STRATIGRAPHIC NOMENCLATURE AND GEOLOGIC SECTIONS OF THE GULF COASTAL PLAIN OF TEXAS

By E.T. Baker, Jr.

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Stratigraphic Nomenclature and Geologic Sections of the Gulf Coastal Plain of Texas

By E.T. Baker, Jr.

Abstract

Geologic sections showing the subsurface delineation of approximately 100 stratigraphic units composing the Mesozoic and Cenozoic Eras illustrate the interrelation of these units across most of the Gulf Coastal Plain of Texas. The geologic names that constitute the nomenclature have been published, and the vast majority are approved for use by the U.S. Geological Survey. Four dip sections and four strike sections, extending from the land surface to a maximum of about 18,000 feet below sea level, provide continuity of correlation from the outcrop to the deep subsurface. Stratigraphic units containing water with less than 3,000 milligrams per liter concentration of dissolved solids are shown on the geologic sections and serve as an indicator of water quality in the Gulf Coastal Plain of Texas.

INTRODUCTION

This report presents the stratigraphic nomenclature and illustrates the subsurface geology with geologic sections for approximately 90,000 mi^2 of the Gulf Coastal Plain of Texas. That part of the subsurface containing water with less than 3,000 mg/L (milligrams per liter) concentration of dissolved solids also is shown on the sections. The many lithologic changes within stratigraphic units downdip and along strike, with attendant changes in nomenclature, have caused problems in identifying and correlating the units—problems which this report attempts to mitigate. This report is a contribution of the U.S. Geological Survey's Regional Aquifer-System Analysis (RASA) program to investigate regional ground-water systems nationwide. More specifically, the purpose of this report is to present geologic sections showing the geologic framework of the Texas part of the Gulf Coast RASA, a study that included only the Coastal Plain sediments of Tertiary and younger age in all or parts of 10 states (Grubb, 1984). The geologic sections in this report also include thousands of feet of Cretaceous rocks in Texas that were studied by the Edwards-Trinity RASA (Bush, 1986). The Gulf Coastal Plain of Texas, the study area, and the geographic subareas are shown in figure 1 (at end of report); the geologic sections are presented as figures 2–9 (at end of report) and also are duplicated in larger form as plates 1–8 in the pocket in back of this report.

Geologic sections, type logs of oil fields including faunal occurrences, and field reports by the Corpus Christi Geological Society, East Texas Geological Society, Houston Geological Society, South Texas Geological Society, Gulf Coast Association of Geological Societies, and Bureau of Economic Geology were useful for identifying geologic contacts and correlating deep subsurface formations. The geologic sections of Eargle, Dickinson, and Davis (1975) were used to identify near-surface formations in parts of South Texas.

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STRATIGRAPHIC NOMENCLATURE

Stratigraphic nomenclature of rock units underlying the Gulf Coastal Plain of Texas is complex. This is attributable to multidirectional changes in lithology of many of the time-stratigraphic units across a geographical area some 500 mi long and a few hundred miles wide. A secondary factor is the many thousands of feet of sediment in the Gulf Coast geosyncline that have been differentiated over the last century into numerous stratigraphic units. This differentiation was mainly the result of extensive drilling by the oil industry, which opened up progressively deeper parts of the subsurface to study and to subsequent separation into identifiable and mappable units.

Stratigraphic units applicable to the Gulf Coastal Plain of Texas are presented in figure 10 (at end of report). These units constitute the Mesozoic and Cenozoic Erathems and include sediments of the Quaternary System down to and including the Triassic System. This mass of sediments rests largely on deformed Paleozoic rocks of Ouachita facies. Three geographical areas composing the Coastal Plain are presented in figure 10 mainly to accommodate stratigraphic name changes that result from facies changes. These geographical areas are designated "east coastal plain," "central coastal plain," and "south coastal plain" (fig. 1). Primary structural features associated with each area that influenced facies changes in each area are the East Texas Basin, Sabine uplift, and Houston embayment (east coastal plain); the San Marcos arch (central coastal plain); and the Rio Grande embayment (south coastal plain).

A total of approximately 100 geologic names of stratigraphic units constitutes the nomenclature set forth in figure 10. All of the names of stratigraphic units in the Gulf Coastal Plain of Texas have been published, and the vast majority are approved for use by the U.S. Geological Survey (Swanson and others, 1981; and U.S. Geological Survey lexicons by Wilmarth, 1938; Wilson and others, 1957; Keroher and others, 1966; Keroher, 1970; and Luttrell and others, 1981).

