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PUBLIC WATER SUPPLIES IN CENTRAL AND NORTH-CENTRAL TEXAS

By

R. W. Sundstrom, W. L. Broadhurst, and Mrs. B. C. Dwyer

Prepared in cooperation between the Texas State Board of Water Engineers and the Geological Survey, U. S. Department of the Interior

July 1947

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ABSTRACT

This report gives a summarized description of the public water supplies in 53 counties of central and north-central Texas, extending from the southern boundaries of Travis, Blanco, Gillespie, and Kerr Counties northward to the Texas-Oklahoma State line. It gives the available data as follows for each of the 145 communities: population of the community; name of the official from whom the information was obtained; ownership of water works, whether private or municipal; source of supply, whether ground water or surface water; the amount of water consumed; the facilities for storage; the number of customers served; the character of the chemical and sanitary treatment, if any; and chemical analyses of the water. Where ground water is used, the following is also given: records of wells, including drillers' logs; character of the pumping equipment; yields of the wells and records of water levels, where they are available.

The communities served by these public supplies had a population of 657,116 in 1940. Ground water is used by 94 of these communities and surface water by 51. The total amount of water consumed averages about 79,000,000 gallons a day, of which approximately 18,500,000 gallons is obtained from ground water and approximately 60,500,000 gallons from surface water. The average consumption of ground water per community is small. Only eight cities of more than 5,000 population use ground water exclusively for public supply, of which the largest had a population of 12,192 in 1940.

The ground-water reservoirs of the region, from which the public water supplies are drawn, occur in rocks that range in age from Cambrian to Quaternary. For convenience in summarizing the sources of municipal water supplies, the region has been divided into four areas as shown on plate 1.

Area A includes and surrounds the Llano uplift, commonly known as the central mineral region of Texas. Surrounding this uplift are the Hickory sandstone member of the Riley formation and the Ellenberger group, the two oldest productive ground-water reservoirs in the State. In Area B, with a few exceptions, little or no ground water suitable for public supplies is available. The Pennsylvanian and Permian rocks that cover most of the area yield small or highly mineralized supplies, or both. Most of the public supplies in the area are obtained from surface water. In Area C, ground-water reservoirs in the Cretaceous formations furnish nearly two-thirds of all the ground-water supplies of the region. Most prominent of these reservoirs are sands in the Trinity group, the Edwards limestone, and the Woodbine sand. In Area D most public supplies are obtained from shallow sands and gravels of Quaternary age.

Only a small number of ground-water supplies receive any treatment. The dissolved solids of the ground-water supplies range from 125 to 2,610 parts per million. Ninety-three percent of these supplies have less than 1,000 parts per million dissolved solids. The average hardness of the ground-water supplies is 213 parts per million. Most of the public supplies obtained from surface water are filtered and given further treatment which alters the chemical character of the water. The dissolved solids in the surface water supplies range from 117 to 1,000 parts per million, except for one supply which contains 3,500 parts per million. The average hardness of the surface-water supplies is 188 parts per million. Of all the public supplies in the region, about 11 percent furnish water of less than 75 parts per million hardness, 51 percent range from 76 to 150 parts per million, and 24 percent are above 250 parts per million.

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INTRODUCTION

Extent of region and scope of report

This is the third in a series of reports prepared by the Texas State Board of Water Engineers in cooperation with the United States Geological Survey giving summarized descriptions of the public water supplies throughout Texas. The first report, in two volumes covering 77 counties in eastern Texas, was released by the Texas State Board of Water Engineers in February 1945, and the second report, covering 42 counties in southern Texas, was released in November 1946.

The region covered by this report includes 53 counties in central and north-central Texas extending from the southern boundaries of Travis, Blanco, Gillespie, and Kerr Counties northward to the Texas-Oklahoma State line (see map). It comprises 47,679 square miles and in 1940 had a population of 1,185,573.

The cities and towns in this region that have public water-supply systems had a population of 657,116 in 1940. The total amount of water used by them averages about 79,000,000 gallons a day, of which about 18,500,000 gallons is obtained from ground water and about 60,500,000 gallons from surface water. Of the 145 towns and cities listed in this report, 94 use ground water; the average consumption of ground water per community, therefore, is small. Only eight cities of more than 5,000 population (Brady, Cleburne, Denton, Gainesville, Kerrville, Taylor, Vernon, and Weatherford) use ground water exclusively for public supply. Of these Denton in Denton County is the largest, and it had a population of 11,192 in 1940.

The need for certain basic data in the studies of quantitative and qualitative problems of public water supplies has long been apparent. This is especially true in Texas where, in recent years, there has been an enormous increase in the demands for water for public and industrial uses. The phenomenal growth of many Texas cities has resulted in the need from time to time for expanding or rebuilding the waterworks systems. Most of the communities throughout the State originally used ground water; some still use the original source of supply, some have developed additional sources of ground water, and others have changed from inadequate supplies of ground water to surface water.

The available information for each community is given in condensed form as follows: population in 1940; name of official from whom the information was obtained; owner of waterworks, whether private or municipal; source of supply, whether ground water or surface water; the amount of water consumed; the facilities for storage; the number of customers served; the character of the chemical and sanitary treatment of the water; and chemical analyses of the water. Where ground water is used the following is also given: records of wells,

including depth, diameter, and drillers' logs; character of pumping equipment; yield of the wells; records of water levels, if available; and temperature of the water. Unfortunately many communities have kept very poor records, or no records at all, regarding the amount of ground water pumped and the resulting decline of water level or artesian pressure in the wells since they were drilled, and for such localities the information given is necessarily incomplete. The availability of this information is very important, particularly in areas where the withdrawals from underground supplies are approaching the limits of safety or where enormous increases in withdrawals are anticipated.

Acknowledgments

Grateful acknowledgment is made to the well drillers, city officials, and others who furnished most of the descriptive material that is given for each public supply. The investigation was made possible through the cooperation of the Geological Survey, United States Department of the Interior, and the Texas State Board of Water Engineers. Most of the field work was done by R. W. Sundstrom and W. L. Broadhurst, who were assisted by J. H. Dante, D. B. Knowles, W. C. Rasmussen, W. O. George, and G. H. Cromack. Most of the report was prepared by R. W. Sundstrom and W. L. Broadhurst under the direction of W. N. White, district engineer in charge of ground-water investigations in Texas. The analyses of water were made in the laboratory of the Geological Survey in Austin, and the section on the chemical character of water was prepared by Mrs. B. C. Dwyer, under the direction of W. W. Hastings, district chemist in charge of the laboratory.

GROUND WATER

The ground-water reservoirs of the region, from which the public water supplies are drawn, occur in rocks that range in age from Cambrian to Quaternary. From older to younger the members, formations, or groups of formations and their ages are as follows: Hickory sandstone member of Riley formation, Cambrian; Ellenberger group, Ordovician; Strawn, Canyon, and Cisco groups, Pennsylvanian; Clearfork group, Permian; Trinity and Fredericksburg groups, Lower Cretaceous; Woodbine sand, Upper Cretaceous; Seymour formation and present stream deposits, Quaternary.

For convenience of discussing the sources of water for public supply, the region has been divided into four areas - A, B, C, and D (see map).

The Hickory sandstone member of the Riley formation furnished supplies to Eden and Brady in the southwestern part of the region, and the Ellenberger group is believed to furnish the supplies for Burnet and Fredericksburg in the southern part of the region (see Area A). These rocks crop out around the flanks of the Llano uplift in Llano and adjacent counties, and the beds dip rather steeply beneath younger rocks to great depths below the land surface within relatively short distances from the outcrops. Therefore, the territory in which these older rocks may be considered potential sources of water for public supplies is comparatively small.

Pennsylvanian and Permian rocks are exposed over much of the central and western parts of the region in Areas B and D, but they are relatively unimportant as sources of public water supply. The Pennsylvanian rocks consist chiefly of

alternating beds of shale, sandstone, limestone, and dolomite. The Permian rocks consist of a somewhat similar succession of beds, but they include considerable red and blue clay and gypsum. In general the beds of the Pennsylvanian and the Permian rocks that are sources of ground-water supplies dip westward beneath younger formations. Five towns--Bryson, Jacksboro, Mercury, Nocona, and Rochelle--obtain rather small quantities of water from sands in the Pennsylvanian formation; and two towns, Merkel and Miles, obtain mineralized water from Permian rocks.

Sands and sandstones in the Trinity group of Lower Cretaceous age, which belong to the Travis Peak formation and the Paluxy sand, furnish water for practically all the public supplies in Area C and for nearly two-thirds of the public supplies that are obtained from ground water in the region. The Travis Peak strata crop out in an irregular pattern along the western boundary of Area C and the southern boundary of Area B. The Paluxy sand appears in irregular outcrop east of the Travis Peak outcrop from Coryell County northward at least to Wise County.

The Edwards limestone crops out in the southern part of Area C. It is the source of supply for five towns all of which are in Williamson and Travis Counties.

The Woodbine sand of Upper Cretaceous age crops out along the eastern edge of Area C, from southern Hill County northward to the Red River. It supplies water to only two towns in the region, Grandview in Johnson County and Mansfield in Tarrant County.

All the rocks of the Lower and Upper Cretaceous in this region dip eastward at an angle somewhat greater than the slope of the land surface; therefore, the ground-water reservoirs occur at increasingly greater depths eastward or down dip from the outcrops.

Surficial deposits of sand and gravel, to which the name Seymour formation has been given, furnish water for the public supplies of several towns and cities in Area D. These deposits unconformably overlie the Permian rocks on the divides between the larger streams, principally in Haskell, Knox, Foard, and Wilbarger Counties. They are usually shallow but in some places reach depths of 50 feet, and, where sufficiently saturated, they yield water in considerable quantities to wells. The deposits are considered to be of Pleistocene age by most geologists.

A few supplies scattered throughout the region are obtained from shallow deposits in the flood plains or along the terraces of the present streams.

The following table gives the municipalities that use ground water and the probable geologic member, formation, or group of formations from which the supplies are obtained:

Municipalities served by ground water and the probable water-bearing unit from which the water is drawn.

Municipality	Probable water-bearing unit
Alvarado	Trinity group
Arlington	Trinity group
Baird	Trinity group
Bartlett	Trinity group
Belton	Trinity group
Bertram	Trinity group

Municipalities served by ground water and the probable geological unit from which the water is drawn (continued).

Municipality	Probable water-bearing unit
Blanco	Recent stream deposits
Blanket	Trinity group
Brady	Hickory sandstone member of Riley formation
Bryson	Cisco group
Burkburnett	--
Burleson	Trinity group
Burnet	Ellenberger group
Chillicothe	--
Cleburne	Trinity group
Clifton	Trinity group
Clyde	Trinity group
Coleman	Recent stream deposits
Copperas Cove	Trinity group
Cranfills Gap	Trinity group
Cross Plains	Trinity group
Crowell	Seymour formation (?)
Decatur	Trinity group
De Leon	Trinity group
Denton	Trinity group
Desdemona	Trinity group
Dublin	Trinity group
Eden	Hickory sandstone member of Riley formation
Electra	Recent stream deposits
Evant	Trinity group
Everman	Trinity group
Fairy	Trinity group
Florence	Trinity group
Fredericksburg	Ellenberger group
Gainesville	Trinity group
Gatesville	Trinity group
Georgetown	Edwards limestone
Glen Rose	Trinity group
Godley	Trinity group
Goldthwaite	Trinity group
Goree	Seymour formation
Gorman	Trinity group
Granbury	Trinity group
Grandview	Woodbine sand
Granger	Trinity group
Handley	Trinity group
Haskell	Seymour formation
Hico	Trinity group
Holland	Trinity group
Hutto	Edwards limestone

Municipalities served by ground water and the probable geological unit from which the water is drawn (continued).

Municipality	Probable water-bearing unit
Iredell	Trinity group
Jacksboro	Canyon group
Jarrell	Edwards limestone
Joshua	Trinity group
Junction	--
Kerrville	Trinity group
Knox City	Seymour formation
Lipan	Trinity group
Lometa	Trinity group
Manor	Trinity group
Mansfield	Woodbine sand
Melvin	Recent stream deposits
Mercury	Strawn group
Meridian	Trinity group
Merkel	Clearfork group
Miles	Clearfork group
Morgan	Trinity group
Muenster	Trinity group
Mullin	Trinity group
Munday	Seymour formation
Nocona	Cisco group
Oglesby	Trinity group
Ovalo	Recent stream deposits
Pflugerville	Edwards limestone
Quanah	Recent stream deposits (?)
Rising Star	Trinity group
Rochelle	--
Rochester	Seymour formation
Rogers	Trinity group
Round Rock	Edwards limestone
Rule	Seymour formation
Saint Jo	Trinity group
Seymour	Recent stream deposits
Sipe Springs	Trinity group
Stephenville	Trinity group
Taylor	Trinity group
Thrall	Recent stream deposits
Tuscola	Recent stream deposits

Municipalities served by ground water and the probable geological unit from which the water is drawn (continued).

Municipality	Probable water-bearing unit
Valley Mills	Trinity group
Valley View	Trinity group
Vernon	Seymour formation(?)
Walnut Springs	Trinity group
Weatherford	Trinity group
West Vernon	Seymour formation (?)

SURFACE WATER

In the region covered by this report 51 municipalities use surface water. Of these, 40 are in Area B where, with the exception of a few localities, no ground water suitable for public supply is available. Most of Area B is underlain by Pennsylvanian or Permian rocks that yield either scanty or highly mineralized supplies of ground water, or both.

Eight cities in the region use surface water in excess of a million gallons a day. Fort Worth is the largest and uses an average of more than 21,000,000 gallons a day from three reservoirs on the West Fork of the Trinity River. The next largest is Austin which uses an average of more than 13,000,000 gallons a day from the Colorado River. The third largest city is Wichita Falls which in the past has used an average of more than 6,000,000 gallons a day from Lake Wichita on Holliday Creek, supplemented by canal water from Lake Kemp. The city has recently constructed a new reservoir on the Little Wichita River which will be put into service soon. Brownwood, Abilene, and Temple use an average of 3,000,000 to 4,000,000 gallons a day. Brownwood obtains its supply from Lake Brownwood on Pecan Bayou, Abilene from three lakes on Elm and Cedar Creeks, and Temple from a lake on Leon River. Mineral Wells and Lampasas use more than 1,000,000 gallons a day from reservoirs on Rock and Sulphur Creeks respectively.

CHEMICAL CHARACTER OF WATER

Analyses of water

The analyses in this report were made in the water resources laboratory of the Geological Survey, U. S. Department of the Interior, Austin, Texas. The samples were collected in gallon pyrex bottles by the Geological Survey and Texas State Board of Water Engineers. The analyses show the fitness of the water for industrial, domestic, or agricultural uses, and have no bearing on the sanitary aspects of the samples.

One analysis of a sample from a well usually represents the character of the water for long periods, since the chemical composition of ground water seldom changes over a period of years. Water from streams will often vary considerably in dissolved solids and hardness. Therefore, periodic analyses are needed to determine the variations in the composition of supplies that are obtained from rivers or those that receive treatment.

About half of the public water supplies in this region receive treatment, one-third of which receive chlorination only. For all supplies that are treated, a brief description of the process is given with the operations and chemicals listed in the order in which they are used.

The results of the analyses are given in parts per million for the different chemical constituents and in equivalents per million for those radicals that enter in ionic balance. The analyses were made by methods in general use 1/. The complete analyses for each public supply includes results for silica (SiO_2), iron (Fe), calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), bicarbonate (HCO_3), sulfate (SO_4), chloride (Cl), fluoride(F), nitrate (NO_3), total hardness reported as $CaCO_3$, dissolved solids, and hydrogen ion concentration (pH). Each of the constitutents is discussed in the following text.

Mineral constituents in solution

Silica (SiO_2) is found in all natural waters, and in the north-central Texas region most of the supplies have silica content less than 20 parts per million. Silica is usually present in greater quantities in the more alkaline waters. Well waters generally have a higher silica content than surface water. The usefulness of water for domestic purposes is not affected by the usual amounts of silica found, although when the water is used in boilers silica may contribute to the formation of scale.

Iron (Fe) is dissolved from practically all soils and rocks. Iron may be dissolved from pipes, particularly from hot water lines and boilers, in quantities large enough to be objectionable. Waters of low mineral content may be corrosive, especially if the pH is low. Water that contains more than 0.5 part per million of iron may be undesirable because of the "reddish" appearance of the water caused by oxidation of the iron, which stains white porcelain or enameled ware and fixtures and fabrics washed with the water. Iron is easily removed by aeration and filtration. Only about one-fourth of the supplies in the north-central Texas region had an iron content above 0.3 part per million.

Calcium (Ca) and magnesium (Mg) have somewhat different chemical properties, but their effects upon the industrial and domestic uses of water are so much alike that they are usually considered together. Calcium and magnesium are found in waters in contact with limestone, dolomite, calcareous sand, or gypsum. The salts of calcium and magnesium cause hardness in water (see hardness page 9). The scale found in containers in which water is heated or evaporated is almost entirely caused by the salts of calcium and magnesium. Calcium and magnesium are the predominate basic constituents in many supplies of lower mineral content in the north-central Texas region.

1/ Collins, W. D., Notes on practical water analyses: U. S. Geological Survey, Water-Supply Paper 596-H, 1928; Am. Public Health Ass'n., Standard methods of the examination of water and sewage, 7th ed., 1932.

Sodium (Na) and potassium (K) are found in all natural waters. Moderate quantities of sodium and potassium have no effect on the suitability of water for domestic and industrial uses, though large quantities may cause trouble in the operation of steam boilers. Potassium is usually present in relatively small quantities with respect to sodium. The content of sodium in the supplies covered in this report differ widely, sodium generally being the principle basic constituent in the more highly mineralized waters.

Bicarbonate (HCO_3) in water results from the action of carbon dioxide dissolving the carbonates of calcium and magnesium from rocks and soils. Bicarbonate has little significance in the domestic use of water though when present in large amounts, it effects the palatibility of the water. Only a few of the ground-water supplies in the region contain sufficient quantities of bicarbonate to produce a noticeable taste in the supply.

Sulfate (SO_4) is dissolved from rocks and soils and especially from materials containing gypsum. Calcium sulfate in hard water will form a hard, adhering boiler scale and may influence the choice of the method of treatment for boiler-feed water. Sulfates in most north-central Texas supplies are below 250 parts per million. Some supplies from wells and a few from surface sources in the area have a higher sulfate content.

Chloride (Cl), when present in large amounts in the water, produces a salty taste, but otherwise has little influence in the domestic use of water. Appreciable quantities of chloride in equilibrium with calcium and magnesium may increase the corrosiveness of water. The chloride content of the waters analyzed varies widely in the north-central Texas region, though most supplies contain less than 250 parts per million. The chlorides in two public supplies are more than 1,000 parts; such water would be noticeably salty to most people.

Nitrate (NO_3) in water may indicate contamination by sewage as it represents the final stage of oxidation in the nitrogen cycle. Some nitrate may be dissolved from rocks and soils containing nitrate salts. The quantity of nitrate present in north-central Texas water supplies is generally low and the amounts of nitrates observed would have no effect on the value of the water for ordinary uses.

Fluoride (F) has recently been recognized by the medical profession as causing mottled enamel on teeth. If water containing more than 1.0 part per million of fluoride is used for drinking and cooking, mottling of teeth often occurs during calcification or formation of the teeth of children. On the other hand, water containing from 0.3 to 1.0 part per million of fluoride may result in a lower incident of dental caries. Only about one-fourth of the waters of north-central Texas supplies contain fluoride above 1.0 part per million

The dissolved solids represent the approximate quantity of total dissolved mineral substances in solution, though the value reported may include some organic matter and water of crystallization. If the dissolved solids in the water are more than 1,000 parts per million, the water is likely to contain enough of certain constituents to be undesirable for domestic and industrial uses. The analyses show that about 15 percent of the water supplies in this area have dissolved solids above 1,000 parts per million. The dissolved solids of the ground-water supplies in north-central Texas range from 125 parts to 2,610 parts per million. Ninety-three percent of these supplies have solids less than 1,000 parts per million. Surface waters in the area are generally of low mineral

content. The dissolved solids in the surface water supplies ranged from 117 parts to 1,870 parts, except the Wichita Falls supply which contained 3,500 parts.

The hydrogen ion concentration (pH) is an expression of the acidity or alkalinity of a water and is useful in determining the corrosiveness of the water as delivered to the distribution system. Oxygen, carbon dioxide, free acid, and acid generating salts are the principal constituents that cause corrosion, whereas the alkalinity is a factor in decreasing corrosion. In many public supplies, corrosive attacks and destruction of metallic surfaces may be avoided by maintaining the pH slightly above 7.0, or in the alkaline range. The average pH of waters of public supplies in north-central Texas is 7.8.

Hardness

The hardness of water probably receives the most attention with reference to industrial and domestic use. Hardness is usually recognized by the increased quantity of soap required to produce lather and by the "scum" of insoluble salts formed when hard water is heated. Hardness is caused almost entirely by calcium and magnesium, and is reported as the amount of calcium carbonate equivalent to the calcium and magnesium. The hardness caused by calcium and magnesium equivalent to the bicarbonate in a water is called "carbonate hardness" or "temporary hardness", and the remainder "non-carbonate hardness" or "permanent hardness". The character of the scale formed in steam boilers and the treatment is governed by the types of hardness found in the supply.

The degrees of hardness as referred to in this report are as follows: waters with hardness of 75 parts per million or less are considered soft; between 76 and 150 parts per million are moderately soft; between 151 and 250 parts per million are moderately hard; and above 250 parts per million are very hard.

The average hardness of the ground-water supplies is 213 parts per million, while the average hardness of surface supplies in the region is 188 parts per million. The following table gives the total number of persons in 1940 using waters of different ranges of hardness from 137 public supplies in north-central Texas:

Range in hardness Parts per million	Persons	Percent users
1 - 75	72,889	11.2
76 - 150	331,979	51.2
151 - 250	86,576	13.4
251 +	156,692	24.2

Wichita Falls, the third largest city in the area, obtains its water supply at the present time from Lake Kemp. The lake water has a hardness of 1,400 parts per million and dissolved solids of 3,500 parts. The city's new supply from Lake Kickapoo may be utilized during 1947. The water in Lake Kickapoo has a hardness of 58 parts and dissolved solids of 115 parts. When Wichita Falls with its 55,000 inhabitants starts receiving Lake Kickapoo water, the hardness distribution shown in the preceding table will be materially changed.

Standards of water quality

The effect of various constituents in water that is used for public supplies and for industrial purposes with reference to Texas well waters is discussed by Cohen in an early bulletin by the Texas State Department of Health 2/. The standards most widely used now for quality of domestic water supplies are the United States Public Health Service drinking water standards for the drinking and culinary water supply used by common carriers in Interstate Commerce 3/.

2/ Cohen, Chester A., Chemical analyses of Texas well waters, Texas State Department of Health Bulletin, 1931.

3/ Public Health Service drinking water standards: Public Health Reports, vol. 61, pp. 371-384, 1946.

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1. Geography and geology of the Black and Grand Prairies, Texas: U. S. Geological Survey, 21st Annual Report, Pt. 7, 1900, R. T. Hill.

2. The geology and underground waters of the Wichita region, north-central Texas: U. S. Geological Survey Water-Supply Paper 317, 1913, C. H. Gordon.

3. Artesian water in Somervell County, Texas: U. S. Geological Survey Water-Supply Paper 660, 1935, A. G. Fiedler.

4. Ground water resources in the vicinity of Crowell, Texas: Texas State Board of Water Engineers, 1941, W. O. George and C. E. Johnson.

5. Ground water resources in Fort Worth and vicinity: Texas State Board of Water Engineers, 1942, W. O. George and N. A. Rose.

6. Results of pumping tests of wells at tank destroyer center near Gatesville, Texas: Texas State Board of Water Engineers, 1943, N. A. Rose.

7. Ground water resources at Grand Prairie and vicinity, Texas: Texas State Board of Water Engineers, 1943, W. O. George and W. L. Broadhurst.

8. Results of pumping tests of wells at Camp Hood, Texas: Texas State Board of Water Engineers, 1943, W. F. Guyton and W. O. George.

9. Ground water resources in the vicinity of Vernon, Texas: Texas State Board of Water Engineers, 1944, C. R. Follett and R. W. Sundstrom.

In addition to the above listed reports, mimeographed publications containing records of wells and springs, drillers' logs, partial chemical analyses of water from wells and springs and a map showing the location of wells have been published by the Texas State Board of Water Engineers for the following counties in the area: Blanco, Brown, Callahan, Coleman, Eastland, Foard, Gillespie, Hardeman, Knox, San Saba, Stephens, Taylor, Travis, and Williamson.

Unpublished reports

The following manuscript reports giving results of ground-water investigations are available for reference in the offices of the Geological Survey and Texas Board of Water Engineers at Austin:

1. Ground water resources in the vicinity of Baird, 1940.

2. Ground water in the vicinity of Crowell, 1941.

3. Ground water in the vicinity of Burnet and Bertram, 1942.

4. Ground water resources in the vicinity of Gatesville, 1942.

5. Ground water resources in the vicinity of Menard and Melvin, 1942.

6. Ground water in selected areas in Erath, Hood, and Hamilton Counties, 1942.
7. Ground water in the vicinity of Wichita Falls, 1943.
8. Ground water resources in the vicinity of Nocona, Texas, 1944.
9. Ground water at Coleman, 1944.
10. Exploration for ground water at Childress, 1946.

ARCHER COUNTY

Archer City

Population in 1940: 1,675.

Source of information:
B. D. Robertson,
water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: Impounding reservoir on draw $\frac{3}{4}$ mile southwest of city hall; capacity 12 acre feet.

Pumpage (estimated): Summer 200,000 gallons a day, winter 100,000 gallons a day.

Storage: 2 concrete clear wells, 75,000 gallons each; elevated tank, 100,000 gallons.

Number of customers: 500.

Treatment: Coagulation, sedimentation, pre and post chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

	Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	5.7	
Iron (Fe)	0.32	
Calcium (Ca)	20	0.998
Magnesium (Mg)	5.8	0.477
Sodium (Na)	23	0.983
Potassium (K)	5.3	0.136
Bicarbonate (HCO_3)	70	1.147
Sulfate(SO_4)	44	0.916
Chloride (Cl)	18	0.508
Fluoride (F)	0.2	0.010
Nitrate (NO_3)	0.8	0.013
Dissolved solids	166	
Total hardness as $CaCO_3$	74	
pH	6.8	

ARCHER COUNTY

Holliday

Population in 1940: 798.

Source of information:
R. L. Yarbrough, water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: City lake (dry in summer of 1946). Present source of supply; Lake Kemp from irrigation canal.

Pumpage (estimated): Average 75,000 gallons a day.

Storage: Elevated tank, 100,000 gallons.

Number of customers: 235.

Treatment: Coagulation, sedimentation, hypo-chlorination.

Analysis:of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

	Lake Kemp finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.0	
Iron (Fe)	0.11	
Calcium (Ca)	277	13.83
Magnesium (Mg)	65	5.35
Sodium (Na)	810	35.21
Potassium (K)	38	0.97
Bicarbonate (HCO_3)	86	1.41
Sulfate (SO_4)	802	16.70
Chloride (Cl)	1,320	37.23
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.8	0.01
Dissolved solids	3,460	
Total hardness as $CaCO_3$	959	
pH	7.4	

BAYLOR COUNTY

Seymour

Population in 1940: 3,328.

Source of information:
City Secretary
Oct., 1943

Ownership: Municipal.

Source of supply: 4 wells.

Well 1. Known as East well; dug, depth about 42 feet, diameter 12 feet; deep-well turbine pump and electric motor; yield 500 gallons a minute.

Well 2. Known as South well; 75 feet from Well 1, dug, depth 48 feet; deep-well turbine pump and electric motor; yield 750 gallons a minute.

Well 3. Known as West well; depth about 40 feet; deep-well turbine pump and electric motor; yield 400 gallons a minute.

Well 4. Known as North well; drilled, depth 38 feet, diameter 18 inches; deep-well turbine pump and electric motor; yield 350 gallons a minute.

Pumpage (estimated): Maximum 500,000 gallons a day.

Storage: Elevated tank, about 75,000 gallons.

Number of customers: 725.

Treatment: None.

Analysis of water:

Date collected: Oct., 1945 — Analyzed by J. H. Rowley

	Well 3	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.04	
Calcium (Ca)	68	3.39
Magnesium (Mg)	33	2.71
Sodium (Na)	114	4.97
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	387	6.34
Sulfate (SO_4)	79	1.64
Chloride (Cl)	84	2.37
Fluoride (F)	1.1	0.06
Nitrate (NO_3)	60	0.97
Total dissolved solids	656	
Total hardness as $CaCO_3$	305	
pH	7.9	

BELL COUNTY

Belton

Population in 1940: 3,572.

Source of information:
Frank Hemner, water superintendent
Feb. 27, 1947

Ownership: Municipal.

Source of supply: 3 wells.

Well 1. Two blocks west of City Hall; date of drilling unknown, depth 850 feet, diameter 6 inches; equipped with air life pump; yield 350 gallons a minute when pumped with air.

Well 2. Sixty feet north of Well 1; drilled in 1915 by D. C. Hammell, depth 1,175 feet, diameter 6 inches; well flows 100 to 150 gallons a minute when other wells are not pumping; air life pump; yield 350 gallons a minute.

Well 3. Drilled in 1943 by Kent and Preston, depth 1,172 feet, diameter 10 inches; static water level at ground surface; deep-well turbine pump and 40 horsepower electric motor, pump set at 200 feet; yield 1,000 gallons a minute; temperature 83° F.

Pumpage: Summer maximum, 1,000,000 gallons a day; winter average, 400,000 gallons a day.

Storage: Concrete ground reservoir, 90,000 gallons; concrete stand pipe, 200,000 gallons.

Number of customers: 1,400.

Treatment: None.

Analysis of water:

Date collected: June 24, 1943 — Analyzed by J. H. Rowley

	Well 3	
	Parts per million	Equivalents per million
Silica (SiO_2)	12	
Iron (Fe)	0.06	
Calcium (Ca)	13	0.65
Magnesium (Mg)	7.6	0.62
Sodium and Potassium (Na + K)	519	22.56
Sulfate (SO_4)	376	7.83
Bicarbonate (HCO_3)	490	8.03
Chloride (Cl)	275	7.76
Fluoride (F)	4.0	0.21
Nitrate (NO_3)	0.0	0.00
Dissolved solids	1,448	
Total hardness as $CaCO_3$	64	
pH	7.9	

BELL COUNTY

Belton -- Continued

Driller's log: 4/

Well 3

	Thickness (feet)	Depth (feet)
Soil	24	24
Send end lime	22	46
Lime end chalk	46	92
Lime	43	135
Gray shale	45	180
Dark shale	15	195
Lime	5	200
Lime and shale	60	260
Gray shale and lime shells	35	295
Lime	35	330
Gray shale and lime	85	415
Lime chalk	117	532
Lime chalk	66	598
Lime and shale, broken	64	662
Lime	48	710
Lime and shale, broken	55	765
Blue shale	13	778
Lime	69	847
Trinity sand	23	870
Sandy shale	5	875
Trinity sand	12	887
Sand (water)	33	920
Dark shale	28	948
Sandy lime	17	965
Blue shale	2	967
Sandy lime	8	975
Blue shale	109	1084
Red shale	2	1086
Trinity sand	44	1130
Sand	36	1166
Sand and gravel	4	1170
Blue shale	2	1172

4/ Geologic names used in this and the following logs are those used by the drillers.

BELL COUNTY

Holland

Population in 1940: 741.

Source of information:
O. D. Harrell, water superintendent
Apr. 22, 1943

Ownership: Municipal.

Source of supply: Well one block west of Missouri, Kansas and Texas railway depot; drilled in 1929 by K. E. Edwards, depth 1,993 feet, diameter 8 to 6 inches; well flows 63 gallons a minute.

Pumpage (estimated): 95,000 gallons a day.

Storage: Elevated tank, 50,000 gallons; concrete ground reservoir, 50,000 gallons.

Number of customers: 120.

Treatment: None.

Analysis of water:

Date collected: Apr. 22, 1943 — Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	10	
Iron (Fe)	0.86	
Calcium (Ca)	60	2.99
Magnesium (Mg)	42	3.45
Sodium (Na)	712	30.95
Potassium (K)	13	0.33
Bicarbonate (HCO_3)	410	6.72
Sulfate (SO_4)	978	20.36
Chloride (Cl)	362	10.21
Fluoride (F)	5.4	0.28
Nitrate (NO_3)	9.4	0.15
Dissolved solids	2,395	
Total hardness as $CaCO_3$	322	
pH	7.8	

BELL COUNTY

Holland -- Continued

Driller's log:

Well

	Thickness (feet)	Depth (feet)
Surface soil	8	8
Yellow clay, surface water	17	25
Yellow clay - blue shale rock	6	31
Gray gumbo	44	75
Gumbo	75	150
Lime	50	200
Blue limestone	50	250
Lime	110	360
Lime with streak of blue clay	170	530
Gumbo	95	625
Black shale	82	707
Gray limestone	13	720
Blue shale with lime shells	86	806
Gray limestone (Georgetown)	30	836
Gumbo with clay	154	990
Water sand (sulfur water, Edwards lime)	54	1044
Lime, 2 feet of sand, little water	22	1066
Gumbo, white clay	49	1115
Water sand	5	1120
Gray lime	20	1140
Blue shale	25	1165
Lime(shows a little water)	65	1230
Blue shale	18	1248
White lime	102	1350
Lime with streak of white clay, water	150	1500
Lime	250	1750
Lime	45	1795
Gumbo	5	1800
Water sand	5	1805
Lime with streak of white clay	107	1912
Trinity water sand	53	1965
Gumbo	5	1970
Black gumbo	23	1993

BELL COUNTY

Killeen

Population in 1940: 1,263.

Source of information:
Clifford Glazner, water superintendent
Feb. 27, 1947

Ownership: Municipal.

Source of supply: Water for the municipal supply of Killeen is obtained from Camp Hood. Most of the Camp Hood water supply is derived from the Lampasas River.

Pumpage: Maximum, 253,000 gallons a day; minimum, 182,000 gallons a day.

Storage: Ground storage reservoir, 250,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 924.

Treatment: Chlorination.

Analysis of water:

Date collected: Feb. 27, 1947 — Analyzed by Mrs. B. C. Dwyer

	Parts per million	Equivalents per million
Silica (SiO_2)	2.4	
Iron (Fe)	0.16	
Calcium (Ca)	61	3.04
Magnesium (Mg)	25	2.06
Sodium & Potassium (Na + K)	40.8	1.73
Bicarbonate (HCO_3)	256	4.21
Sulfate (SO_4)	30	0.62
Chloride (Cl)	70	1.97
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	1.5	0.02
Dissolved solids	383	
Total hardness as $CaCO_3$	255	
pH	8.1	

Rogers

Population in 1940: 911.

Source of information:
Frank Vaught, city secretary
Apr. 22, 1943

Ownership: Municipal.

Source of supply: Well 1½ miles south of town; drilled in 1940 by Layne-Texas Company, depth 3,178 feet, diameter 10-3/4 to 5 inches; well flowed 835 gallons a minute in 1940 with head of 166 feet above land surface; temperature 120° F.

Pumpage: Well flows continuously into Lake. Amount used by City unknown.

Storage: Elevated tank.

Number of customers: 195.

Treatment: Aeration.

BELL COUNTY

Rogers -- Continued

Analysis of water:

Date collected: Apr. 22, 1943 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	20	
Iron (Fe)	0.04	
Calcium (Ca)	9.1	0.45
Magnesium (Mg)	2.9	0.24
Sodium (Na)	381	16.57
Potassium (K)	6.0	0.15
Bicarbonate (HCO_3)	511	8.39
Sulfate (SO_4)	277	5.77
Chloride (Cl)	110	3.10
Fluoride (F)	2.8	0.15
Nitrate (NO_3)	0.0	0.00
Dissolved solids	1,060	
Total hardness as $CaCO_3$	34	
pH	8.4	

Driller's log:

Well

	Thickness (feet)	Depth (feet)
Surface soil	4	4
Yellow clay	12	16
Black shale	82	98
Grey shale	238	336
Black shale	203	539
Gray shale	49	588
Chalk	283	871
Chalk and shale	10	881
Shale	16	897
Chalk and shale	35	932
Chalk	182	1114
Chalk and shale	57	1171
Black shale	62	1233
Lime and shale	10	1243
Shale	22	1265
Lime	82	1347

BELL COUNTY

Rogers -- Continued

Driller's log - continued:

Well	Thickness (feet)	Depth (feet)
Lime and shale	30	1377
Lime	120	1497
Lime and shale	27	1524
Lime	215	1739
Shale	3	1742
Lime and shale	24	1766
Lime	123	1889
Lime and shale	250	2139
Shale and lime	18	2157
Lime	222	2379
Lime and shale	56	2435
Shale and lime	32	2467
Lime	28	2495
Lime and shale	73	2568
Soft lime	21	2589
Lime	160	2749
Shale and lime	16	2765
Porous lime	11	2776
Lime and shale	62	2838
Lime	5	2843
Sand and shale	15	2858
Sand	8	2866
Shale and sandy shale	30	2896
Lime and shale	14	2910
Sand with layers of shale	100	3010
Hard shale	11	3021
Sand and gravel	86	3107
Shale	6	3113
Sand	59	3172
Hard shale	6	3178

BELL COUNTY

Temple

Population in 1940: 15,344.

Source of information:
N. E. Trostle, water superintendent
Apr. 23, 1943

Ownership: Municipal.

Source of supply: Lake on Leon River below highway bridge on U. S. Highway 81.

Pumpage: Average 3,000,000 gallons a day in 1945.

Storage: 2 elevated tanks, 500,000 gallons each; concrete ground reservoir, 3,000,000 gallons.

Number of customers: 4,000.

Treatment: Sedimentation, coagulation, filtration and chlorination.

Analyses of water:

Date collected: Apr. 23, 1943 — Analyzed by J. H. Rowley

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	12		12	
Iron (Fe)	0.04		0.04	
Calcium (Ca)	47	2.35	35	
Magnesium (Mg)	12	0.99	28	1.75
Sodium & Potassium (Na + K)	183	7.96	88	2.30
Bicarbonate (HCO_3)	307	5.03	104	3.84
Sulfate (SO_4)	79	1.64	83	1.72
Chloride (Cl)	162	4.57	155	1.73
Fluoride (F)	0.5	0.03	0.5	4.37
Nitrate (NO_3)	2.0	0.03	2.5	0.03
Dissolved solids	651		455	0.04
Total hardness as $CaCO_3$	167		202	
pH	8.0		8.4	

BLANCO COUNTY

Blanco

Population in 1940: 453.

Source of information:
V. J. Quinlan, water superintendent
Aug. 21, 1941

Ownership: Municipal.

Source of supply: 1 well dug in 1941 by Works Progress Administration, depth 13 feet, diameter 60 x 96 inches; centrifugal pump and 7½-horsepower electric motor; static water level 4.23 feet below land surface on August 21, 1941; yield 70 gallons a minute.

Pumpage (estimated): 20,000 to 30,000 gallons a day.

