

UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY

WATER SUPPLY NEAR WOODALL, IN SOUTHWESTERN CORNER OF HARRISON COUNTY, TEXAS

By

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**STATE BOARD OF WATER ENGINEERS  
AUSTIN, TEXAS**

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Texas State Board of Water Engineers

File Harrison

Prepared in cooperation with the Texas State Board of Water Engineers

February 26, 1942

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Ground Water

By W. L. Broadhurst and W. N. White

According to the geologic map of Texas, compiled by the Federal Geological Survey, the area under consideration is on the outcrops of the Reklaw member and the Carrizo sand. These formations are underlain by a thickness of about 700 feet of shales, clays and sands belonging to the Wilcox group. These rocks dip generally toward the northwest. The Reklaw is a poor water bearer. The Carrizo sand yields good water but is only about 60 feet thick, even where its full thickness is present, and cannot be expected to yield very large quantities. The sands in the upper 600 feet of the Wilcox seem to afford the only opportunity for a moderately large supply of water of low mineral content.

There are several domestic and stock wells in the vicinity of the tract, but so far as known no attempt has been made to obtain wells of large yield. Down the dip to the west and northwest the water in the Wilcox is somewhat highly mineralized. Two wells (Gregg County No. 1) 400 to 600 feet in depth, drilled by the City of Longview about 35 years ago, yielded water which contained about 1,000 parts per million of sodium chloride. These wells were abandoned in 1914, when the city turned to the Sabine River for its supply. In 1936 the river became so polluted with oil field waste during low flow that the city constructed a pipe line to Big Sandy Creek, which enters the river about 25 miles upstream. A well (No. 2) drilled for the Lone Star Gas Company in September 1941, about two miles southwest of

Longview, produces water containing approximately 800 parts of chloride per million from a depth of 302 to 423 feet. The yield is about 175 gallons a minute, with a drawdown of 50 feet. A well (No. 503) two miles south of Longview drilled to a depth of 467 feet yields approximately 100 gallons a minute, containing 940 parts per million of chloride. Farther west the water is more highly mineralized. The City of Greggtown abandoned its wells on that account and now takes water from the Longview pipe line. A well (No. 607) three miles south of Longview yields a small supply of water, containing 290 parts per million of chloride.

Water of better quality is found in directions approximately along the strike of the rocks to the southwest and northeast of the tract. A well (No. 3) at the Gregg County airport, about five miles southwest of the tract and approximately along the strike, yields water containing only 86 parts per million of chloride. The well produces only about 175 gallons per minute, with a drawdown of 90 feet. It is screened at 246 to 249, 311 to 332, 358 to 360, and 413 to 444 feet. The electrical log shows shallower sands than those screened at 100 to 110, 115 to 130, and 145 to 165 feet. These shallow sands will be partly unwatered by heavy pumping. The well was sunk to a depth of 603 feet but encountered no good sand below 442 feet.

At Hallsville, approximately along the strike toward the northeast,

a well (Harrison County No. 19) was drilled to 613 feet and plugged back to 200 feet. This well yields 100 gallons per minute, with 35 feet of drawdown, and the water contains only 17 parts per million of chloride. The log shows the presence of a sand about 100 feet thick between 500 and 600 feet. No reason is known for not screening this deeper sand, unless the water in it was not of acceptable quality.

The City of Marshall, farther along the strike to the northeast, is supplied with a maximum of about 1,500,000 gallons a day, from 10 wells (Nos. 1 - 10) ranging in depth from 240 feet to about 610 feet. The yield of these wells ranges from 88 to 210 gallons per minute and averages about 150 gallons a minute, or at the rate of slightly over 200,000 gallons a day. The Darco Manufacturing Company at Marshall obtains an average of about 400,000 gallons a day from seven wells (Nos. 11 - 17), all less than 200 feet deep. The maximum yield of these wells is about 135 gallons a minute. An average of about 2,000,000 gallons a day is pumped at Marshall from 20 wells, practically all of which is obtained from sands of the Wilcox group. The water is fairly low in total dissolved minerals but is rather high in iron. Exploratory wells at Marshall 800 feet deep failed to find water below 500 feet.

About nine miles east of the tract and three miles south of Hallsville an oil test (No. 18) was drilled to a depth of about 3000 feet. An electrical log of this well to a depth of 1200 feet shows about 30 feet of sand from 310 to 340 feet, and about 90 feet of sand from 590 to 680 feet. Apparently the water is not excessively mineralized. A well (No. 20) drilled to a depth of 343 feet in Panola County, about

12 miles southeast of Hallsville, has a flow of approximately 50 gallons a minute of water of good quality.

