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REGIONAL TERTIARY CROSS SECTIONS – TEXAS GULF COAST

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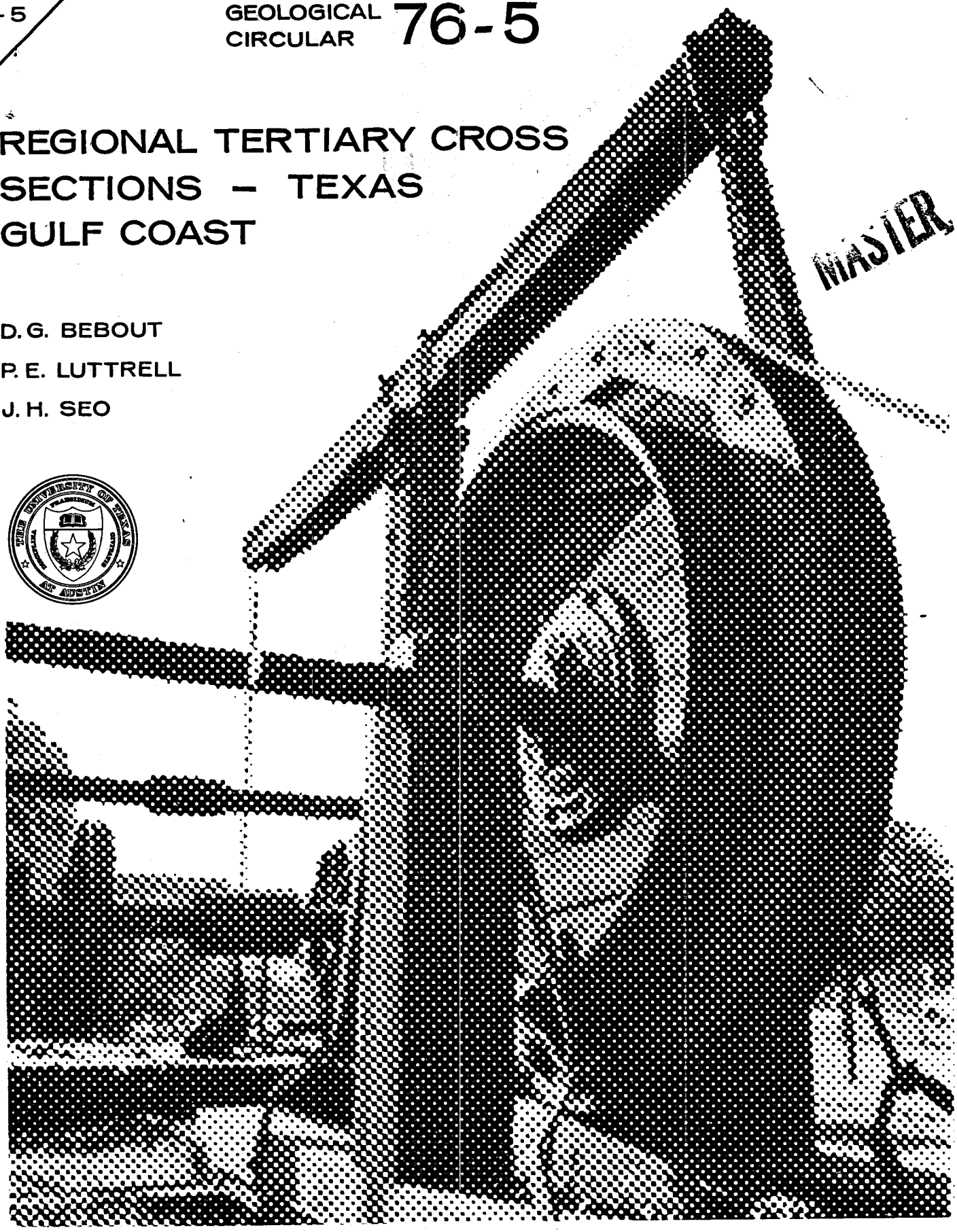

BUREAU OF ECONOMIC GEOLOGY
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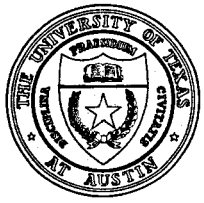