Storage: Concrete reservoir, 109,000 gallons.

Treatment: None.

Analysis of water:

Date collected: Aug. 21, 1941 — Analyzed by W. W. Hastings

	Parts per million	Equivalents per million
Calcium (Ca)	23	1.148
Magnesium (Mg)	9.5	.781
Sodium and Potassium (Na + K)	10	.445
Bicarbonate (HCO_3)	98	1.606
Sulfate (SO_4)	13	.271
Chloride (Cl)	11	.310
Fluoride (F)	0.5	.026
Nitrate (NO_3)	10	.161
Dissolved solids	125	
Total hardness as $CaCO_3$	96	

Drillers' log:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Silt	4	4	Gravel	9	13

BOSQUE COUNTY

Clifton

Population in 1940: 1,732.

Source of information:
Wm. C. Hurst, water superintendent
Feb. 6, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. Drilled in 1915 by E. E. Erickson, depth 687 feet, diameter 8 inches; deep-well turbine pump and 7½-horsepower electric motor; static water level reported 20 feet below land surface; yield 200 gallons a minute with a pumping level of 88 feet.

Well 2. About 800 feet from well 1; drilled in 1945, depth 698 feet, diameter 8 inches; deep-well turbine pump and 7½-horsepower electric motor; static water level 5 feet below land surface; yield 150 gallons a minute with a pumping level of 68 feet.

Pumpage: Average 135,000 gallons a day.

Storage: Ground storage reservoir, 50,000 gallons; elevated tank, 200,000 gallons.

Number of customers: 508.

Treatment: None.

Analysis of water:

Date collected: Feb. 6, 1946 Analyzed by J. H. Rowley and P. A. Witt

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	11	
Iron (Fe)	0.01	
Calcium (Ca)	3.4	0.17
Magnesium (Mg)	1.9	0.16
Sodium (Na)	193	8.41
Potassium (K)	6.0	0.15
Bicarbonate (HCO_3)	434	7.96
Sulfate (SO_4)	56	1.17
Chloride (Cl)	21	0.59
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.0	0.00
Dissolved solids	506	
Total hardness as $CaCO_3$	16	
pH	8.4	

BOSQUE COUNTY

Clifton -- Continued

Drillers' log:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Gravel	30	30	Honeycomb lime	15	212
Blue shale and soapstone	12	42	White lime with few breaks	338	550
Lime	40	82	Very hard lime	11	561
Blue shale	4	86	Shale and gumbo	26	587
Hard lime	12	98	Black gumbo	3	590
Blue shale	10	108	Hard cap rock-pyrite	3	593
Hard cap rocks	2	110	Green shale and green sand	7	600
Green sand	4	114	Trinity sand(flowing lots of water)	46	646
Paluxy sand (lots of water)	18	132	Red bed	110	756
Gumbo	4	136	Sand	31	787
White lime	61	197			

Well 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Gravel	35	35	Limestone	343	530
Rock	55	90	Green shale	28	558
Black gumbo	3	93	Sand (cap rock)	2	560
Green shale	2	95	Trinity sand	40	600
Paluxy sand	25	120	Green shale	10	610
Black gumbo	3	123	Red rock	56	666
Rock	15	138	White sand	8	674
Black gumbo	2	140	Shale and gumbo	12	686
Limestone	43	183			
Honeycombed lime	4	187			

BOSQUE COUNTY

Cranfills Gap

Population in 1940: 600.

Source of information:
A. C. Grimland, city secretary
Feb. 10, 1943

Ownership: Municipal.

Source of supply: One well located west of the city; drilled in 1934 by E. E. Erickson; depth 549 feet; diameter $6\frac{1}{4}$ to $3\frac{1}{2}$ inches; equipped with deep-well cylinder and pump jack; static water level reported 120 feet below land surface in 1934.

Pumpage: No record.

Storage: Concrete ground storage reservoir on hill, capacity 18,000 gallons.

Number of customers: 60.

Treatment: None.

Analysis of water:

Date collected: Feb. 10, 1943 — Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	8.8	
Iron (Fe)	0.2	
Calcium (Ca)	20	1.00
Magnesium (Mg)	14	1.15
Sodium (Na)	132	5.73
Potassium (K)	14	0.36
Bicarbonate (HCO_3)	330	5.41
Sulfate (SO_4)	90	1.87
Chloride (Cl)	31	0.87
Fluoride (F)	1.1	0.06
Nitrate (NO_3)	2.0	0.03
Dissolved solids	476	
Total hardness as $CaCO_3$	108	
pH	8.4	

BOSQUE COUNTY

Iredell

Population in 1940: 483.

Source of information:
J. W. Parks, city secretary
Feb. 10, 1943

Ownership: Municipal.

Source of supply: Two wells: One owned by the city and the other leased by the city from a private owner.

Well 1. Drilled about 1900; depth 335 feet; diameter 6 inches; equipped with deep-well cylinder and pump jack, cylinder set at 180 feet; well flowed when drilled.

Well 2. Owned by R. S. Echols, drilled in 1901 by Joe Candy, depth 257 feet, diameter 6 inches, equipped with deep-well cylinder and pump jack, cylinder set at 225 feet; water level reported about 75 feet below surface.

Pumpage: No record.

Storage: Tank, capacity 42,000 gallons.

Number of customers: 55.

Treatment: None.

Analyses of water:

Date collected: Feb. 10, 1943 — Analyzed by J. H. Rowley

	City well		R. S. Echols well	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	14		8	
Iron (Fe)	0.12		0.16	
Calcium (Ca)	44	2.20	35	1.75
Magnesium (Mg)	32	2.63	27	2.22
Sodium (Na)	49	2.15	70	3.06
Potassium (K)	11	0.28	13	0.33
Bicarbonate (HCO_3)	362	5.93	324	5.31
Sulfate (SO_4)	42	0.87	67	1.39
Chloride (Cl)	16	0.45	23	0.65
Fluoride (F)	0.2	0.01	0.1	0.01
Nitrate (NO_3)	0.0	0.00	0.2	0.00
Dissolved solids	387		403	
Total hardness as $CaCO_3$	242		198	
pH	8.4		8.4	

BOSQUE COUNTY

Iredell -- Continued

Driller's log:

Well 1

	Thickness (feet)	Depth (feet)
Soil	20	20
Limestone	10	30
Soft blue marl	80	110
Blue marl	6	116
Soft white stone	50	166
Sandstone, limestone, and marl	100	266
Soft and hard sand rock	45	311
Fine-grained sandstone	6	317
Packsand (flow of water)	18	325

Meridian

Population in 1940: 1,016.

Source of information:
W. B. Dorman, water superintendent
Feb. 6, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. Drilled about 1924, depth 725 feet, diameter 8 to 6 inches, deep-well turbine pump and 25-horsepower electric motor; static water level 100 feet below pump base, February 1946; yield 300 gallons a minute with drawdown of fifty feet; temperature 73° F.

Well 2. Drilled in 1939 by J. L. Myers, depth 733 feet, diameter 12 to 8 inches; deep-well turbine and electric motor (submersible); yield 330 gallons a minute.

Pumpage (estimated): 300,000 gallons a day in summer; 90,000 gallons a day in winter.

Number of customers: 240.

Treatment: None.

BOSQUE COUNTY

Meridian -- Continued

Analyses of water:

Date collected: Feb. 6, 1946 — Analyzed by C. B. Cibulka

	Well 1		Well 2	
	Parts per million	Equivelents per million	Parts per million	Equivalents per million
Silica (SiO_2)	11		11	
Iron (Fe)	1.4		0.04	
Calcium (Ca)	114	5.69	17	0.85
Megnesium (Mg)	14	0.14	1.7	1.15
Sodium (Na)	120	7.03	162	5.22
Potassium (K)	7.5	0.19	6.0	0.15
Bicarbonate (HCO_3)	408	6.69	382	6.26
Sulfate (SO_4)	186	3.87	53	1.10
Chldride (Cl)	60	1.69	28	0.79
Fluoride (F)	0.0	0.00	0.0	0.00
Nitrate (NO_3)	0.0	0.00	1.2	0.02
Dissolved solids	714		468	
Total hardness as $CaCO_3$	342		50	
pH	7.3		7.7	

Driller's log:

Well 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	10	10	Sandy shale	5	526
Gravel	2	12	Water sand	10	536
Hard lime	18	30	Green shale	5	541
Soft lime	6	36	Red shale	9	550
Hard lime	8	44	Red rock	1	551
Water sand	10	54	Red shale	32	583
Rock	16	70	Gray gumbo	4	587
Gray shale	11	81	Green shale	8	595
Rock	10	91	Gray sandy shale	13	608
Sandy shale	4	95	Sand rock	2	610
Water sand	10	105	Gray shale	5	615
Lime rock	370	475	Brown gumbo	6	621
Sandy shale	5	480	Red shale	9	630
Water send	15	495	Mixed shale	6	636
Sandy shale	15	510	Rock	1	637
Water sand	7	517	Gray shale	13	650
Lime rock	4	521	Hard sand (water)	5	655

BOSQUE COUNTY

Meridien -- Continued

Driller's log - continued:

Well 2 -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Water sand	15	670	Mixed red and gray shale	9	759
Herd sand (water)	16	686	Mixed red, yellow and grey shale	11	770
Soft sand	19	705	Red shale	10	780
Soft sand (water)	15	720	Sandy lime	4	784
Hard sand	4	724	Brown shale	2	786
Hard rock	1	725	Sandy lime	24	810
Coarse sand and gravel	8	733	Brown shale	9	819
Hard lime	1	734			
Yellow shale	4	738			
Rocky ridge shale	12	750			

BOSQUE COUNTY

Morgan

Population in 1940: 503.

Source of information:
C. C. McGhee, water superintendent
Feb. 10, 1943

Ownership: Municipal.

Source of supply: Two wells.

Well 1. At north edge of city; drilled in 1906 by J. S. Smith - depth 675 feet, diameter 4 inches; equipped with deep-well cylinder and pump jack; static water level reported 90 feet below surface in 1943.

Well 2. At north edge of city; drilled in 1902 as an oil test, depth 210 feet, effective depth as water well about 800 feet; equipped with deep-well turbine pump; pump set 110 feet below surface; well reported to have flowed when drilled; static water level about 70 feet below land surface in 1943; yield 300 gallons a minute.

Pumpage: No record.

Storage: One elevated tank, capacity 10,000 gallons.

Number of customers: 91.

Treatment: None.

Analysis of water:

Date collected: Feb. 10, 1943 — Analyzed by J.H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	11	
Iron (Fe)	0.05	
Calcium (Ca)	23	1.15
Magnesium (Mg)	14	1.15
Sodium (Na)	106	4.62
Potassium (K)	18	0.46
Bicarbonate (HCO_3)	371	6.08
Sulfate (SO_4)	45	0.94
Chloride (Cl)	12	0.34
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	0.2	0.00
Dissolved solids	414	
Total hardness as $CaCO_3$	115	
pH	8.3	

BOSQUE COUNTY

Valley Mills

Population in 1940: 803.

Source of information:
R. L. Roberson, manager
Feb. 6, 1946

Owner: Community Public Service Co.

Source of supply: One well at Avenue Eight and First Street, drilled about 1929, depth 962 feet, diameter 8 inches; deep-well turbine pump and 15-horsepower electric motor; well still flows when idle for several days; yield 133 gallons a minute.

Pumpage: Average 75,000 gallons a day in August 1945; 62,000 gallons a day in January 1946.

Storage: Ground storage reservoir on hill, 100,000 gallons.

Number of customers: 348.

Treatment: None.

Analysis of water:

Date collected: Feb. 6, 1946 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	12	
Iron (Fe)	0.02	
Calcium (Ca)	3.0	0.15
Magnesium (Mg)	1.2	0.10
Sodium (Na)	225	9.79
Potassium (K)	4.5	0.12
Bicarbonate (HCO_3)	438	7.16
Sulfate (SO_4)	95	1.98
Chloride (Cl)	36	1.02
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	0.0	0.00
Dissolved solids	582	
Total hardness as $CaCO_3$	12	
pH	8.4	

BOSQUE COUNTY

Walnut Springs

Population in 1940: 723.

Source of information:
J. S. Jackson, water superintendent
Jan., 1946

Ownership: Municipal.

Source of supply: One well drilled about 1930 by Montgomery; depth 545 feet, diameter 8 inches; deep-well submersible turbine pump with 10-horsepower motor; yield 105 gallons a minute.

Pumpage (estimated): Summer, 69,000 gallons a day; winter, 50,000 gallons.

Storage: Concrete reservoir on hill, 135,000 gallons; ground storage reservoir, 72,000 gallons.

Number of customers: 225.

Treatment: None.

Analysis of water:

Date collected: Nov., 1945 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.08	
Calcium (Ca)	37	1.85
Magnesium (Mg)	32	2.63
Sodium (Na)	57	2.46
Potassium (K)	9.5	0.24
Bicarbonate (HCO_3)	364	5.97
Sulfate (SO_4)	38	0.79
Chloride (Cl)	14	0.39
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	0.0	0.00
Dissolved solids	388	
Total hardness as $CaCO_3$	224	
pH	7.0	

BROWN COUNTY

Bangs

Population in 1940: 756.

Source of information:
C. B. Loveless, city treasurer
Apr. 19, 1946

Ownership: Municipal.

Source of supply: (Water purchased from the City of Brownwood, see City of Brownwood).

Pumpage: Average 33,000 gallons a day.

Storage: Concrete ground reservoir, 50,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 280.

Treatment: See City of Brownwood.

Analysis of water: See City of Brownwood.

Blanket

Population in 1940: 327.

Source of information:
T. M. McCulley, mayor
Mar. 21, 1946

Ownership: Municipal.

Source of supply: Well drilled in 1928 by Elmer Simpson, depth 180 feet, diameter 6 inches; deep-well cylinder and pump jack and 1½ horsepower motor; static water level 160.9 feet below land surface on March 21, 1946.

Pumpage: No record.

Storage: Ground storage tank, 2,000 gallons; elevated tank, 3,000 gallons.

Number of customers: 48.

Treatment: None.

BROWN COUNTY

Blanket -- Continued

Analysis of water:

Date collected: Mar. 21, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.5	
Iron (Fe)	0.14	
Calcium (Ca)	94	4.69
Magnesium (Mg)	64	5.26
Sodium (Na)	52	2.25
Potassium (K)	10	0.26
Bicarbonate (HCO_3)	400	6.56
Sulfate (SO_4)	154	3.21
Chloride (Cl)	94	2.65
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	1.8	0.03
Dissolved solids	704	
Total hardness as $CaCO_3$	498	
pH	7.5	

Brownwood

Population in 1940: 13,398.

Source of information:
Mr. Martin, water superintendent
Apr. 19, 1946

Ownership: Municipal.

Source of supply: Lake Brownwood on Pecan Bayou 9 miles north of Brownwood; capacity 141,800 acre feet.

Pumpage: Average 3,830,000 gallons a day.

Storage: 2 concrete ground reservoirs on top of hill west of City, 1,000,000 gallons each.

Number of customers: 5,000.

Treatment: Aeration, coagulation, sedimentation, rapid sand filters, pre and post chlorination.

BROWN COUNTY

Brownwood -- Continued

Analysis of water:

Date collected: Apr. 19, 1946 — Analyzed by C. B. Cibulka

	Lake Brownwood	
	Parts per million	Equivalents per million
Silica (SiO_2)	3.4	
Iron (Fe)	0.06	
Calcium (Ca)	45	2.246
Magnesium (Mg)	6.0	.493
Sodium (Na)	25	1.071
Potassium (K)	4.2	.107
Bicarbonate (HCO_3)	1.40	2.295
Sulfate (SO_4)	21	.437
Chloride (Cl)	42	1.185
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	0.0	0.000
Dissolved solids	223	
Total hardness as $CaCO_3$	137	
pH	7.3	

BURNET COUNTY

Bertram

Population in 1940: 800.

Source of information:
Roy Potts, water plant operator
Jan. 15, 1946

Ownership: Municipal.

Source of supply: 3 wells.

Well 1. Old well near elevated tank, drilled before 1910 by R. J. Bostic, depth 430 feet, diameter 8 inches; deep-well cylinder and pump jack and 5-horsepower electric motor; static water level reported 350 feet below land surface; yield 10 gallons a minute; temperature 68° F.

Well 2. 100 yards east of elevated tank, drilled in 1944 by Layne-Texas Company, depth 423 feet, diameter 8 inches, gravel walled; deep-well cylinder and pump jack and 5-horsepower electric motor; static water level 340 feet below land surface; yield 14 gallons a minute; temperature 68° F.

Well 3. About 4 blocks south of elevated tank, drilled in 1945 by W. Hunt, depth 451 feet, diameter 8 inches, gravel walled; Peerless Hi-Lift pump and electric motor; yield 14 gallons a minute.

Pumpage (estimated): 33,000 gallons a day.

Storage: Ground reservoir 50,000 gallons, old elevated tank 25,000 gallons, new elevated tank 60,000 gallons.

Number of customers: 163.

Treatment: None.

Analysis of water:

Date collected: Jan. 15, 1946 — Analyzed by C. B. Cibulka

	Composite sample from Wells 1 and 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	19	
Iron (Fe)	0.29	
Calcium (Ca)	74	3.69
Magnesium (Mg)	38	3.12
Sodium (Na)	28	1.20
Potassium (K)	9.5	0.24
Bicarbonate (HCO_3)	354	5.80
Sulfate (SO_4)	56	1.17
Chloride (Cl)	44	1.24
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	0.8	0.01
Dissolved solids	446	
Total hardness as $CaCO_3$	340	
pH		7.7

BURNET COUNTY

Bertram -- Continued

Driller's log:

Abandoned City Well

	Thickness (feet)	Depth (feet)
Top soil	1	1
White limestone	16	17
Soft gray shale	3	20
Rock ledges, sand shale	32	52
Green sandy shale	7	59
Water sand, very fine	10	69
Sand rock	1	70
Shale rock ledges - 6" thick	8	78
Hard shell bed	3	81
Broken formation - shale rock	69	150
Sand,shale	5	155
Broken formation shale shell beds	70	225
Hard rock	7	232
Sandy shale	5	237
Shell beds	7	244
Crystal rock - white	16	260
Shell and shale	15	275
Hard rock	5	280
Sticky shale	4	284
Crystal rock	6	290
Soft sandy shale	10	300
Broken formation	25	325
Green shale	2	327
Fine sand-little water	8	335
Gray sandy shale	3	338
Water sand - rock ledges	22	360
Coarse water sand-crystal rock	10	370
Green sandy shale	13	383
Shell bed - crystal rock	2	385
Green shale - shells - sticky	5	390
Light green sandstone	10	400
Coarse sand	2	402
Green sandstone - crystal rock	31	433
Hard sandstone	7	440
Crystal rock with some shale	13	453
Hard blue lime rock	4	457
Sticky green shale	12	469

BURNET COUNTY

Burnet

Population in 1940: 1,945.

Source of information:
C. A. Schilling, water superintendent
Jan. 15, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. At north limit of N. Main Street; drilled in 1937 by Johnson Well Drilling Company, depth 74 feet, diameter 10 inches; deep-well turbine pump and 15-horsepower electric motor; static water level reported 20 feet below land surface; yield 200 gallons a minute; temperature 69° F.

Well 2. About 50 feet north of Well 1; drilled in 1937 by Johnson Well Drilling Company, depth 74 feet, diameter 10 inches; deep-well turbine pump and 15-horsepower electric motor; yield 200 gallons a minute.

Pumpage:

(Average in gallons a day)

1945	
June	62,000
July	66,000
Aug.	76,000
Sept.	75,000
Oct.	63,000
Nov.	66,000
Dec.	60,000

Storage: Elevated tank, 60,000 gallons.

Number of customers: 370.

Treatment: None.

Analysis of water:

Date collected: Jan. 15, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.6	
Iron (Fe)	0.39	
Calcium (Ca)	97	4.84
Magnesium (Mg)	32	2.63
Sodium (Na)	16	0.70
Potassium (K)	1.8	0.05
Bicarbonate (HCO_3)	408	6.69
Sulfate (SO_4)	17	0.35
Chloride (Cl)	31	0.87

BURNET COUNTY

Burnet -- Continued

Analysis of water - continued:

	Well 1	
	Parts per million	Equivalents per million
Fluoride (F)	0	0.00
Nitrate (NO_3)	19	0.31
Dissolved solids	439	
Total hardness as $CaCO_3$	374	
pH	7.8	

Marble Falls

Population in 1940: 1,021.

Source of information:
Rudolph Giesecke, water superintendent
Jan. 15, 1946

Ownership: Municipal.

Source of supply: Colorado River.

Pumpage (estimated): 100,000 gallons a day.

Storage: Concrete settling basin, 100,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 300.

Treatment: Coagulation, sedimentation, rapid sand filtration, and chlorination.

BURNET COUNTY

Marble Falls -- Continued

Analyses of water:

Date collected: Jan. 15, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	8.8		5.8	
Iron (Fe)	0.08		0.06	
Calcium (Ca)	51	2.546	46	2.30
Magnesium (Mg)	17	1.398	16	1.32
Sodium (Na)	21	0.915	30	1.29
Potassium (K)	4.0	0.102	8.7	0.22
Bicarbonate (HCO_3)	181	2.968	181	2.97
Sulfate (SO_4)	30	0.625	32	0.67
Chloride (Cl)	48	1.354	53	1.49
Fluoride (F)	0.2	0.011	0	0.00
Nitrate (NO_3)	0.2	0.003	0.2	0.00
Dissolved solids	271		285	
Total hardness as $CaCO_3$	197		181	
pH	7.9		8.0	

CALLAHAN COUNTY

Baird

Population in 1940: 1,810.

Source of information:
R. L. Elliott, superintendent of utilities
Feb. 5, 1946

Ownership: Municipal.

Source of supply: Eight wells, in well field adjacent to the Texas and Pacific Railroad, 3½ miles west of Baird.

Well 1. Dug in 1927, depth 42 feet, diameter 6 feet; deep-well turbine pump and 1½-horsepower electric motor; yield 20 gallons a minute.

Well 2. Dug in 1927, depth 45 feet, diameter 6 feet; deep-well turbine pump and 1½-horsepower electric motor; yield 10 gallons a minute.

Well 3. Dug in 1927, diameter 6 feet; deep-well turbine pump and 1½-horsepower electric motor; yield 8 gallons a minute.

Well 4. Dug in 1927, depth about 45 feet, diameter 6 feet; deep-well turbine pump and 1½-horsepower electric motor; yield 10 gallons a minute.

Well 5. Dug in 1927, depth about 45 feet, diameter 6 feet; deep-well turbine pump and 1½-horsepower electric motor; yield 10 gallons a minute.

Well 6. Dug in 1929, depth about 45 feet, diameter 6 feet (not in use).

Well 7. Dug in 1929, depth about 45 feet; deep-well turbine pump and 5-horsepower electric motor; yield 15 gallons a minute.

Well 8. Dug about 1930, depth about 45 feet, diameter 6 feet; deep-well turbine pump and 5-horsepower electric motor; yield 10 gallons a minute.

Well 10. Dug by W. P. A., 15 feet wide and 30 feet long, depth 38 feet; yield 3 or 4 gallons a minute, well abandoned.

Pumpage:

(Average in gallons a day)

	1941	1942	1943	1944
Jan.	44,800	60,600	45,100	45,400
Feb.	49,000	64,000	63,400	48,100
Mar.	43,000	49,300	52,100	39,800
Apr.	57,700	56,000	53,800	57,800
May	47,900	50,900	69,800	58,300
June	57,600	57,900	78,500	70,300
July	82,600	93,400	100,000	89,000
Aug.	94,400	88,800	106,000	95,800
Sept.	62,700	60,800	77,700	61,500
Oct.	56,700	46,200	49,300	57,400
Nov.	52,700	45,800	51,600	54,600
Dec.	46,900	49,200	46,800	44,400

CALLAHAN COUNTY

Baird -- Continued

Storage: Ground storage reservoir at well field, 136,000 gallons, elevated tank, 60,000 gallons.

Number of customers: 500.

Treatment: Chlorinated lime.

Analyses of water:

Date collected: Feb. 5, 1946 Analyzed by C. B. Cibulka

	Well 1		Well 9	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	12		16	
Iron (Fe)	0.9		0.30	
Calcium (Ca)	93	4.64	144	7.19
Magnesium (Mg)	10	0.82	19	1.56
Sodium (Na)	36	1.58	61	2.64
Potassium (K)	5.0	0.13	12	0.31
Bicarbonate (HCO_3)	267	4.38	364	5.97
Sulfate (SO_4)	41	0.85	83	1.73
Chloride (Cl)	66	1.86	136	3.84
Fluoride (F)	0.0	0.00	0.2	0.01
Nitrate (NO_3)	4.8	0.08	9.6	0.15
Dissolved solids	417		686	
Total hardness as $CaCO_3$	273		438	
pH	7.0		7.0	

CALLAHAN COUNTY

Clyde

Population in 1940: 800.

Source of information:
H. E. Swafford, water commissioner
Feb. 5, 1946

Ownership: Municipal.

Source of supply: Two wells.

Well 1. At elevated tank, dug, depth 25 feet, diameter 5 feet; deep-well turbine pump and electric motor; yield 25 gallons a minute.

Well 2. 30 feet east of well 1, dug about 1939, depth 25 feet; deep-well turbine pump and electric motor (pumped directly into well 1 and then from well 1 to the distribution system).

Pumpage (estimated): Summer, 50,000 gallons a day; winter, 25,000 gallons a day.

Storage: Elevated tank, 50,000 gallons.

Name of customers: 125.

Treatment: Chlorination.

Analysis of water:

Date collected: Feb. 5, 1946 — Analyzed by C. B. Cibulka

	Composite sample	
	Parts per million	Equivalents per million
Silica (SiO_2)	28	7.59
Iron (Fe)	0.05	2.30
Calcium (Ca)	152	5.25
Magnesium (Mg)	28	0.28
Sodium (Na)	121	7.84
Potassium (K)	11	2.56
Bicarbonate (HCO_3)	478	4.57
Sulfate (SO_4)	123	0.03
Chloride (Cl)	162	0.42
Fluoride (F)	0.6	
Nitrate (NO_3)	26	
Dissolved solids	919	
Total hardness as $CaCO_3$	494	
pH	7.3	

CALLAHAN COUNTY

Cross Plains

Population in 1940: 1,229.

Source of information:
B. B. Huntington, water superintendent
Feb. 5, 1946

Ownership: Municipal.

Source of supply: 6 wells, located 1½ miles northeast of Cross Plains.

Well 1. Dug, depth 50 feet, diameter 6 feet; deep-well cylinder and pump jack; static water level 15 feet below surface, February, 1946: yield 20 gallons a minute.

Well 2. Dug, depth 50 feet, diameter 4 feet, deep-well cylinder and pump jack; yield 20 gallons a minute.

Well 3. Drilled in 1945, depth 50 feet, diameter 8 inches; deep-well cylinder and pump jack; yield 20 gallons a minute.

Well 4. Drilled, depth 50 feet, diameter 8 inches; deep-well cylinder and pump jack; yield 20 gallons a minute.

Well 5. Drilled about 1941, depth 50 feet, diameter 8 inches; deep-well cylinder and pump jack; yield 20 gallons a minute.

Well 6. Drilled about 1941, depth 50 feet, diameter 8 inches; deep-well cylinder and pump jack; yield 20 gallons a minute.

Pumpage (estimated): Maximum 170,000 gallons a day.

Storage: Ground storage reservoir, 72,000 gallons; elevated tank, 85,000 gallons.

Number of customers: 365.

Treatment: None.

Analyses of water:

Date collected: Feb. 5, 1946 — Analyzed by C. B. Cibulka

	Well 2		Well 4	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	19		11	
Iron (Fe)	0.03		0.04	
Calcium (Ca)	99	4.94	227	11.33
Magnesium (Mg)	13	1.07	23	1.89
Sodium (Na)	76	0.16	138	6.01

CALLAHAN COUNTY

Cross Plains -- Continued

Analyses of water - continued:

	Well 2		Well 4	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Potassium (K)	6.2	6.61	12	0.31
Bicarbonate (HCO_3)	403	1.00	520	2.66
Sulfate (SO_4)	48	1.61	128	7.98
Chloride (Cl)	57	0.02	283	0.01
Fluoride (F)	0.4	0.24	0.2	0.37
Nitrate (NO_3)	15		23	
Dissolved solids	533		1100	
Total hardness as $CaCO_3$	300		661	
pH	7.0		7.0	

Putnam

Population in 1940: 487.

Source of information:
John Fisher, pump operator
Jan., 1946

Ownership: Municipal.

Source of supply: Lake one mile southwest of Putnam, reservoir capacity 4,000,000 gallons.

Pumpage (estimated): 12,000 gallons a day.

Storage: Elevated tank, 50,000 gallons.

Treatment: None.

CALLAHAN COUNTY

Putnam -- Continued

Analysis of water:

Date collected: Nov., 1945 — Analyzed by J. H. Rowley

	Lake water	
	Parts per million	Equivalents per million
Silica (SiO_2)	7.6	
Iron (Fe)	0.23	
Calcium (Ca)	30	1.497
Magnesium (Mg)	10	0.822
Sodium (Na)	37	1.597
Potassium (K)	4.4	0.113
Bicarbonate (HCO_3)	150	2.459
Sulfate (SO_4)	51	1.062
Chloride (Cl)	18	0.508
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	0.0	0.000
Dissolved solids	242	
Total hardness as $CaCO_3$	116	
pH	7.4	

CLAY COUNTY

Byers

Population in 1940: 427.

Source of information:
J. F. Bridges, water superintendent
June 5, 1946

Ownership: Municipal.

Source of supply: Lake ½ mile northwest of Byers.

Pumpage:

(Average in gallons a day)

	1945	1946
Jan.		20,000
Feb.		19,000
Mar.		21,000
Apr.		27,000
May		36,000
June		40,000
July		--
Aug.	21,000	
Sept.	22,000	
Oct.	17,000	
Nov.	16,000	
Dec.	18,000	

Storage: Settling tank at lake, 28,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 162.

Treatment: Coagulation, sedimentation, and hypo-chlorination.

CLAY COUNTY

Byers -- Continued

Analyses of water:

Date collected: June 5, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	7.8		2.5	
Iron (Fe)	0.06		0.20	
Calcium (Ca)	27	1.348	37	1.847
Magnesium (Mg)	7.2	0.592	7.0	0.576
Sodium (Na)	22	0.965	33	1.414
Potassium (K)	5.1	0.130	5.3	0.136
Bicarbonate (HCO_3)	134	2.196	143	2.360
Sulfate (SO_4)	6.9	0.144	34	0.708
Chloride (Cl)	24	0.677	32	0.902
Fluoride (F)	0.2	0.010	0.0	0.000
Nitrate (NO_3)	0.5	0.008	0.2	0.003
Dissolved solids	168		191	
Total hardness as $CaCO_3$	97		121	
pH	7.8		7.9	

CLAY COUNTY

Henrietta

Population in 1940: 2,391.

Source of information:
C. C. McKinney, water superintendent
June 5, 1946

Ownership: Municipal.

Source of supply: Little Wichita River 2 miles north of city.

Pumpage (estimated): 250,000 gallons a day.

Storage: 3 settling basins, 200,000 gallons each; clear well, 200,000 gallons; stand-pipe, 85,000 gallons.

Number of customers: 800.

Treatment: Coagulation, sedimentation, filtration, and chlorination.

Analyses of water:

Date collected: June 5, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	10		2.4	
Iron (Fe)	0.11		0.03	
Calcium (Ca)	59	2.94	64	3.19
Magnesium (Mg)	18	1.48	16	1.32
Sodium (Na)	173	7.51	159	6.91
Potassium (K)	19	0.49	22	0.56
Bicarbonate (HCO_3)	128	2.10	126	2.07
Sulfate (SO_4)	7.1	0.15	22	0.46
Chloride (Cl)	360	10.15	334	9.42
Fluoride (F)	0.2	0.01	0.4	0.02
Nitrate (NO_3)	0.5	0.01	0.05	0.01
Dissolved solids	778		755	
Total hardness as $CaCO_3$	221		226	
pH	8.0		8.0	

CLAY COUNTY

Petrolia

Population in 1940: 597.

Source of information:
T. D. Chatman, water superintendent
June 5, 1946

Ownership: Municipal.

Source of supply: City lake 1.5 miles north of Petrolia.

Pumpage (estimated): 40,000 gallons a dey.

Storage: Settling basin, 40,000 gallons; elevated tank, 55,000 gallons.

Number of customers: 173.

Treatment: Coagulation, sedimentation, filtration, and chlorination.

Analyses of water:

Date collected: June 5, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per milllion
Silica (SiO_2)	773		6.2	
Iron (Fe)	1.9		0.11	
Calcium (Ca)	20	0.998	3.6	0.18
Magnesium (Mg)	5.7	0.469	3.9	0.32
Sodium (Na)	31	1.335	218	9.48
Potassium (K)	5.0	0.013	9.6	0.25
Bicarbonate (HCO_3)	106	1.738	412	6.75
Sulfate (SO_4)	13	0.271	126	2.62
Chloride (Cl)	27	0.761	30	0.85
Fluoride (F)	0.4	0.021	0.2	0.01
Nitrate (NO_3)	1.5	0.024	0.2	0.00
Dissolved solids	163		601	
Total hardness as $CaCO_3$	73		25	
pH	7.5		9.5	

COLEMAN COUNTY

Burkett

Population in 1940: 198.

Source of information:
W. N. Newton, owner
Apr. 18, 1946

Owner: W. N. Newton

Source of supply: Pecan Bayou, pumping station on west edge of town about 500 yards north of Highway 206.

Pumpage (estimated): Maximum 44,000 gallons a day.

Storage: Elevated tank, 44,000 gallons.

Number of customers: 43.

Treatment: None.

Analysis of water:

Date collected: Apr. 18, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	3.0	
Calcium (Ca)	70	3.49
Magnesium (Mg)	11	0.90
Sodium (Na)	21	0.90
Potassium (K)	5.0	0.13
Bicarbonate (HCO_3)	269	4.41
Sulfate (SO_4)	1.5	0.03
Chloride (Cl)	31	0.87
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	6.1	0.10
Dissolved solids	302	
Total hardness as $CaCO_3$	220	
pH	7.2	

COLEMAN COUNTY

Coleman

Population in 1940: 6,054.

Source of information:
Herbert Shore, water superintendent
Apr. 19, 1946

Ownership: Municipal.

Source of supply: Lake Scarbrough and 2 stand-pipe wells.

Lake Scarbrough: On Indian Creek 4½ miles north of Coleman; capacity 2,000 acre-feet.

Well 1. Dug in 1944, depth 23 feet, diameter 6 feet; centrifugal pump and 10-horsepower electric motor; yield 250 gallons a minute.

Well 2. Dug in 1944, depth 23 feet, diameter 6 feet; deep-well turbine pump and 15-horsepower electric motor; yield 150 gallons a minute.

Pumpage: Average 400,000 gallons a day.

Storage: Ground reservoir, 500,000 gallons; elevated tank, 250,000 gallons.

Number of customers: 2,000.

Treatment: Coagulation, sedimentation, rapid sand filters, pre and post chlorination.

Analyses of water:

Date collected: Apr. 19, 1946 Analyzed by J. H. Rowley and M. L. Begley

Lake water

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	4.8			
Iron (Fe)	0.08			
Calcium (Ca)	47	2.346	42	2.096
Magnesium (Mg)	7.9	0.650	7.3	0.600
Sodium (Na)	10	0.450	(	)
Potassium (K)	4.9	0.125	(20	0.878)
Bicarbonate (HCO_3)	164	2.688	140	2.296
Sulfate (SO_4)	16	0.333	22	0.458
Chloride (Cl)	19	0.536	48	0.790
Fluoride (F)	0.2	0.011	0.4	0.021
Nitrate (NO_3)	0.2	0.003	0.2	0.003
Dissolved solids	193		189	
Total hardness as $CaCO_3$	150		134	
pH	8.1			

COLEMAN COUNTY

Coleman -- Continued

Analyses of water:

Date collected: Apr. 10, 1944 — Analyzed by W. W. Hastings

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	0.000	
Calcium (Ca)	148	7.39
Magnesium (Mg)	38	3.12
Sodium and Potassium (Na + K)	113	4.91
Bicarbonate (HCO_3)	424	6.95
Sulfate (SO_4)	143	2.98
Chloride (Cl)	178	5.02
Fluoride (F)	0.3	0.02
Nitrate (NO_3)	28	0.45
Dissolved solids	878	
Total hardness as $CaCO_3$	526	
pH	7.6	

Santa Anna

Population in 1940: 1,641.

Source of information:
Water superintendent
Apr. 19, 1946

Ownership: Municipal.

Source of supply: Lake San-Tana and Lake Sealy.

Pumpage: (Average in gallons a day)

	1945	1946
Jan.	69,000	94,000
Feb.	65,000	89,000
Mar.	74,000	103,000
Apr.	105,000	
May	108,000	
June	124,000	
July	116,000	
Aug.	137,000	
Sept.	138,000	
Oct.	91,000	
Nov.	104,000	
Dec.	96,000	

COLEMAN COUNTY

Santa Anna -- Continued

Storage: 2 steel reservoirs on hilltop, 55,000 gallons each.

Number of customers: 530.

Treatment: Coagulation and sedimentation.

Analysis of water:

Date collected: Apr. 19, 1946 — Analyzed by J. H. Rowley

	Raw water	
	Parts per million	Equivalents per million
Silica (SiO_2)	5.4	
Iron (Fe)	0.38	
Calcium (Ca)	40	1.997
Magnesium (Mg)	5.4	0.444
Sodium (Na)	11	0.493
Potassium (K)	5.0	0.128
Bicarbonate (HCO_3)	141	2.311
Sulfate (SO_4)	8.3	0.173
Chloride (Cl)	20	0.564
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	0.2	0.003
Dissolved solids	171	
Total hardness as $CaCO_3$	122	
pH	8.2	

COLEMAN COUNTY

Talpa

Population in 1940: 254.

Source of information:
Charles Hill, manager
Apr. 18, 1946

Owner: Mrs. E. M. Hale.

Source of supply: Lake one mile north of town.

Pumpage: No record.

Storage: Elevated tank, 13,500 gallons.

Number of customers: 70.

Treatment: None.

Analysis of water:

Date collected: Apr. 18, 1946 — Analyzed by J. H. Rowley

	Raw water	
	Parts per million	Equivalents per million
Silica (SiO_2)	10	
Iron (Fe)	1.5	
Calcium (Ca)	58	2.895
Magnesium (Mg)	5.0	0.411
Sodium (Na)	6.0	0.263
Potassium (K)	4.5	0.115
Bicarbonate (HCO_3)	194	3.180
Sulfate (SO_4)	3.3	0.070
Chloride (Cl)	13	0.367
Fluoride (F)	0.6	0.032
Nitrate (NO_3)	2.2	0.035
Dissolved solids	209	
Total hardness as $CaCO_3$	165	
pH	7.6	

COMANCHE COUNTY

Comanche

Population in 1940: 2,435.

Source of information:
N. R. Jones, city secretary
Mar. 20, 1946

Ownership: Municipal.

