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TEXAS

STATE BOARD OF WATER ENGINEERS

C. S. Clark, Chairman
A. H. Dunlap, Member
J. W. Pritchett, Member

REFUGIO COUNTY AND PART OF GOLIAD COUNTY, TEXAS

Records of wells, drillers' logs,
and water analyses, and maps
showing location of wells.

WORKS PROGRESS ADMINISTRATION

GROUND-WATER SURVEY

PROJECT 2082

R. A. Muenster and E. J. Michal,
Project Superintendents

Analyses made, data assembled and
report mimeographed by

WORKS PROGRESS ADMINISTRATION

PROJECT 6507-5112

Sponsored by the State Board of Water Engineers with the Bureau of Industrial Chemistry of The University of Texas and the United States Department of the Interior, Geological Survey, cooperating.

Austin, Texas
June 6, 1938

Reprinted May 1953

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REFUGIO COUNTY AND PART OF GOLIAD COUNTY, TEXAS

Introduction

by

Samuel F. Turner

Associate Hydraulic Engineer

Geological Survey

United States Department of the Interior

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The purpose of this survey was to obtain information concerning existing wells and the quantity and quality of water they yield, and to put down test holes where additional information was needed.

This project was part of a statewide Works Progress Administration project known as a "Statewide Inventory of Water Wells," sponsored by the State Board of Water Engineers. The Division of Ground Water of the Geological Survey, United States Department of the Interior, cooperated in the technical direction of the project and the Bureau of Industrial Chemistry of The University of Texas furnished laboratory space and equipment and supervised the chemical analyses.

The analyses were made by chemists employed on Works Progress Administration Project 6507-5112 at Austin, Texas, sponsored by the State Board of Water Engineers. Typists employed on this project typed and assembled this release.

The field work in Refugio and part of Goliad Counties was started on December 19, 1935, and completed April 1, 1937. This work was done as Project 2082 of Administrative Field Office 10 of the Works Progress Administration, San Antonio, Texas. R. A. Muenster and E. J. Michal, engineers, were project superintendents. Mr. Muenster started the work in Refugio County. The project was shut down on May 3, 1936, when the work in Refugio County was about 65% complete, due to the lack of funds. When more money was available, the project was reopened on February 1, 1937, with Mr. Michal as project superintendent. Work in Refugio County was completed in March, 1937, and Mr. Michal started work in Goliad County. When the work in Goliad County was about 10% complete, the project was closed because labor was not available to complete the project.

Both Mr. Muenster and Mr. Michal should be given credit for their interest in the work and for the many extra hours they spent on the project. The San Antonio office of the Works Progress Administration made this work possible by their constant help and cooperation.

This release contains the well records and well logs obtained by the project superintendents, logs of the test wells drilled by the W.P.A. labor, and the chemical analyses of water from privately-owned wells. Locations of all wells listed are shown on the maps in the release. The part of the work done by Mr. Muenster, pages 3 to 41 of this report, was published June 10, 1936. The remainder of the report, pages 42 to 91, represents the part of the work done by Mr. Michal.

The test wells were drilled by W.P.A. labor using a soil auger, drop auger, churn drill, and a sand bucket. Samples were collected at one-foot intervals by the well driller in charge of the party. The project superintendents studied these samples and compiled the logs.

Records of wells in Refugio County, Texas

(Topographic situation is usually flat or slightly rolling. All wells are bored or drilled unless otherwise noted in Remarks).

No.	Distance from Courthouse at Refugio	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) a/
1	2½ miles north	G.E. Strauch	W.P.A. test well	1936	51	3	0
2	2 miles north	Mrs. Frank Munsch	Sam Shaw	--	72	4	1.3
3	1-¾ miles north	John Buckley	W.P.A. test well	1936	46	3	0
4	do	E.W. Johnson	--	--	39	4	3.0
d/5	1½ miles north	J.T. Vance	W.P.A. test well	1936	27	3	0
6	do	J.T. Vance	R.L. Rischer	--	500	3	0
d/7	1-¼ miles north	State Highway	W.P.A. test well	1936	25	3	--
8	do	Heard and Heard, Inc.	T.P. Morgan	--	700	4	--
9	do	Clyde Low	--	--	368	6	--
10	1 mile north	Antonio Reyna	Antonio Reyna	--	75	4	--
11	do	John Kay Estate	R. Rischer	1919	884	4	--
12	¾ miles north	Ramon Trevino	--	--	62	4	2.2
13	¾ miles northeast	Mrs. Benito Cavasas	--	--	43	4	20
d/14	do	City Street	W.P.A. test well	1936	27	3	0
d/15	½ mile northeast	do	do	1936	19	3	--
16	do	Ramon Trevino	--	--	50	4	1.5
17	½ mile north	F.C. Bailey	Raymond Rischer	1925	820	2	--
18	do	G.E. Strauch	United Gas Co.	1930	940	4	--
19	¼ mile north	do	Raymond Rischer	1930	792	2	0
20	do	Lawrence O'Conner	do	1929	850	3	0

a/ Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T., turbine; Cf, centrifugal; C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records obtained by R. A. Muenster
Project Superintendent
(Chemical analyses of water from these
wells are given in the table of analyses)

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measur- ing point (feet)	Date of measure- ment.			
1	-26.2	Feb. 11, 1936	None	N	Water rose 5½ feet in 1/2 hour.
2	-36.9	Mar. 9, 1936	C,W	D,S	Reported capacity 5 gallons a minute.
3	-36.5	Feb. 15, 1936	None	N	Water rose 24 inches in 1/2 hour.
4	-30.4	Feb. 27, 1936	C,W	D,S	
5	-27.0	Jan. 17, 1936	None	N	Hit hard sandstone at 15 feet in a hole 100 feet north.
6	-15	e/	C,W	D,S	Well originally flowed 9 feet above ground but head declined rapidly.
7	--	--	None	N	Dry hole
8	--	--	C,W	D,S	Slight sulphur taste reported.
9	--	--	Gas	D,S	Water raised by jetting with natural gas.
10	--	--	C,W	D,S	
11	--	--	C,W	D,S	Water has slight taste and odor of sul- phur.
12	-28.0	Jan. 9, 1936	C,H	D,S	
13	-21.6	Jan. 9, 1936	C,H	D	
14	-14.5	Jan. 9, 1936	None	N	Water rose 26 inches in 30 minutes and 12½ feet in 4 hours.
15	--	--	None	N	Dry hole
16	-24.5	Jan. 8, 1936	C,H	D	
17	Flows	Jan. 25, 1936	None	D	Water from sand at 400 feet unfit for domestic use. Reported flow of 35 gallons a minute at 26½ feet above ground when well was completed.
18	do.	Jan. 24, 1936	None	D,S	Screen at bottom of casing.
19	+8	e/	C,W	D	Screen and perforated pipe at bottom. Reported flow of 60 gallons a minute in 1930.
20	+10	e/	None	D	Water has odor and taste of sulphur.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock;
N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in Refugio County--Continued

No.	Distance from Courthouse at Refugio	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) ^{a/}
21	1/4 mile northeast	Town of Refugio	Layne-Texas Company	1930	920	10	0
22	1/2 mile northwest	Mercy Academy	Phillips Petroleum Co.	1930	600	2	0
d/23	1/2 mile east	County road	W.P.A. test well	1936	27	3	--
d/24	1 mile east	do.	do.	1936	27	3	--
d/25	2-3/4 miles east	County road	W.P.A. test well	1936	34	3	--
26	4 miles east	do.	do.	1936	40	3	0
d/27	5 miles east	do.	do.	1936	20	3	--
d/28	6 miles east	do.	do.	1936	33	3	--
29	8 1/2 miles northwest	Mrs. M. Sullivan	Dan Beedy	1904	44	4	0
30	8 miles northwest	Mrs. E. D. Clarkson	Harvey Brooks	--	51	4	3.1
d/31	do.	do.	--	--	41	60	0
32	do.	Fox Heirs	--	--	70	4	1.4
33	7 miles northwest	J.C. West	--	--	72	4	0.3
34	do.	do.	--	--	76	4	0.2
35	do.	Tom Lambert	Al May	1906	63	3	2.6
36	6 miles northwest	Earl Jackson	--	1911	51	6	1.9
37	do.	Mrs. P. R. Dorsey	--	--	49	6	2.0
38	8-1/4 miles northwest	Miss Anne Williams	John Maley	1900	140	4	0
39	do.	do.	Raymond Rischer	1928	850	4	0
40	7 miles northwest	J. C. West	Henry Simms	1932	108	4	0.4
41	do.	J.L.Williams	Dan Beedy	1908	95	4	1.6

^{a/} Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

^{b/} T, turbine; Cf, centrifugal; C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measur- ing point (feet)	Date of Measure- ment. e/			
21	Flows	e/	T, E 3)	D	Well flowed 58 gallons a minute on Sept. 24, 1930. The drawdown was 68 feet at 550 gallons a minute on May 18, 1933.
22	+25	e/	None	D, S	Well has been flowing for 5 years. Estimated flow on Jan. 15, 1936 was 100 gallons a minute.
23	--	--	None	N	Dry hole.
24	--	--	None	N	Do.
25	--	--	None	N	
26	-39.5	Apr. 4, 1936	None	N	
27	--	--	None	N	Dry hole
28	--	--	None	N	Dry hole
29	-38.3	Mar. 17, 1936	C, W	D, S	
30	-42.3	do.	C, W	S	Water level measured while pumping.
31	-36.0	do.	None	N	A very old dug well.
32	-48.5	Mar. 20, 1936	CH	D	
33	-28.9	Mar. 17, 1936	C, W	S	
34	-53.8	Mar. 20, 1936	C, W	D, S	
35	-45.6	do.	C, W	D, S	
36	-42.1	do.	C, W	D, S	
37	-34.8	do.	C, W	S	Water is cloudy
38	-40	e/	C, W	D, S	
39	+2	e/	Flows	S	Flow estimated at 5 gallons a minute, Mar. 14, 1936.
40	-55.1	Mar. 14, 1936	C, W	S	
41	-53.4	do.	C, W	S	Reported that windmill pumps well dry in one hour.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records on wells in Refugio County--Continued

No.	Distance from Courthouse at Refugio	Owner	Driller	Date completed.	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) ^{a/}
42	6½ miles north-west	J.M.McGrew	Harvey Brooks	--	105	4	0
43	do.	Lewis Powers	Henry Simms	1913	44	4	--
44	do.	C.E.Brandon	Toby Hearn	1932	56	4	1.2
45	do.	County Road	W.P.A. test well	1936	48	3	0
46	6 miles northwest	C. J. Birmingham	--	--	58	4	1.0
47	do.	Raymond Rischer	William House	1928	850	4	0
48	do.	Milton Williams	Milton Williams	1935	54	4	0.5
d/49	6 miles northwest	County road	W.P.A. test well	1936	43	3	--
50	do.	Levi Williams	Levi Williams	1935	58	4	1.6
d/51	5-3/4 miles northwest	State Highway	W.P.A. test well	1936	24	3	--
52	5½ miles northwest	J.N.Mitchell	--	--	196	4	0
53	do.	do.	--	--	43	4	2.0
54	4½ miles northwest	do.	--	--	187	4	--
55	4-3/4 miles northwest	Tom Heard	--	--	58	6	0.3
56	2-3/4 miles northwest	County road	W.P.A. test well	1936	48	3	0
57	do.	Ira Heard	Y.G. Rocha	1935	134	3	--
d/58	do.	County road	W.P.A. test well	1936	50	3	0
59	3-1/4 miles northwest	Joe Shay	--	--	60	4	2.5
d/60	do.	County road	W.P.A. test well	1936	46	3	--
d/61	3-3/4 miles northwest	do.	do.	1936	41	3	--
d/62	4-1/4 miles northwest	do.	do.	1936	35	3	--
63	5 miles north-west	do.	do.	1936	32	3	--

a/ Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; Cf, centrifugal, C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells-in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measur- ing point	Date of measure- ment.			
42	(feet) -45	e/	C,W	S	
43	--	--	C,W	D,S	
44	-45.3	Mar.12, 1936	C,W	D,S	
45	42	Mar.26, 1936	None	N	Water rose 4 feet in 30 minutes.
46	-51.3	Mar.10, 1936	C,W	D,S	
47	+1	e/	Flows	D,S	Nearly stopped flowing in Summer of 1933
48	-50.3	Mar.12, 1936	C,H	D	Very weak well.
49	--	--	None	N	Dry hole.
50	-53.2	Mar.12, 1936	C,H	D,S	No screen at bottom of casing.
51	--	--	None	N	Dry hole.
52	-20	e/	C,W	D,S	
53	-39.6	Mar.10, 1936	C,W	S	Screen at bottom of casing.
54	--	--	C,W	S	
55	-44.7	Mar.17, 1936	C,W	S	
56	-43.7	Feb.23, 1936	None	N	Water rose 4.7 feet in one hour.
57	--	--	C,W	S	Casing has screen at bottom.
58	-48.7	Feb.27, 1936	None	N	Water sand caved badly.
59	-52.6	Feb.26, 1936	C,W	S	
60	--	--	None	N	Dry hole.
61	--	--	None	N	Dry hole.
62	--	--	None	N	Struck casing "quick sand" at 31 feet.
63	--	--	None	N	

c/ I, irrigation; Ind, industrial; P, public; D, domestic;
S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in Refugio County,--Continued

No.	Distance from Courthouse at Refugio	Owner	Driller	Date completed.	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) a/
64	5-3/4 miles northwest	Leslie Grant	-.Newberry	--	69	4	1.2
65	do.	Jim West	--	--	55	4	1.2
66	5 1/2 miles northwest	W.A. Meyers	J.L.Hatcher	1890	67	4	3.8
67	4-3/4 miles northwest	J.S. Kelly	Al My	1898	98	6	0.2
68	4 1/2 miles northwest	C.P. Jones	R.F. Nichols	1926	600	2 1/2	0
69	2 1/2 miles northwest	Pat Lambert	--	--	60	6	0.5
70	2 miles northwest	United Gas Co.	---.White	1926	680	6	0
71	1-3/4 miles northwest	County road	W.P.A. test well	1936	43	3	0
72	2 miles northwest	J.T. Vance	Bob Morrow	--	105	4	--
d/73	2-1/4 miles northwest	County road	W.P.A. test well	1936	11	3	--
74	2 miles northwest	John Buckloy	Raymond Reicher	1925	412	4	0
d/75	1 mile northwest	City of Refugio	W.P.A. test well	1936	21	3	0
76	3/4 miles northwest	Ed. Simpson	Pierson Drilling Co.	1929	940	12	0
77	do.	Mrs. Robert Rigby	--	1905	35	6	2.5
78	1/2 mile northwest	Miss Emma Huddleston	--	--	46	4	0.5
79	3/4 mile northwest	County road	W.P.A. test well	1936	22	3	0
80	2-3/4 miles west	F.B. Rocke, estate No.3	Houston Oil Co.	1928	200±	4	--
81	3 miles west	do. No. 1	Pratt-Hewitt	1921	84±	4	--
d/82	3-1/4 miles west	do.	W.A.Howard	--	100±	3	--
83	3 miles west	do.	Houston Oil Co.	1928	640	8-1/4	--
84	3 1/2 miles southwest	do.No.B-1	W.A.Howard	1931	900±	4 1/2	0
1882/85	1 1/2 miles southwest	State Highway	W.P.A. test well	1936	23	3	--

a/ Measuring point is the point from which water level measurement was made and was usually top of casing top of pump base or top of water pipe clamp.

b/ T, turbine; Cf, centrifugal, C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measur- ing point (feet)	Date of measure- ment.			
64	-56.1	Mar.23, 1936	C, H	D,S	
65	-49.3	do	C,W	D,S	Well was drilled before 1880.
66	-56.8	do	C,W	D,S	
67	-58	e/	C,W	D	
68	+5	e/	Flows	D,S	Flow reported as 19 gallons a minute.
69	-47.2	Feb.20, 1936	C,W	D,S	
70	Flows	Jan.31, 1936	C,E,5	D,S	Screen on bottom of casing. Flow reported as 60 gallons a minute.
71	-38.6	Feb.17, 1936	None	N	Water appeared at 42½ feet.
72	--	--	C,W	D,S	Screen set from 97 to 105 feet.
73	--	--	None	N	Dry hole.
74	Flows	Jan.31, 1936	C,W	D,S	Flow reported as 7 gallons a minute.
75	-20	Jan. 2, 1936	None	N	
76	+10	e/	Flows	D,S	Flows about 10 gallons a minute. Original water level was 12 feet above surface.
77	-20.9	Jan.24, 1936	C,W	D,S	
78	-15.1	do	C,W	D,S	
79	-19.9	Mar.23, 1936	None	N	Water rose 1.7 feet in 15 minutes.
80	--	Mar.24, 1936	--	D,Ind.	Flow increased by jetting. Natural flow estimated at 15 gallons a minute.
81	--	--	C,W	D,Ind.	
82	--	--	C,W	N	Strong odor and taste of sulphur.
83	--	--	"gas"	D,Ind.	In 1934, casing was perforated by Layne-Texas Co. at 703-735, 563-630 and 630-640.
84	+3	Mar.24, 1936	None	S	Water has slight taste of sulphur.
85	--	--	None	N	Well not completed.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock, N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in Refugio County--Continued

No.	Distance from Courthouse at Refugio *(wells 95-106, distance from Woodsboro)	Owner	Driller	Date completed.	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) a/
d/86	1 mile southwest	State Highway Dept.	W.P.A. test well	1936	27	3	0
87	1/4 mile southwest	L.R. Jeter	Edwin M. Jones	--	870	3	--
88	do.	do.	--	--	200±	4	--
d/89	2-1/4 miles southwest	State Highway Dept.	W.P.A. test well	1936	28	3	0
90	2-3/4 miles southwest	F.B. Rooke and Sons	John Young	1900	900±	4	0
91	3-1/4 miles southwest	do.	Frank Zarsky	1925	398	2	0
92	3-3/4 miles southwest	do.	--	--	920	2 1/2	0
93	4-3/4 miles southwest	do.	Frank Zarsky	1927	715	--	0
94	5 1/2 miles southwest	do.	E.T. Ellwood	--	682	2	0
*95	2 miles east	Frank Huser	Tobe Hearn	1928	71	5	0
96	1/2 mile east	Allen McKenzie	Allen McKenzie	1931	101	4	0.9
97	do.	Tom Hargrove	do.	--	137	4	--
98	1/4 mile east	E.C. Thomas	E.T. Ellwood	1930	606	2	0
99	1/4 mile south	Charles Zarsky	--	--	80	3	--
d/100	Center of town	Town of Woodsboro	A.E. Fawcett, Jr.	--	203	12	0
101	1/4 mile northwest	A.D. Rooke	--	--	642	2	0
102	3/4 miles northwest	F.B. Rooke and Sons	L.W. Borden	1930	678	2	0
103	1 mile west	do.	Magnolia Oil Co.	1934	800±	6	0
104	1-1/4 miles west	do.	A.C. McKenzie	1936	218	4-1/4	0
105	2-1/2 miles west	do.	L.W. Borden	1930	817	2	--
106	1 mile southwest	do.	E. T. Ellwood	--	837	2	0

a/ Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; Cf, centrifugal; C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below measuring point	Date of measurement.			
86	(feet) -27.0	Apr. 15, 1936	None	N	
87	--	--	None	D,S	Emergency town supply. The estimated natural flow is 50 gallons a minute.
88	--	--	C,E,1/3	D,S	
89	- 28.0	Apr. 23, 1936	None	N	Caving sand prevented deeper drilling.
90	+15	e/	C,E,1/2	D,S	Natural flow estimated as 20 gallons a minute.
91	+8	e/	None	S	Natural flow partly due to pressure of natural gas.
92	+6.5	Mar. 25, 1936	None	S	Estimated flow, 12 gallons a minute.
93	0	e/	C,W	S	Flowed for 7 years.
94	+7.0	e/	None	S	20 feet of 2 inch screen and back pressure valve at bottom of casing.
95	-35	e/	C,W	D,S	Well was 42 feet deep from 1908 to 1928 with weak supply. Has large supply at 71 feet.
96	-40.6	Mar. 25, 1936	C,W	D	Furnishes water for four houses.
97	--	--	C,W	D	
98	+10	e/	None	D	Flow estimated as 15 gallons a minute.
99	--	--	C,W	D	
100	-32	e/	T,E,10	P	40 foot drawdown pumping 270 gallons a minute on Aug. 14, 1935. Test by M. C. St. John.
101	+8	e/	C,E, $\frac{1}{8}$	D	Flows, pump used to raise water to tank.
102	+8	o/	Flows	S	Flow estimated as 12 gallons a minute.
103	+7	e/	do	S	Flow estimated as 25 gallons a minute.
104	-32	e/	C,W	S	This was formerly a flowing well 816 feet deep but strainer clogged and well was re-worked at 218 feet.
105	--	--	Flows	S	Flow estimated as 15 gallons a minute.
106	+6	e/	do	S	Flow estimated as 18 gallons a minute.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock, N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in Refugio County--Continued

No	Distance from Woodsboro	Owner	Driller	Date completed.	Depth of well (feet)	Diameter of well (in.)	Height of measuring point above ground (feet) ^{a/}
107	1 mile southwest	F. B. Rooke & Sons	E. T. Ellwood	--	702	2	0
108	3/4 miles southwest	do.	--	1913	54	4	0
109	3/4 miles southeast	H.J. Brymer	Tobe Hearn	1935	67	4	1.1
110	1 1/2 miles southeast	H.A. Boenig	--	1910	55	4	0
111	2-3/4 miles southeast	-- Oppenheimer	--	1910	175	6	--
112	2 miles southeast	County road	W.P.A. test well	1936	19 1/2	3	0
113	2 miles south	Otto Niemann	Charlie Niemann	1913	60	4	--
114	2-1/4 miles southeast	F.B. Rooke & Sons	E. T. Ellwood	--	703	2	0
115	3 1/2 miles south	do.	do.	1931	775	2	0
116	3-1/4 miles southeast	W. R. Churchill	W. R. Churchill	1928	24	3	1.0
117	4 miles southeast	F.A. Jurica	Frank Zarsky	1920	291	3	0
118	5 miles southeast	E.E. Swift	--	--	80	4	--
119	4 1/2 miles southeast	F.J. Boehm	Frank Zarsky	1915	80	4	0.8
120	4-1/4 miles southeast	County road	W.P.A. test well	1936	11	3	0
121	do.	do.	do.	1936	22	3	0
122	3-3/4 miles south	Henry Schirmer	Henry Schirmer	1909	49	36	2.2
123	3 1/2 miles south	A. W. Buehring	Allen McKenzie	1928	162	3	0.7
d/124	4-3/4 miles southwest	F. B. Rooke & Sons	E. T. Ellwood	1930	936	2	0
125	6 miles southwest	do.	do.	1930	889	2	0
126	5 1/2 miles south	do.	do.	1930	864	2	0
127	do.	do.	do.	1930	708	2	0

a/ Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; Cf, centrifugal, C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells in Refugic County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measuring point	Date of measurement			
107	(feet) +8	e/	Flows	D,S	Flow reported as 14 gallons a minute.
108	-24	e/	C,W	D,S	
109	-25.9	Apr. 1, 1936	C,W	D	
110	-33.3	Apr. 10, 1936	C,W	S	Use rain water from cistern for drinking.
111	--	--	C,H	D,S	Sulphur taste reported.
112	16.1	Apr. 10, 1936	None	N	
113	--	--	C,W	D,S	
114	-10	e/	Flows	D,S	Flow reported as 25 gallons a minute.
115	+10	e/	do	S	Flow reported as 15 gallons a minute.
116	-15.8	Apr. 9, 1936	C,H	D,S	
117	-20	e/	C,W	D,S	Water reported as not good for irrigation.
118	--	--	C,W	D,S	
119	-18.2	Apr. 1, 1936	C,W	D,S	Several salt water sands at shallower depths.
120	-9.5	Apr. 8, 1936	None	N	
121	-19.5	do.	do.	N	
122	-34.4	April 1, 1936	C,W	D,S	Dug well with brick curbing.
123	-25.4	do.	C,H	D,S	
124	+15	e/	Flows	S	Cased with 916 feet of 2 inch pipe with 20 feet of 2 inch Stancliff screen at bottom. Reported flow of 20 gallons a minute.
125	+12	e/	do.	S	Flow reported as 20 gallons a minute.
126	+10	e/	do.	S	Flow reported as 15 gallons a minute.
127	+8	e/	do.	S	Do.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in Refugio County--Continued

No.	Distance from Woodsboro *(wells 141-148, Distance from Bayside)	Owner	Driller	Date completed.	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) a/
128	5 miles south	E.C. Yarrow	Bert Kraemer	1930	495	3	1.5
129	4-1/4 miles south	P.M. Michna	Hans Lindner	1920	33	36	0.5
130	4-3/4 miles south	C.F. Sasso	Charlie May	1908	64	4	0.2
131	do.	do.	C.F. Sasso	1914	25	48	2.5
132	5 miles south	F. B. Roche and Sons	--	--	386	4	0
133	5-1/4 miles southeast	E. F. Schlaback	Bert Kraemer	1926	172	4-1/4	0.2
134	5-3/4 miles southeast	County road	W.P.A. test well	1936	25	3	0
135	6 1/2 miles southeast	Willie Damon	Bert Kraemer	1933	180	4	1.5
136	6-3/4 miles southeast	County Road	W.P.A. test well	1936	27	3	0
137	5-3/4 miles southeast	Glenn Duel	--	1908	70	4-1/4	--
138	6 miles south	Mrs. W. Lamprecht	--	1928	37	1 1/2	--
139	7 miles southwest	F. B. Roche and Sons	John Young	1910	800±	4	0
140	7 miles south	J. R. Barry	Allon McKenzie	1929	125	6	--
*141	8 miles northwest	Henry Schirmer	Bert Kraemer	1920	424	3	0
142	7 1/2 miles northwest	Emil Niemann	Landbloom & Jurico	1920	490	3-1/4	0
143	6-3/4 miles north	Leo Vesolka	--	--	600*	2 1/2	0
144	5-3/4 miles north	Paul Dorn	Frank Zarsky	1920	445	2	0
145	6 1/2 miles northwest	P. M. Peck	--	--	430	6	0
146	6-3/4 miles northwest	Henry Schirmer	Bert Kraemer	1931	612	2	0
147	6 1/2 miles northwest	County road	W.P.A. test well	1936	34	3	0
148	5-3/4 miles northwest	A. H. Boenig	Bert Kraemer	1926	40	3	0

a/ Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

b/ T, turbine; Cf, centrifugal; C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, hand.

Records of wells in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of water c/	Remarks
	Above + below - measur- ing point	Date of measur- ment.			
128	(feet) -1	e/	C,W	D,S	Well formerly flowed.
129	-28.6	Apr.11, 1936	C,W	D,S	Dug well with brick curbing.
130	-31.1	do.	C,W	D,S	
131	-26.0	do.	H	D	Very weak supply.
132	+10	e/	Flows	S	Considerable gas, water flows in herds.
133	-22.5	Apr. 3, 1936	C,W	D	Tide reported to affect well.
134	-25	Apr.14, 1936	None	N	
135	-25	e/	C,H	D	Drilled to furnish water for drilling oil well.
136	-25	Apr.14, 1936	None	N	Water rose 2 feet in 15 minutes.
137	--	--	C,W	D	
138	--	--	C,W	D,S	
139	+20	e/	C,W	D,S	Flow reported as 15 gallons a minute.
140	--	--	C,W	D,S	
141	+12	e/	Flows	D,S	Reported flow of 5 gallons a minute.
142	+12	e/	do.	D,S	Reported flow of 2 gallons a minute.
143	+4.5	e/	do.	D,S	Reported flow of 3 gallons a minute.
144	+2	e/	C,W	D,S	Estimated flow as 2 gallons a minute. Reported salt water at 30 feet and sulphur water at 80 feet.
145	+16	e/	Flows	D,S	Some gas reported.
146	+14	e/	do.	S	Reported flow of 14 gallons a minute.
147	-27.6	Apr. 9, 1936	None	N	
148	-21.4	Apr.10, 1936	C,W	D,S	Slight sulphur odor reported.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Records of wells in R fugic County--Continued

No.	Distance from Bayside	Owner	Driller	Date completed.	Depth of well (ft.)	Diameter of well (in.)	Height of measuring point above ground (feet) ^{a/}
149	5½ miles northwest	Paul Dorn	Bert Kraemer	1935	600±	2	0
150	5-3/4 miles northwest	W. C. Pfeil	do.	1920	450	3	0
151	5 miles north	Hilmer Hultgren	do.	--	300	3	0
152	5-1/4 miles north	Conn Brown	do.	1906	729	3	0
153	4½ miles northeast	Fred Schroeder	do.	1914	337	4	--
154	3-3/4 miles northeast	County road	W.P.A. test well	1936	45	3	0
155	3½ miles northwest	E. W. Bartholomae	Bert Kraemer	--	220*	4	--
156	3-3/4 miles northwest	L. J. Pihl	Allen McKenzie	1923	600±	2	0
157	4-1/4 miles northwest	Paul Neumann	Bert Kraemer	1922	220+	3½	0.4
158	5 miles northwest	A. F. Walter	do.	1935	105	3	--
159	2-1/4 miles northwest	County road	W.P.A. test well	1936	32	3	0
160	1½ miles northeast	Bennie Earp	Bert Kraemer	1929	151	3	--
161	1/4 mile north	Town of Bayside	Charlie Walton	1911	930±	3½	0
162	3/4 miles north	L.H.Heinlein	Bert Kraemer	1926	711	2	0
163	1-1/4 miles northwest	County road	W.P.A. test well	1936	26	3	0
164	1-1/4 miles southwest	- Yarrow	Bert Kraemer	--	200	4	--
165	1/2 mile southwest	Bert Hornberg	do.	--	715	2	0

^{a/} Measuring point is the point from which water level measurement was made and was usually top of casing, top of pump base or top of water pipe clamp.