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REGIONAL TERTIARY CROSS SECTIONS—TEXAS GULF COAST

D. G. Bebout, P. E. Luttrell, and J. H. Seo

For the past two years, the Bureau of Economic Geology has been conducting regional studies of the Frio Formation along the Texas Gulf Coast to evaluate potential geothermal energy from deep, geopressured sandstone reservoirs (Bebout, Dorfman, and Agagu, 1975; Bebout, Agagu, and Dorfman, 1975). The procedures used in this evaluation were reviewed at the Second Geopressured Geothermal Energy Conference held at The University of Texas at Austin and sponsored by the United States Energy Research and Development Administration. The index map (fig. 1) and cross sections (figs. 2-7) included in this circular were prepared for that meeting and were included in the Proceedings (Bebout, 1976).

Published regional cross sections (Corpus Christi Geological Society Study Group, 1954-55, 1964; Deussen and Owen, 1939; Houston Geological Society Study Group, 1954, 1972; and South Texas Geological Society, 1951), unpublished cross sections provided by several major oil companies, and extensive micropaleontological and electrical-log files at the Bureau of Economic Geology served as basic data. These sections are meant to show gross regional distribution of sand and shale facies both laterally and vertically throughout the entire Tertiary section along the Texas Gulf Coast. Closely spaced wells were used for detailed correlation, but for clarity many have been omitted for these cross sections (fig. 1 and table 1). Growth faults tend to obscure regional trends and have been omitted. The top of the geopressure zone is indicated by an arrow.

At least eight sand-shale wedges are easily recognized on regional electrical-log cross sections (figs. 2-7). Hardin (1961) illustrated the major wedges as the Midway/Wilcox, Reklaw/Queen City, Weches/Sparta, Cook Mountain/Yegua, Jackson, Vicksburg, Frio, and Anahuac/Fleming. The Pliocene and Pleistocene comprise additional cycles but are undifferentiated in this study. These cycles reflect changes in the ancient shoreline resulting from variations in sediment supply, rate of subsidence, and position of sea level. In general, in the updip end of the wedge the main sand depocenter is in the lower part of the section

and downdip it is progressively higher in the section; this is a progradational cycle. In order to emphasize these wedges, the boundary between the facies-related sand-shale couplet is defined by a dashed line on the cross sections. Time lines within the couplet are expected to cross the dashed line as the deltaic or barrier sands prograde basinward over the prodelta or shelf shales.

These sections are also available from the Bureau of Economic Geology at approximately twice the size of those included in this report as blue-line copy at the cost of reproduction.

ACKNOWLEDGEMENTS

Special thanks are extended to Exxon Company, U.S.A., and Tenneco Oil Company who provided significant basic data used in this report.

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_____ 1972, Cross section A - A′.

South Texas Geological Society, 1951, Nueces River cross section.

Table 1. List of wells.

BB'

1.	Atlantic Refg. Co.	Tomas Saenz #1
2.	Shell Oil Co.	H. W. Lehman #1
3.	Sun Oil Co.	Reilly #1-A
4.	Phillips Petr. Co.	N. Flores #1
5.	Humble Oil Co.	Texan Devel. Co. #1
6.	Continental Oil Co.	M. L. Talbot #1
7.	Tenneco Oil Co.	McAllen Field Wide Unit #36
8.	Sinclair Oil & Gas Co.	Houston Unit #2
9.	La Gloria Corp.	South Weslaco Gas Unit #10
10.	Shell Oil Co.	W. H. Drawe #1
11.	Harkins & Mosbacher	Leona Rohman #1
12.	Chevron Oil Co.	Jose A. Rodriguez #1
13.	Dow Chemical Co.	Continental Oil Co. Mineral Fee #1

EE'