Source of supply: Lake 3½ miles southwest of town; capacity 1,000 acre feet.

Pumpage:

	(Average in gallons a day) 1945	1946
Jan.	231,000	257,000
Feb.	200,000	308,000
Mar.	226,000	
Apr.	235,000	
May	282,000	
June	333,000	
July	368,000	
Aug.	403,000	
Sept.	362,000	
Oct.	256,000	
Nov.	272,000	
Dec.	271,000	

Storage: Concrete reservoir on top of hill on Wright Avenue, 550,000 gallons; settling tank at pumping station, 100,000 gallons.

Number of customers: 1,000.

Treatment: Chlorination.

Analyses of water:

Date collected: Mar. 20, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	6.4		6.0	
Iron (Fe)	0.08		0.04	
Calcium (Ca)	54	2.70	58	
Magnesium (Mg)	13	1.07	14	
Sodium (Na)	32	1.39	24	
Potassium (K)	5.2	0.13	6.1	
Bicarbonate (HCO_3)	200	3.28	196	
Sulfate (SO_4)	47	0.98	46	
Chloride (Cl)	36	1.02	38	
Fluoride (F)	0.2	0.01	0.0	
Nitrate (NO_3)	0.0	0.00	0.0	
Dissolved solids	290		293	
Total hardness as $CaCO_3$	188		202	
pH	7.4		7.5	

COMANCHE COUNTY

De Leon

Population in 1940: 2,318.

Source of information:
Robert L. Wofford, water superintendent
Mar. 20, 1946

Ownership: Municipal.

Source of supply: 11 wells.

Well 1. Drilled, depth 200 feet, diameter 6 inches; no pumping equipment in well; static water level 45.37 feet March 20, 1946.

Well 2. Drilled, depth 210 feet, diameter 6 inches; deep-well cylinder and pump jack and 5-horsepower electric motor; yield 15 gallons a minute.

Well 3. Drilled, depth 210 feet, diameter 6 inches;deep-well cylinder and pump jack and 15-horsepower electric motor; yield 10 gallons a minute.

Well 4. Drilled, depth 150 feet, diameter 6 inches; deep-well turbine pump.

Well 5. Drilled, depth 150 feet, diameter 6 inches; deep-well cylinder and pump jack and electric motor; yield 10 gallons a minute.

Well 6. Drilled by J. B. Tatum, depth 150 feet, diameter 6 inches; deep-well cylinder and pump jack and electric motor; yield 10 gallons a minute.

Well 7. Drilled, depth 210 feet, diameter 8 inches; Peerless Hi-Lift pump and 3-horsepower electric motor; yield 20 gallons a minute.

Well 8. Drilled, depth 200 feet, diameter 6 inches; deep-well turbine pump and 3-horsepower electric motor; yield 25 gallons a minute.

Well 9. Drilled by J. B. Tatum, depth 200 feet, diameter 6 inches; deep-well turbine pump and 3-horsepower electric motor; yield 25 gallons a minute.

Well 10. Drilled by J. B. Tatum, depth 150 feet, diameter 10 inches; deep-well turbine pump and 5-horsepower electric motor; yield 35 gallons a minute.

Well 11. Drilled by J. B. Tatum, depth 150 feet, diameter 16 inches; deep-well turbine pump and 5-horsepower electric motor; yield 25 gallons a minute.

COMANCHE COUNTY

De Leon -- Continued

Pumpage: (Average in gallons a day)

	1945	1946
Jan.	43,600	54,000
Feb.	42,000	
Mar.	42,000	
Apr.	42,100	
May	48,000	
June	60,000	
July	72,000	
Aug.	78,000	
Sept.	78,000	
Oct.	54,000	
Nov.	54,000	
Dec.	54,000	

Storage: Concrete ground reservoir, 1,000,000 gallons; elevated tank, 120,000 gallons.

Number of customers: 650.

Treatment: Chlorination.

Analyses of water:

Date collected: Mar. 20, 1946 Analyzed by C. B. Cibulka

	Well 8		Well 11	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	12		12	
Iron (Fe)	0.03		0.04	
Calcium (Ca)	150	7.49	162	8.09
Magnesium (Mg)	22	1.81	20	1.64
Sodium (Na)	17	0.73	12	5.17
Potassium (K)	5.8	0.15	8.4	0.21
Bicarbonate (HCO_3)	296	4.85	390	6.39
Sulfate (SO_4)	33	0.69	86	1.79
Chloride (Cl)	160	4.51	242	6.83
Fluoride (F)	0.0	0.00	0.0	0.00
Nitrate (NO_3)	8.2	0.13	6.0	0.10
Dissolved solids	675		912	
Total hardness as $CaCO_3$	465		486	
pH	7.2		7.2	

COMANCHE COUNTY

Sipe Springs

Population in 1940: 575.

Source of information:
Robert Humphrey, owner
Mar. 20, 1946

Owner: Robert Humphrey.

Source of supply: Dug well, depth 20 feet, diameter 6 feet, walled with rock; centrifugal pump and 1½-horsepower electric motor.

Pumpage: Average 4,100 gallons a dey.

Storage: Elevated tank, 15,400 gallons.

Number of customers: 15.

Treatment: None.

Analysis of water:

Date collected: Mar. 20, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.35	
Calcium (Ca)	110	5.49
Magnesium (Mg)	11	0.90
Sodium (Na)	35	1.53
Potassium (K)	3.2	0.08
Bicarbonate (HCO_3)	382	6.26
Sulfate (SO_4)	43	0.90
Chloride (Cl)	27	0.76
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	5.0	0.08
Dissolved solids	436	
Total hardness as $CaCO_3$	320	
pH	7.4	

CONCHO COUNTY

Eden

Population in 1940: 1,603.

Source of information:
C. O. Smith, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: Well 3 blocks north and 2 blocks west of Square on Ballard Street; drilled in 1944 (?), depth 4,410 feet, diameter 8 inches; deep-well turbine pump and electric motor; static water level reported 350 feet below land surface; yield 225 gallons a minute; temperature 105° F.

Pumpage (estimated): 150,000 gallons a day.

Storage: Concrete ground reservoir, 750,000 gallons; elevated tank, 55,000 gallons.

Number of customers: 386.

Treatment: None.

Analysis of water:

Date collected: Apr. 17, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	20	
Iron (Fe)	0.46	
Calcium (Ca)	7.2	0.36
Magnesium (Mg)	2.0	0.16
Sodium (Na)	423	18.37
Potassium (K)	22	0.56
Bicarbonate (HCO_3)	454	7.45
Sulfate (SO_4)	20	0.42
Chloride (Cl)	406	11.45
Fluoride (F)	2.4	0.13
Nitrate (NO_3)	0.0	0.00
Dissolved solids	1,130	
Total hardness as $CaCO_3$	26	
pH	7.8	

CONCHO COUNTY

Paint Rock

Population in 1940: 800.

Source of information:
Walter Hagelstein, manager
Apr. 16, 1946

Owner: Central Service Company.

Source of supply: Concho River.

Pumpage: Average 40,000 gallons a day.

Storage: Rock reservoir, 53,600 gallons; settling basin, 55,000 gallons; elevated tank, 3,200 gallons.

Number of customers: 100.

Treatment: Chlorination, sedimentation.

Analyses of water:

Date collected: Apr. 16, 1946 — Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	9.2		6.0	
Iron (Fe)	0.19		0.09	
Calcium (Ca)	74	3.69	61	3.04
Magnesium (Mg)	46	3.78	41	3.37
Sodium (Na)	101	4.41	92	4.01
Potassium (K)	7.7	0.20	7.9	0.20
Bicarbonate (HCO_3)	214	3.51	170	2.79
Sulfate (SO_4)	144	3.00	142	2.96
Chloride (Cl)	196	5.53	172	4.85
Fluoride (F)	0.4	0.02	0.2	0.01
Nitrate (NO_3)	1.2	0.02	0.4	0.01
Dissolved solids	785		713	
Total hardness as $CaCO_3$	374		320	
pH	7.3		7.3	

COOKE COUNTY

Gainesville

Population in 1940: 9,651.

Source of information:
P. T. Booher, chief engineer
Feb. 25, 1944

Ownership: Municipal.

Source of supply: 4 wells.

Well 1. About 100 feet northeast of power plant, drilled 1912, depth 864 feet, diameter 10 to 8 inches; casing perforated at 480-520, 640-680 and 800-860 feet; deep-well turbine pump set at 220 feet; static water level 110.6 feet below surface February 25, 1944; yield 450 gallons a minute.

Well 2. About 300 feet northwest of power plant, drilled 1941, depth 931 feet, diameter 15½ to 8¼ inches; screened at 767-789, 856-873 and 887-927 feet; deep-well turbine pump; reported static water level 74 feet in 1931 and 138 feet about January 1, 1944; pumping level 186 feet; yield 400 gallons a minute; temperatur 69° F.

Well 3. At corner of Broadwey and Ritchie Streets, drilled 1937, depth 1,025 feet, diameter 18-5/8 and 10¾ inches; screened at 776-798, 814-835, 879-921, 936-999 and 1,019-1,022 feet; deep-well turbine pump set at 250 feet; static water level reported 110 feet September 10, 1937; pumping level 331 feet after pumping 720 gallons a minute for 100 hours in 1943; yield 200 gallons a minute.

Well 4. At city barn, drilled 1943, depth 953 feet, diameter 12 inches; static water level 133.28 feet below concrete foundation February 25, 1944; pump not installed.

Pumpage: (Average in gallons a day)

	1939	1940	1941	1942	1943
Jan.	668,000	763,000	777,000	659,000	1,047,000
Feb.	657,000	816,000	796,000	684,000	1,168,000
Mar.	691,000	806,000	769,000	740,000	1,462,000
Apr.	808,000	852,000	819,000	746,000	1,554,000
May	873,000	878,000	901,000	753,000	1,482,000
June	1,027,000	965,000	892,000	1,138,000	1,256,000
July	1,491,000	1,337,000	1,138,000	1,455,000	1,287,000
Aug.	1,136,000	1,210,000	951,000	1,232,000	1,210,000
Sept.	1,147,000	1,066,000	896,000	1,149,000	971,000
Oct.	1,002,000	1,034,000	954,000	1,200,000	795,000
Nov.	939,000	904,000	800,000	357,000	897,000
Dec.	790,000	800,000	669,000	324,000	932,000

COOKE COUNTY

Gainesville -- Continued

Storage: 2 concrete ground reservoirs, 500,000 gallons each; 1 steel ground reservoir, 50,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 3,050.

Treatment:

Analyses of water:

Date collected; Well 1 Mar., 1944; well 2 Feb. 25, 1944 Analyzed by J. H. Rowley

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		10	
Iron (Fe)	.16		.02	
Calcium (Ca)	2.4	0.12	3.6	0.18
Magnesium (Mg)	1.0	.08	1.0	.08
Sodium (Na)	196	8.50	194	8.42
Potassium (K)	1.9	.05	3.0	.08
Bicarbonate (HCO_3)	484	6.33	392	5.57
Sulfate (SO_4)	31	.65	31	.65
Chloride (Cl)	5.0	.14	5.8	1.64
Fluoride (F)	.2	.01	.2	.01
Nitrate (NO_3)	1.2	.02	1.0	.02
Dissolved solids	490		536	
Total hardness as $CaCO_3$	8		13	
pH	8.6		7.8	

	Well 3	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.2	
Iron (Fe)	.01	
Calcium (Ca)	2.3	0.11
Magnesium (Mg)	.6	.05
Sodium (Na)	170	7.38
Potassium (K)	3.1	.08
Bicarbonate (HCO_3)	414	5.70
Sulfate (SO_4)	26	.54
Chloride (Cl)	.10	.28
Fluoride (F)	.2	.01
Nitrate (NO_3)	1.2	.02
Dissolved solids	442	
Total hardness as $CaCO_3$	8	
pH	7.9	

COOKE COUNTY

Gainesville -- Continued

Drillers' logs:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	16	16	Sand	6	518
Gravel	7	23	Shale	8	526
Lime rock	78	101	Sand	7	533
Shale and boulders	41	142	Shale and sand	5	538
Rock	29	171	Sand	12	550
Shale	22	193	Red shale	26	576
Rock	3	196	Sand	9	585
Shale and sand	116	312	Hard shale and rock	9	594
Sand rock	2	314	Shale	21	615
Sand rock and shale	20	334	Shale and sand	6	621
Sand	8	342	Sand	7	628
Shale	7	349	Shale	12	640
Sand rock	7	356	Sand	10	650
Shale	6	362	Rock	4	654
Hard shale and sand	9	371	Shale	10	664
Blue shale	19	390	Sand	15	679
Shale and sand	41	431	Shale	4	683
Shale	12	443	Rock	5	688
Rock	2	445	Shale	26	714
Shale and boulders	7	452	Shale and boulders	23	737
Shale and sand rock	8	460	Shale	20	757
Rock	10	470	Rock	16	773
Shale	5	475	Shale	20	793
Sand	18	493	Sand	7	800
Hard shale	7	500	Sand and shale	16	816
Sand	9	509	Rock	4	820
Shale and sand	3	512	Sand	30	850

Well 2

Surface soil	15	15	Gumbo, layers sandstone	68	328
Gravel	10	25	Hard sand	22	350
Blue clay	5	30	Shale and lime	10	360
Shale and shell	87	117	Soapstone	12	372
Sand rock	3	120	Shale and lime	31	403
Blue slate	34	154	Soapstone	4	407
Lime	28	182	Gumbo	43	450
Sand	13	195	Hard sand	15	465
Shale	40	235	Soapstone	20	485
Sand	25	260	Sand	15	500

COOKE COUNTY

Gainesville -- Continued

Well 2 -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Lime and shale	27	527	Shale	25	764
Red beds	9	536	Coarse-grained sand and gravel	26	790
Sandy shale	24	560	Shale	30	820
Sand	10	570	Fine-grained sand	19	839
Lime and shale	65	635	Shale	19	858
Sand	11	646	Sand	18	877
Shale	4	650	White lime	8	885
Sand	28	678	Sand	28	913
Sandy shale	35	713	Lime	2	915
Lime	5	718	Sandy gravel	15	930
Sand	14	732	Yellow clay	1	931
Hard lime	2	734			
Red beds	5	739			

Well 3

Surface soil	5	5	Shale	49	326
Clay	15	20	Sand	6	332
Gravel	10	30	Lime	4	336
Shale and shell	30	60	Good sand	20	356
Gray lime	22	82	Fine-grained sand	16	372
Blue shale	6	88	Sandy shale	24	396
Gray lime	2	90	Hard shale	28	424
Blue shale	10	100	Sand	11	435
Sandy lime	20	120	Hard shale	25	460
Blue shale	6	126	Sandy lime	10	470
Hard sandy lime	19	145	Hard fine-grained sand	32	502
Gray shale	14	159	Hard shale	18	520
Lime	1	160	Hard fine-grained sand	17	537
Grey shale	8	168	Hard shale	18	555
White lime	9	177	Lime and shell	2	557
Hard sandy lime	11	188	Hard shale	27	584
Gray lime	4	192	Hard fine-grained sand	20	604
Black shale	25	217	Sandy shale, layers of sand	36	640
Hard lime	3	220	Hard shale	25	665
White lime	25	245	Sandy, layers sandy shale	33	698
Water sand	5	250	Hard fine-grained sand	39	737
Hard sand rock	3	253	Sandy lime	7	744
Sand	24	277			

COOKE COUNTY

Gainesville -- Continued

Well 3 -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Red shale	6	750	Shale	10	936
Lime	2	752	Fine-grained sand	22	958
Red and blue shale	22	774	Lime	3	961
Sand	32	806	Sand	8	969
Sandy lime	5	811	Lime, shell	1	970
Shale	6	817	Coarse-grained sand, small gravel, layers of shale	15	985
Sand	23	840	Shale	3	988
Hard sandy shale	5	845	Good sand	15	1,003
Shale	29	874	Lime	5	1,008
Fine-grained sand	29	903	Hard shale and lime	17	1,025
Lime	4	907			
Fine-grained sand	19	926			

Well 4

Surface soil	8	8	Sand, shale, shells	15	650
Clay	16	24	Lime, shells	15	665
Brown shale and clay	3	27	Shale	10	675
Shale, shells	29	56	Sandy shale	9	684
Sand, shells	22	78	Lime, shale	6	690
Shale	39	117	Shale, hard sand	17	707
Shale, shells	35	152	Shale	10	717
Sandy shale	22	174	Sand - Trinity	33	750
Lime	28	202	Sandy shale	58	808
Sand, lime, shale	18	220	Shale	13	821
Lime, shale	23	243	Sandy shale	46	867
Sand	39	282	Sand	17	884
Sand and shale	18	300	Sand and shells	3	887
Sand, shale, clay	74	374	Sand, hard shells	36	923
Sand, shale, shells	55	429	Coarse-grained sand	6	929
Sand	23	452	Coarse-grained sand and shells	16	945
Shale, shells	22	474	Sandy shale	2	947
Sand, shale, shells	90	564	Shale	6	953
Sandy shale	71	635			

COOKE COUNTY

Muenster

Population in 1940: 599.

Source of information:
I. A. Schoech, water superintendent
Feb. 25, 1944

Ownership: Municipal.

Source of supply: well, drilled 1939, depth 618 feet, diameter 8¼ to 6-5/6 inches, casing perforated from 563 to 618 feet; deep-well turbine pump set at 270 feet; yield 78 gallons a minute April 7, 1941.

Pumpage (estimated): Average, 25,000 gallons a day in 1943; maximum in summer, 40,000 gallons a day.

Storage: Concrete ground reservoir, 50,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 186.

Treatment: None.

Analysis of water:

Date collected: Feb. 25, 1944 — Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	13	
Iron (Fe)	.02	
Calcium (Ca)	2.4	0.12
Magnesium (Mg)	.7	.06
Sodium (Na)	162	7.05
Potassium (K)	3.4	.09
Bicarbonate (HCO_3)	375	5.16
Sulfate (SO_4)	38	.79
Chloride (Cl)	12	0.34
Fluoride (F)	0	.00
Nitrate (NO_3)	2.0	.03
Dissolved solids	418	
Total hardness as $CaCO_3$	9	
pH	8.0	

COOKE COUNTY

Muenster -- Continued

Driller's log:

Log of well

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Gravel	9	9	Red-gray shale	45	310
Lime	24	33	Blue-gray shale	35	345
Sandy shale	7	40	Blue sandy shale	65	410
Gray shale	35	75	Red rock	20	430
Water sand	20	95	Lime-sand	15	445
Gray sandy shale	20	115	Gray shale	12	457
Blue shale	5	120	Water sand	8	465
Shale, lime shells	38	158	Sand, shale	5	470
Blue shale	17	175	Water sand	15	485
Lime	5	180	Lime	20	505
Shale, lime	20	200	Gray shale	5	510
Blue shale	13	213	Red beds	32	542
Yellow shale	7	220	Blue shale	28	570
Blue shale	33	253	Water sand	47	617
Broken lime	12	265	Hard lime	1	618

Valley View

Population in 1940: 700.

Source of information:
C. T. Nichols, co-owner
Feb. 25, 1944

Owner: C. T. Nichols and Son.

Source of supply: Well, drilled in 1935, depth 817 feet, diameter 10 to 6 inches; deep-well turbine pump set at 200 feet; static water level reported 50 feet below surface in 1935; yield 165 gallons a minute.

Another well drilled about 1912; depth 420 feet; equipped with pump jack and deep-well cylinder pump is availeble for emergency use. This well furnished the public supply until 1935.

Pumpage (estimated): Average, 40,000 gallons a day in summer and 20,000 gallons a day in winter.

Storage: Elevated tank, 10,000 gallons.

Number of customers: 150.

Treatment:

COOKE COUNTY

Valley View -- Continued

Analysis of water:

Date collected: Feb. 25, 1944 — Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	12	
Iron (Fe)	.02	
Calcium (Ca)	1.5	0.08
Magnesium (Mg)	.5	.04
Sodium (Na)	187	8.11
Potassium (K)	2.6	.07
Bicarbonate (HCO_3)	457	6.21
Sulfate (SO_4)	30	.62
Chloride (Cl)	6.0	0.17
Fluoride (F)	.2	.01
Nitrate (NO_3)	1.2	.02
Dissolved solids	467	
Total hardness as $CaCO_3$	6	
pH	8.0	

CORYELL COUNTY

Copperas Cove

Population in 1940: 356.

Source of information:
Forrest Aldridge, operator
June 3, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. At elevated tank; drilled in 1925, depth 652 feet, diameter 6 inches (?); deep-well turbine pump and 5-horsepower electric motor; static water level reported 140 feet below land surface; yield 40 gallons a minute.

Well 2. About .25 mile south of Well 1; drilled in 1944 by Layne-Texas Company, depth 640 feet; deep-well turbine pump and 20-horsepower electric motor; yield 50 gallons a minute.

Pumpage: No record.

Storage: Elevated tank, 30,000 gallons.

Number of customers: 130.

Treatment: None.

Analysis of water:

Date collected: June 3, 1946 — Analyzed by C. B. Cibulka

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.43	
Calcium (Ca)	27	1.35
Magnesium (Mg)	7.6	0.62
Sodium (Na)	750	32.61
Potassium (K)	56	1.43
Bicarbonate (HCO_3)	380	6.23
Sulfate (SO_4)	700	14.57
Chloride (Cl)	530	14.95
Fluoride (F)	4.4	0.23
Nitrate (NO_3)	1.8	0.03
Dissolved solids	2,280	
Total hardness as $CaCO_3$	98	
pH	7.8	

CORYELL COUNTY

Event

Population in 1940: 500.

Source of information:
Jack Elam, owner.
June 4, 1946

Owner: Jack Elam.

Source of supply: 2 wells.

Well 1. At elevated tank; drilled in 1936, depth 500 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; yield 9 gallons a minute; temperature 72° F.

Well 2. One block north of Well 1; drilled in 1944 by Edward Dyson, depth 450 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; yield 5 gallons a minute.

Pumpage: No record.

Storage: Elevated tank, 5,500 gallons.

Number of customers: 100.

Treatment: None.

Analysis of water:

Date collected: June 4, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO)	65	
Iron (Fe)	0.52	
Calcium (Ca)	16	0.80
Magnesium (Mg)	10	0.82
Sodium (Na)	412	17.90
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	352	5.77
Sulfate (SO_4)	334	6.95
Chloride (Cl)	246	6.94
Fluoride (F)	1.8	0.09
Nitrate (NO_3)	5.0	0.08
Dissolved solids	1,280	
Total hardness as $CaCO_3$	81	
pH	7.9	

CORYELL COUNTY

Gatesville

Population in 1940: 3,177.

Source of information:
Otho Johnson, water superintendent
June 4, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 2. East of pump station; drilled, depth 768 feet, diameter 8 inches; deep-well turbine pump and 20-horsepower electric motor; static water level reported 138 feet below land surface; yield 380 gallons a minute.

Well 3. North of pump station; drilled, depth 786 feet, diameter 10 to 8 inches; deep-well turbine pump and 20-horsepower electric motor; yield 440 gallons a minute.

Pumpage (estimated): 400,000 gallons a day.

Storage: Ground reservoir at pumping station, 96,000 gallons; elevated tank, 102,000 gallons.

Treatment: None.

Analysis of water:

Date collected: June 4, 1946 — Analyzed by C. B. Cibulka

	Well 3	
	Parts per million	Equivalents per million
Silica (SiO_2)	10	
Iron (Fe)	0.05	
Calcium (Ca)	7.8	0.39
Magnesium (Mg)	4.4	0.36
Sodium (Na)	435	18.90
Potassium (K)	22	0.56
Bicarbonate (HCO_3)	448	7.34
Sulfate (SO_4)	211	4.39
Chloride (Cl)	293	8.26
Fluoride (F)	3.0	0.16
Nitrate (NO_3)	4.0	0.06
Dissolved solids	1,210	
Total hardness as $CaCO_3$	38	
pH	8.0	

CORYELL COUNTY

Gatesville -- Continued

Drillers' log:

City well at swimming pool in City Park

	Thickness (feet)	Depth (feet)
Sand and clay	12	12
Gray limestone	348	360
Sandy limestone	25	385
Blue shale	5	390
Sandy lime	33	423
Water sand	14	437
Sandy shale	10	447
Water sand (Trinity)	19	466
Marly clay	4	470
Red clay	70	540
Water sand	10	550
Pink shale	33	583
Water sand	8	591
Sandy shale	39	630
Water sand and gravel	23	653
Red shale	17	670
Shale (top of Strawn)	30	700

Oglesby

Population in 1940: 360.

Source of information:
Mrs. F. B. Lam
June 3, 1946

Owner: F. B. Lam.

Source of supply: Well at elevated tank; drilled about 1935, depth 1,187 feet, diameter 6 inches; deep-well turbine pump and natural gas motor.

Pumpage (estimated): Average 11,500 gallons a day.

Storage: Elevated tank, 11,500 gallons.

Number of customers: 125.

Treatment: None.

CORYELL COUNTY

Oglesby -- Continued

Analysis of water:

Date collected: June 3, 1946 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.20	
Calcium (Ca)	8.1	0.40
Magnesium (Mg)	7.3	0.60
Sodium(Na)	402	17.48
Potassium (K)	27	0.69
Bicarbonate (HCO_3)	493	8.10
Sulfate (SO_4)	300	6.25
Chloride (Cl)	166	4.68
Fluoride (F)	2.2	0.12
Nitrate (NO_3)	1.5	0.02
Dissolved solids	1,170	
Total hardness as $CaCO_3$	50	
pH	8.5	

DENTON COUNTY

Denton

Population in 1940: 11,192.

Source of information:
L. R. Burrow, water and light superintendent
Feb. 26, 1944.

Ownership: Municipal.

Source of supply: 5 wells.

Well 1. At northwest corner of power plant, drilled in 1937, depth 1,142 feet, diameter 8-5/8 to 5-3/16 inches, casing perforated from 980 to 1,140 feet; deep-well turbine pump and 30-horsepower electric motor, pump set at 450 feet; yield 137 gallons a minute; temperature 78° F.

Well 2. About 50 feet southeast of power plant, drilled about 1937, depth about 1,142 feet, diameter 6-5/8 to 5-3/16 inches; deep-well turbine pump and 30-horsepower electric motor, pump set at 450 feet; yield 138 gallons a minute; temperature 82° F.

Well 3. North of Ward School, drilled in 1939 by J. L. Myers and Sons, depth 1,195 feet, diameter 10 to 8¼ inches, casing perforated from 1,045 to 1,195; deep-well turbine pump and 100-horsepower electric motor, pump set at 500 feet; reported, static water level 200 feet below land surface and yield 490 gallons a minute with drawdown of about 200 feet in 1939; present yield 486 gallons a minute; temperature 78° F.

Well 4. On McKinney Street, three blocks north of power plant, depth about 1,142 feet, diameter 13-3/8 to 10-3/4 inches; deep-well turbine pump and 200-horsepower electric motor, pump set at 450 feet; yield 400 gallons a minute.

Well 5. On Sherman Drive near Bell Street, drilled in 1940 by J. L. Myers and Sons, depth 1,132 feet, diameter 8 to 7 inches, casing perforated below 1,029 feet; deep-well turbine pump and 100-horsepower electric motor, pump set at 550 feet; yield 286 gallons a minute.

West Denton Well. At corner of Prairie Street and Avenue D, drilled in 1930 by Q. D. Lewis, depth 1,156 feet (originally drilled to 1,374 feet and plugged back); diameter 15 to 12 inches; casing perforated from 1,058 to 1,156 feet, unused; reported salty water.

DENTON COUNTY

Denton -- Continued

Pumpage: (Average in gallons a day)

	1934	1935	1936	1937	1938	1939
Jan.	670,000	824,000	847,000	932,000	922,000	726,000
Feb.	712,000	712,000	934,000	826,000	843,000	818,000
Mar.	663,000	819,000	908,000	806,000	913,000	910,000
Apr.	686,000	846,000	1,090,000	910,000	854,000	847,000
May	821,000	817,000	1,020,000	1,070,000	951,000	1,080,000
June	1,350,000	947,000	1,320,000	1,180,000	1,100,000	1,110,000
July	1,460,000	1,180,000	1,330,000	1,360,000	1,220,000	1,440,000
Aug.	1,290,000	1,200,000	1,580,000	1,200,000	1,320,000	1,350,000
Sept.	776,000	862,00	1,060,000	840,000	1,130,000	1,290,000
Oct.	954,000	924,000	930,000	884,000	1,130,000	1,120,000
Nov.	1,050,000	912,000	952,000	800,000	917,000	977,000
Dec.	688,000	824,000	840,000	755,000	714,000	855,000

	1940	1941	1942	1943	1944
Jan.	1,030,000	1,040,000	1,240,000	1,040,000	1,350,000
Feb.	996,000	1,040,000	1,250,000	1,100,000	
Mar.	978,000	1,040,000	1,300,000	1,360,000	
Apr.	1,120,000	1,100,000	1,310,000	1,490,000	
May	1,220,000	1,230,000	1,380,000	1,540,000	
June	1,180,000	1,250,000	1,400,000	1,760,000	
July	1,250,000	1,640,000	1,750,000	1,810,000	
Aug.	1,300,000	1,680,000	1,500,000	1,870,000	
Sept.	1,200,000	1,490,000	1,350,000	1,390,000	
Oct.	1,200,000	1,490,000	1,210,000	1,410,000	
Nov.	1,070,000	1,400,000	1,080,000	1,350,000	
Dec.	974,000	1,290,000	926,000	1,220,000	

Storage: Concrete ground reservoir, 1,000,000 gallons; elevated tank, 300,000 gallons.

Number of customers: 4,200.

Treatment: Chlorination.

DENTON COUNTY

Denton -- Continued

Analyses of water:

Date collected: Feb. 28, 1944 — Analyzed by J. H. Rowley

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		16	
Iron (Fe)	.01		.02	
Calcium (Ca)	2.2	0.11	1.8	0.09
Magnesium (Mg)	1.9	.16	.4	.03
Sodium (Na)	227	9.85	231	10.03
Potassium (K)	5.3	.14	5.4	.14
Bicarbonate (HCO_3)	445	6.02	433	5.56
Sulfate (SO_4)	106	2.21	110	2.29
Chloride (Cl)	26	.73	30	.85
Fluoride (F)	.5	.03	.5	.03
Nitrate (NO_3)	0	.00	1.8	.03
Dissolved solids	603		610	
Total hardness as $CaCO_3$	14		6	
pH	8.3		8.2	

	Well 3		Well 5	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		16	
Iron (Fe)	.01		.01	
Calcium (Ca)	2.0	0.10	2.2	0.11
Magnesium (Mg)	.5	.04	.8	.07
Sodium (Na)	226	9.82	193	8.39
Potassium (K)	5.8	.15	3.4	.09
Bicarbonate (HCO_3)	417	5.10	379	5.03
Sulfate (SO_4)	114	2.37	93	1.94
Chloride (Cl)	30	.85	18	.51
Fluoride (F)	.5	.03	.1	.01
Nitrate (NO_3)	1.8	.03	0	.00
Dissolved solids	599		513	
Total hardness as $CaCO_3$	7		9	
pH	8.2		7.9	

DENTON COUNTY

Denton -- Continued

Drillers' logs:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	6	6	Hard sand	12	772
Yellow clay	22	28	Blue shale	3	775
Lime	14	42	White lime	23	798
Blue shale	58	100	Blue shale	17	815
Sandy shale	10	110	Hard sandy shale	13	828
Blue shale	100	210	Blue shale	7	835
Blue lime	150	360	Hard white sand	22	857
Black shale	40	400	Shale and shells	32	889
White lime	70	470	Blue shale	45	934
Putty sand	30	500	Hard lime	7	941
White sand	25	525	Blue shale	29	970
Putty sand	15	540	Shale	16	986
Pink and red gumbo	20	560	White lime and sand	21	1007
Hard sand	20	580	Sand	13	1020
Putty sand	20	600	White sand	7	1027
Hard sand	75	675	Sand	8	1035
Putty sand	5	680	Blue shale	5	1040
White lime	2	682	Prime shale	3	1043
Gumbo	5	687	Water sand	57	1100
Sandy lime	35	722	Broken sand	20	1120
White shale	8	730	Coarse-grained sand	20	1140
Sand	15	745	Shale	2	1142
Hard lime	15	760			

DENTON COUNTY

Denton -- Continued

Well 5

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	3	3	Sand rock	11	707
Red clay	12	15	Mixed shale	7	714
Sands	27	42	Mixed sandy shale	51	765
Gray shale	12	54	Gray shale	4	769
Gray rock	4	58	Hard sand	13	782
Gray shale	2	60	Lime rock	4	786
Sand	3	63	Gray shale	4	790
Gray shale	97	160	Green putty sand	6	796
Brown shale	10	170	Blue shale	9	805
Mixed rocky shale	150	320	Sandy lime	17	822
Hard rock	62	382	Blue sandy shale	5	827
Rock	8	390	Water sand	12	839
Black shale	28	418	Gray shale	31	870
Chalk rock	80	498	Lime rock	6	876
Sand	17	515	Hard sand	15	891
Lime rock	2	517	Green gumbo	2	893
Sand rock	11	528	Lime rock	7	900
Lime rock	2	530	Red shale	2	902
Gumbo, all colors	10	540	Lime rock	3	905
Sandy shale	7	547	Mixed sandy shale	51	956
Putty shale	11	558	Sand	14	970
Lime rock	5	563	Sandy shale	3	973
Sandy shale	22	585	Lime rock	1	974
Hard rock	7	592	Mixed shale	21	995
Sandy ----	8	600	Sandy shale	6	1001
Rock	6	606	Gray shale	10	1011
Sandy ----	11	617	Fine-grained sand	19	1030
Sand rock	13	630	Sand rock	5	1035
Sandy shale	7	637	Hard and soft sand	79	1114
Rock	2	639	Hard sand	2	1116
Shale	13	652	Gray shale	11	1127
Hard sand	40	692	Red shale	5	1132
Lime	4	696			

DENTON COUNTY

Denton -- Continued

West Denton Well

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Soft yellow clay	22	22	Hard gray lime	10	825
Soft blue shale	28	50	Blue shale	5	830
Soft blue sand	17	67	Light sandy shale	15	845
Soft gray sand	3	70	Blue shale	5	850
Soft gray shale	20	90	Hard gray lime	13	863
Hard gray lime	20	110	Soft blue shale	12	875
Blue shale	20	130	Hard gray lime	4	879
Soft gray sand	5	135	Soft blue shale	9	888
Soft blue shale	38	173	Hard gray lime	12	900
Hard gray lime	7	180	Soft blue shale	5	905
Soft blue shale	17	197	Hard white sand	2	907
Hard white lime	8	205	Soft white sand	19	926
Soft brown shale	30	235	Soft red shale	4	930
Hard gray lime	7	242	Hard white lime	20	950
Soft blue shale	13	255	Soft pink sand	20	970
Soft brown shale	17	272	Soft blue shale	14	984
Hard blue lime	58	330	Soft gray sand	8	992
Hard gray lime	85	415	Shale	6	998
Blue lime-shale	10	425	Soft blue shale	8	1006
Soft blue shale	20	445	Sandy shale	10	1010
Hard gray lime	50	495	Hard white sand	9	1025
Hard white lime	15	510	Soft blue shale	5	1035
Hard shell rock	20	530	Soft white sand	7	1042
Soft white sand	25	555	Sandy shale	16	1058
Soft blue shale	5	560	Hard blue sand	4	1062
Hard gray sand	4	564	Hard gray lime	16	1078
Soft gray shale	8	572	Sandy shale	7	1085
Soft white sand	8	580	White sand	7	1092
Tough gray shale	37	617	Hard white lime	9	1101
Soft white sand	13	630	Soft pink sand	4	1105
Hard white sand	3	633	Hard white sand	3	1108
Soft white water sand	47	680	Soft white sand	12	1120
Hard gray sand	18	698	Soft blue shale	3	1123
Hard blue shale	5	703	Soft pink sand	11	1134
Hard gray sand	19	722	Soft blue shale	11	1145
Hard red shale	4	726	Pink sand	11	1156
Hard brown lime	6	732	White shale	24	1180
Soft gray sand	6	738	Soft pink sand	12	1192
Hard white sand	18	756	Hard pink sand	36	1228
Hard gray lime	4	760	Blue shale	6	1234
Soft blue shale	6	766	Red shale	5	1239
Hard gray sand	14	780	Pink sand	3	1242
Soft blue shale	4	784	Red shale	5	1247
Hard gray sand	11	795	Blue shale	5	1252
Soft blue shale	20	815	Red shale	8	1260

DENTON COUNTY

Denton -- Continued

West Denton Well -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Herd gray lime	7	1267	Soft gray sand	31	1342
Soft gray sand	3	1270	Herd gray lime	6	1348
Soft brown shale	14	1284	Soft blue shale	6	1354
Soft gray sand	7	1291	Green sandy shale	10	1364
Herd gray sand	11	1302	Soft gray sand	10	1374
Soft white sand	9	1311			

EASTLAND COUNTY

Cisco

Population in 1940: 4,868.

Source of information:
Geo. W. Downie, city secretary
Nov., 1945

Ownership: Municipal.

Source of supply: Lake Cisco, three miles north of Cisco on north and west Sendy Creeks; capacity of reservoir, 40,000 acre feet, constructed in 1921.

Pumpage: (Average in gallons a day)

	1944
Jan.	420,000
Feb.	420,000
Mar.	465,000
Apr.	660,000
May	557,000
June	900,000
July	1,130,000
Aug.	1,130,000
Sept.	-
Oct.	480,000
Nov.	557,000
Dec.	-

Storage: Two concrete standpipes, 165,000 gallons each; one steel standpipe, 47,000 gallons.

Treatment: Aeration, chlorination, part time treatment with alum and lime, activated carbon settling and filtration.

Analyses of water:

Date collected: Nov., 1945 Analyzed by J. H. Rowley

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	9.7		8.3	
Iron (Fe)	0.10		0.05	
Calcium (Ca)	40	1.997	40	1.997
Magnesium (Mg)	5.6	0.461	5.8	0.477
Sodium (Na)	9.8	.424	6.0	.263
Potassium (K)			4.7	0.120
Bicarbonate (HCO_3)	121	1.983	116	1,901
Sulfate (SO_4)	21	0.437	21	0.437
Chloride (Cl)	16	0.451	18	0.508
Fluoride (F)	0.2	0.011	0.2	0.011
Nitrate (NO_3)	0.0	0.000	0.0	0.000
Dissolved solids	175		175	
Total hardness as $CaCO_3$	123		124	
pH			7.3	

EASTLAND COUNTY

Desdemone

Population in 1940: 198.

Source of information:
W. H. Davis, owner
Feb. 6, 1946

Owner: W. H. Davis.

Source of supply: 2 wells.

Well 1. Drilled about 1932, depth 80 feet, diameter 6 inches, deep-well cylinder and pump jack, static water level reported 60 feet below surface in 1945.

Well 2. Forty feet south of well 1, drilled about 1932, depth 80 feet, diameter 6 inches, deep-well cylinder and pump jack.

Pumpage: No data.

Treatment: None.