A few of the geologic names of stratigraphic units currently have informal status. They were obtained from various sources and are established in the literature, but to date (July 1995) do not have formal approval of the Geologic Names Committee of the U.S. Geological Survey for use in Texas. From oldest to youngest, they include Gilmer Limestone (Forgotson and Forgotson, 1976) of Upper Jurassic Series; Durango and Nuevo Leon Groups of Coahuilan Series (Imlay, 1944); James Limestone Member (Weeks, 1938) of Pearsall Formation of Trinity Group; West Nueces (Lozo and Smith, 1964), Kainer (Rose, 1972), and McKnight (Imlay, 1945) Formations, and Regional Dense Member (Rose, 1972) of Fredericksburg Group; Edwards Group (Rose, 1972) of Comanchean Series; Person Formation (Rose, 1972), Salmon Peak Formation (Lozo and Smith, 1964), and Maness Shale (Bailey, Evans, and Adkins, 1945) of Washita Group; Vicksburg Group (Cooke, 1923) of Oligocene Series; and Anahuac Formation (Ellisor, 1944) of Oligocene(?) or Miocene Series. These informal geologic names are italicized in the chart of stratigraphic nomenclature (fig. 10) to distinguish them from the formal names approved by the U.S. Geological Survey.

GEOLOGIC SECTIONS

The network of geologic sections primarily is designed to show graphically the vertical and lateral lithostratigraphic framework of the Gulf Coastal Plain of Texas with regard to Mesozoic and Cenozoic rocks (pls. 1–8). From the hundreds of well logs that were examined, 158 electric logs, including common and composite logs, were selected for control on the sections (fig. 11 and table 1 at end of report). The selected electric logs are mostly induction and dual-induction logs. Log curves that are shown on the sections are the spontaneous potential (SP) curve on the left of the centerline of each well site and a resistivity curve having a shallow depth of investigation on the right side. The induction and dual-induction logs were used for precise placement of lithologic or formational boundaries.

Four regional dip sections and four regional strike sections constitute the network of geologic sections (figs. 2–9 and pls. 1–8). The dip sections, A–A', B–B', C–C', and D–D', are spaced from about 40 to 190 mi apart and represent the east, central, and south Gulf Coastal Plain geographic subareas in Texas (fig. 1). Because the Gulf Coastal Plain of Texas varies in width, the dip sections range in length from about 160 to 290 mi. Each dip section extends from near the Cretaceous-Tertiary contact to as much as 26 mi offshore onto the Continental Shelf. Data from logs of holes that were not precisely on the dip section lines were projected to the section lines along the strike of the geologic formations. Distances over which data were projected ranged from less than 1 mi to 12 mi. In each case, however, the data transferred corresponded well to the expected geology along the section lines. The strike sections range in length from about 160 to 220 mi and tie into the dip sections at common control points.

Three of the strike sections, E–E', E'–E", and E"–E"', are segments of a continuous section line extending about 540 mi from near the Texas-Mexico border to near the Texas-Louisiana border. This composite section is from about 100 to 150 mi inland from the Gulf of Mexico and is essentially parallel to the coastline. Strike section F–F' is about 170 mi long and is near the axis of the East Texas Basin.

The geologic sections extend from outcrops at the land surface to a maximum depth of about 18,000 ft below sea level. The most up-to-date geologic mapping by the Bureau of Economic Geology from its Geologic Atlas of Texas (V.E. Barnes, Project Director) was used for surface control. Selected faunal occurrences are included where they are known or are inferred by lithologic correlation from nearby well logs.

The sedimentary deposits of Mesozoic and Cenozoic age in the Gulf Coastal Plain of Texas, estimated to be from 50,000 to 60,000 ft thick near the coastline, are markedly disrupted by fault systems. Although faulting is common regionally and is complex in some areas, all faults have been omitted from the geologic sections to maintain unbroken continuity of the formation boundaries. The disadvantage of such omission is the representation of an unrealistic and simplistic picture of unbroken strata with uninterrupted boundaries. In reality, many of the faults have not only broken the hydraulic continuity of the strata but, more importantly, have become barriers to fluid flow or conduits for cross-formational flow.

The extent of ground water having less than 3,000 mg/L concentration of dissolved solids was determined by estimating the concentration from electrical characteristics shown on the logs. The SP curve on the electric log generally is the best approach to determine water quality from borehole geophysics (Alger, no date; Schlumberger and others, 1934; Wyllie, 1949; and Weiss, 1987). However, for concentrations of dissolved solids below about 10,000 mg/L, the SP curve is not considered reliable according to Patten and Bennett (1963). An alternate method of estimating water quality from electric logs is based on formation resistivity (Turcan, 1962; Keys and MacCary, 1971). A modification of the method described by Turcan (1962) was used to calculate the dissolved-solids concentration from a field formation factor. The modified method assumes a constant formation factor with increasing depth—an assumption that MacCary (1984) found to be inadequate in sediments of Tertiary age in the Gulf Coastal Plain of Texas. However, the extent of ground water with less than 3,000 mg/L concentration of dissolved solids is shown on the geologic sections because water with dissolved-solids concentrations less than 3,000 mg/L usually is present in the upper 4,000 ft or less of sediments in the study area, and the assumption of a constant field formation factor is believed to be adequate for purposes of this report.