^{b/} T, turbine; Cf, centrifugal, C, cylinder; Gas, gas lift; O, diesel or semi-diesel; G, gasoline engine or tractor; W, windmill; H, H.r.d.

Records of wells in Refugio County--Continued

No.	Water Level		Pump and kind and amount of power b/	Use of Water c/	Remarks
	Above + below - measuring point	Date of measurement.			
149	(feet) +15	e/	Flows	D,S	Reported flow of 15 gallons a minute.
150	+4	e/	C,W	D,S	Reported flow of 2 gallons a minute.
151	-8	e/	C,H	D,S	
152	+6	e/	C,W	D,S	Reported flow of 1-1/4 gallons a minute.
153	--	---	C,W	D,S	
154	24.8	Apr. 21, 1936	None	N	Water rose 14 feet in 1-3/4 hours.
155	--	--	C,W	D	
156	+12	e/	Flows	Ind.	"Fiehl Gin" well.
157	-22.2	Apr. 3, 1936	C,W	D,S	
158	--	--	C,H	D,S	Salty water reported at 75 to 114 feet.
159	-30	Apr. 7, 1936	None	N	
160	--	--	C,G,1 $\frac{1}{2}$	D,S	
161	+18	e/	Flows	P,I	Flow reported as 10 gallons a minute.
162	+15	e/	do	D,S,1	Flow reported as 5 gallons a minute.
163	-23	Apr. 25, 1936	None	N	Water rose 3 feet in 1/2 hour.
164	--	--	C,W	D,S	Sulphur taste and odor.
165	+32	e/	Flows	D,S	Flow reported as 15 gallons a minute with 11 pounds pressure.

c/ I, irrigation; Ind, industrial; P, public; D, domestic; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported and no date given.

Table of Driller's Logs,

Refugio County, Texas.

Driller's log of well 21

(Town of Refugio, owner)

Thickness Depth		Thickness Depth	
(feet)	(feet)	(feet)	(feet)
Clay-----	58	Sand, hard-----	35
Sand-----	8	Shale-----	9
Shale-----	129	Sand-----	83
Sand-----	12	Shale and boulders-----	28
Shale-----	38	Sand-----	10
Sand-----	8	Rock-----	1
Rock-----	1	Sand-----	7
Sand-----	18	Rock-----	3
Shale-----	8	Sand-----	12
Sand-----	7	Rock-----	2
Shale-----	33	Shale, sticky-----	61
Sand-----	12	Sand, good-----	24
Shale-----	57	Shale-----	10
Sand-----	16	Sand, good-----	10
Shale-----	11	Rock-----	2
Sand-----	25	Shale-----	16
Shale-----	19	Sand, good-----	20
Sand-----	8	Shale-----	16
Shale-----	20	Rock sand-----	5
Sand-----	22	Shale-----	22
Shale-----	34		

CASING RECORD: 168 feet and 8 inches of 10 inch pump pit, swedged to 620 feet of 8 inch casing, set at 790 feet; 20 feet of 6 inch casing from 770 to 790, 47 feet 4 inches of 6 inch screen to 837 feet; 23 feet of 6 inch casing from 837 to 860 feet and 22 feet of 6 inch screen at 860 to 882 feet with nipple, back pressure valve and wood wash plug to 886 feet.

Table of Drillers Logs, Refugio County, Texas

Driller's log of well 94
(F.B. Rooke and Sons, owner)
Known as Woods No. 1

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Clay-----	20	20	Mud clay-----	17	354
Sand-----	10	30	Coarse sand-----	2	356
Gravel-----	10	40	Clay-----	16	372
Sand and boulders-----	45	85	Sand-----	5	377
White clay-----	35	120	Clay-----	1	378
Sand-----	6	126	Sand-----	50	408
White clay-----	24	150	Red clay-----	26	434
Sand-----	13	163	Sand-----	8	442
White clay-----	22	185	Mixed clay-----	33	475
Coarse sand-----	5	190	Red shale-----	30	505
Brown shale-----	50	240	Mixed clay-----	60	565
Sand-----	23	263	Sand-----	11	576
White clay-----	19	282	White clay-----	9	585
Lime rock-----	3	285	Sand-----	6	591
Clay-----	2	287	Clay-----	6	597
Gravel-----	6	293	Sand-----	25	622
Mud clay-----	9	302	Clay-----	6	628
Sand-----	8	310	Sand-----	5	633
Clay-----	12	322	Clay-----	10	643
Sand and boulders-----	15	337	Sand-----	39	682

Driller's log of well 98
(E.C. Thomas, owner)

Soil-----	2	2	Blue clay-----	8	292
Clay-----	10	12	Good sand-----	16	308
Sand-----	6	18	Mixed clay-----	16	324
Yellow clay-----	47	65	Fine sand-----	10	334
Good sand, boulders-----	10	75	Red clay-----	13	347
Brown clay-----	9	84	Coarse sand-----	5	353
Sand and boulders-----	4	88	Mixed clay-----	30	382
Clay-----	2	90	Coarse sand-----	4	386
Sand-----	7	97	Soft clay or mud-----	19	405
Clay-----	8	105	Broken formation-----	33	438
Good sand-----	12	117	Good sand-----	15	453
Clay-----	2	119	Clay-----	21	474
Sand and rock-----	6	125	Good sand-----	17	491
Blue clay-----	15	140	Blue clay-----	9	500
Good sand-----	17	157	Good sand-----	13	513
Brown clay-----	6	163	Red and blue clay-----	27	540
Good sand-----	12	182	Fine sand-----	4	544
Mixed shale-----	16	198	Clay-----	1	545
Sand and soft rock-----	10	208	Coarse sand-----	5	550
Mixed clay-----	52	260	Clay-----	2	552
Sand-----	17	277	Fine sand-----	5	557
Clay-----	3	280	Blue clay-----	5	562
Sand-----	4	284	Good sand-----	44	606

Table of Driller's Logs. -- Continued

Driller's log of well 100
(City of Woodsboro, owner)

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil-----	2	2	Clay-----	10	105
Clay-----	28	30	Sand (best water sand)-----	35	140
Sand and clay-----	30	60	Clay-----	12	152
Sand and boulders-----	35	95	Sand and shale-----	35	185
			Fine sand (poor water sand)-----	16	203

Driller's log of well 106
(F.B. Rooke and Sons, owner)

Soil-----	2	2	Clay-----	2	522
Yellow clay-----	13	15	Rock-----	5	527
Sand-----	7	22	Red and blue clay-----	11	538
Brown clay-----	38	60	Sand-----	12	550
Fine sand-----	12	72	Clay-----	2	552
Clay-----	3	75	Sand-----	10	562
Lime rock-----	5	80	Rock-----	2	564
Sand and lime rock-----	35	115	Sand-----	17	581
Red and white clay-----	15	130	Clay-----	7	588
Sand, strips of clay-----	38	168	Rock-----	2	590
Rock-----	1	169	Rock and sand-----	10	600
Sand-----	3	172	Clay-----	5	605
White clay-----	20	192	Sand-----	21	626
Fine sand and rocks-----	5	197	Red and blue clay-----	80	706
Red clay-----	42	239	Rock and sand-----	3	709
Rock-----	1	240	Clay-----	3	712
Good sand-----	27	267	Rock-----	1	713
Clay and strips of sand-----	58	325	Sand and rocks-----	11	724
Coarse sand-----	17	342	Clay-----	19	743
Red clay-----	61	403	Sand and boulders-----	19	762
Sand and rocks-----	10	413	Hard shale-----	8	770
Clay-----	12	425	Sand-----	4	774
Sand-----	9	434	Clay-----	4	778
Clay-----	11	445	Sand-----	5	783
Sand and boulders-----	10	455	Soft rock-----	7	790
Red and white clay-----	40	495	Hard red clay-----	32	822
Rock-----	9	504	Good sand-----	15	837
Clay-----	6	510	Flowing about 18 gallons a minute.		
Sand-----	10	520			

Driller's log of well 107
(F.B. Rooke and Sons, owner)

Soil-----	2	2	Rock-----	2	155
Joint clay-----	10	12	Brown clay-----	15	170
Sand and strips of clay-----	58	70	Boulders-----	5	175
Clay-----	5	75	Good sand-----	10	185
Good sand-----	15	90	Mixed clay-----	30	215
Clay-----	5	95	Rock-----	6	221
Sand-----	7	102	Good sand-----	30	251
Brown clay-----	13	115	Clay-----	2	253
Fine sand-----	5	120	Sand-----	8	261
Brown shale-----	14	134	Mixed shale-----	15	276
Sand-----	4	138	Good sand-----	27	303
Clay-----	2	140	Blue gumbo-----	6	309
Good sand-----	13	153			

Table of Driller's Logs.-- Continued

Driller's log of well 107. - Continued

Thickness Depth		Thickness Depth			
(feet)	(feet)	(feet)	(feet)		
Sand-----	38	347	Brown clay-----	57	538
Clay-----	3	350	Sand-----	11	549
Fine sand-----	17	367	Clay-----	1	550
Hard blue clay-----	11	378	Good sand-----	27	577
Soft rock-----	4	382	Gumbo-----	6	583
Mixed clay-----	48	430	Fine sand and rock-----	9	592
Fine sand-----	6	436	Blue clay-----	11	603
Rock-----	1	437	Fine sand broken-----	27	630
Good sand-----	13	450	Clay and rock-----	13	643
Clay-----	5	455	Sand-----	10	653
Rock-----	20	475	Red and blue clay-----	30	683
Sand-----	6	481	Sand-----	19	702

Driller's log of well 114
(F.B. Rooke and Sons, owner)

Soil-----	6	6	Gumbo-----	13	348
Joint clay-----	9	15	Sand-----	7	355
Sand-----	7	22	Gumbo-----	23	378
Joint clay-----	5	27	Soft shale-----	4	382
Tough clay-----	12	39	Sand-----	5	387
Sand-----	8	47	Gumbo-----	3	390
Mixed shale-----	25	72	Broken sand-----	30	420
Sand and rock-----	44	116	Tough clay-----	30	450
Shale-----	1	117	Sand-----	5	455
Sand-----	9	126	Brown gumbo-----	40	495
Shale-----	4	130	Soft shale-----	5	500
Rock and sand-----	9	139	Sand and strips of clay-----	45	545
Gumbo-----	16	155	Broken sand-----	61	606
Soft shale and boulders-----	12	167	Gumbo-----	24	630
Gumbo-----	19	186	Rock-----	2	632
Soft shale-----	18	204	Sand-----	1	633
Gumbo-----	32	236	Mud and sand-----	7	640
Mud-----	8	244	Gumbo-----	18	658
Mixed shale-----	6	250	Mud and strips of sand-----	8	666
Sand-----	10	260	Gumbo-----	24	690
Tough shale-----	18	278	Good sand-----	13	703
Sand broken-----	57	335	Flowing about 25 gallons a minute.		

Driller's log of well 115
(F.B. Rooke and Sons, owner)

Known as Aldrete 2

Soil-----	2	2	Clay-----	3	165
Clay-----	18	20	Sand-----	8	173
Sand-----	6	26	Brown shale-----	22	195
Brown clay-----	40	66	Hard sand-----	10	205
Sand and lime rock-----	19	85	Mixed clay-----	35	240
Clay-----	9	94	Good sand-----	16	256
Sand-----	8	102	Clay-----	1	257
Brown shale-----	6	108	Coarse sand-----	7	264
Coarse sand-----	11	119	Brown and blue clay-----	26	290

Table of Driller's Logs--Continued

Driller's log of well 115. - Continued

Thickness Depth		Thickness Depth			
(feet)	(feet)	(feet)	(Feet)		
Clay-----	11	130	Sand-----	22	312
Good sand-----	32	162	Red and blue gumbo-----	66	378
Fine sand-----	7	385	Clay-----	4	508
Mixed clay-----	25	410	Sand and gravel-----	12	520
Soft clay-----	7	417	Red clay-----	15	535
Good sand-----	10	427	Good sand-----	15	550
Clay-----	1	428	Soft clay and mud-----	20	570
Fine sand-----	2	430	Sand and gravel-----	13	583
Blue gumbo-----	28	458	Blue gumbo-----	14	597
Coarse sand-----	15	473	Coarse sand-----	6	603
Gumbo-----	7	480	Clay and soft rock-----	27	630
Good sand-----	14	494	Mixed clay and shale-----	110	740
Clay-----	2	496	Sand and gravel-----	35	775
Sand-----	8	504			

Driller's log of well 124
(F.B. Rooke and Sons, owner)
Known as Cranell 1

Soil-----	4	4	Sand and shale-----	11	393
Clay-----	11	15	Mixed shale-----	24	417
Sand-----	6	21	Good sand-----	11	428
Joint clay-----	44	65	Mixed shale-----	32	460
Lime, boulders and sand-----	25	90	Good sand-----	5	465
Good sand-----	30	120	Mixed shale-----	70	535
Gumbo-----	4	124	Hard sand-----	8	543
Good sand-----	8	132	Gumbo-----	11	554
Gumbo-----	4	136	Good sand-----	12	566
Good sand-----	8	144	Red clay-----	11	577
Clay-----	6	150	Good sand-----	11	588
Good sand-----	18	168	Mixed shale-----	12	600
Brown shale-----	22	190	Good sand, water rose to 3 feet above surface-----	35	635
Good sand-----	3	193	Brown shale-----	10	645
Brown shale-----	12	205	Mixed shale-----	30	675
Blue shale-----	38	243	Good sand-----	8	683
Good sand-----	14	257	Mixed shale-----	98	781
Blue shale-----	3	260	Coarse sand-----	4	785
Rock-----	2	262	Mixed shale-----	88	873
Good sand-----	13	275	Sand and rock-----	3	876
Blue gumbo-----	6	281	Gumbo-----	21	897
Good sand-----	8	289	Rock-----	8	905
Brown shale-----	7	296	Good sand-----	8	913
Good sand-----	22	318	Gumbo-----	6	919
Mottled sand-----	64	382	Good sand-----	17	936

Table of Driller's Logs--Continued

Driller's log of well 125
(F.B. Rooke and Sons, owner)
Known as Cranell 2

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Soil-----	2	2	Sand and clay-----	69	160
Clay-----	33	35	Brown clay-----	10	170
Brown sand-----	13	48	Rock-----	1	171
Joint clay-----	27	75	Strips of sand and rock----	26	197
Sand-----	16	91	Blue mud-----	55	252
Coarse sand-----	10	262	Clay and boulders-----	15	565
Blue clay-----	36	298	Rocks with strips of sand--	51	616
Blue sand-----	12	310	Brown and blue shale-----	17	633
Mixed clay and sand-----	20	330	Broken formation-----	17	650
Blue gumbo-----	25	355	Blue and brown shale-----	44	694
Sand-----	30	385	Sand-----	58	752
Gumbo-----	25	410	Mixed clay-----	88	840
Gravel-----	5	415	Soft clay-----	16	856
Gumbo-----	25	440	Strips of sand and clay----	19	875
Sand-----	20	460	Sand-----	14	889
Red and brown shale-----	80	540			

Driller's log of well 126
(F.B. Rooke and Sons, owner)
Known as Aldrete 3

Soil-----	2	2	Red and blue clay-----	20	496
Clay-----	12	14	Coarse sand-----	8	504
Sand-----	6	20	Soft clay-----	13	517
Brown clay-----	55	75	Sand-----	9	526
Sand and boulders-----	30	105	Blue gumbo-----	12	538
Clay-----	5	110	Coarse sand-----	7	545
Coarse sand-----	40	150	Clay-----	8	553
Blue and brown shale-----	27	177	Good sand-----	21	574
Sand and boulders, strips clay-----	19	196	Rock-----	2	576
Blue gumbo-----	29	225	Gumbo-----	4	580
Good sand-----	13	238	Good sand-----	16	596
Blue gumbo-----	12	250	Red shale-----	7	603
Lime sand-----	5	255	Fine sand and rock-----	5	608
Brown and blue shale-----	12	267	Blue gumbo-----	14	622
Good sand-----	35	302	Coarse sand-----	10	632
Rock-----	3	305	Mixed clay-----	23	655
Fine sand-----	23	328	Good sand-----	5	760
Soft clay-----	10	338	Shale-----	1	761
Coarse sand-----	10	348	Sand-----	4	765
Hard blue shale-----	12	360	Gumbo-----	7	772
Fine sand and rock-----	10	370	Sand-----	8	780
Coarse sand-----	23	393	Mixed clay-----	52	832
Mixed gumbo-----	69	462	Good sand-----	32	864
Sand and limo rock-----	14	476			

Table of Driller's Logs. -- Continued

Driller's log of well 127
 (F.B. Rooke and Sons, owner)
 Known as Aldrete 4

Thickness Depth		Thickness Depth			
	(feet)	(feet)			
Soil-----	3	3	Coarse sand-----	24	110
Clay-----	12	15	Clay-----	2	112
Sand-----	15	30	Sand-----	18	130
White clay-----	25	55	Clay and strips of sand-----	103	233
Sand-----	15	70	Good sand-----	12	245
Yellow clay-----	16	86	Blue gumbo-----	16	261
Sand-----	8	269	Clay-----	1	485
Clay-----	7	276	Sand-----	10	495
Fine sand-----	16	292	Clay-----	1	496
Clay-----	2	294	Sand-----	9	505
Coarse sand-----	11	305	Clay-----	2	507
Clay-----	2	307	Sand-----	7	514
Sand-----	11	318	Hard clay-----	10	524
Clay-----	4	322	Good sand-----	12	536
Sand-----	5	327	Blue gumbo-----	29	565
Brown and blue clay-----	42	369	Sand-----	2	567
Fine sand-----	11	380	Gumbo-----	3	570
Soft clay-----	8	388	Sand-----	7	577
Sand-----	7	395	Gumbo-----	11	588
Red and blue clay-----	35	430	Good sand-----	23	611
Sand-----	10	440	Clay-----	4	615
Blue gumbo-----	28	468	Sand and strips of clay-----	15	630
Sand and lime rocks-----	10	478	Mixed clay-----	50	680
Soft clay-----	6	484	Sand-----	28	708

Logs of test wells in Refugio County, Texas, drilled by W. P. A. labor.

Samples examined and classified by R.A. Muenster,

Project Superintendent

Well 1

Located 2 $\frac{1}{2}$ miles north of courthouse at Refugio
in northeast corner of George E. Streub property.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Black sand-----	4	4	Silty sand and caliche balls--	1 $\frac{1}{2}$	23
Yellow clay-----	2	6	Clay and caliche balls-----	1	24 $\frac{1}{2}$
White dry sand-----	1	7	Yellow clay-----	$\frac{1}{2}$	25
Fine sand-----	3	10	Yellow sand-----	1	26
Coarse damp sand-----	2	12	Yellow clay-----	21	47
Silty sand and clay-----	2	14	Gray clay and caliche balls---	3	50
White sand and clay-----	4	18	Water sand-----	1	51
Gray clay and caliche balls---	2	20	Water found at 50 feet and stood at		26.2
Yellow sand and clay-----	1	21	feet below ground level 12 days after		
Silty sand-----	$\frac{1}{2}$	21 $\frac{1}{2}$	well was completed.		

Well 3

Located 2 miles north of courthouse
and $\frac{1}{4}$ mile east of John Buckley Residence

Black sand-----	4	4	Sandy clay-----	1	44
Yellow clay-----	5	9	Silty sand-----	1	35
Gray clay-----	3	12	Sandy clay-----	1	36
Yellow clay-----	6	18	Gray clay-----	2	38
Red clay-----	7	25	Yellow clay-----	3	41
Silty sand-----	1	26 $\frac{1}{2}$	Clay and caliche-----	3	44
Sandy clay-----	$\frac{1}{2}$	27	Sandy clay-----	1	45
Silty sand-----	2	29	Sandy clay, caliche balls,		
Gray clay-----	1	30	sandstone and water-----	1	46
Silty sand-----	3	33	Water level was 36.5 feet below ground		
			level 3 days after well was completed.		

Well 7

Located 1 $\frac{1}{2}$ mile north of courthouse and
1000 feet north of Heard and Heard barn.

Gray sand-----	1	1	Coarse white sand-----	4	20
Black gumbo-----	3	4	Fine white sand-----	2	22
Gray clay-----	3	7	Clay-----	3	25
Yellow clay-----	4	11	Struck caliche and considerable		
Sand and clay (mixed)-----	5	16	rock at 25 feet. No water found.		

Well 14

Located 3/4 mile northeast of courthouse
on Lot 6, Block 7, Shelly addition.

Black gumbo-----	3	3	Soft sandstone-----	3	27
Gray clay-----	4	7	Water reached at 24 feet.		
Gray sand-----	9	16	Water level was 14.5 feet below ground		
Yellow clay-----	8	24	level 4 hours after well was completed.		

Logs of W. P. A. Test wells - continued.

Well 15

Located $\frac{1}{2}$ mile northeast of courthouse
on Lot 9, Block 105, Refugio.

Thickness (feet)	Depth (feet)	Thickness (feet)	Depth (feet)
Black gumbo-----	3	Yellow clay-----	4
Gray clay-----	2	Red clay-----	3
Yellow clay-----	4	Yellow sand-----	1
Red clay-----	2	At 19 feet hard sandstone was encountered and hole was abandoned. No water found	
	3		15
	5		18
	9		19
	11		

Well 23

Located $\frac{1}{2}$ mile east of courthouse
on west edge of Ryals Estate; 400 feet north of road.

Black sand-----	1	White calicho-----	1	15
Gray clay-----	1	Red clay-----	1	16
Dry white clay-----	4	Yellow clay-----	1	17
Yellow clay-----	1	Yellow sand-----	1	18
Calicho-----	1	Gray clay-----	1	19
Yellow clay-----	2	White sand-----	2	21
White calicho-----	2	Red sand-----	4	25
Yellow sand-----	1	Red clay-----	2	27
Yellow clay-----	1	Stopped at 27 feet. Dry hole.		
	1			
	2			
	6			
	7			
	8			
	10			
	12			
	13			
	14			

Well 24

Located 1 mile east of courthouse
on southeast corner of Ryals Estate.

Black sand-----	3	Red clay and sand-----	3	23
Gray clay and calicho-----	5	Red clay and calicho-----	1	24
Calicho-----	3	Calicho-----	3	27
Yellow clay-----	9	Dry hole--stopped drilling at 27 foot.		
	3			
	8			
	11			
	20			

Well 25

Located 2 $\frac{3}{4}$ miles east of courthouse
on Austwell road, $\frac{1}{2}$ mile west of O'Connor Ranch house

Black gumbo-----	2	Fine golden sand-----	$\frac{1}{2}$	20
Gray clay-----	2	Yellow clay-----	6	26
Clay and caliche-----	$4\frac{1}{2}$	Gray clay-----	8	34
Sandy clay-----	$4\frac{1}{2}$	Hit water sand and water at 34 feet		
Fine white sand-----	$6\frac{1}{2}$			
	2			
	4			
	$8\frac{1}{2}$			
	13			
	$19\frac{1}{2}$			

Well 26

Located 4 miles east of courthouse
on south side of Austwell road.

Black gumbo-----	4	Yellow clay-----	$1\frac{1}{2}$	$32\frac{1}{2}$
Gray clay-----	6	Gray clay-----	$4\frac{1}{2}$	37
Yellow clay-----	$4\frac{1}{2}$	Red clay-----	$2\frac{1}{2}$	$39\frac{1}{2}$
Gray clay-----	$4\frac{1}{2}$	Hit gray clay, silty sand and water at 39 $\frac{1}{2}$ foot.		
Silty sand-----	12			
	4			
	10			
	$14\frac{1}{2}$			
	19			
	31			

Well 27

Located 5 miles east of courthouse
on Austwell road.

Black gumbo-----	$5\frac{1}{2}$	Gray clay-----	$2\frac{1}{2}$	$13\frac{1}{2}$
Yellow clay-----	$5\frac{1}{2}$	Silty sand-----	$6\frac{1}{2}$	20
	$5\frac{1}{2}$	No water found as hole was not finished.		
	11			

Logs of W. P. A. Test wells - continued.

Well 28

Located 6 miles east of courthouse
on Austwell Road

Thickness (feet)		Depth (feet)	Thickness (feet)		Depth (feet)
Black gumbo-----	3	3	Caliche stone-----	1	28
Gray clay-----	1	4	Silty sand-----	1 $\frac{1}{2}$	29 $\frac{1}{2}$
Silty sand-----	6	10	Gray clay-----	3 $\frac{1}{2}$	33
Silty clay-----	17	27	Well was not completed.		

Well 45

Located on Boeville Highway 6 $\frac{1}{2}$ miles
northwest of courthouse

Black sand-----	1	1	Sand and clay-----	5 $\frac{1}{2}$	34 $\frac{1}{2}$
Dark clay-----	2	3	Clay and caliche-----	1 $\frac{1}{2}$	36
Yellow clay-----	1	4	Fine white sand-----	2	38
Clay and caliche-----	3	7	Coarse silty sand-----	4	42
Silty sand-----	16	23	Clay and silty sand-----	4	46
Gray clay-----	4	27	White water sand-----	2	48
Hard silty sand-----	2	29	Water found at 46 feet and rose 4 feet in 30 minutes.		

Well 49

Located 6 miles northwest of courthouse
and 100 feet north of well 48

Gray sand-----	1	1	Gray clay-----	1	20
Yellow clay-----	4	5	White hard caliche-----	1 $\frac{1}{2}$	21 $\frac{1}{2}$
Clay and caliche-----	1	6	Fine silty sand-----	9 $\frac{1}{2}$	31
Silty sand-----	2	8	Hard silty sand-----	1 $\frac{1}{2}$	32 $\frac{1}{2}$
Silty sand and caliche-----	2	10	Sandstone-----	1 $\frac{1}{2}$	34
Red silty sand-----	3	13	White sand-----	5	39
Red sand and clay-----	1	14	Sand and caliche-----	4	43
White silty sand-----	1	15	Hard sandstone was found at 43 feet.		
Silty sand and clay-----	2	17	No water found		
Clay and caliche-----	2	19			

Well 51

Located 5 $\frac{3}{4}$ miles northwest of courthouse
on Beaville road.

Black sand-----	1	1	Caliche and sand-----	2	17
Red clay and mixed sand-----	4	5	Gray clay-----	1 $\frac{1}{2}$	18 $\frac{1}{2}$
Yellow sand-----	2	7	Hard caliche-----	2 $\frac{1}{2}$	21
Pure white caliche-----	5	12	Gray sand and clay-----	1	22
Caliche and sand-----	1 $\frac{1}{2}$	13 $\frac{1}{2}$	Hard caliche stone-----	2 $\frac{1}{2}$	24 $\frac{1}{2}$
Gray clay-----	1 $\frac{1}{2}$	15	Hit rock and hole was abandoned.		

Well 56

Located 2 $\frac{3}{4}$ miles northwest of courthouse

Black gumbo-----	2 $\frac{1}{2}$	2 $\frac{1}{2}$	Silty sand-----	2 $\frac{1}{2}$	34 $\frac{1}{2}$
Gray clay-----	3 $\frac{1}{2}$	6	Silty sand and caliche-----	2 $\frac{3}{4}$	37
Sandy clay-----	2	8	Hard silty sand-----	3 $\frac{1}{2}$	37 $\frac{1}{2}$
Clay and caliche-----	1 $\frac{1}{2}$	8 $\frac{1}{2}$	Yellow clay-----	1 $\frac{1}{2}$	39
Gray clay-----	1 $\frac{1}{2}$	10	Clay and sand-----	0	48
Yellow clay-----	15	25	Water sand at 48 feet.		
Sandy clay-----	2	27	Water rose 4 feet in one hour and stood 43.1 feet below ground level 3 days after well was completed.		
Sandy caliche-----	1	28			
Sandy clay-----	4	32			

Logs of W. P. A. Test wells - continued

Well 58

Located 2 3/4 miles northwest of courthouse on Beville road.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Black sand-----	3	3	Fine silty sand-----	5	33 1/2
Gray sand-----	9 1/2	12 1/2	Sandy clay-----	5	38 1/2
Silty sand-----	3 3/4	16	Silty sand-----	5	43 3/4
Caliche-----	1	17	Sandstone-----	1 1/2	44
Yellow clay-----	4 1/2	21 1/2	White water sand-----	2	46
Gray clay-----	1	22 1/2	Hard silty sand-----	3	49
Sandstone-----	1 1/2	23	Sandstone-----	1 1/2	49 1/2
Gray clay-----	2 1/2	25 1/2	White water sand-----	1 1/2	50
Silty coarse sand-----	2	27 1/2	Water stood at 48.7 feet below ground		
Yellow sand-----	1	28 1/2	level 30 hours after well was completed.		