Analysis of water:

Date collected: Feb. 6, 1946 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	13	
Iron (Fe)	0.0	
Calcium (Ca)	117	5.84
Magnesium (Mg)	11	0.90
Sodium (Na)	26	1.12
Potassium (K)	6.1	0.16
Bicarbonate (HCO_3)	324	5.31
Sulfate (SO_4)	20	0.42
Chloride (Cl)	76	2.14
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	9.4	0.15
Dissolved solids	450	
Total hardness as $CaCO_3$	337	
pH	7.2	

EASTLAND COUNTY

Eastland

Population in 1940: 3,849.

Source of information:
A. L. LeClaire, water superintendent
Nov., 1945

Ownership: Municipal.

Source of supply: Lake Eastland, about one mile northwest of the city on the north fork of the Leon River; reservoir capacity, 1900 acre feet. (Lake dry in 1930).

Pumpage: (Average in gallons a day)

Jan.	390,000
Feb.	368,000
Mar.	344,000
Apr.	427,000
May	438,000
June	778,000
July	768,000
Aug.	854,000
Sept.	454,000
Oct.	394,000
Nov.	350,000
Dec.	357,000

Storage: Two standpipes on hill, total capacity, 950,000 gallons.

Number of customers: 1,062.

Treatment: Alum, lime, chlorination, lime and ammonia chloride, activated carbon at times, settling, no filtration.

Analyses of water:

Date collected: Nov., 1945 — Analyzed by J. H. Rowley

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	7.3		3.1	
Iron (Fe)	0.75		0.04	
Calcium (Ca)	27	1.348	34	1.697
Magnesium (Mg)	3.1	0.255	3.4	0.280
Sodium (Na)	11		7.2	.313
Potassium (K)		.494	5.4	0.138
Bicarbonate (HCO_3)	88	1.442	54	0.893
Sulfate (SO_4)	10	0.208	48	0.999
Chloride (Cl)	15	0.423	19	0.536
Fluoride (F)	0.4	0.021	0.0	0.000
Nitrate (NO_3)	0.2	0.003	0.0	0.000
Dissolved solids	158		158	
Total hardness as $CaCO_3$	80		99	
pH	7.1		8.8	

EASTLAND COUNTY

Gorman

Population in 1940: 1,157.

Source of information:
B. C. Eppler, water superintendent
Feb. 6, 1946

Ownership: Municipal.

Source of supply: 5 wells.

Well 1. At city pumping station, drilled in 1944 by Charles Gordon, depth 100 feet, diameter 6 inches; deep-well cylinder and pump jack; yield 25 gallons a minute.

Well 2. Forty feet north of well 1, dug about 1914, depth 84 feet, diameter 6 feet, brick curb, two deep-well cylinders and pump jacks; yield 30 gallons a minute each.

Well 4. Forty feet north of well 2, drilled in 1920 by Bradford Brothers, depth 120 feet, diameter 10 inches; deep-well cylinder pump jack; yield 30 gallons a minute.

Well 5. One hundred fifty feet northeast of well 4, drilled in 1924 by Bradford Brothers, depth 106 feet, diameter 8 inches; deep-well cylinder and pump jack; yield 30 gallons a minute.

Well 6. Sixty feet north of well 5, drilled in 1924 by Bradford Brothers, depth 106 feet, diameter 8 inches; deep-well cylinder and pump jack, static water level reported 40 feet below the surface when well was repaired in 1945; yield 25 gallons a minute.

Pumpage: 150,000 gallons a day in summer, 85,000 gallons a day in winter.

Storage: Elevated tank, 100,000 gallons, concrete ground storage reservoir, 19,000 gallons.

Treatment: None.

EASTLAND COUNTY

Gorman -- Continued

Analyses of water:

Date collected: Feb. 6, 1946 — Analyzed by C. B. Cibulka

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	10		14	
Iron (Fe)	0.30		0.16	
Calcium (Ca)	226		285	
Magnesium (Mg)	15		17	
Sodium (Na)	91		116	
Potassium (K)	13		10	
Bicarbonate (HCO_3)	402		408	
Sulfate (SO_4)	45		89	
Chloride (Cl)	311		409	
Fluoride (F)	0.0		0.0	
Nitrate (NO_3)	30		54	
Dissolved solids	939		1,200	
Total hardness as $CaCO_3$	626		782	
pH	7.2			

Date collected: Feb. 6, 1946 — Analyzed by C. B. Cibulka

	Well 6	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.08	
Calcium (Ca)	181	9.03
Magnesium (Mg)	14	1.15
Sodium (Na)	30	1.30
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	396	6.49
Sulfate (SO_4)	45	0.94
Chloride (Cl)	147	4.15
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	13	0.21
Dissolved solids	742	
Total hardness as $CaCO_3$	509	
pH	7.2	

EASTLAND COUNTY

Ranger

Population in 1940: 4,553.

Source of information:
M. H. Alexander, plant operator
Nov., 1945

Ownership: Municipal.

Source of supply: Lake Hagaman, at head of Palo Pinto Creek, two and one-half miles northeast of Ranger; capacity of lake, about 1,250 acre feet.

Pumpage: (Average in gallons a day)

	1943	1944	1945
Jan.	293,000	249,000	278,000
Feb.	298,000	245,000	287,000
Mar.	294,000	310,000	302,000
Apr.	308,000	281,000	281,000
May	335,000	282,000	317,000
June	402,000	376,000	391,000
July	510,000	390,000	413,000
Aug.	506,000	412,000	470,000
Sept.	327,000	278,000	-
Oct.	280,000	266,000	247,000
Nov.	238,000	282,000	-
Dec.	226,000	268,000	-

Storage: Clear well at pumping station, 50,000 gallons; standpipe on hill, 500,000 gallons.

Number of customers: 1,150.

Treatment: Aeration, pre-chlorination, alum and lime, settling, rapid filtration, post-chlorination.

EASTLAND COUNTY

Ranger -- Continued

Analyses of water:

Date collected: Nov., 1945 — Analyzed by J. H. Rowley

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	5.0		2.0	
Iron (Fe)	0.11		0.04	
Calcium (Ca)	39	1.947	44	2.196
Magnesium (Mg)	6.2	0.510	6.8	0.559
Sodium (Na)	38	1.660	32	1.372
Potassium (K)			4.9	0.125
Bicarbonate (HCO_3)	102	1.672	91	1.492
Sulfate (SO_4)	18	0.375	35	0.729
Chloride (Cl)	73	2.059	72	2.031
Fluoride (F)	0.2	0.011	0.0	0.000
Nitrate (NO_3)	0.0	0.000	0.0	0.000
Dissolved solids	248		263	
Total hardness as $CaCO_3$	123		138	
pH	7.2		7.3	

EASTLAND COUNTY

Rising Star

Population in 1940: 1,198.

Source of information:
C. F. Carroll, water superintendent
Jan. 4, 1946

Ownership: Municipal.

Source of supply: 5 wells.

Well 1. At city hall drilled in 1922, depth 70 feet, diameter 10 inches; deep-well turbine pump and 7½-horsepower electric motor; static water level reported 20 feet below surface; yield 30 gallons a minute.

Well 2. One block southwest of city hall, dug in 1933, depth 60 feet, diameter 5 feet; jet pump and 3-horsepower electric motor; yield 20 gallons a minute.

Well 3. Five blocks west of city hall, drilled about 1940, depth 70 feet, diameter 6 inches; deep-well turbine pump and 3-horsepower electric motor; yield 30 gallons a minute.

Well 4. Seven blocks northwest of city hall, drilled in 1941, depth 75 feet, diameter 8 inches; deep-well turbine pump and 3-horsepower electric motor; yield 30 gallons a minute.

Well 5. Two blocks south of city hall, drilled in 1944, depth 75 feet, diameter 6 inches; deep-well turbine pump and 3-horsepower electric motor; yield 30 gallons a minute.

Pumpage: 187,000 gallons a day in summer, estimated 130,000 gallons a day in winter.

Storage: Elevated tank, 55,000 gallons.

Number of customers: 300.

Treatment: None.

EASTLAND COUNTY

Rising Star -- Continued

Analyses of water:

Date collected: Feb. 4, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	16	
Iron (Fe)	0.04	
Calcium (Ca)	98	4.80
Magnesium (Mg)	46	3.78
Sodium (Na)	30	1.29
Potassium (K)	5.6	0.14
Bicarbonate (HCO_3)	398	6.52
Sulfate (SO_4)	30	0.62
Chloride (Cl)	105	2.96
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	0.0	0.00
Dissolved solids	569	
Total hardness as $CaCO_3$	434	
pH	7.3	

Date collected: Feb. 4, 1946 — Analyzed by C. B. Cibulka

	Well 5	
	Parts per million	Equivalents per million
Silica (SiO_2)	22	
Iron (Fe)	0.08	
Calcium (Ca)	111	5.54
Magnesium (Mg)	30	2.47
Sodium (Na)	106	4.62
Potassium (K)	9.3	0.24
Bicarbonate (HCO_3)	426	6.98
Sulfate (SO_4)	62	1.29
Chloride (Cl)	143	4.03
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	35	0.56
Dissolved solids	883	
Total hardness as $CaCO_3$	400	
pH	7.0	

ERATH COUNTY

Dublin

Population in 1940: 2,546.

Source of information:
W. M. Fewell, city secretary
Nov., 1945

Ownership: Municipal.

Source of supply: 5 wells, all at City pumping station.

Well 1. Drilled about 1911, depth about 500 feet, diameter 8 to 6 inches; deep-well turbine pump; yield 90 gallons a minute.

Well 2. Drilled about 1911, depth 330 feet, diameter 6 inches; deep-well cylinder and steam engine, (abandoned).

Well 3. Drilled, depth about 350 feet, diameter 6 inches; deep-well cylinder and steam engine.

Well 4. Drilled, depth 330 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 80 gallons a minute.

Well 5. Owned by Missouri-Kansas and Texas Railroad Company (used by City), depth about 330 feet, diameter 8 inches; deep-well turbine pump; yield 76 gallons a minute.

Frisco well. East of railroad station, drilled in 1944, depth 106 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 75 gallons a minute.

Pumpage: No record.

Storage: Standpipe 60,000 gallons; two concrete ground storage reservoirs, capacity unknown.

Number of customers: 750.

Treatment: None.

ERATH COUNTY

Dublin -- Continued

Analyses of water:

Date collected: Nov., 1945 — Analyzed by C. B. Cibulka

	Well 4		Frisco Well	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	15		11	
Iron (Fe)	0.4		0.10	
Calcium (Ca)	79	3.94	204	10.18
Magnesium (Mg)	33	2.71	8.3	0.68
Sodium (Na)	11	0.47	18	0.80
Potassium (K)	4.1	0.10	7.4	0.19
Bicarbonate (HCO_3)	380	6.23	332	5.44
Sulfate (SO_4)	22	0.46	132	2.75
Chloride (Cl)	17	0.48	59	1.66
Fluoride (F)	0.2	0.01	0.0	0.00
Nitrate (NO_3)	2.2	0.04	124	2.00
Dissolved solids	371		778	
Total hardness as $CaCO_3$	332		543	
pH	6.9		7.3	

ERATH COUNTY

Stephenville

Population in 1940: 4,768.

Source of information:
J. P. Anderson, water superintendent
Nov., 1945

Ownership: Municipal.

Source of supply: Five wells.

Well 1. At elevated tank, drilled in 1924 by W. A. Walker, depth 600 feet, diameter 10 to 8 inches: pumped with air; static water level 256 feet; yield 200 gallons a minute with drawdown of 31 feet.

Well 2. North of ground storage reservoir, drilled in 1932 by W. A. Walker, depth 372 feet, diameter 10 inches; deep-well turbine pump and 30-horsepower electric motor; yield 250 gallons a minute.

Well 3. West of ground storage reservoir, drilled in 1938 by J. B. Tetum; depth 370 feet, diameter 12½ inches; deep-well turbine pump and 40-horsepower electric motor; yield 300 gallons a minute.

Well 4. One block northeast of pumping station, drilled in 1940 by F. E. Thate; depth 370 feet, diameter 10 inches; deep-well turbine pump and 30-horsepower electric motor; yield 250 gallons a minute.

Well 5. 500 feet northwest of pumping station, drilled in 1943 by C. Calloway, depth 370 feet, diameter 10 inches; deep-well turbine pump and 40-horsepower electric motor; yield 300 gallons a minute.

Pumpage (estimated): Maximum, 1,250,000 gallons a day; winter average about 800,000 gallons a day.

Storage: Elevated tank, 100,000 gallons; ground storage reservoir, 750,000 gallons.

Number of customers: 1,740.

Treatment: None.

ERATH COUNTY

Stephenville -- Continued

Analyses of water:

Date collected: Nov., 1945 Analyzed by C. B. Cibulka

	Well 3		Well 5	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	16		16	
Iron (Fe)	0.10		0.10	
Calcium (Ca)	90	4.49	76	3.79
Magnesium (Mg)	38	3.12	29	2.38
Sodium (Na)	9.7	0.42	19	0.82
Potessium (K)	5.2	0.13	5.0	0.13
Bicarbonate (HCO_3)	383	6.28	341	5.59
Sulfate (SO_4)	39	0.81	27	0.56
Chloride (Cl)	36	1.02	33	0.93
Fluoride (F)	0.2	0.01	0.0	0.00
Nitrate (NO_3)	2.2	0.04	2.5	0.04
Dissolved solids	432		377	
Total hardness as $CaCO_3$	380		308	
pH	7.0		7.0	

Driller's log:

Well 3

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Top soil	6	6	Shale	16	168
Clay	6	12	Lignite	2	170
Lime	2	14	Dry sand	10	180
Shale	7	35	Red rock	4	184
Lime	7	42	Hard sand	26	210
Sand and water	3	45	Water	5	215
Shale	11	56	Shale	5	220
Lime	4	60	Dry sand	20	240
Broken lime	30	90	Clay and sand	33	273
Shale	8	98	Red bed	3	276
Shale	17	115	Sand and water	14	290
Broken lime	23	138	Blue shale	10	300
Shale	10	148	Red bed	7	307
Red bed	4	152	Sand and gravel	44	351

FOARD COUNTY

Crowell

Population in 1940: 1,817.

Source of information:
H. N. Roberts, consulting engineer
June 21, 1945

Ownership: Municipal.

Source of supply: 6 wells about 8 miles north-northeast of Crowell and about 2 miles north-northeast of Margaret.

Well 1. On extreme end of east work of pipe line from Margaret pumping station; drilled in 1944 by Bud Daniel, depth 29 feet, diameter 12 inches, gravel walled to 42 inches; deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Well 2. 300 feet west of well 1; drilled in 1944 by Bud Daniel, depth 37 feet, diameter 12 inches, gravel walled to 42 inches; deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Well 3. 300 feet west of well 2; drilled in 1944 by Bud Daniel, depth about 30 feet, diameter 12 inches, gravel walled to 42 inches; deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Well 4. Center well of group of 3 wells on north fork of pipe line from Margaret pumping station; drilled in 1944 by Bud Daniel, depth 27.5 feet, diameter 12 inches; gravel walled to 42 inches, deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Well 5. 300 feet north of well 4; drilled in 1944 by Bud Daniel, depth 27.5 feet, diameter 12 inches; gravel walled to 42 inches; deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Well 6. 300 feet south of well 4; drilled in 1944 by Bud Daniel, depth 25 feet, diameter 12 inches, gravel walled to 42 inches; deep-well turbine pump and one-horsepower electric motor; yield 20 gallons a minute.

Pumpage:

(Average in gallons a day)

	1945
Jan.	85,000
Feb.	70,000
Mar.	64,000
Apr.	64,000
May	106,000
June	131,000

FOARD COUNTY

Crowell -- Continued

Storage: Concrete ground reservoir at Margaret pumping station, 50,000 gallons; concrete ground reservoir at Crowell, 50,000 gallons; elevated tank, 75,000 gallons.

Number of customers: 402.

Treatment: Chlorination.

Analyses of water:

Date collected: June 21, 1945 Analyzed by J. H. Rowley

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	17		19	
Iron (Fe)	0.05		0.10	
Calcium (Ca)	62	3.09	90	4.49
Magnesium (Mg)	26	2.14	36	2.96
Sodium & Potassium (Na + K)	23	0.99	51	2.20
Bicarbonate (HCO_3)	265	4.34	300	4.92
Sulfate (SO_4)	56	1.17	131	2.73
Chloride (Cl)	11	0.31	40	1.13
Fluoride (F)	1.0	0.05	1.0	0.05
Nitrate (NO_3)	22	0.35	51	0.82
Dissolved solids	349		573	
Total hardness as $CaCO_3$	262		372	
pH	7.5		7.6	

	Well 5	
	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	0.05	
Calcium (Ca)	68	3.39
Magnesium (Mg)	41	3.37
Sodium & Potassium (Na + K)	43	1.85
Bicarbonate (HCO_3)	317	5.20
Sulfate (SO_4)	88	1.83
Chloride (Cl)	29	0.82
Fluoride (F)	1.0	0.05
Nitrate (NO_3)	44	0.71
Dissolved solids	487	
Total hardness as $CaCO_3$	338	
pH	7.7	

FOARD COUNTY

Crowell -- Continued

Driller's log:

Test well No. 33

	Thickness (feet)	Depth (feet
Gray sand	5	5
Sandy red clay	5	10
Coarse-grained red sand	2	12
Red sand and pea gravel	2	14
White sand and pea gravel	4	18
Red clay and pea gravel	1	19
Grey sand and gravel	1	20
Tan colored sand	4	24
Coarse-grained sand and gravel	4	28
Fine-grained water sand	2	30
Sand and gravel	9	39
Birds eye clay	1	40

Water level 19.9 feet below land surface Nov. 4, 1940

Gillespie County

Fredericksburg

Population in 1940: 3,544.

Source of information:
Herman Rusche, assistant water superintendent
May 17, 1946

Ownership: Municipal.

Source of supply: 4 wells 5 miles southeast of town near the river.

Well 1. Drilled by Layne-Texas Company, depth 210 feet, diameter 16 to 8-5/8 inches; deep-well turbine pump and 7½-horsepower electric motor; static water level 42 feet below land surface April 14, 1939; yield 145 gallons a minute with a drawdown of 23 feet after 6 hours of pumping; temperature 68° F.

Well 2. Drilled in 1935 by Layne-Texas Company, depth 39 feet, diameter 8 inches, gravel walled to a diameter of 40 inches; well tested at 350 gallons a minute, not used at present; static water level 28 feet below land surface Nov. 27, 1935.

Well 3. Drilled in 1939 by Layne-Texas Company, depth 260 feet, diameter 15 to 12 inches; deep-well turbine pump and 20-horsepower electric motor; yield 550 gallons a minute with drawdown of 9 feet after 9 hours of pumping.

Well 4. Drilled in 1944 by Layne-Texas Company, depth 260 feet, diameter 16 to 12-3/4 inches; deep-well turbine pump and 30-horsepower electric motor; static water level 51.27 feet below land surface April 17, 1946; yield 550 gallons a minute with drawdown of 11 feet.

Pumpage: Average 200,000 gallons a day.

Storage: Concrete ground reservoir, 300,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 802.

Treatment: None.

GILLESPIE COUNTY

Fredericksburg -- Continued

Analyses of water:

Dete collected: May 17, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.88	
Calcium (Ca)	92	4.59
Magnesium (Mg)	47	3.87
Sodium (Na)	35	1.51
Potassium (K)	7.8	0.20
Bicarbonate (HCO_3)	358	5.87
Sulfate (SO_4)	36	0.75
Chloride (Cl)	117	3.30
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	14	0.23
Dissolved solids	578	
Total hardness as $CaCO_3$	423	
pH	7.7	

	Well 2		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	15		17	
Iron (Fe)	0.12		2.3	
Calcium (Ca)	96	4.79	121	6.04
Magnesium (Mg)	47	3.87	55	4.52
Sodium (Na)	32	1.38	66	2.85
Potassium (K)	7.4	0.19	10	0.26
Bicarbonate (HCO_3)	357	5.85	412	6.75
Sulfate (SO_4)	36	0.75	53	1.10
Chloride (Cl)	120	3.38	192	5.42
Fluoride (F)	0.2	0.01	0	0.00
Nitrate (NO_3)	15	0.24	25	0.40
Dissolved solids	583		827	
Total hardness as $CaCO_3$	433		528	
pH	7.4		7.0	

GILLESPIE COUNTY

Fredericksburg -- Continued

Driller's log:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Unreported	80	80	Yellow rock	5	162
Gravel	5	85	Blue rock	8	170
Lime	7	92	Yellow and blue lime	5	175
Yellow lime	28	120	Gray and yellow lime	5	180
Yellow rock	18	138	Yellow sand rock	25	205
Gray and yellow rock	19	157	Blue rock	5	210

Well 3

Soil and gravel	6	6	Grey lime	17	127
Sand	12	18	Yellow lime	28	155
Gravel	21	39	Pink rock	30	185
Red clay	46	85	Gray lime	3	188
Boulders and rock	5	90	Yellow lime	47	235
Hard limestone	6	96	Grey lime	4	239
Gray limestone	4	100	Pink limestone	16	255
Yellow lime	10	110	Honeycomb rock	5	260

Well 4

Surface soil	6	6	Grey lime	25	127
Sand	12	18	Yellow lime	30	157
Gravel	22	40	Pink rock	18	175
Red clay	44	84	Gray lime	8	183
Boulders and gravel	6	90	Yellow lime	47	230
Hard yellow lime	3	93	Grey lime	5	235
Yellow and gray lime	9	102	Pink rock	1	236
			Crevice	4	240

HAMILTON COUNTY

Fairy

Population in 1940: 117

Source of information:
M. E. Parks
Mar. 19, 1946

Owner: M. E. Parks and others.

Source of supply: Well 100 yards northwest of M. E. Parks General Store, drilled by W. L. Jones, depth 400 feet, diameter 6 inches; deep-well cylinder and windmill.

Pumpage: No record.

Storage: 2 elevated tanks, 5,000 and 7,500 gallons.

Number of customers: 10.

Treatment: None.

Analysis of water:

Date collected: Mar. 19, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.6	
Iron (Fe)	1.7	
Calcium (Ca)	24	1.20
Magnesium (Mg)	14	1.15
Sodium (Na)	158	6.85
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	284	4.66
Sulfate (SO_4)	158	3.29
Chloride (Cl)	52	1.47
Fluoride (F)	1.0	0.05
Nitrate (NO_3)	2.2	0.04
Dissolved solids	571	
Total hardness as $CaCO_3$	118	
pH	7.9	

HAMILTON COUNTY

Hamilton

Population in 1940: 2,725

Source of information:
Charles Taylor, city secretary
Mar. 19, 1946

Ownership: Municipal.

Source of supply: Lake on Two-Mile Creek 2 miles east of City, constructed about 1923; capacity 1,614 acre-feet.

Pumpage: Average 160,000 gallons a day.

Storage: Concrete reservoir ½ mile west of city limits, 120,000 gallons; elevated tank, 100,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 675.

Treatment: Chlorination.

Analysis of water:

Date collected: Mar. 19, 1946 — Analyzed by J. H. Rowley

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	7.8	
Iron (Fe)	0.22	
Calcium (Ca)	59	2.945
Magnesium (Mg)	5.2	0.428
Sodium (Na)	9.4	0.410
Potassium (K)	4.8	0.123
Bicarbonate (HCO_3)	183	3.000
Sulfate (SO_4)	25	0.520
Chloride (Cl)	13	0.367
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	0.5	0.008
Dissolved solids	226	
Total hardness as $CaCO_3$	169	
pH	8.0	

Hico

Population in 1940: 1,242

Source of information:
Roy Barnett, water superintendent
Mar. 19, 1946

Ownership: Municipal.

HAMILTON COUNTY

Hico -- Continued

Source of supply: 2 wells.

Well 1. Drilled to depth about 1,200 feet and plugged back to 350 feet, diameter 12 inches; deep-well double-acting cylinder and pump jack and electric motor; temperature 71° F.

Well 2. Drilled about 1915, depth 335 feet, diameter 7 inches; deep-well turbine pump and 15-horsepower electric motor; yield 140 gallons a minute.

Pumpage:

(Average in gallons a day)

	1945	1946
Jan.	51,000	65,000
Feb.	51,000	77,000
Mar.	49,000	
Apr.	105,000	
May	65,000	
June	75,000	
July	87,000	
Aug.	73,000	
Sept.	73,000	
Oct.	78,000	
Nov.	60,000	
Dec.	72,000	

Storage: Concrete settling basin, 100,000 gallons; 2 stand pipes 75,000 gallons each.

Number of customers:

Treatment: Aeration, coagulation, sedimentation, rapid sand filters and chlorination.

Analyses of water:

Date collected: Mar. 19, 1946 Analyzed by J. H. Rowley

	Well 1 (raw water)		Well 2 (finished water)	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		13	
Iron (Fe)	2.2		0.06	
Calcium (Ca)	70	3.49	6.1	0.304
Magnesium (Mg)	36	2.96	29	2.385
Sodium (Na)	20	0.89	34	1.4777
Potassium (K)	8.4	0.21	5.4	0.138
Bicarbonate (HCO_3)	350	5.74	150	2.452
Sulfate (SO_4)	47	0.98	49	1.020
Chloride (Cl)	29	0.82	29	0.818
Fluoride (F)	0.2	0.01	0.2	0.011
Nitrate (NO_3)	0.0	0.00	0.2	0.003
Dissolved solids	405			
Total hardness as $CaCO_3$	322			
pH	7.4		8.4	

HARDEMAN COUNTY

Chillicothe

Population in 1940: 1,423.

Source of information:
Earnest Tedmore, water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: 4 wells.

Well 1. Dug in 1917, depth 80 feet, diameter 18 feet; tri-plex cylinder pump and electric motor; static water level 40 feet below land surface; yield 100 gallons a minute.

Well 2. Dug in 1921, depth 75 feet, diameter 20 feet; tri-plex cylinder pump and electric motor; yield 400 gallons a minute.

Well 3. Dug in 1929, depth 50 feet, diameter 8 feet; deep-well turbine pump and electric motor; yield 200 gallons a minute.

Well 4. Drilled in 1946, depth 35 feet, diameter 12 inches; deep-well turbine pump and electric motor; yield 35 gallons a minute.

Pumpage (estimated): Summer 200,000 gallons a day, winter 75,000 gallons a day.

Storage: 4 concrete ground reservoirs, total capacity 150,000 gallons; 2 elevated tanks, 50,000 gallons each.

Number of customers: 500.

Treatment: Chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	26	3.99
Iron (Fe)	0.12	
Calcium (Ca)	80	3.99
Magnesium (Mg)	29	2.38
Sodium (Na)	57	2.49
Potassium (K)	4.2	0.11
Bicarbonate (HCO_3)	328	5.38
Sulfate (SO_4)	62	1.29
Chloride (Cl)	52	1.47
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	51	0.82
Dissolved solids	523	
Total hardness as $CaCO_3$	318	
pH	7.4	

HARDEMAN COUNTY

Quanah

Population in 1940: 3,767.

Source of information:
C. Lacy, manager
Sept. 20, 1946

Owner: Quanah Water Company

Source of supply: 7 wells in 2 well fields--1 well field 8 miles north of town and one well field 21 miles northeast of town along the Red River sand dunes.

Well field 8 miles north of town:

Well 1. Dug in 1924, depth 62 feet, diameter 5 feet; deep-well turbine pump and electric motor; yield 250 gallons a minute.

Well field 21 miles northeast of town:

Well 1. Drilled in 1931 by Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; static water level 23 feet below land surface; yield 100 gallons a minute.

Well 2. Drilled in 1931 by Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 100 gallons a minute.

Well 3. Drilled in 1931 by Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 100 gallons a minute.

Well 4. Drilled in 1939 by the Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 100 gallons a minute.

Well 5. Drilled in 1939 by the Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 100 gallons a minute.

Well 6. Drilled in 1939 by Southern Union Gas Company, depth 100 feet, diameter 8 inches; deep-well turbine pump and electric motor; yield 100 gallons a minute.

Pumpage: Summer 500,000 to 600,000 gallons a day, winter 300,000 to 450,000 gallons a day.

Storage: Ground storage reservoir, 500,000 gallons; elevated tank, 125,000 gallons.

Number of customers: 1,200.

Treatment: Chlorination.

HARDEMAN COUNTY

Quanah -- Continued

Analysis of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

	Composite sample	
	Parts per million	Equivalents per million
Silica (SiO_2)	16	
Iron (Fe)	0.07	
Calcium (Ca)	167	8.34
Magnesium (Mg)	33	2.71
Sodium (Na)	34	1.49
Potassium (K)	4.0	0.10
Bicarbonate (HCO_3)	264	4.33
Sulfate (SO_4)	332	6.91
Chloride (Cl)	28	0.79
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	38	0.61
Dissolved solids	809	
Total hardness as $CaCO_3$	552	
pH	7.4	

HASKELL COUNTY

Haskell

Population in 1940: 3,051.

Source of information:
J. Belton Duncan, city secretary
Mar. 17, 1944

Ownership: Municipal.

Source of supply: 5 wells.

Well 1. 3½ blocks south of court house; dug in 1906, depth 20 feet; standby well.

Well 2. 3½ blocks south of court house, just north of well 1; dug in 1906, depth 20 feet; standby well.

Well 3. 3 blocks west and 9½ blocks north of northwest corner of court house square; dug in 1926, depth 36 feet, diameter 20 feet; centrifugal pump and electric motor.

Well 4. One-half block south and one-half block west of southeast corner of court house square; dug by Mart Clifton in 1928, depth 28 feet, diameter 20 feet; centrifugal pump and electric motor, capacity 400 gallons a minute; static water level 19 feet below land surface on Mar. 17, 1944.

Well 5. One-half block south of southeast corner of court house square; dug by Mart Clifton in 1928, depth 28 feet, diameter 20 feet; centrifugal pump and electric motor, capacity 400 gallons a minute; static water level 19 feet below land surface on Mar. 17, 1944.

Pumpage (estimated): Average 500,000 gallons a day.

Storage: Elevated tank, 159,000 gallons.

Number of customers: 540.

Treatment: None.

HASKELL COUNTY

Haskell -- Continued

Analysis of water:

Date collected: Mar. 17, 1944 — Analyzed by J. H. Rowley

	Well 5	
	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.02	
Calcium (Ca)	151	7.54
Magnesium (Mg)	92	7.57
Sodium (Na)	221	9.60
Potassium (K)	10	0.26
Bicarbonate (HCO_3)	399	6.54
Sulfate (SO_4)	251	5.23
Chloride (Cl)	365	10.29
Fluoride (F)	1.2	0.06
Nitrate (NO_3)	177	2.85
Dissolved solids	1,490	
Total hardness as $CaCO_3$	756	
pH	7.6	

Rochester

Population in 1940: 611.

Source of information:
J. A. Hudspeth, water superintendent
Mar. 24, 1944

Ownership: Municipal.

Source of supply: Well at east side of elevated tank; dug in 1926, depth 54 feet, diameter 12 feet; deep-well turbine pump and 15-horsepower electric motor, pump set at 35 feet; static water level 15 feet below land surface on Mar. 24, 1944, reported static water level 46 feet below land surface when dug; yield 350 gallons a minute in 1944.

Storage: Elevated tank, 55,000 gallons.

Number of customers: 140.

Treatment: None.

HASKELL COUNTY

Rochester -- Continued

Analysis of water:

Date collected: Mar. 24, 1946 Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.14	
Calcium (Ca)	75	3.74
Magnesium (Mg)	17	1.40
Sodium (Na)	107	4.73
Potassium (K)	5.2	0.13
Bicarbonate (HCO_3)	333	5.46
Sulfate (SO_4)	59	1.23
Chloride (Cl)	43	1.21
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	129	2.08
Dissolved solids	623	
Total hardness as $CaCO_3$	257	
pH	7.6	

Driller's log:

	Thickness (feet)	Depth (feet)
Surface soil	4	4
Silt, sand and gravel (dry)	42	46
Sand and gravel (water)	8	54
Red beds	-	54

Rule

Population in 1940: 1,195.

Source of information:
J. Ben Sellers, water superintendent
Mar. 20, 1944

Ownership: Municipal.

Source of supply: Well at elevated tank; dug by D. H. Head in 1923, depth 45 feet, diameter 18 feet, curbed with concrete block 8 by 8 by 14 inches; centrifugal pump and 30-horsepower electric motor; static water level 32.0 feet below land surface on Mar. 20, 1944; reported static water level about 28 feet when dug; drawdown 8.5 feet after pumping 445 gallons a minute for 89 minutes on Mar. 21, 1944.

HASKELL COUNTY

Rule -- Continued

Pumpage: Average 96,000 gallons a day in 1943.

Storage: Eleveted tank, 55,000 gallons.

Number of customers: 285.

Treatment: Nonè.

Analysis of water:

Date collected: Mar. 21, 1944 Analyzed by J. H. Rowley

	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.05	
Calcium (Ca)	91	4.54
Magnesium (Mg)	24	1.97
Sodium (Na)	114	4.97
Potassium (K)	6.6	0.17
Bicarbonate (HCO_3)	362	5.93
Sulfate (SO_4)	57	1.19
Chloride (Cl)	73	2.06
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	152	2.45
Dissolved solids	717	
Total hardness as $CaCO_3$	326	
pH	7.8	

HOOD COUNTY

Granbury

Population in 1940: 1,166.

Source of information:
Jack Brown, city secretary
Aug. 13, 1942

Ownership: Municipal.

Source of supply: 4 wells.

Well 1. Drilled, depth 175 feet, diameter 6 inches; deep-well turbine pump and 10-horsepower electric motor; yield 75 gallons a minute.

Well 2. Drilled in 1933 by J. Hall, depth 160 feet; deep-well turbine and 7½-horsepower electric motor; yield 65 gallons a minute.

Well 3. Drilled in 1939 by Carlisle and Miller, depth 685 feet, diameter 10 to 6-5/8 inches; deep-well turbine pump and electric motor; yield 75 gallons a minute.

Well 4. Drilled in 1940 by C. H. Stoner, depth 176 feet, diameter 10 to 8 inches; deep-well turbine pump and electric motor; yield 75 gallons a minute.

Pumpage:

Average in gallons a day

	1941	1942
Jan.	135,000	158,000
Feb.	153,000	157,000
Mar.	111,000	135,000
Apr.	162,000	156,000
May	126,000	137,000
June	137,000	137,000
July	148,000	201,000
Aug.	166,000	
Sept.	142,000	
Oct.	141,000	
Nov.	132,000	
Dec.	123,000	

Storage: Concrete ground storage reservoir, 200,000 gallons; stand pipe, about 100,000 gallons.

Number of customers: 300.

Treatment: Hypo-chlorination.

HOOD COUNTY

Granbury -- Continued

Analysis of water:

Date collected: Aug. 13, 1942 — Analyzed by B. Irelan

	Well 3	
	Parts per million	Equivalents per million
Iron (Fe)	0.08	
Calcium (Ca)	2.9	0.14
Magnesium (Mg)	0.8	0.06
Sodium & Potassium (Na + K)	216	9.38
Bicarbonate (HCO_3)	406	6.67
Sulfate (SO_4)	84	1.75
Chloride (Cl)	41	1.16
Nitrate (NO_3)	0.0	0.00
Dissolved solids	574	
Total hardness as $CaCO_3$	10	
pH		

Driller's log:

Well 3

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	6	6	Limestone	4	395
Dry sand	19	25	Water sand	25	420
Quicksand and gravel	8	33	Gray lime	6	426
Hard lime	10	43	Water sand	21	447
Gray shale	26	69	Blue limestone	3	450
Sandy lime	29	98	Water sand	7	457
Water sand	77	175	Lime and sand	8	465
Gray shale	7	182	Blue shale	19	484
Red shale	26	208	Water sand	14	498
Blue shale	2	210	Blue shale	10	508
Red shale	35	245	Black shale	2	510
Blue shale	5	250	Water sand	14	524
Yellow shale	49	299	Hard shale	24	548
Brown lime	15	314	Water sand	6	554
Yellow shale	26	340	Blue shale	93	647
Blue shale	51	391	Water sand	25	672
			Blue shale	13	685

HOOD COUNTY

Lipan

Population in 1940: 300.

Source of information:
Otis Tipton, operator
Nov. 1945

Owner: David Pope.

Source of supply: Well 1¼ miles east of Lipan, dug several years ago; depth 50 feet, diameter 5 feet; two deep-well cylinders and pump jacks; static water level 28 feet below land surface; yield 40 gallons a minute.

Pumpage (estimated): 12,000 gallons a day.

Storage: Elevated tank, 20,000 gallons.

Number of customers: 63.

Treatment: None

Analysis of water:

Date collected: Nov. 1945 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	16	
Iron (Fe)	0.10	
Calcium (Ca)	117	5.84
Magnesium (Mg)	16	1.32
Sodium (Na)	12	0.52
Potassium (K)	4.4	0.11
Bicarbonate (HCO_3)	357	5.85
Sulfate (SO_4)	23	0.48
Chloride (Cl)	25	0.71
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	45	0.73
Dissolved solids	477	
Total hardness as $CaCO_3$	358	
pH	7.0	

JACK COUNTY

Bryson

Population in 1940: 806.

Source of information:
W. L. McCloud, water superintendent
Sept. 21, 1946

Ownership: Municipal.

Source of supply: 8 wells.

Well 1. Drilled in 1937 by Layne-Texas Company, depth 240 feet diameter 7 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; static water level 129 feet below land surface; yield 6 gallons a minute.

Well 2. Drilled in 1937 by Layne-Texas Company, depth 249 feet, diameter 7 to 5-3/8 inches; deep-well cylinder and pump jack and electric motor; yield 4 gallons a minute.

Well 3. Drilled in 1937 by Nathan Harlan, depth 235 feet, diameter 5-3/8 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; yield 6 gallons a minute.

Well 4. Drilled in 1938 by Mr. Pace, depth 235 feet, diameter 7 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; yield 5 gallons a minute.

Well 5. Drilled in 1938 by Mr. Pace, depth 235 feet, diameter 7 inches; deep-well cylinder and pump jack and electric motor; yield 6 gallons a minute.

Well 6. Drilled in 1938 by Mr. Pace, depth 235 feet, diameter 5 inches; deep-well cylinder and pump jack and electric motor; yield 6 gallons a minute.

Well 7. Drilled in 1946 by W. L. Thedford, depth 300 feet, diameter 5-3/8 inches; deep-well cylinder and pump jack and electric motor; yield 8 gallons a minute.

Well 8. Drilled in 1946 by W. L. Thedford, depth 250 feet, diameter 5-3/8 inches; pump not installed; yield on test 10 gallons a minute.

Pumpage: Average 35,000 gallons a day.

Storage: Ground storage reservoir, 50,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 156.

Treatment: Chlorination.