1.	Copano Oil Co. et al.	Apache Ranch #A-1
2.	Copano Oil Co. et al.	Palafox Exploration Co. #A-1
3.	Pan American Petr. Corp.	Sophie Martin #1
4.	Tejas Gas Corp. & Vanderbilt Resources Corp.	Ben F. Vaughan, Jr. #1
5.	Lamar Hunt	Reuthinger #1
6.	Exsun Oil Corp.	Killam & Hurd, Ltd. #1
7.	Ginther, Warren & Ginther, Gulf & Halbouty	O. W. Killam #1-A
8.	Humble Oil Co.	Carlos Y. Benavides #1
9.	O. W. Killam	Killam #1
10.	Skelly Oil Co.	J. C. Martin #6
11.	Texaco, Inc.	O. G. De Da Camara #28
12.	Atlantic Refg. Co.	E. Garcia #1
13.	Atlantic Richfield	Marrs McLean #3-C
14.	Northern Pump Co.	Silver Lake Ranch #1
15.	Humble Oil Co.	Mestena #1-D
16.	McGuire	Saunders #1
17.	Humble	C. F. Hopper #2
18.	Forest Oil Co.	Ed Rachal Foundation #1
19.	Humble Oil Co.	R. J. Kleberg, Jr. #7
20.	Humble Oil Co.	Mrs. S. K. East #22
21.	Humble Oil Co.	Charles M. Armstrong #20
22.	Humble Oil Co.	Mrs. S. K. East #1-G
23.	Humble Oil Co.	King Ranch-Tio Moya #2
24.	Gulf Oil Corp.	State Tract #427 #1

HH'

1.	Alvin C. Hope	Francis Korus #1
2.	Petro Tex, Inc.	Pedro Garcia, Jr. #1
3.	Sorelle & Sorelle	D. D. Heinen #1
4.	Carrl Oil & Dan Auld	Tom Campbell #1
5.	Stewart Petr. Co.	McIlvaine et al. #1
6.	Hewit & Dougherty	Cleo Dubose #1
7.	Shell Oil Co.	Juan Alvarado et al. #1
8.	Atlantic Richfield Co.	J. R. Dougherty Est. #1
9.	Hancock & Young	Klipstein #1
10.	Amerada Petr. Corp.	Bernice Stalcup #1
11.	The Superior Co.	Minnie S. Welder #27
12.	McCulloch	Boehm #1
13.	Hamon	Harvey #3
14.	Tenneco Oil Co.	McCampbell #1
15.	Pel-Tex Petr. Co.	Ima Hogg #1

KK'

1.	Cecil Hagen	Calvert #1
2.	Sutton Prod. Co.	Ida Weinaug #1
3.	Lecuno Oil Corp.	M. K. Towns #1
4.	Humble Oil & Rfg.	Allie Barnett #1
5.	H. L. Hunt	E. M. Stoeltje #1
6.	Avalanche Jour. Publ. Co.	P. S. Rittner #1
7.	W. L. Sinclair, Coastal States Gas Prod. Co., & Greenbriar, Ltd.	Stiles Cattle Co., Inc. #1
8.	Shell	Gohlke Heirs #4-A
9.	The Texas Co.	Gonzales #1
10.	Skelly Oil Co.	Welder-Cliburn #1
11.	Amerada Petr. Co.	Allan Kovar #1
12.	Lone Star Prod. Co.	L. J. Foester #1-A
13.	Coastal States Gas Prod. Co. & Royal Resources	Duncan #1
14.	Alcoa Mining Co. & Southern Prod. Co.	Melbourn #1-C
15.	Walter Van Norman	Powderhorn #1

WW'

1.	Mudge Oil Co.	Koppe #1
2.	Pure Oil Co.	Hendrix #1
3.	Gulf Oil Corp.	Fannie Upchurch #1
4.	The Texas Co.	J. W. Harris #1
5.	Placid Oil Co.	Thomas #1
6.	Petroleum Management Co.	Jones & Shands #1
7.	Sinclair Oil & Gas Co.	Martin Estate #1
8.	Steve Gose	Katherine K. Kramer #1
9.	Texaco, Inc.	H. H. Mergele #1
10.	Oil Properties Inc.	Anna M. Gaylor #1
11.	Pan American Petr. Corp.	Dorothy D. Brown #1
12.	Carl Casey	R. H. Autrey #1
13.	Jack Frazier	Lackner #1
14.	Curry B. Davis & Co.	Susholts-Ziebe Co. #1
15.	Gulf Coast Leaseholds, Inc.	G. Y. Hastings Unit #1
16.	Gulf Coast Leaseholds, Inc.	Yost #1
17.	Superior Oil Co.	Conklin Oil Unit #1
18.	The Texas Co.	J. W. Harris #1B
19.	Phillips Petr. Co.	Houston "JJ" #1
20.	Phillips Petr. Co.	State Lease 51000, Block 32 #1

