48	48	Tj	260	41.0	Dec. 30, 1968	J,E,3/4	D	Dug well, square concrete curb at top.
403	Elijah Ratliff	Pomykal Drilling Co.	1961	260	3	Tj	264	44.8	do.	J,E,1/2	D	
* 502	George Butler	--	1874	75	60	Tcs	438	54.4	July 2, 1942	N	U	Dug well, rock curb. Unused.
* 605	Sun Oil Co.	Walter E. Rinn	1936	123	6	Tj	290	--	--	P,E	D	Formerly used as public supply well, now only supplies office. Perforated below 98 ft; exact interval unknown.
606	do.	--	1930	505	6	--	255	16.0	Aug. 22, 1968	P	U	
* 607	do.	Walter E. Rinn	1937	160	5	J	212	+2.0	Nov. 13, 1942	Flows	U	Perforated from 120 to 160 ft.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-45-608	Sun Oil Co.	Walter E. Rinn	1936	115	7	Tj	292	89.4	Nov. 13, 1942	N	U	Reported poor well, never used.
701	W. B. Whenthoff	--	1954	285	6	Tcs	402	99.8 99.2	Oct. 2, 1959 Aug. 30, 1960	T	P	Used two years for irrigation, used for recreation since 1957.
* 702	H. W. Wendt	--	--	180	8	Tcs	364	--	--	J,E,2	D	Formerly used by gin. Old well.
* 704	Mills Cox	Beaumier Iron Works	1963	505	4	Tcs	360	142.3	July 16, 1968	S,E,2	D	Screen from 464 to 484 ft.
705	do.	do.	1966	565	4	Tcs	360	155	July 1966	S,E,2	D	Screen from 535 to 565 ft.
* 706	do.	do.	1967	560	4	Tcs	362	120	July 1967	S,E,2	D	Screen from 530 to 560 ft.
707	R. M. Strange	Pomykal Drilling Co.	1964	352	6	Tcs	485	180	July 1964	S,E,25	S	Casing slotted from 332 to 352 ft. 2/
708	do.	A. B. Conklin	1960	252	4	Tcs	470	180	July 1963	J,E,13	D	
709	W. H. Hueske	--	1860	44	36	J	422	5.5	Dec. 16, 1968	J,E,1/2	D	Dug well, concrete curb.
* 710	do.	--	1910	10	30	J	400	2	Dec. 1968	J,E,1	D	Dug well, rock curb.
711	Calvin Sayles	--	1952	162	5	Tcs	405	80.1	Dec. 30, 1968	P,E,1/2	U	
801	Old Gay Hill Church	--	--	26	30	J	350	15.5	Aug. 12, 1968	B,H	D	Dug well, concrete curb.
* 802	F. S. Bryan	Seismic Crew	1939	83	3	J	325	+5.5	Sept. 11, 1942	Flows	S	Seismic test hole.
* 803	Otto Janner	--	1840	24	42	J	440	12.8	July 2, 1942	N	U	Dug well, rock walled, wooden curb on top.
* 804	Big Springs	--	--	Spring	--	J	311	+	Feb. 16, 1942	Flows	U	Dug out spring; once supplied steam driven gin; in use from about 1840 to 1940.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-45-906	W. F. Schlottmann	--	1890	50	44	Tcs	390	32.4	Dec. 4, 1969	J,E,3/4	D	Dug well, concrete curb above; rock wall below.
907	Harold T. Ray, Jr.	Beaumier Iron Works	1967	203	4	Tcs	340	67.8	do.	S,E,1	D	Casing slotted from 186 to 196 ft. 2/
46-101	C. L. Vickers	Pomykal Drilling Co.	1967	97	4	Tcs	275	50	Jan. 1967	S,E,3	D	Casing slotted from 87 to 97 ft. 2/
* 201	Wm. Engel	--	--	37	24	Tcs	268	32.8	Nov. 16, 1942	N	U	Dug well, concrete curb. Old well.
* 304	F. C. Sommers	Bob Felder	1910	320	8	Tcs	387	169.6	Dec. 5, 1968	S,E,1	Ind	
* 305	O. G. Gindorf	--	1892	175	3	Tcs	382	150	1942	N	U	Destroyed.
306	do.	Pomykal Drilling Co.	1947	517	4	Tj	382	250	1947	S,E,3/4	D	
307	O. C. Gindorf	Joe Pomykal	1942	317	6	Tcs	382	174.9	Dec. 5, 1968	N	U	
* 401	Dillon Anderson	Pomykal Drilling Co.	1963	150	8	Tcs	328	90.8	July 24, 1968	T,E,30	Irr	Casing slotted from 107 to 147 ft. Measured discharge 322 gpm on Aug. 8, 1968. Temp. 23°C. 2/
402	Independence Smoke House	Pomykal Drilling Co.	1967	242	4	Tcs	380	96.6	Aug. 21, 1968	S,E,3/4	Ind	Casing slotted from 222 to 242 ft. 2/
* 403	Independence Baptist Church	do.	1966	179	4	Tcs	350	70	Oct. 1966	S,E,1/2	P	Casing slotted from 159 to 179 ft. 2/
404	do.	do.	1966	327	4	Tcs	385	142 142.2	Oct. 1966 Aug. 21, 1968	S,E,3/4	Irr	Casing slotted from 301 to 327 ft. 2/
405	Independence Cemetery	do.	1967	149	4	Tcs	320	84.4	Aug. 22, 1968	S,E,1/2	Irr	Casing slotted from 138 to 149 ft. 2/
406	Dillon Anderson	do.	1963	1,017	--	--	328	--	--	N	U	Test hole.
407	Edward Scheffer	do.	1967	162	4	J	352	58	Jan. 1967	S,E,1/2	D	Casing slotted from 152 to 162 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-46-408	C. F. Toalson	--	--	57	6	J	378	47.8	Nov. 16, 1942	N	U	Steel casing. Old well.
* 409	E. F. Clay	--	--	27	42	J	--	17.0	Nov. 17, 1942	N	U	Dug well, rock and wooden curb. Old well.
* 502	Dillon Anderson	Pomykal Drilling Co.	1958	701	4	Tj	360	--	--	S,E,<1	D	Casing slotted from 660 to 700 ft. 2/
503	David Dahman	do.	1966	206	4	J	378	99	Apr. 1966	S,E,1/2	D	Casing slotted from 190 to 206 ft. 2/
504	R. J. McAmis	do.	1965	240	4	Tcs	382	106	Nov. 1965	S,E,3/4	D	Casing slotted from 220 to 240 ft. 2/
601	G. T. Newman	Pomykal Drilling Co.	1968	290	4	J	322	94	May 1968	S,E	D	Casing slotted from 267 to 290 ft. 2/
* 702	H. V. Niemann	--Dietz	1955	330	6	J	310	47.8	Dec. 4, 1968	S,E, 1 1/2	D	Screen from 310 to 330 ft.
* 703	Washington County	Seismic Crew	1939	90	4	J	272	+	do.	Flows, N	U	Seismic test hole, converted to water well estimated flow 50 gpm, Dec. 4, 1968.
* 704	M. H. Sommers Estate	Carl Booth	1925	222	6	J	230	3.4	do.	J,E,1/2	S	Well drilled inside 30 ft. Deep concrete lined well.
* 705	do.	do.	1926	222	6	J	301	+	Oct. 21, 1942	J,E,1/2 Flows	S	Not flowing on Dec. 4, 1968. Temp. 22°C.
* 706	do.	do.	1918	222	3	J	302	14.9	do.	J,E,1/2	Irr	Well drilled inside 30 ft. Deep rock lined well.
707	M. O. Miller	Pomykal Drilling Co.	1966	325	4	J	342	38	Dec. 1966	S,E,3/4	D	Slotted from 308 to 325 ft. Pump set at 84 ft. 2/
801	Hebert Gebert	L. Patterson Inc.	1957	2,728	10	J,Tj	392	102.0 96.2	Oct. 2, 1959 Aug. 22, 1968	N	U	Slotted from 262 to 288 ft; 425 to 435 ft. Screen set at 2,400 ft. Length unknown.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-46-802	Herbert Gebert	Layne-Texas Co.	1962	457	12	J	340	119 90.8	Sept. 1962 Aug. 22, 1968	T,E,50	Irr	Casing slotted from 243 to 446 ft. Reported 4 1/2 hours pumping level, 236 ft, Sept. 25, 1962. 2/
* 803	do.	Pomykal Drilling Co.	1937	237	5	J	355	61.9	Oct. 21, 1942	P,E,2	D	Screen from 217 to 237 ft.
* 804	G. Ellerman	E. L. Gajeske	1955	136	4	J	240	+	Dec. 4, 1968	Flows, J,E	D	Measured flow 4 gpm on Dec. 4, 1968.
* 805	Buell Moore	Beaumier Iron Works	1967	204	4	J	245	+	do.	Flows, S,E, 7 1/2	Irr	Screen from 184 to 204 ft. Measured flow 22 gpm on Dec. 4, 1968. Irrigated 14 acres of coastal bermuda in 1968. 2/
901	T. G. Pittman	do.	1962	150	4	J	329	82.4	Dec. 5, 1968	S,E,3/4	D	
* 902	Dudley Briggs	Pomykal Drilling Co.	1967	400	4	J	302	89.0	do.	S,E,3/4	S	Casing slotted from 358 to 400 ft. Pump set at 147 ft. 2/
903	do.	--	--	93	6	J	305	54.2	do.	N	U	Old well.
* 47-101	St. Matthew Church	--	1909	20	40	Qal	350	12.5 7.9	Oct. 20, 1942 Aug. 12, 1968	B,H	D	Dug well, rock curb.
* 102	W. H. Baugh	--	1962	560	4	Tj	361	60.9	Nov. 21, 1968	S,E, 1 1/2	D	Screen from 540 to 560 ft.
103	Wells Estate	--	--	32	36	J	240	9.0	Dec. 17, 1968	J,E	D	Dug well, rock curb. Corrugated metal on top.
201	T. J. Moore	--	--	209	4	Tcs	247	90.4	Nov. 26, 1968	P,E,1/2	S	
* 202	Harry Moore	Walter Rinn	1925	135	4	Tcs	302	--	--	P,E,1/2	S	
* 203	Mt. Fall School	--	--	40	30	Tcs	278	--	--	N	U	Dug well. Concrete curb to 20 ft; tile from 20 ft. to bottom. Old well.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-47-301	Moore Bros.	--	1890	245	3	J	192	4.5	Nov. 26, 1968	J,E,1/2	Ind	3/
* 302	do.	--	1936	340	4	J	192	1.1	May 22, 1961	N	U	Casing slotted from 320 to 340 ft. Temp. 23°C. 3/
* 401	O. L. Sommers	--	--	250	6	J	352	--	--	N	U	
402	do.	--	--	50	24	J	352	38.7	Nov. 19, 1942	N	U	Dug well, tile curb. Old well.
* 502	L. F. Jensen	Pomykal Drilling Co.	1966	299	4	J	259	64.4	Dec. 17, 1968	S,E,1/2	Ind	Casing slotted from 289 to 299 ft. Pump set at 115 ft. Old well drilled deeper.
* 503	Mt. Zion School	A. D. Hafer	1940	130	4	J	325	--	--	N	U	
* 504	--Williams	--	--	40	24	Ev	327	33.7	July 1, 1942	N	U	Dug well, tile and concrete casing. Old well.
601	Mrs. W. F. Borgstedte	Dunn Water Well Drilling Co.	1953	50	18	Qal	185	33.6	Aug. 21, 1968	T,G,10	U	3/
* 604	State of Texas	Pomykal Drilling Co.	1965	385	4	J	220	23.4	do.	S,E, 1 1/2	P	Screen from 365 to 385 ft. Pump set at 130 ft. 2/
* 605	do.	Joe Pomykal	1935	412	6	J	220	+	July 1, 1942	T,E,2, Flows	U	Perforated from 390 ft. to bottom.
606	Willie Stolz	Falkenbury Drilling Co.	1966	105	4	B;J?	228	50	Nov. 1966	S,E,1/2	D	Screen from 95 to 105 ft. 2/
607	State of Texas	--	--	310	4	J	190	11.6	July 1, 1942	--	U	
* 608	R. Dickschat	Pomykal Drilling Co.	1966	126	4	B;J?	201	37.2	Nov. 26, 1968	J,E,1	D	Screen from 115 to 126 ft. 2/
* 609	Mrs. W. F. Borgstedte	--	1920	80	3	B	268	--	--	P,W	S	
* 610	F. W. Wellman	Ed. Hoffer	1927	82	6	J	281	49	Jan. 1927	N	U	