JACK COUNTY

Bryson -- Continued

Analyses of water:

Date collected: Sept. 21, 1946 Analyzed by C. B. Cibulka

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	8.0		11	
Iron (Fe)	4.3		0.01	
Calcium (Ca)	10	0.50	19	0.95
Magnesium (Mg)	3.3	0.27	6.2	0.51
Sodium (Na)	325	14.15	309	13.45
Potassium (K)	23	0.59	21	0.54
Bicarbonate (HCO_3)	414	6.79	476	7.80
Sulfate (SO_4)	148	3.08	148	3.08
Chloride (Cl)	196	5.53	158	4.46
Fluoride (F)	1.4	0.07	1.0	0.05
Nitrate (NO_3)	2.2	0.04	3.5	0.06
Dissolved solids	921		911	
Total hardness as $CaCO_3$	38		73	
pH	7.8		7.8	

	Well 6	
	Parts per million	Equivalents per million
Silica (SiO_2)	11	
Iron (Fe)	0.02	
Calcium (Ca)	18	0.90
Magnesium (Mg)	8.3	0.68
Sodium (Na)	193	8.39
Potassium (K)	15	0.38
Bicarbonate (HCO_3)	372	6.10
Sulfate (SO_4)	90	1.87
Chloride (Cl)	80	2.26
Fluoride (F)	1.4	0.07
Nitrate (NO_3)	3.2	0.05
Dissolved solids	603	
Total hardness as $CaCO_3$	79	
pH	7.4	

JACK COUNTY

Bryson -- Continued

Drillers' log:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	2	2	Blue shale	9	99
Red sand	5	7	Sandy lime	9	108
Yellow clay	30	37	Sand	7	115
Sandstone	5	42	Sandy shale	15	130
Red sand and shale	4	46	Water sand	28	158
Sand and gray shale	14	60	Gray shale	12	170
Blue shale	5	65	Sand	28	198
Hard sand	9	74	Sand and shale	10	208
Sandy shale	16	90	Sand	34	242
			Shale	3	245

Jacksboro

Population in 1940: 2,368.

Source of information:
R. H. Tate, water superintendent
Sept. 21, 1946

Ownership: Municipal.

Source of supply: 18 wells in well field extending about 1¼ miles from the water tower southeastward. Most of the wells range in depth from 135 to 220 feet; most wells are 7 inches in diameter; all wells are equipped with deep-well cylinders and pump jacks operated by electric motors; average yield of each well 11,000 gallons per 24 hours.

Pumpage: Summer 200,000 gallons a day, winter 150,000 gallons a day.

Storage: 1 ground storage reservoir, 119,000 gallons; 1 ground storage reservoir 5,000 gallons; 1 steel tank, 18,000 gallons; elevated tank, 75,000 gallons.

Number of customers: 725.

Treatment: Chlorination.

JACK COUNTY

Jacksboro -- Continued

Analysis of water:

Date collected: Sept. 21, 1946 — Analyzed by C. B. Cibulka

	Composite sample	
	Parts per million	Equivalents per million
Silica (SiO_2)	12	
Iron (Fe)	1.0	
Calcium (Ca)	25	1.25
Magnesium (Mg)	5.2	0.43
Sodium (Na)	136	5.91
Potassium (K)	9.9	0.25
Bicarbonate (HCO_3)	378	6.20
Sulfate (SO_4)	32	0.67
Chloride (Cl)	32	0.90
Fluoride (F)	0.8	0.04
Nitrate (NO_3)	2.0	0.03
Dissolved solids	441	
Total hardness as $CaCO_3$	84	
pH	7.7	

JOHNSON COUNTY

Alvarado

Population in 1940: 1,324

Source of information:

J. M. Mallicote, city secretary
Feb. 12, 1943

Ownership: Municipal.

Source of supply: Well at the north edge of city; drilled in 1931 by Q. D. Lewis, depth 1,677 feet, diameter 15½ to 8 inches; deep-well turbine pump, pump set at 390 feet below the surface; yield 185 gallons a minute.

Pumpage: No record.

Storage: Elevated tank, 85,000 gallons; concrete ground reservoir, 85,000 gallons.

Number of customers: 300.

Treatment: None.

Analysis of water:

Date collected: Feb. 12, 1943 — Analyzed by P. A. Witt

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.06	
Calcium (Ca)	2.4	0.12
Magnesium (Mg)	0.7	0.06
Sodium (Na)	242	10.53
Potassium (K)	4	0.10
Bicarbonate (HCO_3)	459	7.50
Sulfate (SO_4)	74	1.54
Chloride (Cl)	62	1.75
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.5	0.01
Dissolved solids	626	
Total hardness as $CaCO_3$	9	
pH	8.4	

Highway 74; drilled in 1930, depth 550 feet; deep-well cylinder and pump jack; the city has a second well leased from private owner as a stand-by well.

JOHNSON COUNTY

Burleson -- Continued

Pumpage: No record.

Storage: Elevated tank, 50,000 gallons.

Number of customers: 225.

Treatment: None.

Analysis of water:

Date collected: Feb. 12, 1943 Analyzed by P. A. Witt

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	12	
Iron (Fe)	0.01	
Calcium (Ca)	0.8	0.04
Magnesium (Mg)	0.5	0.04
Sodium (Na)	205	8.90
Potassium (K)	8.0	0.20
Bicarbonate (HCO_3)	480	7.88
Sulfate (SO_4)	41	0.85
Chloride (Cl)	13	0.37
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	3.0	0.05
Dissolved solids	520	
Total hardness as $CaCO_3$	4	
pH	8.8	

Cleburne

Population in 1940: 10,558

Source of information:
F. B. Stevens, engineer
Feb. 11, 1943

Ownership: Municipal.

Source of supply: 6 wells.

Well 1. At water works; depth 950 feet, diameter 8 inches; submersible deep-well turbine pump set 700 feet below land surface; water level reported 450 feet below surface Feb. 11, 1942; reported drawdown 75 feet when well is pumping 250 gallons a minute.

JOHNSON COUNTY

Cleburne -- Continued

Well 2. At water works; drilled about 1900, depth 950 feet, diameter 6 inches; water level reported 450 feet below surface February 11, 1943; reported draw-down 85 feet when pumping 175 gallons a minute.

Well 3. At water works; drilled in 1913, depth 1,196 feet, diameter 8 inches; submersible deep-well turbine pump, pump set at 715 feet; static water level reported 365 feet below surface on February 11, 1943; draw-down reported 267 feet when pumping 182 gallons a minute.

Well 4. At water works; drilled in 1940 by Q. D. Lewis, depth 935 feet, diameter 8¼ to 6 inches; submersible deep-well turbine pump, pump set at 700 feet below surface; static water level reported 450 feet below surface on February 11, 1943; pumping level reported 90 feet below static level when pumping 175 gallons a minute.

Well 5. One-half mile northwest of city water works; drilled in 1938 by Layne-Texas Company, depth 1,274 feet, diameter 16 to 5 inches, all sands under-reamed and gravel packed; static water level reported 350 feet below surface in January 1938; deep-well turbine pump, draw-down reported 250 feet when pumping 400 gallons a minute.

Well 6. About 600 feet northeast of water works; drilled in 1941 by Layne-Texas Company, depth 1,206 feet, diameter 22 to 8-5/8 inches; deep-well turbine pump set at 700 feet; static water level 478 feet below surface in June 1941 with draw-down 46 feet when pumping 400 gallons a minute.

Pumpage:

(Average in gallons a day)

	1941	1942
Jan.	760,000	720,000
Feb.	840,000	760,000
Mar.	680,000	550,000
Apr.	840,000	620,000
May	810,000	590,000
June	940,000	700,000
July	910,000	830,000
Aug.	940,000	1,080,000
Sept.	1,010,000	790,000
Oct.	840,000	720,000
Nov.	850,000	650,000
Dec.	720,000	590,000

JOHNSON COUNTY

Cleburne -- Continued

Storage: Concrete ground reservoir, 1,000,000 gallons; 2 elevated tanks, 125,000 gallons and 500,000 gallons.

Number of customers: 3,800.

Treatment: Chlorination.

Analysis of water:

Date collected: Feb. 11, 1943 — Analyzed by P. A. Witt

	Well 3	
	Parts per million	Equivalents per million
Silica (SiO_2)	13	
Iron (Fe)	0.02	
Calcium (Ca)	2.3	0.11
Magnesium (Mg)	1.2	0.10
Sodium (Na)	231	10.03
Potassium (K)	6.4	0.16
Bicarbonate (HCO_3)	413	6.79
Sulfate (SO_4)	102	2.12
Chloride (Cl)	52	1.47
Fluoride (F)	0.3	0.02
Nitrate (NO_3)	0.0	0.00
Dissolved solids	612	
Total hardness as $CaCO_3$	10	
pH	8.8	

Drillers' log:

Well 4

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sandy loam	6	6	Water sand	7	451
Gravel	6	12	Blue shale	19	470
Lime	133	145	Water sand	10	480
Shale	15	160	Sandy shale	40	520
Lime	35	195	Lime	82	602
Shale	10	205	Sandy shale (water)	13	615
Lime	70	275	Weatherford lime	235	850
Shale	10	285	Blue shale	10	860
Lime	50	335	Gray lime	30	890
Blue shale	54	389	Water sand	5	895
Brown shale	26	415	Shale	10	905
Lime	18	433	Water sand, good	26	931
Gray sand	11	444	Shale	5	936

JOHNSON COUNTY

Cleburne -- Continued

Well 5

	Thickness (feet)	Depth (feet)
Lime	40	40
Brown shale	10	50
Lime	10	60
Blue shale	5	65
White lime	20	85
Brown shale	25	110
Lime	5	115
Blue shale	5	120
White lime	71	191
Blue shale	29	220
White lime	70	290
Blue shale	4	294
White lime	56	350
Blue shale and shell	13	363
White lime	7	370
Blue shale	8	378
Lime	10	388
Shale	6	394
Lime	4	398
Hard shell, rock	17	415
Brown sandy shale	25	440
Paluxy sand	12	452
Shale	8	460
Hard sandy shale and lime streaks	35	495
Sand	7	502
Lime	1	503
Sand	9	512
Hard lime	1	513
Hard sand	8	521
Hard shale	3	524
Lime	2	526
Shale	6	532
Lime	1	533
Fine white sand	5	538
Sandy shale	11	549
Lime	1	550
Shale	3	553
Hard lime	8	561
Hard shale	9	570
Lime	223	793
Sandy lime and streaks of shale	36	829
Shale and streaks of lime	23	852
Hard shale	8	860
Hard shale and lime	14	874
Lime	10	884
Shale and lime	11	895
Lime and layers of shale	6	901
Lime	10	911
Shale	2	913
Shaley sand	11	924
Lime	3	927
Sand and shale	6	933
Lime	2	935
Hard shale	16	951
Sand and streaks of shale	6	957
Sand and streaks of shale (cored)	8	965
Sand	14	979
Hard shale	4	983
Sand broken with shale	13	996
Sand rock	3	999
Rock (cut with rock bit)	6	1005
Sand	5	1010
Lime	3	1013
Sandy shale, layers of lime	41	1054
Hard sand	11	1065
Shale	2	1067
Sand	8	1075
Shale	4	1079
Sand	2	1081
Sand and shale	8	1089
Shale	35	1124
Rock	4	1128
Sand	16	1144
Shale	2	1146
Sand and shale	10	1156
Sand broken with shale	21	1177
Sand rock	4	1181
Hard sand with layers of red sandy shale	9	1190
Hard red shale	4	1194
Sand	20	1214
Rock	2	1216
Sand and fine gravel	4	1220
Shale and layers of sand	15	1235
Sandy shale, layers of sand	19	1254
Yellow, red, and blue shale	20	1274

JOHNSON COUNTY

Cleburne -- Continued

Well 6

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	3	3	Good sand	32	936
Gravel	4	7	Hard shale	5	941
Lime	47	54	Shale and lime	21	962
Shale and lime	81	135	Sand	9	971
Lime	19	154	Rock	1	972
Lime and shale	138	292	Shale	1	973
Lime	37	329	Lime and shale	5	978
Shale and lime	19	348	Sand	18	996
Hard shale	56	404	Hard red and blue shale sand, rock layers	63	1059
Sandy shale	16	420	Hard red shale	44	1103
Lime and shale	17	437	Sand rock	4	1107
Paluxy sand	16	453	Shale and lime	5	1112
Shale	13	466	Hard shale and sand	21	1133
Paluxy sand	10	476	Sand	19	1152
Shale	27	503	Rock	2	1154
Hard shale	106	609	Sand	30	1184
Lime and shale	74	683	Rock	3	1187
Lime	109	792	Hard shale	14	1201
Lime and shale	63	855	Hard rock	3	1204
Lime	17	872	Hard red and yellow shale	2	1206
Shale and lime	19	891			
Sand	6	897			
Shale and lime	7	904			

Godley

Population in 1940: 317

Source of information:
H. W. Sawyer, owner
Feb. 11, 1943

Owner: H. W. Sawyer

Source of supply: 2 wells.

Well 1. North side of town; drilled about 1913, depth about 430 feet, diameter 4 inches; deep-well cylinder and pump jack.

Well 2. 26 feet north of Well 1; drilled 1931, depth 428 feet, diameter 6-5/8 inches; deep-well cylinder and pump jack.

JOHNSON COUNTY

Godley -- Continued

Pumpage: No record.

Storage: 2 elevated wooden tanks, 20,000 gallons.

Number of customers: 92.

Treatment: None

Analyses:

Date collected: Feb. 11, 1943 Analyzed by P. A. Witt

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		11	
Iron (Fe)	0.0		0.01	
Calcium (Ca)	1.7	0.08	1.8	0.09
Magnesium (Mg)	0.7	0.06	0.9	0.07
Sodium (Na)	163	7.08	164	7.14
Potassium (K)	6.4	0.16	4.0	0.10
Bicarbonate (HCO_3)	369	6.05	370	6.08
Sulfate (SO_4)	39	0.81	41	0.85
Chloride (Cl)	18	0.51	16	0.45
Fluoride (F)	0.2	0.1	0.4	0.02
Nitrate (NO_3)	0.0	0.0	0.0	0.0
Dissolved solids	424		421	
Total hardness as $CaCO_3$	7		8	
pH	8.3		8.4	

Grandview

Population in 1940: 823
Source of information:
Olan Adwelt
Apr. 21, 1943

Ownership: Municipal.

Source of supply: Well at west side of railroad track, one block south of Main Street; drilled in 1931 by Stinson of Hillsboro, Texas, depth 273 feet, diameter 12 to 10 inches; deep-well turbine pump set at 195 feet; static water level 51 feet below surface in 1931; yield 300 gallons a minute.

JOHNSON COUNTY

Grandview -- Continued

Pumpage: Average 80,000 gallons a day.

Storage: Elevated tank, 500,000 gallons; concrete ground reservoir, 80,000 gallons.

Number of customers: 245.

Treatment: None.

Analysis of water:

Date collected: Apr. 21, 1943 Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	13	
Iron (Fe)	0.04	
Calcium (Ca)	21	1.05
Magnesium (Mg)	8.6	0.71
Sodium (Na)	138	6.00
Potassium (K)	3.4	0.09
Bicarbonate (HCO_3)	273	4.47
Sulfate (SO_4)	115	2.39
Chloride (Cl)	31	0.87
Fluoride (F)	0.5	0.03
Nitrate (NO_3)	5.6	0.09
Dissolved solids	479	
Total hardness as $CaCO_3$	88	
pH	7.8	

Joshua

Population in 1940: 810

Source of information:
J. D. Vroom, owner
Feb. 11, 1943

Owner: J. D. Vroom

Source of supply: 2 wells.

Well 1. At northeast side of City at residence of owner; depth 630 feet, diameter 4½ inches; deep-well cylinder and pump jack; water level 400 feet below surface Feb. 11, 1943; used as standby well only.

JOHNSON COUNTY

Joshua -- Continued

Well 2. About 75 feet north of Well 1; drilled by J. E. Millican in 1930, depth 677 feet, diameter 10 to 6 inches; deep-well cylinder and pump jack; static water level 407 feet below surface in 1930.

Pumpage: Average 25,000 gallons a day.

Storage: Elevated steel tank, 25,000 gallons; ground reservoir, 6,000 gallons.

Number of customers: 140.

Treatment: None.

Analysis of water:

Date collected: Feb. 11, 1946 — Analyzed by P. A. Witt

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.2	
Iron (Fe)	0.05	
Calcium (Ca)	1.7	0.08
Magnesium (Mg)	0.7	0.06
Sodium (Na)	175	7.60
Potassium (K)	4.2	0.11
Bicarbonate (HCO_3)	414	6.77
Sulfate (SO_4)	33	0.69
Chloride (Cl)	12	0.34
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	2.0	0.03
Dissolved solids	442	
Total hardness as $CaCO_3$	7	
pH	9.0	

JONES COUNTY

Anson

Population in 1940: 2,338

Source of information:
D. W. Gray, water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: 3 lakes. 2 lakes constructed in 1923 and 1936, 2½ miles southeast of pumping station. One lake constructed in 1940, 7 miles north of pumping station.

Pumpage (estimated): 500,000 gallons a day.

Storage: 4 concrete ground storage reservoirs, 125,000 gallons each; elevated tank, 73,000 gallons.

Number of customers: 700.

Treatment: coagulation, sedimentation and chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

	North Lake - Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	8.0	
Iron (Fe)	0.12	
Calcium (Ca)	99	4.94
Magnesium (Mg)	24	1.97
Sodium (Na)	24	1.03
Potassium (K)	7.2	0.18
Bicarbonate (HCO_3)	172	2.82
Sulfate (SO_4)	203	4.23
Chloride (Cl)	38	1.07
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	0.0	0.00
Dissolved solids	500	
Total hardness as $CaCO_3$	346	
pH	7.3	

Hamlin

Population in 1940: 2,406

Source of information:
W. C. Roundtree, water superintendent
Sept. 19, 1946

JONES COUNTY

Hamlin -- Continued

Ownership: Municipal.

Source of supply: 3 lakes. 1 lake 1½ miles west of town on California Creek; one lake 3 miles west of town on California Creek; capacity of both lakes 350,000,000 gallons, lake 5 miles south of town on Dry Kelly Creek; capacity 900,000,000 gallons. All water taken from south lake since 1940.

Pumpage: Summer 600,000 gallons a day, winter average 270,000 gallons a day.

Storage: Ground reservoir, 147,000 gallons; elevated tank, 75,000 gallons.

Number of customers: 850.

Treatment: Aeration, coagulation, sedimentation, rapid sand filtration, and chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 Analyzed by C. B. Cibulka

	South Lake - Raw water	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.0	
Iron (Fe)	0.14	
Calcium (Ca)	27	1.348
Magnesium (Mg)	7.1	0.584
Sodium (Na)	9.8	0.427
Potassium (K)	5.6	0.143
Bicarbonate (HCO_3)	118	1.943
Sulfate (SO_4)	8.1	0.169
Chloride (Cl)	13	0.367
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	2.0	0.032
Dissolved solids	158	
Total hardness as $CaCO_3$	97	
pH	6.8	

Stamford

Population in 1940: 4,810

Source of information:
Frank Sosebee, water superintendent
Sept. 19, 1946

Ownership: Municipal.

JONES COUNTY

Stamford -- Continued

Source of supply: Reservoir on Clear Fork of the Brazos River.

Pumpage:

(Average in gallons a day)

	1940	1941	1942	1943
Jan.	396,000	332,000	384,000	427,000
Feb.	359,000	306,000	374,000	468,000
Mar.	374,000	313,000	458,000	453,000
Apr.	413,000	316,000	443,000	511,000
May	419,000	484,000	468,000	559,000
June	377,000	673,000	530,000	667,000
July	555,000	513,000	635,000	904,000
Aug.	523,000	551,000	580,000	913,000
Sept.	430,000	590,000	472,000	687,000
Oct.	423,000	520,000	515,000	637,000
Nov.	322,000	440,000	427,000	603,000
Dec.	321,000	342,000	422,000	473,000

Storage: Reservoir 3 miles west of Leuders, 500,000 gallons; reservoir 2 miles east of pumping station, 1,000,000 gallons; rock reservoir, 2,000,000 gallons; elevated tank, 100,000 gallons.

Treatment: Coagulation, sedimentation, and chlorination.

Analysis of water:

Date collected: Sept. 19, 1946 Analyzed by J. H. Rowley

	Finished Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	7.4	
Iron (Fe)	0.10	
Calcium (Ca)	84	4.19
Magnesium (Mg)	7.5	0.62
Sodium (Na)	77	3.33
Potassium (K)	7.0	0.18
Bicarbonate (HCO_3)	55.9	2.09
Sulfate (SO_4)	189	3.93
Chloride (Cl)	80	2.26
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	1.2	0.02
Dissolved solids	510	
Total hardness as $CaCO_3$	240	
pH	9.5	

KERR COUNTY

Kerrville -- Continued

Storage: Elevated concrete reservoir, 360,000 gallons.

Number of customers: 1,712.

Treatment: None.

Analyses of water:

Date collected: Nov. 16, 1945 Analyzed by J. H. Rowley

	Well 2		Well 4	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	14		12	
Iron (Fe)	0.26		0.10	
Calcium (Ca)	79	3.94	66	3.29
Magnesium (Mg)	45	3.70	43	3.54
Sodium (Na)	11	0.48	9.9	0.43
Potassium (K)	66	0.17		
Bicarbonate (HCO_3)	368	6.03	373	6.11
Sulfate (SO_4)	79	1.64	26	0.54
Chloride (Cl)	20	0.56	20	0.56
Fluoride (F)	1.0	0.05	1.0	0.05
Nitrate (NO_3)	0.5	0.01	0.0	0.00
Dissolved solids	451		372	
Total hardness as $CaCO_3$	382		342	
pH	7.9		7.4	

Drillers' log:

Well 3

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	6	6	Hard gray lime	63	514
Gravel and clay	56	62	Hard red, white, pink and yellow lime	73	587
Blue shale	83	145	Hard pink and black sand	55	642
Black shale	9	154	White sand	34	676
Blue shale	81	235	Hard schist	49	725
Brown shale	33	268			
Hard red sand	183	451			

KERR COUNTY

Kerrville -- Continued

Well 4

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	5	5	Red sandstone	56	342
Clay and gravel	37	42	White lime	14	356
Gravel	9	51	Water sand	8	364
Gray sandstone	43	94	Hard lime	48	412
Hard sandy shale	14	108	Red sand rock	10	422
Gray sandstone	36	144	Green shale	2	424
Blue shale	11	155	Red shale	11	435
Gray sandy shale	31	186	Green shale	6	441
Gray sandstone	51	237	Hard sandstone	135	576
Brown sandy shale	34	271	Gravel	8	584
Red sandy shale	15	286	Hard lime	22	606

KIMBLE COUNTY

Junction

Population in 1940: 2,088

Source of information:
Dr. H. E. Wright, mayor
Apr. 17, 1946

Ownership: Municipal.

Source of supply: 2 wells, 2 blocks south of City Square on South 5th Street.

Well 1. Dug, depth 37 feet, diameter 14 feet; centrifugal pump and 35-horsepower electric motor; yield 500 gallons a minute; temperature 65.5° F.

Well 2. Dug, depth 14 feet, diameter 10 feet; centrifugal pump and 35-horsepower electric motor; yield 500 gallons a minute.

Pumpage (estimated): Average 300,000 gallons a day.

Storage: Reservoir at wells, 100,000 gallons; reservoir in west part of city, 235,000 gallons.

Number of customers: 450.

Treatment: Chlorination.

Analyses of water:

Date collected: Apr. 17, 1946 Analyzed by J. H. Rowley

	Composite sample of wells 1 and 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.06	
Calcium (Ca)	70	3.49
Magnesium (Mg)	18	1.48
Sodium (Na)	3.9	0.17
Potassium (K)	3.0	0.08
Bicarbonate (HCO_3)	280	4.59
Sulfate (SO_4)	9.2	0.19
Chloride (Cl)	14	0.39
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	2.2	0.04
Dissolved solids	273	
Total hardness as $CaCO_3$	248	
pH	7.2	

KNOX COUNTY

Benjamin

Population in 1940: 599.

Source of information:
W. M. Hertel, city manager
July 1946

Ownership: Municipal.

Source of supply: Lake about 1½ miles south-southwest of Benjamin. Supply insufficient to supply city during extreme dry periods; water usually shipped to Benjamin from Knox City.

Pumpage: Average 135,000 gallons a day.

Number of customers: 109.

Analysis of water:

Date collected: Oct. 5, 1945 — Analyzed by J. H. Rowley and C. B. Cibulka

	Raw Water	
	Parts per million	Equivalents per million
Calcium (Ca)	40	2.000
Magnesium (Mg)	16	1.316
Sodium and Potassium (Na + K)	20	0.854
Bicarbonate (HCO_3)	132	2.164
Sulfate (SO_4)	69	1.437
Chloride (Cl)	18	0.508
Fluoride (F)	-	-
Nitrate (NO_3)	3.8	0.061
Dissolved solids	317	
Total hardness as $CaCO_3$	166	
pH		

KNOX COUNTY

Goree

Population in 1940: 425.

Source of information:
B. Justice, water superintendent
Mar. 22, 1944

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. At south side of elevated tank; dug in 1925, depth 45 feet, diameter 12 feet, curbed with concrete blocks; deep-well turbine pump and 15-horsepower electric motor; static water level reported 28 feet below land surface in 1938, measured 21.7 feet below land surface Mar. 22, 1944; well can be pumped dry in 4 hours at 220 gallons a minute.

Well 2. At north side of elevated tank about 60 feet north of Well 1; drilled in 1940, depth 45 feet, diameter 12 inches; deep-well turbine pump and 10-horsepower electric motor; static water level 22.08 feet below land surface Mar. 22. 1944; yield 150 gallons a minute.

Pumpage (estimated): 70,000 gallons a day in summer and 35,000 gallons a day in winter.

Storage: Elevated tank, 55,000 gallons.

Number of customers: 90.

Treatment: None.

Analysis of water:

Date collected: Mar. 22, 1944 — Analyzed by M. L. Begley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	26	
Iron (Fe)	0.02	
Calcium (Ca)	113	5.64
Magnesium (Mg)	60	4.93
Sodium (Na)	294	12.79
Potassium (K)	10	0.26
Bicarbonate	410	6.73
Sulfate (SO_4)	386	8.04
Chloride (Cl)	296	8.35
Fluoride (F)	1.5	0.08
Nitrate (NO_3)	26	0.42
Dissolved solids	1,460	
Total hardness as $CaCO_3$	528	
pH	7.9	

KNOX COUNTY

Knox City

Population in 1940: 1,127

Source of information:
J. G. Dutton, water superintendent
Mar. 22, 1946

Ownership: Municipal.

Source of supply: Well dug in 1930, depth 38 feet, diameter 12 feet; 2 centrifugal pumps driven by 15 and 25-horsepower electric motors; static water level 18.5 feet Mar. 22, 1944; yield 125 and 250 gallons a minute.

Pumpage (estimated): 175,000 gallons a day in summer and 60,000 gallons a day in winter.

Number of customers: 275.

Treatment: None.

Analysis of water:

Date collected: Mar. 22, 1944 — Analyzed by M. L. Begley

	Well 1	
	Parts per million	Equivalents per million
Calcium (Ca)	135	6.74
Magnesium (Mg)	55	4.52
Sodium and Potassium (Na + K)	187	8.12
Bicarbonate (HCO_3)	296	4.87
Sulfate (SO_4)	315	6.56
Chloride (Cl)	251	7.08
Nitrate (NO_3)	54	0.87
Dissolved solids	1,140	
Total hardness as $CaCO_3$	563	

Munday

Population in 1940: 1,545

Source of information:
R. B. Harrell, water superintendent
Mar. 22, 1944

Ownership: Municipal.

Source of supply: Well at elevated tank; dug in 1922, depth 37 feet, diameter 20 feet; 2 deep-well turbine pumps and 25-horsepower electric motors; static water level 13 feet below land surface Mar. 22, 1944; yield 500 gallons a minute from each pump.

KNOX COUNTY

Munday -- Continued

Pumpage (estimated): Average 200,000 gallons a day.

Storage: Elevated tank, 50,000 gallons.

Number of customers: 260.

Treatment: None.

Analysis of water:

Date collected: Mar. 22, 1944 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.12	
Calcium (Ca)	112	5.59
Magnesium (Mg)	99	8.14
Sodium (Na)	372	16.17
Potassium (K)	15	0.38
Bicarbonate (HCO_3)	481	7.88
Sulfate (SO_4)	469	9.76
Chloride (Cl)	340	9.59
Fluoride (F)	1.9	0.10
Nitrate (NO_3)	183	2.95
Dissolved solids	1,850	
Total hardness as $CaCO_3$	686	
pH	7.6	

LAMPASAS COUNTY

Lampasas

Population in 1940: 3,426

Source of information:
Wade Wooten, water superintendent
Jan. 19, 1946

Ownership: Municipal.

Source of supply: Sulphur Creek, pumping plant at south end of City.

Pumpage (estimated): Average 1,250,000 gallons a day.

Storage: Stand pipe 225,000 gallons.

Number of customers: 923.

Treatment: Coagulation, sedimentation, chlorination.

Analysis of water:

Date collected: Jan. 19, 1946 — Analyzed by J. H. Rowley

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.6	
Iron (Fe)	0.63	
Calcium (Ca)	72	3.59
Magnesium (Mg)	39	3.21
Sodium (Na)	51	2.23
Potassium (K)	7.2	0.18
Bicarbonate (HCO_3)	352	5.77
Sulfate (SO_4)	25	0.52
Chloride (Cl)	102	2.88
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	1.8	0.03
Dissolved solids	501	
Total hardness as $CaCO_3$	340	
pH		8.0

LAMPASAS COUNTY

Lometa

Population in 1940: 915.

Source of information:
C. M. Green, water superintendent
Jan. 18, 1946.

Ownership: Municipal.

Source of supply: 6 wells.

Well 1. On top of hill near 8th and Lampasas Streets; drilled in 1925 by Mr. Cass, depth 594 feet, diameter 10 to 6 inches; deep-well cylinder and pump jack and 5-horsepower electric motor; yield 18 gallons a minute; temperature 71° F.

Well 2. At Lampasas Street near 8th Street; depth 250 feet, diameter 6 inches; deep-well cylinder and pump jack and 5-horsepower electric motor; yield 5 gallons a minute.

Well 3. 100 feet north of Well 2; drilled by Marcus McLean in 1918, depth 250 feet, diameter 6 inches; deep-well cylinder and pump jack and 2-horsepower electric motor, this electric motor also operates pump jack on Well 4.

Well 4. About 10 feet from Well 3; drilled by Marcus McLean in 1918, depth 250 feet, diameter 6 inches; deep-well cylinder and pump jack and electric motor on Well 3.

Well 5. On Elm Street near East Railroad Street; drilled in 1941 by Ross Smart, depth 300 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor, this electric motor also operates pump jack on Well 6; yield 7 gallons a minute; temperature 70° F.

Well 6. 10 feet west of Well 5; drilled in 1943 by Ross Smart, depth 300 feet, diameter 6 inches; deep-well cylinder and pump jack operated by electric motor on Well 5; static water level reported about 200 feet below land surface; yield 7 gallons a minute; temperature 69° F.

Pumpage (estimated): 50,000 gallons a day.

Storage: Concrete reservoir, 100,000 gallons.

Treatment: None.

LAMPASAS COUNTY

Lometa -- Continued

Analyses of water:

Date collected: Jan. 18, 1946 — Analyzed by C. B. Cibulka

	Well 1		Well 6	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	7.0		7.0	
Iron (Fe)	0.28		0.39	
Calcium (Ca)	64	3.17	74	3.69
Magnesium (Mg)	50	4.11	58	4.77
Sodium (Na)	118	5.15	90	3.91
Potassium (K)	26	0.67	15	0.38
Bicarbonate (HCO_3)	401	6.57	396	6.49
Sulfate (SO_4)	228	4.75	200	4.16
Chloride (Cl)	62	1.75	72	2.03
Fluoride (F)	1.0	0.05	1.0	0.05
Nitrate (NO_3)	0.0	0.00	1.2	0.02
Dissolved solids	754		726	
Total hardness as $CaCO_3$	365		423	
pH	7.7		7.9	

LLANO COUNTY

Llano

Population in 1940: 2,658.

Source of information:
H. C. Wallis, manager utilities
Glen O. Myers, plant operator
Feb. 13, 1946

Ownership: Municipal.

Source of supply: Llano River dammed at site of water plant.

Pumpage:

(Average in gallons a day)

	1944	1945
Jan.	104,000	94,000
Feb.	97,000	112,000
Mar.	107,000	120,000
Apr.	173,000	146,000
May	134,000	175,000
June	174,000	173,000
July	209,000	264,000
Aug.	195,000	202,000
Sept.	153,000	188,000
Oct.	121,000	160,000
Nov.	125,000	149,000
Dec.	114,000	148,000

Storage: Elevated tank, 100,000 gallons.

Treatment: Coagulation, sedimentation, rapid sand filters and chlorination.

LLANO COUNTY

Llano -- Continued

Analyses of water:

Date collected: Feb. 13, 1946 Analyzed by J. H. Rowley

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	15		5.0	
Iron (Fe)	0.78		0.19	
Calcium (Ca)	28	1.398	40	1.997
Magnesium (Mg)	12	0.987	20	1.645
Sodium (Na)	13	0.559	9.1	0.396
Potassium (K)	4.5	0.115	7.8	0.200
Bicarbonate (HCO_3)	130	2.131	162	2.655
Sulfate (SO_4)	15	0.312	43	0.895
Chloride (Cl)	21	0.592	24	0.677
Fluoride (F)	0.2	0.011	0.2	0.011
Nitrate (NO_3)	0.8	0.013	0	0.000
Dissolved solids	180		234	
Total hardness as $CaCO_3$	119		182	
pH	7.8		7.4	

McCULLOCH COUNTY

Brady

Population in 1940: 5,002.

Source of information:
Edward Geeslin, manager
Jan. 18, 1946

Ownership: Municipal.

Source of supply: 3 wells.

Well 1. On west edge of town at west end of Commerce Street near Brady Creek, 50 yards north of power plant; drilled in 1921, depth 2,114 feet, diameter 15½ to 10 inches; deep-well turbine pump and 60-horsepower electric motor; static water level reported 134 feet below land surface; yield 550 gallons a minute; temperature 81° F.

Well 2. 400 feet south of the power plant; drilled in 1932 by Layne-Texas Company, depth 2,112 feet; deep-well turbine pump and 50-horsepower electric motor; yield 434 gallons a minute.

Well 3. At corner of Oak and East 1st Street in the central part of the City; drilled in 1943 by Layne-Texas Company, depth 2,082 feet, diameter 12¾ to 10¾ inches; deep-well submersible pump and 75-horsepower electric motor; yield 750 gallons a minute.

Pumpage:

(Average in gallons a day)

	1944	1945
Jan.	772,000	945,000
Feb.	894,000	1,100,000
Mar.	743,000	931,000
Apr.	1,057,000	1,134,000
May	1,104,000	1,183,000
June	913,000	1,263,000
July	1,582,000	1,134,000
Aug.	1,693,000	1,578,000
Sept.	1,101,000	1,228,000
Oct.	930,000	950,000
Nov.	1,025,000	776,000
Dec.	865,000	--

Storage: Concrete reservoir 2½ miles south of pumping plant, 1,000,000 gallons; elevated tank, 175,000 gallons.

Number of customers: 1,800.

McCULLOCH COUNTY

Brady -- Continued

Treatment: Hetametaphosphate.

Analyses of water:

Date collected: Jan. 18, 1946 Analyzed by C. B. Cibulka

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	12		7.5	
Iron (Fe)	0.32		0.46	
Calcium (Ca)	59	2.94	24	1.20
Magnesium (Mg)	46	3.78	22	1.81
Sodium (Na)	12	0.52	199	8.64
Potassium (K)	8.4	0.21	23	0.59
Bicarbonate (HCO_3)	366	6.00	402	6.76
Sulfate (SO_4)	41	0.85	111	2.31
Chloride (Cl)	20	0.56	107	3.02
Fluoride (F)	0.8	0.04	2.8	0.15
Nitrate (NO_3)	0.0	0.00	0.0	0.00
Dissolved solids	389		694	
Total hardness as $CaCO_3$	336		150	
pH	7.8		7.9	

Driller's log:

Well 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Clay	20	20	Lime	89	542
Sand and gravel	12	32	Gray shale	13	555
Blue shale	18	50	Lime	40	595
Sandy shale	25	75	Gray shale	5	600
Sand	10	85	Lime	530	1130
Gray sandy shale	20	105	Brown shale	5	1135
White lime	11	116	Lime	128	1263
Blue shale	74	190	Shale	17	1280
Red beds and shale	15	205	Lime	10	1290
Gray lime	6	211	Sandy shale	50	1340
Gray shale	24	235	Red rock	5	1345
Lime	211	446	Shale	20	1365
Sand	7	453	Lime	15	1380

(Continued on next page)

McCULLOCH COUNTY

Brady -- Continued

Well 2 -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sand	12	1392	Sand	17	1680
Lime	78	1470	Red sand	16	1696
Sand	23	1493	Sand	29	1725
Shale	17	1510	Sand and red rock	25	1750
Hard sand	25	1535	Shale	20	1770
Hard sand and shale	25	1560	Sand	65	1835
Coarse sand	35	1595	Sand and shale	14	1849
Shale	10	1605	Sand	55	1904
Sandy shale	27	1632	Hard white sand	24	1928
White lime	31	1663	Brown sand	175	2103
			Blue shale	9	2112

Melvin

Population in 1940: 450.

Source of information:
A. L. McDonald, operator
Jan. 17, 1946

Owner: R. B. Hardin

Source of supply: Dug well at east edge of town on creek bank; depth 15 feet, diameter 6 feet; centrifugal pump and 7½-horsepower electric motor; static water level 11.1 feet below land surface Jan. 17, 1946; yield 30 gallons a minute; temperature 60° F.

Pumpage (estimated): Average 30,000 gallons a day.

Storage: 2 elevated tanks, 10,000 gallons each.

Number of customers: 175.

Treatment: Chlorination.

McCULLOCH COUNTY

Melvin -- Continued

Analysis of water:

Date collected: Jan. 17, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	16	
Iron (Fe)	0.06	
Calcium (Ca)	120	5.99
Magnesium (Mg)	27	2.22
Sodium (Na)	92	3.98
Potassium (K)	16	0.41
Bicarbonate (HCO_3)	382	6.26
Sulfate (SO_4)	103	2.14
Chloride (Cl)	139	3.92
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	17	0.27
Dissolved solids	744	
Total hardness as $CaCO_3$	410	
pH	7.5	

Mercury

Population in 1940: 489

Source of information:
R. L. Gossett, water superintendent
Jan. 17, 1946

Ownership: Municipal.

Source of supply: Well drilled, depth 430 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; temperature 68° F.

Pumpage (estimated): Average 7,000 gallons a day.

Storage: Concrete stand pipe, 14,400 gallons.

Number of customers: 35.

Treatment: None.

McCULLOCH COUNTY

Mercury -- Continued

Analysis of water:

Date collected: Jan. 17, 1946 — Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	7.0	
Iron (Fe)	0.53	
Calcium (Ca)	8.4	0.42
Magnesium (Mg)	10	0.82
Sodium (Na)	310	13.46
Potassium (K)	18	0.46
Bicarbonate (HCO_3)	570	9.35
Sulfate (SO_4)	1.6	0.03
Chloride (Cl)	204	5.75
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	0.2	0.00
Dissolved solids	848	
Total hardness as $CaCO_3$	62	
pH	7.9	

Rochelle

Population in 1940: 515

Source of information:
M. A. Gainer, owner
Jan. 18, 1946

Owners: M. A. Gainer and J. P. Boyd.