Water Supply Available from Streams  
By Trigg Twichell

Stream flow records obtained by the Federal Geological Survey in cooperation with the Texas Board of Water Engineers show that a continuous supply of 10 million gallons per day, or 15 second-feet, cannot be obtained at all times from the Sabine River or creeks in the vicinity of Longview. However, the average annual rainfall at Longview is 42 inches, and except during periods of drought the Sabine River, Cherokee Bayou, Little Cypress Creek or Big Sandy Creek would more than supply a continuous flow of 15 second-feet. By providing storage to supply water during droughts of six months' duration the supply could be readily obtained from any of these streams. The storage required would not be large, and suitable reservoir sites of the magnitude necessary probably can be found on any of these streams.

Salt water waste from oil fields pollutes the Sabine River upstream from the area under discussion to Gladewater, and the City of Longview discontinued using the river water in 1936 because of this pollution and now obtains its supply from Big Sandy Creek. This creek is a spring-fed stream and contains water of good quality. Its minimum discharge since the beginning of the record in February 1939 has been 7.7 second-feet. Because of the sustained spring flow and

the good quality of water it is the best source of surface supply in the Longview area. The Longview city water plant, located at the mouth of Big Sandy Creek, can now divert a maximum of about 1,600,000 gallons a day, or about  $2\frac{1}{2}$  second-feet, from the creek.

Stream flow records of Sabine River near Longview available for the periods January, 1904, to December, 1907, and November, 1923, to December, 1932, show an average discharge of 2,040 second-feet, or more than a thousand million gallons a day. Records of flow near Gladewater, 25 miles upstream, are available from October 1932 to date. The unregulated low flow at both locations does not differ greatly, as no springs enter the river, nor is there any known channel loss of consequence within the reach between the two stations.

The following table shows the number of days during the period of record when the discharge was below indicated rates of flow.

## Minimum discharge of Sabine River near Longview or Gladewater, Texas

Number of days when discharge was less than that shown in second column

Water year	Disch./ Sec.-ft.	Oct.	Nov.	Dec. to June	July	Aug.	Sept.	Total
1925	10					0	0	0
	15	0	0	0	0	3	0	3
1934	7.5					0		
	10					2	0	2
	15	0	0	0	0	18	0	18
1936	10					0	0	0
	15	0	0	0	0	2	24	26
1938	7.5						0	0
	10						1	1
	15	0	0	0	0	0	8	8
1939	5					0		
	7.5					4	0	4
	10					4	20	24
	15	0	0	0	0	21	28	49
1940	5	0						0
	7.5	3						3
	10	9						9
	15	30	8	0	0	0	0	38

One second-foot equals approximately 650,000 gallons a day

Absolute minimum discharge for period of record was 5.6 second-feet.

From a study of the above table it is found that the discharge fell below 15 second-feet, or 10 million gallons a day, on 142 days during the 21-year period; and it fell to 7.5 second-feet, or 5 million gallons a day, on 4 days during the 21 years of record. The most prolonged period of deficient flow was that from August to November 1939, when the discharge was below 15 second-feet for 87 days. During the same period the flow was below 7.5 second-feet for 4 days, in which the flow dropped to 5.6 second-feet, or the minimum discharge recorded for the 21 years of record. The

rainfall during the late summer and fall of 1939 was about the lowest on record. During the drought periods the flow of the Sabine River is mostly sustained by Big Sandy Creek, a spring-fed tributary which enters the river 15 miles upstream from Gladewater. This is the only stream except the Sabine River which does not go dry in this vicinity during drought periods. Stream-flow records of Big Sandy Creek near Big Sandy and near its mouth are available for the period February 1939 to September 1941. An analysis of these records shows that the flow during these 31 months was below 15 second-feet for 181 days, and below 10 second-feet for 54 days, and that the minimum discharge was 7.7 second-feet during the period February 1939 to September 1941. The most prolonged period of low flow was 122 days during the period July 1939 to November 1939, mentioned above, which was one of the driest known.

Although the record of Big Sandy Creek is of short duration, when compared with records of the Sabine River near Gladewater and Longview, it appears that the minimum recorded on Big Sandy probably approaches the minimum unregulated flow which might be expected from Big Sandy Creek. Daily records of the discharge of the creek for the 1939 and 1940 water years are enclosed.