Well 60

Located 3 1/4 miles northwest of courthouse on Beville road.

Gray sand-----	1	1	Gray clay-----	2	24 1/2
Yellow clay-----	2	3	Yellow clay-----	1	25
Gray sand-----	1/2	3 1/2	Clay and caliche-----	2	27
Silty sand and clay-----	5	8 1/2	Water sand-----	4 1/2	31 1/2
Yellow clay and caliche-----	2	10 1/2	Sandy clay-----	2 1/2	34
Gray clay and caliche-----	1	11 1/2	Silty sand-----	2	36
Red clay-----	3 1/2	15	Hard sandstone-----	1	37
Gray clay-----	2 1/2	17 1/2	Hard sandstone-----	1	38
Yellow clay-----	2	19 1/2	Hard silty sand-----	8	46
Clay and sand-----	3	22 1/2	Hit hard white rock and abandoned hole. No water found.		

Well 61

Located 3 3/4 miles northwest of courthouse on Beville road

Black sand-----	1	1	Clay and caliche-----	5	26
Yellow clay-----	2 1/2	3 1/2	Sandy clay-----	10	36
Gray clay-----	3	6 1/2	Hard sandstone-----	3 1/2	39 1/2
Clay and caliche-----	1 1/2	8	Silty sand and caliche-----	1 1/2	40
Gray clay-----	5	13	White hard rock-----	1 1/2	40 1/2
Yellow clay-----	6	19	Silty sand and clay-----	1 1/2	41
Sandy clay-----	2	21	Silty sand and caliche. No water found.		

Well 62

Located 4 1/4 miles northwest of courthouse on Beville road.

Black sand-----	4	4	Silty sand-----	3	16
Sandy clay-----	5 1/2	9 1/2	Yellow sand-----	15	31
Coarse silty sand-----	1	10 1/2	White water sand-----	4	35
Gray clay-----	2 1/2	13	Struck wet saving quick-sand at 31 feet and stopped drilling at 35 feet.		

Well 63

Located 5 miles northwest of courthouse on Beville road.

Black sand-----	2	2	Clay and caliche-----	1 1/2	20 1/2
Yellow clay-----	3	5	Silty sand-----	4 1/2	25
White caliche-----	1	6	Fine white sand-----	1 1/2	26 1/2
Silty sand-----	2	8	Fine yellow sand-----	1	27 1/2
White caliche-----	4	12	Silty sand and clay-----	1 1/2	29
Clay and caliche-----	1 1/2	12 1/2	Fine white water sand-----	3	32
Yellow clay-----	2 1/2	15	Found water at 31 feet.		
Red clay-----	5	20			

Logs of W. P. A. Test wells - continued.

Well 71

Located 1 3/4 miles northwest of courthouse on Boeville road.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Black sand-----	3	3	Sandy clay-----	1 1/2	25 1/2
Gray sand-----	5	8	Silty sand-----	1 1/2	26
Gray clay and caliche-----	3	11	Sandy clay-----	1	27
Yellow clay-----	2	13	Yellow clay-----	3	30
Clay and caliche-----	1	14	Gray clay and caliche-----	3	33
Yellow clay-----	5	17	Red clay-----	4	37
Red clay-----	3	20	Sandy clay and caliche-----	5 1/2	42 1/2
Red clay and caliche-----	1	21	Found water at 42 1/2 feet and water		
Red sand-----	3	24	stood at 38.6 feet below ground level		
Red clay-----	1	25	3 days after well was completed.		

Well 73

Located 2 1/4 miles northwest of courthouse on Boeville road.

Black sand-----	2	2	Silty sand-----	2	10
Gray clay-----	3	5	Clay and caliche-----	1	11
Caliche-----	3	8	Struck hard sandstone and abandoned the hole.		

Well 75

Located in northwest part of Refuge.

Black sand-----	2	2	Caliche-----	3	11
White joint clay and caliche-----	4	6	Yellow sand (water at 20		
Yellow sand-----	2	8	foot)-----	10	21

Well 79

Located 3/4 mile northwest of courthouse and 200 yards west of Calvary Cemetery.

Yellow sand-----	7	7	Caliche and silty sand-----	4	21
Gray clay-----	4	11	White water sand-----	1 1/2	21 1/2
Silty sand-----	5	16	Water rose within 19.9 feet of ground		
Water sand-----	1	17	surface in 15 minutes.		

Well 85

Located 1 1/2 miles southwest of courthouse on State Highway 128.

Black gumbo-----	2	2	Silty sand-----	16	23
Gray clay-----	5	7	Hole filled with rain water and was not completed.		

Well 86

Located 1 mile southwest of courthouse on State Highway 128.

Silty sand-----	6 1/2	6 1/2	White water sand-----	3	27
Silty clay-----	3 1/2	10	Struck water at 27 feet, but could not obtain sample - on account of		
Silty sand and clay-----	14	24	"heaving" hole.		

Well 89

Located 2 1/2 miles southwest of courthouse on State Highway 128.

Yellow clay-----	4	4	White sand-----	3	28
Silty sand (white)-----	20	24	Struck water at 28 feet but could not obtain water sample because of		
White flinty hard rock-----	1	25	caving hole.		

Logs of W. P. A. Test wells - continued

Well 112

Located 2 miles southeast of Woodsboro
125 yards north of Willow or Seuz creek.

	Thickness (foot)	Depth (foot)		Thickness (foot)	Depth (foot)
Yellow sand-----	1	1	Gray clay-----	5	15
Gray clay-----	3	4	Silty sand and clay-----	4	19
Caliche clay-----	4	8	White water sand-----	$\frac{1}{2}$	$19\frac{1}{2}$
Yellow clay-----	2	10	Hit rock at $19\frac{1}{2}$ feet. Water stood 16.1 feet below ground surface 15 minutes after well was completed.		

Well 120

Located $4\frac{1}{2}$ miles southeast of Woodsboro on Bayside road.

Gray clay-----	1	1	Silty sand-----	$4\frac{1}{2}$	$9\frac{1}{2}$
Caliche clay-----	4	5	Water sand-----	$1\frac{1}{2}$	11
			Hit water at $9\frac{1}{2}$ feet.		

Well 121

Located $4\frac{1}{2}$ miles southeast of Woodsboro on Bayside road.

Gray clay and sand-----	8	8	Water sand-----	1	22
Silty sand-----	13	21	Water found at 21 feet and rose to $19\frac{1}{2}$ feet.		

Well 134

Located $5\frac{3}{4}$ miles southeast of Woodsboro
and 1 mile east of Bonnie View School.

Black gumbo-----	4	4	Clay and caliche-----	$5\frac{1}{2}$	14
Yellow clay (with some mica)-	$2\frac{1}{2}$	$6\frac{1}{2}$	Silty sand and clay-----	2	16
Silty sand-----	1	$7\frac{1}{2}$	Silty sand-----	9	25
Yellow clay-----	1	$8\frac{1}{2}$	Found white water sand and water at 25 feet.		

Well 136

Located $6\frac{3}{4}$ miles southeast of Woodsboro
and $1\frac{1}{2}$ miles southeast of Bonnie View School.

Black gumbo-----	6	6	White water sand-----	4	22
Silty sand-----	2	8	Hard silty sand-----	3	25
Gray clay-----	5	13	White water sand-----	2	27
Silty sand and clay-----	5	18	Water rose 24 inches in 15 minutes.		

Well 147

Located 6 miles southeast of Woodsboro on Bayside road.

Black gumbo-----	5	5	Gray clay-----	11	33
Gray clay-----	2	7	Silty sand-----	1	34
Yellow clay-----	7	14	White water sand at 34 feet.		
Silty sand-----	7	21	Water stood at 27.6 feet below ground surface 3 days after well was complet- ed.		
Yellow sand-----	1	22			

Well 154

Located $3\frac{3}{4}$ miles northeast of Bayside
and $1\frac{1}{2}$ miles east of Richardson School.

Black gumbo-----	2	2	Red clay-----	$10\frac{1}{2}$	$41\frac{1}{2}$
Gray clay-----	5	7	Gray sandy clay-----	$3\frac{1}{2}$	45
Silty sand-----	8	15	Water was found at 45 feet and rose 14 feet in $1\frac{3}{4}$ hours. Water stood 24.8 feet 19 hours after well was completed.		
Yellow clay-----	10	25			
Caliche and silty sand-----	$1\frac{1}{2}$	$26\frac{1}{2}$			
Yellow clay-----	$4\frac{1}{2}$	31			

Logs of W. F. A. Test wells - continued

Well 159

Located $2\frac{1}{4}$ miles northwest of Bayside.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Black gumbo-----	$7\frac{1}{2}$	$7\frac{1}{2}$	Silty sand-----	6	23
Caliche and clay-----	$2\frac{1}{2}$	10	Fine water sand-----	$1\frac{1}{2}$	$24\frac{1}{2}$
Yellow silty clay-----	3	13	Caliche and clay-----	$5\frac{1}{2}$	30
Silty sand-----	3	16	Clay and sand-----	2	32
Clayey gravel-----	1	17	Water found at 30 feet.		

Well 163

Located $1\frac{1}{2}$ miles northwest of Bayside

Black gumbo-----	7	7	Silty sand-----	1	17
Gray clay-----	3	10	Gray silty clay-----	6	23
Yellow clay-----	3	13	Gray clay-----	2	25
Yellow sand-----	1	14	Water sand-----	1	26
Gray clay-----	2	16	Found salt water at 26 feet and water rose 37 inches in 30 minutes.		

Partial analyses of water from wells in Refugio County, Texas.

(Analyzed at the State University under the direction of Dr. E. P. Schoch, Director of the Bureau of Industrial Chemistry, by J. E. Stullken, C. R. Stewart, and D. F. Riddell, Chemists, and J. A. Harmaza, Roy Brown and Jack Ramsey, Assistant Chemists. Results are in parts per million. Well numbers corresponds to numbers in table of well records)

Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
1	Geo. E. Strauch	51	Feb.11,1936	3,250	108	74	1,009	146	406	1,580	574
2	Mrs.Frank Munsch	72	March 9,1936	956	14	26	325	525	121	208	143
3	John Buckley	46	Feb.17, 1936	3,001	49	55	1,010	476	469	1,180	347
4	E.W. Johnson	39	Feb.27, 1936	1,560	84	59	425	391	187	610	451
6	J.T. Vance	500	Jan.14, 1936	784	36	-	347	58	87	285	90
8	Heard & Heard	700	Jan.13, 1936	-	-	-	-	296	76	290	a/50
9	Clyde Low	368	.do.	936	28	3	340	408	76	285	84
10	Antonio Reyna	75	do.	-	-	-	-	445	115	280	a/129
11	John Kay Estate	884	do.	-	-	-	-	348	40	320	a/ 63
12	Ramon Trevino	62	Jan. 9, 1936	-	-	-	-	434	83	310	a/312
13	Mrs.Benito Cavasas	43	-	-	-	-	-	493	216	662	a/285
16	Ramon Trevino	50	Jan. 8, 1936	-	-	-	-	496	131	372	a/185

a/Determined by soap method.

Partial analyses of water from wells in Refugio County, Texas.

-2-

Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
17	F.C. Bailey	820	Jan.25,1936	1,010	24	-	382	432	63	325	60
18	Geo. Strauch	940	Jan.24,1936	964	16	2	370	432	45	315	45
19	do.	792	Mar.9, 1936	975	24	6	358	452	51	310	82
20	Lawrence O'Conner	850	do.	1,328	19	9	476	464	277	315	81
21	Town of Refugio	120	Jan.6, 1936	-	-	-	-	337	50	355	a/71
22	Mercy Academy	600	Jan.15,1936	1,118	28	-	420	426	117	350	70
26	County Road	40	Apr.4, 1936	4,431	195	174	1,615	183	446	2,910	1,202
29	Mrs.M. Sullivan	44	Mar.17,1936	1,085	16	37	347	268	136	415	195
30	Mrs.E.D. Clarkson	51	do.	1,272	41	50	370	232	160	535	306
32	Fox Heirs	70	Mar.20,1936	1,006	12	37	317	220	145	385	183
33	J.C. West	72	Mar.17,1936	898	24	40	266	256	75	365	225
34	do.	76	Mar.20,1936	988	21	30	311	232	160	350	174
35	Tom Lambert	63	do.	1,116	71	30	314	427	148	340	299
36	Earl Jackson	51	do.	233	46	13	25	146	b/	76	170
37	Mrs.P.R.Dorsey	49	do.	973	38	25	312	378	219	240	198

a/Determined by soap method.

b/ Sulphate less than 5 parts per million.

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Partial analyses of water from wells in Refugio County, Texas.

-3-

Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
38	Miss Anne Williams	140	Mar.14,1936	922	21	30	284	266	103	330	174
39	do.	850	do.	654	9	20	222	390	63	145	107
40	J.C. West	108	do.	1,336	28	37	426	397	237	410	223
41	J.L. Williams	95	do.	1,695	61	55	498	232	245	720	377
42	J.M. McGrew	105	Mar.13,1936	1,036	8	33	342	317	130	365	152
43	Lewis Powers	44	do.	787	73	32	174	330	28	315	314
44	C.E. Brandon	56	Mar.12,1936	870	36	35	248	226	83	355	234
45	County road	48	Mar.26,1936	942	49	44	240	122	63	485	305
46	C.J. Birmingham	58	Mar.10,1936	966	66	42	235	122	117	445	338
47	Raymond Rischer	850	do.	773	12	10	279	390	87	190	72
48	Milton Williams	54	Mar.12,1936	1212	175	76	178	464	51	500	751
50	Levi Williams	58	Mar. 2, 1936	694	24	37	195	305	32	254	215
52	J.N. Mitchell	196		646	21	28	190	305	62	190	169
53	do.	43	Mar.10,1936	858	58	57	189	159	20	455	379
54	do.	187	Mar.12,1936	1,145	25	32	374	281	89	485	194
55	Tom Heard	58	Mar.17,1936	2,597	18	99	823	195	320	1240	452

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Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
56	County road	48	Feb.20,1936	1,966	36	20	685	207	242	880	172
57	Ira Heard	134	Feb.21,1936	1,283	17	32	437	342	106	520	174
59	Joe Shay	60	Feb.26,1936	2,087	81	94	272	195	348	1,195	590
63	County road	32	Mar.19,1936	870	29	47	234	305	133	275	266
64	Leslie Grant	69	Mar.23,1936	633	44	25	166	293	57	195	213
65	Jim West	55	do.	442	65	39	47	146	b/	218	325
66	W.A. Myers	67	do.	415	24	27	101	183	b/	172	173
67	J.S. Kelly	98	do.	535	42	25	132	293	34	156	208
68	C.P. Jones	600	do.	801	4	8	305	415	69	208	41
69	Pat Lambert	60	Feb.17,1936	3,238	142	117	915	171	289	1,690	837
70	United Gas Co.	680	Jan.31,1936	814	4	16	298	192	-	400	76
71	County road	43	Feb.20,1936	3,461	68	91	1,113	244	387	1,680	546
72	J.T. Vance	105	Mar.9, 1936	1,807	32	61	563	305	266	730	332
74	John Buckley	412	Jan.31,1936	849	24	6	305	372	68	260	86
76	Ed Simpson	940	Jan.13,1936	879	24	1	294	372	84	290	165
77	Mrs.Robt. Rigby	35	Jan.24,1936	2,475	32	55	865	606	96	1,120	305
78	Miss Emma Huddleston	46	do.	1,161	28	14	414	600	115	290	126

b/ Sulphate less than 5 parts per million.

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Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
79	County road	22	Apr. 23, 1936	952	36	20	317	560	54	245	172
80	F.B. Rooke Estate	200+	Mar. 24, 1936	921	6	5	358	464	45	275	36
81	do.	84+	do.	894	8	-	351	415	53	275	20
83	do.	640	do.	979	2	3	397	524	b/	315	15
84	do.	900	do.	873	4	3	340	427	49	254	20
87	L.R. Jeter	870	Jan. 10, 1936	-	-	-	-	371	2	350	a/29
88	do.	200+	do.	-	-	-	-	485	115	362.	a/146
90	E.B. Rooke Estate	900	Mar. 26, 1936	985	-	3	400	524	b/	320	11
91	F.B. Rooke & Sons	398	do.	873	4	-	347	402	51	270	10
92	do.	920	Mar. 25, 1936	1,280	2	3	514	512	b/	505	15
93	do.	715	Mar. 26, 1936	773	8	5	291	366	78	208	41
94	do.	682	do.	870	24	5	309	402	117	214	81
95	Frank Huser	71	Apr. 10, 1936	2,708	114	64	830	464	258	1,210	548
96	Allen McKenzie	101	Mar. 25, 1936	867	17	25	288	319	93	285	143
97	Tom Hargrove	137	do.	810	20	12	284	378	53	252	102
98	E.C. Thomas	606	Mar. 31, 1936	1,068	8	3	418	451	34	380	30

a/ Determined by soap method.

b/ Sulphate less than 5 parts per million.

Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
99	Charles Zarsky	80	Mar. 25, 1936	977	89	32	538	305	91	375	355
101	A.D. Rooke	642	Mar. 26, 1936	1,352	4	-	538	378	51	580	10
102	F.B. Rooke & Sons	678	do.	913	3	-	359	415	49	290	20
103	do.	600 $\frac{1}{2}$	do.	1,000	6	3	393	403	47	350	25
104	do.	218	do.	1,078	61	32	315	439	71	380	204
105	do.	217	do.	806	20	5	295	439	65	202	71
106	do.	837	do.	1,067	4	3	418	408	63	375	20
107	do.	702	do.	1,618	12	3	634	438	b/	750	40
108	do.	54	do.	2,319	116	108	717	268	274	1,270	734
109	H.J. Brymer	67	Apr. 1, 1936	1,377	25	37	427	329	209	495	215
110	H.A. Boenig	55	Apr. 10, 1936	2,509	92	96	728	305	211	1,230	622
111	-- Oppenheimer	175	do.	1,187	12	15	445	464	b/	482	92
112	County road	19 $\frac{1}{2}$	do.	11,336	982	568	2,470	342	535	6,650	4,788
113	Otto Niemann	60	Apr. 1, 1936	1,671	5	42	580	281	154	750	185
114	F.B. Rooke & Sons	703	Mar. 31, 1936	1,067	4	5	421	415	b/	430	31
115	do.	775	do.	2,534	24	5	982	366	b/	1,340	81

b/ Sulphate less than 5 parts per million.

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Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
116	W.R. Churchill	24	Apr. 9, 1936	1,571	31	32	514	370	106	645	209
117	F.A. Jurica	291	do.	1,011	-	5	04	464	b/	370	21
118	E.E. Swift	80	do.	1,438	17	22	532	427	74	610	133
119	F.J. Boehm	00	Apr. 1, 1936	3,032	71	83	960	207	395	1,420	520
120	County road	11	Apr. 8, 1936	1,372	3	27	677	97	187	430	119
121	do.	22	do.	1,322	65	37	376	366	266	395	315
122	Henry Schizer	49	Apr. 1, 1936	759	17	32	233	329	79	234	175
123	A.W. Buehring	162	do.	1,311	21	25	453	268	103	575	153
125	F.B. Rooke & Sons	889	Mar. 31, 1936	2,521	19	8	930	378	b/	1,275	81
126	do.	864	do.	3,590	40	5	1,370	330	b/	2,010	121
127	do.	708	do.	1,228	8	3	720	415	b/	890	30
128	E.C. Varrow	495	Apr. 11, 1936	1,077	-	-	430	403	66	380	-
129	P.M. Michna	33	do.	1,535	90	98	333	330	309	540	627
130	C.F. Sasse	64	do.	3,582	158	166	944	232	418	1,700	1,079
131	do.	25	do.	966	144	17	197	232	62	430	432
132	F.B. Rooke & Sons	886	do.	1,799	4	5	712	586	b/	780	30

b/ Sulphate less than 5 parts per million.

Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
133	E.F. Schlaback	172	Apr. 13, 1936	1,206	18	12	446	439	14	495	97
134	County road	25	Apr. 14, 1936	10,649	1,266	660	1,800	220	773	11,900	5,882
135	Willie Damon	100	Apr. 3, 1936	1,210	9	14	454	370	21	520	92
136	County road	27	Apr. 14, 1936	19,026	2,356	725	3,730	195	668	11,450	8,670
137	Glenn Duel	70	Apr. 3, 1936	1,623	33	30	558	370	103	710	204
138	Mrs. J. Lamprecht	37	Apr. 11, 1936	1,364	26	46	447	317	137	550	206
139	F.B. Rooke & Sons	800 †	Mar. 31, 1936	1,368	6	-	540	403	35	585	15
140	J.R. Barry	125	Apr. 11, 1936	2,131	50	61	675	212	219	1,020	378
141	Henry Schirmer	424	Apr. 9, 1936	1,113	2	5	437	427	66	395	26
142	Emil Niemann	490	do.	1,001	-	3	405	476	b/	355	11
143	Leo Veselka	600 †	Apr. 15, 1936	1,330	-	3	530	439	63	515	11
144	Paul Dorn	445	do.	1,270	4	3	499	452	85	455	20
145	P.M. Peck	430	Apr. 9, 1936	1,234	6	5	408	500	b/	365	36
146	Henry Schirmer	612	do.	1,775	4	3	626	464	b/	710	19
147	County road	34	do.	14,590	718	457	4,320	560	415	8,500	3,677
148	A.H. Boenig	40	Apr. 10, 1936	1,168	8	8	453	438	b/	480	51

b/ Sulphate less than 5 parts per million.

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Partial analyses of water from wells in Refugio County, Texas.

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Well No.	Owner	Depth of well (feet)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Total hardness as Ca CO ₃ (calculated)
149	Paul Dorn	600†	Apr. 10, 1936	1,307	-	-	510	415	145	445	-
150	W.C. Pfeil	450	do.	1,079	6	3	480	500	b/	300	25
151	Hilmer Hultgren	300	Apr. 15, 1936	1,237	4	3	493	464	b/	505	20
152	Conn Brown	729	Apr. 20, 1936	1,411	-	0	520	450	75	583	31
153	Fred Schroeder	337	do.	1,366	6	12	584	415	b/	615	72
154	County road	45	Apr. 24, 1936	12,439	1,533	920	4,140	363	533	11,200	7,614
155	E.W. Bartholomew	220	Apr. 3, 1936	1,670	18	17	518	293	31	540	117
156	L.J. Piehl	800†	do.	1,360	2	3	542	427	b/	600	16
157	Paul Neuman	220†	do.	1,317	20	17	480	366	67	550	122
158	A.F. Walter	105±	do.	1,122	8	17	422	452	b/	455	92
159	County road	32	Apr. 7, 1936	10,823	1,214	443	2,200	85	504	6,420	4,855
160	Benny Earp	151	Apr. 25, 1936	2,871	39	27	1,058	451	1,112	1,510	208
161	Town of Bayside	930±	do.	1,550	4	3	652	288	37	710	20
162	L.H. Heinlein	711	do.	1,603	6	3	634	476	12	710	25
163	County road	26	Apr. 30, 1936	27,880	1,888	795	9,050	415	341	15,600	8,000
164	— Yarrow	200	Apr. 25, 1936	2,690	53	29	960	415	81	1,360	254
165	Bert Hornberg	715	do.	1,707	-	5	678	500	24	750	21

b/ Sulphate less than 5 parts per million.

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Records of wells and springs in Refugio County, Texas

(Topographic situation is usually flat or slightly rolling.)

(See "Logs of W. P. A. test wells" for all records of test wells.)

No.	Distance from Refugio	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
/201	16½ miles north	Ed. Dickinson	James Waelder	—	—	75	6
202	15½ miles northeast	Jas. Power & Jas. Hewitson	do.	—	—	70	6
203	do.	do.	do.	—	—	70	6
d/204	16 miles northeast	Juan & Juan Jose Garza & Jose Vidaurri	J. F. Power	—	—	75	4
d/205	do.	do.	do.	—	—	75	6
d/206	16½ miles northeast	Jas. Power & Jas. Hewitson	Mrs. T. C. Lambert	—	—	60	4
208	18½ miles northeast	John Keating	D. M. O'Connor Est.	—	—	865	6
210	17 miles northeast	Jas. Power & Jas. Hewitson	do.	—	—	860	6
d/211	do.	do.	do.	—	—	75	8
214	14½ miles northeast	Juan & Juan Jose Garza & Jose Vidaurri	James Power	—	—	60	6
215	14 miles northeast	do.	do.	—	—	70	6
216	14½ miles northeast	do.	J. F. Power	—	—	60	4
217	13½ miles northeast	do.	do.	—	—	70	6
218	14 miles northeast	Jas. Power & Jas. Hewitson	do.	—	—	60	6
219	do.	do.	James Waelder	—	—	870	4
220	13 miles northeast	Jose Manuel Blanco	do.	—	—	75	4
221	13½ miles north	J. M. Smith	do.	—	—	75	6
222	do.	do.	do.	—	—	860	6
223	12½ miles north	J. Blanton	do.	—	—	75	10
224	do.	A. Jackson	do.	—	—	70	4
225	12 miles north	J. Farley	do.	—	—	850	6
226	11½ miles north	M. Smith	do.	—	—	60	4
227	11 miles north	C. E. P. I & M. Co.	— West Est.	—	—	50	4
d/228	10½ miles north	F. Brichta	J. J. O'Brien	—	—	—	4

a/ Measuring point was usually top of casing, top of pump base, or top of well curb.

b/ C, cylinder; E, electric; G, gasoline engine; H, hand; S, steam; W, windmill; number indicates horsepower.

Records obtained by Emil J. Michal, Project Superintendent

(All wells are bored or drilled unless otherwise indicated in "Remarks" column.)

(Chemical analyses of water from these wells and springs are in the table of analyses.)

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
201	0.3	25.3	Mar. 17, 1937	C,W	S	60-75	
202	0	25	e/	C,W	S	—	
203	1.4	26.9	Mar. 16, 1937	C,W	D,S	60-70	
204	1.6	37.4	Mar. 15, 1937	C,W	S	65-75	
205	0.9	37.6	do.	C,W	S	65-75	Measured drawdown, 0.6 foot after pumping $3\frac{1}{2}$ gallons a minute for $\frac{1}{4}$ hour.
206	—	36	e/	C,W	S	58-60	
208	—	Flows	Mar. 13, 1937	None	S	840-865	Estimated flow, 25 gallons a minute. Located $\frac{1}{2}$ mile east of Inari.
210	—	Flows	do.	None	S	—	Estimated flow, 18 gallons a minute.
211	1.5	35.3	do.	None	N	—	
214	0.3	31.5	do.	C,W	S	55-60	Water level measured while pumping.
215	—	28	e/	C,W	S	60-70	
216	1.7	31.1	Mar. 15, 1937	C,W	S	55-60	Measured drawdown, 0.1 foot after pumping $2\frac{1}{2}$ gallons a minute for $\frac{1}{4}$ hour.
217	—	27.2	e/	C,W	S	60-70	Measured drawdown, 2.1 feet after pumping 3 gallons a minute for 1 hour.
218	—	25	e/	C,W	S	60	Located on fence line. 10 minutes.
219	—	Flows	Mar. 17, 1937	None	S	—	Measured flow, 5 gallons a minute. Temperature, 87° F.
220	1.3	29.3	do.	C,W	S	60-75	
221	1.3	20.3	do.	C,W	S	60-75	
222	—	Flows	do.	C,W	S	—	Measured flow, 15 gallons a minute. Temperature, 83 $\frac{1}{2}$ ° F.
223	1.1	29.9	do.	C,W	D,S	60-75	
224	0.9	12.9	do.	C,W	S	60-70	Water level measured after pumping $2\frac{1}{2}$ gallons a minute for 2 hours.
225	—	Flows	do.	None	S	—	Measured flow, 10 gallons a minute. Temperature, 78 $\frac{1}{2}$ ° F.
226	2.7	26.7	do.	C,W	S	—	Measured drawdown, 1.1 feet after pumping 3 gallons a minute for 10 minutes.
227	0	21.5	Mar. 18, 1937	C,W	S	—	Water level measured after pumping $\frac{1}{2}$ gallon a minute for $2\frac{1}{2}$ hours.
228	0.9	20.6	Mar. 1, 1937	None	N	—	Oil test. Odor of gas reported.

c/ A, air-lift; D, domestic; Ind, industrial; Of, oil field; P, public; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported.