Source of supply: Well drilled in 1930 by J. C. Verdell, depth 300 feet, diameter 6 inches; deep-well cylinder pump and windmill; temperature 70° F.

Pumpage (estimated): Average 3,000 gallons a day.

Storage: Elevated tank, 3,000 gallons.

Number of customers: 38.

Treatment: None.

McCULLOCH COUNTY

Rochelle -- Continued

Analysis of water:

Date collected: Jan. 18, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	5.5	
Iron (Fe)	0.64	
Calcium (Ca)	28	1.40
Magnesium (Mg)	17	1.40
Sodium (Na)	201	8.74
Potassium (K)	15	0.38
Bicarbonate (HCO_3)	318	5.21
Sulfate (SO_4)	226	4.71
Chloride (Cl)	68	1.92
Fluoride (F)	1.2	0.06
Nitrate (NO_3)	1.2	0.02
Dissolved solids	720	
Total hardness as $CaCO_3$	140	
pH		8.2

MENARD COUNTY

Menard

Population in 1940: 2,375.

Source of information:
Jim Stockton, water superintendent
Jan. 16, 1946

Ownership: Municipal.

Source of supply: San Saba River.

Pumpage:

(Average in gallons a day)

1945

Jan.	103,000	July	174,000
Feb.	104,000	Aug.	213,000
Mar.	-	Sept.	204,000
Apr.	117,000	Oct.	141,000
May	136,000	Nov.	142,000
June	149,000	Dec.	-

Storage: Elevated tank, 200,000 gallons; concrete ground reservoir, 120,000 gallons.

Treatment: Coagulation, sedimentation, pre and post chlorination.

Analyses of water:

Date collected: Jan. 16, 1946 Analyzed by J. H. Rowley

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	11		8.2	
Iron (Fe)	0.08		0.11	
Calcium (Ca)	64	3.19	72	3.59
Magnesium (Mg)	22	1.81	22	1.81
Sodium (Na)	9.2	0.40	1.1	0.05
Potassium (K)	3.0	0.08		
Bicarbonate (HCO_3)	262	4.66	276	4.52
Sulfate (SO_4)	11	0.23	17	0.35
Chloride (Cl)	20	0.56	20	0.56
Fluoride (F)	0.2	0.01	0.0	0.00
Nitrate (NO_3)	1.0	0.02	1.2	0.02
Dissolved solids	275		281	
Total hardness as $CaCO_3$	250		270	
pH	8.2		8.0	

MILLS COUNTY

Goldthwaite

Population in 1940: 1,412.

Source of information:
W. C. Barnett, utilities manager
Mar. 19, 1946

Ownership: Municipal.

Source of supply: 7 wells.

Well 1. Dug by the Santa Fe Railroad Company prior to 1910, depth 50 feet, diameter 30 feet; plunger pump and 3-horsepower electric motor; static water level 30 feet below land surface Mar. 19, 1946; temperature 62° F.

Well 2. Dug by the Santa Fe Railroad Company prior to 1910, depth 50 feet, diameter 30 feet; Peerless Hi-Lift pump and 3-horsepower electric motor; temperature 63° F.

Well 3. Drilled, depth 80 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor.

Well 4. Drilled, depth 95 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor.

Well 5. Drilled in 1939 by Clyde D. Layne, depth 370 feet, diameter $8\frac{1}{4}$ to 6 inches; Peerless Hi-Lift pump and 5-horsepower electric motor.

Well 6. $1\frac{1}{2}$ miles north of town; drilled in 1945 by Layne-Texas Company, depth 353 feet, diameter $10\frac{3}{4}$ inches; deep-well submersible turbine pump and electric motor; yield about 45 gallons a minute.

Well 7. 900 feet north of old water plant; drilled in 1945 by Layne-Texas Company, depth 370 feet, diameter $10\frac{3}{4}$ inches; deep-well turbine pump and electric motor; yield about 45 gallons a minute.

Pumpage (estimated): 100,000 gallons a day.

Storage: Concrete reservoir on hill top, 257,000 gallons; ground reservoir near the wells, 50,000 gallons.

Number of customers: 375.

Treatment: Hypo-chlorination.

MILLS COUNTY

Goldthwaite -- Continued

Analysis of water:

Date collected: Mar. 19, 1946 Analyzed by J. H. Rowley

	Well 6	
	Parts per million	Equivalents per million
Silica (SiO_2)	8.8	
Iron (Fe)	0.05	
Calcium (Ca)	74	3.69
Magnesium (Mg)	53	4.36
Sodium (Na)	105	4.56
Potassium (K)	18	0.46
Bicarbonate (HCO_3)	421	6.90
Sulfate (SO_4)	141	2.94
Chloride (Cl)	113	3.19
Fluoride (F)	0.8	0.04
Nitrate (NO_3)	0.0	0.00
Dissolved solids	732	
Total hardness as $CaCO_3$	402	
pH		7.3

Drillers' log:

Well 5

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	3	3	Hard sand	35	135
Lime	19	22	Broken sand	41	176
Blue soapstone	16	38	Sand and lime	40	216
Lime shell	2	40	Sandy lime	6	222
Yellow shale	8	48	Broken sand	13	235
Dry sand	22	70	Red bed	25	260
Sandy shale	10	80	Lime	27	287
Lime shell	2	82	Broken lime	61	348
Soft sand water	5	87	Water sand	20	368
Sand water	13	100	Red bed	2	370

MILLS COUNTY

Goldthwaite -- Continued

Well 6

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sand and gravel	5	5	Lime and red rock	55	290
Yellow sand rock	17	22	Sand and lime	4	294
Gray lime and shale	6	28	Lime	4	298
Lime and shale	22	50	Sandy lime	11	309
Water sand	28	78	Sand	3	312
Lime and sand	2	80	Water sand	8	320
Sand	10	90	Lime and shale	6	326
Lime	7	97	Sand and lime - red rock and fine gravel	6	332
Sandy lime and shale	5	102	Lime and sandy shale	3	335
Lime and shale	5	107	Very limey sand and gravel	8	343
Sandy lime	7	114	Shaley sand	4	347
Lime	6	120	Lime and shale	3	350
Dry sand	5	125	Shale and yellow clay	3	353
Lime and shale	75	200			
Sandy lime	8	208			
Lime and red rock	12	220			
Dry sand	15	235			

Well 7

Black soil	5	5	Sand and red rock	5	255
Gravel and sand rock	11	16	Sand and shale	5	260
Yellow sand rock	6	22	Sand, coarse, no water	5	265
Gray lime and shale	19	41	Sand	5	270
Sand water	39	80	Red rock	10	280
Shale	15	95	Sandy red rock	18	298
Lime and shale	65	160	Lime and red rock	22	320
Sand, lime and shale	25	185	Sand and lime	27	347
White sandy lime	35	220	Hard sand	15	362
Red rock	30	250	Coarse sand	5	367
			Red beds	3	370

MILLS COUNTY

Mullin

Population in 1940: 404.

Source of information:
W. L. Smith
Mar. 21, 1946

Owner: S. J. Eton.

Source of supply: Well drilled about 1916 by Henry Hart, depth about 100 feet, diameter 6 inches; deep-well cylinder and windmill.

Pumpage: No record.

Storage: Elevated tank, 1,500 gallons.

Number of customers: 8.

Treatment: None.

Analysis of water:

Date collected: Mar. 21, 1946. Analyzed by C. B. Cibulka

	Well 1	
	Parts per million.	Equivalents per million
Silica (SiO_2)	9.6	
Iron (Fe)	0.30	
Calcium (Ca)	151	7.54
Magnesium (Mg)	95	7.81
Sodium (Na)	26	1.11
Potassium (K)	7.9	0.20
Bicarbonate (HCO_3)	472	7.74
Sulfate (SO_4)	51	1.06
Chloride (Cl)	152	4.29
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	221	3.56
Dissolved solids	946	
Total hardness as $CaCO_3$	768	
pH	7.5	

MONTAGUE COUNTY

Bowie

Population in 1940: 3,407.

Source of information:
Harry Davis, water superintendent
June 4, 1946

Ownership: Municipal.

Source of supply: Lake Bowie 7½ miles north of Bowie, capacity 1,800 acre feet.

Pumpage:

(Average in gallons a day)

1945

Jan.	170,000	July	275,000
Feb.	182,000	Aug.	372,000
Mar.	165,000	Sept.	297,000
Apr.	194,000	Oct.	224,000
May	238,000	Nov.	248,000
June	254,000	Dec.	226,000

Storage: 2 ground tanks at Lake, 70,000 gallons each; one settling basin at Lake, 150,000 gallons; ground reservoir, 187,000 gallons; standpipe, 90,000 gallons.

Number of customers: 1,500.

Treatment: Coagulation, sedimentation, and chlorination.

Analyses of water:

Date collected: June 4, 1946 — Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	6.7		4.7	
Iron (Fe)	1.9		0.06	
Calcium (Ca)	18	0.90	26	1.298
Magnesium (Mg)	7.2	0.59	6.1	0.502
Sodium (Na)	20	0.88	19	0.816
Potassium (K)	4.0	0.12	4.9	0.125
Bicarbonate (HCO_3)	104	1.70	69	1.131
Sulfate (SO_4)	14	0.29	54	1.124
Chloride (Cl)	17	0.48	16	0.451
Fluoride (F)	0.2	0.01	0.6	0.032
Nitrate (NO_3)	0.4	0.01	0.2	0.003
Dissolved solids	143		167	
Total hardness as $CaCO_3$	74		90	
pH	7.8		7.8	

MONTAGUE COUNTY

Nocona

Population in 1940: 2,605

Source of information:
Water superintendent
Nov. 17, 1944

Ownership: Municipal.

Source of supply: 9 wells.

Well 1. One block west of pump station; drilled, depth 388 feet, diameter (?); Peerless Hi-lift pump and electric motor; yield 32 gallons a minute on November 17, 1944.

Well 2. One block northwest of pump station; drilled in 1926, depth 712 feet, diameter 8 to 5-3/16 inches; deep-well cylinder and pump jack and electric motor; static water level 268 feet below land surface Nov. 1944; yield 19 gallons a minute on Nov. 17, 1944.

Well 3. 100 feet north of pump station; drilled in 1926, depth 600 feet, diameter 12 inches; Peerless Hi-lift pump and electric motor; yield 10½ gallons a minute on Nov. 17, 1944.

Well 4. 50 feet south of pump station; drilled in 1926, depth 600 feet, diameter 12 inches; deep-well cylinder and pump jack and electric motor; yield 6½ gallons a minute on Nov. 17, 1944.

Well 5. ¼ mile northeast of pump station; drilled in 1938, depth 525 feet, diameter 8 to 6-5/8 inches; deep-well cylinder and pump jack and electric motor; static water level 321 feet below land surface Nov. 16, 1944; yield 12 gallons a minute on Nov. 13, 1944.

Well 6. 124 feet north of Well 5; drilled in 1942, depth about 600 feet, diameter 8 inches; deep-well cylinder and pump jack and electric motor; static water level 306 feet below land surface Nov. 1944; yield 17 gallons a minute with a drawdown of 180 feet in Nov. 1944.

Well 7. Approximately ½ mile south of pump station; drilled in 1938, depth 500 feet, diameter 10 inches; deep-well cylinder and pump jack and electric motor; static water level 182 feet below land surface Nov. 1944; yield 23 gallons a minute with a drawdown of 164 feet in Nov. 1944.

Well 8. 250 feet south of Well 7; drilled in 1939, depth 508 feet, diameter 10 inches; Peerless Hi-lift pump and electric motor; static water level 141 feet below land surface Nov. 1944; estimated yield 25 gallons a minute in Nov. 1944.

MONTAGUE COUNTY

Nocona -- Continued

Well 9. About 20 feet north of pump station; drilled in 1944, depth 780 feet, cased to 680 feet, diameter 8-5/8 inches; deep-well cylinder and pump jack and electric motor; static water level 209 feet below land surface Nov. 17, 1944; yield 28 gallons a minute with a drawdown of 340 feet in Nov. 1944.

Storage: Elevated tank, 100,000 gallons; concrete ground reservoir, 50,000 gallons.

Treatment: None.

Analyses of water:

Date collected: Nov. 17, 1944 Analyzed by J. H. Rowley

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13			
Iron (Fe)	0.03			
Calcium (Ca)	2.6	0.13	2.7	0.13
Magnesium (Mg)	0.7	0.06	2.1	0.17
Sodium (Na) Potassium (K)	210	9.11	221	9.61
Bicarbonate (HCO_3)	503	8.24	542	8.87
Sulfate (SO_4)	30	0.62	34	0.71
Chloride (Cl)	12	0.34	11	0.31
Fluoride (F)	1.6	0.08	-	-
Nitrate (NO_3)	1.5	0.02	1.2	0.02
Dissolved solids	532		574	
Total hardness as $CaCO_3$	10		15	
pH	8.4		8.4	

MONTAGUE COUNTY

Nocona -- Continued

Date collected: Nov. 17, 1944 Analyzed by J. H. Rowley

	Well 6		Well 7	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	8.4			
Iron (Fe)	0.34			
Calcium (Ca)	3.8	0.19	2.1	0.10
Magnesium (Mg)	0.9	0.07	0.4	0.03
Sodium (Na)	278	12.09	205)	8.92)
Potassium (K)	4.5	0.12		
Bicarbonate (HCO_3)	647	10.59	498	8.16
Sulfate (SO_4)	53	1.10	20	0.42
Chloride (Cl)	19	0.54	16	0.45
Fluoride (F)	4.0	0.21	-	-
Nitrate (NO_3)	1.8	0.03	1.2	0.02
Dissolved solids	708		518	
Total hardness as $CaCO_3$	13		6	
pH	8.4		8.4	

	Well 9	
	Parts per million	Equivalents per million
Silica (SiO_2)	11	
Iron (Fe)	16	
Calcium (Ca)	4.6	0.23
Magnesium (Mg)	1.4	0.12
Sodium (Na)	481	20.91
Potassium (K)	5.8	0.15
Bicarbonate (HCO_3)	736	12.06
Sulfate (SO_4)	53	1.10
Chloride (Cl)	286	8.07
Fluoride (F)	3.0	0.16
Nitrate (NO_3)	1.2	0.02
Dissolved solids	1,210	
Total hardness as $CaCO_3$	18	
pH	8.4	

MONTAGUE COUNTY

Nocona -- Continued

Drillers' logs:

Well 5
Partial log

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	10	10	Gray shale	4	190
Yellow clay	15	25	Red shale	125	315
Shale	15	40	Sandy gray shale	25	340
Brown shale	10	50	Water sand	6	346
Sandy gray shale	44	94	Sandy gray shale	9	355
Water sand	7	101	Water sand	15	370
Gray shale	39	140	Sandy gray shale	4	374
Red shale	10	150	Water sand	21	395
Blue shale	25	175	Blue shale	5	400
Black shale	11	186	Red shale	5½	405½

Well 7
Partial log

Red clay	25	25	Blue shale	28	230
Sand rock	10	35	Water sand	32	262
Red clay	13	48	Red clay	3	265
Sand rock	12	60	Blue shale	7	272
Water sand	12	72	Red clay	43	315
Red clay	33	105	Gray shale	7	322
Water sand	40	145	Red clay	9	331
Blue shale	20	165	Sandy shale	15	346
Sandy shale	12	177	Water sand	31	377
Water sand	25	202			

Well 8
Partial log

Red clay	16	16	Red clay	10	218
Sand rock	12	28	Sandy shale	13	231
Red clay	20	48	Water sand	51	282
Sand rock	15	63	Red clay	12	294
Green shale	17	80	Gray shale	28	322
Red clay	38	118	Red clay	23	345
Sandy shale	24	142	Sandy shale	25	370
Gray shale	8	150	Water sand	12	382
Red clay	30	180	Gray shale	16	398
Blue shale	5	185	Water sand	24	422
Water sand	23	208	Sandy shale	4	426

MONTAGUE COUNTY

Nocona -- Continued

Well 9

	Thickness (feet)	Depth (feet)
Sand, gravel,and shale	204	204
Sand, shale, and shells	123	327
Clay, shale, and broken sand	92	419
Sand, shale, and shells	231	650
Sandy shale, lime, shells, and sand	32	682
Sand	72	754
Lime shells and white sand	26	780

Saint Jo

Population in 1940: 1,010.

Source of information:
J. L. Farris, mayor
June 5, 1946

Ownership: Municipal.

Source of supply: Well at City Hall; drilled in 1938 by Harry Baird, depth 430 feet, diameter 7 inches; deep-well turbine pump and electric motor; static water level reported 160 feet below land surface; yield 80 gallons a minute.

Pumpage: Average 66,300 gallons a day.

Storage: Ground reservoir, 120,000 gallons; elevated tank, 90,000 gallons.

Number of customers: 312.

Treatment: None.

MONTAGUE COUNTY

Saint Jo -- Continued

Analysis of water:

Date collected: June 5, 1946 — Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	0.06	
Calcium (Ca)	102	5.09
Magnesium (Mg)	33	2.71
Sodium (Na)	27	1.17
Potassium (K)	6.8	0.17
Bicarbonate (HCO_3)	408	6.69
Sulfate (SO_4)	96	2.00
Chloride (Cl)	13	0.37
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	3.8	0.06
Dissolved solids	504	
Total hardness as $CaCO_3$	390	
pH	7.4	

PALO PINTO COUNTY

Gordon

Population in 1940: 532.

Source of information:
J. A. Stewart, mayor

Ownership: Municipal.

Source of supply: Lake about one mile southwest of Gordon, capacity about 240 acre feet.

Pumpage: Estimated 30,000 gallons a day.

Storage: Concrete reservoir on hill, 55,000 gallons.

Number of customers: 140.

Treatment: Chlorination (no filtration).

Analysis of water:

Date collected: Nov. 1945 Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	8.6	
Iron (Fe)	0.30	
Calcium (Ca)	28	1.400
Magnesium (Mg)	6.6	0.543
Sodium (Na)	5.2	
Potassium (K)		0.224
Bicarbonate (HCO_3)	101	1.656
Sulfate (SO_4)	13	0.271
Chloride (Cl)	8.0	0.226
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	0.2	
Dissolved solids	128	0.003
Total hardness as $CaCO_3$	97	
pH	7.2	

PALO PINTO COUNTY

Graford

Population in 1940: 804.

Source of information:
Joe Baggett, water superintendent
May 23, 1946

Ownership: Municipal.

Source of supply: Keechi Creek 1 mile west of town.

Pumpage: Average 36,000 gallons a day.

Storage: Concrete settling reservoir 30,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 200.

Treatment: Coagulation, sedimentation and chlorination.

Analyses of water:

Date collected: May 23, 1946 — Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	16		8.2	
Iron (Fe)	0.14		0.26	
Calcium (Ca)	54	2.695	58	2.895
Magnesium (Mg)	4.5	0.370	7.1	0.584
Sodium (Na)	22	0.943	15	0.673
Potassium (K)	4.4	0.113	5.1	0.130
Bicarbonate (HCO_3)	186	3.049	110	1.803
Sulfate (SO_4)	17	0.354	81	1.686
Chloride (Cl)	25	0.705	28	0.790
Fluoride (F)	0.0	0.000	0.0	0.000
Nitrate (NO_3)	0.8	0.013	0.2	0.003
Dissolved solids	236		264	
Total hardness as $CaCO_3$	153		175	
pH	7.8		7.0	

PALO PINTO COUNTY

Mineral Wells

Population in 1940: 6,303.

Source of information:
T. A. Camp, water commissioner
Jan. 1946

Ownership: Municipal.

Source of supply: Reservoir, six miles east of Mineral Wells, on Rock Creek; reservoir capacity 2,500,000,000 gallons.

Pumpage: Maximum, 2,000,000 gallons a day; winter average, about 1,500,000 gallons a day.

Storage: Ground storage reservoir, 1,090,000 gallons.

Number of customers: 2,300 (also supplies Camp Wolters).

Treatment: Alum and lime, pre-chlorination, rapid sand filtration, ammonia and post-chlorination.

Analyses of water:

Date collected: Nov. 1945. Analyzed by J. H. Rowley

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	9.8		4.3	
Iron (Fe)	0.09		0.04	
Calcium (Ca)	38	1.897	42	2.096
Magnesium (Mg)	10	0.822	10	0.822
Sodium (Na)	14	.628	16	.677
Potassium (K)	5.2	0.133	4.4	0.113
Bicarbonate (HCO_3)	137	2.246	132	2.164
Sulfate (SO_4)	33	0.687	43	0.895
Chloride (Cl)	19	0.536	23	0.649
Fluoride (F)	0.2	0.011	0.0	0.000
Nitrate (NO_3)	0.0	0.000	0.0	0.000
Dissolved solids	221		217	
Total hardness as $CaCO_3$	136		146	
pH	7.4		7.3	

PALO PINTO COUNTY

Mingus

Population in 1940: 570.

Source of information:
Pump operator
Jan. 1946

Owner: T. and P. Mercantile Company owns Lake.
City owns distribution system.

Source of supply: T. and P. Mercantile Company Lake at Thurber.

Pumpage: Estimated 5,000 to 10,000 gallons a day.

Storage:

Number of customers: 80.

Treatment: Chlorination and filtration.

Analysis of water:

Date collected: Nov. 1945. Analyzed by C. B. Cibulka

	Finished Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	7.9	
Iron (Fe)	1.6	
Calcium (Ca)	22	1.098
Magnesium (Mg)	5.4	0.444
Sodium (Na)	12	
Potassium (K)		0.513
Bicarbonate (HCO_3)	102	1.672
Sulfate (SO_4)	4.3	0.090
Chloride (Cl)	10	0.282
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	0.0	0.000
Dissolved solids	117	
Total hardness as $CaCO_3$	77	
pH	7.2	

PALO PINTO COUNTY

Strawn

Population in 1940: 1,107.

Source of information:
A. M. Barrett, city secretary

Ownership: Municipal.

Source of supply: Lake No. 4 on Walnut Creek, 2½ miles north of Strawn; reservoir capacity 400 acre feet. New lake five miles west of Strawn on Russell's Creek; reservoir capacity, 1,200 acre feet; available for city added supply, but not used at present.

Pumpage (estimated): 35,000 gallons a day in summer and about 30,000 gallons a day in winter.

Storage: Elevated tank 100,000 gallons.

Number of customers: 330.

Treatment: H. T. H. alum, lime and activated carbon.

Analyses of water:

Date collected: Nov. 1945. Analyzed by J. H. Rowley

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	12		3.2	
Iron (Fe)	0.24		0.04	
Calcium (Ca)	46	2.296	90	4.492
Magnesium (Mg)	3.9	0.321	3.5	0.288
Sodium (Na) Potassium (K)	3.0	.131	3.8	.166
Bicarbonate (HCO_3)	150	2.459	106	1.737
Sulfate (SO_4)	7.8	0.162	146	3.040
Chloride (Cl)	4.0	0.113	6.0	0.169
Fluoride (F)	0.2	0.011	0	0.000
Dissolved solids	158	0.003	331	0.000
Total hardness as $CaCO_3$	131		239	
pH	7.7		7.0	

PARKER COUNTY

Weatherford

Population: 5,924.

Source of information:
E. C. Shelby, Sr., water superintendent

Ownership: Municipal.

Source of supply: 6 wells.

Well 1. At Davis and Lee Streets, drilled in 1889, depth 401 feet, diameter 10 inches; deep-well turbine pump and 15-horsepower electric motor; yield 60 gallons a minute.

Well 2. Drilled in 1925 by Q. D. Lewis, depth 500 feet, diameter 8 inches; double action deep-well cylinder and pump jack; yield 60 gallons a minute.

Well 3. Drilled in 1927 by Henry Measures, depth 388 feet, diameter 8 inches; deep-well turbine and 20-horsepower electric motor; yield 100 gallons a minute.

Well 4. Drilled in 1941 by Layne-Texas Company; depth 401 feet, diameter 16 inches; deep-well turbine pump and 25-horsepower electric motor; static water level, July 23, 1941, 295 feet; pumping level 366 feet when pumping 152 gallons a minute.

Well 5. Drilled in 1941 by Layne-Texas Company, depth 456 feet, diameter 16 inches; deep-well turbine pump and 25-horsepower electric motor; yield 65 gallons a minute; static water level Sept. 21, 1941, 356 feet; pumping level 440 feet when pumping 75 gallons a minute.

Well 6. Drilled in 1944 by Layne-Texas Company, depth 400 feet, diameter 16 inches; deep-well turbine pump and 25-horsepower electric motor; yield 72 gallons a minute.

Pumpage: Estimated average 450,000 gallons a day.

Customers: 1,750.

Storage: Two ground storage reservoirs, total capacity 3,000,000 gallons.

Treatment: Chlorination.

PARKER COUNTY

Weatherford -- Continued

Analyses of water:

Date collected: Nov. 1945. Analyzed by C. B. Cibulka

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	14		15	
Iron (Fe)	0.15		0.10	
Calcium (Ca)	61	3.04	68	3.39
Magnesium (Mg)	28	2.30	40	3.29
Sodium (Na)	106	4.62	83	3.62
Potassium (K)	20	0.51	20	0.51
Bicarbonate (HCO_3)	396	6.49	420	6.88
Sulfate (SO_4)	109	2.27	110	2.29
Chloride (Cl)	59	1.66	57	1.61
Fluoride (F)	0.0	0.00	0.6	0.03
Nitrate (NO_3)	3.0	0.05	0.0	0.00
Dissolved solids	595		608	
Total hardness as $CaCO_3$	267		334	
pH	7.2		7.2	

	Well 4	
	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.68	
Calcium (Ca)	63	3.14
Magnesium (Mg)	35	2.88
Sodium (Na)	91	3.95
Potassium (K)	18	0.46
Bicarbonate (HCO_3)	403	6.61
Sulfate (SO_4)	105	2.19
Chloride (Cl)	57	1.61
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	1.0	0.02
Dissolved solids	603	
Total hardness as $CaCO_3$	301	
pH	7.2	

PARKER COUNTY

Weatherford -- Continued

Drillers' logs:

Well 4

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Soil	5	5	Sandy shale	10	346
Sandy soil	16	21	Sand	10	356
Hard sandy shale	13	34	Hard shale	15	371
Hard white sandy shale with layers of hard fine sand	32	66	Hard red and blue shale	18	389
			Sand	9	398
			Red and blue shale	9	407
Hard fine-grained sand	7	73	Red, blue and yellow shale	50	457
Hard shale	9	82	Lime	12	469
Hard sandy lime	3	85	Shale	31	500
Blue shale	15	100	Hard black shale, layers of fine sand and lignite (bottom of Trinity)	6	506
Lime	104	204			
Lime and shale	25	229			
Hard shale and lime	42	271			
Lime	4	275			
Shale	19	294			
Fine-grained sand	12	306			
Hard shale	12	318			
Good sand	18	336			

Well 5

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	3	3	Hard shale	11	190
Clay	5	8	Hard lime	3	193
Sand	8	16	Hard shale and lime	4	197
Shale	4	20	Rock	3	200
Shale and lime streaks	15	35	Shale and rock	9	209
Fine-grained white sand	7	42	Hard rock	15	224
Hard lime	12	54	Hard lime rock and shale	12	236
Sand and shale	11	65	Hard rock	5	241
Hard shale	4	69	Hard lime and shale	16	257
Sandy shale	5	74	Hard lime rock	10	267
Sand (cut good)	26	100	Hard shale	2	269
Hard lime	8	108	Lime rock and shale	13	282
Rock	1	109	Hard lime	11	293
Lime	3	112	Shale and lime	16	309
Hard lime and shale	13	125	Hard lime	15	324
Hard sand	2	127	Rock	2	326
Blue shale and lime	21	148	Shale and lime	20	346
Shale and boulders	5	153	Hard fine white sand	9	355
Hard shale	18	171	Shale and lime	18	373
Hard lime	6	177	Lime sand and lime	11	384
Shale	2	179	Shale	3	387
			Sand	9	396
			Shale and lime	13	409
			White sand and shale	11	420
			Coarse white sand	21	441
			Brown shale	20	461

RUNNELS COUNTY

Ballinger

Population in 1940: 4,472.

Source of information:
K. V. Northington, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: 2 lakes on Elm Creek.

Pumpage:

(Average in gallons a day)

	1945	1946
Jan.	239,000	250,000
Feb.	247,000	311,000
Mar.	280,000	365,000
Apr.	293,000	
May	426,000	
June	521,000	
July	496,000	
Aug.	565,000	
Sept.	535,000	
Oct.	325,000	
Nov.	298,000	
Dec.	242,000	

Storage: Elevated tank, 250,000 gallons; stand pipe, 80,000 gallons; settling basin at pumping station, 315,000 gallons.

Number of customers: 1,551.

Treatment: Aeration, coagulation, sedimentation, filtration, chlorination.

RUNNELS COUNTY

Ballinger -- Continued

Analyses of water:

Date collected: Apr. 17, 1946 Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	20		6.0	
Iron (Fe)	0.49		0.03	
Calcium (Ca)	120	5.99	118	5.89
Magnesium (Mg)	83	6.83	82	6.74
Sodium (Na)	193	8.38	203	8.84
Potassium (K)	30	0.77	36	0.92
Bicarbonate (HCO_3)	193	3.16	202	3.31
Sulfate (SO_4)	232	4.83	245	5.10
Chloride (Cl)	495	13.96	495	13.96
Fluoride (F)	0.0	0.00	0.2	0.01
Nitrate (NO_3)	1.20	0.02	0.5	0.01
Dissolved solids	1,270		1,290	
Total hardness as $CaCO_3$	641		632	
pH	7.4		7.4	

Miles

Population in 1940: 814.

Source of information:
F. G. Lewin, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. 200 feet northeast of pump house; drilled about 1928 by the State Highway Department, depth about 120 feet, diameter 8 inches; deep-well cylinder and pump jack and 5-horsepower electric motor; reported yield 90 to 120 gallons a minute.

Well 2. 150 feet southeast of pump house; drilled in 1921 by J. O. Donaldson, depth about 120 feet, diameter 6 inches; deep-well cylinder and pump jack and 3-horsepower electric motor; yield 28 gallons a minute.

Pumpage (estimated): Average 100,000 gallons a day.

RUNNELS COUNTY

Miles -- Continued

Storage: Ground reservoir, 50,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 208.

Treatment: Chlorination.

Analysis of water:

Date collected: Apr. 17, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.11	
Calcium (Ca)	204	10.18
Magnesium (Mg)	85	6.99
Sodium (Na)	133	5.78
Potassium (K)	6.2	0.16
Bicarbonate (HCO_3)	312	5.11
Sulfate (SO_4)	584	12.16
Chloride (Cl)	201	5.67
Fluoride (F)	1.8	0.09
Nitrate (NO_3)	5.2	0.08
Dissolved solids	1,390	
Total hardness as $CaCO_3$	858	
pH	7.4	

Winters

Population in 1940: 2,335.

Source of information:
C. D. Blackley, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: Lake about 5 miles southeast of Winters.

Pumpage (estimated): 130,000 gallons a day.

Storage: Settling basin, 140,000 gallons; clear well, 25,000 gallons, 2 stand pipes, 100,000 and 150,000 gallons.

RUNNELS COUNTY

Winters -- Continued

Number of customers: 600.

Treatment: Coagulation, sedimentation and pre and post chlorination.

Analyses of water:

Date collected: Apr. 17, 1946 Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	2.4		2.0	
Iron (Fe)	0.14		0.06	
Calcium (Ca)	58	2.89	60	2.99
Magnesium (Mg)	20	1.64	20	1.64
Sodium (Na)	16	0.70	17	0.72
Potassium (K)	9.6	0.25	9.1	0.23
Bicarbonate (HCO_3)	234	3.84	226	3.70
Sulfate (SO_4)	45	0.94	54	1.12
Chloride (Cl)	24	0.68	27	0.76
Fluoride (F)	0.0	0.00	0.0	0.00
Nitrate (NO_3)	1.2	0.02	0.2	0.00
Dissolved solids	310		316	
Total hardness as $CaCO_3$	226		232	
pH	7.6		7.4	

SAN SABA COUNTY

Richland Springs

Population in 1940: 451

Source of information:
Herman Atchison, water superintendent
Jan. 18, 1946

Ownership: Municipal.

Source of supply; 2 springs at north end of Carter Street, one block north of Highway 190; discharge of south spring 1,536 gallons a minute Oct. 28, 1938; water pumped from spring by centrifugal pump and 10-horsepower electric motor.

Storage: Elevated tank, 60,000 gallons.

Number of customers: 140.

Treatment: Chlorination.

Analysis of water:

Date collected: Jan. 18, 1946. Analyzed by J. H. Rowley

	Composite analysis	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.2	
Iron (Fe)	0.06	
Calcium (Ca)	104	5.19
Magnesium (Mg)	23	1.89
Sodium (Na)	30	1.31
Potassium (K)	6.7	0.17
Bicarbonate (HCO_3)	401	6.57
Sulfate (SO_4)	13	0.27
Chloride (Cl)	58	1.64
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	3.8	0.06
Dissolved solids	448	
Total hardness as $CaCO_3$	354	
pH	7.7	

San Saba

Population in 1940: 2,927.

Source of information:
Reeves Kuykendall, city secretary
Jan. 18, 1946

Onwership: Municipal.

SAN SABA COUNTY

San Saba -- Continued

Source of supply: Springs in eastern part of City; temperature 72° F.

Pumpage: Average 720,000 gallons a day.

Storage: Elevated tank, 100,000 gallons.

Number of customers: 650.

Analysis of water:

Date collected: Jan. 18, 1946 Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	9.2	
Iron (Fe)	0.05	
Calcium (Ca)	116	5.79
Magnesium (Mg)	41	3.37
Sodium (Na)	61	2.64
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	466	7.64
Sulfate (SO_4)	7.2	0.15
Chloride (Cl)	152	4.29
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	1.8	0.03
Dissolved solids	648	
Total hardness as $CaCO_3$	458	
pH	7.8	

SHACKELFORD COUNTY

Albany

Population in 1940: 2,230.

Source of information:
Roy Matthews, water superintendent
Sept. 19, 1946

Ownership: Municipal.

Source of supply: Lake McCarty 7 miles south of city.

Pumpage: Summer 400,000 gallons a day, winter 130,000 gallons a day.

Storage: Elevated tank, 75,000 gallons.

Number of customers: 625.

Treatment: Aeration, coagulation, sedimentation, rapid sand filtration, and chlorination.

Analysis of water:

Date collected: Sept. 19, 1946 — Analyzed by J. H. Rowley

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.04	
Calcium (Ca)	57	2.85
Magnesium (Mg)	17	1.40
Sodium (Na)	79	3.44
Potassium (K)	11	0.28
Bicarbonate (HCO_3)	160	2.62
Sulfate (SO_4)	26	0.54
Chloride (Cl)	170	4.79
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.5	0.01
Dissolved solids	513	
Total hardness as $CaCO_3$	212	
pH	7.7	

SOMERVELL COUNTY

Glen Rose

Population in 1940: 1,050.

Source of information:
C. A. Stevenson, water superintendent

Ownership: Municipal.

Source of supply: One well at pumping station, drilled in 1934 by Layne-Texas Company, depth 320 feet, diameter 8 inches; deep-well turbine pump with 10-horsepower electric motor; well flows from 20,000 to 30,000 gallons a day; pump not used much until recently; yield when pumping 200 gallons a minute.

Pumpage (estimated): Summer, 75,000 to 100,000 gallons a day; winter, 50,000 gallons a day.

Storage: Elevated tank, 50,000 gallons; ground storage reservoir, 50,000 gallons.

Number of customers: 141.

Treatment: None.

Analysis of water:

Date collected: Nov. 1945. Analyzed by C. B. Cibulka

	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.05	
Calcium (Ca)	25	1.25
Magnesium (Mg)	22	1.81
Sodium (Na)	97	4.20
Potassium (K)	6.1	0.16
Bicarbonate (HCO_3)	395	6.48
Sulfate (SO_4)	20	0.42
Chloride (Cl)	18	0.51
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.2	0.00
Dissolved solids	386	
Total hardness as $CaCO_3$	153	
pH	7.2	

STEPHENS COUNTY

Brackenridge

Population in 1940: 5,826

Source of information:
E. A. Cain, manager
May 24, 1946

Owner: Community Public Service Company.

Source of supply: 2 lakes on Clear Fork River about 10 miles northwest of Brackenridge near Crystal Falls.

Pumpage:

(Average in gallons a day)

	1945
Jan.	332,000
Feb.	345,000
Mar.	387,000
Apr.	362,000
May	464,000
June	571,000
July	610,000
Aug.	692,000
Sept.	609,000
Oct.	430,000
Nov.	421,000
Dec.	403,000

Storage: Earth and ground reservoir at Crystal Falls, 3,000,000 gallons; settling basin in City, 1,000,000 gallons; clear well, 65,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 1,875.

Treatment: Coagulation, sedimentation, pre and post chlorination.

STEPHENS COUNTY

Brackenridge -- Continued

Analysis of water:

Date collected: May 24, 1946 — Analyzed by C. B. Cibulka

	Finished Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	2.0	
Iron (Fe)	0.28	
Calcium (Ca)	190	9.48
Magnesium (Mg)	66	5.43
Sodium (Na)	322	13.98
Potassium (K)	17	0.43
Bicarbonate (HCO_3)	117	1.92
Sulfate (SO_4)	758	15.78
Chloride (Cl)	411	11.59
Fluoride (F)	0.4	0.02
Nitrate (NO_3)	0.5	0.01
Dissolved solids	1,870	
Total hardness as $CaCO_3$	746	
pH	7.8	

Caddo

Population in 1940: 700.

Source of information:
John Luttrell
May 23, 1946

Owner: John Luttrell.

Source of supply: Lake on small draw.

Pumpage: Average 2,100 gallons a day.

Storage: Elevated tank, 6,000 gallons.

Number of customers: 22.

Treatment: Chlorination -- part time.

STEPHENS COUNTY

Caddo -- Continued

Analysis of water:

Date collected: May 23, 1946 — Analyzed by C. B. Cibulka

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	4.7	
Iron (Fe)	1.3	
Calcium (Ca)	47	2.346
Magnesium (Mg)	4.6	0.378
Sodium (Na)	7.2	0.313
Potassium (K)	3.9	0.100
Bicarbonate (HCO_3)	106	1.737
Sulfate (SO_4)	55	1.145
Chloride (Cl)	8.0	0.226
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	1.8	0.029
Dissolved solids	185	
Total hardness as $CaCO_3$	136	
pH	7.4	

TARRANT COUNTY

Arlington

Population in 1940: 4,240.

Source of information:
G. C. Pearce, plant superintendent
May 22, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 5. At end of West Main Street; drilled in 1930 by McKee and Hightower, depth 900 feet, diameter 12 inches; deep-well turbine pump and 100-horsepower electric motor; yield 400 gallons a minute.

Well 6. About 500 feet from well 5 at the end of West Main Street; drilled in July 1942 by Layne-Texas Company, depth 1,775 feet, diameter 13-3/8 to 7 inches, 184 casing perforated from 1,567 to 1,761 feet; deep-well turbine pump and 100-horsepower electric motor; static water level reported 267 feet below land surface in 1942; yield 448 gallons a minute with drawdown of 72 feet; temperature 85° F.