Conclusions  
By W. N. White

The available data indicate that it is unlikely that five million to ten million gallons a day of water of moderately low mineral content can be obtained from wells in the vicinity of the tract. Perhaps such a supply of the order of one million to two million gallons a day might be obtained from

a considerable number of wells less than 600 feet in depth. If more highly mineralized water can be used the Wilcox sands from 600 to 800 feet might be tapped but even if this is done it is considered unlikely that five million to ten million gallons a day can be obtained for any considerable length of time. The quality of the water in the Wilcox sands from 600 to 800 feet can not be estimated. At Kilgore the water at that horizon contains about 800 parts chloride. If rather highly mineralized water can be used as a part of the supply it might be feasible to use both well-water and water from the Sabine River, with a relatively small amount of storage.

The water of the Sabine is fresh most of the time but may carry as much as 3,000 parts of chloride per million during brief periods of low flow. If all the water must be low in dissolved minerals it will be necessary to resort to the storage of a considerable supply of water either from the river or from the creeks mentioned under the section on water supply available from streams. The possibility of using considerably less than five to ten million gallons a day by reusing the cooling water should be considered.

Records of wells in the Woodall area near Longview, Texas

Harrison County, Texas

a/ No.	Location	Owner	Date com- ple- ted	Depth of well (ft.)	Diam- eter of well (in.)	Yield (g.p.m.)	b/ Remarks
35-30-401	3 miles north of Marshall	City of Marshall No. 1	1906	610	10	88	Water level, 15.97 feet. Cased to 300 feet, perforated at 60-100 and 260-280 feet.
35-30-406	do.	City of Marshall No. 18	1938	240	8	145	Casing perforated from 180 to 240 feet. Temperature 65°F.
405	do.	City of Marshall No. 17	1932	300	10	132	Casing perforated from 220 to 280 feet. Water level, 24.50 feet.
402	do.	City of Marshall No. 9	1925	300	10	145	
403	do.	City of Marshall No. 12	1928	300	8	120	Drilled to 1,012 feet and plugged back. Cased to 300 feet.
404	do.	City of Marshall No. 11	1927	330	8	145	Cased to 300 feet.
408	In Marshall	City of Marshall No. 4	1938	422	16	158	Drilled to 479 feet and plugged back. Temperature 71° F. See log.
704	do.	City of Marshall No. 1	1937	473	16	210	Drilled to 521 feet and plugged back. See log.
703	do.	City of Marshall No. 2	1937	375	16	198	Drilled to 472 feet and plugged back. Water level: 181.90 feet 9 days after pump was shut down; reported 100 feet in 1937 when drilled. Temperature 69° F. See log.
702	do.	City of Marshall No. 3	1936	351	16	145	Drilled to 371 feet and plugged back. Water level: 175.66 feet 25 hours after pump was shut down; reported 100 feet in 1936 when drilled. See log.
35-29 906	West edge of Marshall	Barco Corp. No. 5	1926	248	6	80	Screens at 90-110 and 143-192 feet.
907	do.	Barco Corp. No. 6	1927	192	6	80	See log.

a/ See sketch map for locations of wells.

b/ Water level measurements were made in November 1941.

Records of wells in the Woodall area near Longview, Texas--Continued

Harrison County

a/ No.	Location	Owner	Date com- ple- ted	Depth of well (ft.)	Diam- eter of well (in.)	Yield (g.p.m.)	b/ Remarks
35-29- 908	13 West edge of Marshall	Darco Corp. No. 7	1927	201	6	60	Screen from 75 to 194 feet.
909	14 do.	Darco Corp. No. 8	1934	111	16	80	Screen from 71 to 111 feet.
910	15 do.	Darco Corp. No. 9	1940	50	48	22	See log. ✓
911	16 do.	Darco Corp. No. 10	1941	128	10	130	
912	17 do.	Darco Corp. No. 11	1941	125	10	130	See log.
35-36- 302	18 3½ miles southeast of Hallsville	R. Bonner No. 1	1941	3,000	--	--	Electrical log shows 30 feet of sand at 310 to 340 feet, and 90 feet at 590 to 680 feet.
35-28- 803	19 In Hallsville	City of Hallsville	1939	201	10	100	Drilled to 613 feet and plugged back. Water level reported 90 feet in 1939 when drilled. Reported 35 feet drawdown after pumping 100 gallons a minute for 10 hours. See log.
	20 11½ miles southeast of Hallsville	John Lingo Lumber Co.	1941	343	4	50	Well in Panola County. Flows 50 gallons a minute. See log.

a/ See sketch map for locations of wells.

b/ Water level measurements were made in November, 1941.