Records of wells and springs in Refugio County—Continued

No.	Distance from Refugio	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
229	11½ miles north	F. Brichta	J. J. O'Brien	—	—	800	6
230	10½ miles north	P. Wilson	do.	—	—	75	6
d/231	12 miles northeast	Jas. Power & Jas. Hewitson	James Waelder	—	—	—	4
232	do.	do.	do.	—	—	860	4
233	11 miles northeast	Jas. T. McGrew	do.	—	—	860	3
d/234	11½ miles northeast	do.	do.	—	—	70	6
235	do.	do.	do.	—	—	65	4
236	do.	do.	do.	—	—	940	6
237	12½ miles northeast	Juan & Juan Jose Garza & Jose Vidaurri	J. F. Power	—	—	60	8
238	do.	do.	do.	—	—	75	6
d/239	do.	do.	do.	—	—	75	4
240	do.	do.	James Power	—	—	60	6
242	12 miles northeast	do.	Power & Waelder	—	—	60	4
243	do.	Jas. T. McGrew	James Waelder	—	—	60	6
244	11½ miles northeast	do.	do.	—	—	65	6
d/247	8 miles northeast	N. S. Crunk	J. M. O'Brien	—	1933	4,386	7
248	9 miles northeast	M. Bryant	J. J. O'Brien	—	—	900	6
249	do.	do.	do.	—	—	800	6
250	7½ miles north	Wm. Donohoe	do.	—	—	900	6
251	8 miles north	do.	do.	—	—	800	6
252	9 miles north	Jose Leonard de la Garza Trudo	Howard West	—	—	40	4
253	7½ miles north	do.	do.	—	—	40	36
d/256	do.	John Coughlin	Ed Clarkson	—	—	50	4
d/258	5½ miles northwest	John Scott	Mrs. Josephine St. John	—	1929	3,699	10

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
229	—	Flows	Mar. 1, 1937	None	S	—	Measured flow, 3.3 gallons a minute. Located on south shore of St. Nicholas Lake.
230	0	15.7	do.	C,W	S	—	Water level measured while pumping $3\frac{1}{2}$ gallons a minute.
231	2.7	22.4	Mar. 16, 1937	---	N	60-75	
232	—	Flows	do.	None	S	840-860	Measured flow, 7.5 gallons a minute.
233	—	Flows	do.	C,W	S	—	Measured flow, 75 gallons a minute. Temperature, 76° F.
234	0.6	25.8	do.	C,W	S	60-70	
235	0.4	26.5	do.	C,W	D,S	60-65	
236	—	Flows	do.	None	D,S	920-940	Estimated flow, 18 gallons a minute. Temperature, 79° F.
237	1	29.7	do.	C,W	S	55-60	
238	0.6	23.9	do.	C,W	D,S	60-75	Located $\frac{1}{2}$ mile north of Vidaurri.
239	1.4	24.8	do.	C,W	S	60-75	Do.
240	0	23.9	Mar. 13, 1937	C,W	D,S	55-60	Water level measured while pumping 3 gallons a minute.
242	0	30.5	do.	C,W	D,S	55-60	Located at Vidaurri.
243	—	24	e/	C,W	S	58-60	
244	0.3	23.1	Mar. 13, 1937	C,W	S	60-65	Measured drawdown 0.1 feet after pumping 3 gallons a minute for 10 minutes.
247	—	—	—	—	—	—	Oil test. known as J. M. O'Brien, well C-1. Located in center of 22-acre tract in northwest corner of survey. Altitude, 62 feet.
248	—	Flows	Mar. 1, 1937	None	S	—	Measured flow, 33 gallons a minute. See log.
249	—	Flows	do.	None	S	—	Measured flow, 2.5 gallons a minute.
250	—	Flows	do.	None	S	—	Measured flow, 43 gallons a minute.
251	—	Flows	do.	None	S	—	Measured flow, 5.7 gallons a minute.
252	1.3	23.7	Mar. 18, 1937	C,W	S	—	
253	0	24.8	do.	C,W	D,S	35-40	Dug well. Rock casing. Measured drawdown, 0.3 foot after pumping $1\frac{1}{2}$ gallons a minute for $\frac{1}{4}$ hour.
256	3.2	40.5	e/	C,W	S	45-50	
258	—	—	—	—	—	—	Oil test. Known as Mrs. Josephine St. John, well 1. Located approximately 3,075 feet from east line and 708 feet from north line. See log.

Records of wells and springs in Refugio County—Continued

No.	Distance from Refugio	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
261	3½ miles north	Isabella Brien	J. J. O'Brien	—	—	800	6
262	4½ miles north	John Malone	do.	—	—	75	8
263	4¾ miles north	do.	do.	—	—	800	6
264	do.	do.	do.	—	—	900	6
265	5 miles northeast	do.	do.	—	—	—	4
d/268	6½ miles northeast	E. W. Harper	Mrs. M. F. Lambert	—	—	60	6
d/269	6 miles northeast	do.	do.	—	—	843	1½
270	do.	do.	do.	—	—	60	6
d/271	5½ miles northeast	D. M. O'Connor, blk. 1	do.	—	—	60	6
272	6½ miles northeast	Chas. Hardwick	do.	—	—	843	4
273	8½ miles northeast	D. M. O'Connor, blk. 1	Tom O'Connor	— Young	—	960	6
274	10½ miles east	James Hewitson	do.	do.	1897	960	6
275	9½ miles east	do.	do.	—	—	80	4
276	6½ miles east	do.	do.	— Young	—	960	6
277	8 miles east	do.	do.	do.	—	960	6
278	7½ miles east	James Power	do.	do.	—	960	4
280	6½ miles east	do.	do.	do.	—	960	6
281	do.	do.	do.	do.	—	950	4
282	4½ miles east	W. Williams	do.	do.	—	960	6
283	2½ miles northeast	Refugio	T. M. O'Connor	—	—	920	6
d/235	5½ miles northeast	Isabella Brien	J. J. O'Brien	—	—	—	6
286	2¾ miles northeast	do.	do.	—	—	65	4
287	2½ miles north	Refugio	Mrs. Frank Munsch	—	—	—	4
288	¾ mile south	do.	Mrs. J. Mitchell	—	—	50	6

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
261	—	Flows	Mar. 1, 1937	None	S	—	Measured flow, 6.8 gallons a minute.
262	0.9	29.5	do.	C,W	S	65-75	Water level measured while pumping $\frac{1}{2}$ gallon a minute.
263	—	Flows	do.	None	S	—	Measured flow, 5.4 gallons a minute.
264	—	Flows	do.	None	S	—	Measured flow, 18.7 gallons a minute.
265	0.7	20.8	do.	C,W	D,S	—	Concrete curb. Water level measured while pumping $\frac{1}{2}$ gallon a minute.
268	0.8	27.7	Feb. 15, 1937	C,W	N	—	Wood casing. Located at field camp.
269	—	Flows	do.	None	D,S	835-843 600-610	
270	1	29.1	do.	C,W	D,S	55-60	
271	0	31.5	do.	C,W	S	—	Water level measured after pumping 2 gallons a minute for 3 hours.
272	—	Flows	do.	None	S,Of	835-843 600-610	Reported flow, 4 gallons a minute. Temperature, 85° F.
273	—	Flows	Feb. 18, 1937	None	S	930-960 820-840	Measured flow, 9.4 gallons a minute. Temperature, 83° F.
274	—	Flows	do.	None	S	930-960 820-840	Estimated flow, 200 gallons a minute. Considerable decrease in flow reported in last five years. Temperature, 85° F.
275	—	32	e/	C,H	D,S	77-80 32-35	
276	—	Flows	Feb. 18, 1937	None	S	930-960 820-840	Measured flow, 16.7 gallons a minute. Temperature, 85° F.
277	—	Flows	do.	None	S	930-960 820-840	Measured flow, 10.7 gallons a minute. Temperature, 81° F.
278	—	Flows	Feb. 17, 1937	None	S	930-960 820-840	Measured flow, 43 gallons a minute. Temperature, 85° F.
280	—	Flows	do.	None	S	930-960 820-840	Measured flow, 10.7 gallons a minute. Temperature, 85° F.
281	—	Flows	do.	None	S	930-960 820-840	Estimated flow, 10 gallons a minute. Temperature, 85° F.
282	—	Flows	Feb. 18, 1937	None	S	930-960 820-840	Measured flow, 27 gallons a minute. Temperature, 85° F.
283	—	Flows	Feb. 16, 1937	None	S	900-920 625-660	Reported flow, 25 gallons a minute. Temperature, 85° F.
285	0.6	28.6	Mar. 1, 1937	None	N	—	
286	0.3	30.8	Feb. 15, 1937	C,W	S	—	Water level measured after pumping $\frac{1}{2}$ gallon a minute for 3 hours.
287	1	33.5	do.	C,W	D,S	—	Measured drawdown, 5.5 feet after pumping $2\frac{1}{2}$ gallons a minute for 12 minutes. Owner reported well formerly flowed, but flow of all nearby artesian wells ceased when several gas wells blew out.
288	1.4	28.4	Feb. 5, 1937	C,W	S	—	

Records of wells and springs in Refugio County--Continued

No.	Distance from Refugio	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
289	1 mile south	Refugio	Mrs. J. Mitchell	—	—	—	6
291	2 miles south	do.	Jas. Power	—	—	40	6
293	2 $\frac{1}{4}$ miles south	do.	Walter Boenig	—	—	60	6
d/294	2 $\frac{1}{4}$ miles southeast	do.	St. John heirs	—	—	45	4
d/295	1 $\frac{3}{4}$ miles southeast	do.	do.	—	—	—	4
d/296	1 $\frac{1}{2}$ miles southeast	do.	do.	—	—	45	3
297	1 $\frac{3}{4}$ miles southeast	do.	T. M. O'Connor Est.	—	—	800	6
d/298	1 $\frac{1}{4}$ miles east	do.	do.	—	—	840	6
299	1 $\frac{1}{4}$ miles east	do.	Jno. J. O'Brien	—	—	—	4
300	3 miles east	Brazella Latham	T. M. O'Connor Est.	—	—	800	6
301	3 $\frac{1}{2}$ miles east	T. Hoyt	Tom O'Connor	—	1936	840	6
302	5 $\frac{3}{4}$ miles east	do.	do.	—	1910	840	6
303	4 $\frac{1}{4}$ miles east	Mathew L. White	do.	— Young	—	840	6
d/304	4 $\frac{1}{4}$ miles southeast	B.B.B. & C.R.R. Co.	do.	—	1934	7,033	7
305	do.	do.	do.	—	—	1,000	6
306	5 miles southeast	Thos. O'Connor	do.	— Young	—	960	6
307	6 $\frac{1}{2}$ miles southeast	Robt. M. Williamson	do.	do.	—	960	4
308	do.	do.	do.	do.	—	960	6
309	9 miles southeast	Dan'l. Young	do.	do.	—	950	6
310	10 $\frac{1}{2}$ miles southeast	Pablo Ortiz	do.	E. Landgraf	1937	832	6
311	12 miles southeast	J. T. Frice	do.	— Young	—	930	6
312	14 miles southeast	Jno. Collett	do.	do.	—	840	6

a/ Measuring point was usually top of casing, top of pump base, or top of well curb.

b/ C, cylinder; E, electric; G, gasoline engine; H, hand; S, steam; W, windmill; number indicates horsepower.

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
289	—	Flows	Feb. 6, 1937	None	N	—	Oil test. Measured flow, 3 gallons a minute. Located 100 yards east of road.
291	0.5	28.6	Feb. 5, 1937	C,H	D,S	—	
293	2.7	32.9	do.	C,H	D,S	—	
294	2.6	20.3	Feb. 7, 1937	C,W	S	—	Water level measured after pumping 1½ gallons a minute for 3 hours.
295	2.8	31.1	do.	C,H	N	—	Slight sulphur odor reported.
296	0	22.5	do.	None	N	—	Do.
297	—	Flows	Feb. 16, 1937	None	S	780-800	Reported flow, 15 gallons a minute.
298	—	Flows	do.	None	D,S	800-840 600-620	Estimated flow, 18 gallons a minute. Temperature, 85° F.
299	2.4	29.1	Feb. 7, 1937	C,H	S	—	
300	—	Flows	Feb. 16, 1937	None	S	—	Reported flow, 18 gallons a minute. Temperature, 85° F.
301	—	Flows	Feb. 5, 1937	None	S	820-840	Reported flow, 15 gallons a minute. Water is piped over ranch.
302	—	Flows	do.	None	S	—	Reported flow, 15 gallons a minute.
303	—	Flows	Feb. 17, 1937	None	S	820-840	Measured flow, 4.7 gallons a minute. Temperature, 79° F.
304	—	—	—	—	—	—	Oil test. Known as Thos. O'Connor, well B-1. Located 150 feet from east line and 2,225 feet from south line of Abstract 96. See log.
305	—	Flows	Feb. 18, 1937	None	N	—	Reported flow, 14 gallons a minute.
306	—	Flows	Feb. 17, 1937	None	S	930-960 820-840	Measured flow, 7.9 gallons a minute.
307	—	Flows	do.	None	S	930-960 820-840	Measured flow, 7.7 gallons a minute. Temperature, 85° F.
308	—	Flows	Feb. 18, 1937	None	S	930-960 820-840	Measured flow, 9.7 gallons a minute. Temperature, 85° F.
309	—	Flows	Feb. 17, 1937	None	S	930-950 820-840	Measured flow, 13.6 gallons a minute. Temperature, 81° F.
310	—	Flows	do.	None	S	815-832	Measured flow, 8.3 gallons a minute. Temperature, 79° F.
311	—	Flows	do.	None	S	900-930 820-840	Measured flow, 13 gallons a minute. Temperature, 83° F.
312	—	Flows	do.	None	S	810-840	Measured flow, 2.2 gallons a minute. Temperature, 83° F.

c/ A, air-lift; D, domestic; Ind, industrial; Of, oil field; P, public; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported.

Records of wells and springs in Refugio County—Continued

No.	Distance from Woodsboro	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
d/401	2½ miles southeast	Bonnie View Ranch Subdivision	— Weiss	—	1935	6,008	10
402	1½ miles northeast	Dona Anastacio Reojas	Mrs. B. M. Scott	—	—	65	6
403	1¼ miles northeast	do.	do.	—	—	65	3
405	6 miles northwest	C.E.P.I. & M. Co.	H. A. Boenig	—	—	50	6
406	5½ miles northwest	Thos. O'Connor	Mrs. Mannie Wood	—	—	50	4
d/407	do.	Garcia, Montes, & Duran	do.	—	—	65	4
408	7 miles northwest	Jas. McCobans	do.	—	—	60	3
409	7½ miles west	Jose M. Castillo	C. L. Terrell	—	—	600	1½
410	5½ miles west	Martin Power	do.	—	—	600	1½
411	6 miles west	Thos. O'Connor	George Roache	—	—	65	4
d/412	6½ miles west	do.	do.	—	—	60	6
d/413	9 miles west	Patrick Downey	Mrs. L. D. Thompson	—	—	60	6
414	do.	do.	do.	—	—	60	4
415	8 miles west	Rosa Brown	George Roache	—	—	60	6
416	5½ miles southwest	R., J., P., T., & J. Downey	do.	—	—	—	4
419	do.	do.	do.	—	—	60	6

No.	Distance from Tivoli	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
501	12½ miles northwest	Jas. Power & Jas. Hewitson	D. M. O'Connor Est.	—	—	75	12
502	do.	do.	do.	—	—	880	6
503	11 miles northwest	John Keating	do.	—	—	75	10
504	10½ miles northwest	do.	do.	—	—	75	4
d/506	11½ miles northwest	L. Serna	Mrs. M. V. O'Connor	—	1926	3,128	6¼
507	do.	—	D. M. O'Connor Est.	—	—	90	6

a/ Measuring point was usually top of casing, top of pump base, or top of well curb.

b/ C, cylinder; E, electric; G, gasoline engine; H, hand; S, steam; W, windmill; number indicates horsepower.

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
401	--	--	--	--	--	--	Oil test. Known as Weiss well 1. See log.
402	1	28.7	Feb. 5, 1937	C,W	S	--	
403	0	27.2	do.	C,W	D,S	--	Located 1/4 mile south of turn in road.
405	0.6	36.2	Feb. 12, 1937	C,H	D,S	--	
406	0.2	37.4	do.	C,W	D,S	--	Located 1/4 mile west of road.
407	1.1	41.3	Feb. 11, 1937	C,W	S	--	
408	2.1	39.5	Feb. 12, 1937	C,W	D,S	--	
409	--	Flows	do.	None	S	--	Measured flow, 4 gallons a minute. Temperature, 83° F.
410	--	Flows	Feb. 10, 1937	None	S	--	Estimated flow, 20 gallons a minute from pipe 5 feet above ground.
411	2.1	32.5	do.	C,W	D,S	--	Temperature, 85° F.
412	0.4	32.4	do.	None	N	--	Sulphur odor reported.
413	0	42.8	do.	C,W	N	--	
414	2.4	45.7	do.	C,W	S	--	Measured drawdown, 3 feet after pumping 1 1/2 gallons a minute for 1/2 hour.
415	0.4	44.2	do.	C,W	S	--	Measured drawdown, 2 feet after pumping 3 gallons a minute for 1/2 hour.
416	1.3	55.3	do.	C,W	S	--	Measured drawdown, 16.7 feet after pumping 2 1/2 gallons a minute for 1/2 hour.
419	1.1	35.1	do.	C,W	D,S	--	Measured drawdown, 4.5 feet after pumping 3 1/2 gallons a minute for 1/2 hour.

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
501	1.3	43.2	Mar. 13, 1937	C,W	D,S	60-75 18-20	
502	--	Flows	Mar. 12, 1937	None	S	--	Estimated flow, 2 gallons a minute. Well reported over 50 years old.
503	2.8	39.1	do.	C,W	S	60-75	Measured drawdown, 12.1 feet after pumping 4 gallons a minute for 1/2 hour.
504	0.9	38.8	do.	C,W	D,S	60-75	
506	--	--	--	--	--	--	Oil test. Known as Mrs. M. V. O'Connor well 1. Located in Victoria
507	1.4	42.2	Mar. 13, 1937	C,W	S	70-90	Located in Victoria <u>ria County.</u>

c/ A, air-lift; D, domestic; Ind, industrial; Of, oil field; P, public; S, stock; N, not used.

d/ No water sample collected for analysis.

a/ Water level reported

Records of wells and springs in Refugio County--Continued

No.	Distance from Tivoli	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
508	11 miles northwest	—	D. M. O'Connor Est.	—	—	85	6
d/509	10 $\frac{1}{2}$ miles northwest	—	do.	—	—	900	6
510	8 $\frac{1}{2}$ miles northwest	Edward Perry	E. T. Morrow	—	1933	60	6
512	9 miles northwest	do.	W. Avery Est.	—	—	60	4
513	8 $\frac{1}{2}$ miles west	do.	R. A. Morrow	—	—	60	6
514	9 $\frac{1}{2}$ miles west	Florentino Rios	D. M. O'Connor Est.	E. Landgraf	—	960	6
515	8 $\frac{1}{2}$ miles west	Edward Perry	do.	do.	—	840	6
517	7 miles northwest	Nicholas Fagan	P. H. Fagan Est.	—	—	75	12
518	6 miles west	Michael Reiley	do.	—	—	60	3
519	do.	do.	T. C. Holeman	—	—	65	4
521	4 miles west	Cornelius P. Hermans	Martin O'Connor	—	—	60	4
523	3 miles west	Wm. Robertson	do.	—	—	945	6
524	2 miles west	Manuel Hernandez	A. Rathkamp	—	—	60	3
526	1 $\frac{1}{4}$ miles west	B. C. Bennett	Al Schultz	—	—	—	3
527	1 $\frac{1}{4}$ miles west	do.	Lee Huffman	—	—	60	6
528	2 $\frac{1}{2}$ miles northwest	Manuel Hernandez	Martin O'Connor	E. Landgraf	1935	943	6
529	2 miles northwest	F. Brichta	Edward Rathkamp	—	—	46	4
d/530	1 $\frac{3}{4}$ miles north	John Crockett	G. W. Bissett	—	1934	6,026	10
531	2 $\frac{1}{4}$ miles north	Thos. Scott	P. R. Austin Est.	—	—	75	6
532	1 $\frac{1}{2}$ miles northeast	Pierce Rollins	Ernest Pagel	—	—	55	4
533	1 mile north	Thos. Scott	John Beckham	—	—	62	3
535	In Tivoli	do.	City of Tivoli	E. Landgraf	1928	1,148	8
536	2 miles southeast	A. Gray	G. W. Gullett	—	—	137	3
537	6 $\frac{1}{2}$ miles east	D. W. Fulton	Ernest Landgraf	Tide Water Oil Co.	—	418	6
538	2 $\frac{3}{4}$ miles southeast	A. Storrs	O. F. Hartmann	—	—	Spring	—

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
508	1.7	54.2	Mar. 13, 1937	C,W	S	70-85	Measured drawdown, 0.5 foot after pumping $4\frac{1}{2}$ gallons a minute for 10 minutes. Located in Victoria County.
509	—	Flows	do.	None	S	—	Estimated flow, 18 gallons a minute. Located in Victoria County.
510	—	20	e/	C,W	D,S	50-60	
512	1.7	20.9	Mar. 13, 1937	C,H	D,S	55-60	
513	0	24.6	do.	C,W	D,S	55-60	Concrete curb. Measured drawdown, 0.4 foot after pumping $3\frac{1}{2}$ gallons a minute for 12 minutes. Reported a minute for 12 minutes. Temperature, 76° F.
514	—	Flows	Mar. 14, 1937	None	S	—	Estimated flow, 14 gallons a minute. Temperature, 80° F.
515	—	Flows	do.	None	S	—	
517	2.1	42.9	Mar. 9, 1937	C,W	D,S	65-75	
518	0	34.6	do.	C,W	S	55-60	Measured drawdown, 0.3 foot after pumping $1\frac{1}{2}$ gallons a minute for 10 minutes.
519	—	28	e/	C,W	D,S	60-65	
521	1.7	29.1	Mar. 9, 1937	C,W	D,S	—	
523	—	Flows	Feb. 24, 1937	None	S	915-945	Measured flow, 23 gallons a minute.
524	1.8	25.7	Mar. 9, 1937	C,W	D,S	52-60	
526	0.6	26.3	Mar. 2, 1937	C,W	D,S	—	
527	0.3	27.8	Mar. 9, 1937	C,W	D,S	50-60	Concrete curb.
528	—	Flows	Feb. 24, 1937	None	S	910-943	Measured flow, 50 gallons a minute.
529	0.9	32.7	Mar. 9, 1937	C,W	D,S	40-46	Concrete curb.
530	—	—	—	—	—	—	Oil test. Known as G. W. Bissett well 1. See log.
531	0.9	25.9	Feb. 25, 1937	C,H	D,S	—	
532	2.8	31.9	do.	C,W	D,S	45-55	Measured drawdown, 1.4 feet after pumping $\frac{3}{4}$ gallon a minute for 10 minutes.
533	2.4	33.5	do.	C,W	D,S	52-62	
535	—	Flows	do.	None	P	1,110-1,148	Reported flow, 300 gallons a minute. Water pressure reported, 45 pounds
536	—	25	e/	C,W	D,S	—	Located $\frac{1}{4}$ mile north of turn in road. when well completed.
537	—	Flows	Feb. 24, 1937	None	N	412-418	Measured flow, 0.5 gallon a minute.
538	—	Flows	Feb. 25, 1937	None	S	—	Reported flow, 2 gallons a minute from 1 opening. Has flowed continuously with seasonal fluctuations. since appearance one year ago.

Records of wells and springs in Refugio County--Continued

No.	Distance from Tivoli	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
539	2 $\frac{3}{4}$ miles southeast	A. Storrs	O. F. Hartmann	—	1921	60	4
540	3 $\frac{1}{2}$ miles south	John Rainey	Temple Lumber Co.	—	—	300	6
541	1 $\frac{1}{2}$ miles south	Wm. Wilson	Martin O'Connor	—	—	980	6
d/543	1 $\frac{1}{2}$ miles southwest	Canutillo C. Ditch Co.	do.	—	1893	60	8
544	2 miles southwest	do.	do.	—	—	978	6
545	3 $\frac{1}{4}$ miles southwest	Caeza Green	do.	—	—	960	6
546	do.	Manuel Hernandez	do.	—	—	935	6
547	4 $\frac{3}{4}$ miles southwest	do.	do.	—	—	970	6
548	do.	Wm. Robertson	do.	—	—	1,002	6
549	4 $\frac{1}{2}$ miles west	do.	do.	—	—	860	6
550	5 miles southwest	Cornelius P. Hermans	do.	—	—	978	6
551	6 miles west	Mary Byrne	do.	—	1927	1,075	6
552	7 miles west	Jas. Fagan	do.	E. Landgraf	1936	840	6
553	8 miles west	Nicholas Fagan	do.	—	—	1,000	6
554	do.	do.	D. M. O'Connor Est.	—	—	140	6
555	do.	do.	do.	—	—	900	6
556	9 miles west	Edward Perry	do.	E. Landgraf	—	980	6
557	10 miles west	H. C. Sweet	do.	—	—	860	4
558	do.	Florentino Rios	do.	—	—	850	4
559	do.	do.	do.	—	—	970	4
560	12 miles west	Jas. Power & Jas. Hewitson	do.	—	—	870	6
561	do.	C.E.P.I. & M. Co.	do.	—	—	980	4
562	13 $\frac{1}{2}$ miles west	Sampler Turner	do.	—	—	850	4
563	13 $\frac{1}{2}$ miles southwest	I. & G.N.R.R. Co.	do.	—	—	840	4
564	11 $\frac{1}{2}$ miles southwest	do.	do.	—	—	850	4
d/565	12 miles southwest	E. W. Best	J. M. Tatton	—	1901	850	6
566	10 miles southwest	I. & G.N.R.R. Co.	Martin O'Connor	—	—	973	6

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
539	0	27.4	Feb. 25, 1937	C,W	D,S	50-60	
540	1.3	33.9	do.	C,G	D,S	275-300	Automobile engine used for power.
541	--	Flows	Feb. 23, 1937	None	S,Ind	950-980	Measured flow, 16.7 gallons a minute. Supplies cotton gin.
543	0	24.5	do.	None	N	55-60	
544	--	Flows	do.	None	S	950-978	Measured flow, 43 gallons a minute.
545	--	Flows	do.	None	S	940-960	Measured flow, 60 gallons a minute.
546	--	Flows	do.	None	S	900-935	Measured flow, 50 gallons a minute.
547	--	Flows	do.	None	S	950-970	Measured flow, 43 gallons a minute.
548	--	Flows	do.	None	S	970-1,000	Reported flow, 35 gallons a minute.
549	--	Flows	do.	None	D,S	840-860	Reported flow, 25 gallons a minute.
550	--	Flows	do.	None	S	950-978	Measured flow, 18.7 gallons a minute.
551	--	Flows	Feb. 24, 1937	None	S	1,050-1,075	Measured flow, 60 gallons a minute. Known locally as Horseshoe Lake
552	--	Flows	do.	None	S	760-840	Measured flow, 27 gallons a minute. Well.
553	--	Flows	do.	None	S	970-1,000	Measured flow, 27 gallons a minute. "Fagan Well."
554	0	18.2	do.	None	N	120-140	"Landgraf Well."
555	--	Flows	do.	None	S	880-900	Measured flow, 38 gallons a minute. "Company Well."
556	--	Flows	Mar. 14, 1937	None	S	--	Estimated flow, 60 gallons a minute. Temperature, 84½° F.
557	--	Flows	Mar. 19, 1937	None	S	--	Reported flow, 22 gallons a minute. "Beef Pasture Well." Temperature,
558	--	Flows	do.	None	D,S	--	Estimated flow, 2½ gallons a minute. 80° F. "Hollow Well."
559	--	Flows	do.	None	S	--	Reported flow, 50 gallons a minute. "Hollow Well." Temperature, 89° F.
560	--	Flows	do.	None	S	850-870	Estimated flow, 25 gallons a minute. "Cowan Well." Temperature, 76° F.
561	--	Flows	do.	None	S	--	Estimated flow, 35 gallons a minute. "Mill Well." Temperature, 85° F.
562	--	Flows	do.	None	S	--	Estimated flow, 25 gallons a minute. "Heard Well." Temperature, 82° F.
563	--	Flows	do.	None	S	--	Estimated flow, 22 gallons a minute. "New Well." Temperature, 76° F.
564	--	Flows	do.	None	S	--	Estimated flow, 25 gallons a minute. "Red Well." Temperature, 76° F.
565	--	Flows	Mar. 4, 1937	None	S	--	Measured flow, 200 gallons a minute. "Twin Mott Well."
566	--	Flows	Feb. 24, 1937	None	S	945-973	Measured flow, 33 gallons a minute.