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-47-611	State of Texas	Pomykal Drilling Co.	1969	358	6	J	220	33	Jan. 1969	S,E,15	P	Screen from 313 to 358 ft. 2/
702	Antioch Church	--	--	80	30	Ev	322	65.6	Nov. 21, 1968	N	U	Dug well, concrete curb.
703	Ward Dillard	--	1900	30	32	Qal	260	33.0	Nov. 29, 1968	P,E,H	D	Do.
* 704	George Butler	--	--	8	30	Ev	245	1.0	Nov. 19, 1942	N	S	Dug well, concrete curb. Old well.
* 802	A. Stegemueher	--	1850	36	26	Ev	270	26.3	Nov. 29, 1968	J,E,1/3	D	Dug well, tile curb.
803	Rosa Goeking	Pomykal Drilling Co.	1959	250	4	BjEv	308	108.8	do.	S,E,2	D	
804	W. J. Lauter Estate	--	1915	42	36	Ev	285	35.4	Nov. 29, 1968	P,E,1/3	S	Dug well, concrete curb.
* 805	George Boenker	A. B. Conklin	1955	180	4	Ev	265	--	--	J,E,1	D	Screen from 170 to 180 ft.
* 806	A. L. Bohne	G. C. Booth	1909	125	6	Ev	312	92.3	Oct. 23, 1942	J,E	D	
807	do.	--	1940	705	6	J	313	82.3	do.	N	U	
* 902	T. J. Moore	--	--	124	6	Ev	272	103.7 108.0 92.4	Oct. 22, 1942 Oct. 15, 1959 Oct. 7, 1968	S,E,3/4	D	
903	C. D. Dickschat	Pomykal Drilling Co.	1967	180	4	Ev	239	--	--	S,E,1	D	Screen from 161 to 180 ft. Pump set at 136 ft. 2/
* 904	H. C. Buck	G. C. Booth	1918	160	6	Ev?	312	--	--	N	U	
* 905	H. Wehmeyer	--	1890	43	6	Ev	223	34.3	Oct. 22, 1942	N	U	
* 48-402	C. F. Holle	E. Gajeske	1954	700	4	J	186	+10.3	Nov. 29, 1968	N, Flows	S	Measured flow 8.5 gpm, Nov. 29, 1968. Perforated from 668 to 700 ft.
701	H. Wehmeyer	--	1933	85	6	Qal	192	29.1	May 22, 1961	N	U	3/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND SUR-FACE DATUM (FT)	DATE OF MEASURE-MENT			
* YY-59-48-702	H. Wehmeyer	--	1933	700	4	J	192	+0.5	May 22, 1961	N, Flows	S	Screen from 680 to 700 ft. Measured flow 1/4 gpm on May 22, 1961. 3/
703	T. J. Moore	--	--	28	--	Qal	192	22.1	Aug. 21, 1964	B,H	D	Dug well, concrete curb. Old well.
704	J. F. Renn	--	1900	35	48	Ev	193	28.1	Aug. 20, 1964	J,E	D	Dug well, concrete curb.
* 705	Joe Baldridge	--	1920	700	3	J	185	+	Oct. 22, 1942	Flows, N	U	Measured flow 16 gpm on Nov. 22, 1942.
* 50-905	R. B. Fogle	Beaumier Iron Works	1968	362	4	Tj	470	162	Dec. 1968	S,E,2	D	Screen from 328 to 358 ft. 2/
* 51-103	A. G. Loewe	Walter Rinn	1927	114	3	Tj	335	--	--	C,E,<1	D	
104	E. Lehmann	Charles Ressman	1965	150	4	Tj	316	41.0	Sept. 9, 1968	S,E,1/2	D	Open hole.
* 105	H. Schoenemann	Pomykal Drilling Co.	1951	63	4	Tj	319	42	Aug. 1968	J,E,1/2	S	
106	Kamins Ranch	L. D. Arrington	1964	298	6	Tj	292	38.8	Sept. 8, 1968	S,E,5	D	
* 202	Double D Farm	--	1929	105	3	Tj	352	50.6	Nov. 12, 1942	N	U	
301	J. W. Link	Pomykal Drilling Co.	1967	172	4	Tcs	399	75	Apr. 1967	S,E,1/2	D	Screen from 160 to 172 ft. Pump set at 126 ft. 2/
302	R. Benford	Pomykal Drilling Co.	1967	126	4	Tj	349	50.3	Sept. 9, 1968	S,E,1/3	D	Casing slotted from 116 to 126 ft. Pump set at 94 ft. 2/
* 602	Mrs. Ed Kieke	--	1929	69	9	Tcs	450	45.8 49.5 47.7	Nov. 12, 1942 Oct. 16, 1959 Sept. 10, 1968	J,E,1/2	D	Bored well, tile curb.
* 603	K. L. Nixon	--	1900	60	8	Tcs	400	15.8	Sept. 10, 1968	J,E,1/3	D	Bored well, concrete curb.
* 605	T. R. Fincher	--	1900	38	48	Tcs	545	2.6 3.0	Nov. 12, 1942 Sept. 10, 1968	B,H	U	Dug well, rock curb.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-51-606	Kerin Kieke	--	1923	66	26	Tcs	445	20.6	Sept. 10, 1968	N	U	Dug well, brick and concrete curb.
* 607	L. B. Davenport	Pomykal Drilling Co.	1967	155	4	Tcs	433	37.4	Oct. 8, 1968	S,E,5	Irr	Casing slotted from 135 to 155 ft. Measured flow 75 gpm on Oct. 8, 1968. Pump set at 126 ft. 2/
* 703	Nolan Schmidt	Walter Rinn	1936	216	3	Tj	452	84 104.3	1957 Dec. 18, 1968	A,W	S	
* 805	R. Stiewert	--	1890	70	8	Tcs	452	46.6	Sept. 9, 1968	P,W,H	D	Bored well, tile curb.
901	E. H. Cutler	Pomykal Drilling Co.	1967	170	6	Tcs	492	82	May 1967	S,E	D	Screen from 133 to 170 ft. Pump set at 147 ft. 2/
* 902	Paul Kessler	--	1890	28	8	J	468	--	--	N	U	Bored well, tile curb.
52-101	Fieldcrest Farm	Pomykal Drilling Co.	1968	390	4	Tcs	415	140.1	Sept. 9, 1968	S,E,2	S	Casing slotted from 350 to 390 ft.
* 102	Gardner Symonds	--	--	35	38	Tcs	376	21.1	Dec. 13, 1968	N	U	Dug well, concrete curb. Old well.
* 103	do.	Joe Pomykal	1948	280	4	Tj	376	74.6	do.	J,E,2	S	
104	do.	Pomykal Drilling Co.	1967	303	4	Tcs	402	105.1	do.	S,E, 1 1/2	S	Casing slotted from 276 to 303 ft. Pump set at 168 ft. 2/
105	do.	do.	1967	338	4	Tcs	382	76.4	do.	S,E,1	S	Casing slotted from 318 to 338 ft. Pump set at 126 ft. 2/
106	do.	do.	1967	286	4	Tcs	376	75	Aug. 1967	S,E, 1 1/2	D	Casing slotted from 261 to 286 ft. Pump set at 147 ft. 2/
201	Sydnor Oden	--Swearingen	1955	800	--	Tj	412	--	--	N	U	Drilled to 3,200 ft; plugged back to about 800 ft.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-52-202	Rocky Creek Manor	Beaumier Iron Works	1968	292	4	Tcs	235	36.9	Sept. 18, 1968	S,E,2	P	Casing slotted from 268 to 288 ft. 2/
203	M. A. Weber	Walter Rinn	1925	320	3	Tcs	515	130.9	Dec. 12, 1968	S,E,1	D	
204	do.	--	1910	30	28	Tcs	515	4.5	do.	N	U	Dug well, concrete curb.
205	Sydnor Oden	Beaumier Iron Works	1962	258	4	Tcs	522	157.6	Dec. 13, 1968	S,E,2	S	Screen from 231 to 258 ft.
206	do.	Pomykal Drilling Co.	1965	417	4	Tcs	432	128	Aug. 1965	S,E,3/4	S	Casing slotted from 401 to 417 ft. Pump set at 168 ft. 2/
* 301	Gus Foerster	do.	1968	193	4	Tcs	445	33	July 1968	J,E,3/4	D	Casing slotted from 173 to 193 ft.
* 302	Louis Roehling	--	1918	35	48	J	522	8.1	Sept. 18, 1968	B,H	D	Dug well, rock curb.
303	H. Glaesmann	John Booth	1915	165	6	J	475	--	--	J,E,1	D	
304	H. Winklemann	Seismic Crew	1942	70	5	Tcs	435	7.2	Nov. 13, 1942	N	U	Seismic test hole.
401	Burton Water Supply Corp.	Pomykal Drilling Co.	1966	775	8	Tj	452	150	Jan. 1966	S,E,20	P	Screen from 693 to 753 ft. Pump set at 351 ft. 2/
402	A. Sommerfeld	Wagoner Bros.	1900	71	8	Tcs	522	49.1	Sept. 10, 1968	S,E,3/4	D	Bored well, tile casing.
403	Fred De Laume	Pomykal Drilling Co.	1966	252	4	Tcs	455	88	Apr. 1966	S,E,3/4	D	Screen from 211 to 252 ft. 2/
* 404	Farmers National Bank	Joe Pomykal	1941	160	3	Tcs	495	--	--	N	U	
405	Kamins Ranch	Pomykal Drilling Co.	1967	491	4	Tcs	470	170	Jan. 1967	S,E,<1	S	Casing slotted from 468 to 491 ft. 2/
* 501	Kirby Lehrmann	Walter Rinn	1935	192	5	J	342	12.8	Dec. 31, 1968	J,E,1/2	S	Reported flowed Sept. 12, 1942; ceased flowing between 1942 and 1959. Casing slotted from 172-192 ft. 3/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-52-502	Theo A. Ganske	Pomykal Drilling Co.	1964	150	4	J	435	69	Nov. 1964	N	D	Casing slotted from 139 to 150 ft. 2/
503	Oscar Schultz	do.	1964	203	4	J	480	107.3	Dec. 13, 1968	S,E,1/2	D	Casing slotted from 180 to 203 ft. 2/
* 504	R. A. Fuchs	--	--	58	36	J	445	26.4 20.4	Nov. 20, 1942 Dec. 31, 1968	P,E,1	D	Dug well, concrete curb. Old well.
* 505	do.	--	--	126	6	J	445	--	--	P,W	S	Old well.
* 603	Kirby Lehrmann	Will Homeyer	1912	200	6	J	398	16.1 62.5 5.4	July 23, 1942 Oct. 16, 1959 Dec. 31, 1968	N	U	Dug well, concrete curb from 30 to 74 ft; drilled well from 74 ft. to 200 ft. Old well.
* 604	Edmond Schultz	G. Brinkman	1967	126	4	J	350	+13.0	Dec. 12, 1968	Flows, N	S	Casing slotted from 106 to 126 ft. Measured flow 1.6 gpm, Dec. 12, 1968.
* 605	do.	do.	1966	160	4	J	404	23.5	Dec. 12, 1968	S,E,3/4	Ind	
* 606	Texas Highway Dept.	--	1921	80	4	J	329	+14.1 +	Sept. 12, 1942 Dec. 31, 1968	N Flows	U	Reported flowed around outside of casing Dec. 31, 1968. Measured flow 5 gpm, July 17, 1942.
* 607	K. Kraft	--	1922	150	6	J	340	+	July 7, 1942	P,E,3 Flows	D	Flowed July 17, 1942.
608	I. Rosenbaum	Pomykal Drilling Co.	1965	157	4	J	357	30	Jan. 1965	S,E,1/2	D	Casing slotted from 137 to 157 ft. Pump set at 84 ft. 2/
609	E. Ganske	do.	1964	126	4	J	335	20	Nov. 1964	S,E,1/2	D	Casing slotted from 116 to 126 ft. 2/
* 702	Max Zuehlke	do.	1967	275	6	J	460	77.9	Sept. 10, 1968	S,E,15	Ind	Casing slotted from 181 to 275 ft. Measured flow 181 gpm, Sept. 10, 1968. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-52-703	L. D. Neutzler	Pomykal Drilling Co.	1965	212	4	J	415	45 43.7	Aug. 1965 Oct. 16, 1968	S,E,1/2	D	Casing slotted from 200 to 212 ft. 2/
704	G. Schwartz	do.	1967	208	4	J	388	30	July 1967	S,E,<1	D	Casing slotted from 190 to 208 ft. 2/
705	Oliver Whitener	Joe Pomykal	1952	248	4	J	481	104.6	Dec. 31, 1968	S,E,1	S	
* 801	Henry Kramer	Henry Kramer	--	55	38	J	342	6.4	Dec. 31, 1968	J,E	S	Dug well, rock curb. Old well. 3/
* 802	R. & H. Kramer Kramer	E. Gajeske	1935	117	4	J	335	+12	1935	P,E,1/2 Flows	U	Measured flow 0.5 gpm, July 23, 1942; stopped flowing 1968. Perforated casing from 107 to 117 ft.
803	do.	Pomykal Drilling Co.	1968	135	4	J	328	+	Dec. 31, 1968	J,E,1/2, Flows	D	Measured flow 1.2 gpm, Dec. 31, 1968.
* 804	Walter Maass	John Franks	1917	170	10	J	332	+10.0 + .1 3.9	July 23, 1942 Oct. 16, 1959 Dec. 31, 1968	J,E,1/2	D	Casing perforated from 150 to 170 ft. Not flowing July 23, 1942 and Dec. 31, 1968; flowing Oct. 16, 1959.
* 901	O. A. Schawe	G. C. Booth	1917	260	5	J	320	25 33	1942 1966	J,E	D	Measured temp. 22°C.
902	Herman Peters	Pomykal Drilling Co.	1965	265	4	J	373	100	Mar. 1965	S,E	S	Casing slotted from 234 to 265 ft. 2/
903	R. L. Landua	E. Gajeske	1953	178	4	J	321	6	Jan. 1966	J,E,1/4	D	Casing slotted from 168 to 178 ft. Flowed until 1956.
904	P. Krivacka Estate	Pomykal Drilling Co.	1952	210	4	J	298	38.1	Jan. 3, 1969	N	D	Casing slotted from 202 to 210 ft. Measured flow 33 gpm, Jan. 3, 1969. Measured temp. 22°C.
* 905	H. Wendler	--	1936	17	41	J	333	9.5 7.5	July 23, 1942 Jan. 3, 1969	N	U	Dug well, concrete curb.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-52-906	Charles Hodde	Frank Bros.	1915	161	6	J	340	+	July 23, 1942	J,E,1/2 Flows	D	Measured flow 0.4 gpm, July 23, 1942.
* 907	Mrs. R. Wendler	--Bomill	1907	191	6	J	355	+	do.	E,<1 Flows	D	Flow small "trickle", July 23, 1942.
908	Harold Wendler	C. Erickson	1955	198	4	J	333	+	Jan. 3, 1969	J,E, Flows	D	Estimated flow 4 gpm, Jan. 3, 1969.
* 53-101	Vernon Runge	Beaumier Iron Works	1964	356	4	J	455	124.4	Dec. 12, 1968	S,E,1	D	Casing slotted from 301 to 352 ft.
* 102	A. D. Spinn	--	--	22	48	J	400	--	--	N	U	Dug well, rock curb. Old well.
* 201	Yegua Development Co.	Layne-Texas Co.	1964	1,070	8 5/8	J,Tcs	350	76.8	July 26, 1968	T,E,20	P	Casing slotted from 470 to 500, 505 to 625, 775 to 795, 805 to 825, 930 to 950, 960 to 970, 985 to 990, and 1,025 to 1,060 ft. 2/
* 202	C. Machemehl	Pomykal Drilling Co.	1965	320	2 1/2	J	255	+21.8	Nov. 19, 1968	N Flows	S	Open hole. Reported flow 10 gpm, Sept. 27, 1965. 2/
* 203	Richard Spinn	E. Gajeske	1940	175	4	J	270	--	--	J,E,1	D	Reported flowed until 1962.
204	do.	Seismic Crew	1953	104	4	J	265	15.0	Nov. 19, 1968	N	U	Seismic test hole. Reported flowed until 1962.
* 205	Leo Arndt	E. Gajeske	1924	69	7	J	330	+	July 31, 1942	Flows,N	U	Estimated flow 10 gpm, July 31, 1942.
* 206	H. Hodde	--	--	130	6	J	342	--	--	N	U	
* 207	J. F. Presley	Seismic Crew	1940	123	3	J	278	+	July 24, 1942	Flows	U	Measured flow 6 gpm, July 24, 1942. Reported no longer flows, Oct. 16, 1959.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
YY-59-53-302	N. W. Freeman	--	--	80	6	J	261	5.0	Nov. 19, 1968	N	U	Reported well may be caved. Old well.
* 303	do.	Pomykal Drilling Co.	1955	261	4	J	261	+9.2	do.	J,E,1/2 Flows	D	Measured flow 17 gpm, Nov. 19, 1968. Reported has sulphur odor.
304	St. John's Church	do.	1965	312	4	J	371	108	Jan. 1965	S,E,<1	D	Casing slotted from 172 to 202 ft. 2/
* 305	N. W. Freeman	E. A. Holly Co.	1955	229	8	J	255	10.5	Feb. 11, 1969	S,E	D	Reported flowed when drilled, and for several years thereafter.
* 306	L. C. Jeske	Ed Hafer	1930	218	3	J	250	30	1930	J,E	U	Measured flow 1.7 gpm, July 2, 1942. Reported no longer flowed in 1968.
* 401	Robert Lange	Alfred Conklin	1953	434	4	J	422	--	--	J,E,3	P	
* 402	do.	Pomykal Drilling Co.	1961	436	4	J	422	123.9	Oct. 17, 1968	S,E,2	P	
403	Louis Look	E. Gajeske	1930	89	4	J	405	52.0	Dec. 12, 1968	S,E,1/3	D	
405	G. L. Morris	Pomykal Drilling Co.	1966	126	4	J	380	45	Sept. 1966	S,E,1/2	D	Casing slotted from 112 to 126 ft. 2/
* 501	The Old Brazos Forge	Beaumier Iron Works	1964	292	4	J	355	150	Nov. 1964	S,E,1	U	Casing slotted from 264 to 284 ft.
502	--Jackson well 1	Shell Oil Co.	1963	11,614	--	--	352	--	--	--	--	Oil test. 1/
503	Brenham Bowling Corp.	Pomykal Drilling Co.	1959	420	4	J	405	--	--	S,E	Ind	
* 504	do.	do.	1964	480	4	J	400	141	June 1964	S,E, 1 1/2	Ind	Casing slotted from 447 to 480 ft. 2/
505	Edwin Draehn	do.	1965	167	4	J	392	112	May 1965	S,E,<1	D	Casing slotted from 158 to 167 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-53-602	Brenham Packing Co.	--	1942	48	5	B	289	32	May 1942	N	U	
603	Robert Gascamp	A. B. Conkling	1955	135	4	B	339	--	--	J,E,1	Irr	Casing slotted from 125 to 135 ft. 2/
604	F. C. Kugel	Beaumier Iron Works	1957	495	4	J	330	100	Feb. 1969	S,E, 1 1/2	Ind	Casing slotted from 475 to 495 ft.
701	Mt. Pilgrim Church	--	--	40	24	J	342	--	--	N	U	Dug well, concrete curb. Dry, Oct. 17, 1968.
* 702	W. Ludemann	--	1910	34	48	J	300	23.2 24.1	July 22, 1942 Oct. 17, 1968	J,E,3/4	Ind	Dug well, concrete curb. Pesticide and herbicide analyses taken Oct. 17, 1968; results negative.
* 703	Robert Lange	Pomykal Drilling Co.	1951	337	4	J	335	+	June 1951	J,E,1/2 Flows	D	Reported not flowing in 1968.
704	Travis Smith	J. W. Schwickert	1900	30	38	B	296	22.8	Dec. 27, 1968	J,E,1/2	D	Dug well, concrete curb.
* 802	V. Whitmarsh	J & S Drilling	1965	457	4	J	405	127.1	Oct. 17, 1968	S,E,1	D	
* 803	do.	A. B. Conklin	1950	127	4	J	406	--	--	P,E,1/2	D	
804	W. Engelage	Pomykal Drilling Co.	1967	168	4	B-J	380	105	Aug. 1967	S,E,1/2	D	Casing slotted from 149 to 168 ft. 2/
805	Leo Hinze	do.	1964	176	4	J	390	120	Apr. 1964	S,E,1/2	D	Casing slotted from 156 to 176 ft. 2/
806	Calvin Borman	do.	1967	63	4	B	398	48	Oct. 1967	S,E,1/2	D	Casing slotted from 50 to 63 ft. 2/
808	Wilfred Nordt	A. B. Conklin	1954	125	4	B	325	40	1965	J,E,1	S	Casing slotted from 115 to 125 ft.
809	J. A. Boeker	Preismeyer Bros.	1962	105	4	B	350	59.3	Dec. 19, 1968	J,E,1/2	D	
* 810	Fred Weiss	--	1890	41	24	B	311	31.7	July 15, 1942	N	U	Dug well, tile curb.
* 811	Charles Hodde	--	--	76	6	B	370	67	July 1942	N	U	Old well.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-53-901	City of Brenham well 1	--	1913	320	8	J	310	58.7 57.2	June 23, 1942 Nov. 20, 1942	N	U	Abandoned in 1934; destroyed prior to 1959.
902	City of Brenham well 2	--	1913	185	12	J	320	59.5 56.6	June 23, 1942 Nov. 20, 1942	N	U	Destroyed prior to 1959.
903	City of Brenham well 3	G. C. Booth	1913	182	8	J	310	58.8	Nov. 20, 1942	N	U	
904	City of Brenham well 4	do.	1913	96	12	B	310	10.7	June 23, 1942	N	U	Destroyed prior to 1968.
* 905	City of Brenham well 5	Layne-Texas Co.	1933	1,515	8	Tcs	310	35.5	May 22, 1961	N	U	Screen from 1,210-1,240, 1,298-1,320, and 1,432-1,495 ft. 2/ 3/
* 906	City of Brenham well 6	J. W. Jackson	1935	143	10	J;B?	310	41.0	Feb. 13, 1969	T,E,5	P	Water level measured while water was cascading through hole in casing at around 30 ft. 2/
* 907	City of Brenham well 7	do.	1934	198	10	J	310	67.2	May 22, 1961	N	U	3/
* 908	City of Brenham well 8	--	1944	200	6	J	310	--	--	N	U	
* 909	City of Brenham well 9	Layne-Texas Co.	1948	511	5	J	310	82.3 68.1	July 24, 1968 Feb. 11, 1969	T,E,40	P	Screen from 98-121, 129-139, 169-190, 371-401, 424-434, and 479-512 ft.
* 910	City of Brenham well 10	do.	1948	500	10	J	310	70	Jan. 1949	T,E,40	P	Screen from 84-120, 139-150, 188-211, 360-380, 438-449, and 468-490 ft. 2/
* 911	City of Brenham well 11	Texas Water Wells	1952	593	10	J	280	65	Aug. 1952	T,E,60	P	Screen from 73-88, 95-107, 122-142, 185-207, 298-308, 345-395, 465-505, 518-525 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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			
* YY-59-53-912	City of Brenham	--	1884	Spring	--	B	305	+	Jan. 2, 1969	Flows	P	Spring, dug out and brick lined, used for "well reservoir". In use since about 1884, as auxiliary public supply source. Reported to flow continuously. Measured discharge 12 gpm, Jan. 2, 1969. Measured temp. 21°C.
913	City of Brenham well 9	Layne-Texas Co. and John Booth	1930	1,504	16	Tcs	310	--	--	N	U	Well never used. One of two wells numbered "9". Screen from 1,216-1,234, 1,257-1,303, 1,355-1,396, and 1,452-1,501 ft. Reported yield 406 gpm. 2/
* 914	Travis Voelkel	Layne-Texas Co.	1907	785	12	J	336	--	--	T,E,10	P	
* 915	City of Brenham well 12	Texas Water Wells	1963	820	12	J	267	42	Dec. 1963	T,E,75	P	Casing: 12-in. to 415 ft; 10-in. from 415 to 820 ft. Screen from 75-86, 120-143, 350-414, 468-518, and 750-810 ft. 2/
* 916	City of Brenham well 13	do.	1968	1,000	12	J	315	200	Apr. 1958	T,E,100	P	Casing: 12-in. to 520 ft; 10-in. from 520-1,000 ft. Screen from 120 to 135, 395 to 470, 520 to 595, 835 to 885, and 970 to 990 ft.
917	Brenham Cotton Mills well 1	Beaumier Iron Works	1963	660	4	J	310	71	1963	S,E,5	Ind	Casing slotted from 464 to 542 ft.
* 918	Brenham Cotton Mills well 2	do.	--	598	4	J	310	96.6	July 30, 1968	S,E,5	Ind	Casing slotted from 349 to 577 ft.
919	Brenham Cotton Mills well 3	Pomykal Drilling Co.	1962	535	8	J	310	--	--	T,E,5	Ind	Screen from 494 to 535 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-53-920	Brenham Cotton Mills well 4	Beaumier Iron Works	1967	587	6	J	270	--	--	T,E,40	Ind	Screen from 294 to 416 ft. Reported pumping level 250 ft.
* 921	Brenham Cotton Mills	do.	1903	200	10 3/4	J	310	40 73.3	July 1941 July 30, 1968	N	U	
* 922	Brenham Bottling Co.	E. Gajeske	1955	168	4	J	335	40	1955	S,E, 1 1/2	Ind	Screen from 163 to 168 ft.
* 923	Blue Bell Creameries	do.	1923	180	6	J	315	79.0	Aug. 23, 1968	S,E,5	Ind	Screen from 160 to 180 ft. Used for cooling and washing.
* 924	M. C. Morris	A. B. Conklin	1960	212	4	Ev	372	132.9	Nov. 22, 1968	S,E,3/4	D	Screen from 198 to 212 ft.
* 925	Louise Stone	--Posey	1895	700	5	J	375	--	--	N	U	Drilled before 1906 by Heberstone. At 1,500 ft. water rose to within 40 ft. of the surface, but the well did not flow.
* 926	Albert Kramer	Walter Rinn	1930	102	3	Ev	370	--	--	N	U	
* 54-101	W. Schomburg	B & P Drilling Co.	1956	433	4	J	260	1.1	Sept. 16, 1968	S,E	D	Casing slotted from 412 to 433 ft.
102	City of Brenham Airport	Beaumier Iron Works	1967	210	6	J	240	.6	do.	S,E,3	P	Casing slotted from 168 to 210 ft. Test hole 343 ft.
103	B. R. Wellman	Pomykal Drilling Co.	1965	114	4	J	308	83	Apr. 1965	S,E,1/2	D	Casing slotted from 104 to 114 ft. Pump set at 105 ft. 2/
* 104	Mrs. P. Schulte	do.	1958	360	4	J	342	43.4	Aug. 16, 1968	S,E,3/4	D	
105	Henry Wellman	do.	1963	115	4	J	285	+	Jan. 29, 1963	Flows, N	D	Casing slotted from 103 to 115 ft. 2/
201	F. Fulberg	Mount Selman	1941	4,762	--	--	283	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-54-202	Arnold Lammert	Seismic Crew	1940	95	3	Ev?	201	+6.0 +2.0	Oct. 21, 1942 Oct. 2, 1959	N, Flows	U	Seismic test hole. Destroyed.
* 203	Henry Wellman	Sun Seismic Crew	1932	200	3	Ev?	190	+3.3	July 1, 1942	N, Flows	U	
204	J. L. Murphy	Alfred Conklin	1960	187	4	Ev?	251	--	--	J,E,3/4	D	
301	Cecil Burch	Pomykal Drilling Co.	1965	128	4	Ev	248	55	Aug. 1965	S,E,1/2	D	Casing slotted from 115 to 128 ft. 2/
302	H. Wellman	do.	1966	126	4	Ev	205	13.2	Dec. 17, 1968	S,E,1/2	S	Casing slotted from 110 to 126 ft. 2/
303	do.	H. Wellman	1956	24	28	Ev	205	16.6	do.	N	U	Dug well, concrete curb.
* 401	Zeiss & Kuecker	Alfred Conklin	1957	135	8	B	198	+7.2	Sept. 12, 1968	T,E,20 Flows	Irr	Casing slotted from 105 to 135 ft.
402	Brenham Country Club	Pomykal Drilling Co.	1967	218	4	B?	275	85 85.3	Mar. 1967 Aug. 23, 1968	S,E,1/2	Irr	Casing slotted from 193 to 218 ft. Pump set at 164 ft. 2/
403	do.	Beaumier Iron Works	1952	420	4	J	235	15.0	Aug. 23, 1968	S,E,2	Irr	
* 404	Owen Zeiss	Alfred Conklin	1956	86	4	J	212	7.3	Sept. 12, 1968	J,E	D	Casing slotted from 76 to 86 ft.
* 405	Ed Dever	--	1930	52	30	Ev	298	--	--	J,E,1/3	D	Dug well, concrete curb.
406	Arnold Thim	Pomykal Drilling Co.	1967	75	4	B	219	15	June 1967	J,E,1/2	D	Casing slotted from 50 to 75 ft. 2/
* 407	F. W. Sultan	Alfred Conklin	1959	617	4	J	322	60 76.2	1959 Dec. 17, 1968	S,E, 1 1/2	S	Casing slotted from 587 to 617 ft.
501	Lowell S. Fink	--	1890	49	24	Ev	228	34.6	Sept. 12, 1968	J,E,1/3	D	Dug well, concrete curb.
* 502	O. Tomachefsky	Pomykal Drilling Co.	1967	88	4	Ev	240	32.3	Oct. 7, 1968	S,E,1/2	D	Casing slotted from 67 to 88 ft. 2/
503	M. C. Goessler	do.	1968	274	4	B	325	115.0	do.	S,E,3/4	D	Casing slotted from 232 to 274 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-54-504	F. W. Sultan	Alfred Conklin	1960	250	6	B?	275	65.3	Dec. 17, 1968	S,E,1/2	S	Casing: 6-in. to about 63 ft, 4-in. from about 63 ft. to bottom.
601	O. M. Brown	Pomykal Drilling Co.	1966	202	2	Ev	289	113	June 1966	S,E,3/4	D	Casing slotted from 188 to 202 ft. 2/
603	Clarann Ranch	Beaumier Iron Works	1965	396	4	Ev	287	--	--	S,E,3	Irr	
604	do.	do.	1963	396	4	Ev	273	90.5	Sept. 12, 1968	S,E,3	Irr	Casing slotted from 354 to 396 ft.
* 605	Frank Gurka	David Ohlman	1966	147	4	Ev	200	20.0	Sept. 16, 1968	J,E,3/4	D	Casing slotted from 141 to 147 ft.
* 701	E. Nordt	--	1906	40	24	Ev	342	26.7	June 30, 1942	N	U	Dug well, tile curb.
702	Gun & Rod Club	E. Gajeske	1958	290	4	B	245	103	Feb. 1963	T,E, 7 1/2	Irr	Casing slotted from 268 to 290 ft.
* 703	do.	--	--	Spring	--	Ev	245	+	Sept. 16, 1968	Flows	P	Spring with dugout reservoir, estimated flow 30 gpm, Sept. 16, 1968.
704	Jack Mehrens	Pomykal Drilling Co.	1963	168	4	Ev	342	104	Mar. 1963	S,E, 1 1/2	D	Casing slotted from 135 to 168 ft.
705	W. Kuretsch	do.	1967	200	4	Ev	314	87	Jan. 1967	J,E,3/4	D	Casing slotted from 185 to 200 ft. 2/
707	Bill Fischer	do.	1968	345	4	B?	338	123	July 1968	S,E,3/4	D	Casing slotted from 325 to 425 ft.
* 801	Pulawski School	--	--	21	24	Ev	240	9.3	Nov. 17, 1942	N	U	Dug well, concrete curb.
802	T. J. Mabry	Pomykal Drilling Co.	1959	407	4	Ev	322	--	--	S,E,3	D	Casing slotted from 379 to 407 ft. 2/
803	A. Schwettmann	do.	1967	245	4	Ev	350	140	May 1967	S,E,3/4	D	Casing slotted from 233 to 245 ft. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-54-901	E. A. Kelley	--	--	190	6	Ev	285	82.3 87.1 102.2	Nov. 17, 1942 Oct. 12, 1959 Dec. 16, 1968	P,W	U	
* 902	Chappell Hill Water Supply Corp.	Key Drilling Co.	1967	778	8	J	310	116.0	July 29, 1968	S,E,10	P	Screen from 738 to 768 ft. Measured pumping level 279.6 ft. while pumping 32 gpm, July 29, 1968. Measured temp. 26°C. 2/
* 903	Matthew Bros.	W. W. Browning	1858	27	24	Ev	311	18.8	July 29, 1968	J,E,1/3	S	Dug well, concrete curb.
904	H. R. Matthews	J & S Well Service	1962	198	4	Ev	290	110	1962	S,E,3	Irr	Screen from 192 to 198 ft.
* 905	R. L. Felder	Falkenbury Drilling Co.	1951	292	7	Ev	330	149.5	Aug. 15, 1968	S,E,5	D	Measured discharge 50 gpm, Aug. 15, 1968, from 272 to 292 ft.
* 906	L. M. Davis	--	--	31	24	Ev	312	25.2	Nov. 17, 1942	N	U	Dug well, concrete curb. Old well.
907	do.	--	1956	192	4	Ev	312	121.3	Sept. 12, 1968	S,E	D	Casing slotted from 152 to 192 ft.
* 908	Abe Sampson	--	--	190	4	Ev	290	98.1	Nov. 17, 1942	N	U	
* 909	C. A. Polk	Pomykal Drilling Co.	1968	446	4	B?	294	108.4	Sept. 12, 1968	S,E,3	Irr	Casing slotted from 404 to 446 ft.
* 910	John Sheessley	J. C. Bland	1942	211	6	Ev	290	96.9 105.1	Nov. 17, 1942 Sept. 18, 1968	T,E,3	D	Screen from 191 to 211 ft.
911	Atkinson Cemetery Assn.	--	--	249	3	Ev	332	132.3	Oct. 28, 1968	S,E	Irr	
912	Routt & Schaer	G. C. Booth	--	101	6	Ev	298	20.1	July 13, 1942	--	U	Old well.
* 55-101	John Somers	--	--	138	4	Ev	302	90	1942	N	U	
* 102	do.	Pomykal Drilling Co.	1958	150	4	Ev	302	93.6	Oct. 7, 1968	J,E,3/4	D	Screen from 125 to 150 ft.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
YY-59-55-103	S. L. Whiting	Pomykal Drilling Co.	1967	194	4	Ev	287	84	Nov. 1967	S,E,3/4	S	Casing slotted from 162 to 174 ft. 2/
104	Henry Hughes	--	--	17	28	Ev	185	11.4	Nov. 21, 1968	N	U	Dug well, concrete curb.
105	do.	--	1944	50	6	Ev	215	31.0	do.	N	U	
* 201	T. S. Jackson	Pomykal Drilling Co.	1967	66	4	Ev	178	9.4	Aug. 9, 1968	J,E,< 1	D	Casing slotted from 40 to 66 ft. 2/
* 202	Brenham I.S.D.	--	--	28	36	Ev	202	26.3	Oct. 22, 1942	N	U	Dug well. Wooden curb. Old well.
* 203	do.	A. B. Conklin(?)	1944	97	4	Ev	202	11.8	Oct. 8, 1968	S,E,3/4	P	
* 301	Mrs. W. Nazrd	Falkenbury Drilling Co.	1953	1,049	5	J	180	+29.2	do.	N, Flows	S	Measured discharge 51 gpm. Screen from 1,020 to 1,040 ft.
302	do.	do.	1949	1,059	4	J	175	+24.0	do.	N, Flows	S	
303	do.	do.	1960	438	6	Ev	232	47.2	Aug. 10, 1968	S,E, 1 1/2	D	Screen from 428 to 438 ft.
* 304	T. Borgstedte	E. Gajeske	1939	65	6	Ev	272	53	1939	N	U	Casing slotted from 46 to 65 ft.
* 305	Brown's College	--	1940	46	36	Ev	230	43.6	Oct. 22, 1942	N	U	Dug well, wooden curb.
501	C. H. Alexander Estate	C. H. Alexander	1952	100	18	Qal,Ev	164	14.5	Apr. 7, 1969	T,E,20	Irr	3/
502	do.	do.	1956	--	16	Qal,Ev	163	17.0	Aug. 16, 1968	N	U	Reported never used. 3/
503	do.	do.	1956	--	13	Qal,Ev	163	14.5	Aug. 16, 1968	N	U	Do. 3/
504	D. G. Austin	Falkenbury Drilling Co.	1947	374	2	Ev	166	+	Oct. 1, 1959	Flows	S	Screen from 350 to 374 ft. 2/
505	R. L. Felder	Dunn Water Well Drilling Co.	1955	119	18	Qal,Ev	166	21.8	Aug. 15, 1968	T,G,40	U	2/ 3/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-55-507	R. Schaer	--	--	21	6	Ev	169	11.7	Nov. 10, 1942	N	U	
510	Unknown	--	--	30	--	Ev	185	20.5	Aug. 21, 1964	N	U	Dug well.
* 511	J. B. Schaer	J & S Well Service	1965	352	2	Ev	162	+	Aug. 9, 1968	Flows N	S	Reported flows 10 gpm. Casing slotted from 332 to 352 ft. 2/
* 512	C. H. Alexander Estate	--	--	400	4	Ev	164	+ 8.9	July 23, 1968	Flows, N	S	Measured flow 216 gpm. Old well.
513	R. L. Felder	Falkenbury Drilling Co.	1943	367	3	Ev	164	+ 3.8	Aug. 15, 1968	S,E,3/4, Flows	S	Screen from 347 to 367 ft.
514	do.	--	1935	65	6	Qal	166	25.1	do.	J,E,1/2	S	
515	Mrs. E. O. Routt Estate	--	1943	365	2	Ev	166	+	do.	Flows, N	S	Reported flows 0.3 gpm.
606	E. O. Routt Estate	--	--	105	6	Qal	150	32.4	do.	N	U	
701	C. H. Alexander Estate	C. H. Alexander	1952	90	20	Qal	160	25.5	Apr. 7, 1969	T,Ng,50	Irr	3/
* 703	E. D. Butcher	Falkenbury Drilling Co.	1957	70	18	Ev	163	26.2	June 5, 1964	T,Ng,25	Irr	Casing slotted from 50 to 70 ft. Pumping level 28.3 ft. while pumping 168 gpm on Aug. 15, 1963.
* 704	San Antonio Loan & Trust Co.	--	--	65	6	Qal	235	--	--	N	U	Old well.
801	C. H. Alexander Estate	C. H. Alexander	1956	163	20	Qal,Ev	159	23.3	Aug. 9, 1968	T,Ng,70	Irr	3/
802	do.	do.	1956	100	12	Qal	162	22.4	do.	T,Ng,70	Irr	3/
804	do.	do.	1952	105	10	Qal	159	18.9 24.3	Oct. 21, 1959 Aug. 15, 1963	N	U	
805	R. L. Felder	Falkenbury Drilling Co.	1947	340	4	Ev	165	+ 1.5	Aug. 15, 1968	Flows, N	S	Measured flow 1 gpm, Aug. 18, 1968. 2/