Records of wells in the Woodall area near Longview, Texas

Gregg County

a/ No.	Location	Owner	Date com- ple- ted	Depth of well (ft.)	Diam- eter of well (in.)	Yield (g.p.m.)	Remarks	
1	In Longview	City of Longview	Old	400- 600	--	--	Two wells 400 to 600 feet deep, abandoned in 1914 when salt reached about 1,000 parts per million.	
2	3 miles west of Longview	Lone Star Gas Co.	1941	423	18- 3/8	175	Drilled to 558 feet and plugged back. Water level reported 107 feet in 1941 when drilled. Drawdown reported 45 feet after pumping 200 gallons a minute for 24 hours. See log.	
35-35 701	3	8 miles south of Longview	Gregg County Airport	1941	454	16	175	Drilled to 803 feet and plugged back. Drawdown reported 90 feet pumping 175 gallons a minute. Temperature 72° F. See log.
35-34 702	468	In Kilgore	City of Kilgore No. 4	1934	780	16	165?	See log. ✓
35-33 901	469	do.	City of Kilgore No. 1	1931	875	15 1/2	550	Water level: 162.51 feet on September 3, 1941, 18 days after pump was shut down; reported 87 feet in 1931 when drilled. Screen at 773-873 feet. Temperature 80° F.
902	470	do.	City of Kilgore	1934	908	10	340	Water level: 157.78 on September 3, 1941, 18 days after pump was shut down; reported 134 feet in 1934 when drilled. Temperature 80° F. See log. ✓
	503	1 1/2 miles south of Longview	D. H. Jones	1934	467	6	100	Water level 32.0 feet on June 30, 1936.
35-35 401	607	3 miles south of Longview	United Gas Public Service Co.	1931	378	6	--	See log.

a/ See sketch map for locations of wells.

## Drillers' Logs of wells in the Woodall area near Longview, Texas

## Harrison County

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
<u>Well 7</u> 35 30 408			<u>Well 8--Continued</u>		
City of Marshall No. 4, Layne-Texas Co. drillers.					
Red clay	26	26	Soft rock	1	42
Coarse-grained loose gray sand	38	64	Soft gray shale	15	57
Fine-grained gray sand and shale	87	151	Lignite, shale and some sand	47	104
Rock	1	152	Fine-grained silty sand	15	119
Sand	5	157	Soft shale	16	135
Lignite	3	160	Hard rock	1	136
Soft blue shale and fine-grained sand	42	202	Soft shale	9	145
Rock	5	207	Soft rock	1	146
Hard brown shale and layers of sand	33	240	Hard gray shale	35	181
Lignite	5	245	Soft shale layers, silty sand	29	210
Fine-grained silty sand	17	262	Hard shale	12	222
Soft shale and fine-grained dark-gray sand	67	329	Fine-grained silty sand	16	238
Fine-grained dark-gray sand and shale	37	366	Soft shale, thin layers lignite, fine-grained sand	30	268
Sand	6	372	Fine-grained sand and blue shale	28	296
Hard rock	1	373	Rock	1	297
Dark-gray sand	30	403	Dark-colored fine-grained sand, some shale	45	342
Rock	2	405	Rock	11	343
Sticky brown shale	74	479	Fine-grained sand and shale	21	364
CASING: 280 feet of 16-inch, cemented from surface to bottom; 422 feet of 8-inch. Screens: from 276 to 320 and 336 to 399 feet. Under-reamed to 42 inches and gravel packed from 278 to 422 feet. Drilled to 479 feet and plugged back.			Rock	2	366
<u>Well 8</u> 35 30 704			Soft blue shale, some sand	68	434
City of Marshall No. 1, Layne-Texas Co. drillers.					
Sandy surface soil	3	3	Rock	1	435
Red clay	12	15	Soft shale layers, fine-grained sand	44	479
Thin layers of gray sandy shale	26	41	Rock	1	480
			Soft shale	41	521
			CASING: 296 feet of 16-inch cemented from surface to bottom; 491 feet of 8-inch. Underreamed to 42 inches, screened and gravel packed from 296 to 468 feet. Drilled to 521 feet and plugged back.		

## Drillers' Logs of wells in the Woodall area near Longview--Continued

## Harrison County

	Thickness (feet)	Depth (feet)
<u>Well 9</u> 3530703		
City of Marshall No. 2, Layne-Texas Co. drillers.		
Surface soil	2	2
White sand	10	12
Good white sand	37	49
Loam with sand and lignite	17	66
Lignite	15	61
Sand and shale	14	95
Rock	1	96
Gray sand and mica	20	116
Silty sand and layers of shale	70	186
Sand and layers of shale	53	239
Fine-grained sand and layers of lignite	25	264
Rock	1	265
Fine-grained dark-gray sand	45	310
Rock	3	313
Dark-gray sand	47	360
Soft rock	1	361
Coarse-grained sand	18	379
Rock	1	380
Soft shale	92	472
CASING: 254 feet of 16-inch, cemented from surface to bottom; 397 feet of 8-inch. Underreamed to 42 inches, screened and gravel packed from 254 to 375 feet. Drilled to 472 feet and plugged back.		