Records of wells and springs in Refugio County--Continued

No.	Distance from Tivoli	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
567	10 miles southwest	I. & G.N.R.R. Co.	Martin O'Connor	---	---	950	6
568	10½ miles southwest	do.	do.	---	---	75	6
569	do.	Robt. Rogers heirs	do.	---	---	1,212	6
570	8½ miles southwest	M. Whalen	do.	---	---	1,187	6
571	8 miles southwest	I. & G.N.R.R. Co.	do.	--- Nolan	1899	1,217	6
572	7 miles southwest	do.	do.	---	---	68	6
573	9½ miles southwest	do.	do.	---	---	1,138	6
574	8½ miles southwest	do.	do.	---	---	93	6
d/575	8 miles southwest	Dan'l McNail	J. M. Tatton	---	---	960	6
576	6½ miles southwest	Manuel Hernandez	Martin O'Connor	---	---	960	6
577	5 miles southwest	Adeline McKinney	do.	---	---	1,000	6
d/578	7½ miles south	Dan'l McNail	J. M. Tatton	---	---	900	6
579	4¾ miles south	John Rainey	L. Fhlevens	---	---	243	2
580	4¼ miles south	do.	M. J. Adair	---	---	240	4
581	5½ miles south	Peter Hynes	W. A. Davis	---	---	200	---
582	5½ miles southeast	James Collyer	City of Austwell	---	1928	560	4
583	8½ miles southeast	John Solberg	H. H. McDowell	---	---	160	6
584	do.	Chas. Labaltrier	do.	---	1934	170	6
585	8 miles southeast	John C. Solberg	do.	---	---	273	4
586	7 miles south	Peter Hynes	San Antonio Joint Stock & Land Bank	---	---	252	3
587	9 miles south	Heirs Geo. W. Main	Temple Investment Co.	---	1925	350	4
588	10 miles south	D. Garrett	--- Plumber	---	---	---	4
589	9½ miles south	Maria J. Ximenes	San Antonio Joint Stock & Land Bank	---	---	---	3
590	8½ miles south	Geo. C. Childress	Mrs. Emma Becker	---	---	265	4

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
567	—	Flows	Feb. 24, 1937	None	S	930-950	Reported flow, 28 gallons a minute.
568	0	5.3	Feb. 23, 1937	None	N	65-75	
569	—	Flows	do.	None	S	990-1,212	Measured flow, 75 gallons a minute.
570	—	Flows	Feb. 24, 1937	None	S	1,165-1,187	Measured flow, 13.6 gallons a minute.
571	—	Flows	do.	None	S	1,190-1,217	Reported flow, 90 gallons a minute.
572	0	25.8	Feb. 23, 1937	C,W	S	64-68	
573	—	Flows	do.	None	S	1,110-1,138	Measured flow, 43 gallons a minute.
574	1.1	21.7	do.	C,W	S	85-93	Measured drawdown, 6.1 feet after pumping $7\frac{1}{2}$ gallons a minute for 10 minutes.
575	—	Flows	Mar. 4, 1937	None	S	—	Measured flow, 25 gallons a minute. "Beef Pasture Well."
576	—	Flows	Feb. 23, 1937	None	S	930-960	Measured flow, 11.1 gallons a minute.
577	—	Flows	do.	None	S	970-1,000	Measured flow, 16.7 gallons a minute.
578	—	Flows	Mar. 4, 1937	None	S	—	Reported flow, 12 gallons a minute. "Cut-Off Well."
579	0.3	10.1	Mar. 2, 1937	C,W	D,S	230-243	
580	—	15	e/	C,W	D,S	215-240	
581	0.3	68.6	Mar. 2, 1937	C,W	D,S	—	Concrete curb. Measured drawdown, 19.9 feet after pumping $1\frac{1}{2}$ gallons a minute for 20 minutes.
582	—	—	—	C,E, $7\frac{1}{2}$	P	525-560	Resident reported water level 10 feet above ground. Well originally drilled to depth of 700 feet but supply reported no stronger than that from 560 feet. Well now cased
583	1.3	11.4	Feb. 25, 1937	C,W	D,S	135-160	Measured drawdown, to latter depth. 15.4 feet after pumping 2 gallons
584	1.3	12.2	do.	C,W	S	150-170	Measured drawdown, 13.2 feet after pumping a minute for $\frac{1}{4}$ hour.
585	—	18	e/	C,W	D,S	250-273	3 gallons a minute for $\frac{1}{4}$ hour.
586	1.1	11.9	Mar. 2, 1937	C,W	D,S	—	
587	—	45	e/	C,W	D,S	320-350	
588	—	Flows	Mar. 2, 1937	None	S	—	Measured flow, 1.9 gallons a minute.
589	0.3	4.7	do.	C,W	D,S	—	
590	0	9.7	do.	C,W	D,S	—	

Records of wells and springs in Refugio County--Continued

No.	Distance from Tivoli	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
d/592	12 miles south	Benj. D. Condon	J. M. Tatton	--	--	240	8
d/593	10 miles south	Santiago Chivano	do.	--	--	930	6
534	10 miles southwest	I. & G.N.R.R. Co.	Martin O'Connor	--	--	1,050	6
d/598	15½ miles southwest	Luke A. Falvel	J. M. Tatton	--	--	240	8
d/599	14 miles southwest	E. Sloan	do.	--	--	835	6
d/600	13 miles southwest	Jas. F. Irwin	do.	--	--	800	6
d/601	14 miles southwest	J. Rogers	do.	--	--	880	6
d/603	12 miles southwest	Robt. Rogers heirs	do.	--	--	870	--
d/605	13 miles southwest	G. W. Edwards	do.	--	--	840	6
d/606	do.	Mrs. Essy Reed	do.	--	--	860	6
607	15 miles southwest	do.	Tom O'Connor	-- Young	1935	110	4
d/610	15½ miles southwest	Jas. M. Cross	J. M. Tatton	--	--	840	6
d/611	16½ miles southwest	John M. Swisher	Tom O'Connor	-- Young	--	960	--
d/612	16 miles southwest	A. M. Berry	J. M. Tatton	--	--	870	6
d/613	17 miles southwest	W. G. Martin	do.	-- Rischer	1933	1,201	6
d/614	19 miles southwest	Wm. Nettles	do.	--	--	830	6
d/615	18 miles southwest	Jas. Mitchell	do.	--	--	850	6
d/616	18½ miles southwest	John M. Shreve	do.	--	--	1,000	6
d/617	15 miles southwest	Luke A. Falvel	do.	--	--	260	8
d/618	15 miles south	Wm. S. Tuton	do.	--	--	60	8
d/619	21½ miles south	Wm. Lewis	Mrs. K. J. Edwards, et al.	--	1929	5,585	10

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
591	--	Flows	e/	C,W	S	220-240	Water level reported 15 feet above ground by J. O. Linney, foreman. Known as "Willow Well." Located in
593	--	Flows	Mar. 4, 1937	None	S	--	Estimated flow, 18 <u>Aransas County</u> , gallons a minute. "Corner Well."
594	--	Flows	Feb. 23, 1937	None	S	1,015-1,050	Reported flow, 30 gallons a minute.
598	--	Flows	e/	C,W	S	220-240	Water level reported 15 feet above ground by Mr. Linney. "Red Well." Located in <u>Aransas County</u> .
599	--	Flows	Mar. 4, 1937	None	S	--	Estimated flow, 20 gallons a minute "Lee Well". Located in <u>Aransas</u>
600	--	Flows	do.	None	D,S	--	Estimated flow, 32 gallons <u>County</u> , a minute. "Ranch Well."
601	--	Flows	do.	None	S	--	Measured flow, 50 gallons a minute. "Thomas Well."
603	--	Flows	do.	None	S	--	Estimated flow, 25 gallons a minute. "Linney Well."
605	--	Flows	do.	None	S	820-840	Measured flow, 25 gallons a minute. "Middle Well."
606	--	Flows	do.	None	S	--	Measured flow, 20 gallons a minute. "Zapato Well."
607	1.8	31.6	Feb. 18, 1937	C,H	N	104-110	
610	--	Flows	Mar. 4, 1937	None	S	--	Measured flow, 22 gallons a minute. "Chiltipin Well."
611	--	Flows	Feb. 17, 1937	None	S	930-960 820-840	Measured flow, 13 gallons a minute, Temperature, 79° F.
612	--	Flows	Mar. 4, 1937	None	S	--	Estimated flow, 25 gallons a minute. "Cashus Well." Located in <u>Aransas</u>
613	--	Flows	do.	None	S	1,175-1,200	Reported flow, 35 gallons <u>County</u> , a minute. Located in <u>Aransas Coun-</u>
614	--	Flows	do.	None	S	--	Measured flow, 5.8 gallons <u>ty</u> , a minute. "Winsor Well." In
615	--	Flows	do.	None	S	--	Estimated flow, 25 <u>Aransas County</u> , gallons a minute. "Smith Well." In
616	--	Flows	do.	None	S	--	Measured flow, 3.8 <u>Aransas County</u> , gallons a minute. Well flowed 10 gallons a minute when drilled, reported by J. O. Linney. Known as Bay Well. Located in <u>Aransas Coun-</u>
617	--	Flows	e/	C,W	S	230-260	Water level reported 13 feet <u>ty</u> , above ground by Mr. Linney. "Bridge Well." In <u>Aransas County</u> .
618	--	Flows	e/	C,W	S	40-60	Water level reported 10 feet above ground by Mr. Linney. "Barrel Tree Bend Well." In <u>Aransas County</u> .
619	--	--	--	--	--	--	Oil test. Known as Mrs. K. J. Edwards, et al, well 1. Altitude, 13½ feet. Located in <u>Aransas County</u> . See log.

Records of wells in southern Goliad County, Texas
 (Topographic situation is usually flat or slightly rolling.)
 (See "Logs of W. P. A. test wells" for all records of test wells.)

No.	Distance from Goliad	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
701	10 miles south	—	C. L. Prescott	—	—	63	5
702	11 miles south	—	W. Z. Rigby	—	—	70	6
703	10 miles south	—	Emil Williams	—	—	54	4
704	10½ miles south	—	Mrs. Mary Blackburn	—	—	70	4
705	11 miles south	—	Dr. L. W. Chilton	—	—	60	6
706	11½ miles south	—	H. Friedrichs	—	1885	90	4
707	12 miles south	—	Catherine Foster	—	—	80	4
708	12½ miles south	—	Geo. Hecht	—	—	80	4
709	14½ miles south	—	J. J. O'Brien	—	—	75	4
710	14 miles south	—	do.	—	—	900	4
711	13½ miles south	—	do.	—	—	65	6
712	do.	—	do.	—	—	75	4
713	13 miles south	—	E. C. Friedrichs	—	—	68	4
714	13½ miles south	—	Albert Friedrichs	—	—	70	4
715	14 miles south	—	J. J. O'Brien	—	—	900	4
716	do.	—	do.	—	1935	—	4
717	15 miles south	—	Will Shelton	—	—	80	4
718	14½ miles south	—	A. Friedrich	—	—	65	4
719	do.	—	John Powers	—	—	75	4
720	15 miles south	—	do.	—	—	75	6
721	do.	—	do.	—	—	75	6
722	15½ miles south	—	do.	—	—	80	4
723	15 miles south	—	A. Friedrich	—	—	75	4

a/ Measuring point was usually top of casing, top of pump base, or top of well curb.

b/ C, cylinder; E, electric; G, gasoline engine; H, hand; S, steam; W, windmill; number indicates horsepower.

Records obtained by Emil J. Michal, Project Superintendent
(All wells are bored or drilled unless otherwise indicated in "Remarks" column.)
(Chemical analyses of water from these wells are in the table of analyses.)

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
701	1.9	49.9	Mar. 27, 1937	C,W	D,S	60-63	Weak supply; pumps dry in $\frac{1}{2}$ hour. Owner reported well never fails in
702	1.6	41.8	do.	C,W	D,S	65-70	Supply exhausted after <u>drought.</u> pumping $2\frac{1}{2}$ gallons a minute for $\frac{1}{2}$ hour. Owner reported water in hard red and white clay.
703	1.4	40.7	do.	C,W	D,S	50-54	Concrete curb. Owner reported water in sandy clay.
704	0.7	60.3	do.	C,H	D,S	—	
705	0	49.6	do.	C,W	S	55-60	Measured drawdown, 3.4 feet after pumping 3 gallons a minute for 10
706	1	43.5	do.	C,I	D,S	80-90	Concrete curb. <u>minutes.</u>
707	1.3	41.3	do.	C,W	D,S	70-80	Do.
708	0.7	43.8	Mar. 26, 1937	C,W	D,S	75-80	Concrete curb. Owner reported water in clay or adobe.
709	1	57.5	Mar. 25, 1937	C,W	S	70-75	Concrete curb. Measured drawdown, 6.7 feet after pumping $2\frac{1}{2}$ gallons a minute for 10 minutes.
710	—	Flows	do.	None	S	—	Measured flow, 17.7 gallons a minute. Temperature, 81° F.
711	1.3	16.5	do.	C,W	D,S	60-65	Concrete curb. Measured drawdown, 4.8 feet after pumping $3\frac{1}{2}$ gallons a
712	1.7	31.2	do.	C,W	S	70-75	Concrete <u>minute for 10 minutes.</u> curb.
713	0.2	42.1	do.	C,W	D,S	65-68	
714	1.1	37.1	do.	C,W	D,S	65-70	Concrete curb.
715	—	Flows	Mar. 26, 1937	None	S	—	Measured flow, 18.8 gallons a minute. Temperature, 80° F.
716	1.8	2.1	do.	C,W	S	—	Slight drawdown after pumping 3 gallons a minute for 10 minutes.
717	1.8	61.1	do.	C,W	S	70-80	Measured drawdown, 7.9 feet after pumping 4 gallons a minute for 10
718	0.4	33.9	do.	C,W	S	60-65	Concrete curb. <u>minutes.</u>
719	0.8	33.9	do.	C,W	S	70-75	Measured drawdown, 4.3 feet after pumping $3\frac{1}{2}$ gallons a minute for 10
720	0	28.4	do.	C,W	S	70-75	Measured drawdown, 2.7 <u>minutes.</u> feet after pumping $2\frac{1}{2}$ gallons a
721	0.3	34.2	do.	C,G, $1\frac{1}{2}$	D,S	70-75	<u>minute for 10 minutes.</u>
722	—	34	e/	C,W	S	70-80	
723	0.9	42.7	Mar. 26, 1937	C,I	S	70-75	Concrete curb.

c/ A, air-lift; D, domestic; Ind, industrial; Of, oil field; P, public; S, stock; N, not used.

d/ No water sample collected for analysis.

Records of wells in southern Goliad County--Continued

No.	Distance from Goliad	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
724	17 $\frac{1}{2}$ miles south	—	Joe McGuill	—	—	70	6
d/725	18 $\frac{1}{2}$ miles south	—	Mrs. D. E. Beedy	—	—	50	6
726	18 miles south	—	M. McGuill	—	—	48	4
727	17 $\frac{1}{2}$ miles south	—	Mary McGuill	—	—	70	4
728	17 miles south	—	do.	—	—	60	4
729	16 $\frac{1}{2}$ miles south	—	Mrs. E. B. Tuttle	—	—	70	6
730	16 miles south	—	Joe Williams	—	—	70	4
731	15 $\frac{1}{2}$ miles south	—	Nora Plummer	—	—	83	3
732	do.	—	J. J. O'Brien	—	—	65	4
733	do.	—	do.	—	—	65	4
d/734	do.	—	do.	—	—	65	4
735	do.	—	do.	—	—	70	4
736	16 miles south	—	do.	—	—	75	4
737	17 miles south	—	do.	—	—	65	4
738	18 miles southwest	—	do.	—	—	65	3
739	16 $\frac{1}{2}$ miles southwest	—	do.	—	—	70	4
740	6 miles south	María Jesusa De Leon	M. E. O'Connor	—	—	101	6
741	10 $\frac{1}{2}$ miles south	Domingo Morris	T. J. Heard	—	—	71	4
d/742	8 $\frac{1}{2}$ miles south	Pedro Villa & Son	O'Connor Ranch	—	—	60	6
743	4 $\frac{1}{2}$ miles south	J. F. Ragland	do.	—	—	78	—
744	3 $\frac{1}{4}$ miles south	La Bahia	Lawrence O'Connor	—	—	99	5
745	do.	do.	Mrs. R. R. Le Master	—	—	95	6
746	10 $\frac{1}{2}$ miles east	Wm. Reed	Lee Swickheimer	—	1931	107	4 $\frac{1}{2}$
747	10 miles east	Juan Rener & Son	State of Texas	—	1914	86	6
748	9 $\frac{1}{2}$ miles east	Edw. Townsend, et al	South Texas Cotton Oil Co.	—	1927	68	7

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) a/	Water Level		Pump and power b/	Use of water c/	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
724	0.2	38.8	Mar. 27, 1937	C,H	D,S	60-70	
725	0.5	34.7	Mar. 24, 1937	C,W	S	45-50	
726	0.9	37.7	do.	C,W	D,S	45-48	Wood curb. In Bee County.
727	0.5	39.9	Mar. 27, 1937	C,W	S	65-70	
728	0	35.2	Mar. 24, 1937	C,W	D,S	55-60	Measured drawdown, 0.1 foot after pumping 2½ gallons a minute for ¼ hour.
729	-0.9	32.7	Mar. 27, 1937	C,W	D,S	65-70	Top of casing, which is below ground level, was used as measuring point.
730	0.6	47.7	Mar. 24, 1937	C,W	D,S	60-70	Concrete curb. Measured drawdown, 0.3 foot after pumping 2 gallons a minute for 10 minutes.
731	0	42.8	do.	C,W	D,S	75-83	
732	0.9	46.8	Mar. 25, 1937	C,W	S	60-65	Concrete curb. Measured drawdown, 3.4 feet after pumping 3 gallons a minute for 10 minutes.
733	1.1	50.5	do.	C,W	S	60-65	Concrete curb. Measured drawdown, 15.2 feet after pumping 1½ gallons a minute for 10 minutes.
734	0.2	50.1	do.	None	N	60-65	
735	2.1	54.6	do.	C,W	S	60-70	
736	2.6	61.5	do.	C,W	S	70-75	Measured drawdown, 4.7 feet after pumping 3 gallons a minute for 10 minutes.
737	1.8	19.5	do.	C,W	S	60-65	Concrete curb. Measured drawdown, 8.5 feet after pumping 3½ gallons a minute for 10 minutes.
738	—	50	e/	C,W	S	60-65	
739	1.3	45.9	Mar. 25, 1937	C,W	S	60-70	Measured drawdown, 4.8 feet after pumping 3 gallons a minute for 10 minutes.
740	1.5	27.8	Oct. 15, 1937	C,W	S	—	Located near creek bank.
741	1	31.2	Oct. 7, 1937	C,W	D,S	—	Wood curb; iron casing.
742	2	31.7	do.	C,W	D,S	—	
743	1	41.7	do.	C,W	S	—	Wood curb.
744	1.5	59.7	Oct. 15, 1937	C,W	S	—	Iron casing.
745	0.5	58.3	Oct. 7, 1937	C,W	—	—	Concrete block curb; iron casing.
746	2	43.3	Oct. 15, 1937	C,W	D,S	107- —	Wood curb; iron casing. Water reported in coarse sand.
747	—	46	e/	C,W, G, 2½	P	—	Concrete curb; iron casing. Located in Fannin State Park.
748	—	28	e/	C,S	Ind	40-43 60-68	Iron casing. Strong supply reported in white sand.

Records of wells in southern Goliad County—Continued

No.	Distance from Goliad	Survey and Block	Owner	Driller	Date completed	Depth of well (ft.)	Diameter of well (in.)
749	9½ miles east	Edw. Townsend, et al	C. R. Chance	—	1930	54	4½
750	1 mile southeast	La Bahia	State of Texas	—	1937	173	4
751	¾ mile southeast	do.	do.	—	1932	120	5
752	½ mile south	do.	City of Goliad	—	—	325	—
d/753	¼ mile north	Range B, blk. 4, City of Goliad	do.	—	1936	461	—
754	12¾ miles northeast	—	A. G. Riemschneider	—	—	710	8

a/ Measuring point was usually top of casing, top of pump base, or top of well curb.

b/ C, cylinder; E, electric; G, gasoline engine; H, hand; S, steam; W, windmill: number indicates horsepower.

Emil J. Michal, Project Superintendent

No.	Height of measuring point above ground (ft.) <u>a/</u>	Water Level		Pump and power <u>b/</u>	Use of water <u>c/</u>	Reported depth of water-bearing beds	Remarks
		Depth below measuring point (ft.)	Date of measurement				
749	1	39.4	Oct. 14, 1937	C,W	D, Ind	43-54	Iron casing. Owner reports dry, caving sand at 15 to 35 feet.
750	0.5	34.1	Oct. 6, 1937	C,E, 1 $\frac{1}{2}$	P	—	Iron casing. Drilled to supply C.C.C. camp in Goliad State Park.
751	1	62.3	Oct. 8, 1937	C,W	P	—	Iron casing. Altitude, 162 feet.
752	2.5	9.5	Oct. 6, 1937	A,E, 15	P	—	Concrete curb. Located on river bank. Well supplies two reservoirs.
753	—	59	<u>e/</u>	T,E, 25	P	—	City well 2. Altitude, 219 feet. Altitude, 208 feet.
754	2	14.0	Oct. 13, 1937	C,W	D,S,I	70-88	Located near Coletto Creek, $\frac{1}{4}$ mile west of Weesatche. See log.

c/ A, air-lift; D, domestic; Ind, industrial; Of, oil field; P, public; S, stock; N, not used.

d/ No water sample collected for analysis.

e/ Water level reported.

Table of Drillers' Logs, Refugio County, Texas

	Thickness (feet)	Depth (feet)
Driller's log of well 247		
Southwest Oil Corp., J. M. O'Brien well		
C-1. 8 miles northeast of Refugio.		
Soil- - - - -	5	5
Clay- - - - -	10	15
Shale and caliche- - - - -	14	29
Water sand- - - - -	1	30
Caliche- - - - -	60	90
Sand rock and hard sand- - -	5	95
Sticky shale- - - - -	90	185
Sand- - - - -	10	195
Gumbo and caliche- - - - -	70	265
Sticky shale- - - - -	20	285
Hard sand- - - - -	9	294
Water sand- - - - -	15	309
Shale- - - - -	16	325
Sticky shale - - - - -	8	333
Sand- - - - -	19	352
Sticky shale- - - - -	108	460
Hard sand- - - - -	13	473
Sticky shale- - - - -	36	509
Sand streaks and shale- - -	11	520
Gumbo and caliche- - - - -	90	610
Sand- - - - -	10	620
Shale and sticky caliche- -	140	760
Water sand- - - - -	25	785
Sticky shale- - - - -	65	850
Sand- - - - -	16	866
Sticky shale- - - - -	29	895
Sand and boulders - - - - -	8	903
Gumbo- - - - -	8	911
Sticky shale - - - - -	76	987
Sand- - - - -	9	996
Shale and boulders- - - - -	69	1065
Gumbo- - - - -	36	1101
Sand- - - - -	38	1139
Sticky shale- - - - -	24	1163
Sand- - - - -	29	1192
Shale and hard lime streaks- - - - -	39	1231
Hard rock- - - - -	17	1248
Sticky shale and lime streaks- - - - -	22	1270
Sand- - - - -	18	1288
Gumbo- - - - -	92	1380
TOTAL DEPTH- - - - -		4386
CASING RECORD: 1248 feet 13-inch casing; 4346 feet 7-inch casing; 4270 feet 2 ¹ / ₂ - inch tubing.		

	Thickness (feet)	Depth (feet)
Driller's log of well 258		
Blanco Creek Oil Corp., Mrs. Josephine		
St. John well 1. 5 ¹ / ₂ miles northwest of		
Refugio.		
Sand and clay- - - - -	30	30
Caliche- - - - -	35	65

	Thickness (feet)	Depth (feet)
Driller's log of well 258--Continued		
Sand- - - - -	10	75
Clay- - - - -	55	130
Sand- - - - -	10	140
Clay- - - - -	30	170
Hard sand - - - - -	15	185
Clay- - - - -	25	210
Sand- - - - -	15	225
Clay- - - - -	23	248
Shale- - - - -	16	264
Hard sand- - - - -	10	274
Gumbo- - - - -	10	284
Sand- - - - -	12	296
Gumbo- - - - -	14	310
Sticky shale- - - - -	30	340
Gumbo- - - - -	46	386
Sand and shale- - - - -	34	420
Sticky shale- - - - -	37	457
Gumbo- - - - -	20	477
Sand- - - - -	5	482
Gumbo- - - - -	10	492
Sandy shale- - - - -	28	520
Gumbo- - - - -	5	525
Sandy shale- - - - -	42	567
Gumbo- - - - -	13	580
Sand- - - - -	33	613
Sandy shale- - - - -	25	638
Gumbo- - - - -	20	658
Sandy shale- - - - -	20	678
Gumbo- - - - -	12	690
Sand- - - - -	20	710
Sticky shale- - - - -	11	721
Sand- - - - -	16	737
Sandy shale- - - - -	23	760
Gumbo- - - - -	15	775
Sandy shale- - - - -	38	813
Gumbo- - - - -	9	822
Sand- - - - -	13	835
Gumbo- - - - -	8	843
Sandy shale- - - - -	42	885
Gumbo- - - - -	20	905
Sticky shale- - - - -	45	950
Gumbo- - - - -	15	965
Sticky shale- - - - -	69	1034
Sand- - - - -	6	1040
Gumbo- - - - -	15	1055
Sandy shale- - - - -	10	1065
Gumbo- - - - -	7	1072
Sticky shale- - - - -	49	1121
Sandy shale- - - - -	23	1144
Gumbo- - - - -	6	1150
Sandy shale- - - - -	50	1200
Gumbo- - - - -	10	1210
Sandy shale- - - - -	18	1228
Shale- - - - -	17	1245

(Continued on next page)

Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 258--Continued</u>		
Hard shale and gumbo- - - - -	20	1445
Coal- - - - -	8	1453
Hard shale- - - - -	26	1479
Hard green sand- - - - -	5	1484
Hard shale and gumbo- - - - -	46	1530
Blue sand- - - - -	7	1537
Gumbo- - - - -	20	1557
Hard sand- - - - -	28	1585
Gumbo- - - - -	24	1609
Sand and shale- - - - -	37	1646
Rock- - - - -	2	1648
Soft shale and gumbo- - - - -	87	1735
Sand rock- - - - -	4	1739
Gumbo- - - - -	21	1760
Water sand- - - - -	35	1795
Gumbo- - - - -	26	1821
Hard sand- - - - -	5	1826
Soft shale and gumbo- - - - -	84	1910
Hard sand- - - - -	4	1914
Gumbo- - - - -	12	1926
Broken sand and shale- - - - -	69	1995
Sand- - - - -	20	2015
Gumbo- - - - -	12	2027
Sand- - - - -	13	2040
Gumbo- - - - -	20	2060
Hard sand- - - - -	6	2066
Rock- - - - -	2	2068
Gumbo and lime- - - - -	18	2086
Sticky shale- - - - -	19	2105
Water sand- - - - -	6	2111
Gumbo- - - - -	24	2135
Sand and shale- - - - -	33	2168
Soft shale and gumbo- - - - -	52	2220
Sand and shale- - - - -	18	2238
Gumbo and lime- - - - -	20	2258
Soft shale- - - - -	35	2293
Gumbo- - - - -	6	2299
Sand- - - - -	9	2308
Shale- - - - -	32	2340
Gumbo- - - - -	21	2361
Hard sand- - - - -	20	2381
Gumbo- - - - -	6	2387
Sand- - - - -	4	2391
Soft shale and gumbo- - - - -	8	2399
Hard shale- - - - -	5	2404
Brown gumbo- - - - -	5	2409
Gumbo and lime- - - - -	48	2457
Sand- - - - -	18	2475
Gumbo and lime- - - - -	50	2525
Sand and brown shale- - - - -	3	2528
Blue gumbo- - - - -	19	2547
Sand and shale- - - - -	4	2551
Hard sand- - - - -	8	2559
Sticky shale- - - - -	3	2562
Hard sand and iron pyrites- -	19	2581

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 258--Continued</u>		
Hard sand- - - - -	15	2596
Gumbo- - - - -	2	2598
Tough gumbo- - - - -	50	2648
Sandy shale and gumbo- - - -	24	2672
Hard gumbo- - - - -	14	2686
Gumbo- - - - -	72	2758
Water sand and shale - - - -	59	2817
Sticky shale- - - - -	45	2862
Shale and sand- - - - -	46	2908
TOTAL DEPTH- - - - -		3699