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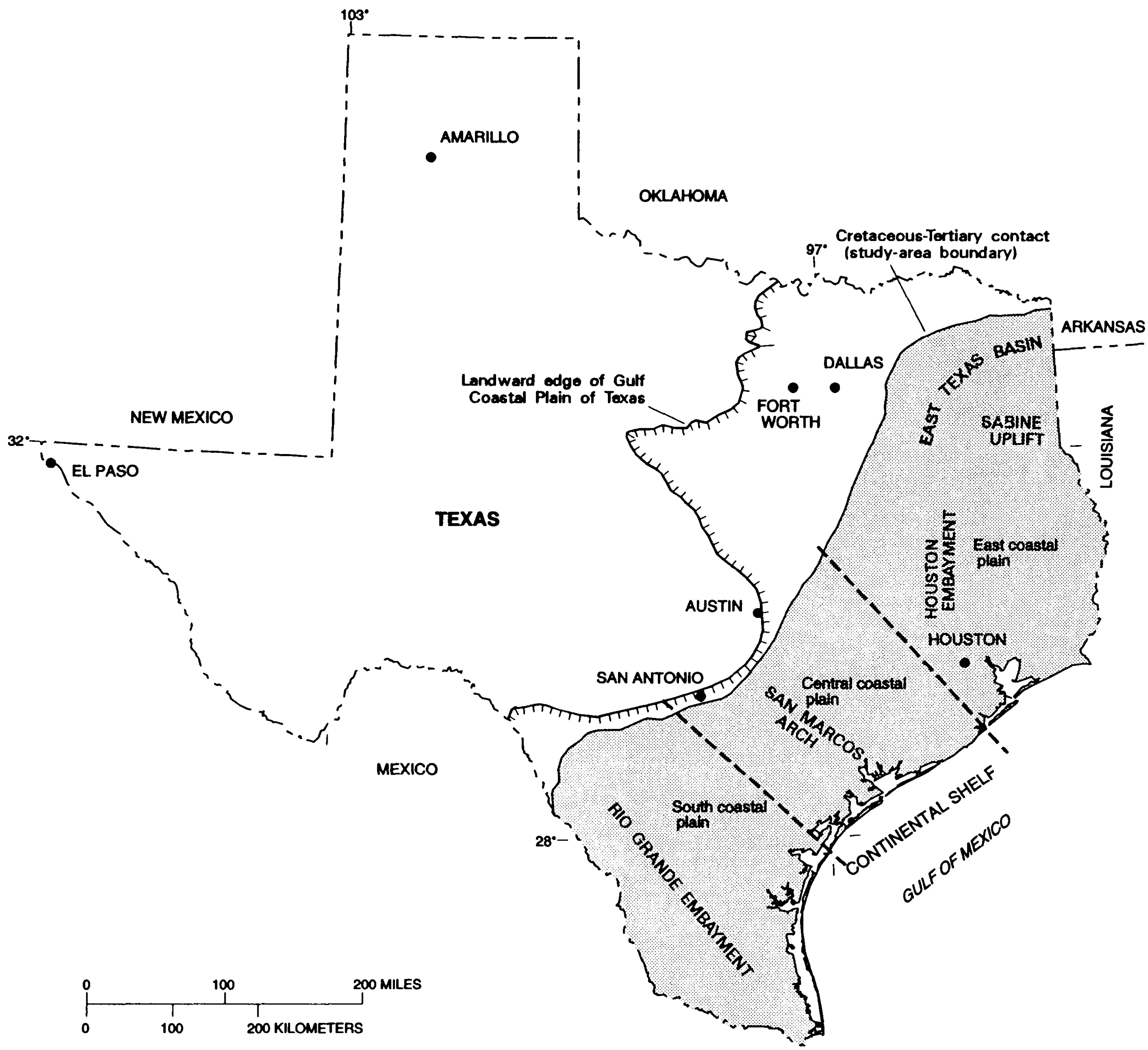


Figure 1. Index map of Texas showing location of Gulf Coastal Plain, study area, and geographic subareas.

Figure 10. Stratigraphic nomenclature of the Gulf Coastal Plain of Texas.