YY'

1.	Pulaski & Bock	Alpha Musick #1
2.	Associated Oil & Gas Exploration, Inc.	J. T. Kee #1
3.	Continental Oil Co.	R. E. Holcombe #1
4.	American Liberty Oil Co. & Webb & Knapp	Cameron Heirs #1
5.	Wainoco	Carter Bros. #1
6.	Shell Oil Co.	E. E. Alexander #1
7.	Shell Oil Co.	Southland Paper Mills #2
8.	Hassie Hunt Trust	Wirt Davis #1
9.	Oil Reserves Corp.	W. T. Carter #1
10.	International Nuclear Corp.	Harris #1
11.	Sun Oil Co.	Dishman-Lucas #1
12.	Sun Oil Co.	Stone #2
13.	Texaco, Inc.	P. B. Leger #1
14.	Deep South Oil Co. of Texas	Aldridge #1
15.	Belco Petroleum Corp.	Crawford 161 #2
16.	Sun Oil Co.	J. T. White "B" #1

Figure 1. Index to regional cross sections.

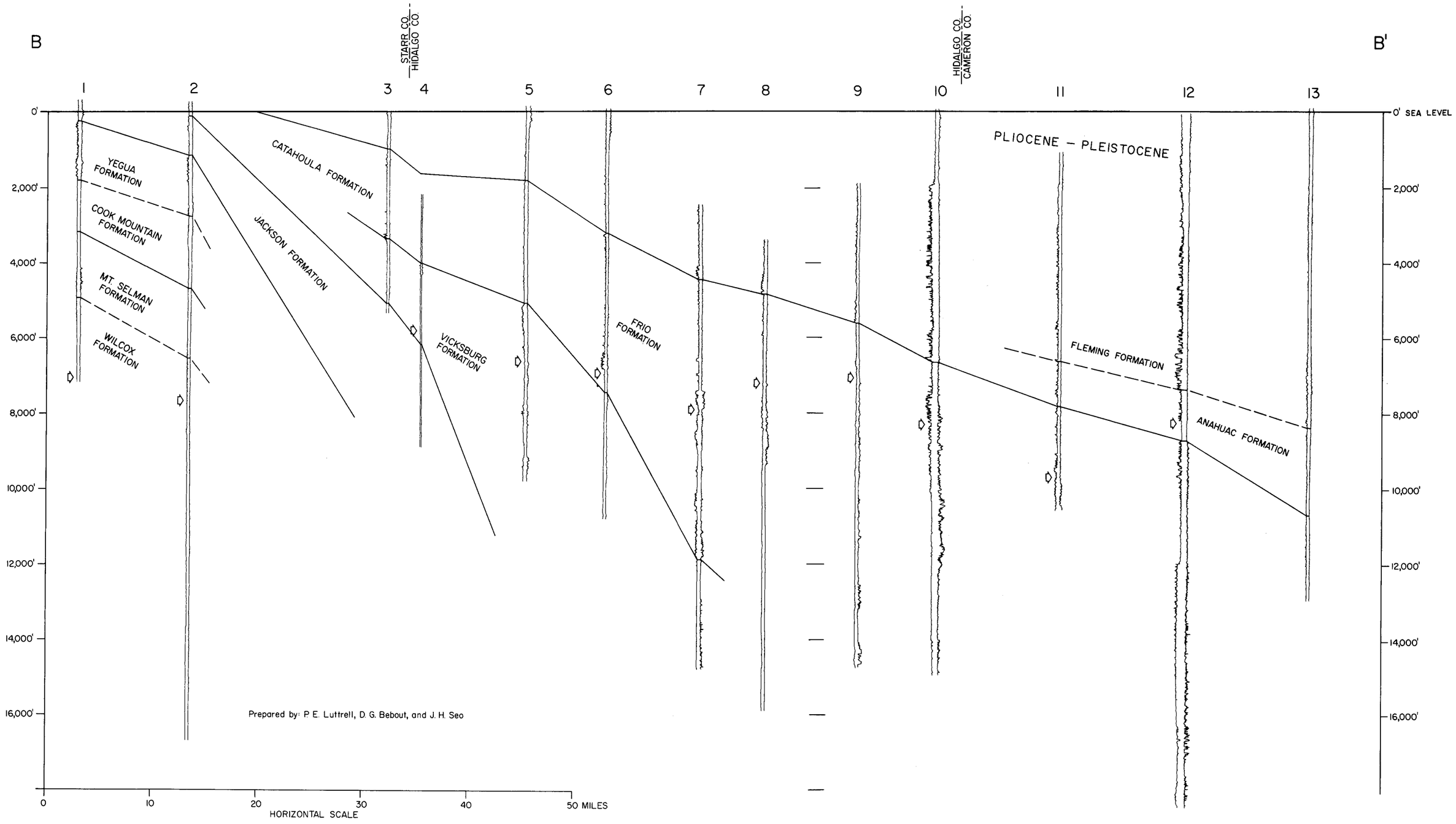

Figure 2. Regional cross section B-B′.

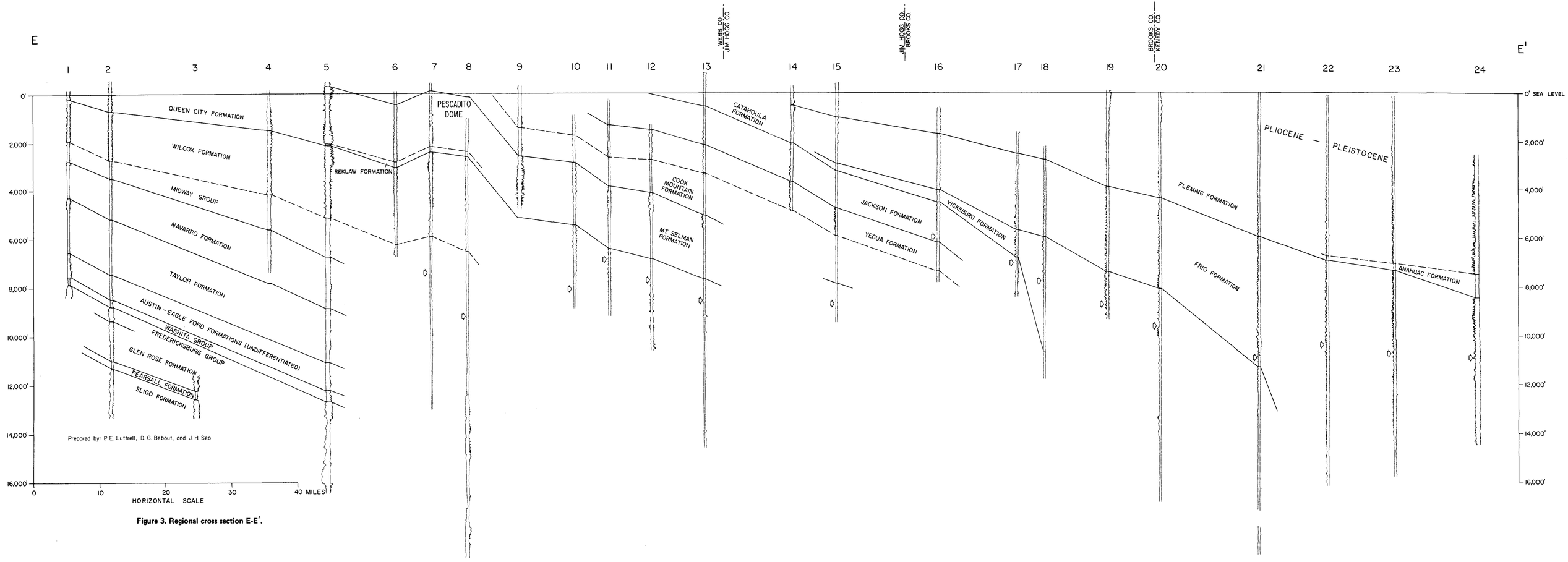

Figure 3. Regional cross section E-E'.