	Thickness (feet)	Depth (feet)
<u>Well 10</u> 3530702		
City of Marshall No. 3, I. B. White driller.		
Surface soil	12	12
White sand	14	26
Shale and lignite	24	50
Gummy shale and streaks of lignite	35	85
Shale and boulders	20	105
Fine-grained gray sand	13	118
Shale	39	157
Rock, sand and streaks of pyrite	3	160
Shale	14	174

	Thickness (feet)	Depth (feet)
<u>Well 10--Continued</u>		
Rock	1	175
Shale and boulders	10	185
Fine-grained gray sand and boulders	15	200
Shale	35	233
Dark-gray fine-grained sand	18	253
Sand rock	1	254
Sand and shale mixture	10	264
Gray sand, water	87	351
Sand and shale mixture	20	371
CASING: 264 feet of 18-inch, cemented from 150 feet to bottom; 351 feet of 12-inch. Underreamed, screened and gravel packed from 264 to 351 feet. drilled to 371 feet and plugged back.		

	Thickness (feet)	Depth (feet)
<u>Well 12</u> 3529907		
Darco Corporation No. 6.		
Red clay	7	7
Water sand	6	13
Packsand	5	18
Sandstone	1	19
Yellow and brown sand	21	40
Rock	2	42
Poor water sand	7	49
Rock	1	50
Packsand	3	53
Broken sand	7	60
Gray sand	7	67
Sandy shale and boulders	25	92
Water sand	13	105
Backsand	8	113
Faulty lignite	5	118
Gumbo	18	136
Faulty lignite	12	148
Gumbo	2	150
Sandy shale	24	174
Gumbo	5	179
Water sand	13	192
CASING: 192 feet of 6-inch. Screens from 90 to 110 and 143 to 192 feet.		

## Drillers' Logs of wells in the Woodall area near Longview--Continued

## Harrison County

	Thickness (feet)	Depth (feet)
<u>Well 15</u> 35-29-910		
Darco Corporation No. 9.		
Top soil	1	1
Red clay	8	9
Gravel	1	10
Gray gumbo	5	15
Sandy red clay	10	25
Gray water sand	16	41
Red sand rock	6	47
Red sand	3	50

	Thickness (feet)	Depth (feet)
<u>Well 17</u> 912		
Darco Corporation No. 11, B. F. Eddington driller.		
Red clay	6	6
Red water sand	59	65
Green water sand	38	103
White water sand	12	115
Lignite	2	117
Sand and lignite	8	125

	Thickness (feet)	Depth (feet)
<u>Well 19</u> 35-28-803		
City of Hallsville, Layne-Texas Co. drillers		
Sandy white clay	3	3
Yellow clay	10	13
Sticky black shale	106	119
Rock	1	120
Shale and boulders	22	142
Sandy shale	20	162
Good white sand	38	200
Blue shale	44	244
Rock	1	245
Sandy shale	7	252

	Thickness (feet)	Depth (feet)
<u>Well 19--Continued</u> 3528803		
Black sand	17	269
Sandy shale	6	275
Sand	10	285
Sandy shale	33	318
Brittle shale	68	386
Black shale	69	455
Sandy shale	46	501
Fine-grained gray sand	91	592
Shale	10	602
Rock	1	603
Shale and lignite	10	613
CASING: 181 feet of 10-inch; 21 feet of 10-inch from 181 to 201 feet. Drilled to 613 feet and plugged back.		

	Thickness (feet)	Depth (feet)
<u>Well 20</u>		
John Lingo Lumber Co., A. G. Foster driller.		
Surface soil	28	28
Lignite	9	37
Shale	200	237
Sand	31	268
Shale	32	300
Sand	43	343
CASING: 343 feet of 4-inch, perforated at 237-268 and 300-343 feet.		