ERA	SYSTEM	SERIES	SW — SOUTH COASTAL PLAIN (includes Rio Grande embayment) — SE	SW — CENTRAL COASTAL PLAIN (includes San Marcos arch) — SE	SW — EAST COASTAL PLAIN (includes East Texas Basin, Sabine uplift, and Houston embayment) — SE
CENOZOIC	Quaternary	Holocene	Alluvium	Alluvium	Alluvium
		Pleistocene	Beaumont Formation	Beaumont Formation	Beaumont Formation
			Lissie Formation	Lissie Formation Montgomery Formation Bentley Formation	Lissie Formation Montgomery Formation Bentley Formation
			(absent or hiatus)	(absent or hiatus) Willis Sand	Willis Sand
	Tertiary	Pliocene	Goliad Sand	Goliad Sand	Goliad Sand
		Miocene	Fleming Formation	Fleming Formation	Fleming Formation
			Oakville Sandstone	Oakville Sandstone	Oakville Sandstone
		?	Catahoula Tuff subsurface: Upper part of Catahoula Tuff Anahuac Formation Frio Formation	Catahoula Tuff or Sandstone subsurface: Upper part of Catahoula Tuff or Ss. Anahuac Formation Frio Formation	Catahoula Sandstone subsurface: Upper part of Catahoula Ss. Anahuac Formation Frio Formation
		? Oligocene	Frio Clay *Vicksburg Fm.* (subsurface)	Frio Clay *Vicksburg Fm.* (subsurface)	*Vicksburg Fm.* (subsurface)
		? ?	Jackson Group	Jackson Group Whitsett Fm. Manning Clay Wellborn Ss. Caddell Fm. Jackson Group	Jackson Group
		Eocene	Claiborne Group: Yegua Formation Laredo Formation (Cook Mountain Fm., Sparta Sand) El Pico Clay (Weches Formation, Queen City Sand) Bigford Formation (Reklaw Formation) Carrizo Sand	Claiborne Group: Yegua Formation Cook Mountain Formation Sparta Sand Weches Formation Queen City Sand Reklaw Formation Carrizo Sand	Claiborne Group: Yegua Formation Cook Mountain Formation Sparta Sand Weches Formation Queen City Sand Reklaw Formation Carrizo Sand
			Wilcox Group: Indio Formation	Wilcox Group: Calvert Bluff Formation Simsboro Formation Hooper Formation	Wilcox Group: Calvert Bluff Formation Simsboro Formation Hooper Formation
		Paleocene	Midway Group	Midway Group	Midway Group
MESOZOIC	Cretaceous	Gulfian	Navarro Group: Escondido Formation Olmos Formation	Navarro Group: Escondido Formation Kemp Clay Olmos Formation Corsicana Marl Nacatoch Sand Neylandville Marl	Navarro Group: Kemp Clay Corsicana Marl Nacatoch Sand Neylandville Marl
			Taylor Marl: Upper part Taylor Marl San Miguel Formation Upson Clay Anacacho Limestone	Taylor Marl: Upper part Taylor Marl Anacacho Limestone Pecan Gap Chalk Wolfe City Sand Lower part Taylor Marl	Taylor Marl: Upper part Taylor Marl Pecan Gap Chalk Wolfe City Sand Lower part Taylor Marl Annona Chalk