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-55-806	Texas Highway Dept.	G. C. Booth	1925	1,674	6	J	151	+	Aug. 13, 1968	Flows, N	U	Estimated flow 11 gpm, July 13, 1942; flowing from around outside of casing, 1968.
808	R. L. Felder	Falkenbury Drilling Co.	1955	416	3	Ev	154	11.7	Aug. 15, 1968	N	S	Casing slotted from 395 to 416 ft. Measured flow 2.4 gpm, Aug. 15, 1968. Measured temp. 20°C. 2/
* 809	Tom Stolarski	G. C. Booth	1915	87	8	Ev	252	72	July 1915	N	U	
906	R. L. Felder	Dunn Water Well Drilling Co.	1955	138	18	Qal	166	27.4	Aug. 15, 1968	T,G,40	Irr	2/ 3/
* 907	do.	--	1909	400	3	Ev	165	+2.1 6.3	Nov. 10, 1942 Oct. 1, 1959	N	U	Measured flow 9 gpm through discharge pipe, plus some additional unconfined flow Nov. 10, 1942. Casing raised to about 95 ft. See well YY-59-55-914.
912	do.	Falkenbury Drilling Co.	1949	428	4	Ev	155	+6.6	Aug. 15, 1968	N, Flows	S	Casing slotted from 402 to 425 ft. Measured flow 2 gpm. Measured temp. 23°C. 2/
913	do.	J & S Well Service	1964	378	3	Ev	161	+4.0	do.	N, Flows	S	Screen from 358 to 378 ft. Measured flow 6 gpm. Measured temp. 24°C. 2/
914	do.	--	1909	93	3	Qal	165	22.1	do.	N	U	Shallow portion of well YY-59-55-907.
56-101	--James well 1	David C. Bintliff	1952	11,009	--	--	210	--	--	--	--	Oil test. 1/
105	T. J. Moore	Siegert Water Wells	1964	71	16	Qal,Ev	174	35.3	Oct. 7, 1968	T,G,30	Irr	Pumping level 51.4 ft. while pumping 165 gpm on Aug. 21, 1964.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-56-106	T. J. Moore	Siegart Water Wells	1964	71	16	Qal,Ev	174	35.2	Oct. 8, 1968	N	Irr	
108	do.	Falkenbury Drilling Co.	1960	900	4	J	177	+	do.	N, Flows	S	Estimated flow 3 gpm.
* 109	do.	Siegart Water Wells	1967	900	4	J	173	+	do.	N, Flows	S	Measured flow 10 gpm.
110	do.	--	1967	85	16	Qal	174	34.7	do.	T,G,30	Irr	
* 303	O. A. Bergmann	A. B. Conklin	1962	162	4	J	443	76.6	Dec. 18, 1968	P,E,3/4	S	Screen from 152 to 162 ft.
* 60-101	Mrs. E. Menn	Walter Rinn	1932	165	3	J	350	+6.9	Oct. 15, 1942	N, Flows	U	Measured flow 3 gpm, Nov. 15, 1942; 0.2 gpm, Oct. 16, 1959.
102	D. J. Kieke	Pomykal Drilling Co.	1966	208	4	J	419	41	May 1966	S,E,3/4	D	Casing slotted from 179 to 208 ft. 2/
* 103	Fritz Steenken	--	1870	36	36	J	363	--	--	N	U	Dug well, rock curb.
104	do.	C. Erickson	1953	205	4	J	363	3.6	Dec. 27, 1968	J,E,1/2	D	Screen from 185 to 205 ft. Reported flowed when drilled, stopped flowing about 1963.
* 105	Helen Neumann	--	1910	210	--	J	372	+0.5	July 20, 1942	J,E,<1 Flows	D	Reported flowed "trickle", July 24, 1942.
106	R. Elverson	Dunn Water Well Drilling Co.	1948	182	3	J	340	+18 +10.0	1948 Dec. 28, 1968	J,E,1/2 Flows	D	Measured flow 6 gpm, Dec. 27, 1968.
107	H. F. Hansel	Pomykal Drilling Co.	1963	170	4	J	332	+12.7	Dec. 27, 1968	N Flows	S	Measured flow 9 gpm, Dec. 27, 1968.
* 108	Seldel Bros.	--	1900	151	3	J	400	--	--	N	U	
* 109	Hugo Krause	Walter Rinn	1925	180	3	J	358	+	July 20, 1942	Flows, N	U	Measured flow 3 gpm, July 20, 1942.