Pumpage (estimated): Maximum 1,000,000 gallons a day; average 800,000 gallons a day.

Storage: Elevated tank, 100,000 gallons; 2 ground reservoirs, 57,000 and 130,000 gallons each.

Treatment: None.

Analysis of water:

Date collected: May 22, 1946 — Analyzed by C. B. Cibulka

	Composite samples of Wells 5 and 6	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.0	
Calcium (Ca)	2.9	0.14
Magnesium (Mg)	1.3	0.11
Sodium (Na)	306	13.30
Potassium (K)	7.4	0.19
Bicarbonate (HCO_3)	505	8.29
Sulfate (SO_4)	189	3.93
Chloride (Cl)	50	1.41
Fluoride (F)	1.6	0.08
Nitrate (NO_3)	1.8	0.03
Dissolved solids	823	
Total hardness as $CaCO_3$	12	
pH		8.6

TARRANT COUNTY

Arlington -- Continued

Driller's log:

Well 6

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sandy clay	10	10	Sandy shale and sand	23	1017
Blue shale	65	75	Shale and lime	58	1075
Sand	28	103	Sandy lime and shale	55	1130
Shale and lignite	30	133	Soft sandy lime	5	1135
Hard shale	9	142	Lime and shale	143	1278
Sand	11	153	Brown sandy lime	20	1298
Blue shale	50	203	Shale and lime	22	1320
Hard rock	3	206	Black and gray shale and lime	48	1368
Shale	9	215	Sandy shale	31	1399
Sand	20	235	Sandy shale and lime	31	1430
Shale	102	337	Sand	10	1440
Lime and shale	27	364	Lime and red shale	9	1449
Shale	27	391	Sand	26	1475
Lime and shale	147	538	Red and blue shale	17	1492
Lime	8	546	Sand	13	1505
Lime and shale	201	747	Blue shale and sand	28	1533
Sandy shale and lime	19	766	Red sandy shale	18	1551
Sand-few shale breaks	38	804	Sand	43	1594
Sandy shale and sand	25	829	Shale and layers of sand	19	1613
Shale	9	838	Sand	25	1638
Sand and shale breaks	16	854	Sandy shale and sand	6	1644
Sandy shale and lime	8	862	Sand	68	1712
Sand	8	870	Hard shale	6	1718
Sandy shale	7	877	Sand, gravel and shale	31	1749
Sand	11	888	Red, blue, and yellow shale	26	1775
Shale	29	917			
Hard lime and shale	77	994			

Everman

Population in 1940: 250.

Source of information:
C. G. Vaughn
May 22, 1946

Owner: C. G. Vaughn

TARRANT COUNTY

Everman -- Continued

Source of supply: 2 wells.

Well 1. Drilled in 1915 by T. M. Hellams, depth about 600 feet, diameter 6 inches; deep-well cylinder and pump jack and 10-horsepower steam engine; static water level reported 300 feet below land surface; yield 20 gallons a minute.

Well 2. Drilled in 1915 by T. M. Hellams, depth about 600 feet, diameter 6 inces; deep-well cylinder and pump jack and 40-horsepower gasoline engine; yield 20 gallons a minute.

Pumpage (estimated): 10,000 gallons a day.

Storage: 2 steel tanks, 12,000 and 4,000 gallons.

Number of customers: 95.

Treatment: Occasional chlorination.

Analysis of water:

Date collected: May 22, 1946 Analyzed by C. B. Cibulka

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	15	
Iron (Fe)	0.14	
Calcium (Ca)	1.3	0.06
Magnesium (Mg)	0.5	0.04
Sodium (Na)	203	8.84
Potassium (K)	4.8	0.12
Bicarbonate (HCO_3)	470	7.69
Sulfate (SO_4)	44	0.92
Chloride (Cl)	15	0.42
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	0.0	0.00
Dissolved solids	516	
Total hardness as $CaCO_3$	5	
pH	8.8	

TARRANT COUNTY

Fort Worth

Population in 1940: 177,662

Source of information:
Ewall Stephens, water superintendent
May 22, 1946

Ownership: Municipal.

Source of supply: 3 lakes.

Lake Worth. Constructed in 1914 on the west fork of the Trinity River about 9 miles west of Fort Worth; capacity about 20,000 acre feet.

Eagle Mountain Lake. Constructed in 1932 on the west fork of the Trinity River about 18 miles northwest of Fort Worth; capacity 216,000 acre feet.

Lake Bridgeport. Constructed about 1932 on the west fork of the Trinity River above Eagle Mountain Lake and about 4 miles northwest of Bridgeport; capacity 284,000 acre feet.

Pumpage:

(Average in gallons a day)

1945

Jan.	18,730,000	July	25,540,000
Feb.	18,800,000	Aug.	27,900,000
Mar.	19,200,000	Sept.	26,500,000
Apr.	18,200,000	Oct.	18,700,000
May	22,650,000	Nov.	18,400,000
June	24,100,000	Dec.	18,250,000

Storage: Concrete reservoir on south side of City, 5,000,000 gallons; concrete reservoir on north side of City, 4,500,000 gallons; 3 elevated tanks, 500,000 gallons each; 2 elevated tanks, 100,000 gallons each; stand pipe, 300,000 gallons.

Number of customers: 55,800.

Treatment: Aeration, coagulation, filtration and chlorination.

TARRANT COUNTY

Fort Worth -- Continued

Analyses of water:

Date collected: May 22, 1946 Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	6.4		2.4	
Iron (Fe)	0.23		0.0	
Calcium (Ca)	43	2.146	46	2.296
Magnesium (Mg)	6.9	0.567	7.0	0.576
Sodium (Na)	16	0.686	20	0.862
Potassium (K)	4.8	0.123	5.3	0.135
Bicarbonate (HCO_3)	154	2.524	160	2.623
Sulfate (SO_4)	17	0.354	23	0.479
Chloride (Cl)	22	0.620	26	0.733
Fluoride (F)	0.4	0.021	0.6	0.032
Nitrate (NO_3)	0.2	0.003	0.2	0.003
Dissolved solids	190		201	
Total hardness as $CaCO_3$	136		144	
pH	8.2		8.2	

Handley

Population in 1940: 3,000

Source of information:
E. Hoover, assistant cashier
May 22, 1946

Ownership: Tarrant County Water Control and Improvement District No. 2.

Source of supply: 2 wells.

Well 1. Drilled in 1930, depth 1,364 feet, diameter 8 to 6 inches; deep-well turbine pump and 75-horsepower electric motor; static water level reported 371 feet below land surface; yield 224 gallons a minute.

Well 2. On street west of water office $\frac{3}{4}$ mile north of Highway 80; drilled in 1946 by Layne-Texas Company, depth 1,431 feet, diameter $10\frac{3}{4}$ to 7 inches; deep-well turbine pump and electric motor to be installed.

TARRANT COUNTY

Handley -- Continued

Pumpage:

(Average in gallons a day)

1945

Jan.	137,000	July	152,000
Feb.	92,000	Aug.	154,000
Mar.	107,000	Sept.	190,000
Apr.	130,000	Oct.	135,000
May	191,000	Nov.	147,000
June	183,000	Dec.	-

Storage: Ground reservoir at Well 1, 35,000 gallons; ground reservoir at Well 2, 75,000 gallons; elevated tank, 125,000 gallons.

Number of customers: 831.

Treatment: None.

Analysis of water:

Date collected: May 22, 1946 — Analyzed by C. B. Cibulka

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.6	
Iron (Fe)	0.05	
Calcium (Ca)	3.2	0.16
Magnesium (Mg)	1.4	0.12
Sodium (Na)	302	13.13
Potassium (K)	6.6	0.17
Bicarbonate (HCO_3)	556	9.14
Sulfate (SO_4)	90	1.87
Chloride (Cl)	86	2.43
Fluoride (F)	2.0	0.11
Nitrate (NO_3)	2.0	0.03
Dissolved solids	777	
Total hardness as $CaCO_3$	14	
pH	8.4	

TARRANT COUNTY

Handley -- Continued

Driller's log:

Well 2

	Thickness (feet)	Depth (feet)
Surface soil	2	2
Clay and sandy clay	10	12
Sand and boulders	8	20
Sand and layers of shale	15	35
Shale	15	50
Sand and boulders	31	81
Rock	2	83
Shale	12	95
Rock	2	97
Sticky shale	10	107
Lime and streaks of hard rock	38	145
Shale	11	156
Shale and lime	11	167
Shale	8	175
Hard lime and shale	32	207
Shale	11	218
Rock	1	219
Hard lime and shale	23	242
Lime and shale	36	278
Hard lime and shale	41	319
Sandy shale and lime	25	344
Shale and streaks of lime	37	381
Shale and streaks of sandy shale and lime	17	398
Lime and shale	39	437
Shale and streaks of sandy shale and lime	18	455
Shale and lime	27	482
Sandy shale	25	507
Shale and lime	16	523
Sandy shale and lime	24	547
Shale	7	554
Sand, sandy shale and sandy lime	26	580
Sand and layers of sandy shale	20	600
Shale and lime	7	607
Sand	10	617
Shale	4	621
Sand and sandy shale	12	633
Shale and lime	12	645
Sandy shale and lime	5	650
Shale and lime	13	663
Sand and streaks of sandy shale	5	668
Sandy lime and shale	30	698
Hard lime	11	709
Hard lime and shale	12	721
Hard sandy lime and shale	43	764
Sandy shale	6	770
Lime and shale	3	773
Sandy shale	5	778
Shale	7	785
Sandy shale and lime	20	805
Shale and lime	37	842
Hard lime and streaks of sandy shale	30	872
Lime, shale and sandy shale	8	880
Lime	36	916
Lime and shale	24	940
Sandy shale and lime	15	955
Lime and shale	41	996
Lime	5	1001
Shale with streaks of lime	28	1029
Lime and sandy shale	48	1077
Sandy shale	6	1083
Lime, shale and sand	12	1095
Shale and lime	6	1101
Sand, lime and shale	17	1118
Sandy shale and lime	30	1148
Sandy shale with streaks of shale and lime	19	1167
Shale	3	1170
Sandy shale	12	1182
Lime	1	1183

(Continued on next page)

TARRANT COUNTY

Handley -- Continued

Well 2 -- Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sand	4	1187	Shale	6	1364
Hard lime	5	1192	Coarse sand and gravel (good)	20	1384
Sandy shale	11	1203	Shale and sandy shale	7	1391
Sand, lime and shale	22	1225	Coarse sand and gravel (good)	11	1402
Shale, lime and streaks of sand	19	1244	Shale	12	1414
Sand	5	1249	Sand (good)	10	1424
Sandy shale	8	1257	Shale	7	1431
Sand and sandy shale	63	1320			
Shale and sandy shale	4	1324			
Sand and pink and red shale (cuts good)	8	1332			
Shale and sandy shale	26	1358			

Mansfield

Population in 1940: 774.

Source of information:
M. N. Farr, water superintendent
May 22, 1946

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. One block west and ½ block north of Memorial Hall; drilled by Mr. Rose, depth about 200 feet, diameter 10 to 8 inches; deep-well turbine pump and 10-horsepower electric motor; static water level reported 60 feet below land surface; yield 100 gallons a minute.

Well 3. Behind Memorial Hall; drilled in 1945 by S. Stoner, depth 200 feet, diameter 7 inches; deep-well turbine pump and 5-horsepower electric motor; static water level reported 43 feet below land surface; yield 75 gallons a minute.

Pumpage (estimated): 50,000 gallons a day.

Storage: Ground reservoir at Well 1, 4,500 gallons; ground reservoir at abandoned Well 2, 6,800 gallons; elevated tank, 50,000 gallons.

TARRANT COUNTY

Mansfield -- Comtinued

Number of customers: 291.

Treatment: None.

Analyses of water:

Date collected: May 22, 1946 Analyzed by C. B. Cibulka

	Well 1		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	10		12	
Iron (Fe)	0.11		1.1	
Calcium (Ca)	11	0.55	4.0	0.20
Magnesium (Mg)	2.2	0.18	0.6	0.05
Sodium (Na)	200	8.70	267	11.62
Potassium (K)	5.1	0.13	8.3	0.21
Bicarbonate (HCO_3)	324	5.31	466	7.64
Sulfate (SO_4)	159	3.31	176	3.66
Chloride (Cl)	31	0.87	25	0.71
Fluoride (F)	0.4	0.02	1.2	0.06
Nitrate (NO_3)	3.2	0.05	0.4	0.01
Dissolved solids	582		730	
Total hardness as $CaCO_3$	36		12	
pH	8.1		9.1	

TAYLOR COUNTY

Abilene

Population in 1940: 27,292.

Source of information:
L. A. Grimes, water superintendent
Apr. 18, 1946

Ownership: Municipal.

Source of supply: 3 lakes.

Lake Abilene. 10 miles southwest of the City, built about 1920; capacity 45,000 acre feet.

Lake Kirby. About 5 miles south of Abilene on east side of Highway 277; constructed in 1928; capacity 8,500 acre feet.

Lake Fort Phantom Hill. About 15 miles northeast of Abilene on Elm Creek; constructed in 1941; capacity 74,000 acre feet.

Pumpage:

(Average in gallons a day)

1945

	Lake Abilene		Lakes Kirby and Fort Phantom Hill
Jan.	2,180,000	Jan.	1,590,000
Feb.	1,390,000	Feb.	2,200,000
Mar.	558,000	Mar.	3,030,000
Apr.	321,000	Apr.	3,305,000
May	396,000	May	4,580,000
June	517,000	June	5,090,000
July	1,250,000	July	4,210,000
Aug.	1,383,000	Aug.	5,270,000
Sept.	1,550,000	Sept.	4,760,000
Oct.	2,470,000	Oct.	1,590,000
Nov.	2,510,000	Nov.	1,606,000
Dec.	2,410,000	Dec.	1,195,000

1946

Jan.	2,480,000	Jan.	1,210,000
Feb.	2,350,000	Feb.	1,200,000
Mar.	2,430,000	Mar.	1,970,000

TAYLOR COUNTY

Abilene -- Continued

Storage: Lake Abilene clear well 675,000 gallons; Lake Fort Phantom Hill clear wells, 1,685,000 gallons; storage reservoir, 2,000,000 gallons.

Number of customers: 8,917.

Treatment: Coagulation, sedimentation, rapid sand filters, pre and post chlorination.

Analyses of water:

Date collected: Apr. 18, 1946 — Analyzed by J. H. Rowley

Lake Abilene	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.6	
Iron (Fe)	0.25	
Calcium (Ca)	51	2.546
Magnesium (Mg)	15	1.2384
Sodium (Na)	9.3	0.405
Potassium (K)	5.1	0.130
Bicarbonate (HCO_3)	210	3.444
Sulfate (SO_4)	21	0.437
Chloride (Cl)	15	0.423
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	0.0	0.000
Dissolved solids	234	
Total hardness as $CaCO_3$	189	
pH	7.6	

Lake Kirby		
Silica (SiO_2)	5.5	
Iron (Fe)	0.70	
Calcium (Ca)	44	2.196
Magnesium (Mg)	12	0.987
Sodium (Na)	13	0.554
Potassium (K)	2.9	0.125
Bicarbonate (HCO_3)	202	3.318
Sulfate (SO_4)	11	0.229
Chloride (Cl)	9.0	0.254
Fluoride (F)	1.0	0.053
Nitrate (NO_3)	0.5	0.008
Dissolved solids	209	
Total hardness as $CaCO_3$	159	
pH	8.0	

TAYLOR COUNTY

Abilene -- Continued

Lake Fort: Phantom Hill	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.0	
Iron (Fe)	0.50	
Calcium (Ca)	46	2.30
Magnesium (Mg)	19	1.56
Sodium (Na)	52	2.24
Potassium (K)	8.5	0.22
Bicarbonate (HCO_3)	222	3.65
Sulfate (SO_4)	52	1.00
Chloride (Cl)	56	1.58
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.2	0.00
Dissolved solids	360	
Total hardness as $CaCO_3$	193	
pH	7.9	

Bradshaw

Population in 1940: 300.

Source of information:
C. M. Hunt, owner
Apr. 18, 1946

Owner: C. M. Hunt

Source of supply: Lake west of Bradshaw.

Pumpage: No record.

Storage: Elevated tank, 12,600 gallons.

Number of customers: 15.

Treatment: None.

TAYLOR COUNTY

Bradshaw -- Continued

Analysis of water:

Date collected: Apr. 18, 1946 — Analyzed by J. H. Rowley

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.3	
Iron (Fe)	2.0	
Calcium (Ca)	34	1.697
Magnesium (Mg)	7.2	0.592
Sodium (Na)	8.0	0.346
Potassium (K)	4.8	0.123
Bicarbonate (HCO_3)	143	2.344
Sulfate (SO_4)	7.4	0.154
Chloride (Cl)	7.0	0.197
Fluoride (F)	0.2	0.011
Nitrate (NO_3)	3.2	0.052
Dissolved solids	177	
Total hardness as $CaCO_3$	114	
pH	7.5	

Lawn

Population in 1940: 306.

Source of information:
Alex Edwards, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: Lake Stith 1¼ miles southwest of City Hall on road to Ovalo.

Pumpage: No record.

Storage: Stand pipe, estimated 50,000 gallons.

Number of customers: 210.

Treatment: Chlorination.

TAYLOR COUNTY

Lawn -- Continued

Analysis of water:

Date collected: Apr. 17, 1946 Analyzed by J. H. Rowley

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.6	
Iron (Fe)	0.25	
Calcium (Ca)	49	2.446
Magnesium (Mg)	14	1.151
Sodium (Na)	23	1.009
Potassium (K)	9.1	0.233
Bicarbonate (HCO_3)	185	3.032
Sulfate (SO_4)	45	0.937
Chloride (Cl)	30	0.846
Fluoride (F)	0.4	0.021
Nitrate (NO_3)	0.2	0.003
Dissolved solids	281	
Total hardness as $CaCO_3$	180	
pH	7.7	

Merkel

Population in 1940: 2,005

Source of information:
Mack Busby, water superintendent
Apr. 17, 1946

Ownership: Municipal.

Source of supply: 7 wells.

Well 1. In pump house about 3 blocks east of town along Highway 84; drilled in 1909, depth about 100 feet, diameter 8 inches; deep-well turbine pump and 5-horsepower electric motor; yield 100 gallons a minute.

Well 2. About 50 feet southeast of Well 1; dug by J. B. Ferris, depth 75 feet, diameter 5 feet, lined with brick; connected by Well 1 and pumped with same pump as used in Well 1.

Well 3. About .2 mile east of Well 1; drilled in 1925 by L. Sublett, depth about 100 feet, diameter 8 inches; jet pump and 3-horsepower electric motor; yield 100 gallons a minute.

TAYLOR COUNTY

Merkel -- Continued

Well 4. About 20 feet south of Well 3; dug in 1926 by W. E. Kimmery, depth 70 feet, diameter 10 feet, cement lined, connected by tunnel by Well 3; pumped by pump in Well 3.

Well 5. About .15 mile northeast of Well 3; drilled in 1926 by L. Sublett, depth 100 feet, diameter 8 inches; deep-well turbine pump and 5-horsepower electric motor; yield 100 gallons a minute.

Well 6. About 20 feet south of Well 5; dug in 1945 by W. E. Kimmery, depth 63 feet, diameter 15 feet, lined with cement, connected to Well 5 by tunnel; pumped with pump in Well 5.

Well 7. Drilled in 1926 by L. Sublett, depth 100 feet, diameter diameter 8 inches; deep-well cyoinder and pump jack and 3-horsepower electric motor; yield 18 gallons a minute.

Pumpage (estimated): 67,000 gallons a day.

Storage: Concrete ground reservoir, 100,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 300.

Treatment: Chlorination.

Analysis of water:

Date collected: Apr. 17, 1946 Analyzed by J. H. Rowley

	Composite sample of Wells 1 and 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.06	
Calcium (Ca)	468	23.16
Magnesium (Mg)	90	7.40
Sodium (Na)	209	9.07
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	245	4.02
Sulfate (SO_4)	1,410	29.36
Chloride (Cl)	161	4.54
Fluoride (F)	0.8	0.04
Nitrate (NO_3)	123	1.98
Dissolved solids	2,850	
Total hardness as $CaCO_3$	1,530	
pH	7.2	

TAYLOR COUNTY

Merkel -- Continued

Date collected: Apr. 17, 1946 — Analyzed by J. H. Rowley

	Composite sample of Wells 3 and 4	
	Parts per million	Equivalents per million
Silica (SiO_2)	20	
Iron (Fe)	0.16	
Calcium (Ca)	120	5.99
Magnesium (Mg)	43	3.54
Sodium (Na)	77	3.34
Potassium (K)	7.5	0.19
Bicarbonate (HCO_3)	328	5.38
Sulfate (SO_4)	269	5.60
Chloride (Cl)	43	1.21
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	52	0.84
Dissolved solids	832	
Total hardness as $CaCO_3$	476	
pH	7.5	

Date collected: Apr. 17, 1946 — Analyzed by J. H. Rowley

	Composite sample of Wells 5 and 6	
	Parts per million	Equivalents per million
Silica (SiO_2)	19	
Iron (Fe)	0.14	
Calcium (Ca)	200	9.98
Magnesium (Mg)	50	4.11
Sodium (Na)	102	4.44
Potassium (K)	9.1	0.23
Bicarbonate (HCO_3)	289	4.74
Sulfate (SO_4)	577	12.01
Chloride (Cl)	58	1.64
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	21	3.34
Dissolved solids	1,180	
Total hardness as $CaCO_3$	704	
pH	7.4	

TAYLOR COUNTY

Merkel -- Continued

Date collected: Apr. 17, 1946 Analyzed by J. H. Rowley

	Well 7	
	Parts per million	Equivalents per million
Silica (SiO_2)	21	
Iron (Fe)	0.40	
Calcium (Ca)	263	13.13
Magnesium (Mg)	64	5.26
Sodium (Na)	119	5.18
Potassium (K)	16	0.41
Bicarbonate (HCO_3)	287	4.70
Sulfate (SO_4)	749	15.59
Chloride (Cl)	89	2.51
Fluoride (F)	1.0	0.05
Nitrate (NO_3)	7.0	1.13
Dissolved solids	1,530	
Total hardness as $CaCO_3$	920	
pH	7.4	

Ovalo

Population in 1940: 500.

Source of information:
M. A. Horton
Apr. 18, 1946

Ownership: Municipal.

Source of supply: Dug well 2¾ miles east of Ovalo on Jim Ned Creek; dug by H. B. Coggins, depth 24 feet, diameter 3 feet, lined with cement blocks; deep-well cylinder and pump jack and 5-horsepower electric motor; static water level reported 18 feet below land surface.

Pumpage: No record.

Storage: Concrete reservoir, 12,000 gallons.

Number of customers: 40.

Treatment: None.

TAYLOR COUNTY

Ovalo -- Continued

Analysis of water:

Date collected: Apr. 18, 1946 Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Silica (SiO_2)	22	
Iron (Fe)	3.1	
Calcium (Ca)	110	5.49
Magnesium (Mg)	84	6.91
Sodium (Na)	315	13.71
Potassium (K)	12	0.31
Bicarbonate (HCO_3)	526	8.62
Sulfate (SO_4)	403	8.39
Chloride (Cl)	280	7.90
Fluoride (F)	1.8	0.09
Nitrate (NO_3)	88	1.42
Dissolved solids	1,570	
Total hardness as $CaCO_3$	620	
pH		7.3

Tuscola

Population in 1940: 300

Source of information:
F. C. Rogers, owner
Apr. 18, 1946

Owner: F. C. Rogers.

Source of supply: 2 dug wells.

Well 1. One block east from Highway 83 behind cafe on Main Street; depth 28 feet, diameter 6 feet; 2 inch centrifugal pump and 5-horsepower electric motor; static water level reported 20 feet below land surface; well pumps dry after several hours of pumping.

Well 2. In creek flat .2 mile south of War Highway 7 to Buffalo Gap; depth 28 feet, diameter 12 feet; centrifugal pump and 5-horsepower electric motor; static water level reported 16 feet below land surface; yield 98 gallons a minute.

Pumpage (estimated): 10,000 gallons a day.

Storage: 2 elevated tanks, 4,200 and 3,400 gallons.

TAYLOR COUNTY

Tuscola -- Continued

Number of customers: 100.

Treatment: Chlorination and lime.

Analysis of water:

Date collected: Apr. 18, 1946 — Analyzed by J. H. Rowley

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	25	
Iron (Fe)	0.08	
Calcium (Ca)	117	5.84
Magnesium (Mg)	50	4.11
Sodium (Na)	142	6.19
Potassium (K)	5.9	0.15
Bicarbonate (HCO_3)	388	6.36
Sulfate (SO_4)	142	2.96
Chloride (Cl)	180	5.08
Fluoride (F)	1.0	0.05
Nitrate (NO_3)	114	1.84
Dissolved solids	968	
Total hardness as $CaCO_3$	498	
pH	7.0	

THROCKMORTON COUNTY

Throckmorton

Population in 1940: 1,133.

Source of information:
H. A. Bachman, water superintendent
Sept. 19, 1946

Ownership: Municipal.

Source of supply: Lake one mile southwest of town on South Elm Creek, capacity 1,600 acre feet.

Pumpage: Average 100,000 gallons a day.

Storage: 3 settling basins, 60,000 gallons each; elevated tank, 25,000 gallons.

Number of customers: 387.

Treatment: Aeration, coagulation, sedimentation, and chlorination.

Analysis of water:

Date collected: Sept. 19, 1946 — Analyzed by C. B. Cibulka

	Raw Water	
	Parts per million	Equivalents per million
Silica (SiO_2)	10	
Iron (Fe)	0.17	
Calcium (Ca)	30	1.497
Magnesium (Mg)	4.8	0.395
Sodium (Na)	31	1.352
Potassium (K)	3.5	0.090
Bicarbonate (HCO_3)	126	2.065
Sulfate (SO_4)	26	0.541
Chloride (Cl)	25	0.705
Fluoride (F)	0.2	0.010
Nitrate (NO_3)	0.8	0.013
Dissolved solids	197	
Total hardness as $CaCO_3$	95	
pH		7.4

TRAVIS COUNTY

Austin

Population in 1940: 87,930

Source of information:
Albert R. Davis, water superintendent
Nov. 4, 1946

Ownership: Municipal.

Source of supply: Colorado River.

Average monthly temperature in degrees Fahrenheit at raw-water intake: Jan., 54; Feb., 56; Mar., 61; Apr., 63; May, 67; June, 71; July, 72; Aug., 76; Sept., 77; Oct., 71; Nov., 67; Dec., 58.

Pumpage:

(Average in thousands of gallons a day)

	1942	1943	1944	1945	1946
Jan.	7,250	8,470	9,490	10,270	9,710
Feb.	6,880	8,850	9,250	9,830	9,840
Mar.	8,100	9,270	9,440	10,070	10,670
Apr.	7,820	10,750	12,100	9,310	10,980
May	8,470	11,500	10,560	11,750	11,140
June	11,820	13,990	14,750	13,800	16,170
July	11,470	15,110	19,380	15,370	19,650
Aug.	11,580	18,020	18,660	16,950	19,700
Sept.	8,450	10,770	12,240	13,260	12,350
Oct.	7,840	8,110	11,120	10,600	11,950
Nov.	7,850	9,240	10,940	10,950	
Dec.	7,740	8,700	8,850	9,920	

Storage: Ground storage reservoir, 10,000,000 gallons.

Number of customers: 24,955

Treatment: Pre-chlorination, coagulation, sedimentation, rapid sand filtration, and softening.

TRAVIS COUNTY

Austin -- Continued

Analysis of water:

Date collected: May 14, 1945 Analyzed by J. H. Rowley

	Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.9	
Iron (Fe)	0.03	
Calcium (Ca)	14	0.699
Magnesium (Mg)	14	1.151
Sodium (Na)	21	0.899
Potassium (K)	4.8	0.123
Bicarbonate (HCO_3)	76	1.230
Sulfate (SO_4)	26	0.541
Chloride (Cl)	38	1.072
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	1.8	0.029
Dissolved solids	175	
Total hardness as $CaCO_3$	92	
pH		9.4

Manor

Population in 1940: 688.

Source of information:
W. A. Boeneman, water superintendent
Mar. 20, 1940

Ownership: Municipal.

Source of supply: Well about 200 feet southwest of post office in Manor; drilled in 1936 by W. B. Hinton, depth 3,001 feet, diameter 8 to 4 inches; static water level Mar. 20, 1941, 80 feet above land surface; well flowed 110 gallons a minute in 1941, original flow 150 gallons a minute in 1936; temperature 110° F.

Pumpage (estimated): 21,000 gallons a day.

Storage: Concrete ground reservoir, 50,000 gallons; elevated tank, 50,000 gallons

Number of customers: 43.

Treatment: None.

TRAVIS COUNTY

Manor -- Continued

Analysis of water:

Date collected: Mar. 20, 1940 Analyzed by J. W. Yett, Jr.

	Parts per million	Equivalents per million
Calcium (Ca)	94	4.69
Magnesium (Mg)	24	1.97
Sodium and Potassium (Na + k)	517	22.48
Bicarbonate (HCO_3)	366	6.00
Sulfate (SO_4)	746	15.53
Chloride (Cl)	264	7.45
Fluoride (F)	0	0
Nitrate (NO_3)	3.2	0.05
Dissolved solids	1,828	
Total hardness as $CaCO_3$	335	

Driller's log:

	Thickness (feet)	Depth (feet)
Top soil	6	6
Yellow clay	11	17
Gravel	7	24
Yellow clay	31	55
Blue clay	525	580
Chalk	53	633
Chalk and pyrites	66	699
Chalk and flintrock	36	735
Hard white flint	17	752
Chalk and pyrites	38	790
Chalk, hard streaks	50	840
Chalk with hard streaks	40	880
Chalk	22	902
Chalk, hard streaks	63	965
Clay	20	985
Broken lime	25	1010
Georgetown lime	55	1165
Edwards lime	477	1642
Hard blue shale	38	1680
Glen Rose lime	62	1742
Hard lime	65	1807
Sandy lime	143	1950
Comanche Peak	200	2150
Walnut clay	210	2360
Sandy lime and shale	403	2763
Hard sand rock	22	2785
Trinity sand	216	3001

TRAVIS COUNTY

Pflugerville

Population in 1940: 500.

Source of information:
Otto Pfluger, water works operator
Mar. 21, 1941

Owner: Pflugerville Gin Company

Source of supply: 2 wells.

Well 1. Drilled about 1910, depth 650 feet, diameter 8 inches; deep-well cylinder and gasoline engine; used as standby well since 1936.

Well 2. Drilled in 1938, depth 696 feet, diameter 6-5/8 inches; deep-well turbine pump and 7½ horsepower electric motor; static water level 125 feet below land surface Mar. 1941; yield 60 gallons a minute; temperature 75° F.

Pumpage: Maximum 22,000 gallons a day in summer, 3,600 gallons a day in winter.

Storage: Elevated tank, 23,000 gallons.

Number of customers: 85.

Treatment: None.

Analysis of water:

Date collected : Mar. 21, 1941 Analyzed by Texas State Board of Health

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	0.5	
Calcium (Ca)	92	4.59
Magnesium (Mg)	37	3.04
Sodium and Potassium (Na + K)	452	19.65
Bicarbonate (HCO_3)	415	6.80
Sulfate (SO_4)	345	7.18
Chloride (Cl)	472	13.31
Fluoride (F)	0.8	0.04
Nitrate (NO_3)	0.4	0.01
Dissolved solids	1,608	
Total hardness as $CaCO_3$	382	
pH	7.6	

TRAVIS COUNTY

Pflugerville -- Continued

Driller's log:

Well 2

	Thickness (feet)	Depth (feet)
Surface soil	4	4
Blue Buda lime	46	50
Sandy yellow lime	10	60
Blue broken lime	26	86
Hard lime	14	90
White chalk	25	115
Blue shale	7	122
White Austin chalk	181	303
Sandy gray shale	32	335
Black Eagle Ford shale	32	367
Gray hard cap	5	372
Gray lime	30	402
Blue Del Rio clay	45	447
Blue-gray gumbo, tough	36	483
White Georgetown lime	111	594
Georgetown lime, black flint streaks	6	600
Georgetown lime, porous	15	615
Hard gray Georgetown lime	16	631
Porous lime	59	690
Hard gray lime	6	696

WICHITA COUNTY

Burkburnett

Population in 1940: 2,814

Source of information:
P. A. Wiggins, city manager
June 6, 1946

Ownership: Municipal.

Source of supply: 14 wells about 3 miles southeast of town.

Wells 1 to 8. Located 3 miles southeast of town on river flats; drilled by City in 1936, depth 40 to 50 feet, diameters 12 inches; water level reported 8 feet below land surface; pumped by air; yield about 3 gallons a minute each.

Well 9. About ½ mile southeast of pump station and about 3½ miles southeast of Burkburnett; drilled by City in 1942, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; static water level 11.7 feet below land surface; yield 35 gallons a minute.

Well 10. 0.1 mile southeast of Well 9; drilled by City in 1942, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; yield 50 gallons a minute.

Well 11. 0.1 mile northeast of Well 10; drilled by City in 1942, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; yield 50 gallons a minute.

Well 12. 0.1 mile southeast of Well 11; drilled by City in 1942, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; yield 50 gallons a minute.

Well 13. 0.14 mile northwest of Well 11; drilled by City in 1942, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; yield 50 gallons a minute.

Well 14. 0.14 mile northwest of Well 13; drilled by City in 1943, depth 48 feet, diameter 6 inches; centrifugal pump and ½-horsepower electric motor; yield 35 gallons a minute.

Pumpage (estimated): Average 350,000 gallons a day.

Storage: 2 steel ground reservoirs, 55,000 gallons each at pump station; concrete ground reservoir at pump station, 190,000 gallons; elevated tank north of City Hall, 55,000 gallons.

Treatment: Chlorination.

WICHITA COUNTY

Burkburnett -- Continued

Analyses of water:

Date collected: June 6, 1946 Analyzed by C. B. Cibulka

	Well 2		Well 3	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		13	
Iron (Fe)	0.06		0.03	
Calcium (Ca)	77	3.84	58	2.89
Magnesium (Mg)	58	4.77	52	4.28
Sodium (Na)	69	2.98	70	3.03
Potassium (K)	7.9	0.20	4.2	0.11
Bicarbonate (HCO_3)	438	7.19	436	7.14
Sulfate (SO_4)	40	0.83	42	0.87
Chloride (Cl)	72	2.03	63	1.78
Fluoride (F)	0.6	0.03	0.8	0.04
Nitrate (NO_3)	106	1.71	30	0.48
Dissolved solids	679		572	
Total hardness as $CaCO_3$	430		358	
pH	7.8		8.0	

	Well 12	
	Parts per million	Equivalents per million
Silica (SiO_2)	13	
Iron (Fe)	0.05	
Calcium (Ca)	59	2.94
Magnesium (Mg)	36	2.96
Sodium (Na)	46	2.00
Potassium (K)	1.8	0.05
Bicarbonate (HCO_3)	369	6.05
Sulfate (SO_4)	24	0.50
Chloride (Cl)	35	0.99
Fluoride (F)	0.8	0.04
Nitrate (NO_3)	23	0.37
Dissolved solids	420	
Total hardness as $CaCO_3$	295	
pH	7.6	

WICHITA COUNTY

Electra

Population in 1940: 5,588.

Source of information:
Howard Hutchins, water superintendent
June 6, 1946

Ownership: Municipal.

Source of supply: Lake on China Creek and 12 wells.

Well 1. Dug in 1937 by Works Projects Administration, depth about 30 feet, diameter 9 feet; centrifugal pump and ½-horsepower electric motor; water level reported 20 feet below land surface; yield 40 gallons a minute.

Well 2. 200 feet east of Well 1; dug in 1937 by Works Projects Administration, depth 30 feet, diameter 9 feet; centrifugal pump and 2-horsepower electric motor; yield 100 gallons a minute.

Well 3. 200 feet east of Well 2; dug in 1937 by Works Projects Administration, depth 30 feet, diameter 9 feet; centrifugal pump and 3-horsepower electric motor; yield 100 gallons a minute.

Well 4. 200 feet east of Well 3; dug in 1937 by Works Projects Administration, depth 30 feet, diameter 9 feet; centrifugal pump and 2-horsepower electric motor; yield 100 gallons a minute.

Well 5. 200 feet east of Well 4; dug in 1937 by Works Projects Administration, depth 30 feet, diameter 9 feet; centrifugal pump and 2-horsepower electric motor; yield 100 gallons a minute.

Well 6. 200 feet west of Well 1; dug in 1940 by City, depth 30 feet, diameter 8 feet; centrifugal pump and 2-horsepower electric motor; yield 50 gallons a minute; temperature 82° F.

Well 7. 200 feet east of Well 5; dug in 1937 by City, depth 30 feet, diameter 8 feet; deep-well turbine pump and 2-horsepower electric motor; yield 60 gallons a minute.

Well 8. 200 feet east of Well 6; dug in 1937 by City, depth 30 feet, diameter 8 feet; centrifugal pump and 1-horsepower electric motor; yield 40 gallons a minute.

Well 10. 200 feet east of Well 8; dug in 1941 by City, depth 30 feet, diameter 6 feet; centrifugal pump and 2-horsepower electric motor; yield 100 gallons a minute.

WICHITA COUNTY

Electra -- Continued

Well 11. 200 feet east of Well 5; dug in 1941 by City, depth 30 feet, diameter 8 feet; centrifugal pump and 2-horsepower electric motor; yield 100 gallons a minute.

Well 12. 200 feet east of Well 11; dug in 1941 by City, depth 30 feet, diameter 8 feet; centrifugal pump and 7½-horsepower electric motor; yield 100 gallons a minute; temperature 75° F.

Well 13. 200 feet north of Well 12; dug in 1945 by City, 30 feet deep, 100 feet long and 15 feet wide; centrifugal pump and 15-horsepower electric motor; yield 200 gallons a minute.

The City pumps on an average of 16 hours a day from the well field and 8 hours a day from the Lake.

Pumpage:

(Average in gallons a day)

	1945	1946
Jan.	260,000	313,000
Feb.	300,000	302,000
Mar.	250,000	303,000
Apr.	255,000	425,000
May	364,000	414,000
June	410,000	
July	430,000	
Aug.	514,000	
Sept.	359,000	
Oct.	303,000	
Nov.	286,000	
Dec.	325,000	

Storage: 2 settling basins, 192,000 gallons each; elevated tank, 250,000 gallons.

Number of customers: 1,500.

Treatment: Coagulation, sedimentation, and chlorination.