<u>Driller's log of well 304</u>		
Quintana Petroleum Co., Thomas O'Connor well B-1. 4-3/4 miles southeast of Refugio.		
Soil- - - - -	3	3
Sandy clay- - - - -	17	20
Sand- - - - -	15	35
Caliche and clay- - - - -	265	300
Sand and clay- - - - -	29	329
Clay- - - - -	18	347
Sand- - - - -	8	355
Clay- - - - -	37	392
Caliche- - - - -	30	422
Sandy clay- - - - -	29	451
Caliche- - - - -	38	489
Gumbo- - - - -	11	500
Sand- - - - -	14	514
Soft gumbo- - - - -	18	532
Sand and boulders - - - -	11	543
Soft gumbo- - - - -	55	598
Sand- - - - -	16	614
Gumbo- - - - -	26	640
Sand and boulders- - - -	45	685
Gumbo and clay- - - - -	7	692
Sand and boulders- - - -	31	723
Gumbo- - - - -	126	849
Sand and boulders- - - -	41	890
Gumbo- - - - -	22	912
Sand- - - - -	11	923
Gumbo- - - - -	10	933
Sand- - - - -	33	966
Gumbo- - - - -	19	985
Loose sand and boulders -	81	1066
Gumbo- - - - -	22	1088
Sand and lime- - - - -	23	1111
Gumbo- - - - -	15	1126
Soft sand- - - - -	14	1140
Broken lime- - - - -	4	1144
Soft sand- - - - -	30	1174
Lime- - - - -	1	1175
Soft sand - - - - -	23	1198
Shale and lime- - - - -	39	1237
Gumbo- - - - -	38	1275

(Continued on next page)

Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 304--Continued</u>		
Sand and boulders--	37	1312
Gumbo--	12	1324
Sand--	40	1364
Gumbo--	8	1372
Shale with hard streaks--	26	1398
Hard lime--	24	1422
Gumbo--	76	1498
Broken lime--	3	1501
Shale and lime--	18	1519
Tough gumbo--	36	1555
Shale--	22	1577
Broken lime and shale--	21	1598
Sticky shale--	13	1611
Tough gumbo--	47	1658
Broken lime and shale--	32	1690
Sand and boulders--	10	1700
Broken lime and shale--	31	1731
Sand and boulders--	14	1745
Shale and lime--	41	1786
Soft sand--	6	1792
Coarse gray water sand, cored--	7	1799
Brittle blue shale--	6	1805
Gumbo--	77	1882
Shale and lime--	12	1894
Shale, lime, and pyrites--	36	1930
Sand--	4	1934
Coarse gray salt water sand, cored--	10	1944
Sticky brittle blue shale--	10	1954
Sticky shale--	48	2002
Hard sand--	7	2009
Hard tight gray sand--	1	2010
Hard crumbly shale--	2	2012
Shale--	1	2013
Soft sticky shale--	14	2027
Hard dry shale--	2	2029
Tough shale--	32	2061
Sandy shale with hard streaks--	5	2066
Sandy shale--	1	2067
Sand with hard streaks of sandy lime--	6	2073
Bluish-gray sandy shale--	4	2077
Crumbly shale--	9	2086
Lime and gumbo--	60	2146
Hard sand--	7	2153
Fine hard gray water sand, cored--	20	2173
Tough blue shale--	1	2174
Tough shale--	31	2205
Tough shale and lime--	89	2294
Shale, lime, and pyrites--	41	2335
Gumbo--	10	2345

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 304--Continued</u>		
Shale and lime--	45	2390
Sandy lime--	5	2395
Fine gray water sand, cored--	4	2399
Colored sandy shale--	5	2404
Sticky shale--	11	2415
Shale--	33	2448
Tough gumbo--	14	2462
Sticky shale--	39	2501
Soft sand--	5	2506
Sandy green shale--	2	2508
Tough dry shale--	13	2520
Gray sand and sandy shale--	6	2526
Sticky blue shale--	24	2550
Tough shale with lime streaks--	26	2576
Sand--	5	2581
Greenish-gray water sand, cored--	8	2589
Flaked green shale--	2	2591
Brown shale--	1	2592
Mixed-colored shale--	10	2602
Sticky shale--	33	2635
Hard sand--	5	2640
Soft sandy shale, salty core--	6	2646
Sandy shale with streaks of clean sand--	9	2655
Sticky shale--	5	2660
Shale--	21	2681
Firm sand--	6	2687
Coarse gray salt water sand, cored--	9	2696
Brittle blue shale--	2	2698
Sticky blue shale--	8	2706
TOTAL DEPTH--		7033

<u>Driller's log of well 401</u>		
Conroe Drilling Co., Weiss well 1. 2 1/2		
miles southeast of Woodsboro		
Surface clay--	6	6
Sand--	12	18
Clay--	9	27
Sand and gravel--	19	46
Clay--	12	58
Sand and boulders--	62	120
Clay--	16	136
Water sand--	59	195
Sand--	87	282
Clay--	16	298
Sand--	62	360
Clay--	13	373
Sand--	65	438
Clay--	7	445

(Continued on next page)

Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 401--Continued</u>		
Sand-	25	470
Clay-	15	485
Water sand-	33	518
Sticky shale-	19	537
Sandy shale-	14	551
Sticky shale-	21	572
Water sand-	26	598
Sand and shale-	37	635
Sticky shale-	77	712
Sand-	25	737
Sand and shale-	63	800
Sticky shale-	15	815
Sand-	41	856
Sand and shale-	54	910
Sticky shale-	31	941
Sand-	11	952
Shale-	46	998
Limo-	10	1008
Sand-	32	1040
Shale and lime streaks-	41	1081
Sand-	17	1098
Shale and lime streaks-	62	1160
Shale and sand streaks-	8	1168
Sand-	52	1220
Sticky shale-	15	1235
Hard sand and lime streaks-	88	1323
Sticky shale-	15	1338
Sand and shale streaks-	52	1390
Shale-	70	1460
Sand-	15	1475
Shale-	42	1517
Hard lime-	37	1554
Shale and lime streaks	27	1581
Sticky shale-	184	1765
Sand-	47	1812
Sand and shale-	43	1855
Shale-	35	1890
Sand-	53	1943
Shale and sand streaks-	76	2019
Sticky shale-	44	2063
Shale and lime streaks-	37	2100
Sticky shale-	60	2160
Shale-	40	2200
Sticky shale-	38	2238
Water sand with hard streaks-	19	2257
Sticky shale-	43	2300
Shale-	56	2356
Loose sand	22	2378
Sand with hard streaks	8	2386
Shale-	24	2410
Sand and shale	71	2481
Sandy shale-	24	2505
Sticky shale-	25	2530

	Thickness (feet)	Depth (feet)
Shale and shell-	45	2575
Hard sand-	12	2587
Sandy shale-	14	2601
Sticky shale-	51	2652
Sticky shale, lime and sand streaks-	43	2695
Sticky shale and pyrites-	87	2782
Sand-	3	2785
Sand and shale-	10	2795
Sandy shale-	30	2825
Rock-	2	2827
Shale-	10	2837
Soft shale-	283	3120
Shale-	5	3125
Salt water sand, cored-	4	3129
Sand-	13	3142
Sticky shale-	27	3169
Sand-	21	3190
Sticky shale-	15	3205
Water sand, cored	3	3208
Sand-	26	3234
Shale-	41	3275
Water sand, cored	7	3282
Sand and shale streaks-	56	3338
Shale-	10	3348
Water sand, cored-	42	3390
Sand-	5	3395
Lime and shale-	50	3445
Sandy shale-	65	3510
Sticky shale-	15	3525
Shale-	43	3568
Sandy shale-	33	3601
Sticky shale-	39	3640
Salt water sand, cored-	7	3647
Sticky shale-	13	3660
Salt water sand, cored-	20	3680
Water sand, cored-	160	3840
Sand-	30	3870
TOTAL DEPTH		6008

Driller's log of well 506

Houston Oil Co. of Texas, Mrs. M. V. O'Connor, well 1. 11 $\frac{1}{2}$ miles northwest of Tivoli.

Surface soil-	15	15
White water sand-	33	48
Sandy clay-	52	100
Clay-	20	120
Gray water sand	31	151
Soft lime-	49	200
Lime rock-	5	205
Gray shale and hard lime-	80	285
Sand-	30	315
Clay-	13	328

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Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 506--Continued</u>		
Sand and gravel- - - - -	8	336
Gumbo and soft lime streaks- - - - -	144	480
Gray water sand and fine gravel- - - - -	75	555
Gumbo- - - - -	26	581
Sand and gravel- - - - -	60	641
Gumbo- - - - -	42	683
Sand- - - - -	7	690
Red and pink gumbo- - - - -	30	720
Sand and fine gravel- - - - -	12	732
Gumbo- - - - -	23	755
Sand- - - - -	25	780
Gumbo- - - - -	50	830
Hard sandy shale- - - - -	18	848
Gumbo- - - - -	25	873
Fine sand and gravel - - - - -	12	885
Hard sandy shale- - - - -	30	915
Gumbo- - - - -	3	918
Gumbo and gypsum- - - - -	68	986
Sand and fine gravel- - - - -	39	1025
Gumbo and gypsum- - - - -	25	1050
Sand and boulders- - - - -	49	1099
Blue gumbo- - - - -	34	1133
Sand and boulders- - - - -	84	1217
Gumbo and gypsum- - - - -	18	1235
Broken sand rock- - - - -	5	1240
Gumbo- - - - -	40	1280
Sandy shale and boulders - - - - -	15	1295
Gumbo- - - - -	30	1325
Shale- - - - -	8	1333
Sand rock- - - - -	2	1335
Gumbo- - - - -	24	1359
Shale and hard lime- - - - -	21	1380
Gumbo- - - - -	25	1405
Sand and boulders- - - - -	14	1419
Sandy shale and shelves of pyrites- - - - -	20	1439
Sand rock- - - - -	2	1441
Tough blue gumbo- - - - -	26	1467
Hard sandy lime and bould- ers- - - - -	24	1491
TOTAL DEPTH- - - - -		3128

<u>Driller's log of well 530</u>		
Tivoli Oil & Gas Co., G. W. Bissett, well 1. 1-3/4 miles north of Tivoli.		
Surface clay and sand- - - - -	20	20
Sand- - - - -	22	42
Sandy clay and gravel- - - - -	148	190
Sand- - - - -	25	215
Shale, sand, and boulders- - - - -	150	365
Sand and gravel- - - - -	27	392
Sand and boulders- - - - -	114	506

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 530--Continued</u>		
Shale and sand streaks- - - - -	169	675
Water sand and gravel- - - - -	40	715
Sticky shale- - - - -	49	764
Sandy shale and boulders- - - - -	66	830
Sticky shale- - - - -	20	850
Sand- - - - -	20	870
Sticky red shale- - - - -	90	960
Sand- - - - -	15	975
Sticky shale- - - - -	48	1023
Water sand, cored- - - - -	30	1053
Sticky shale- - - - -	24	1077
Water sand, cored- - - - -	81	1158
Sticky shale- - - - -	31	1189
Water sand, cored- - - - -	48	1237
Sticky shale- - - - -	53	1290
Sandy shale- - - - -	55	1345
Sticky shale- - - - -	25	1370
Sand and boulders- - - - -	17	1387
Shale- - - - -	21	1408
Sand- - - - -	42	1450
Sandy shale- - - - -	45	1495
Shale and boulders- - - - -	23	1518
Sticky shale- - - - -	65	1583
Sand- - - - -	15	1598
Sticky shale- - - - -	20	1618
Sand- - - - -	19	1637
Hard limy shale- - - - -	17	1654
Rock- - - - -	2	1656
Sticky shale- - - - -	14	1670
Shale- - - - -	8	1678
Shale with sticky streaks - - - - -	37	1715
Shale- - - - -	20	1735
Sticky shale- - - - -	31	1766
Hard and sticky limy shale- - - - -	16	1782
Shale- - - - -	12	1794
Shale and lime- - - - -	60	1854
Sandy shale- - - - -	2	1856
Sand- - - - -	20	1876
Sandy shale and boulders- - - - -	42	1918
Sticky shale and boulders - - - - -	12	1930
Sticky shale- - - - -	40	1970
Hard limy shale- - - - -	20	1990
Sticky shale- - - - -	5	1995
Limy shale- - - - -	15	2010
Sticky shale- - - - -	88	2098
Shale- - - - -	2	2100
Soft shale- - - - -	5	2105
Shale- - - - -	55	2160
Hard lime and shale- - - - -	8	2168
Sticky shale- - - - -	68	2236
Salt water sand, cored- - - - -	5	2241
Sand- - - - -	16	2257
Sticky shale- - - - -	3	2260

(Continued on next page)

Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 530--Continued</u>		
Sandy shale and boulders-	82	2342
Sandy shale-	10	2352
Sticky shale-	82	2434
Hard sticky shale	4	2438
Shale-	87	2525
Sticky shale-	7	2532
Limy shale-	10	2542
Sticky shale-	15	2557
Sand-	3	2560
Shale with sand streaks	3	2563
Salty sand and sticky shale, cored-	17	2580
Sand-	6	2586
Water sand, cored	5	2591
Sand-	17	2608
Sticky shale-	33	2641
Salt water sand	29	2670
Shale-	64	2734
Sand-	2	2736
Salt water sand, cored	3	2739
Sand-	7	2746
Sticky shale-	17	2763
TOTAL DEPTH		6026

<u>Driller's log of well 619</u>		
United North & South Development Co., Mrs. K. J. Edwards et al, well 1. 2 1/2 miles south of Tivoli.		
Surface soil-	3	3
Sand-	74	77
Clay-	108	185
Yellow clay-	65	250
Sand and gravel-	25	275
Gumbo-	45	320
Sticky shale-	125	445
Sandy clay-	130	575
Shale-	105	680
Gumbo-	23	703
Shale-	61	764
Sand-	18	782
Shale-	13	795
Gummy shale-	185	980
Sand with shale streaks-	17	997
Gummy shale-	148	1145
Gumbo-	18	1163
Gummy shale-	80	1243
Gumbo-	22	1265
Gummy shale-	36	1301
Gumbo-	55	1356
Pink gumbo-	43	1399
Pink gummy shale-	30	1429
Red gumbo-	13	1442
Soft sand-	3	1445
Sand and gumbo-	40	1485

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 619--Continued</u>		
Gumbo-	55	1540
Sand-	10	1550
Red gumbo-	39	1589
Caving sand-	4	1593
Sand-	8	1601
Gumbo-	90	1691
Red sandy shale-	28	1719
Red sticky shale-	91	1810
Sand and shale-	147	1957
Sticky shale-	19	1976
Sand-	3	1979
Soft gray sand-	11	1990
Red gumbo-	53	2043
Red shale-	64	2107
Red gumbo-	22	2129
Red shale-	36	2165
Red gumbo-	27	2192
Red shale-	17	2209
Shale-	67	2276
Gumbo and lime-	43	2319
Tough blue gumbo-	58	2377
Gumbo and lime-	40	2417
Gumbo and lime streaks-	25	2442
TOTAL DEPTH-		5585

<u>Driller's log of well 754</u>		
A. J. Riemschneider tract, 1/4 mile west of Weesatche, 12-3/4 miles northeast of Goliad. Located in Goliad County.		
Sand and shale-	9	9
Water sand-	10	19
Red shale-	10	29
Lime and shale-	10	39
Sticky red shale-	10	49
Red water sand-	10	59
Sticky green shale-	10	69
Sticky yellow shale with lime streaks-	15	84
Yellow water sand-	30	114
Yellow, green, and blue shale-	15	129
Sandy blue and purplish- colored shale-	30	159
Sandy pink shale-	30	189
Hard sandstone-	15	204
Gray water sand-	50	254
Red, white, and blue shale-	10	264
Sticky blue lime-	10	274
Sandy, pink and blue shale-	15	289
Limestone-	5	294
Lignite and gas sand	7	301
(Continued on next page)		

Table of Drillers' Logs, Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 754--Continued</u>		
Hard limestone- - - - -	10	311
Sandy green shale - - - - -	15	326
Sticky blue shale- - - - -	5	331
Sandy blue shale- - - - -	9	340
Hard sandstone- - - - -	10	350
Sticky blue and green shale-	20	370
Hard sandstone- - - - -	10	380
Purple, blue, and black sandstone- - - - -	15	395
Hard shale- - - - -	20	415
Hard green gumbo- - - - -	20	435
Sticky green shale- - - - -	15	450

	Thickness (feet)	Depth (feet)
<u>Driller's log of well 754--Continued</u>		
Water sand- - - - -	25	475
Hard green shale- - - - -	20	495
Hard sandy shale- - - - -	25	520
Blue and green shale- - -	50	570
Lignite and sand- - - - -	10	580
Sticky gumbo- - - - -	60	640
Sandy blue shale- - - - -	10	650
Sticky gumbo- - - - -	10	660
Hard cap rock- - - - -	10	670
Reported TOTAL DEPTH- - -		710

Logs of test wells drilled by W. P. A. Labor in Refugio County, Texas
 Samples examined and classified by Emil J. Michal,
 Project Superintendent.

	Thickness (feet)	Depth (feet)
<u>Well 207</u>		
In west ditch of State Highway 44, John Keating survey, at Inari, 18 $\frac{1}{2}$ miles north-east of Refugio.		
Black top soil- - - - -	2	2
Bluish-gray clay- - - - -	5	7
Gray clay and sand- - - - -	5	12
Bluish-gray sand and clay -	2	14
Grayish-yellow sand- - - - -	3	17
Struck rock at 17 feet. Mar. 15, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 209</u>		
West side State Highway 44, Jas. Power & Jas. Hewitson survey, 17 $\frac{1}{2}$ miles north-east of Refugio.		
Black top soil - - - - -	3	3
Grayish-yellow clay- - - -	2	5
Bluish-gray clay and sand-	2	7
Brownish-yellow clay and sand- - - - -	1	8
Gray sand and clay- - - - -	3	11
Light-gray sand- - - - -	3	14
Light-yellow sand- - - - -	2	16
Grayish-yellow sand- - - -	1	17
Grayish-white sand- - - - -	1	18
Light yellow sand- - - - -	2	20
Gray sand- - - - -	1	21
Yellow sand- - - - -	5	26
Yellow sand and clay - - - -	1	27
Bluish-gray clay and yellow sand- - - - -	2	29
Yellowish-gray sand- - - - -	4	33
Grayish-white sand- - - - -	1	34
Struck water at 34 feet. Caving at 34 feet. Water level, 33.1 feet below top of ground $\frac{1}{2}$ hour after hole completed. Mar. 13, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 212</u>		
West side State Highway 44, Jas. Power & Jas. Hewitson survey, 15 $\frac{1}{2}$ miles north-east of Refugio.		
Black top soil- - - - -	4	4
Bluish-gray clay and caliche- - - - -	8	12
Yellow clay, sand and caliche- - - - -	4	16
Grayish-yellow clay, sand and caliche- - - - -	4	20
Bluish-gray clay, sand and caliche- - - - -	6	26
Gray sand and clay- - - - -	4	30
Struck water at 29 feet.		

	Thickness (feet)	Depth (feet)
<u>Well 212--Continued</u>		
Water level, 29.0 feet below top of ground $\frac{2}{3}$ hour after hole completed. Mar. 12, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 213</u>		
Alongside State Highway 44, Jas. Power & Jas. Hewitson survey, 14 miles north-east of Refugio.		
Black top soil- - - - -	3	3
Bluish-gray clay and caliche- - - - -	8	11
Bluish-gray clay with yellow ferruginous streaks- - - -	3	14
Bluish-gray and brown clay -	3	17
Light-gray clay and gray sand- - - - -	1	18
Gray clay and sand- - - - -	1	19
Yellowish-gray clay and sand-	1	20
Yellowish-gray silty sand- -	3	23
Gray clay and sand- - - - -	1	24
Struck water at 24 feet. Water level, 22.7 feet below top of ground $\frac{2}{3}$ hour after hole completed. Mar. 12, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 241</u>		
In west ditch of State Highway 44, 50 feet north of culvert at Vidaurri, Juan & Juan Jose Garza & Jose Vidaurri survey, 12 $\frac{1}{2}$ miles northeast of Refugio.		
Black top soil- - - - -	2	2
Yellow clay, sand and caliche- - - - -	1	3
Yellow clay- - - - -	2	5
Bluish-gray clay with yellow ferruginous streaks and caliche- - - - -	7	12
Yellow clay and sand - - - -	1	13
Grayish-white sand- - - - -	4	17
Struck water at 17 feet. Caving at 17 feet. Water level, 15.1 feet below top of ground $\frac{1}{2}$ hour after hole completed. Mar. 8, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 245</u>		
In west ditch of State Highway 44, 835 feet south of north line, John H. Peoples survey, 10 $\frac{1}{2}$ miles northeast of Refugio.		
Light-gray clay with reddish-yellow ferruginous streaks-	1	1
Light-gray clay and sand with red streaks- - - - -	2	3
(Continued on next page)		

Logs of W. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Well 245--Continued</u>		
Gray clay and orange-colored sand- - - - -	1	4
Gray and iron-yellow sand- - - - -	1	5
Light-yellow sand- - - - -	2	7
Bluish-gray clay and yellow sand- - - - -	1	8
Bluish-gray clay- - - - -	2	10
Bluish-gray clay and flint pebbles- - - - -	3	13
Light-gray clay, sand and flint pebbles- - - - -	1	14
Gray clay and sand with yellow streaks- - - - -	1	15
Gray clay and sand- - - - -	1	16
Gray sand- - - - -	1	17
Struck water at 17 feet. Water level, 15.6 feet below top of ground $\frac{1}{2}$ hour after hole completed. Mar. 8, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 246</u>		
Alongside State Highway 44, E. H. Winfield survey, 9 miles northeast of Refugio.		
Black top soil- - - - -	2	2
Bluish-gray clay and caliche- - - - -	11	13
Grayish-yellow clay and sand- - - - -	2	15
Light-yellow sand and caliche- - - - -	2	17
Grayish-yellow sand- - - - -	3	20
Yellow sand- - - - -	3	23
Struck water at 21 feet. Water level, 21.3 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 13, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 254</u>		
In west ditch of county road, $\frac{1}{2}$ mile southeast of Goliad County line, J. Shelly survey, 9 miles north of Refugio.		
Grayish top soil- - - - -	2	2
Yellow clay, sand and caliche- - - - -	3	5
Bluish-gray clay and caliche- - - - -	2	7
Grayish-yellow clay and sand- - - - -	2	9
Bluish-gray clay, sand and caliche, with yellow streaks- - - - -	1	10
Gray clay and sand- - - - -	2	12
Streaked bluish-gray clay and sand- - - - -	4	16
Grayish-yellow silty sand and chalk- - - - -	2	18

	Thickness (feet)	Depth (feet)
<u>Well 254--Continued</u>		
Gray sand- - - - -	1	19
Struck rock at 19 feet. Mar. 16, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 255</u>		
In west ditch of county road, 150 yards south of road junction, John Coughlin survey, $7\frac{1}{2}$ miles north of Refugio.		
Black top soil- - - - -	1	1
Yellow clay and caliche- - - - -	1	2
Yellow sandy clay and caliche- - - - -	3	5
Caliche and bluish-gray clay- - - - -	4	9
Caliche and gray clay- - - - -	1	10
Yellowish-gray sand- - - - -	1	11
Yellowish-gray sandy clay and caliche- - - - -	1	12
Grayish-yellow sand- - - - -	1	13
Bluish-gray clay and chalk- - - - -	1	14
Grayish-yellow clay and sand- - - - -	3	17
Gray clay and sand- - - - -	1	18
Grayish-white sand, streaked iron-yellow- - - - -	1	19
Struck rock at 19 feet. Mar. 17, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 257</u>		
In west ditch of county road, Samuel Blair survey, 6 miles north of Refugio.		
Black top soil- - - - -	1	1
Yellow clay and caliche- - - - -	5	6
Caliche and bluish-gray clay- - - - -	1	7
Bluish-gray clay, sand, and caliche- - - - -	1	8
Gray sand and clay- - - - -	1	9
Gray silty sand- - - - -	3	12
Yellowish-gray sand, clay and caliche- - - - -	7	19
Struck rock at 19 feet. Mar. 16, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 259</u>		
Alongside county road, John Scott survey, 5 miles north of Refugio.		
Top soil and gray clay- - - - -	2	2
Gray clay- - - - -	2	4
Gray clay and sand- - - - -	6	10
Bluish-gray clay with yellow streaks, and sand- - - - -	4	14
Gray clay- - - - -	1	15
Bluish-gray clay and gray sand- - - - -	7	22
Yellowish-gray sand and clay- - - - -	4	26
Struck rock at 26 feet. Mar. 18, 1937.		

Logs of N. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Well 260</u>		
Alongside county road, Isabella Brien survey, 4 miles north of Refugio.		
Top soil- - - - -	2	2
Gray clay and caliche - - -	2	4
Caliche and gray sandy clay-	3	7
Yellowish-gray sand and clay-	2	9
Light yellowish-gray sand- -	1	10
Gray clay- - - - -	1	11
Bluish-gray clay with yellow streaks- - - - -	15	26
Gray clay with brown streaks-	3	29
Yellow clay and sand- - - - -	2	31
Struck rock at 31 feet. Mar. 18, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 266</u>		
Alongside State Highway 44, Wm. Hews & L. Brown survey, 5½ miles northeast of Refugio.		
Black top soil- - - - -	1	1
Grayish-yellow clay - - - -	1	2
Grayish-yellow clay and caliche- - - - -	3	5
Grayish-yellow silty sand and caliche- - - - -	1	6
Light yellow sand- - - - -	3	9
Grayish-white sand and caliche- - - - -	1	10
Grayish-yellow sand and caliche- - - - -	2	12
Yellow "iron" sand- - - - -	1	13
Yellowish-gray sand- - - - -	2	15
Light-gray sand- - - - -	1	16
White and yellow "iron" sand- - - - -	1	17
Yellow "iron" sand- - - - -	3	20
Grayish-yellow sand and clay- - - - -	2	22
Gray sand- - - - -	5	27
Gray sand and clay- - - - -	1	28
Struck water at 27 feet. Water level, 24.4 feet below top of ground 1 hour after hole completed. Feb. 6, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 267</u>		
Alongside State Highway 44, Wm. Hews & L. Brown survey, 7 miles northeast of Refugio.		
Bluish-gray clay- - - - -	2	2
Grayish-yellow clay and caliche- - - - -	3	5
Yellow clay, sand and caliche- - - - -	2	7
Grayish-white sand- - - - -	6	13
Bluish-gray clay and sand- -	1	14

	Thickness (feet)	Depth (feet)
<u>Well 267--Continued</u>		
Bluish-gray clay- - - - -	2	16
Bluish-gray clay and "iron" sand- - - - -	2	18
Gray clay, yellow sand and black mud- - - - -	1	19
Gray clay and sand- - - - -	1	20
Gray silty sand- - - - -	2	22
Gray sand- - - - -	3	25
Struck water at 23 feet. Water level, 21.2 feet below top of ground ¼ hour after hole completed. Feb. 13, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 279</u>		
Alongside Refugio-Austwell road, James Power survey, 7½ miles east of Refugio.		
Black top soil- - - - -	2	2
Grayish-yellow clay - - - -	4	6
Brownish-yellow clay- - - -	3	9
Gray clay- - - - -	3	12
Gray clay and caliche- - -	2	14
Gray clay- - - - -	3	17
Gray clay and caliche- - -	1	18
Bluish-gray clay- - - - -	4	22
Gray clay and caliche- - -	1	23
Bluish-gray clay- - - - -	5	28
Gray sand- - - - -	1	29
Brown clay- - - - -	1	30
Gray sand and clay- - - - -	2	32
Struck water at 32 feet. Water level, 27.5 feet below top of ground ¼ hour after hole completed. Feb. 16, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 284</u>		
Alongside State Highway 44, Isabella Brien survey, 3½ miles northeast of Refugio.		
Top soil and yellow clay- -	2	2
Streaked grayish-yellow clay-	5	7
Gray clay, silty sand and caliche pebbles- - - - -	3	10
Grayish-white sand- - - - -	2	12
Flint rock- - - - -	1	13
Grayish-yellow sand- - - - -	4	17
Struck water at 14 feet. Water level, 13.3 feet below top of ground 1/3 hour after hole completed. Feb. 6, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 290</u>		
Alongside county road, Refugio survey, 1 mile south of Refugio.		
Reddish yellow clay- - - - -	2	2
Yellow sand- - - - -	1	3
Grayish-white sand - - - - -	4	7
(Continued on next page)		

Logs of W. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Well 290--Continued</u>		
Grayish-yellow clay- - - - -	4	11
Very fine-grained white sand-	4	15
Reddish-brown and white sand-	1	16
Gray sand- - - - -	3	19
Gray water sand- - - - -	1	20
Gray and white sand- - - - -	5	25
Light-gray sand- - - - -	4	29
Struck water at 28½ feet. Caving at 29 feet. Water level, 22.9 feet below top of ground ¼ hour after hole completed. Feb. 5, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 292</u>		
Alongside county road, at road junction, Refugio survey, 2-¾ miles south of Refugio.		
Yellow clay and sand- - - - -	3	3
Yellowish-white sand- - - - -	3	6
White sand- - - - -	4	10
White sand and fine caliche gravel- - - - -	12	22
Fine-grained white sand- - - - -	1	23
Very fine-grained white sand- - - - -	2	25
Light-yellowish-gray silty sand- - - - -	2	27
Grayish-white silty sand- - - - -	1	28
Grayish-white sand- - - - -	1	29
Gray sand and clay- - - - -	1	30
White sand- - - - -	1	31
Struck water at 31 feet. Caving at 31 feet. Feb. 5, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 404</u>		
West side State Highway 44, Dona Anastacio Reojas survey, 1½ miles northeast of Woodsboro.		
Grayish-yellow clay- - - - -	3	3
Light-gray clay and sand - - - - -	3	6
Clay, sand and caliche- - - - -	4	10
White sand- - - - -	11	21
Feb. 5, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 417</u>		
West side State Highway 44, J. M. & G. Cobian survey, 3½ miles southwest of Woodsboro.		
Light-gray clay and caliche-	7	7
Reddish-yellow clay and caliche- - - - -	3	10
Reddish-brown clay - - - - -	2	12
Mica- - - - -	1	13
Gray clay- - - - -	1	14
Grayish-yellow clay- - - - -	4	18
Reddish-yellow clay- - - - -	2	20

	Thickness (feet)	Depth (feet)
<u>Well 417--Continued</u>		
Light-yellow sand- - - - -	2	22
Iron-yellow and gray sand-	1	23
Gray sand- - - - -	5	28
Gray clay- - - - -	2	30
Struck water at 27 feet. Water level, 25.2 feet below top of ground 1/3 hour after hole completed. Feb. 9, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 418</u>		
West side State Highway 44, J. M. & G. Cobian survey, 4½ miles southwest of Woodsboro.		
Gray clay- - - - -	5	5
Gray clay and caliche- - - - -	1	6
Bluish-gray clay- - - - -	2	8
Bluish-gray clay and sand-	3	11
Grayish-white sand- - - - -	4	15
Yellow sand- - - - -	1	16
White sand- - - - -	3	19
Bluish-gray clay and sand-	1	20
Bluish-gray clay- - - - -	2	22
Yellow sand- - - - -	1	23
Yellow clay- - - - -	3	26
Struck water at 23 feet. Water level, 22.1 feet below top of ground ¼ hour after hole completed. Feb. 12, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 420</u>		
West side State Highway 44, Jose Maria Aldrote survey, 6½ miles southwest of Woodsboro.		
Gray clay- - - - -	3	3
Gray clay and caliche - - - - -	2	5
Grayish-yellow clay and caliche- - - - -	3	8
Gray sand and caliche- - - - -	4	12
Light-yellow sand- - - - -	1	13
Grayish-white silty sand- - - - -	3	16
Light-yellow silty sand- - - - -	1	17
Light-yellow silty sand with black streaks- - - - -	1	18
Yellow sand- - - - -	1	19
Gray sand, clay and caliche-	1	20
Gray sand with iron-yellow streaks- - - - -	2	22
Reddish-yellow clay- - - - -	4	26
Light-yellow sand- - - - -	2	28
Reddish-yellow clay- - - - -	3	31
Bluish-gray clay- - - - -	1	32
White water sand- - - - -	3	35
Yellow clay- - - - -	1	36
Struck water at 33½ feet. Water level, 32.1 feet below top of ground 1 hour after hole completed. Feb. 1937.		