EXPLANATION

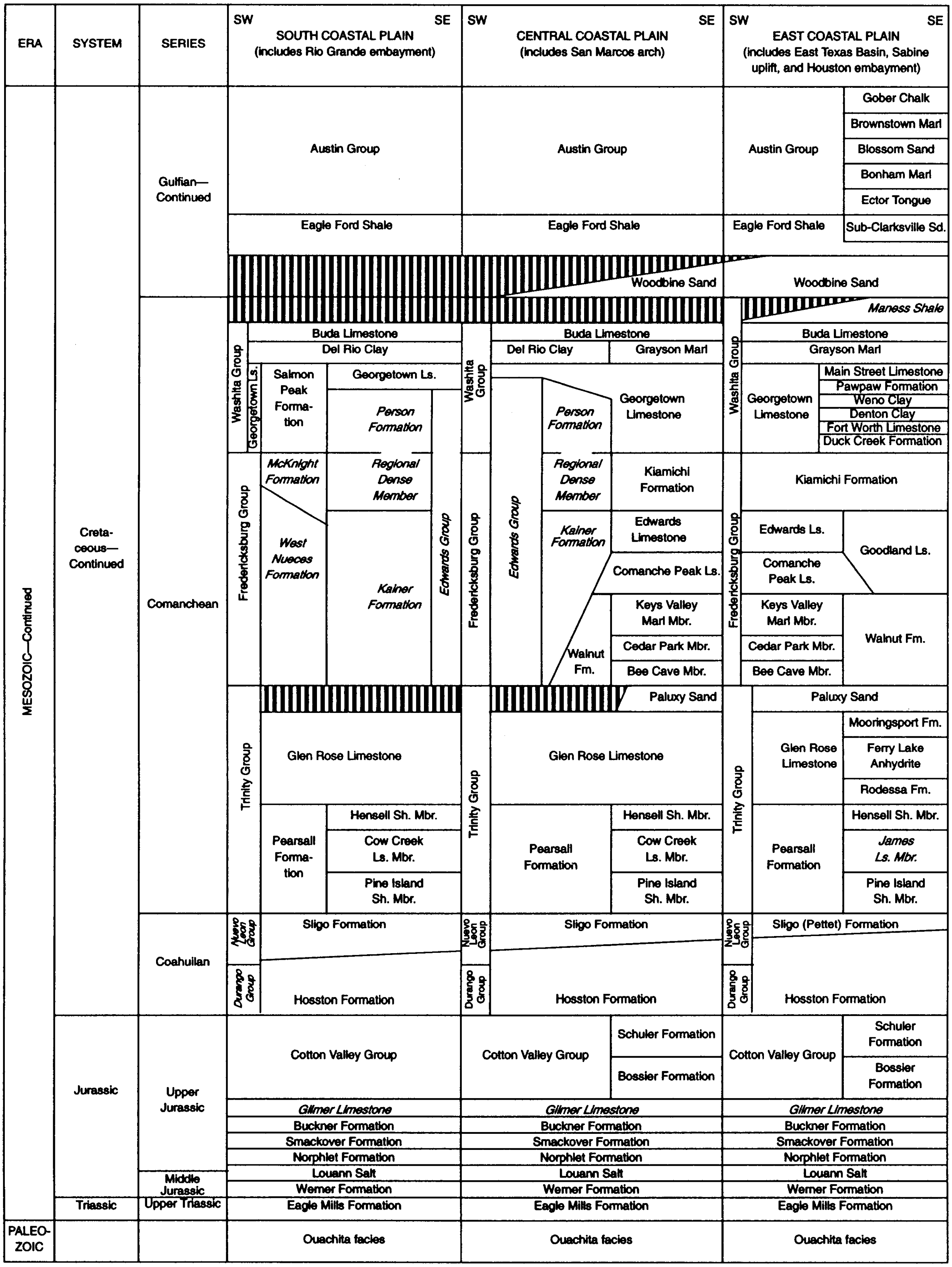
ABSENT OR HIATUS

ABBREVIATION OF LITHOSTRATIGRAPHIC UNITS

Ss., Sandstone — Sd., Sand
Fm., Formation — Ls., Limestone
Mbr., Member — Sh., Shale

Vicksburg Fm., ITALICS INDICATE INFORMAL GEOLOGIC NAMES

Figure 10.—Continued



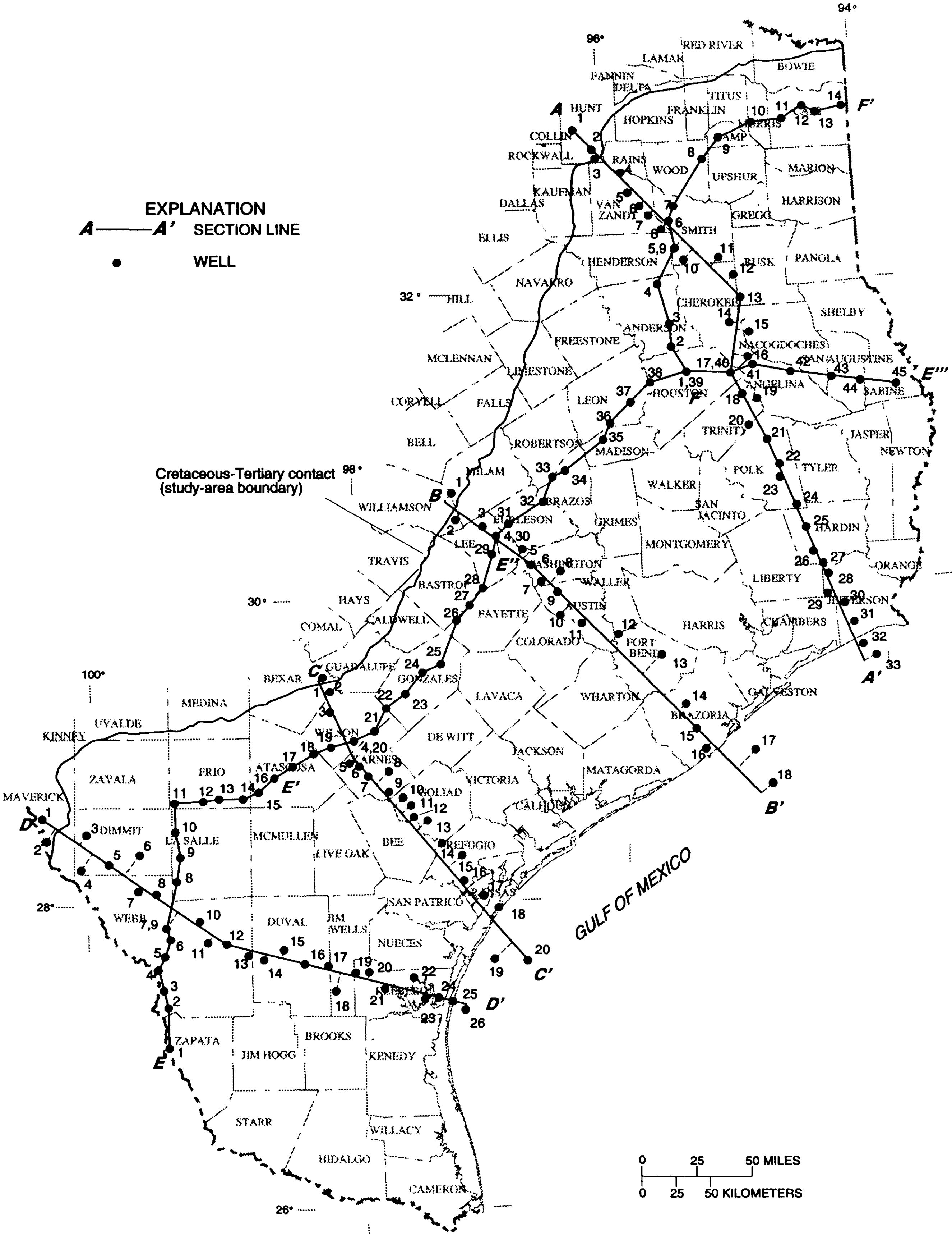


Figure 11. Section lines and wells used for control in study area.