## Drillers' Logs of wells in the Woodall area near Longview--Continued

## Gregg County

		Thickness (feet)	Depth (feet)			Thickness (feet)	Depth (feet)
<u>Well 2</u>				<u>Well 2--Continued</u>			
Lone Star Gas Co., Layne-Texas Co. drillers.				Hard fine-grained gray sand, streaks of shale			
Soil		1	1			54	517
Red sand, clay and iron boulders		15	16	Fine-grained gray sand, thin layers of shale and lignite		26	543
Dark-gray shale		2	18	Shale, sand breaks and lignite		15	558
Sharp gray sand		11	29	CASING: 302 feet of 1 3/8 inch, cemented from surface to bottom; 423 feet of 7-inch. Screens from 313 to 338; 352 to 362; 371 to 381; 385 to 397; and 402 to 418 feet. Underreamed to 30-inches and gravel packed from 302 to 423 feet. Drilled to 558 feet and plugged back.			
Shale and fine-grained gray sand		39	68	<hr/>			
Gray sand with streaks of lignite		25	93	<u>Well 3 35-35-701</u>			
Gray sandy shale with layers of rock		20	113	Gregg County Airport, Layne-Texas Co. drillers.			
Hard shale and lignite		9	122	Red clay		12	12
Sandy shale and lignite		5	127	Sandy clay		11	23
Hard sandy shale and lignite		9	136	Gray sand		5	28
Sandy shale and lignite		17	153	Gray shale		22	50
Gray sand		6	159	Rock		2	52
Gray shale		35	194	Hard shale and rock		4	56
Sand and shale		63	257	Brown sand and lignite		17	73
Shale		5	262	Rock		2	75
Sand and shale		9	271	Sand and lignite		3	78
Sand, hard layers of boulders		4	275	Hard brown sand		9	87
Coarse-grained smooth gray sand		28	303	Rock		1	88
Sharp light-gray sand, layers of shale		35	338	Hard brown sand		8	96
Shale, streaks of sand		6	344	Hard gray sand		17	113
Sand rock		3	347	Hard gray shale, streaks of sand		61	174
Shale and sand breaks		15	362	Gray shale, streaks of sand		35	207
Shale		4	366	Gray shale		42	249
Clean sharp gray sand		15	381	Gray shale, streaks of sand		17	266
Shale		2	383	Rock		1	267
Clean sharp gray sand		12	395	(Continued on next page)			
Gray sand, thin streaks of shale and lignite		7	402				
Clean sharp gray sand		20	422				
Breaks of sand, shale and lignite		3	425				
Gray sand		38	463				

## Drillers' Logs of wells in the Woodall area near Longview--Continued

## Gregg County

	Thickness (feet)	Depth (feet)
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Well 3--Continued

35-35-701

Gray shale, streaks of sand	39	306
Gray sand, streaks of shale, water	25	331
Shale	19	350
Gray sand, water	17	367
Gray shale, streaks of lignite	21	388
Sandy shale	7	395
Gray sand, streaks of shale	7	702
Shale	3	405
Gray sand, streaks of shale, water	37	442
Broken sand and shale	22	464
Gray sand	10	474
Rock	2	476
Sand and shale	14	490
Sandy shale and lignite	46	536
Shale and lignite	11	547
Sandy shale and lignite	5	552
Shale and lignite	8	560
Sandy shale and lignite	43	603
CASING: 307 feet of 16-inch, cemented from surface to bottom; 454 feet of 9-5/8-inch. Screens from 246 to 249; 311 to 332; 358 to 368; and 413 to 444 feet. Drilled to 603 feet and plugged back.		

Well 468 35-34-702

City of Kilgore No. 4, Layne-Texas Co. drillers.		
Red clay	16	16
Sand	10	26
Sandy shale	51	77
Rock	1	78
Sandy shale	38	116
Shale	41	157
Sandy shale	22	179

	Thickness (feet)	Depth (feet)
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Well 468--Continued

35-34-702

Shale, streaks of sand	51	230
Rock	1	231
Shale	8	239
Sandy shale	48	287
Fine-grained sand	16	303
Shale, streaks of sand	76	379
Shale	29	408
Sandy shale	199	607
Sand	20	627
Sand and shale	113	740
Sand	40	780
CASING: 607 feet of 16-inch, cemented from surface to bottom; 777 feet of 10-inch. Screens from 607 to 625 and 665 to 755 feet.		

Well 470 35-33-902

City of Kilgore No. 3, Layne-Texas Co. drillers.		
Surface soil	1	1
Clay	6	7
Sandy clay	12	19
Shale and layers of sand	15	34
Shale and boulders	41	75
Sand rock	2	77
Sand, boulders and shale	80	157
Shale and sand	66	223
Sandy shale	14	237
Shale, sand and lignite	286	523
Shale and boulders	52	575
Sand	30	605
Shale and boulders	32	637
Shale, boulders, lignite	77	714
Sticky shale	15	729
Sand	9	738
Sticky shale	9	747
Sand	159	906
CASING: 763 feet of 10-inch; 906 feet of 6-5/8-inch. Screen from 802 to 907 feet.		