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
YY-59-60-110	Henry Lehrmann	Pomykal Drilling Co.	1966	233	4	J	432	75	May 1966	S,E,1/2	S	Casing slotted from 212 to 233 ft. 2/
* 202	John Eckert	--	--	40	30	J	439	--	--	N	U	Dug well, concrete curb.
203	do.	Pomykal Drilling Co.	1963	383	4	J	439	106.5	Dec. 27, 1968	S,E,1	D	Casing slotted from 360 to 383 ft. 2/
* 204	Emil Drew	--	1897	32	32	B	422	--	--	N	U	Dug well, concrete curb.
* 302	Granville Weiss	O. E. Weiss	1910	45	30	B	403	41.7	Dec. 19, 1968	J,E,1/3	D	Old dug well, concrete curb.
303	Albert Weiss	Pomykal Drilling Co.	1967	497	4	J	398	93	Nov. 1967	S,E,1/2	S	Casing slotted from 455 to 497 ft. Pump set at 168 ft. 2/
404	M. B. Eckerman	Charles Ressman	1953	204	3	J	412	130	1953	P,E,3/4	D	
* 505	E. and L. Heins	O. Waggoner	1890	71	5	J	395	--	--	J,E,1	D	
* 603	Bruno Muske	--	1880	44	30	Ev	380	29.7	Dec. 19, 1968	A,W	D	Dug well, tile curb.
* 604	H. Nitsche	Joe Pomykal	1941	100	3	J	388	--	--	N	U	
* 605	F. Pomykal	A. B. Conklin	1940	140	4	J	325	7.0	July 16, 1942	N	U	
* 61-101	Davis Bros.	Joe Pomykal	1940	394	4	J	298	48.7	Dec. 19, 1968	S,E, 1 1/2	S	Screen from 240 to 244, and 369 to 380 ft. 3/
102	do.	Charlie J. Loehr	1967	420	4	J	252	3	Sept. 1967	S,E, 1 1/2	S	Casing perforated from 378 to 420 ft. 2/
103	R. E. Brooks	Beaumier Iron Works	1961	400	4	J	340	60 64.3	1961 Dec. 19, 1968	S,E,5	S	
201	H. F. Hueske	A. B. Conklin	1955	187	4	B	291	61.7 61.5	Nov. 30, 1965 Nov. 23, 1968	S,E	D	Screen from 177 to 187 ft.
202	do.	--	1968	38	26	Ev	285	30.3 29.5	Nov. 30, 1965 Nov. 23, 1968	P,W	D	Dug well, tile curb.
203	Thelma Roberts	E. Gajeske	1947	110	4	B	303	62.6	Dec. 19, 1968	S,E,1/2	D	

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN)	WATER-BEAR-ING UNIT	ALTI-TUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND SUR-FACE DATUM (FT)	WATER LEVEL: DATE OF MEASURE-MENT	METHOD OF LIFT	USE OF WATER	REMARKS
* YY-59-61-204	E. C. McGraw	--	1941	63	30	B	342	57.0 55.0	July 21, 1942 Dec. 19, 1968	N	U	Dug well, concrete curb.
205	Arthur Hueske	Pomykal Drilling Co.	1967	369	4	J	275	90	Oct. 1967	S,E,3/4	D	Casing slotted from 350 to 369 ft. 2/
* 206	E. Sommerfeld	--	1916	54	30	B	328	41.2	July 15, 1942	N	U	Dug well, concrete curb.
301	E. W. Pieper well 1	--Hunt	1948	9,501	--	--	355	--	--	--	--	Oil test. 1/
* 304	A. W. Winkelmann	--	--	80	30	Ev	301	74	1940	J,E,<1	D	Dug well, concrete curb. Old well.
* 409	Pomykal Estate	A. B. Conklin	1940	125	4	B	352	56.4	July 16, 1942	N	U	
* 410	A. S. Kramer	Brenham Salt Dome Oil Co.	1931	155	10	B	315	36.4	July 15, 1942	N	U	
* 503	H. Lehmann	--	--	Spring	--	B?	270	+	do.	Flows	S	Estimated flow 5 gpm.
62-101	William Bosse	--	1938	17	24	Ev	395	--	--	N	U	Dug well, concrete curb.
102	F. C. Love	--	1924	80	36	Ev	362	61.7	Oct. 28, 1968	P,W	D	Do.
103	Jack Mueller	A. B. Conklin	1957	99	4	Ev	370	75.3	do.	J,E,1	D	
104	W. F. Tegler	Beaumier Iron Works	1953	187	4	--	355	137.9	do.	S,E	D	
* 105	do.	--	1870	6	60	Ev	315	1.7	do.	B,H	S	Dug well, concrete curb.
106	R. R. Ross	Pomykal Drilling Co.	1967	126	4	Ev	330	67	June 1967	S,E,3/4	D	Casing slotted from 80 to 126 ft. Pump set at 119 ft. 2/
107	B. C. Crawford	do.	1963	140	4	Ev	407	103.0	Oct. 28, 1968	S,E,1/2	D	Casing slotted from 128 to 140 ft. Pump set at 116 ft. 2/
* 108	J. L. Zientek	G. C. Booth	1920	100	6	Ev	380	--	--	N	U	
* 201	--Barnett	Max Zettner	1919	148	3	Ev	315	--	--	P,E,<1	D	

See footnotes at end of table.

Table 6.--Records of Wells, Springs, and Test Holes--Continued

WELL	OWNER	DRILLER	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
* YY-59-62-202	Willie Bilski	--	--	95	3	Ev	320	82	June 1940	N	U	Old well.
* 203	Wiesner Estate	--	1909	75	30	Ev	285	60.6	June 30, 1942	P,W	D	Dug well, concrete curb.
* 204	B. Rogers	--	1928	100	4	Ev	330	--	--	N	U	
* 302	Bar D Ranch	--	--	174	4	Ev	244	50.6	Aug. 7, 1968	S,E,2	D	
* 303	do.	--	--	253	7	Ev	285	104.9	do.	S,E,5	D	
304	do.	--	--	161	4	Ev	187	+2.0	Aug. 7, 1968	N Flows	U	
305	do.	--	--	262	4	Ev	275	85.5	Aug. 9, 1968	S,E, 1 1/2	S	
306	do.	--	--	237	6	Ev	300	119.9	Aug. 7, 1968	S,E,1	S	
* 307	M. Wardowski	--	1922	40	24	Ev	233	23.7 22.7	July 14, 1942 Oct. 15, 1959	N	U	Dug well, concrete curb.
* 308	Bar D Ranch	--	--	18	24	Ev	311	10.5	July 14, 1942	N	U	Old well.
* 63-102	Roosevelt Leaks	Roosevelt Leaks	1964	18	24	Ev	235	7.2	Aug. 13, 1968	B,H	D	Dug well, concrete curb.
* 104	L. Cummings	--	--	Spring	--	Ev	220	+	July 14, 1942	Flows	S	Estimated flow 10 gpm, July 14, 1942.
* 105	Abbot Hill	--	1905	85	6	Ev	239	40.7	do.	N	U	
* 106	Grant Bellvine	Pomykal Drilling Co.	1967	211	4	Ev	250	84.1	Aug. 13, 1968	S,E,1/2	D	Casing slotted from 195 to 211 ft. 2/
501	Bud Adams	--	--	70	24	Qal	153	27.8	Apr. 10, 1964	P,W	S	Dug well, concrete curb.
* 502	do.	--	--	45	4	Qal	155	24.1	do.	P,W	S	Do.

* For chemical analyses of water from wells and springs in Washington County see Table 9.
1/ Electric log in file of U.S. Geological Survey or Texas Water Development Board.
2/ For drillers logs of wells in Washington County see Table 7.
3/ See Table 8 for water levels in wells.

Table 7.—Drillers' Logs of Wells

Well YY-59-44-601

Owner: Corps of Engineers
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand	5	5
Rock, hard	10	15
Shale and lignite	130	145
Rock	5	150
Rock and shale	109	259
Shale, sandy	18	277
Sand	3	280
Shale	125	405
Rock and Shale	62	467
Shale	38	505
Sand	25	530
Shale, sandy	5	535

Well YY-59-44-602

Owner: Marineland, Inc.
Driller: Beaumier Iron Works

	THICKNESS (FEET)	DEPTH (FEET)
Shale	153	153
Sand	22	175
Sand and shale	22	197
Shale	109	306
Sand	31	337
Shale	38	375
Sand	25	400

Well YY-59-44-604

Owner: Tom Robbin
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Rock	3	3
Shale	57	60
Shale, sandy	10	70
Shale	60	130
Sandy	15	145
Shale	10	155
Rock, hard	20	175
Sand	3	178
Sandy, hard	14	192
Sandy	4	196
Sand and shale	5	201

Well YY-59-44-701

Owner: Deep Water Assn.
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand	70	70
Sandy, shale and lignite	10	80
Sand	132	212

Well YY-59-44-703

Owner: Harold Rabalais
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	20	20
Lignite and shale	25	45
Shale, green	135	180
Shale and lignite, hard	13	193
Shale, green	107	300
Shale, black, sandy; lignite	335	635

Well YY-59-44-705

Owner: Harold Rabalais
Driller: G. Brinkman

	THICKNESS (FEET)	DEPTH (FEET)
Soil, surface	3	3
Clay	17	20
Clay and coal	30	50
Shale, blue	100	150
Shale, mushy; sand, fine	15	165
Shale, blue	68	233
Shale, mushy; sand, fine	5	238
Shale, blue	89	327
Shale, mushy	11	338
Shale, hard	65	403
Sand	10	413
Shale	37	450
No Record	3	453

Well YY-59-44-801

Owner: Ralph Johnson
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Rock	4	4
Shale, sandy, hard	56	60
Sand	27	87
Shale	25	112

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-44-801—Continued		
Sand, silt	13	125
Shale	40	165
Sand, silt	25	190
Shale	45	235
Sand	55	290
Shale	25	315
Shale, sandy	130	445
Sand	50	495
Shale, hard	35	530
Shale, soft	148	678
Sand, fine	7	685
Shale, sandy	35	720
Shale, sandy, fine	93	813
Well YY-59-44-802		
Owner: Rocky Creek Park Driller: Pomykal Drilling Co.		
Clay	15	15
Rock and sand	35	50
Shale	243	293
Sandy	10	303
Sand	25	328
Rock	4	332
Shale, green	6	338
Shale	125	463
Lignite	52	515
Sand, fine	10	525
Shale	40	565
Sandy	10	575
Shale	208	783
Sand, fine	10	793
Shale	34	827
Well YY-59-44-904		
Owner: John Dahlmann Driller: Pomykal Drilling Co.		
Soil, surface	2	2
Rock, sand	6	8
Shale	4	12

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-44-904—Continued		
Rock and sand	68	80
Shale	233	313
Sand	5	318
Rock, sand, hard	17	335
Well YY-59-45-707		
Owner: R. M. Strange Driller: Pomykal Drilling Co.		
Clay	10	10
Rock, clay, sand	30	40
Shale	285	325
Sand	2	327
Shale, sandy	5	332
Sand, course	13	345
Rock, hard	5	350
Shale	2	352
Well YY-59-45-907		
Owner: Harold T. Ray, Jr. Driller: Beaumier Iron Works		
Shale	45	45
Shale and rock	65	110
Shale	43	153
Shale and rock	25	178
Sand	25	203
Well YY-59-46-101		
Owner: C. L. Vickers Driller: Pomykal Drilling Co.		
Clay	10	10
Shale, green	65	75
Sand	22	97
Well YY-59-46-401		
Owner: Dillon Anderson Driller: Pomykal Drilling Co.		
Clay	75	75
Shale, blue	5	80
Shale	27	107
Sand	43	150

Table 7.—Drillers' Logs of Wells—Continued

Well YY-59-46-402

Owner: Independence Smoke House
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Rock	40	40
Shale	90	130
Sand	1	131
Shale	13	144
Sand	4	148
Shale	10	158
Rock	7	165
Shale	12	177
Sandy	6	183
Shale	38	221
Sand	21	242

Well YY-59-46-403

Owner: Independence Baptist Church
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Rock and sand	5	5
Clay	55	60
Shale, blue	100	160
Sand	19	179

Well YY-59-46-404

Owner: Independence Baptist Church
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Soil, surface	3	3
Rock and sand, hard	22	25
Shale	138	163
Shale, sandy	65	228
Shale	4	232
Sand	95	327

Well YY-59-46-405

Owner: Independence Cemetery
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	5	5
Shale	1	6
Shale	34	40
Shale, blue	60	100
Rock	2	102
Shale, blue	23	125
Sand	24	149

Well YY-59-46-407

Owner: Edward Scheffer
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	40	40
Rock and shale	10	50
Shale, blue	25	75
Rock, hard	15	90
Rock, soft	22	112
Shale, blue	40	152
Sand	8	160
Shale	2	162

Well YY-59-46-502

Owner: Dillon Anderson
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
—	370	370
Shale, sandy	10	380
Shale	120	500
Rock	10	510
Shale, soft	140	650
Sand	51	701

Well YY-59-46-503

Owner: David Dahman
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	5	5
Sand	13	18
Rock	22	40
Shale	35	75
Rock	25	100
Shale	27	127
Rock	8	135
Shale, sandy	10	145
Sandy, hard	15	160
Shale	30	190
Sand	15	205
Shale	1	206

Well YY-59-46-504

Owner: R. A. McAmis
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Shale	15	15

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-46-504—Continued		
Rock	10	25
Rock and shale, hard	35	60
Shale	70	130
Sandy	5	135
Sandy	35	170
Shale	50	220
Sand	20	240
Well YY-59-46-601		
Owner: G. T. Newman Driller: Pomykal Drilling Co.		
Shale	10	10
Rock, sand	43	53
Rock, hard	8	61
Rock, sand	23	84
Shale	10	94
Rock, hard	30	124
Shale	34	158
Shale, sandy	12	170
Shale	27	197
Rock	8	205
Rock, shale	14	219
Sand	2	221
Shale, sandy	47	268
Sand	17	285
Shale, sandy	5	290
Well YY-59-46-707		
Owner: M. O. Miller Driller: Pomykal Drilling Co.		
Clay and sand	10	10
Shale	155	165
Rock and shale, sandy	15	180
Shale	5	185
Rock	30	215
Shale	95	310
Sand	5	315
Sand	10	325

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-46-802		
Owner: Herbert Gebert Driller: Layne Texas Co.		
Soil, surface	4	4
Clay	4	8
Sand	5	13
Clay	55	68
Clay, sandy	26	94
Sand	27	121
Clay	14	135
Rock and sand	9	144
Clay	40	184
Shale, sandy	12	196
Shale and shale, sandy	44	240
Shale, sandy hard	26	266
Sand	17	283
Shale and shale, sandy	18	301
Shale	19	320
Shale, sandy; sand streaks	35	355
Shale	7	362
Sand	14	376
Shale, sandy	9	385
Shale	10	395
Shale, sandy	5	400
Shale	12	412
Sand	9	421
Shale	4	425
Sand	15	440
Shale	17	457
Well YY-59-46-805		
Owner: Buell Moore Driller: Beaumier Iron Works		
Shale, surface	20	20
Shale	144	164
Shale, sandy	20	184
Sand and rock	21	205
Shale	41	246
Sand and shale	61	307
Sand	33	340