Table 1. Geologic-section wells used for control

Well no.	Well name	County	Log interval below land surface (feet)
	GEOLOGIC SECTION A–A'		
1	Humble O&R No. 1 Rutherford	Hunt	94 – 7,482
2	Pan Am. Pet. No. 1 Stark-Kidd	Hunt	365 – 9,311
3	Heape-Berry No. 1 Burnett	Hunt	400 – 10,000
4	Jones-O'Brien No. 1 Pewitt	Rains	135 – 13,170
5	Caraway No. 1 McCoy	Van Zandt	120 – 12,090
6	Halbouty No. 1 Rowan	Van Zandt	360 – 13,525
7	Dallas Expl. No. 1 Sherbert	Van Zandt	73 – 13,194
8	Sinclair No. 1 Curtis	Van Zandt	138 – 10,505
9	Fairway O&G No. 1 Fairway Fee	Smith	60 – 10,588
10	Humble O&R No. 1 Clements	Smith	50 – 10,626
11	Grelling & Am. Petrofina No. 1 Bullock	Smith	400 – 8,656
12	Alamo Pet. No. 1 Irwin-Farrell	Cherokee	54 – 12,257
13	Peyton McKnight No. 1 Sheppard	Rusk	49 – 12,024
14	Humble O&R No. 1 Maness	Cherokee	75 – 9,284
15	Basin Operating No. 1 Koonce	Nacogdoches	68 – 10,242
16	Union Prod. No. 1 Sessions	Cherokee	172 – 10,739
17	Kirby Pet. No. 1 Williams Unit	Houston	70 – 12,686
18	HNG Oil No. 1 Kenley	Trinity	429 – 12,519
19	Temple Ind. No. 1 Southland Paper	Angelina	694 – 9,998
*20	Tesoro Pet. No. 3 Cameron Minerals	Trinity	521 – 5,720
*20	Tesoro Pet. No. 1 Cameron Minerals	Trinity	5,720 – 11,788
21	Rio Rico No. 1 William Cameron	Polk	236 – 5,027
22	Pan Am. Pet. No. 1–A Southland Paper	Polk	100 – 13,575
23	Shell Oil No. 2 Southland Paper	Polk	121 – 15,160
24	Continental Oil No. 1 Carter	Polk	88 – 10,522
25	Bock & Bacon No. 1–B Kirby Lbr.	Hardin	522 – 8,012
26	Humble O&R No. 1 Teel	Hardin	90 – 10,789
27	Sun Oil No. 1 Dishman-Lucas	Hardin	100 – 11,025
28	Texas City Refining No. 1 Garth	Jefferson	95 – 10,721
29	Lamar Hunt No. 5 Dishman-Lucas	Jefferson	820 – 8,712
30	Pan Am. Pet. No. 1–B Marrs-McLean	Jefferson	78 – 12,888
31	Am. Republics No. 1 Pipkin	Jefferson	124 – 12,008
32	GMA Offshore No. 1 State Tract 67–S	(Offshore)	500 – 8,640
*33	Atlantic Richfield No. 1 State Block 24–L	(Offshore)	239 – 9,611
*33	Atlantic Richfield No. C–4 State Block 24–L	(Offshore)	9,611 – 13,391

*Composite logs for shallow and deep control.

Table 1. Geologic-section wells used for control—Continued

Well no.	Well name	County	Log interval below land surface (feet)
	GEOLOGIC SECTION B–B'		
1	Duer Wagner No. 1 Greinert	Milam	168 – 3,828
2	Dugger & Herring Drlg. No. 1 Jensen	Williamson	173 – 5,103
*3	L.M. Lockhart No. 1 Reat	Lee	2,210 – 10,016
*3	Jake L. Hamon No. 1 Reat	Lee	10,016 – 12,136
4	Pan Am. Pet. No. 1 Matejcek	Lee	80 – 16,441
5	Ada Oil Expl. No. 6 Newman	Burleson	69 – 8,779
6	R.J. Whelan No. 1 Solomon	Washington	715 – 10,235
7	Speed Oil No. 1 Makowski	Washington	940 – 5,504
8	Shell Oil No. 1 Jackson	Washington	98 – 18,439
9	Pure Oil No. 1 Stepan	Austin	120 – 11,011
10	Magnolia Pet. No. 1 Wangler	Austin	100 – 10,596
11	The Texas Co. No. 1 Kollatschny	Austin	90 – 11,028
12	Mound Co. No. 1 England	Waller	111 – 13,509
13	H.C. Cockburn No. 1 Clayton	Ft. Bend	100 – 8,748
14	Tide Water Oil No. 1 Ramsey Prison Farm	Brazoria	144 – 10,202
15	Humble O&R No. 1 Retrieve State Farm Tract 4	Brazoria	100 – 13,998
16	Dow Chemical No. 1 Freeport Mineral	Brazoria	100 – 12,248
17	Mesa Pet. No. 1 State Tract 275–L	(Offshore)	795 – 14,076
18	Forest Oil No. 1 OCS–G–1793	(Offshore)	612 – 12,272
	GEOLOGIC SECTION C–C'		
1	Brown & Assoc. No. 1 Schroeder	Bexar	100 – 3,206
2	Fair No. 1 Lyro	Bexar	225 – 4,610
3	Olson No. 2 Roemer	Wilson	106 – 3,476
4	United Production No. 1 Jarzombek	Wilson	312 – 6,582
5	Shell Oil No. 1 Korzekwa	Karnes	87 – 6,430
6	Humble O&R No. 1 Moczygemba	Karnes	90 – 11,052
7	Argo Oil No. 1 Finch	Karnes	70 – 8,382
8	Standard of Texas No. 1 Pace	Karnes	100 – 13,400
9	Martin & Howell No. 1 Reasoner	Karnes	136 – 7,614
10	Humble O&R No. 1–B Powell	Goliad	215 – 9,000
11	General Crude & Mayfair No. 1 Pettus	Goliad	100 – 11,192
12	Magnolia Pet. No. 2 Irby	Goliad	195 – 10,784
13	Blair-Vreeland No. 1 Gayle	Goliad	170 – 4,015
14	Guy Warren No. 1 Warren	Goliad	90 – 6,009
15	Seaboard Oil No. A–1 Hynes	Refugio	38 – 7,023