## Drillers' Logs of wells in the Woodall area near Longview--Continued

## Gregg County

Well 607		Well 607--Continued	
Thickness (feet)	Depth (feet)	Thickness (feet)	Depth (feet)
United Gas Public Service Co., Layne- Texas Co. drillers.		Rock	1 74
Surface sand	3 3	Shale	10 84
Yellow sandy clay	34 37	Sandy shale	21 105
Shale	13 50	Fine-grained white sand	11 116
Sandy shale	12 62	Sandy shale and water sand	144 260
Rock	1 63	Sandy shale	37 297
Shale	1 64	Sand, streaks of shale	25 322
Rock	1 65	Sandy shale and lignite	30 352
Shale	8 73	Sandy shale	26 378

35-35-401

Analyses of water from wells in the Woodall area near Longview, Texas. Analyzed by D. F. Riddell. Results except pH are in parts per million. Numbers at the head of columns refer to corresponding well numbers in the table of well records.

Harrison County											
	1	2	3	4	7	8	9	10	11	12	13
Depth (ft.)	610	240	300	300	422	468	375	351	248	192	201
Iron (Fe) a/	-	-	-	-	-	-	-	-	35	55	50
Calcium (Ca)	10	7.6	10	4.8	6	18	10	15	22	23	19
Magnesium (Mg)	5.4	9.0	5.4	6.6	11	1.7	3.9	0.5	9.0	24	24
Sodium & Potassium (Na + K) calc.	4.8	2.5	2.8	16	109	103	89	100	11	45	84
Bicarbonate (HCO <sub>3</sub> )	6	31	0	24	195	177	165	189	0	0	0
Sulphate (SO <sub>4</sub> )	40	26	96	42	103	100	77	77	23	50	88
Chloride (Cl)	8.0	6.5	6.5	7.0	20	18	15	16	64	182	185
Fluoride (F)	0.2	0.2	0	0.1	0	0.1	0.2	0.2	-	0	-
Nitrate (NO <sub>3</sub> ) b/	-	-	-	-	-	-	-	-	-	-	-
Total dissolved solids	71	67	121	88	345	328	276	302	129	324	400
Total hardness as CaCO <sub>3</sub> (calc.)	48	56	43	39	62	51	42	40	91	155	145
pH a/	-	-	-	-	-	-	-	-	6.3	6.1	6.2

a/ Iron and pH determinations made by Darco Corporation.

b/ Nitrate less than 20 parts per million unless figure is given.

Analyses of water from wells in the Woodall area near Longview--Continued

Harrison County

	14	15	16	17	19	20
Depth (ft.)	111	50	128	125	201	343
Iron (Fe) a/	55	2.5	15	15	-	-
Calcium (Ca)	20	10	20	44	2.8	3
Magnesium (Mg)	20	2.9	13	25	1.7	2.0
Sodium and Potassium (Na + K) calc.	46	17	16	5.3	114	505
Bicarbonate (HCO <sub>3</sub> )	0	12	85	116	156	763
Sulphate (SO <sub>4</sub> )	81	4	46	100	105	5
Chloride (Cl)	208	42	14	16	17	338
Fluoride (F)	-	--	0.2	-	-	-
Nitrate (NO <sub>3</sub> ) b/	-	-	-	-	0	0
Total dissolved solids	377	82	151	247	331	1,225
Total hardness as CaCO <sub>3</sub> (calc.)	132	37	103	210	14	8
pH a/	4.3	6.2	6.6	6.9	-	-

a/ Iron and pH determinations made by Darco Corporation.

b/ Nitrate less than 20 parts per million unless figure is given.