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-46-902		
Owner: Dudley Briggs Driller: Pomykal Drilling Co.		
Sand, rock and shale	50	50
Shale	59	109
Sand	9	118
Shale	4	122
Sandy	11	133
Rock	7	140
Shale	125	265
Rock	10	275
Shale, sandy	25	300
Shale	30	330
Rock	17	347
Shale	33	380
Sand	19	399
Shale	1	400
Well YY-59-47-604		
Owner: State of Texas Driller: Pomykal Drilling Co.		
Clay, red	10	10
Sand	5	15
Shale	10	25
Sand	5	30
Shale	30	60
Rock	3	63
Sandy	17	80
Shale	5	85
Sand	15	100
Sand	7	107
Sand, hard	13	120
Sand, hard	10	130
Shale	20	150
Shale	66	216
Rock, hard	29	245
Shale	45	290
Rock and shale, sandy	25	315
Rock and sand	23	338
Well YY-59-47-604—Continued		
Sand	42	380
No record	5	385
Well YY-59-47-606		
Owner: Willie Stolz Driller: Falkenbury Drilling Co.		
Sand and clay	10	10
Sand, broken	35	45
Clay and rock	37	82
Sand and rock	28	110
Well YY-59-47-608		
Owner: R. Dickschat Driller: Pomykal Drilling Co.		
Sand and gravel	20	20
Sand and rock	25	45
Sand and shale	37	82
Shale, sandy	15	97
Sand	28	125
Shale	1	126
Well YY-59-47-611		
Owner: State of Texas Driller: Pomykal Drilling Co.		
Clay	6	6
Sand and gravel	14	20
Shale	5	25
Sand	10	35
Shale	40	75
Sand	45	120
Shale	120	240
Rock and shale	20	260
Shale	52	312
Rock	13	325
Shale, hard	25	350
Rock	6	356
Shale, sandy	9	365
Sand	30	395
Sand	5	400

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)

Well YY-59-47-903

Owner: C. Dickschat
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	20	20
Sand and rock	45	65
Shale	55	120
Rock and sandy	10	130
Shale	10	140
Shale	20	160
Sand	20	180

Well YY-59-50-905

Owner: R. B. Fogle
Driller: Beaumier Iron Works

	THICKNESS (FEET)	DEPTH (FEET)
Rock	132	132
Shale and sand, blue	87	219
Rock and shale, blue	21	240
Shale, blue	82	322
Sand, blue	40	362

Well YY-59-51-301

Owner: J. W. Link
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Soil surface	4	4
Shale, brown	126	130
Shale	30	160
Sand	12	172

Well YY-59-51-302

Owner: R. Benford
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand	32	32
Shale and lignite	14	46
Sand	21	67
Shale	23	90
Sand	36	126

Well YY-59-51-607

Owner: L. B. Davenport
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	33	33
Sand	7	40

Well YY-59-51-607—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Shale	3	43
Rock and sand	7	50
Shale	74	124
Sandy	5	129
Shale, sandy	6	135
Sand	20	155

Well YY-59-51-901

Owner: E. H. Cutler
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	10	10
Sand, rock	110	120
Shale	15	135
Sand	33	168
Shale	2	170

Well YY-59-52-104

Owner: Gardner Symonds
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	10	10
Sandrock	25	35
Shale, gray	175	210
Shale, blue	10	220
Shale, sandy	10	230
Shale	45	275
Sand	27	302
Shale	1	303

Well YY-59-52-105

Owner: Gardner Symonds
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	10	10
Rock	20	30
Shale, gray	185	215
Shale, blue	101	316
Sand	22	338

Well YY-59-52-106

Owner: Gardner Symonds
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand and shale	30	30

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-52-106—Continued		
Shale	175	205
Sand	5	210
Rock and shale, sandy	40	250
Sand	35	285
Rock	1	286
Well YY-59-52-202		
Owner: Rocky Creek Manor Driller: Beaumier Iron Works		
Shale and rock	23	23
Shale	109	132
Shale and rock	43	175
Shale	87	262
Sand	30	292
Well YY-59-52-206		
Owner: Sydnor Oden Driller: Pomykal Drilling Co.		
Surface, soil	5	5
Shale	99	104
Sand	3	107
Shale	148	255
Shale, sandy	10	265
Shale	10	275
Shale, sandy	5	280
Shale	18	298
Sandy	7	305
Shale	50	355
Sandy	45	400
Sand	15	415
Shale	2	417
Well YY-59-52-401		
Owner: Burton Water Supply Corp. Driller: Pomykal Drilling Corp.		
Clay	5	5
Sand and rock	85	90
Rock and shale, sandy	15	105
Shale and boulders	90	195

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-52-401—Continued		
Shale, soft	20	215
Shale, sandy	22	237
Sand	3	240
Shale, sandy	15	255
Sand	5	260
Shale, sandy	17	277
Sand	3	280
Shale, sandy	15	295
Sandy, very	5	300
Sand, hard	9	309
Shale, sandy	6	315
Rock and sand, hard	5	320
Shale	140	460
Sandy, fine	15	475
Shale	75	550
Shale, blue, soft	105	655
Rock, soft	5	660
Shale	20	680
Rock	10	690
Sand	55	745
Shale, soft	55	800
Rock, hard	5	805
Sand	9	814
Shale, sandy	16	830
Sand	25	855
Shale	19	874
Well YY-59-52-403		
Owner: Fred Delaume Driller: Pomykal Drilling Co.		
Rock	15	15
Shale	30	45
Rock and shale, hard	15	60
Shale	75	135
Shale, sandy	75	210
Sand	10	220
Shale, sandy	6	226
Shale, sandy	21	247
Sand	5	252

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-52-405		
Owner: Kamins Ranch Driller: Pomykal Drilling Co.		
Clay	10	10
Rock and shale	40	50
Shale, sandy	10	60
Shale, gray	130	190
Shale, sandy	3	193
Shale	7	200
Shale, sandy	2	202
Shale, gray	68	270
Rock	15	285
Shale, gray	20	305
Rock	5	310
Shale, blue	80	390
Shale, sandy	20	410
Shale	10	420
Rock	10	430
Shale	30	460
Sand	31	491
Well YY-59-52-502		
Owner: Theo. A. Ganske Driller: Pomykal Drilling Co.		
Rock and clay	20	20
Shale	20	40
Rock	60	100
Shale	30	130
Sand	20	150
Well YY-59-52-503		
Owner: Oscar Schultz Driller: Pomykal Drilling Co.		
Clay	60	60
Rock	40	100
Shale	25	125
Rock	10	135
Shale	45	180
Sand	23	203

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-52-608		
Owner: I. Rosenbaum Driller: Pomykal Drilling Co.		
Clay	10	10
Rock	10	20
Shale	50	70
Rock	20	90
Shale	46	136
Shale, sandy	14	150
Sand	7	157
Well YY-59-52-609		
Owner: Erwin Ganske Driller: Pomykal Drilling Co.		
Clay	5	5
Rock	5	10
Shale	50	60
Rock	25	85
Shale	30	115
Sand	10	125
Shale	1	126
Well YY-59-52-702		
Owner: Max Zuehlke Driller: Pomykal Drilling Co.		
Clay	21	21
Shale and rock	29	50
Shale	56	106
Sand	2	108
Shale, blue	47	155
Sand	5	160
Rock, hard (flint)	20	180
Rock	11	191
Shale	9	200
Sand	5	205
Shale	13	218
Sand	14	232
Shale	15	247
Sand	23	270
Sand	5	275

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-52-703		
Owner: L. D. Neutzler Driller: Pomykal Drilling Co.		
Clay	10	10
Rock	25	35
Shale	165	200
Sand	10	210
Shale	2	212
Well YY-59-52-704		
Owner: G. Schwartz Driller: Pomykal Drilling Co.		
Rock and sand	15	15
Shale	174	189
Shale, sandy	1	190
Sand	18	208
Well YY-59-52-902		
Owner: Herman Peters Driller: Pomykal Drilling Co.		
Clay	25	25
Sand	7	32
Shale	111	143
Sandy	7	150
Shale	70	220
Rock and shale, sandy	15	235
Rock, sandy	30	265
Well YY-59-53-201		
Owner: Yegua Development Corp. Driller: Layne Texas Co.		
Surface, soil	2	2
Clay	152	154
Sand, red and brown	20	174
Shale	73	247
Shale, sandy	10	257
Sand, gray	16	273
Shale and lime	88	361
Shale, gravel and lime	28	389
Shale, lime and shale, sandy	41	430
Shale	25	455

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-53-201—Continued		
Shale and lime	18	473
Sand, fine	24	497
Shale	19	516
Shale, sandy	12	528
Shale, streaks of shale, sandy	199	727
Shale, sandy	14	741
Shale	33	774
Sand	22	796
Shale	9	805
Sand, streaks of shale	19	824
Shale, sandy; streaks of sand	46	870
Shale, streaks of shale, sandy	58	928
Sand, shale, streaks of sand	23	951
Shale and shale, sandy	11	962
Shale, sandy; streaks of sand	33	995
Shale	10	1,005
Shale	17	1,022
Sand	19	1,041
Shale, sandy, hard	92	1,133
Sand	11	1,144
Shale	10	1,154
Well YY-59-53-202		
Owner: C. Machemehl Driller: Pomykal Drilling Co.		
Surface, soil	5	5
Rock and sand	20	25
Shale	20	45
Rock	25	70
Shale	15	85
Sand	15	100
Shale	10	110
Sand	18	128
Shale	27	155
Sand	13	168
Shale	130	298
Sand	22	320

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-53-304		
Owner: St. John's Church Driller: Pomykal Drilling Co.		
Clay	10	10
Sand and rock	12	22
Shale, sandy, fine	10	32
Rock	1	33
Shale, sandy, fine	10	43
Rock	2	45
Shale, sandy, fine	10	55
Shale	90	145
Rock and shale, sandy	30	175
Rock	25	200
Shale	85	285
Sand, blue	15	300
Shale, blue, soft	12	312
Well YY-59-53-405		
Owner: G. L. Morris Driller: Pomykal Drilling Co.		
Clay	5	5
Sand	10	15
Shale	40	55
Rock	23	78
Shale	22	100
Sand and rock soft	26	126
Well YY-59-53-504		
Owner: Brenham Bowling Driller: Pomykal Drilling Co.		
Clay	10	10
Sand	8	18
Shale	62	80
Rock and shale, sandy	45	125
Sand	35	160
Shale	25	185
Sand	15	200
Shale	80	280
Rock	60	340
Shale and rock	105	445

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-53-504—Continued		
Sand	20	465
Sand	15	480
Well YY-59-53-505		
Owner: Edwin Draehn Driller: Pomykal Drilling Co.		
Sand	5	5
Clay	23	28
Sandy, hard	17	45
Sand	20	65
Sand and rock	5	70
Shale	42	112
Sand	17	129
Rock	3	132
Shale	26	158
Sand	9	167
Well YY-59-53-603		
Owner: Robert Gascamp Driller: A. B. Conklin		
Shale	65	65
Sand and rock	19	84
Shale	11	95
Shale, hard	30	125
Sand	10	135
Well YY-59-53-804		
Owner: W. Engelage Driller: Pomykal Drilling Co.		
Sand	10	10
Shale	40	50
Sand and shale	35	85
Shale	40	125
Sand	35	160
Shale	8	168
Well YY-59-53-805		
Owner: Leo Hinze Driller: Pomykal Drilling Co.		
Clay	15	15
Sand	20	35

	THICKNESS (FEET)	DEPTH (FEET)
Well 59-53-805—Continued		
Rock	2	37
Shale	37	74
Sand	13	87
Rock and shale	15	102
Sandy	10	112
Shale	42	154
Sand	21	175
Shale, sandy	1	176

Well YY-59-53-806

Owner: Calvin Borman
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand and clay	40	40
Rock and shale	10	50
Sand	13	63

Well YY-59-53-905

Owner: City of Brenham No. 5
Driller: Layne Texas Co.

	THICKNESS (FEET)	DEPTH (FEET)
Soil, surface	11	11
Sand	10	21
Sand, clay and boulders	92	113
Clay, yellow	30	143
Sand, hard	11	154
Clay, sandy	27	181
Sand, hard	15	196
Clay, sandy, hard	40	236
Clay, sandy	80	316
Lime, sandy	25	341
Clay	17	358
Lime, hard	18	376
Lime	5	381
Shale, brown and gray	105	486
Sand	15	501
Shale	53	554
Sand	32	586
Shale	73	659
Sand, broken; shale and lime	40	699
Shale	30	729
Well YY-59-53-905—Continued		
Shale and lime	89	818
Sand and shale	15	833
Shale	63	896
Shale, sticky	30	926
Shale	290	1,216
Sand	10	1,226
Shale, hard, green	34	1,260
Shale, hard	40	1,300
Sand	6	1,306
Shale, tough	68	1,374
Shale, hard	65	1,439
Sand and shale	15	1,454
Sand	39	1,493
Shale, hard	117	1,610
Shale	66	1,676
Shale, sandy	20	1,696
Shale	299	1,995
Shale, black	115	2,110
Lignite and shale	82	2,192

Well YY-59-53-906

Owner: City of Brenham No. 6
Driller: J. W. Jackson

	THICKNESS (FEET)	DEPTH (FEET)
Soil surface	15	15
Sand and lime	12	27
Lime, rock	16	43
Lime and clay	15	58
Sand, coarse grained	5	63
Clay, tough	19	82
Sand, coarse grained	26	108
Lime, rock	4	112
Sand, coarse grained	16	128
Clay, tough	57	185
Clay, sandy	15	200

Well YY-59-53-910

Owner: City of Brenham No. 10
Driller: Layne Texas Co.

	THICKNESS (FEET)	DEPTH (FEET)
Top soil and clay	13	13

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-53-910—Continued		
Sand	3	16
Sand, hard; layers of rock	10	26
Shale	50	76
Sand	46	122
Shale	11	133
Sand	17	150
Shale	30	180
Sand and lime, sandy	22	202
Shale	115	317
Shale, hard and lime	24	341
Lime, hard, sandy; streaks of shale	44	385
Shale	47	432
Shale, hard and lime	20	452
Shale	15	467
Sand	24	491
Shale	25	516

Well YY-59-53-911

Owner: City of Brenham No. 11
Driller: Texas Water Wells

	THICKNESS (FEET)	DEPTH (FEET)
Soil, surface	6	6
Clay	13	19
Sand	8	27
Clay	46	73
Sand and shale	69	142
Shale	18	160
Shale, sandy	25	185
Sand, streaks of shale	24	209
Shale	89	298
Lime	10	308
Shale	33	341
Lime, streaks of shale	55	396
Shale, streaks of rock	68	464
Sand	42	506
Shale	10	516
Sand	12	528
Shale, streaks of lime	65	593

Well YY-59-53-913

Owner: City of Brenham No. 9 (one of 2 No. 9)
Driller: Layne Texas Co. and John Booth

	THICKNESS (FEET)	DEPTH (FEET)
No record	773	773
Shale and lime	52	825
Sand	12	837
Shale	389	1,226
Sand	10	1,236
Gumbo	14	1,250
Shale and sand	58	1,308
Shale, tough	57	1,365
Shale and sand	15	1,380
Gumbo, tough	8	1,388
Sand	15	1,403
Gumbo, tough	34	1,437
Gumbo	17	1,454
Sand and shale	50	1,504

Well YY-59-53-915

Owner: City of Brenham No. 12
Driller: Texas Water Wells

	THICKNESS (FEET)	DEPTH (FEET)
Rock	5	5
Clay, red and yellow	65	70
Rock	3	73
Sand	23	96
Clay, yellow	40	136
Sand	13	149
Shale	29	178
Sand	28	206
Shale	81	287
Shale, hard; lime streaks	70	357
Lime and sand, cemented	59	416
Shale	147	563
Lime and sand, cemented	8	571
Shale	67	638
Rock	5	643
Shale, sandy	56	699
Shale	49	748
Sand, soft	65	813
Shale	125	938

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-53-915—Continued		
Sand	25	963
Shale	37	1,000
Well YY-59-53-919		
Owner: Brenham Cotton Mills No. 3 Driller: Pomykal Drilling Co.		
No record	87	87
Sand	10	97
Shale	43	140
Sand	15	155
Rock	4	159
Sand	3	162
Shale and rock	7	169
Shale, sandy, hard	10	179
Rock and shale, sandy	14	193
Shale	7	200
Shale, sandy, blue	30	230
Shale, pink	50	280
Rock	5	285
Shale, hard	38	323
Rock	7	330
Shale, soft	59	389
Shale, sandy	4	393
Rock	7	400
Shale, sandy	70	470
Sand, hard, fine	30	500
Sand and shale	70	570
Well YY-59-54-103		
Owner: B. R. Wellman Driller: Pomykal Drilling Co.		
Shale	75	75
Sand	10	85
Shale	15	100
Sand	14	114
Well YY-59-54-105		
Owner: Henry Wellman Driller: Pomykal Drilling Co.		
Clay	20	20
Well YY-59-54-105—Continued		
Sand	35	55
Shale	49	104
Sand	10	114
Shale	1	115
Well YY-59-54-301		
Owner: Cecil Burch Driller: Pomykal Drilling Co.		
Sand and shale	22	22
Shale	42	64
Rock	1	65
Sand	25	90
Shale	13	103
Sand, fine	5	108
Shale	7	115
Sand	13	128
Well YY-59-54-302		
Owner: Henry Wellman Driller: Pomykal Drilling Co.		
Clay	8	8
Sand	12	20
Shale	38	58
Sand	27	85
Sand and shale	20	105
Sand	21	126
Well YY-59-54-402		
Owner: Brenham Country Club Driller: Pomykal Drilling Co.		
Shale	125	125
Sand	46	171
Sand, fine	34	205
Sand, coarse	13	218
Well YY-59-54-406		
Owner: Arnold Thim Driller: Pomykal Drilling Co.		
Clay	50	50
Sand	25	75