*Composite logs for shallow and deep control.

Table 1. Geologic-section wells used for control—Continued

Well no.	Well name	County	Log interval below land surface (feet)
	GEOLOGIC SECTION C–C'—Continued		
16	H.B. Lively No. 1 Voges	Refugio	325 – 7,517
17	Atlantic Refining No. 1 Gwynn	Aransas	115 – 10,000
18	Shell Oil No. 1 State Tract 183	(Offshore)	215 – 12,421
19	Union of Calif. No. 1 State Tract 775–L	(Offshore)	324 – 14,025
20	Atlantic Richfield No. 1 OCS–G–3025 Blk. 780	(Offshore)	426 – 13,486
	GEOLOGIC SECTION D–D'		
*1	Gulf Oil No. 1 Evans	Maverick	80 – 4,422
*1	Tiger Oil & Gas No. 1 Evans	Maverick	4,422 – 7,663
2	Coastal States Gas No. 1 Schwartz	Maverick	100 – 8,962
3	Canus Pet. No. 1–2 Eubanks	Dimmit	27 – 7,022
4	Gulf Oil No. 1 Fitzsimmons	Dimmit	85 – 10,652
5	Parker No. 4 Briscoe Ranch	Dimmit	108 – 4,598
*6	Tarina Oil No. 1 Evans	Dimmit	178 – 5,109
*6	Western Nat. Gas No. 1 Dillon	Dimmit	5,109 – 13,012
7	Estate of Daniel Harrison No. 1 Chenault	Webb	364 – 7,239
8	Pan Am. Pet. No. 1 Garner	Webb	66 – 10,498
9	Lamar Hunt No. 1 Hachar	Webb	157 – 15,387
10	Mobil Oil No. 36 Callaghan Ranch	Webb	522 – 10,397
11	Gulf Oil No. 1 Hirsch	Webb	100 – 7,984
12	Forest Oil No. 1 Olmitos Ranch	Webb	62 – 10,435
13	Argo Oil No. 2 Laredo National Bank	Webb	115 – 5,521
14	Exxon No. 1 Kohler "A"	Duval	299 – 14,012
15	Weatherston No. 1 Carrillo	Duval	100 – 3,566
16	Killam No. 1 Ben-Tex Properties	Duval	300 – 6,238
17	Frio Production No. 1 Hinojosa	Duval	114 – 6,116
18	So. Pet. Expl. No. 1 Conley-Premont Gas Unit 3	Jim Wells	167 – 6,010
19	Humble O&R No. MC–2 King Ranch Borregas	Kleberg	74 – 6,800
20	Humble O&R No. 3 King Ranch Monte Negra	Kleberg	50 – 8,483
21	Stanolind O&G No. 2 Johnson	Kleberg	48 – 9,501
22	Humble O&R No. 4 King Ranch Chiltipin	Kleberg	80 – 10,990
23	Humble O&R No. 3 King Ranch Alazan	Kleberg	100 – 10,475
24	Humble O&R No. 1 King Ranch Ojo de Agua	Kleberg	100 – 10,990
25	Sun Oil No. 1–A Dunn-McCampbell	Kleberg	150 – 11,018
26	Mobil Oil No. 1 State Tract 881–L	(Offshore)	945 – 14,519

*Composite logs for shallow and deep control.