Analyses of water from wells in the Needall area near Longview--Continued

Gregg County

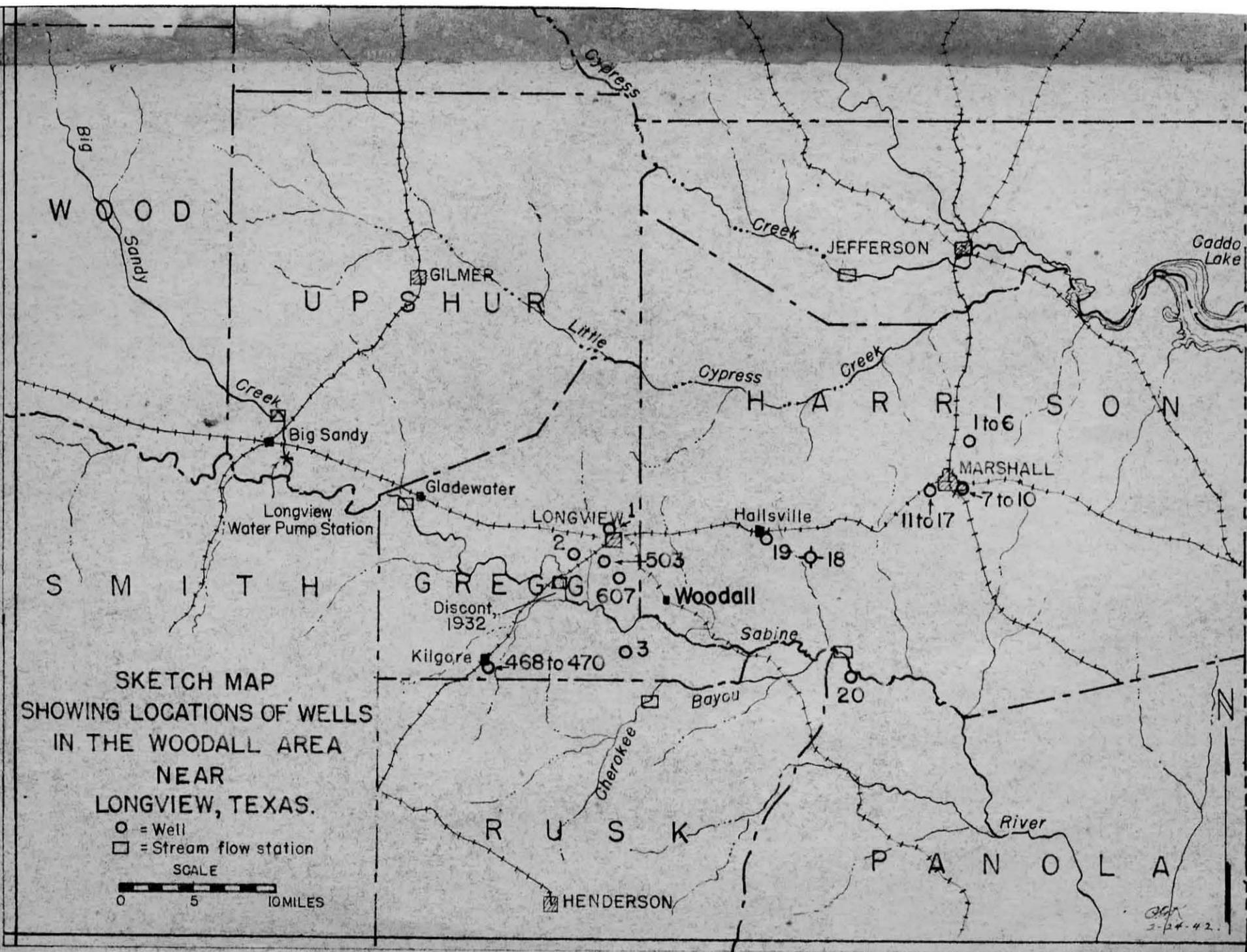
	2	3	468	469	470	503	607
Depth (ft.)	423	454	780	875	906	467	378
Iron (Fe)	0	0.1	0	0.1	0	-	-
Calcium (Ca)	6.4	0.8	4.4	0.4	0.8	3	7
Magnesium (Mg)	2.7	5.1	3.9	3.9	5.1	4	6
Sodium & Potassium (Na + K) calc.	662	272	636	711	728	808	439
Bicarbonate (HCO <sub>3</sub> )	427	549	604	598	586	555	665
Sulphate (SO <sub>4</sub> )	2	38	23	27	23	-	42
Chloride (Cl)	790	86	630	740	780	940	290
Fluoride (F)	0.3	0.5	0.5	0.7	0.6	-	-
Nitrate (NO <sub>3</sub> ) b/	-	-	-	-	-	-	-
Total dissolved solids	1,673	673	1,595	1,777	1,826	2,028	1,111
Total hardness as CaCO <sub>3</sub> (calc.)	27	23	27	17	23	22	44
pH	-	-	-	-	-	-	-

b/ Nitrate less than 20 parts per million unless figure is given.

SKETCH MAP  
SHOWING LOCATIONS OF WELLS  
IN THE WOODALL AREA  
NEAR  
LONGVIEW, TEXAS.

- = Well
- = Stream flow station

SCALE  
0 5 10 MILES



3-24-42.