Logs of W. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Well 421</u>		
West side State Highway 44, Jose Miguel Aldrete and Jose Maria Aldrete survey, 8 miles southwest of Woodsboro.		
Gray clay-	5	5
Yellow clay, caliche and mica-	4	9
Reddish-yellow clay-	3	12
Gray clay and caliche-	7	19
Stratified reddish-brown clay-	7	26
Yellow clay-	1	27
Grayish-yellow clay and sand-	1	28
Reddish-yellow clay-	1	29
Yellow sandy clay-	1	30
Yellow sand-	1	31
Yellow clay and sand-	1	32
Grayish-yellow clay-	1	33
Bluish-yellow clay-	1	34
Reddish-yellow clay-	2	36
Bluish-gray clay-	8	44
Feb. 9, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 422</u>		
West side State Highway 44, Jose Miguel Aldrete and Jose Maria Aldrete survey, 9 miles southwest of Woodsboro.		
Gray sandy top soil-	1	1
Grayish-brown clay-	1	2
Grayish-yellow sand-	2	4
Gray silty sand-	5	9
Grayish-white silty sand-	7	16
Light-gray clay-	2	18
Struck water at 16 feet. Water level, 15.3 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 9, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 505</u>		
Alongside State Highway 44, 15 feet south of San Antonio river bank, Florentino Rios survey, 10 $\frac{1}{2}$ miles northwest of Tivoli.		
Black top soil-	1	1
Gray sand-	1	2
Gray sand, clay and caliche-	1	3
Light-gray sand and clay-	1	4
Yellow clay with gray sand and clay streaks-	6	10
Struck water at 10 feet. Water level, 2.9 feet below top of ground 4 hours after hole completed. Mar. 15, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 511</u>		
Alongside State Highway 113, Edward Perry		

	Thickness (feet)	Depth (feet)
<u>Well 511--Continued</u>		
survey, 9 miles northwest of Tivoli.		
Black top soil-	2	2
Yellow clay and sand-	5	7
Bluish-gray clay with iron-yellow streaks-	2	9
Gray clay and sand-	1	10
Gray clay and sand with iron-yellow streaks-	1	11
Iron-yellow sand-	1	12
Grayish-white sand-	7	19
Coarse-grained yellowish-gray sand-	2	21
Yellowish-gray sand and clay-	1	22
Bluish-gray clay and sand-	1	23
Yellow clay and sand-	1	24
Struck water at 24 feet. Water level, 22.3 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 24, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 516</u>		
South side State Highway 113, Nicholas Fagan survey, 7 miles west of Tivoli.		
Black top soil-	2	2
Gray clay and chalk-	1	3
Yellow clay and chalk-	1	4
Yellow clay and sand-	1	5
Gray clay and sand-	2	7
Yellow clay, streaked iron-yellow, and caliche-	3	10
Yellow clay and sand-	2	12
Gray sand-	1	13
Bluish-gray clay and sand-	1	14
Clay and sand with iron-yellow streaks and caliche-	1	15
Gray sand-	4	19
Gray and yellow sand-	1	20
Yellow and bluish-gray clay, sand and caliche-	1	21
Brown clay with bluish-gray streaks-	9	30
Brownish-yellow clay and sand-	1	31
Struck water at 31 feet. Water level, 28.7 feet below top of ground 1 hour after hole completed. Mar. 9, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 520</u>		
In south ditch of State Highway 113, Mary Byrne survey, 5 $\frac{1}{2}$ miles west of Tivoli.		
Black top soil-	2	2
Yellow sandy clay-	7	9
(Continued on next page)		

Logs of W. P. A. test wells in Refugio County—Continued

	Thickness (feet)	Depth (feet)
<u>Well 520--Continued</u>		
Coarse-grained yellow silty sand- - - - -	3	12
Fine-grained yellow sand- - - - -	1	13
Fine-grained gray sand- - - - -	1	14
Fine-grained grayish-yellow sand- - - - -	1	15
Yellow clay and sand with chalk- - - - -	2	17
Bluish-gray clay - - - - -	3	20
Fine yellow sand- - - - -	1	21
White sand- - - - -	2	23
Yellow sand- - - - -	1	24
Grayish-yellow sand- - - - -	3	27
Yellow sand and bluish-gray clay- - - - -	2	29
Brown clay and sand- - - - -	1	30
Brown sand- - - - -	2	32
Brown clay and sand- - - - -	3	35
Brown sand- - - - -	1	36
Brown clay and sand - - - - -	2	38
Brown quicksand- - - - -	1	39
Struck water at 39 feet. Water level, 38.8 feet below top of ground 1/3 hour after hole completed. Mar. 9, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 522</u>		
Alongside State Highway 113, Wm. Robertson survey, 3 1/2 miles west of Tivoli.		
Dark-brown clay- - - - -	1	1
Dark-gray clay- - - - -	1	2
Yellow clay and sand - - - - -	3	5
Gray clay and lime- - - - -	1	6
Light-yellow sand- - - - -	2	8
Light-gray sand- - - - -	1	9
Light-brown sand- - - - -	2	11
White sand- - - - -	1	12
Light-brown sand- - - - -	2	14
Brown and white sand- - - - -	1	15
Brown sand- - - - -	4	19
Light-brown sand- - - - -	1	20
Brown sand and lime- - - - -	1	21
Brown sand, clay and lime-stone- - - - -	1	22
White and brown sand- - - - -	2	24
Brown sand and clay- - - - -	1	25
Brown clay, sand and lime-stone- - - - -	1	26
Brown sand and clay- - - - -	2	28
Grayish-brown clay and sand- - - - -	1	29
Struck water at 29 feet. Water level, 27.8 feet below top of ground 2/3 hour after hole completed. Mar. 10, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 525</u>		
Alongside State Highway 113, B. C. Bennett survey, 1 1/2 miles west of Tivoli.		
Black top soil- - - - -	2	2
Brown clay and lime - - - - -	1	3
Gray clay and lime- - - - -	1	4
Brown clay and lime- - - - -	1	5
Yellow sand and clay- - - - -	1	6
Yellow sand and limestone - - - - -	1	7
Light-brown sand- - - - -	5	12
White sand- - - - -	3	15
Sand and grayish-brown clay- - - - -	1	16
Brown sand and bluish-gray clay- - - - -	9	25
Grayish-brown clay, sand, and limestone- - - - -	6	31
Grayish-brown clay and sand- - - - -	1	32
Brownish-gray clay and limestone- - - - -	6	38
Light-brownish-gray clay and sand- - - - -	1	39
Struck water at 39 feet. Water level, 37.9 feet below top of ground 1/2 hour after hole completed. Mar. 11, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 534</u>		
In north ditch of State Highway 113, on east side of junction with county road, Lewis Ballard survey, 1/2 mile west of Tivoli.		
Black top soil- - - - -	1	1
Grayish-yellow clay - - - - -	5	6
Light-yellow clay and caliche- - - - -	2	8
Bluish-gray clay with iron-yellow streaks- - - - -	5	13
Gray clay with iron-yellow streaks and gypsum- - - - -	1	14
Bluish-gray clay with yellow streaks- - - - -	10	24
Bluish-gray clay - - - - -	2	26
Bluish-gray sandy clay- - - - -	1	27
Water level, 23.2 feet below top of ground 2/3 hour after hole completed. Feb. 23, 1937.		

	Thickness (feet)	Depth (feet)
<u>Well 542</u>		
Alongside Tivoli-Austwell road, Wm. Wilson survey, 1 1/2 miles south of Tivoli, at Maudlowe.		
Black top soil- - - - -	3	3
Brown clay and sand - - - - -	1	4
Dark brown clay and lime-stone- - - - -	1	5
Gray clay and limestone- - - - -	1	6
(Continued on next page)		

Logs of W. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
<u>Well 542--Continued</u>		
Gray sand- - - - -	1	7
Brownish-gray clay, sand and limestone- - - - -	3	10
Brown and gray sand- - - - -	1	11
White sand- - - - -	1	12
White and brown sand- - - - -	1	13
Gray sand and brown clay - - - - -	1	14
Gray clay and white sand - - - - -	1	15
White and light-brown sand-- - - - - -	2	17
Brown and gray sand- - - - -	2	19
Gray and brown clay- - - - -	3	22
Grayish-brown clay and gray sand- - - - -	1	23
Struck water at 23 feet. Water level, 20.1 feet below top of ground $\frac{2}{3}$ hour after hole completed. Mar. 11, 1937.		

<u>Well 592</u>		
In north ditch of Refugio-Austwell road, at intersection with State Highway 35, Santiago Chirano survey, 10 miles southwest of Tivoli.		
Black top soil- - - - -	2	2
Black top soil and yellow clay- - - - -	1	3
Bluish-gray clay with yellow streaks, mica and gypsum- - - - -	4	7
Brown and bluish-gray clay- - - - -	2	9
Brown clay- - - - -	4	13
Brownish-yellow clay- - - - -	3	16
Yellowish-gray clay - - - - -	2	18
Bluish-gray clay and sand - - - - -	2	20
Grayish-yellow sand and clay- - - - -	2	22
Struck water at 18 feet and at 21 feet. Water level, 17.8 feet below top of ground $\frac{3}{4}$ hour after striking water in clay at 18 feet. Feb. 19, 1937.		

<u>Well 595</u>		
Alongside Refugio-Austwell road, I. & G. N. R.R. Co. survey, 11 miles southwest of Tivoli.		
Black top soil- - - - -	3	3
Bluish-gray clay with yellow streaks- - - - -	3	6
Gray clay, sand and "iron" sand- - - - -	2	8
Bluish-gray clay with iron-yellow streaks- - - - -	2	10
Bluish-gray clay and sand- - - - -	1	11
Fine-grained light-gray sand- - - - -	1	12
Fine-grained yellow sand- - - - -	2	14
Yellow gravelly sand- - - - -	3	17
Struck water at 17 feet. Water level,		

	Thickness (feet)	Depth (feet)
<u>Well 595--Continued</u>		
13.9 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 18, 1937.		

<u>Well 596</u>		
Alongside Refugio-Austwell road, Sumpter Turner survey, 12 miles southwest of Tivoli.		
Black top soil- - - - -	2	2
Gray clay- - - - -	2	4
Grayish-brown clay- - - - -	1	5
Brownish-yellow clay- - - - -	5	10
Gray clay- - - - -	2	12
Gray clay and sand- - - - -	1	13
Bluish-gray clay with iron-yellow streaks- - - - -	3	16
Bluish-gray clay and yellow sand- - - - -	1	17
Bluish-gray clay with yellow streaks- - - - -	1	18
Bluish-gray clay - - - - -	5	23
Gray clay and sand- - - - -	2	25
Struck water at 25 feet. Water level, 24.2 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 18, 1937.		

<u>Well 597</u>		
In west ditch of State Highway 35, 10 feet north of Aransas County line, Luke A. Falvel survey, $12\frac{1}{2}$ miles southwest of Tivoli.		
Black top soil- - - - -	2	2
Bluish-gray clay with iron-yellow streaks- - - - -	3	5
Bluish-gray clay with brown streaks- - - - -	3	8
Grayish-brown clay- - - - -	3	11
Brown clay- - - - -	4	15
Well bored in ditch, which is 2 feet deep. Struck water at 15 feet. Water level, 12.8 feet below bottom of ditch $\frac{3}{4}$ hour after hole completed. Feb. 19, 1937.		

<u>Well 602</u>		
Alongside Refugio-Austwell road, Robert Rogers Heirs survey, $12\frac{1}{2}$ miles southwest of Tivoli.		
Black top soil- - - - -	2	2
Black top soil and caliche- - - - -	2	4
Top soil and sandy clay- - - - -	5	9
Top soil, clay and caliche- - - - -	2	11
Yellow clay- - - - -	2	13
Gray and yellow clay - - - - -	3	16
Gray clay- - - - -	5	21
Gray clay and quicksand- - - - -	3	24
Struck water at 24 feet. Water level, 17.9 feet below top of ground $\frac{1}{2}$ hour after hole completed. Feb. 17, 1937.		

Logs of W. P. A. test wells in Refugio County--Continued

	Thickness (feet)	Depth (feet)
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Well 604

Alongside Refugio-Austwell road, John Roome survey, 14 miles southwest of Tivoli.

Black top soil- - - - -	2	2
Gray clay- - - - -	3	5
Gray clay and caliche - - -	3	8
Yellow clay- - - - -	6	14
Yellow clay and sand- - - -	2	16
Gray clay and quicksand- -	5	21
Struck water at 21 feet. Water level, 18.2 feet below top of ground $\frac{1}{4}$ hour after hole completed. Feb. 17, 1937.		

Well 608

Alongside Refugio-Austwell road, I. & G. N. R.R. Co. survey, 16 miles southwest of Tivoli.

Black top soil- - - - -	4	4
Grayish-yellow clay- - - -	7	11
Yellow clay- - - - -	3	14
Brownish-yellow clay- - - -	4	18
Gray clay- - - - -	3	21
Bluish-gray clay- - - - -	3	24
Gray clay and sand- - - - -	3	27
Gray clay and caliche - - -	8	35

	Thickness (feet)	Depth (feet)
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Well 608--Continued

Gray sand- - - - -	5	40
Gray clay- - - - -	1	41
Struck water at 40 feet. Water level, 37.9 feet below top of ground $\frac{1}{4}$ hour after hole completed. Feb. 16, 1937.		

Well 609

Alongside Refugio-Austwell road, Jas. M. Cross survey, 15 miles southwest of Tivoli.

Black top soil- - - - -	2	2
Black top soil and clay - -	2	4
Gray clay- - - - -	1	5
Gray clay and sand- - - - -	3	8
Yellow clay- - - - -	6	14
Brown clay- - - - -	2	16
Brown clay and caliche- - -	1	17
Brown clay and sand- - - -	1	18
Brown clay- - - - -	1	19
Gray clay and sand- - - - -	2	21
Gray clay, sand and caliche-	1	22
Gray clay and sand- - - - -	1	23
Gray clay, sand and caliche-	4	27
Struck rock at 27 feet. F.b. 17, 1937.		

Partial analyses of water from wells in Refugio County, Texas

(Analyzed at the University of Texas under the direction of Dr. E. P. Schoch, Director of the Bureau of Industrial Chemistry; by J. E. Stulken, D. F. Riddell, H. T. Davidson, Floyd H. Ward and F. G. Steer, Chemists; and J. A. Harmaza, Martin Wieland, and Jack Ramsey, Assistant Chemists. Nitrate determined by E. W. Lohr, U. S. Geological Survey. Results are in parts per million. Well numbers correspond to numbers in table of well records.)

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
201	James Waelder	75	Mar. 17, 1937	-	-	-	-	-	118	340	b/	-
202	do.	70	do.	439	-	-	-	293	20	106	b/	-
203	do.	70	Mar. 16, 1937	245	34	12	48	195	10	46	b/	132
208	D. M. O'Conner Est.	865	Mar. 13, 1937	1,201	-	-	-	342	76	520	b/	-
210	do.	860	do.	812	22	13	282	415	76	215	b/	108
212	W. P. A. test	30	Mar. 12, 1937	-	-	-	-	-	70	230	b/	-
213	do.	24	do.	978	-	-	-	189	206	325	b/	-
214	James Power	60	Mar. 13, 1937	408	-	-	-	195	25	136	b/	-
215	do.	70	do.	645	34	20	188	232	59	230	b/	167
216	J. F. Power	60	Mar. 15, 1937	-	-	-	-	-	51	200	b/	-
217	do.	70	do.	428	-	-	-	256	26	116	b/	-
218	do.	60	Mar. 16, 1937	549	26	13	176	317	28	150	b/	118
219	James Waelder	870	Mar. 17, 1937	707	35	17	222	433	80	140	b/	155
220	do.	75	do.	371	-	-	-	207	29	102	b/	-
221	do.	75	do.	765	49	24	220	464	68	175	b/	220
222	do.	860	do.	733	-	-	-	390	93	180	b/	-
223	do.	75	do.	466	39	18	118	256	34	125	b/	171
224	do.	70	do.	-	-	-	-	-	63	170	b/	-
225	do.	850	do.	753	47	38	190	342	76	230	b/	273
226	do.	60	do.	-	-	-	-	-	139	420	b/	-
227	-- West Est.	50	Mar. 18, 1937	-	-	-	-	-	122	355	b/	-
229	J. J. O'Brien	800	Mar. 1, 1937	763	-	-	-	287	80	265	b/	-
230	do.	75	do.	-	-	-	-	-	80	325	b/	-
232	James Waelder	860	Mar. 16, 1937	836	24	13	286	354	84	250	b/	113
233	do.	860	do.	934	-	-	-	342	97	330	b/	-
235	do.	65	do.	355	-	-	-	159	28	106	b/	-
236	do.	940	do.	804	-	-	-	372	76	250	b/	-
237	J. F. Power	60	do.	523	56	15	126	195	15	215	b/	204
238	do.	75	do.	190	-	-	-	159	14	26	b/	-
240	James Power	60	Mar. 13, 1937	182	28	7	27	98	12	29	31	99

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

Partial analyses of water from wells in Refugio County--Continued

Results are in parts per million.

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
242	Power & Waelder	60	Mar. 13, 1937	234	-	-	-	214	13	26	b/	-
243	James Waelder	60	do.	241	-	-	-	207	13	34	b/	-
244	do.	65	do.	-	-	-	-	-	15	115	b/	-
245	W. P. A. test	17	Mar. 8, 1937	-	-	-	-	-	14	34	64	-
246	do.	23	Feb. 13, 1937	861	-	-	-	366	41	320	b/	-
248	J. J. O'Brien	900	Mar. 1, 1937	797	-	-	-	342	89	250	b/	-
249	do.	800	do.	755	-	-	-	372	96	200	b/	-
250	do.	900	do.	825	22	23	270	378	89	235	b/	149
251	do.	800	do.	862	-	-	-	268	85	340	b/	-
252	Howard West	40	Mar. 18, 1937	1,035	-	-	-	378	114	360	b/	-
253	do.	40	do.	581	43	37	127	226	63	200	b/	258
261	J. J. O'Brien	800	Mar. 1, 1937	786	-	-	-	366	89	230	b/	-
262	do.	75	do.	1,303	64	60	337	195	196	550	b/	407
263	do.	800	do.	826	-	-	-	305	89	285	b/	-
264	do.	900	do.	861	18	7	310	354	107	245	b/	74
265	do.	-	do.	1,107	-	-	-	207	218	400	b/	-
267	W. P. A. test	25	Feb. 13, 1937	365	-	-	-	336	24	32	b/	-
270	Mrs. M. F. Lambert	60	Feb. 15, 1937	362	-	-	-	329	10	50	b/	-
272	do.	843	do.	954	27	9	332	317	99	330	b/	106
273	Tom O'Connor	960	Feb. 18, 1937	887	-	-	-	293	99	325	b/	-
274	do.	960	do.	1,056	22	7	385	390	90	360	b/	84
275	do.	80	do.	-	-	-	-	-	108	730	b/	-
276	do.	960	do.	942	-	-	-	329	99	340	b/	-
277	do.	960	do.	1,028	-	-	-	403	90	365	b/	-
278	do.	960	Feb. 17, 1937	970	-	-	-	354	99	345	b/	-
279	W. P. A. test	32	Feb. 16, 1937	13,578	-	-	-	73	2,918	6,000	-	-
280	Tom O'Connor	960	Feb. 17, 1937	967	-	-	-	329	90	360	b/	-
281	do.	950	do.	1,009	7	9	377	305	86	380	b/	56
282	do.	960	Feb. 18, 1937	953	-	-	-	329	90	355	b/	-
283	T. M. O'Connor	920	Feb. 16, 1937	984	14	7	367	439	90	290	b/	64
284	W. P. A. test	17	Feb. 6, 1937	-	-	-	-	-	408	350	b/	-
286	J. J. O'Brien	65	Feb. 15, 1937	2,053	-	-	-	360	369	790	b/	-
287	Mrs. Frank Munsch	-	do.	962	22	20	331	531	108	220	b/	137
288	Mrs. J. Mitchell	50	Feb. 5, 1937	892	-	-	-	329	69	335	b/	-

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

Partial analyses of water from wells in Refugee County--Continued

Results are in parts per million.

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
289	Mrs. J. Mitchell	--	Feb. 6, 1937	-	-	-	-	-	60	280	b/	-
290	W. P. A. test	29	Feb. 5, 1937	875	-	-	-	488	73	235	b/	-
291	Jas. Power	40	do.	-	-	-	-	-	18	216	b/	-
293	Walter Boenig	60	do.	-	-	-	-	-	16	220	b/	-
297	T. M. O'Connor Est.	800	Feb. 16, 1937	-	-	-	-	-	30	625	b/	-
299	Jno. J. O'Brien	-	Feb. 7, 1937	-	-	-	-	-	352	1,100	b/	-
300	T. M. O'Connor Est.	800	Feb. 16, 1937	1,024	11	9	383	439	90	315	b/	66
301	Tom O'Connor	840	Feb. 5, 1937	991	4	14	367	378	95	325	b/	69
302	do.	840	do.	932	-	-	-	378	86	320	b/	-
303	do.	840	Feb. 17, 1937	1,002	-	-	-	390	95	350	b/	-
305	do.	1,000	Feb. 18, 1937	1,016	13	2	391	439	69	325	b/	41
306	do.	960	Feb. 17, 1937	1,088	-	-	-	427	90	390	b/	-
307	do.	960	do.	1,411	21	2	535	409	82	570	b/	61
308	do.	960	Feb. 18, 1937	1,086	-	-	-	378	95	410	b/	-
309	do.	950	Feb. 17, 1937	1,125	16	3	426	427	95	375	b/	52
310	do.	832	do.	1,256	17	2	476	378	95	480	b/	51
311	do.	930	do.	1,830	18	4	698	488	120	750	b/	63
312	do.	840	do.	2,031	18	4	778	525	133	840	b/	63
402	Mrs. B. M. Scott	65	Feb. 5, 1937	730	-	-	-	348	77	215	b/	-
403	do.	65	do.	661	30	19	210	439	38	148	b/	152
404	W. P. A. test	21	do.	327	-	-	-	244	32	52	b/	-
405	H. A. Boenig	50	Feb. 12, 1937	1,170	124	30	252	134	60	485	153	433
406	Mrs. Mannie Wood	50	do.	-	-	-	-	-	77	525	b/	-
408	do.	60	do.	480	26	20	132	171	38	180	b/	147
409	C. I. Terrell	600	do.	788	34	4	272	403	77	200	b/	103
410	do.	600	Feb. 10, 1937	967	18	3	360	403	103	285	b/	57
411	George Roache	65	do.	2,172	-	-	-	256	292	990	b/	-
414	Mrs. L. D. Thompson	60	do.	2,999	-	-	-	232	172	1,640	b/	-
415	George Roache	60	do.	3,757	247	116	995	122	369	1,970	b/	1,097
416	do.	-	do.	2,020	-	-	-	122	240	1,010	b/	-
417	W. P. A. test	30	Feb. 9, 1937	-	-	-	-	-	3,605	9,100	-	-
418	do.	26	Feb. 12, 1937	-	-	-	-	-	519	1,750	b/	-
419	George Roache	60	Feb. 10, 1937	1,634	-	-	-	207	150	800	b/	-
420	W. P. A. test	36	Feb. --, 1937	17,787	-	-	-	98	3,004	8,600	-	-

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

100
100

Partial analyses of water from wells in Refugio County--Continued

Results are in parts per million.

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
422	W. P. A. test	18	Feb. 9, 1937	519	83	26	58	189	135	74	50	316
501	D. M. O'Connor Est.	75	Mar. 13, 1937	-	-	-	-	-	55	210	b/	-
502	do.	880	Mar. 12, 1937	699	-	-	-	317	89	200	b/	-
503	do.	75	do.	343	-	-	-	244	27	62	b/	-
504	do.	75	do.	430	96	14	54	390	20	54	b/	299
505	W. P. A. test	10	Mar. 15, 1937	-	-	-	-	-	31	106	b/	-
507	D. M. O'Connor Est.	90	Mar. 13, 1937	973	-	-	-	122	190	370	b/	-
508	do.	85	do.	-	-	-	-	-	26	130	b/	-
510	E. T. Morrow	60	Mar. 9, 1937	359	30	14	87	165	34	102	b/	134
511	W. P. A. test	24	Feb. 24, 1937	3,813	-	-	-	61	41	2,350	22	-
512	W. Avery Est.	60	Mar. 13, 1937	327	-	-	-	171	20	74	32	-
513	R. A. Morrow	60	do.	-	-	-	-	-	72	150	132	-
514	D. M. O'Connor Est.	960	Mar. 14, 1937	1,012	11	2	393	390	17	385	b/	36
515	do.	840	do.	846	-	-	-	378	80	270	b/	-
516	W. P. A. test	31	Mar. 9, 1937	-	-	-	-	-	60	112	b/	-
517	P. H. Fagan Est.	75	do.	254	20	12	66	195	14	46	b/	97
518	do.	60	do.	308	-	-	-	244	15	46	b/	-
519	T. C. Holeman	65	do.	-	-	-	-	-	17	66	b/	-
521	Martin O'Connor	60	do.	-	-	-	-	-	30	100	b/	-
522	W. P. A. test	29	Mar. 10, 1937	-	-	-	-	-	32	110	b/	-
523	Martin O'Connor	945	Feb. 24, 1937	932	-	-	-	354	72	345	b/	-
524	A. Rathkamp	60	Mar. 9, 1937	318	-	-	-	244	17	60	b/	-
525	W. P. A. test	39	Mar. 11, 1937	-	-	-	-	-	14	42	b/	-
526	Al Schultz	-	Mar. 2, 1937	323	-	-	-	268	15	52	b/	-
527	Lee Huffman	60	Mar. 9, 1937	401	10	15	131	287	38	66	b/	89
528	Martin O'Connor	943	Feb. 24, 1937	878	20	2	328	342	55	305	b/	56
529	Edward Rathkamp	46	Mar. 9, 1937	452	21	17	134	275	30	106	b/	120
531	P. R. Austin Est.	75	Feb. 25, 1937	-	-	-	-	-	85	210	b/	-
532	Ernest Pagel	55	do.	-	-	-	-	-	115	325	40	-
533	John Beckman	62	do.	901	52	29	241	146	162	340	b/	248
534	W. P. A. test	27	Feb. 23, 1937	2,416	-	-	-	153	955	600	b/	-
535	City of Tivoli	1,148	Feb. 25, 1937	1,197	14	4	462	464	29	460	b/	53
536	G. W. Gullett	137	do.	-	-	-	-	-	119	860	b/	-
537	Ernest Landgraf	418	Feb. 24, 1937	889	25	18	305	415	47	290	b/	136

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

Partial analyses of water from wells in Refuge County--Continued

Results are in parts per million.