Table 1. Geologic-section wells used for control—Continued

Well no.	Well name	County	Log interval below land surface (feet)
	GEOLOGIC SECTION E–E'		
1	Mobil Oil No. 2 Zachry	Zapata	519 – 9,968
2	Gulf Oil No. 1 Moreno	Webb	50 – 8,086
3	Consolidated O&G No. 1 Vela	Webb	468 – 7,654
4	Louisiana Land & Expl. No. 1 Muller	Webb	498 – 15,736
5	Lamar Hunt No. 1 Reuthinger	Webb	199 – 17,134
6	Lamar Hunt No. 1 Benavides	Webb	180 – 15,009
7	Lamar Hunt No. 1 Hachar	Webb	157 – 15,387
8	Shell Oil No. 1 Krause Estate	La Salle	100 – 10,496
9	West Artesia Transmission No. 1 Edwards	La Salle	261 – 6,601
10	Shell Oil No. 1 Matthews	La Salle	82 – 10,743
11	Pan Am. Pet. No. 1 Buerger	Frio	109 – 17,464
12	Millican Oil No. 2 Klopek	Frio	262 – 6,900
13	Pan Am. Pet. No. 1 Culpepper	Frio	100 – 10,895
14	Amerada Pet. No. 1 McKinney	Frio	100 – 8,728
15	Gulf Oil No. 1 Reese	Atascosa	46 – 9,086
16	Skelly Oil No. 1 Winkler	Atascosa	86 – 15,562
	GEOLOGIC SECTION E'–E"		
16	Skelly Oil No. 1 Winkler	Atascosa	86 – 15,562
17	Hamon No. 1 Williams	Atascosa	237 – 7,676
18	Holloway Oil No. 2 Meyer	Atascosa	175 – 6,392
19	Trans-Western Expl. No. 1 Zook	Wilson	100 – 6,386
20	United Production No. 1 Jarzombek	Wilson	312 – 6,582
21	Hewitt & Dougherty No. 1 Manford Estate	Wilson	85 – 7,298
*22	Mowinckle No. 1 Holmes	Gonzales	93 – 1,568
*22	Texas Gas Expl. No. 1 Hassell	Gonzales	2,009 – 9,601
23	Kirkwood & Morgan No. 1 Tinsley	Gonzales	169 – 7,099
24	Magnolia Pet. No. 1 Spahn	Gonzales	200 – 9,002
25	Energy Resources No. 1 Borcher	Gonzales	80 – 7,393
26	Continental Oil No. 1 Malina	Bastrop	40 – 9,275
27	Delange & Neatherly No. 1 Urner	Bastrop	590 – 9,106
28	Mitchell Energy & Brittany No. 1 Krause Unit A	Lee	74 – 8,208
29	Geodynamics O&G No. 1 Kruemcke	Lee	345 – 7,805
30	Pan Am. Pet. No. 1 Matejcek	Lee	80 – 16,441

*Composite logs for shallow and deep control.

Table 1. Geologic-section wells used for control—Continued

Well no.	Well name	County	Log interval below land surface (feet)
	GEOLOGIC SECTION E"–E"'		
30	Pan Am. Pet. No. 1 Matejcek	Lee	80 – 16,441
*31	Geo. Expl. No. 1 Corbin	Burleson	292 – 4,732
*31	Columbia Gas Dev. No. 1 Corbin	Burleson	4,732 – 7,488
32	Hamman O&R No. 1 Sims	Brazos	262 – 5,715
33	Norris Pet. Consultants No. 1 Cocheel	Robertson	503 – 6,976
*34	Kallina & Hardy No. 1 Blanton	Brazos	114 – 4,004
*34	Clayton Williams, Jr., No. 1 Carrabba	Brazos	4,004 – 18,160
35	Mitchell & Assoc. No. 1 Savage	Madison	434 – 8,267
36	Gose & Gibson Drlg. No. 1 Carrington	Leon	306 – 7,594
37	D.H. Byrd No. 1 G. Gresham	Leon	314 – 7,119
38	Supron Energy No. 1 Marcus	Houston	78 – 11,595
39	Magnolia Pet. No. 1 Grounds	Houston	290 – 10,436
40	Kirby Pet. No. 1 Williams Unit	Houston	70 – 12,686
41	Chevron Oil No. 1 Crossman	Angelina	90 – 16,184
42	Union Prod. No. 1 Redditt	Angelina	220 – 10,715
43	Carter Jones Drlg. No. 1 Long Bell Pet.	San Augustine	493 – 9,154
44	Ike Poole No. 1 Pickering Lumber Co.	San Augustine	521 – 7,941
45	Shell Oil No. 1 Temple USA	Sabine	125 – 15,879
	GEOLOGIC SECTION F–F'		
1	Magnolia Pet. No. 1 Grounds	Houston	290 – 10,436
2	Pengo Pet. No. 1 Slocum Dome Gas Unit	Anderson	518 – 11,116
3	Standard Oil No. 1 Trantham	Anderson	73 – 13,103
4	Humble O&R No. 1 Thompson	Anderson	85 – 10,322
5	Fairway O&G No. 1 Fairway Fee	Smith	60 – 10,588
6	Magnolia Pet. No. 1 Pierce	Smith	100 – 9,914
7	Exhange O&G No. 1 Mallory	Smith	632 – 16,506
8	Humble O&G No. 1 Perryville Gas Unit	Wood	533 – 14,129
9	Texas O&G No. 1 Pittsburg Gas Unit 5	Camp	104 – 13,335
10	McBee & Rudman No. 1 Tidwell	Morris	118 – 12,801
11	Wehmeyer & Assoc. No. 1 Wommack	Cass	53 – 12,496
12	The Superior Oil Co. No. 1 Lambert	Cass	102 – 11,769
13	Sunray Mid-Continent & Pan Am. Pet. No. 1 Mays	Cass	105 – 11,507
14	Humble O&R No. 1 Walters	Cass	84 – 11,063

*Composite logs for shallow and deep control.