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-54-502		
Owner: O. Tomachefsky Driller: Pomykal Drilling Co.		
Clay, sandy	60	60
Sand	27	87
Sand	1	88
Well YY-59-54-503		
Owner: M. C. Goessler Driller: Pomykal Drilling Co.		
Rock, shale and sand	80	80
Shale	49	129
Shale, sandy	11	140
Shale	64	204
Rock and shale, sandy	49	253
Sand, hard	21	274
Well YY-59-54-601		
Owner: O. M. Brown Driller: Pomykal Drilling Co.		
Rock and sand	15	15
Shale	117	132
Sand	3	135
Rock	2	137
Sandy	13	150
Shale	37	187
Sand	15	202
Well YY-59-54-702		
Owner: Gun and Rod Club Driller: E. Gajeske		
Sand and rock	65	65
Sand	5	70
Rock and sand	5	75
Sandy	10	85
Shale	65	150
Shale, sandy	35	185
Sandy	10	195
Shale	73	268
Sand, hard	22	290

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-54-705		
Owner: W. Kuretsch Driller: Pomykal Drilling Co.		
Clay	10	10
Rock and shale	25	35
Sand and rock	45	80
Shale	7	87
Sand and rock	13	100
Rock and shale, sandy	10	110
Shale	75	185
Sand	13	198
Shale	2	200
Well YY-59-54-802		
Owner: T. J. Mabry Driller: Pomykal Drilling Co.		
Clay	10	10
Shale, yellow	32	42
Rock, sand	8	50
Shale, yellow	67	117
Sand and rock	16	133
Shale	7	140
Sand	24	164
Rock	4	168
Sand	8	176
Rock	2	178
Shale	8	186
Sand and rock	19	205
Shale	60	265
Rock	5	270
Sand	5	275
Rock and sand	8	283
Shale and rock	52	335
Rock and sand	13	348
Shale	27	375
Rock and sand	4	379
Sand	23	402
Shale	3	405
Sand	2	407

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-54-803		
Owner: A. Schwettmann Driller: Pomykal Drilling Co.		
Soil, surface	2	2
Sand	28	30
Shale	60	90
Rock, soft	10	100
Shale	8	108
Sand	2	110
Shale	10	120
Sand	3	123
Rock	2	125
Shale	20	145
Sand, hard, fine	5	150
Shale	83	233
Sand	12	245
Well YY-59-54-902		
Owner: Chappell Hill Water Supply Corp. Driller: Key Drilling Co.		
Soil, surface and clay	10	10
Sand	12	22
Shale	176	198
Sand	40	238
Shale	148	386
Shale, sandy	36	422
Shale	20	442
Sand	108	550
Shale	96	646
Sand	45	691
Shale	44	735
Sand	33	768
Shale	12	780
Sand	32	812
Shale	74	886
Well YY-59-55-103		
Owner: S. L. Whiting Driller: Pomykal Drilling Co.		
Clay	51	51
Sand, rock	31	82
Well YY-59-55-103—Continued		
Shale	16	98
Shale, sandy	42	140
Shale, sandy	16	156
Rock	5	161
Sandy	12	173
Sand	21	194
Well YY-59-55-201		
Owner: T. S. Jackson Driller: Pomykal Drilling Co.		
Clay, top	5	5
Sand	7	12
Shale	28	40
Sand	18	58
Shale	8	66
Well YY-59-55-504		
Owner: D. G. Austin Driller: Falkenbury Drilling Co.		
Soil, surface and clay	35	35
Sand and gravel	28	63
Rock and clay, broken	28	91
Clay	22	113
Sand	5	118
Clay	39	157
Sand	38	195
Rock and clay	8	203
Clay	112	315
Sand	59	374
Well YY-59-55-505		
Owner: R. L. Felder Driller: Dunn Water Well Drilling Co.		
No record	37	37
Sand	20	57
Gravel	3	60
Chalk	24	84
Sand	18	102
Sand, hard	7	109
Chalk	10	119

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-55-511		
Owner: J. B. Schaer Driller: J & S Well Service		
Surface	10	10
Sand, red	10	20
Clay, red	45	65
Gravel	7	72
Clay, White	33	105
Sand and rock, broken	56	161
Clay	127	288
Rock, broken	5	293
Clay	34	327
Sand and rock, broken	25	352
Well YY-59-55-805		
Owner: R. L. Felder Driller: Falkenbury Drilling Co.		
Top soil, clay and sand, broken	48	48
Gravel	17	65
Clay	46	111
Sand	11	122
Clay	65	187
Sand	10	197
Clay and sand, broken	14	211
Clay	129	340
Rock	3	343
Sand	13	356
Clay and rock	14	370
Sand	15	385
Clay	23	408
Sand	20	428
Clay	78	506
Sand	10	516
Clay and rock	149	665
Rock and clay	68	733
Sand and rock	21	754
Sand and rock, clay, broken	63	817

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-55-808		
Owner: R. L. Felder Driller: Falkenbury Drilling Co.		
Clay	20	20
Sand and gravel	40	60
Clay	30	90
Clay	30	120
Clay	70	190
Sand and rock	26	216
Rock and clay, broken	54	270
Clay	86	356
Sand, broken	7	363
Clay	9	372
Rock and sand, broken	11	383
Clay	5	388
Sand and rock	28	416
Well YY-59-55-906		
Owner: R. L. Felder Driller: Dunn Water Well Drilling Co.		
No record	36	36
Sand	21	57
Gravel	12	69
Chalk	29	98
Sand, broken	40	138
Well YY-59-55-912		
Owner: R. L. Felder Driller: Falkenbury Drilling Co.		
Soil, surface and clay	23	23
Sand, fine	21	44
Sand and gravel, fine	21	65
Clay	42	107
Sand, rock and clay, broken	33	140
Sand	25	165
Clay	48	213
Sand, red	22	235
Clay	53	288
Sand	10	298
Clay and shale	86	384

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-55-912—Continued		
Rock	10	394
Sand	29	423
Rock	5	428
Well YY-59-55-913		
Owner: R. L. Felder Driller: J & S Well Service		
Surface	33	33
Sand and gravel	34	67
Clay	23	90
Sand	36	126
Clay and rock, broken	95	221
Sand	19	240
Clay and rock, broken	57	297
Clay	43	340
Sand and rock	38	378
Well YY-59-60-102		
Owner: D. J. Kieke Driller: Pomykal Drilling Co.		
Top soil	3	3
Sand and rock	7	10
Shale	105	115
Shale, sandy	13	128
Sandy	12	140
Shale	35	175
Shale, sandy	10	185
Sand	15	200
Sandy	8	208
Well YY-59-60-110		
Owner: Henry Lehrman Driller: Pomykal Drilling Co.		
Clay	107	107
Shale, sandy	5	112
Shale	36	148
Shale, sandy	2	150
Shale	58	208
Shale, sandy; sand, hard	22	230
Shale	3	233

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-60-203		
Owner: John Eckert Driller: Pomykal Drilling Co.		
Clay	15	15
Sand	5	20
Shale	47	67
Sand, fine	3	70
Shale	290	360
Sand	20	380
Shale	3	383
Well YY-59-60-303		
Owner: Albert Weiss Driller: Pomykal Drilling Co.		
Clay	60	60
Sand	6	66
Clay	37	103
Sand, rock and shale	17	120
Sand	3	123
Shale, rock	37	160
Shale and rock	61	221
Rock and shale	19	240
Shale	229	469
Sand	28	497
Well YY-59-61-102		
Owner: Davis Bros. Driller: C. J. Loehr		
Sand	20	20
Shale and clay, white	60	80
Limestone	240	320
Sand and shale	60	380
Shale, sandy, hard	20	400
Sand	20	420
Shale, sandy	20	440
Well YY-59-61-205		
Owner: Arthur Hueske Driller: Pomykal Drilling Co.		
Clay	50	50
Sand	5	55

Table 7.—Drillers' Logs of Wells—Continued

	THICKNESS (FEET)	DEPTH (FEET)
Well YY-59-61-205—Continued		
Shale	135	190
Shale, sandy	10	200
Shale	65	265
Rock	35	300
Shale	35	335
Rock	15	350
Sand and rock, soft	19	369

Well YY-59-62-106

Owner: R. R. Ross
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sand and rock	20	20
Shale	60	80
Sand and rock	46	126

Well YY-59-62-107

Owner: B. C. Crawford
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Clay	13	13
Well YY-59-62-107—Continued		
Sand, rock	2	15
Shale	35	50
Rock	5	55
Shale	30	85
Rock and shale, sandy	15	100
Sandy, hard	26	126
Sand	14	140

Well YY-59-63-106

Owner: Grant Bellvine
Driller: Pomykal Drilling Co.

	THICKNESS (FEET)	DEPTH (FEET)
Sandy	10	10
Shale	40	50
Sandy, rock	30	80
Shale	15	195
Sand	16	211

Table 8.—Water Levels in Wells

Well YY-59-47-301

Owner: Moore Bros.

DATE		WATER LEVEL
July	1, 1942	F[a]
Oct.	2, 1959	1.71
Aug.	30, 1960	1.89
May	22, 1961	2.01
Nov.	26, 1968	4.49

Well YY-59-47-302

Owner: Moore Bros.

DATE		WATER LEVEL
Sept.	12, 1942	+10.6
Oct.	2, 1959	1.85
Sept.	30, 1960	1.96
May	22, 1961	1.13

Well YY-59-47-601

Owner: Mrs. W. F. Borgstedte

DATE		WATER LEVEL
Oct.	2, 1959	35.98
Oct.	26	35.72
Apr.	1, 1960	33.95
Aug.	30	35.01
May	22, 1961	29.16
Aug.	21, 1968	33.64

Well YY-59-48-701

Owner: Henry Wehmeyer

DATE		WATER LEVEL
Oct.	22, 1942	28.72
Oct.	2, 1959	35.26
Aug.	30, 1960	33.88
May	22, 1961	29.10

Well YY-59-48-702

Owner: Henry Wehmeyer

DATE		WATER LEVEL
Oct.	22, 1942	+ 3.0
Oct.	2, 1959	11.87[b]
Aug.	30, 1960	11.08[b]
May	22, 1961	+ 0.50

a/ Flowed, head unknown
b/ Well has pump; assume well pumped down
c/ Carried as 20.93 on State records, but carried as 20.95 on original records

Well YY-59-52-501

Owner: Kirby Lehrmann

DATE		WATER LEVEL
Sept.	12, 1942	+ 3.7
Oct.	16, 1959	14.51
Aug.	30, 1960	12.74
May	22, 1961	11.83
Dec.	31, 1968	12.75

Well YY-59-52-801

Owner: H. Kramer

DATE		WATER LEVEL
July	23, 1942	11.39
Oct.	16, 1959	15.80
Aug.	30, 1960	12.44
May	22, 1961	8.24
Dec.	31, 1968	6.44

Well YY-59-53-905

Owner: City of Brenham No. 5

DATE		WATER LEVEL
Sept.	30, 1959	35.50
Oct.	14	35.19
Aug.	30, 1960	35.42
May	22, 1961	35.49

Well YY-59-53-907

Owner: City of Brenham No. 7

DATE		WATER LEVEL
Sept.	30, 1959	64.62
Oct.	14	66.17
Aug.	30, 1960	62.07
May	22, 1961	67.15

Well YY-59-55-501

Owner: C. H. Alexander Estate

DATE		WATER LEVEL
Oct.	21, 1959	17.06
Apr.	22, 1960	17.37
May	22, 1961	14.29
Jan.	22, 1963	17.93
Mar.	25	18.15
Aug.	15	21.32
Oct.	2	20.45

Well YY-59-55-501—Continued

DATE		WATER LEVEL
Dec.	13, 1963	21.10
Apr.	6, 1964	20.63
June	26	20.95[c]
Oct.	5	22.89
Apr.	27, 1965	20.00
May	12, 1966	14.83
Apr.	24, 1967	19.60
Mar.	1, 1968	22.04
Aug.	16	16.80
Apr.	7, 1969	14.50

Well YY-59-55-502

Owner: C. H. Alexander Estate

DATE		WATER LEVEL
Oct.	21, 1959	18.34
Sept.	22, 1960	16.86
Aug.	15, 1963	20.16
Aug.	16, 1968	17.00

Well YY-59-55-503

Owner: C. H. Alexander Estate

DATE		WATER LEVEL
Oct.	21, 1959	16.35
Sept.	22, 1960	14.63
Aug.	15, 1963	17.92
Aug.	16, 1968	14.48

Well YY-59-55-505

Owner: R. L. Felder

DATE		WATER LEVEL
Oct.	1, 1959	24.77
Sept.	22, 1960	22.78
May	22, 1961	18.00
Aug.	15, 1963	27.10
June	5, 1964	28.08
Aug.	15, 1968	21.85

Well YY-59-55-701

Owner: C. H. Alexander Estate

DATE		WATER LEVEL
Oct.	1, 1959	24.48
Oct.	21	19.85

DATE		WATER LEVEL
Well YY-59-55-701—Continued		
Sept.	22, 1960	24.59
May	22, 1961	21.71
Jan.	22, 1963	25.00
Mar.	25	25.46
Aug.	15	24.95
Oct.	2	23.42
Dec.	13	26.44
Apr.	5, 1964	26.06
June	26	26.79
Oct.	5	27.17
Apr.	27, 1965	26.08
May	12, 1966	15.78
Apr.	24, 1967	19.96
Apr.	1, 1968	24.81
Aug.	9	25.05
Apr.	7, 1969	25.53

DATE		WATER LEVEL
Well YY-59-55-801		
Owner: C. H. Alexander Estate		
Oct.	1, 1959	24.04
Oct.	21	19.79
Sept.	22, 1960	23.90
May	22, 1961	23.94
Aug.	15, 1963	25.04
Aug.	9, 1968	23.26
Well YY-59-55-802		
Owner: C. H. Alexander Estate		
Oct.	21, 1959	21.73
Sept.	22, 1960	23.61
May	25, 1961	22.74
Sept.	15, 1963	27.48
Aug.	9, 1968	22.45

DATE		WATER LEVEL
Well YY-59-55-906		
Owner: R. L. Felder		
Oct.	1, 1959	31.76
Sept.	22, 1960	30.51
May	22, 1961	26.52
Aug.	15, 1963	33.3
Aug.	15, 1968	27.38
Well YY-59-61-101		
Owner: Davis Bros.		
Reported	1940	10
do.	1942	12
do.	1950	13
do.	1956	34
Dec.	19, 1968	48.70

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

(Analyses are in milligrams per liter, except percent sodium, sodium-adsorption ratio, residual sodium carbonate, and pH)

When no potassium (K) is reported, sodium and potassium are calculated and reported as sodium (Na).
Bicarbonate (HCO_3) includes any carbonate (CO_3) present.

Water-bearing unit: Qal, Brazos River alluvium; EV, Evangeline aquifer; B, Burkeville aquiclude; J, Jasper aquifer; Tcs, Catahoula Sandstone; Tj, Jackson Group

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	TEMPERATURE °C
								Na	K														
YY-59-43-801	125	Tj	Nov. 11, 1942	--	--	93	13	297	--	214	340	287	--	--	--	1,135	288	--	--	--	--	--	--
4/ 904	70	do.	Sept. 9, 1968	--	--	150	--	--	--	166	280	258	--	--	--	996 E	419	--	--	0.00	1,610	7.0	--
906	306	do.	Oct. 9, 1968	--	--	--	--	--	--	274	--	332	--	--	--	1,370 E	157	--	--	1.35	2,120	7.3	--
44-602	400	do.	Aug. 22, 1968	54	--	52	.8	302	20	490	3.0	292	0.5	6.9	--	972	133	81	11	5.37	1,650	7.3	--
701	212	do.	July 26, 1968	88	--	30	2.0	105	8.2	124	70	124	.2	.0	--	488	83	71	5.0	.37	741	6.9	--
704	45	do.	Sept. 18, 1968	31	--	9.8	1.7	9.2	4.1	24	7.6	10	.5	4.5	--	90	31	35	.7	.00	98	6.2	--
705	453	do.	Nov. 20, 1968	42	0.01	64	1.8	465	13	320	380	400	.5	1.2	2.3	1,530	167	85	16	1.90	2,460	7.5	27
706	101	do.	Nov. 11, 1942	--	--	887	111	693	--	543	1,504	1,535	1.4	--	--	4,998	2,673	--	--	--	--	--	--
801	500	do.	July 26, 1968	83	--	17	.4	74	8.2	130	46	45	.3	.3	.14	338	44	75	4.8	1.25	450	7.1	--
803	315	do.	do.	84	.76	17	.3	68	7.5	130	34	39	.3	.6	--	315	44	74	4.5	1.26	398	7.3	--
804	45	do.	Nov. 11, 1942	--	--	94	5.8	354	--	238	519	207	.2	.0	--	1,297	259	--	--	--	--	--	--
807	547	do.	Dec. 16, 1968	--	--	--	--	--	--	312	244	184	--	.0	--	874 E	138	--	--	2.35	1,490	7.8	--
902	15	do.	Nov. 11, 1942	--	--	4.8	1.0	19	--	24	11	18	.1	.0	--	66	16	--	--	--	--	--	--
905	94	Tcs	Sept. 14, 1942	--	--	144	3.9	125	--	496	60	127	--	.0	--	704	377	--	--	--	--	--	--
45-502	75	do.	July 2, 1942	--	--	--	--	--	--	305	52	78	--	94	--	--	--	--	--	--	--	--	--
605	123	Tj	do.	--	--	46	2.4	208	--	362	85	136	.2	.0	--	705	125	--	--	--	--	--	--
605	123	do.	Aug. 22, 1968	--	--	42	1.2	--	--	386	--	106	--	3.9	--	--	110	--	--	4.13	1,080	8.3	25
607	160	J	Nov. 13, 1942	--	--	20	4.6	800	--	781	2	825	.3	--	--	2,036	68	--	--	--	--	--	--
702	180	Tcs	Sept. 15, 1942	--	--	162	4.5	36	--	344	10	147	.4	.0	--	706	423	--	--	--	--	--	--
704	505	do.	July 18, 1968	84	--	121	2.2	91	17	332	99	114	.3	.1	--	692	311	37	2.2	.00	1,030	7.9	--
706	560	do.	Aug. 14, 1968	--	--	55	.7	--	--	322	--	51	--	--	--	--	140	--	--	2.48	710	8.0	--
4/ 710	10	J	Dec. 16, 1968	--	--	--	--	--	--	314	22	16	--	45	--	--	290	--	--	.00	634	7.7	--
802	83	do.	July 24, 1942	--	--	110	4.1	15	--	310	4.9	21	.2	43	--	430	292	--	--	--	--	--	--
802	83	do.	Aug. 14, 1968	--	--	108	2.2	--	--	308	--	18	--	--	--	--	278	--	--	.00	575	7.3	22
803	24	do.	July 2, 1942	--	--	158	2.7	52	--	421	33	42	--	101	--	596	407	--	--	--	--	--	--
804	Spring	do.	do.	--	--	64	3.9	109	--	232	17	144	.5	3.0	--	456	177	--	--	--	--	--	--
46-201	37	Tcs	Nov. 16, 1942	--	--	172	4.6	186	--	488	23	295	--	14	--	935	448	--	--	--	--	--	--
304	320	do.	Sept. 14, 1942	--	--	82	3.5	55	--	350	14	26	.2	.0	--	444	219	--	--	--	--	--	--
304	320	do.	Dec. 5, 1968	--	--	--	--	--	--	350	--	22	--	--	--	--	220	--	--	1.34	627	7.6	--