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
538	O. F. Hartmann	Spring	Feb. 25, 1937	1,493	53	45	443	146	125	700	55	318
539	do.	60	do.	-	-	-	-	-	217	490	b/	-
540	Temple Lumber Co.	300	do.	1,565	110	49	417	207	107	780	b/	475
541	Martin O'Connor	980	Feb. 23, 1937	-	-	-	-	-	103	440	b/	-
542	W. P. A. test	23	Mar. 11, 1937	-	-	-	-	-	21	32	b/	-
544	Martin O'Connor	978	Feb. 23, 1937	925	-	-	-	378	81	320	b/	-
545	do.	960	do.	1,186	13	2	459	543	95	350	b/	41
546	do.	935	do.	899	-	-	-	342	77	325	b/	-
547	do.	970	do.	1,010	-	-	-	427	86	340	b/	-
548	do.	1,002	do.	1,024	-	-	-	451	86	340	b/	-
549	do.	860	do.	912	-	-	-	342	60	350	b/	-
550	do.	978	do.	889	-	-	-	342	82	315	b/	-
551	do.	1,075	Feb. 24, 1937	1,091	-	-	-	512	60	375	b/	-
552	do.	840	do.	910	-	-	-	317	77	345	b/	-
553	do.	1,000	do.	952	19	1	355	345	77	350	b/	51
554	D. M. O'Connor Est.	140	do.	364	57	11	40	98	-	40	138	186
555	do.	900	do.	870	-	-	-	342	74	310	b/	-
556	do.	980	Mar. 14, 1937	962	-	-	-	329	80	370	b/	-
557	do.	860	Mar. 19, 1937	-	-	-	-	-	89	310	b/	-
558	do.	850	do.	922	23	8	324	281	85	330	b/	90
559	do.	970	do.	868	-	-	-	354	55	320	b/	-
560	do.	870	do.	922	-	-	-	329	89	340	b/	-
561	do.	980	do.	951	-	-	-	354	80	350	b/	-
562	do.	850	do.	954	15	9	348	342	89	325	b/	76
563	do.	840	do.	951	-	-	-	342	76	360	b/	-
564	do.	850	do.	-	-	-	-	-	80	340	b/	-
566	Martin O'Connor	973	Feb. 24, 1937	1,016	-	-	-	384	64	390	b/	-
567	do.	950	do.	904	-	-	-	403	107	270	b/	-
568	do.	75	Feb. 23, 1937	222	5	2	79	49	9	100	b/	21
569	do.	1,212	do.	1,945	22	4	744	390	43	940	b/	73
570	do.	1,187	Feb. 24, 1937	1,087	-	-	-	464	124	340	b/	-
571	do.	1,217	do.	1,334	22	4	515	549	13	510	b/	73
572	do.	68	Feb. 23, 1937	-	-	-	-	-	38	175	b/	-
573	do.	1,138	do.	1,525	19	1	585	512	108	560	b/	50

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

Partial analyses of water from wells in Refugio County--Continued

Results are in parts per million.

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
574	Martin O'Connor	93	Feb. 23, 1937	-	-	-	-	-	95	280	b/	-
576	do.	960	do.	1,025	-	-	-	415	86	360	b/	-
577	do.	1,000	do.	902	-	-	-	427	86	275	b/	-
579	L. Fulevens	243	Mar. 2, 1937	-	-	-	-	-	63	375	20	-
580	M. J. Adair	240	do.	-	-	-	-	-	93	810	b/	-
581	W. A. Davis	200	do.	-	-	-	-	-	148	320	b/	-
582	City of Austwell	560	--	1,219	32	13	431	354	59	510	b/	133
583	H. H. McDowell	160	Feb. 25, 1937	2,492	-	-	-	329	793	700	b/	-
584	do.	170	do.	1,668	-	-	-	293	410	540	b/	-
585	do.	273	do.	731	16	14	240	244	136	190	b/	99
586	San Antonio Joint Stock & Land Bank	252	Mar. 2, 1937	739	37	18	234	488	55	155	b/	166
587	Temple Investment Co.	350	do.	-	-	-	-	-	107	350	b/	-
588	-- Plumber	-	do.	2,023	-	-	-	598	127	850	b/	-
589	San Antonio Joint Stock & Land Bank	-	do.	1,216	-	-	-	451	194	365	b/	-
590	Mrs. Emma Becker	265	do.	1,073	16	12	384	445	165	270	b/	87
592	W. P. A. test	22	Feb. 19, 1937	-	-	-	-	-	2,189	7,750	b/	-
594	Martin O'Connor	1,050	Feb. 23, 1937	1,175	-	-	-	500	120	375	b/	-
595	W. P. A. test	17	Feb. 18, 1937	4,893	-	-	-	214	515	2,550	b/	-
596	do.	25	do.	-	-	-	-	-	986	3,150	b/	-
597	do.	15	Feb. 19, 1937	-	-	-	-	-	2,575	1,220	b/	-
602	do.	24	Feb. 17, 1937	3,344	-	-	-	98	339	1,780	b/	-
604	do.	21	do.	18,024	-	-	-	207	2,832	8,850	b/	-
607	Tom O'Connor	110	Feb. 18, 1937	2,167	107	72	630	207	a/	1,250	b/	564
608	W. P. A. test	41	Feb. 16, 1937	5,481	-	-	-	244	1,395	2,110	b/	-

a/ Sulphate less than 10 parts per million.

b/ Nitrate less than 20 parts per million.

Partial analyses of water from wells in Goliad County, Texas

(Analyzed at the University of Texas under the direction of Dr. E. P. Schoch, Director of the Bureau of Industrial Chemistry; by J. E. Stulken, D. F. Riddell, H. T. Davidson, Floyd H. Ward and F. G. Steer, Chemists; and J. A.

Harmaza, Martin Wieland, and Jack Ramsey, Assistant Chemists. Nitrate determined by E. W. Lohr, U. S.

Geological Survey. Results are in parts per million. Well numbers correspond to numbers in table of well records.)

Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na + K) (calculated)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
701	C. L. Prescott	63	Mar. 27, 1937	492	-	-	-	232	54	136	a/	-
702	W. Z. Rigby	70	do.	409	-	-	-	238	31	104	a/	-
703	Emil Williams	54	do.	509	56	18	111	250	35	138	28	216
704	Mrs. Mary Blackburn	70	do.	874	-	-	-	183	88	380	a/	-
705	Dr. L. W. Chilton	60	do.	920	80	30	228	329	100	320	a/	324
706	H. Friedrichs	90	do.	484	68	20	83	189	35	152	33	252
707	Catherine Foster	80	do.	2,116	-	-	-	140	167	1,120	a/	-
708	Geo. Hecht	80	Mar. 26, 1937	1,787	126	59	443	98	197	820	94	556
709	J. J. O'Brien	75	Mar. 25, 1937	981	-	-	-	207	120	410	a/	-
710	do.	900	do.	553	-	-	-	317	50	138	a/	-
711	do.	65	do.	701	42	27	179	268	112	165	44	217
712	do.	75	do.	-	-	-	-	-	206	810	a/	-
713	E. C. Friedrichs	68	do.	913	-	-	-	220	65	410	a/	-
714	Albert Friedrichs	70	do.	510	20	27	133	195	46	150	38	162
715	J. J. O'Brien	900	Mar. 26, 1937	738	30	27	218	354	96	190	a/	187
716	do.	-	do.	766	-	-	-	189	100	300	a/	-
717	Will Shelton	80	do.	2,088	-	-	-	55	239	1,090	a/	-
718	A. Friedrich	65	do.	408	-	-	-	250	46	84	a/	-
719	John Powers	75	do.	785	-	-	-	73	81	390	a/	-
720	do.	75	do.	1,088	-	-	-	226	185	405	a/	-
721	do.	75	do.	1,005	40	33	291	256	185	330	a/	235
722	do.	80	do.	783	-	-	-	250	143	240	a/	-
723	A. Friedrich	75	do.	1,321	-	-	-	159	239	545	a/	-
724	Joe McGuill	70	Mar. 27, 1937	1,202	-	-	-	146	173	535	a/	-
726	M. McGuill	48	Mar. 24, 1937	586	-	-	-	256	47	188	a/	-
727	Mary McGuill	70	Mar. 27, 1937	968	-	-	-	140	135	420	a/	-
728	do.	60	Mar. 24, 1937	2,054	186	79	439	85	236	930	142	788
729	Mrs. E. B. Tuttle	70	Mar. 27, 1937	444	56	20	84	153	39	170	a/	222
730	Joe Williams	70	Mar. 24, 1937	-	-	-	-	-	192	930	a/	-
731	Nora Plummer	83	do.	1,005	-	-	-	268	51	450	a/	-
732	J. J. O'Brien	65	Mar. 25, 1937	977	-	-	-	159	123	430	a/	-

a/ Nitrates less than 20 parts per million..

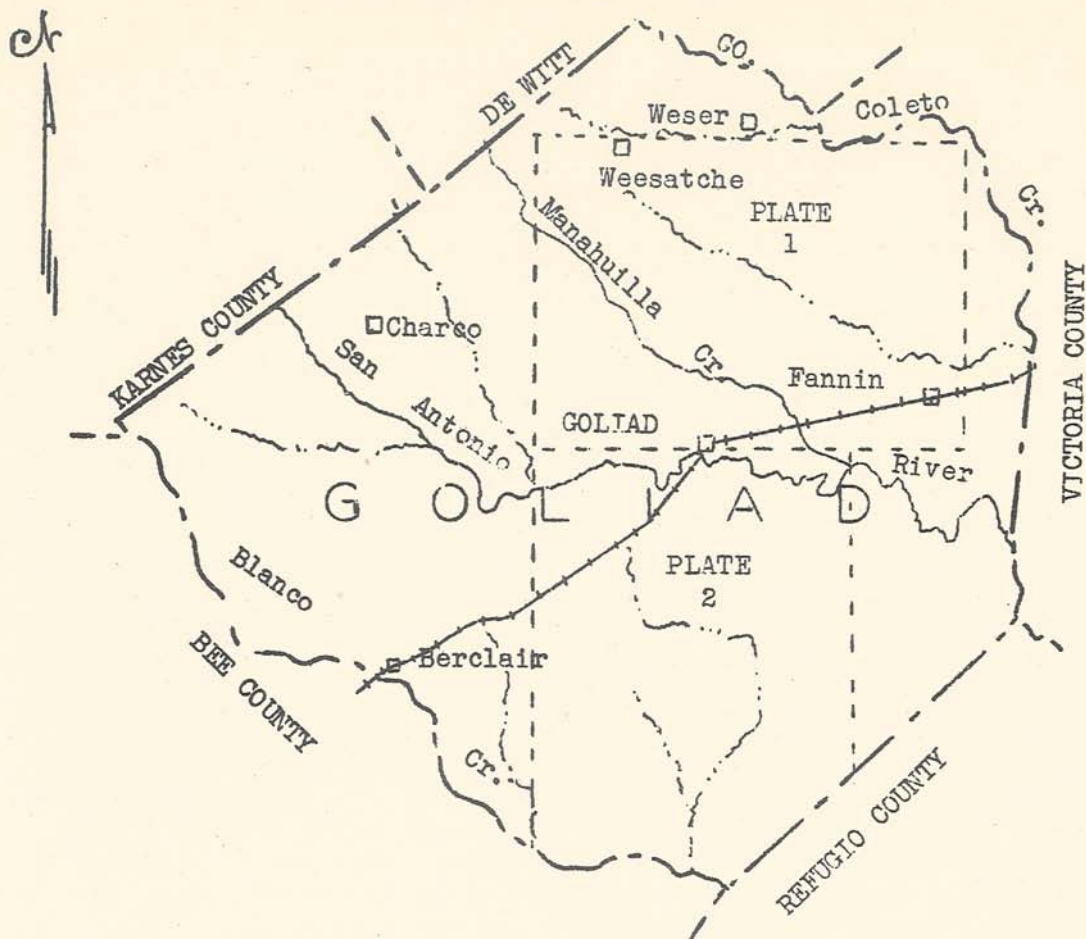
Partial analyses of water from wells in Goliad County--Continued

Results are in parts per million.

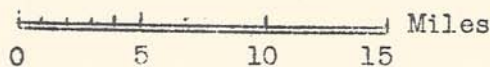
Well No.	Owner	Depth of well (ft.)	Date of collection	Total dissolved solids (calculated)	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na / K) (calculated)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃ (calculated)
733	J. J. O'Brien	65	Mar. 25, 1937	902	-	-	-	122	112	410	a/	-
735	do.	70	do.	905	103	25	210	336	72	330	a/	360
736	do.	75	do.	1,708	134	62	398	61	196	800	88	588
737	do.	65	do.	1,132	94	45	271	268	120	470	a/	418
738	do.	65	do.	-	-	-	-	-	112	750	38	-
739	do.	70	do.	549	-	-	-	220	51	190	a/	-
740	M. E. O'Connor	101	Oct. 15, 1937	725	47	14	219	390	72	180	a/	725
741	T. J. Heard	71	Oct. 7, 1937	515	97	14	84	323	20	138	a/	299
743	O'Connor Ranch	78	do.	1,310	145	35	301	384	149	490	a/	507
744	Lawrence O'Connor	99	Oct. 15, 1937	1,333	128	26	343	344	141	520	a/	426
745	Mrs. R. R. LeMaster	95	Oct. 7, 1937	373	22	10	113	281	14	60	a/	96
746	Lee Swickheimer	107	Oct. 15, 1937	525	75	15	110	342	33	124	a/	249
747	State of Texas	86	Oct. 6, 1937	587	23	16	180	201	64	196	a/	125
748	South Texas Cotton Oil Co.	68	Oct. 14, 1937	931	113	25	199	293	127	305	a/	385
749	C. R. Chance	54	do.	750	112	19	150	366	61	225	a/	357
750	State of Texas	173	Oct. 6, 1937	642	104	21	129	378	44	158	a/	348
751	do.	120	Oct. 8, 1937	669	116	21	112	378	51	182	a/	378
752	City of Goliad	325	Oct. 6, 1937	418	42	20	86	268	36	102	a/	187
754	A. G. Riemschneider	710	Oct. 13, 1937	884	100	40	167	165	84	370	42	415

a/ Nitrate less than 20 parts per million.

INDEX MAP OF GOLIAD COUNTY, TEXAS,
SHOWING AREAS COVERED BY PLATES 1 AND 2.



Scale



Base compiled from topographic sheets
and field notes.

Field work by E. J. Michal

Texas Board of Water Engineers
assisted by U. S. Geological Survey

EXPLANATION

- Well with hand pump.
- Well with windmill or small power pump.
- ⊙ Well with pumping plant (5 horsepower or larger).
- Flowing well.
- Test well drilled by W.P.A. labor.

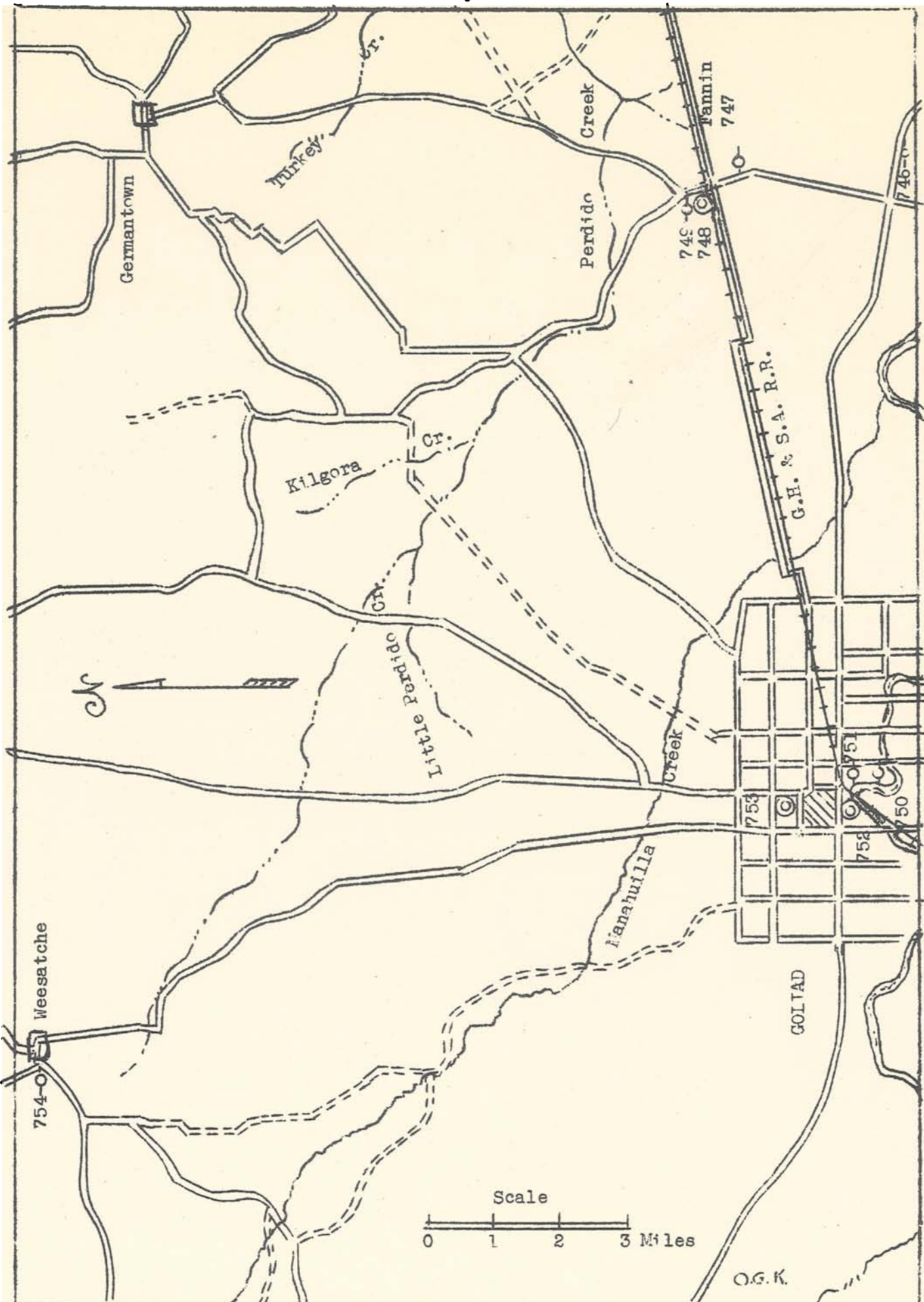


PLATE 1

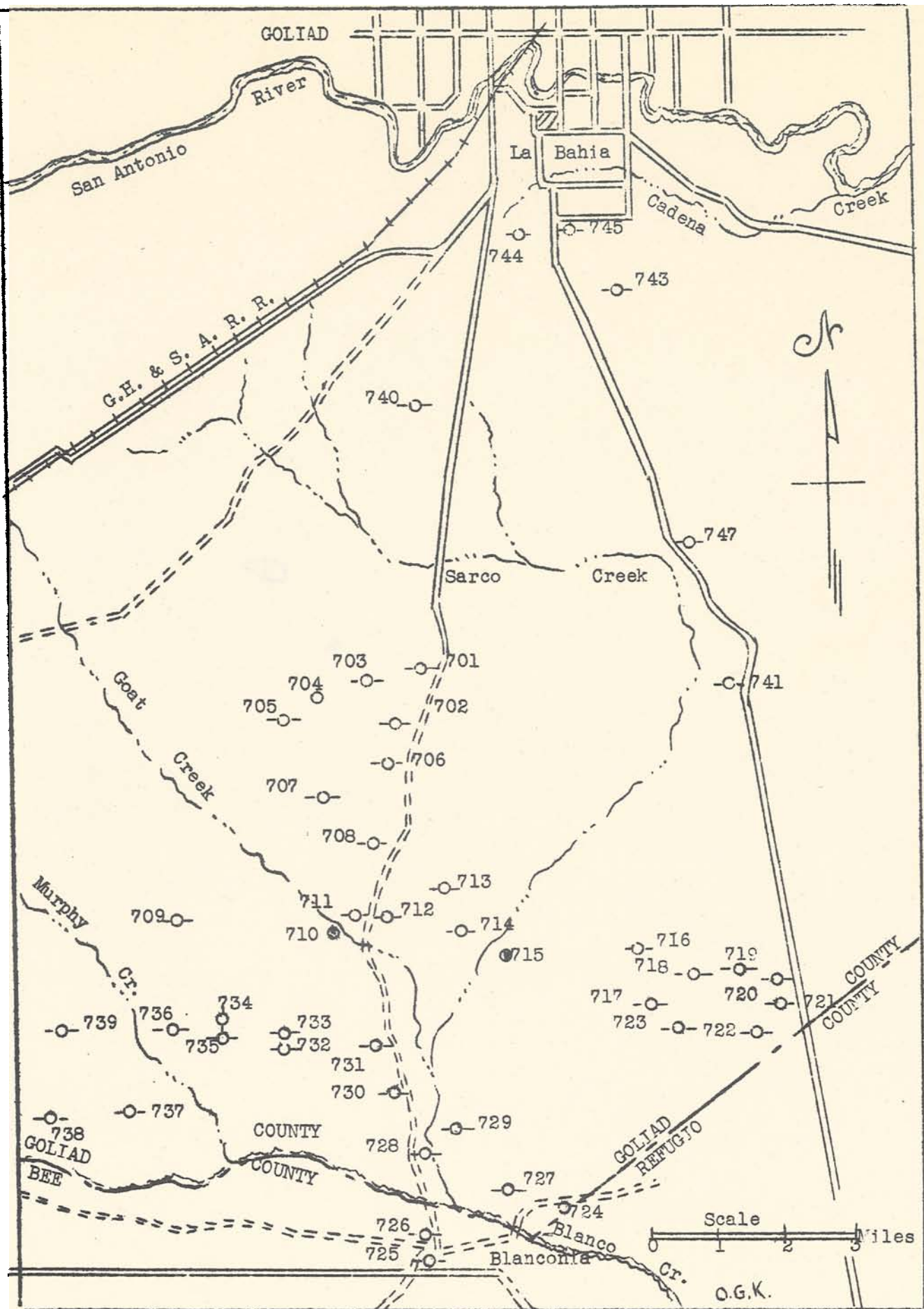
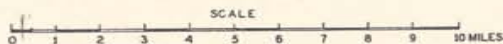


PLATE 2

MAP OF REFUGIO COUNTY, TEXAS

SHOWING LOCATIONS OF WATER WELLS LISTED



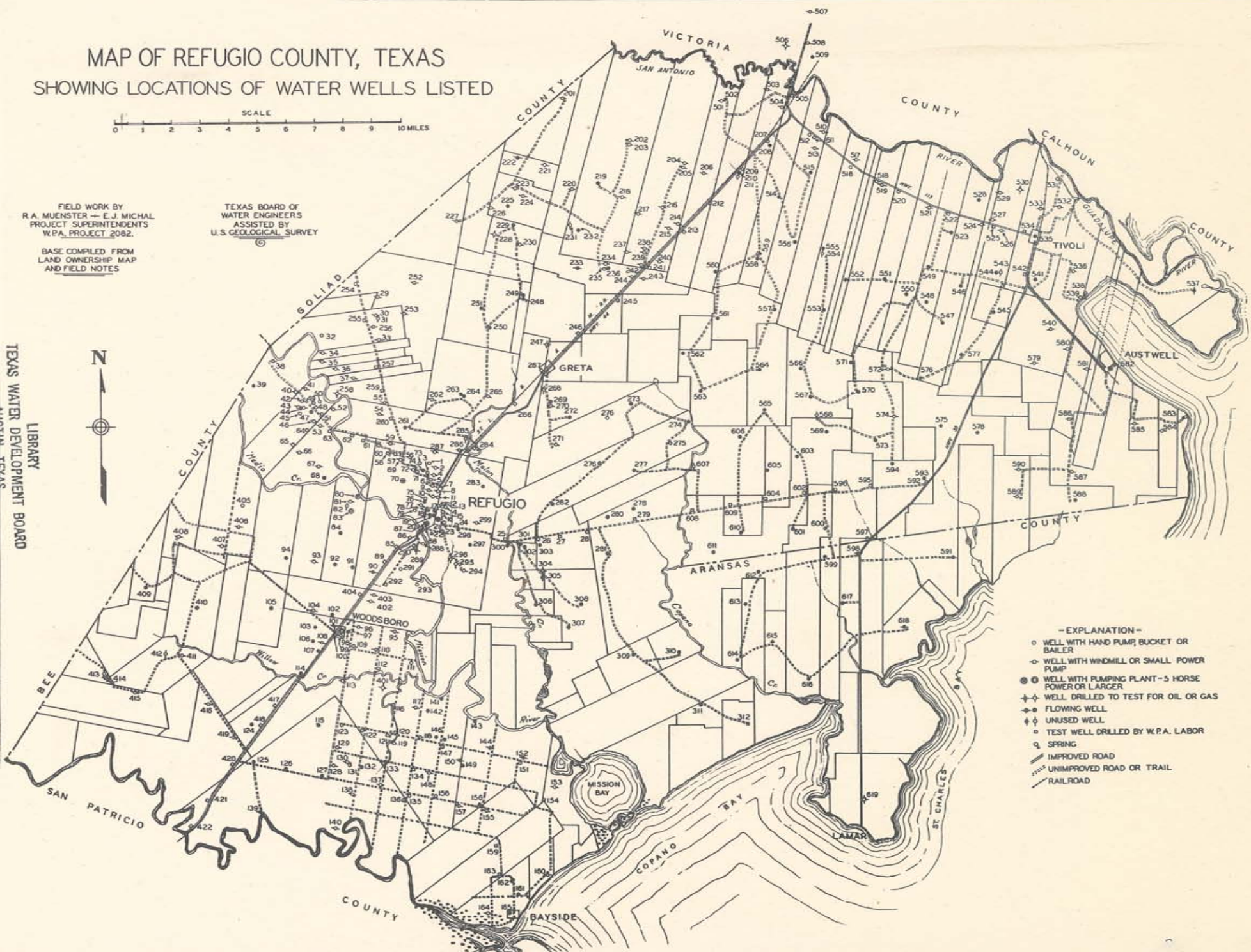
FIELD WORK BY
R.A. MUENSTER + E.J. MICHAL
PROJECT SUPERINTENDENTS
W.P.A. PROJECT 2082.

TEXAS BOARD OF
WATER ENGINEERS
ASSISTED BY
U.S. GEOLOGICAL SURVEY

BASE COMPILED FROM
LAND OWNERSHIP MAP
AND FIELD NOTES



LIBRARY
TEXAS WATER DEVELOPMENT BOARD
AUSTIN, TEXAS



- EXPLANATION -
- WELL WITH HAND PUMP, BUCKET OR BAILER
 - ◊ WELL WITH WINDMILL OR SMALL POWER PUMP
 - WELL WITH PUMPING PLANT - 5 HORSE POWER OR LARGER
 - ⊕ WELL DRILLED TO TEST FOR OIL OR GAS
 - ⊖ FLOWING WELL
 - ⊙ UNUSED WELL
 - ⊕ TEST WELL DRILLED BY W.P.A. LABOR
 - SPRING
 - IMPROVED ROAD
 - - - UNIMPROVED ROAD OR TRAIL
 - RAILROAD