WICHITA COUNTY

Electra -- Continued

Analyses of water:

Date collected: June 6, 1946 Analyzed by C. B. Cibulka

	Raw Water		Finished Water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	8.2		7.4	
Iron (Fe)	0.69		0.14	
Calcium (Ca)	39	1.947	45	2.25
Magnesium (Mg)	9.0	0.740	28	2.30
Sodium (Na)	48	2.088	92	3.98
Potassium (K)	5.4	0.138	4.6	0.12
Bicarbonate (HCO_3)	142	2.328	308	5.05
Sulfate (SO_4)	7.5	0.156	60	1.25
Chloride (Cl)	86	2.426	68	1.92
Fluoride (F)	0.0	0.000	0.8	0.04
Nitrate (NO_3)	0.2	0.003	24	0.39
Dissolved solids	294		484	
Total hardness as $CaCO_3$	134		227	
pH	7.8		7.8	

	Well 13	
	Parts per million	Equivalents per million
Silica (SiO_2)	14	
Iron (Fe)	0.29	
Calcium (Ca)	42	2.10
Magnesium (Mg)	38	3.12
Sodium (Na)	148	6.43
Potassium (K)	13	0.33
Bicarbonate (HCO_3)	456	7.48
Sulfate (SO_4)	72	1.50
Chloride (Cl)	92	2.59
Fluoride (F)	1.4	0.07
Nitrate (NO_3)	21	0.34
Dissolved solids	666	
Total hardness as $CaCO_3$	261	
pH	8.0	

WICHITA COUNTY

Wichita Falls

Population in 1940: 55,100

Source of information:
H. A. Gates, water works manager
June 6, 1946

Ownership: Municipal.

Source of supply: Lake Wichita on Holiday Creek 6 miles southwest of Wichita Falls, capacity 13,500 acre feet and Canal from Lake Kemp 12½ miles northeast of Seymour.

Pumpage:

(Average in gallons a day)

	1945	1946
Jan.	4,480,000	5,900,000
Feb.	4,290,000	5,960,000
Mar.	4,580,000	6,400,000
Apr.	5,100,000	7,200,000
May	6,500,000	7,420,000
June	7,490,000	
July	8,110,000	
Aug.	9,200,000	
Sept.	8,500,000	
Oct.	6,750,000	
Nov.	6,240,000	
Dec.	5,700,000	

Storage: Raw water storage at filter plant, 19,000,000 gallons; underground storage at filter plant, 3,000,000 gallons; elevated tank, 500,000 gallons.

Number of customers: 11,939.

Treatment: Coagulation, sedimentation, filtration, pre and post chlorination.

WICHITA COUNTY

Wichita Falls -- Continued

Analyses of water:

Date collected: Sept. 10, 1946 Analyzed by C. B. Cibulka

Lake Kemp	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	0.0		0.0	
Iron (Fe)	0.15		0.07	
Calcium (Ca)	288	14.37	297	14.82
Magnesium (Mg)	70	5.76	69	5.67
Sodium (Na)	854	37.15)	869	37.78)
Potassium (K)	22	)	22	)
Bicarbonate (HCO_3)	80	1.31	76	1.18
Sulfate (SO_4)	831	17.30	844	17.58
Chloride (Cl)	1,390	39.20	1,420	40.05
Fluoride (F)	0.6	0.03	0.4	0.02
Nitrate (NO_3)	0.2	0.00	0.2	0.00
Dissolved solids	3,500		3,560	
Total hardness as $CaCO_3$	1,010		1,020	
pH	7.4		7.9	

WILBARGER COUNTY

Vernon

Population in 1940: 9,277

Source of information:
Bud Daniels, water superintendent
Apr. 11, 1941

Ownership: Municipal.

Source of supply: 11 wells.

Well 1 (Owner's No. 1-N). At Ackley and Bentley Streets; drilled in 1926 by Layne-Texas Company, depth 43 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; static water level 28.27 feet below pump base Apr. 11, 1941; yield 125 gallons a minute; temperature 68° F.

Well 2 (Owner's No. 2-N). At Heard and Bentley Streets; drilled in 1926 by Layne-Texas Company, depth 42 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; static water level 28.23 feet Apr. 11, 1941; yield 175 gallons a minute.

Well 3 (Owner's No. 3-N). At Dean and Bentley Streets; drilled in 1926 by Layne-Texas Company, depth 44 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; static water level 22.21 feet below pump base Apr. 11, 1941; yield 200 gallons a minute.

Well 4 (Owner's No. 4-N). At Wonders and Bentley Streets; drilled in 1933 by the Kansas Drilling Company, depth 44 feet, diameter 18 inches; deep-well turbine pump and 7½-horsepower electric motor; yield 150 gallons a minute.

Well 5 (Owner's No. 5-N). One block south and 2 blocks west of Well 4; drilled in 1932 by the Kansas Drilling Company, depth 41 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; static water level 28.8 feet below pump base Apr. 11, 1941; temperature 68° F.

Well 6 (Owner's Smoker Field-West Well). Drilled in 1939 by H. E. Reed, depth 41 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; yield 300 gallons a minute.

Well 7 (Owner's Smoker Field-South Well). Drilled in 1940 by H. E. Reed, depth 41 feet, diameter 8 inches; deep-well turbine pump and 10-horsepower electric motor; yield 150 gallons a minute.

Well 8 (Owner's Smoker Field-East Well). Drilled in 1940 by H. E. Reed, depth 41 feet, diameter 18 inches; deep-well turbine pump and 5-horsepower electric motor; yield 150 gallons a minute; this well has been pumped at 300 gallons a minute with a drawdown of 31 feet.

WILBARGER COUNTY

Vernon -- Continued

Well 9 (Owner's No. 6-S). At corner of Wichita and Fannin Streets; drilled in 1931 by H. E. Reed, depth 48 feet, diameter 18 inches; deep-well turbine pump and 7½-horsepower electric motor; static water level 25 feet below pump base; yield 125 gallons a minute; temperature 68° F.

Well 10 (Owner's No. 7-S). At south side of Emperice Street between Lamar and Deaf Smith Streets; drilled by H. E. Reed, depth 48 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; yield 125 gallons a minute.

Well 11 (Owner's No. 8-S). East side of Lamar Street between Paradise and Wichita Streets; drilled in 1931 by H. E. Reed, depth 48 feet, diameter 18 inches; deep-well turbine pump and 10-horsepower electric motor; yield 125 gallons a minute.

Pumpage (estimated): 1,000,000 gallons a day.

Storage: 10 concrete ground reservoirs, total capacity 258,000 gallons; elevated tank, 500,000 gallons.

Treatment: Chlorination.

Analyses of water:

Date collected: Apr. 11, 1941 Analyzed by J. H. Rowley

	Well 2		Well 6	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	20			
Iron (Fe)	0.02			
Calcium (Ca)	73	3.64	60	2.99
Magnesium (Mg)	49	4.03	41	3.37
Sodium and Potassium (Na+K)	78	3.39	78	3.37
Bicarbonate (HCO_3)	324	5.31	326	5.34
Sulfate (SO_4)	93	1.94	59	1.23
Chloride (Cl)	63	1.78	73	2.06
Fluoride (F)	1.1	0.06		
Nitrate (NO_3)	122	1.97	68	1.10
Dissolved solids	659		561	
Total hardness as $CaCO_3$	384		318	
pH	8.3			

WILBARGER COUNTY

Vernon -- Continued

Date collected: Oct. 30, 1943 Analyzed by J. H. Rowley

	Well 10	
	Parts per million	Equivalents per million
Calcium (Ca)	75	3.74
Magnesium (Mg)	30	2.47
Sodium and Potassium (Na + K)	63	2.73
Bicarbonate (HCO_3)	294	4.82
Sulfate (SO_4)	49	1.02
Chloride (Cl)	53	1.49
Nitrate (NO_3)	100	1.69
Dissolved solids	547	
Total hardness as $CaCO_3$	31	

Driller's log:

Well 1

	Thickness (feet)	Depth (feet)
Soil	4	4
Silty sand	8	12
Coarse-grained sand	12	24
Fine-grained sand and clay balls	4	28
Coarse-grained sand	15	43

West Vernon

Population in 1940: 955

Source of information:
Mr. Garrison, manager
Oct. 18, 1943

Owner: West Texas Utilities Company.

Source of supply: 3 wells.

Well 1. Drilled in 1926 by Layne-Texas Company, depth 46 feet, diameter 18 inches; deep-well turbine pump and 7½-horsepower electric motor; yield 198 gallons a minute.

Well 2. Drilled in 1926 by Layne-Texas Company, depth 44 feet, diameter 18 inches; deep-well turbine pump and 7½-horsepower electric motor; yield 184 gallons a minute.

WILBARGER COUNTY

West Vernon -- Continued

Well 3. Drilled in 1926 by Layne-Texas Company, depth 41 feet, diameter 8 inches; using a stand-by well and not equipped with pump.

Pumpage:

(Average in gallons a day)

	1942	1943
Jan.	40,000	42,100
Feb.	39,000	47,600
Mar.	31,000	42,000
Apr.	44,500	50,000
May	46,700	54,900
June	62,600	68,500
July	79,200	119,000
Aug.	84,500	165,000
Sept.	53,100	102,700
Oct.	37,600	
Nov.	37,900	
Dec.	36,000	

Storage: Elevated tank, 50,000 gallons.

Treatment: Chlorination.

Analysis of water:

Date collected: Oct. 18, 1946 Analyzed by J. H. Rowley

	Well 1	
	Parts per million	Equivalents per million
Calcium (Ca)	73	3.64
Magnesium (Mg)	50	4.11
Sodium and Potassium (Na + K)	95	4.15
Bicarbonate (HCO_3)	375	5.15
Sulfate (SO_4)	79	1.64
Chloride (Cl)	69	1.95
Nitrate (NO_3)	134	2.16
Dissolved solids	685	
Total hardness as $CaCO_3$	388	

WILBARGER COUNTY

West Vernon -- Continued

Driller's log:

Well 1

	Thickness (feet)	Depth (feet)
Soil	16	16
Sand, gravel and clay	6	22
Sand and gravel	23	45
Clay	1	46

WILLIAMSON COUNTY

Bartlett

Population in 1940: 1,668

Source of information:
R. B. Stockton, water superintendent
Feb. 5, 1941

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. At corner of Clark and Emma Streets; drilled, depth 1,320 feet, diameter 10 to 6 inches; air lift and 10-horsepower electric motor; well flows 35 gallons a minute when not pumped, original flow 45 gallons a minute; yield when pumped 125 gallons a minute; used as stand-by supply.

Well 2. Southeast corner of Main and Emma Streets; drilled in 1936 by the Layne-Texas Company, depth 1,595 feet, diameter 8 inches; deep-well turbine pump and 15-horsepower electric motor; flow when pump is idle 10 gallons a minute; yield when pumped is 235 gallons a minute.

Pumpage: Average 144,000 gallons a day.

Storage: 2 concrete ground reservoirs, 77,000 gallons and 55,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 450.

Treatment: None.

Analyses of water:

Date collected: Feb. 5, 1941 — Analyzed by E. W. Lohr

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	13		16	
Iron (Fe)	0.8		0.1	
Calcium (Ca)	17	0.85	19	0.95
Magnesium (Mg)	15	1.23	10	0.82
Sodium and Potassium (Na + K)	632	27.48	562	24.44
Bicarbonate (HCO_3)	452	7.75	490	8.03
Sulfate (SO_4)	542	11.28	449	9.35
Chloride (Cl)	360	10.15	30	8.46
Fluoride (F)	7.2	0.38	7.0	0.37
Nitrate (NO_3)	0.0	0.00	0.0	0.00
Dissolved solids	1,806		1,613	
Total hardness as $CaCO_3$	104		88	
pH	8.5		7.8	

WILLIAMSON COUNTY

Bartlett -- Continued

Driller's log:

Well 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Soil	3	3	Lime	380	1041
Clay and gravel	53	56	Limestone	10	1051
Green shale	153	209	Lime	31	1082
Hard shale	75	284	Lime rock	31	1113
Hard shale and chalk	15	299	Lime	24	1137
Rock	29	328	Lime rock	10	1147
Limestone	107	435	Lime and shale	17	1164
Rock	72	507	Lime	18	1182
Limestone	81	588	Rock	67	1249
Rock	52	640	Rock in layers of shale	36	1285
Lime and hard layers of brown shale	203	843	Lime rock	46	1331
Rock	37	880	Rock with layers of shale	19	1350
Shale	65	945	Lime	36	1386
Rock	26	971	Rock	38	1424
Hard lime	9	980	Lime	62	1486
Rock	12	992	Shale and rock	109	1595
Lime	6	998			
Rock	5	1003			

WILLIAMSON COUNTY

Florence

Population in 1940: 476.

Source of information:
John Buchanan, water superintendent
Mar. 20, 1941

Ownership: Municipal.

Source of supply: Well 1 block east of Post Office, drilled in 1928 by G. F. Hunt, depth 685 feet, diameter 8 to 6 inches; double action cylinder pump and 10-horsepower electric motor; yield 50 gallons a minute.

Pumpage (estimated): 20,000 gallons a day.

Storage: Concrete ground reservoir, 50,000 gallons; elevated tank, 50,000 gallons.

Number of customers: 114.

Treatment: None.

Analysis of water:

Date collected: May 2, 1939 Analyzed by E. W. Lohr and D. F. Riddell

	Parts per million	Equivalents per million
Calcium (Ca)	34	1.70
Magnesium (Mg)	17	1.40
Sodium & Potassium (Na + K)	164	7.14
Bicarbonate (HCO_3)	366	6.00
Sulfate (SO_4)	111	2.31
Chloride (Cl)	66	1.86
Fluoride (F)	1.4	0.07
Dissolved solids	573	
Total hardness as $CaCO_3$	156	

WILLIAMSON COUNTY

Georgetown

Population in 1940: 3,682.

Source of information:
L. D. Logan, Jr., water superintendent
Feb., 1941

Ownership: Municipal.

Source of supply: Well 4 blocks west of Post Office, dug in 1912, depth 100 feet, diameter 10 feet, equipped with 2 deep-well turbine pumps with 25 and 40 horsepower electric motors; yield of pumps 500 and 750 gallons a minute, respectively.

Pumpage: (Average in gallons a day)

	1939	1940	1941
Jan.	363,000	354,000	325,000
Feb.	370,000	361,000	
Mar.	371,000	372,000	
Apr.	450,000	372,000	
May	500,000	418,000	
June	560,000	378,000	
July	514,000	400,000	
Aug.	569,000	511,000	
Sept.	542,000	325,000	
Oct.	450,000	330,000	
Nov.	344,000	323,000	
Dec.	321,600	310,000	

Storage: 2 concrete reservoirs, 120,000 and 200,000 gallons; standpipe, 240,000 gallons.

Number of customers: 1,000.

Treatment: None.

WILLIAMSON COUNTY

Georgetown -- Continued

Analysis of water:

Date collected: Feb. 10, 1941 Analyzed by J. W. Yett, Jr., and E. W. Lohr

	Parts per million	Equivalents per million
Silica (SiO_2)	10	
Iron (Fe)	0.05	
Calcium (Ca)	124	6.19
Magnesium (Mg)	23	1.89
Sodium and Potassium (Na + K)	12	0.53
Bicarbonate (HCO_3)	360	5.90
Sulfate (SO_4)	36	0.75
Chloride (Cl)	35	0.99
Fluoride (F)	0	0.00
Nitrate (NO_3)	60	0.97
Dissolved solids	477	
Total hardness as $CaCO_3$	404	
pH	7.2	

WILLIAMSON COUNTY

Granger

Population in 1940: 1,723.

Source of information:
A. F. Burkhart, water superintendent
Feb. 5, 1941

Ownership: Municipal.

Source of supply: Well 2 blocks north and one block west of Post Office; drilled about 1908, depth 2,531 feet, diameter 8 to 4 inches; well flowed 63 gallons a minute August 31, 1943; temperature 106° F.

Pumpage: Average 288,000 gallons a day from natural flow.

Storage: 2 concrete ground reservoirs, 85,000 and 103,000 gallons; elevated tank, 100,000 gallons.

Number of customers: 390.

Treatment: None.

Analysis of water:

Date collected: Feb. 5, 1941 Analyzed by E. W. Lohr

	Parts per million	Equivalents per million
Silica (SiO_2)	17	
Iron (Fe)	0.24	
Calcium (Ca)	18	0.90
Magnesium (Mg)	8.3	0.68
Sodium and Potassium (Na + K)	523	22.75
Bicarbonate (HCO_3)	452	7.41
Sulfate (SO_4)	359	7.47
Chloride (Cl)	330	9.31
Fluoride (F)	2.7	0.14
Nitrate (NO_3)	0.0	0.00
Dissolved solids	1,481	
Total hardness as $CaCO_3$	79	
pH	7.9	

WILLIAMSON COUNTY

Hutto

Population in 1940: 597.

Source of information:
Charles Hanstrom, water plant operator
Mar. 21, 1941

Owners: Mrs C. E. Hanstrom and Mrs. Benny Downing.

Source of supply: Well ½ mile southeast of Post Office; drilled in 1937 by George Hunt, depth 790 feet, diameter 8 inches; deep-well turbine pump and 15-horsepower gasoline engine; water level 65.8 feet below concrete curb July 10, 1940.

Pumpage(estimated): 10,000 gallons a day.

Storage: Elevated tank, 30,000 gallons.

Number of customers: 115.

Treatment: None.

Date collected: Mar. 21, 1941 Analyzed by D. F. Riddell and E. W. Lohr

	Parts per million	Equivalents per million
Calcium (Ca)	21	1.05
Magnesium (Mg)	12	0.99
Sodium and Potassium (Na + K)	527	22.92
Bicarbonate (HCO_3)	494	8.10
Sulfate (SO_4)	391	8.14
Chloride (Cl)	302	8.52
Fluoride (F)	4.2	0.22
Nitrate (NO_3)	0.0	0.00
Dissolved solids	1,500	
Total hardness as $CaCO_3$	103	

WILLIAMSON COUNTY

Jarrell

Population in 1940: 350.

Source of information:
F. J. Viktorin, owner
Mar. 20, 1941

Owner: F. J. Viktorin.

Source of supply: Well 4 blocks north of Post Office; drilled in 1915 by Marion Johnson, depth 615 feet, diameter 6 inches; deep-well cylinder and gasoline engine.

Pumpage (estimated): 11,000 gallons a day.

Storage: Elevated tank, 12,000 gallons.

Number of customers: 60.

Treatment: None.

Analysis of water:

Date collected: Mar. 20, 1941 Analyzed by D. F. Piddell and E. W. Lohr

	Parts per million	Equivalents per million
Calcium (Ca)	78	3.89
Magnesium (Mg)	26	2.14
Sodium & Potassium (Na + K)	12	0.52
Bicarbonate (HCO_3)	342	5.61
Sulfate (SO_4)	16	0.33
Chloride (Cl)	16	0.45
Fluoride (F)	0.6	0.03
Nitrate (NO_3)	8.8	0.14
Dissolved solids	330	
Total hardness as $CaCO_3$	301	

WILLIAMSON COUNTY

Round Rock

Population in 1940: 1,240.

Source of information:
Jack Jordan, water superintendent
Mar. 20, 1941

Ownership: Municipal.

Source of supply: Well 2½ blocks south-southeast of Post Office; drilled in 1935 by Miles Robertson, depth 222 feet, diameter 30 to 12½ inches; deep-well turbine pump and 40-horsepower electric motor; static water level reported 20 feet below land surface; yield 750 gallons a minute.

Pumpage (estimated): 40,000 gallons a day.

Storage: Elevated tank, 60,000 gallons.

Number of customers: 160.

Treatment: None.

Analysis of water:

Date collected: Mar. 20, 1941 — Analyzed by J. W. Yett, Jr.

	Parts per million	Equivalents per million
Iron (Fe)	0.02	
Calcium (Ca)	109	5.44
Magnesium (Mg)	23	1.89
Sodium & Potassium (Na + K)	6.7	0.29
Bicarbonate (HCO_3)	374	6.13
Sulfate (SO_4)	40	0.83
Chloride (Cl)	15	0.42
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	14	0.23
Dissolved solids	408	
Total hardness as $CaCO_3$	367	

Driller's log:

Well

	Thickness (feet)	Depth (feet)
Clay	20	20
Limestone	202	222

WILLIAMSON COUNTY

Taylor

Population in 1940: 7,875.

Source of information:
C. T. Walker, water superintendent
Feb. 3, 1941

Ownership: Municipal.

Source of supply: 3 wells.

Well 1. Northeast corner of 12th and Main Streets; drilled in 1913 by U. S. Oglesby, depth 3,260 feet, diameter 10 to 6-5/8 inches; well flows 520 gallons a minute in 1941, original flow 1,000 gallons a minute; deep-well turbine pump; yield about 600 gallons a minute when pumped.

Well 2. About 1,500 feet north of Well 1 in small City park; drilled in 1934 by Lanning and Coffield, depth 3,308 feet, diameter 12½ to 6-5/8 inches; well flowed naturally about 520 gallons a minute in 1941, original flow 840 gallons a minute; temperature 115° F.

Well 3. Drilled in 1946 by Layne-Texas Company, depth about 3,300 feet, diameter 10 to 8 inches; well not put in service February 29, 1947.

Pumpage: Average 467,000 gallons a day.

Storage: Two concrete ground reservoirs, 150,000 and 350,000 gallons, respectively; elevated tank, 150,000 gallons.

Number of customers: 2,228.

Treatment: None.

Analyses of water:

Date collected: Mar. 21, 1941 — Analyzed by E. W. Lohr

	Well 1		Well 2	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	20		21	
Iron (Fe)	0.10		0.27	
Calcium (Ca)	17	0.85	15	0.75
Magnesium (Mg)	6.1	0.50	5.2	0.43
Sodium and Potassium (Na + K)	462	20.09	464	20.34
Bicarbonate (HCO_3)	452	7.14	462	7.57
Sulfate (SO_4)	421	8.76	349	7.27
Chloride (Cl)	182	5.13	225	6.35
Fluoride (F)	2.7	0.14	2.8	0.15
Nitrate (NO_3)	0	0.00	0	0.00
Dissolved solids	1,333.		1,310	
Total hardness as $CaCO_3$	68		59	
pH	7.8		7.9	

WILLIAMSON COUNTY

Taylor -- Continued

Drillers' logs:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Black soil	8	8	Blue shale and mud	70	2440
Yellow clay	32	40	Grey lime rock	30	2470
Blue clay	460	500	Blue shale and mud	45	2515
White clay	200	700	Dark grey lime rock	65	2580
Soft white lime rock	100	800	Stratified sand & water	142	2722
Blue clay	260	1060	Hard dark sand rock	40	2762
Hard white lime rock	30	1090	Soft sand and water	50	2812
Blue clay	90	1180	Green shale	15	2827
Hard lime rock	135	1315	White soft sand & water	60	2887
Stratified hard lime rock & soft sand rock	160	1475	Stratified sand & water	77	2964
Hard white lime rock	81	1556	Hard sand rock	10	2974
Blue clay	3	1559	Trinity sand and water	286	3260
Hard lime rock	811	2370			

Well 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	10	10	Georgetown lime	176	1236
Taylor marl	188	198	Edwards lime	314	1550
Pecan Gap lime	32	230	Comanche Peak lime	60	1610
Chalky lime	290	520	Walnut blue clay	10	1620
Chalk	380	900	Layers of shale	830	2450
Eagle Ford shale	60	960	Travis Peak lime	250	2700
Buda lime	50	1010	Hard sand rock	15	2715
Del Rio clay	50	1060	Trinity sand and water	593	3308

WILLIAMSON COUNTY

Thrall

Population in 1940: 436.

Source of information:
A. W. Fuchs, operator
Mar. 21, 1941

Owner: Thrall Cooperative Gin Company.

Source of supply: Well one block southeast of depot; dug, depth 37 feet, diameter 48 inches; injector pump and 2-horsepower electric motor; water level 22.82 below land surface February 4, 1941.

Pumpage (estimated): 9,000 gallons a day.

Storage: Elevated wooden tank, 5,000 gallons.

Number of customers: 60.

Treatment: None.

Analysis of water:

Date collected: Mar. 21, 1941 Analyzed by D. F. Riddell and E. W. Lohr

	Parts per million	Equivalents per million
Calcium (Ca)	180	8.98
Magnesium (Mg)	7	0.58
Sodium & Potassium (Na + K)	29	1.28
Bicarbonate (HCO_3)	390	6.39
Sulfate (SO_4)	42	0.87
Chloride (Cl)	84	2.37
Fluoride (F)	0	0.00
Nitrate (NO_3)	75	1.21
Dissolved solids	609	
Total hardness as $CaCO_3$	480	

WISE COUNTY

Bridgeport

Population in 1940: 1,735.

Source of information:
L. F. Herdy, water superintendent
Sept. 21, 1946

Ownership: Municipal.

Source of supply: Reservoir on the west fork of the Trinity River.

Pumpage: Average 50,000 gallons a day.

Storage: Clear well, 55,000 gallons; elevated tank, 125,000 gallons.

Number of customers: 400.

Treatment: Aeration, coagulation, sedimentation, rapid sand filtration, and chlorination.

Analysis of water:

Date collected: Sept. 21, 1946 — Analyzed by C. B. Cibulka

	Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	6.7	
Iron (Fe)	0.11	
Calcium (Ca)	63	3.14
Magnesium (Mg)	11	0.90
Sodium (Na)	46	1.99
Potassium (K)	5.0	0.13
Bicarbonate (HCO_3)	174	2.85
Sulfate (SO_4)	98	2.04
Chloride (Cl)	45	1.27
Fluoride (F)	0.0	0.00
Nitrate (NO_3)	0.0	0.00
Dissolved solids	375	
Total hardness as $CaCO_3$	202	
pH	6.8	

WISE COUNTY

Decatur

Population in 1940: 2,578.

Source of information:
B. F. Owens, water superintendent
Oct. 21, 1941

Ownership: Municipal.

Source of supply: 2 wells.

Well 1. 3 blocks north and one block east of City Hall; drilled in 1937 by Q. D. Lewis, depth 520 feet, diameter 18-3/8 to 10 inches; deep-well turbine pump and electric motor; static water level 375 feet below land surface February 1937; yield 175 gallons a minute.

Well 2. 6 blocks north and 4 blocks east of City Hall; drilled in 1937 by Q. D. Lewis, depth 520 feet, diameter 18-3/8 to 10 inches; deep-well turbine pump and electric motor; yield 175 gallons a minute.

Pumpage: (Average in gallons a day)

	1940
Jan.	136,000
Feb.	145,000
Mar.	169,000
Apr.	168,000
May	171,000
June	154,000
July	185,000
Aug.	159,000
Sept.	196,000
Oct.	212,000
Nov.	187,000
Dec.	198,000

Storage: Ground storage at Well 1, 120,000 gallons; standpipe, 60,000 gallons.

Number of customers: 605.

Treatment: None.

WISE COUNTY

Decatur -- Continued

Analysis of water:

Date collected: Oct. 21, 1947 — Analyzed by J. W. Yett, Jr.

	Well 2	
	Parts per million	Equivalents per million
Silica (SiO_2)	16	
Iron (Fe)	0.04	
Calcium (Ca)	13	0.65
Magnesium (Mg)	6.9	0.57
Sodium and Potassium (Na + K)	89 (calc.)	3.87
Bicarbonate (HCO_3)	272	4.46
Sulfate (SO_4)	21	0.44
Chloride (Cl)	6.0	0.17
Fluoride (F)	0.1	0.01
Nitrate (NO_3)	0.4	0.01
Dissolved solids	290	
Total hardness as $CaCO_3$	61	
pH	8.0	

Drillers' log:

Well 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	5	5	Hard blue shale	70	300
Lime, shale and rock	15	20	Limestone	28	328
Lime and shale	50	70	Blue shale	12	340
Lime, shale and sand	15	85	Sand (water)	6	346
Quicksand	11	96	Dark blue shale	89	435
Blue shale	6	102	Light blue shale	20	455
Grey sandy shale	18	120	Limestone	10	465
Sand (water)	48	168	Sand	12	477
Blue shale	27	195	Blue shale	8	485
Sand (water)	15	210	Fine sand	30	515
Blue sandy shale	20	230	Coarse sand	5	520

YOUNG COUNTY

Graham

Population in 1940: 5,175.

Source of information:
J. F. Niell, chief operator
Sept. 20, 1946

Ownership: Municipal.

Source of supply: Lake on Flint Creek 1½ miles north of pumping station; capacity 6,600 acre feet.

Pumpage: (Average in gallons a day)

	1946
Jan.	480,000
Feb.	445,000
Mar.	524,000
Apr.	565,000
May	639,000
June	945,000
July	1,555,000
Aug.	1,345,000

Storage: 2 clear wells at pumping station, 142,000 gallons; 2 reservoirs on hill, 100,000 and 300,000 gallons.

Number of customers: 1,850.

Treatment: Aeration, coagulation, sedimentation, rapid sand filtration, and pre and post chlorination.

Analyses of water:

Date collected: Sept. 20, 1946 Analyzed by C. B. Cibulka

	Raw water		Finished water	
	Parts per million	Equivalents per million	Parts per million	Equivalents per million
Silica (SiO_2)	16		5.8	
Iron (Fe)	0.24		0.01	
Calcium (Ca)	34	1.697	18	0.898
Magnesium (Mg)	3.2	0.263	4.1	0.337
Sodium (Na)	20	0.874	18	0.778
Potassium (K)	4.2	0.107	4.9	0.125
Bicarbonate (HCO_3)	116	1.901	50	0.820
Sulfate (SO_4)	12	0.250	20	0.416
Chloride (Cl)	28	0.790	32	0.902
Fluoride (F)	0.0	0.000	0.0	0.000
Nitrate (NO_3)	0.0	0.000	0.0	0.000
Dissolved solids	187		127	
Total hardness as $CaCO_3$	98		62	
pH	7.8		9.0	

YOUNG COUNTY

Newcastle

Population in 1940: 1,044.

Source of information:
W. E. Jones, water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: Lake 1 mile south of city.

Pumpage (estimated): 100,000 gallons a day in summer, 50,000 gallons a day in winter.

Storage: Ground storage reservoir, 50,000 gallons; elevated tank, 60,000 gallons.

Number of customers: 270.

Treatment: Aeration, coagulation, sedimentation, rapid sand filtration, and chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

	Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	9.5	
Iron (Fe)	0.09	
Calcium (Ca)	33	1.647
Magnesium (Mg)	0.4	0.033
Sodium(Na)	42	1.837
Potassium (K)	5.0	0.128
Carbonate (CO_3)	18	2.167
Hydroxide (OH)	13	0.764
Sulfate (SO_4)	20	0.416
Chloride (Cl)	10	0.282
Fluoride (F)	0.0	0.000
Nitrate (NO_3)	1.0	0.016
Dissolved solids	123	
Total hardness as $CaCO_3$	84	
pH	10.5	

YOUNG COUNTY

Olney

Population in 1940: 3,497.

Source of information:
E. M. Corley, water superintendent
Sept. 20, 1946

Ownership: Municipal.

Source of supply: Lake on Bear Creek 3 miles north, northwest of city hall, capacity 2,100 acre feet.

Pumpage: Summer 800,000 gallons a day, winter 450,000 gallons a day.

Storage: Clear well at pumping station, 100,000 gallons; concrete reservoir, 500,000 gallons; elevated tank, 103,000 gallons.

Number of customers: 1,125.

Treatment: Coagulation, sedimentation, and pre and post chlorination.

Analysis of water:

Date collected: Sept. 20, 1946 — Analyzed by C. B. Cibulka

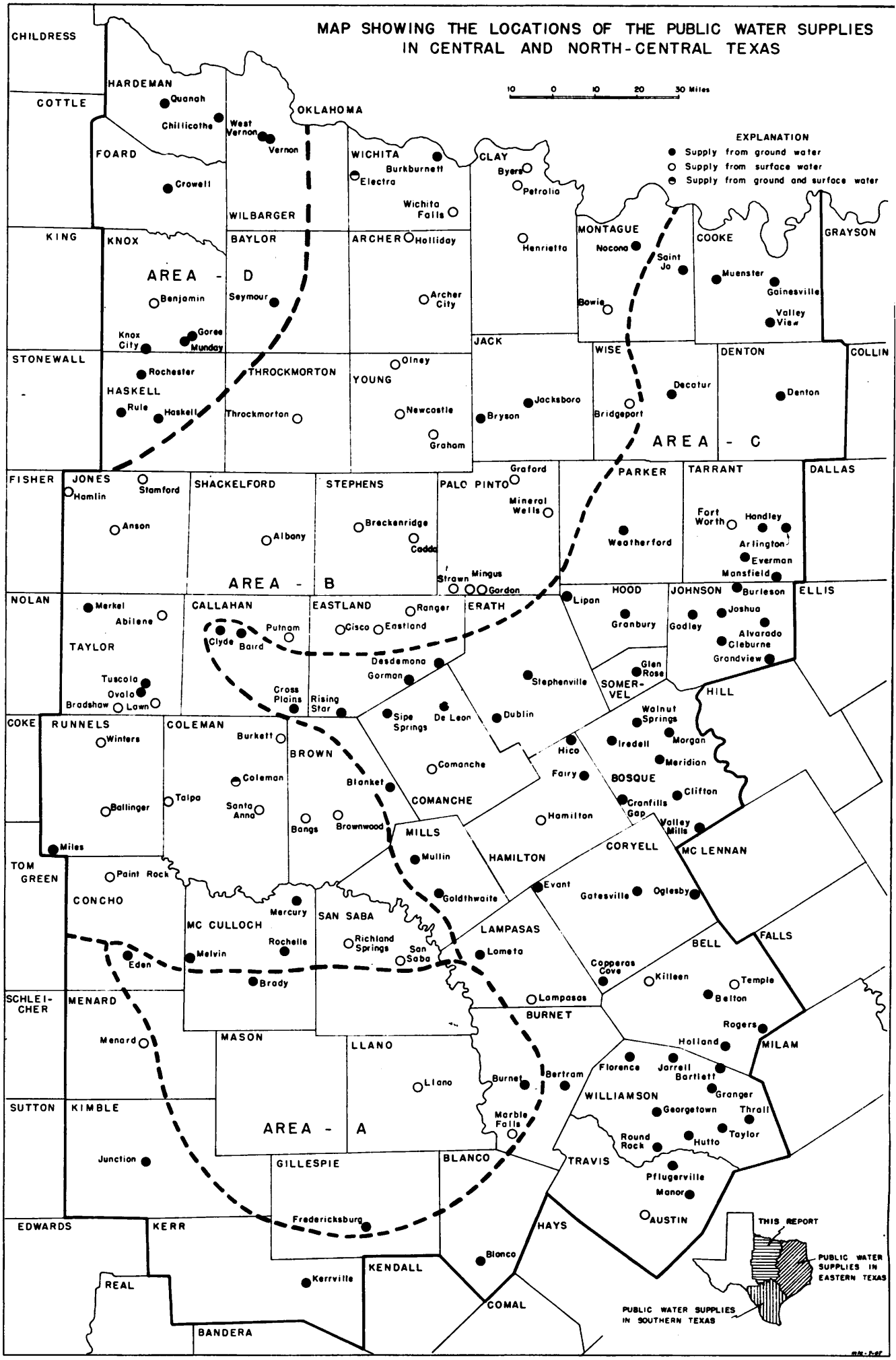
	Finished water	
	Parts per million	Equivalents per million
Silica (SiO_2)	4.5	
Iron (Fe)	0.04	
Calcium (Ca)	18	0.90
Magnesium (Mg)	7.1	0.58
Sodium (Na)	98	4.27
Potassium (K)	3.2	0.08
Bicarbonate (HCO_3)	38	0.93
Sulfate (SO_4)	7.4	0.15
Chloride (Cl)	168	4.74
Fluoride (F)	0.2	0.01
Nitrate (NO_3)	0.2	0.00
Dissolved solids	357	
Total hardness as $CaCO_3$	74	
pH	9.5	

PUBLIC WATER SUPPLIES IN CENTRAL AND NORTH-CENTRAL TEXAS

I N D E X

I N D E X

I N D E X


MAP SHOWING THE LOCATIONS OF THE PUBLIC WATER SUPPLIES IN CENTRAL AND NORTH-CENTRAL TEXAS
10 0 10 20 30 Miles
EXPLANATION
Supply from ground water
Supply from surface water
Supply from ground and surface water
AREA - A
AREA - B
AREA - C
AREA - D
CHILDRESS
HARDEMAN
COTTLE
FOARD
WILBARGER
OKLAHOMA
WICHITA
CLAY
MONTAGUE
COOKE
GRAYSON
KING
KNOX
BAYLOR
ARCHER
JACK
WISE
DENTON
COLLIN
STONEWALL
HASKELL
THROCKMORTON
YOUNG
FISHER
JONES
SHACKELFORD
STEPHENS
PALO PINTO
PARKER
TARRANT
DALLAS
NOLAN
TAYLOR
CALLAHAN
EASTLAND
ERATH
HOOD
JOHNSON
ELLIS
COKE
RUNNELS
COLEMAN
BROWN
COMANCHE
SOMERVEL
HILL
BOSQUE
TOM GREEN
CONCHO
MILLS
HAMILTON
CORYELL
MC LENNAN
MC CULLOCH
SAN SABA
LAMPASAS
BELL
FALLS
SCHLEICHER
MENARD
MASON
LLANO
BURNET
MILAM
SUTTON
KIMBLE
GILLESPIE
BLANCO
WILLIAMSON
EDWARDS
KERR
REAL
KENDALL
COMAL
BANDERA
HAYS
TRAVIS
Quanah
Chillicothe
West Vernon
Vernon
Crowell
Burkburnett
Electra
Wichita Falls
Byers
Petrolia
Henrietta
Nocona
Saint Jo
Bowie
Muenster
Gainesville
Valley View
Benjamin
Seymour
Archer City
Knox City
Goree
Munday
Rochester
Rule
Haskell
Throckmorton
Olney
Newcastle
Graham
Jacksboro
Bryson
Bridgeport
Decatur
Denton
Hamlin
Stamford
Anson
Albany
Breckenridge
Caddo
Graford
Mineral Wells
Strawn
Mingus
Gordon
Weatherford
Fort Worth
Handley
Arlington
Everman
Mansfield
Merkel
Abilene
Clyde
Baird
Putnam
Cisco
Eastland
Ranger
Desdemona
Gorman
Cross Plains
Rising Star
Tuscola
Ovalo
Bradshaw
Lawn
Lipan
Granbury
Godley
Joshua
Alvarado
Cleburne
Grandview
Glen Rose
Stephenville
Sipe Springs
De Leon
Dublin
Walnut Springs
Iredell
Morgan
Meridian
Winters
Ballinger
Miles
Burkett
Coleman
Talpa
Santa Anna
Blanket
Bangs
Brownwood
Comanche
Hico
Fairy
Cranfills Gap
Clifton
Valley Mills
Hamilton
Mullin
Goldthwaite
Evant
Gatesville
Oglesby
Paint Rock
Eden
Mercury
Melvin
Rochelle
Richland Springs
San Saba
Brady
Lometa
Copperas Cove
Killeen
Temple
Belton
Lampasas
Rogers
Holland
Florence
Jarrell
Bartlett
Granger
Georgetown
Thrall
Taylor
Round Rock
Hutto
Pflugerville
Manor
Austin
Menard
Llano
Burnet
Bertram
Marble Falls
Junction
Fredericksburg
Blanco
Kerrville
THIS REPORT
PUBLIC WATER SUPPLIES IN EASTERN TEXAS
PUBLIC WATER SUPPLIES IN SOUTHERN TEXAS