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM * AND POTASSIUM Na	SODIUM * AND POTASSIUM K	BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
YY-59-46-305	175	Tcs	Sept. 14, 1942	--	--	85	2.4	54	--	332	30	25	--	0.0	--	359	222	--	--	--	--	--	--
401	150	do.	July 30, 1964	47	0.06	64	3.0	67	9.3	350	21	18	0.3	.2	0.23	402	172	44	2.2	2.30	619	7.1	23
401	150	Tcs	Aug. 22, 1968	--	--	51	.5	--	--	300	--	23	--	--	--	--	129	--	--	2.34	567	7.6	24
403	179	do.	Aug. 21, 1968	77	--	90	2.3	44	7.8	352	26	18	.1	.0	--	438	234	28	1.2	1.09	624	7.5	--
408	57	J	Nov. 16, 1942	--	--	129	3.4	32	--	268	32	40	.1	120	--	489	337	--	--	--	--	--	--
409	27	do.	do.	--	--	227	3.4	46	--	323	90	118	.1	195	--	839	582	--	--	--	--	--	--
502	701	Tj	July 20, 1964	50	.03	11	.1	225	--	352	59	117	.8	.2	--	636	28	95	18	5.21	1,030	7.3	--
702	330	J	Dec. 4, 1968	--	2.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	332	--	--
703	90	do.	do.	--	--	--	--	--	--	280	26	21	--	--	--	319 E	232	--	--	.00	532	7.4	--
704	222	do.	Oct. 21, 1942	--	--	97	11	32	--	336	25	38	.8	.5	--	369	287	--	--	--	--	--	--
705	222	do.	do.	--	--	98	8.3	32	--	323	29	39	--	.0	--	365	280	--	--	--	--	--	22
706	222	do.	do.	--	--	--	--	--	--	311	24	40	--	.0	--	--	--	--	--	--	--	--	22
706	222	do.	Dec. 5, 1968	--	--	--	--	--	--	426	16	47	--	--	--	--	64	--	--	5.70	808	7.9	--
1/ 803	237	do.	June 1, 1956	--	3.0	106.6	3.8	23	--	329	15.6	32	--	--	--	580	272	--	--	--	--	7.8	--
803	237	do.	Aug. 22, 1968	--	.20	105	4.5	--	--	326	12	27	--	--	--	--	280	--	--	--	601	7.5	--
804	136	do.	Dec. 4, 1968	--	--	--	--	--	--	348	--	37	--	--	--	--	300	--	--	.00	682	7.4	--
805	204	do.	do.	44	--	90	5.7	61	--	356	32	39	.2	.0	.05	447	248	35	1.7	.87	712	7.6	--
902	400	do.	Dec. 5, 1968	--	--	--	--	--	--	364	30	66	--	--	--	445 E	250	--	--	.97	775	8.0	--
47-101	20	Qal	Oct. 20, 1942	--	--	91	3.4	21	--	275	8	29	--	16	--	303	242	--	--	--	--	--	--
101	20	do.	Aug. 12, 1968	--	--	142	1.5	--	--	332	--	85	--	--	--	--	360	--	--	.00	888	7.7	23
102	560	Tj	Nov. 21, 1968	56	--	22	1.0	306	--	694	.0	109	1.2	.1	--	836	59	92	--	10.2	1,300	7.5	24
202	135	Tcs	Oct. 20, 1942	--	--	80	5.8	13	--	293	8	10	.2	.0	--	266	224	--	--	--	--	--	--
202	135	do.	Nov. 26, 1968	--	--	--	--	--	--	274	--	8.2	--	--	--	--	248	--	--	.00	470	8.2	--
203	40	do.	Oct. 20, 1942	--	--	256	5.8	4.6	--	336	3	276	.2	8	--	719	664	--	--	--	--	--	--
301	245	J	July 1, 1942	--	--	102	1.5	53	--	366	26	34	0	1	--	398	261	--	--	--	--	--	22
301	245	do.	Nov. 26, 1968	--	--	--	--	--	--	340	--	33	--	--	--	--	164	--	--	2.29	652	7.6	--
302	340	do.	July 1, 1942	--	--	70	4.5	88	--	364	25	42	.2	.0	--	459	193	--	--	--	--	--	--
401	250	do.	Nov. 19, 1942	--	--	86	5.8	61	--	354	3	55	.1	0	--	385	239	--	--	--	--	--	--
502	299	do.	Dec. 17, 1968	--	--	--	--	--	--	346	--	44	--	--	--	--	224	--	--	1.19	703	8.0	--
503	130	do.	Oct. 20, 1942	--	--	85	3.4	23	--	287	3	23	--	7.0	--	285	227	--	--	--	--	--	--
504	40	Ev	July 1, 1942	--	--	90	1.5	55	--	366	9	10	--	33	--	379	231	--	--	--	--	--	--
604	385	J	Aug. 21, 1968	45	.07	55	3.3	96	12	378	24	26	.1	.5	--	448	150	56	3.4	3.19	683	7.4	--
605	412	do.	July 1, 1942	--	--	43	3.2	125	--	392	22	34	.2	0	--	497	120	--	--	--	--	--	--

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM * AND POTASSIUM Na	SODIUM * AND POTASSIUM K	BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
YY-59-47-608	126	J,B?	Nov. 26, 1968	--	0.03	--	--	--	--	368	7.8	22	--	--	--	--	316	--	--	0.00	627	7.5	--
609	80	B	July 1, 1942	--	--	90	1.5	41	--	329	8	29	--	2.0	--	334	231	--	--	--	--	--	22
610	82	J	do.	--	--	120	1.5	88	--	415	21	72	--	41	--	543	306	--	--	--	--	--	--
704	8	Ev	Nov. 19, 1942	--	--	51	3.4	1.6	--	146	2	3.0	--	24	--	157	142	--	--	--	--	--	--
802	36	do.	Nov. 29, 1968	--	--	--	--	--	--	252	28	47	--	158	--	--	420	--	--	.00	862	7.4	--
805	180	do.	do.	--	--	--	--	--	--	324	4.4	10	--	--	--	--	262	--	--	.07	512	7.6	--
806	125	do.	Oct. 23, 1942	--	--	99	3.4	63	--	214	18	136	0.2	17	--	442	262	--	--	--	--	--	--
902	124	do.	Oct. 22, 1942	--	--	68	4.6	68	--	293	8	59	--	5.0	--	357	188	--	--	--	--	--	--
902	124	do.	Oct. 7, 1968	--	--	--	--	--	--	428	--	81	--	--	--	--	288	--	--	1.25	814	7.2	--
904	160	Ev?	Oct. 23, 1942	--	--	71	3.4	34	--	293	3	15	--	1.0	--	271	192	--	--	--	--	--	22
905	43	Ev	Oct. 22, 1942	--	--	120	7.1	163	--	287	25	281	--	32	--	769	329	--	--	--	--	--	--
48-402	700	J	Nov. 29, 1968	--	--	--	--	--	--	408	16	25	--	--	--	--	62	--	--	5.45	702	8.0	26
702	700	do.	Oct. 22, 1942	--	--	24	7.1	126	--	299	3	79	1.4	--	--	388	89	--	--	--	--	--	--
705	700?	do.	do.	--	--	10	5.8	169	--	415	3	51	.5	0	--	443	49	--	--	--	--	--	24
50-905	362	Tj	Dec. 28, 1968	88	--	18	6.6	84	--	131	62	58	.4	.0	--	381	72	72	4.3	.71	513	6.8	--
51-103	114	do.	Nov. 12, 1942	--	--	127	24	264	--	110	466	292	.2	1.0	--	1,228	415	--	--	--	--	--	--
103	114	do.	Sept. 9, 1968	--	--	127	16	--	--	96	--	295	--	--	--	1,150 E	383	--	--	.00	1,910	6.7	--
105	63	do.	do.	--	7.4	127	10	--	--	376	157	151	--	--	--	768 E	358	--	--	.00	1,280	6.8	--
202	105	do.	Nov. 12, 1942	--	--	181	11	152	--	128	458	173	--	--	--	1,038	497	--	--	--	--	--	--
602	69	Tcs	do.	--	--	36	14	104	--	372	4	46	--	0	--	387	149	--	--	--	--	--	--
602	69	do.	Sept. 10, 1968	--	--	115	3.6	--	--	350	69	--	--	--	--	--	302	--	--	.00	724	8.0	--
603	60	do.	do.	--	.05	154	18	--	--	202	130	365	--	--	--	1,040 E	458	--	--	.00	1,730	6.7	--
605	38	do.	Nov. 12, 1942	--	--	93	2.2	47	--	336	229	25	--	3.0	--	364	241	--	--	--	--	--	--
605	38	do.	Sept. 10, 1968	--	--	127	1.8	--	--	298	--	36	--	--	--	--	324	--	--	.00	651	7.7	--
607	155	do.	Oct. 8, 1968	82	--	105	5.8	31	--	348	18	34	.3	.2	--	447	286	19	.8	.00	652	7.1	23
703	216	Tj	Dec. 18, 1968	57	--	107	17	69	--	354	30	117	.4	1.4	--	573	336	31	1.6	.00	932	7.8	--
805	70	Tcs	Nov. 12, 1942	--	--	230	13	113	--	378	61	354	--	1.0	--	958	628	--	--	--	--	--	--
805	70	do.	Sept. 9, 1968	--	--	770	49	--	--	328	--	1,440	--	--	--	2,980 E	2,120	--	--	.00	4,940	7.1	--
902	28	J	Nov. 12, 1942	--	--	524	7.0	--	--	305	172	622	.1	--	--	1,475	1,339	--	--	--	--	--	--
52-102	35	Tcs	Nov. 11, 1942	--	--	110	4.6	86	--	427	16	75	--	8.0	--	510	293	--	--	--	--	--	--
103	280	Tj	Dec. 13, 1968	76	--	70	4.3	63	--	318	28	28	.3	.0	--	426	192	42	2.0	1.37	608	7.7	--
202	292	Tcs	Sept. 18, 1968	61	.01	106	2.9	45	4.4	358	28	40	.3	.0	.06	464	276	26	1.2	.34	692	7.6	--

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM * AND POTASSIUM		BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
								Na	K														
YY-59-52-301	193	Tcs	Sept. 28, 1968	--	--	99	2.0	--	--	330	0.4	10	--	--	--	--	255	--	--	0.31	521	7.6	--
302	35	J	do.	--	--	315	7.7	--	--	192	200	228	--	443	--	1,250 E	818	--	--	.00	2,080	7.3	23
404	160	Tcs	July 17, 1942	--	--	85	6.3	32	--	342	3	14	0.3	6.0	--	315	239	--	--	--	--	--	--
501	192	J	July 23, 1942	--	--	83	4.6	54	--	345	14	32	.6	.0	--	401	226	--	--	--	--	--	--
504	58	do.	Nov. 20, 1942	--	--	69	2.2	75	--	305	17	39	--	27	--	379	182	--	--	--	--	--	--
505	126	do.	do.	--	--	96	5.8	42	--	354	17	34	.6	0	--	369	264	--	--	--	--	--	--
603	200	do.	July 23, 1942	--	--	--	--	--	--	268	9	62	--	165	--	--	--	--	--	--	--	--	--
604	126	do.	Dec. 12, 1968	52	--	102	5.2	23	--	350	8.4	21	.4	.0	--	384	276	15	0.6	.22	591	7.5	--
605	160	do.	do.	--	--	--	--	--	--	354	--	14	--	--	--	--	284	--	--	.12	583	7.9	--
606	80	do.	July 17, 1942	--	--	--	--	--	--	281	10	220	--	0	--	--	--	--	--	--	--	--	22
607	150	do.	do.	--	--	103	4.5	28	--	342	12	29	.5	.0	--	408	276	--	--	--	--	--	22
702	275	do.	Sept. 10, 1968	--	--	97	2.3	--	--	344	6.2	24	--	--	--	--	252	--	--	.61	581	7.9	23
703	212	do.	Oct. 16, 1968	62	.06	100	4.5	44	--	335	15	51	.4	.4	--	442	262	26	1.2	.13	694	7.9	--
801	55	do.	July 23, 1942	--	--	--	--	--	--	329	26	49	--	5.0	--	--	--	--	--	--	--	--	--
801	55	do.	Dec. 31, 1968	--	--	--	--	--	--	384	--	38	--	2.7	--	--	314	--	--	.01	767	7.5	--
802	117	do.	July 23, 1942	--	--	--	--	--	--	293	11	27	--	0	--	--	--	--	--	--	--	--	--
804	170	do.	do.	--	--	--	--	--	--	336	26	37	.8	0	--	--	--	--	--	--	--	--	23
901	260	do.	do.	--	--	--	--	--	--	366	27	106	0	0	--	--	--	--	--	--	--	--	--
901	260	do.	Jan. 3, 1969	--	--	--	--	--	--	336	--	118	--	--	--	--	288	--	--	.00	907	7.8	22
905	17	do.	July 23, 1942	--	--	--	--	--	--	360	78	416	0	0	--	--	--	--	--	--	--	--	--
906	161	do.	do.	--	--	81	5.0	60	--	349	10	39	.1	.0	--	416	222	--	--	--	--	--	23
907	191	do.	do.	--	--	95	6.3	59	--	342	12	70	.3	0	--	415	264	--	--	--	--	--	22
53-101	356	do.	Dec. 12, 1968	--	.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	556	--	--
102	22	do.	Nov. 13, 1942	--	--	90	5.6	5.1	--	299	3	4	0	7.0	--	262	248	--	--	--	--	--	--
2/ 201	1,070	J,Tcs	Oct. 21, 1964	42	.09	83	1	63	--	343	17	35	--	--	--	586	212	--	--	--	658	7.31	--
201	1,070	do.	July 26, 1968	48	.00	69	1.6	49	11	290	21	29	.2	.1	.04	372	178	36	1.6	1.18	562	7.5	29
202	320	J	Nov. 19, 1968	66	--	--	--	--	--	352	20	18	.2	--	--	--	250	--	--	.77	629	7.1	--
203	175	do.	do.	38	.93	--	--	--	--	338	14	27	.3	--	--	370 E	265	--	--	.24	617	6.9	--
205	69	do.	July 31, 1942	--	--	108	3.4	28	--	363	8.9	26	.2	.0	--	400	284	--	--	--	--	--	21
206	130	do.	do.	--	--	--	--	--	--	293	14	40	--	--	--	--	--	--	--	--	--	--	--
207	123	do.	July 24, 1942	--	--	100	4.3	40	--	347	19	35	.2	.0	--	418	267	--	--	--	--	--	21
303	261	do.	Nov. 19, 1968	47	--	--	--	--	--	356	15	35	.3	--	--	402 E	250	--	--	.83	670	6.9	--

See footnotes at end of table.

Table 9.--Chemical Analyses of Water From Wells 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 Na	K	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	TEMPERATURE °C
YY-59-53-305	229	J	Feb. 11, 1969	--	0.13	--	--	--	--	--	21	--	--	--	--	--	--	--	--	--	883	--	--
306	218	do.	July 2, 1942	--	--	86	5.5	61	--	312	20	66	0.3	0.0	--	430	237	--	--	--	--	--	23
3/ 401	434	do.	June 19, 1961	--	.06	96	7	26	--	351	8	22	.2	--	--	371	271	--	--	--	618	--	--
402	436	do.	Oct. 17, 1968	44	.04	101	4.4	27	--	350	11	21	.3	.3	--	381	270	18	0.7	0.34	613	7.0	--
501	292	do.	July 29, 1968	42	.00	97	4.1	28	3.0	324	16	29	.3	.1	0.06	379	259	19	.8	.13	599	7.6	--
504	480	do.	Oct. 18, 1968	--	.37	--	--	--	--	340	16	21	.3	.0	--	--	272	--	--	.66	598	7.0	--
602	48	B	July 24, 1942	--	--	135	5.1	18	--	421	7	24	.2	12	--	408	358	--	--	--	--	--	--
4/ 702	34	J	July 22, 1942	--	--	224	7.5	44	--	397	22	187	--	92	--	772	590	--	--	--	--	--	--
703	337	do.	Oct. 17, 1968	--	4.5	--	--	--	--	336	15	39	--	--	--	401 E	244	--	--	.63	669	7.1	--
802	457	do.	do.	--	--	--	--	--	--	347	14	22	--	--	--	--	272	--	--	.25	616	6.9	--
803	127	do.	do.	--	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
810	41	B	July 15, 1942	--	--	--	--	--	--	366	30	170	--	3.0	--	--	--	--	--	--	--	--	--
811	76	B?	July 21, 1942	--	--	--	--	--	--	342	24	61	--	66	--	--	--	--	--	--	--	--	--
905	1,515	Tcs	June 23, 1942	--	--	33	1.1	113	--	358	13	18	.3	.0	--	425	87	--	--	--	--	--	33
3/ 906	143	J,B?	Feb. 23, 1939	--	--	129	5	23	--	366	12	46	--	18	--	447	343	--	--	--	--	--	--
906	143	do.	June 23, 1942	--	--	133	3.5	25	--	361	20	42	.2	31	--	473	346	--	--	--	--	--	22
3/ 906	143	do.	Apr. 25, 1958	--	.02	145	8	20	--	332	42	47	.2	55	--	484	395	--	--	--	806	6.9	--
907	198	J	June 23, 1942	--	--	128	3.4	19	--	360	3	49	.3	8	--	446	334	--	--	--	--	--	--
3/ 908	200	do.	Jan. 15, 1957	--	.08	125	1.0	25	--	34	18	33	.2	18.8	--	400	315	--	--	--	663	6.9	--
3/ 909	511	do.	Apr. 25, 1958	--	.02	151	6	23	--	399	8	86	.2	7	--	517	405	--	--	--	862	6.8	--
909	511	do.	Oct. 14, 1959	30	.05	148	3.1	24	1.2	387	8.2	76	.2	5.6	.08	499	382	12	.5	--	839	6.7	22
909	511	do.	July 24, 1968	--	--	80	3.0	--	--	182	10	68	--	--	--	--	212	--	--	--	542	7.3	--
910	500	do.	Apr. 28, 1958	--	.02	102	6	23	--	338	10	35	.2	3.5	--	376	280	--	--	--	626	7.2	23
3/ 910	500	do.	July 24, 1968	28	.00	84	2.6	23	1.3	236	11	39	.2	13	.02	318	220	18	.7	.00	526	7.4	--
911	593	do.	Apr. 28, 1958	--	.04	102	6	20	--	332	9	31	.2	5.3	--	370	280	--	--	--	616	7.1	23
3/ 911	593	do.	July 24, 1968	32	.00	95	2.8	22	2.1	288	10	29	.3	7.9	.03	343	248	16	.6	.00	556	7.4	--
4/ 912	Spring	B	June 23, 1942	--	--	136	2.7	21	--	316	31	34	.1	69	--	519	350	--	--	--	--	--	21
912	Spring	do.	Feb. 11, 1969	--	--	--	--	--	--	--	--	36	--	55	--	--	--	--	--	--	749	--	18
914	785	J	June 23, 1942	--	--	84	3.8	55	--	348	21	26	.2	.2	--	471	225	--	--	--	--	--	28
914	785	J	Nov. 11, 1942	--	--	84	2.9	49	--	326	22	26	.2	0	--	476	222	--	--	--	--	--	--
914	785	do.	Feb. 13, 1969	--	--	--	--	--	--	348	--	28	--	.2	--	--	216	--	--	1.38	649	7.9	--
915	820	do.	July 24, 1968	45	.00	80	2.5	25	3.7	268	10	25	.3	1.3	.05	325	210	20	.8	.19	500	7.4	25
916	1,000	do.	do.	43	.00	64	1.4	54	7.6	312	11	41	.2	.4	.20	376	166	40	1.8	1.80	557	7.4	--

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM * AND POTASSIUM Na	SODIUM * AND POTASSIUM K	BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
YY-59-53-918	598	J	July 30, 1968	43	--	99	2.4	23	3.7	320	13	27	0.3	0.1	--	368	257	16	0.6	0.10	583	7.6	--
920	587	do.	do.	42	--	93	2.6	22	3.6	316	12	26	.3	.0	--	356	242	16	.6	.33	550	7.7	--
921	200	do.	June 24, 1942	--	--	124	3.3	16	--	354	9.6	26	.1	25	--	450	323	--	--	--	--	--	--
922	168	do.	Aug. 23, 1968	29	--	130	3.0	24	1.4	382	9.2	42	.2	2.0	--	429	337	13	.6	.00	717	7.0	--
923	180	do.	June 24, 1942	--	--	91	3.3	17	--	268	6.3	26	.2	17	--	333	240	--	--	--	--	--	--
923	180	do.	Aug. 23, 1968	--	.12	125	3.9	--	--	376	--	36	--	--	--	328	--	--	--	.00	688	7.5	--
924	212	Ev	Nov. 22, 1968	26	--	93	6.8	21	--	344	3.2	14	.2	.0	--	333	260	15	.6	.44	553	6.4	--
925	700	J	July 17, 1942	--	--	--	--	--	--	299	7	34	.3	--	--	--	--	--	--	--	--	--	--
926	102	Ev	July 16, 1942	--	--	--	--	--	--	323	13	69	--	20	--	--	--	--	--	--	--	--	--
54-101	433	J	Sept. 16, 1968	--	--	89	3.9	--	--	328	33	25	--	--	--	374 E	238	--	--	.62	624	7.2	--
104	360	do.	do.	--	--	95	5.0	--	--	348	18	37	--	--	--	--	258	--	--	.55	661	7.6	--
202	95	Ev	Oct. 21, 1942	--	--	97	4.5	39	--	371	3.4	26	.4	.5	--	386	261	--	--	--	--	--	--
203	200?	do.	July 1, 1942	--	--	97	4.5	37	--	350	4.6	34	.3	.2	--	382	260	--	--	--	--	--	--
401	135	B	Aug. 12, 1968	36	--	102	4.8	22	3.2	324	14	30	.2	0	.02	371	274	15	.6	.00	601	7.4	22
404	86	J	Sept. 12, 1968	--	.08	102	4.5	--	--	324	15	34	--	--	--	--	273	--	--	.00	613	7.6	--
405	52	Ev	Nov. 17, 1942	--	--	79	3.4	22	--	275	4	6	--	27	--	276	212	--	--	--	--	--	--
405	52	do.	Sept. 12, 1968	--	--	96	1.4	--	--	304	--	14	--	--	--	--	246	--	--	.07	522	8.1	--
407	617	J	Dec. 17, 1968	53	--	78	7.7	65	--	364	24	31	.2	.0	--	438	226	38	1.9	1.45	671	7.4	--
502	88	Ev	Oct. 7, 1968	--	--	--	--	--	--	304	13	29	--	--	--	--	280	--	--	.00	589	7.0	--
605	147	do.	Sept. 16, 1968	--	--	101	5.2	--	--	330	15	28	--	--	--	362 E	274	--	--	.00	603	7.6	--
701	40	do.	June 30, 1942	--	--	--	--	--	--	262	12	35	--	58	--	--	--	--	--	--	--	--	--
703	Spring	do.	Sept. 16, 1968	19	.20	94	1.6	10	1.6	261	9.8	18	.1	13	--	295	241	8	.3	.00	491	7.2	--
801	21	do.	Nov. 17, 1942	--	--	66	5.8	19	--	256	4	11	.2	1	--	233	189	--	--	--	--	--	--
901	190	do.	do.	--	--	62	4.6	50	--	311	2	17	.1	--	--	289	173	--	--	--	--	--	--
902	778	J	July 29, 1968	23	.02	63	6.1	60	7.3	330	14	27	.5	.1	.17	363	182	41	1.9	1.77	593	7.7	26
903	27	Ev	do.	25	--	220	12	170	1.3	360	183	332	.9	5.8	--	1,130	598	38	30	.00	1,880	7.0	--
905	292	do.	Aug. 15, 1968	--	--	80	3.7	--	--	280	28	--	--	--	--	--	214	--	--	.30	516	7.5	--
906	31	Ev	Nov. 17, 1942	--	--	99	3.4	57	--	348	9	42	--	41	--	422	262	--	--	--	--	--	--
908	190	do.	do.	--	--	96	5.8	43	--	372	2	35	--	0	--	365	264	--	--	--	--	--	--
909	446	B?	Sept. 12, 1968	--	--	91	1	--	--	340	14	41	--	--	--	--	231	--	--	.95	654	7.5	--
910	211	Ev	Nov. 17, 1942	--	--	104	4.6	28	--	342	3	38	.1	1	--	347	278	--	--	--	--	--	--
910	211	do.	Sept. 18, 1968	--	--	104	2.6	--	--	348	--	12	--	--	--	--	270	--	--	.30	548	7.7	--
55-101	138	do.	Oct. 20, 1942	--	--	89	2.2	20	--	305	2	12	--	6.0	--	281	231	--	--	--	--	--	--

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM + AND POTASSIUM		BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
								Na	K														
YY-59-55-102	150	Ev	Oct. 7, 1968	--	--	--	--	--	--	288	14	12	--	--	--	--	240	--	--	0.00	502	7.3	--
201	66	do.	Aug. 9, 1968	22	--	143	4.2	54	1.7	384	19	115	0.3	1.1	--	549	374	24	1.2	.00	963	7.3	--
202	28	do.	Oct. 22, 1942	--	--	96	7.1	30	--	317	4	48	.3	1	--	342	269	--	--	--	--	--	--
203	97	do.	Oct. 7, 1968	--	--	--	--	--	--	300	--	22	--	.0	--	--	244	--	--	.04	539	7.3	--
301	1,049	J	Oct. 8, 1968	40	--	21	2.6	162	--	420	22	34	.4	.2	--	489	63	85	8.9	5.62	754	8.0	24
304	65	Ev	Oct. 22, 1942	--	--	104	5.3	29	--	354	3	30	--	15	--	361	284	--	--	--	--	--	--
305	46	do.	do.	--	--	146	13	52	--	336	11	169	.1	8	--	564	418	--	--	--	--	--	--
507	21	do.	Nov. 10, 1942	--	--	118	7.1	184	--	500	32	182	--	29	--	798	324	--	--	--	--	--	--
511	352	do.	Aug. 9, 1968	--	--	45	10	--	--	244	13	28	--	--	--	--	153	--	--	.93	480	7.7	23
512	400	do.	July 23, 1968	--	--	66	8.8	--	--	360	14	23	--	--	--	378 E	200	--	--	1.89	630	7.5	23
703	70	do.	Aug. 15, 1963	28	0.01	104	5.1	29	--	352	5.2	33	.6	.2	0.04	378	280	18	.8	.17	617	6.8	23
704	65	Qal	Nov. 10, 1942	--	--	86	4.1	27	--	220	5	35	--	71	--	336	233	--	--	--	--	--	--
806	1,674	J	July 13, 1942	13	.07	10	1.3	139	--	306	.7	55	1.6	.0	--	377	30	--	--	--	--	7.9	27
809	87	Ev	do.	--	--	87	5.1	48	--	268	8	69	--	19	--	368	238	--	--	--	--	--	--
907	400	do.	Nov. 10, 1942	--	--	57	12	75	--	384	12	20	.2	0	--	365	192	--	--	--	--	--	--
56-106	71	Qal,Ev	Aug. 21, 1964	24	3.1	119	17	62	2.0	463	54	54	.2	--	.06	560	367	27	1.4	.25	918	6.8	--
109	900	J	Oct. 8, 1968	--	--	--	--	--	--	526	--	65	--	--	--	--	60	--	--	7.42	976	7.6	26
59-303	162	do.	Dec. 18, 1968	--	.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	677	--	--
60-101	165	do.	July 20, 1942	--	--	100	7	88	--	368	18	106	.1	.0	--	572	278	--	--	--	--	--	--
103	36	do.	do.	--	--	146	3.9	76	--	336	18	61	--	207	--	677	382	--	--	--	--	--	22
105	210	do.	do.	--	--	--	--	--	--	305	33	63	.2	3.0	--	--	--	--	--	--	--	--	--
108	151	do.	do.	--	--	--	--	--	--	305	21	63	--	270	--	--	--	--	--	--	--	--	22
109	180	do.	do.	--	--	102	7.6	69	--	364	22	80	.1	.0	--	511	286	--	--	--	--	--	--
202	40	do.	July 21, 1942	--	--	--	--	--	--	220	92	181	--	318	--	--	--	--	--	--	--	--	--
204	32	B	do.	--	--	105	6.3	33	--	348	17	32	.4	15	--	380	289	--	--	--	--	--	--
302	45	do.	Dec. 19, 1968	--	--	--	--	--	--	424	67	378	--	13	--	1,100 E	576	--	--	.00	1,830	7.6	--
505	71	J	July 20, 1942	--	--	94	11	111	--	293	52	68	--	165	--	645	282	--	--	--	--	--	--
505	71	do.	Dec. 27, 1968	--	--	--	--	--	--	--	--	413	--	348	--	1,490 E	--	--	--	--	2,490	--	--
603	44	Ev	July 21, 1942	--	--	--	--	--	--	220	18	65	.3	39	--	--	--	--	--	--	--	--	--
604	100	J	do.	--	--	--	--	--	--	299	4	15	.2	22	--	--	--	--	--	--	--	--	--
605	140	do.	July 16, 1942	--	--	--	--	--	--	317	4	86	--	0	--	--	--	--	--	--	--	--	--
61-101	394	do.	June 24, 1942	--	--	--	--	--	--	250	17	38	.8	0	--	--	--	--	--	--	--	--	22

See footnotes at end of table.

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

WELL	PRODUCING INTERVAL OR WELL DEPTH (FT)	WATER-BEARING UNIT	DATE OF COLLECTION	SILICA (SiO_2)	IRON (Fe)	CAL-CIUM (Ca)	MAGNE-SIUM (Mg)	SODIUM AND POTASSIUM		BICAR-BONATE (HCO_3)	SUL-FATE (SO_4)	CHLO-RIDE (Cl)	FLUO-RIDE (F)	NITRATE (NO_3)	BORON (B)	DIS-SOLVED SOLIDS	HARD-NESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORP-TION RATIO (SAR)	RESIDUAL SODIUM CARBONATE (RSC)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH	TEMPER-ATURE °C
								Na	K														
YY-59-61-101	394	J	Dec. 19, 1968	--	--	--	--	--	--	240	--	106	--	--	--	427 E	192	--	--	0.09	711	7.4	--
204	63	B	July 21, 1942	--	--	--	--	--	--	409	7	84	--	0	--	--	--	--	--	--	--	--	--
206	54	do.	July 15, 1942	--	--	--	--	--	--	250	6	16	--	1.9	--	--	--	--	--	--	--	--	--
304	80	Ev	July 16, 1942	--	--	--	--	--	--	256	14	112	--	72	--	--	--	--	--	--	--	--	--
409	125	B	do.	--	--	--	--	--	--	342	37	59	0.2	0	--	--	--	--	--	--	--	--	--
410	155	do.	July 15, 1942	--	--	--	--	--	--	275	2	40	--	1	--	--	--	--	--	--	--	--	--
503	Spring	B?	do.	--	--	--	--	--	--	378	8	57	--	64	--	--	--	--	--	--	--	--	--
62-101	17	Ev	July 3, 1942	--	--	66	1.5	21	--	220	17	7	--	12	--	233	171	--	--	--	--	--	--
105	6	do.	Oct. 28, 1968	14	--	--	--	--	--	383	22	23	1.0	--	--	--	--	328	--	.00	729	7.1	--
108	100	do.	July 13, 1942	--	--	--	--	--	--	268	6	31	--	39	--	--	--	--	--	--	--	--	--
201	148	do.	June 30, 1942	--	--	86	2.7	46	--	348	4	27	--	1	--	338	227	--	--	--	--	--	--
202	95	do.	do.	--	--	82	3.9	27	--	299	9	19	--	--	--	288	222	--	--	--	--	--	--
203	75	do.	June 20, 1942	--	--	68	7.5	125	--	293	18	123	--	50	--	536	200	--	--	--	--	--	--
204	100	do.	June 30, 1942	--	--	--	--	--	--	232	89	430	.1	1	--	--	--	--	--	--	--	--	--
302	174	do.	Aug. 7, 1968	32	--	103	3.3	20	2.0	328	5.6	28	.3	.6	--	356	270	14	0.5	.00	591	7.4	--
303	253	do.	do.	--	--	108	4.1	--	--	352	7.8	45	--	--	--	--	286	--	--	.04	674	7.6	--
307	40	do.	July 14, 1942	--	--	--	--	--	--	458	100	500	--	0	--	--	--	--	--	--	--	--	--
308	18	do.	do.	--	--	--	--	--	--	256	59	28	--	.5	--	--	--	--	--	--	--	--	--
63-102	18	do.	Aug. 13, 1968	--	--	144	23	--	--	109	18	147	--	386	--	816 E	454	--	--	.00	1,360	7.5	--
104	Spring	do.	July 14, 1942	--	--	--	--	--	--	153	14	18	.2	12	--	--	--	--	--	--	--	--	--
105	85	do.	do.	--	--	--	--	--	--	293	12	21	--	30	--	--	--	--	--	--	--	--	--
106	211	do.	Aug. 13, 1968	--	--	100	7.0	--	--	336	--	39	--	--	--	--	278	--	--	.00	623	7.5	--
502	45	Qal	Apr. 10, 1964	15	0.16	102	38	103	--	365	57	201	.4	.0	--	691	411	35	2.2	.00	1,240	7.7	23

1/ Analysis by Curtis Laboratories, Houston, Texas.
2/ Analysis by Microbiology Service Laboratories, Houston, Texas.
3/ Analysis by Texas State Department of Public Health, Austin, Texas.
4/ Pesticide analyses in files of U.S. Geological Survey.
E Dissolved solids estimated from specific conductance value.