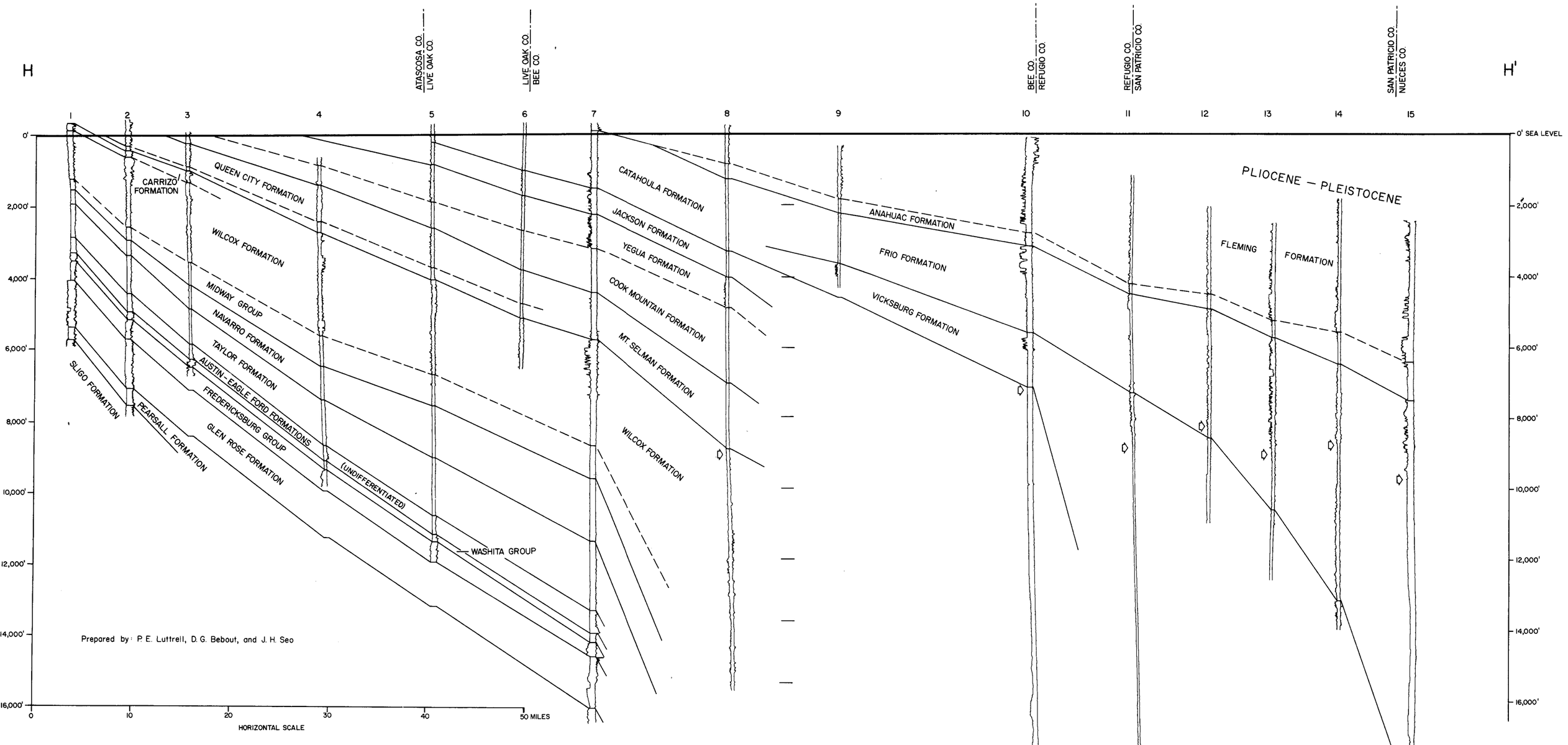

Figure 4. Regional cross section H-H'.

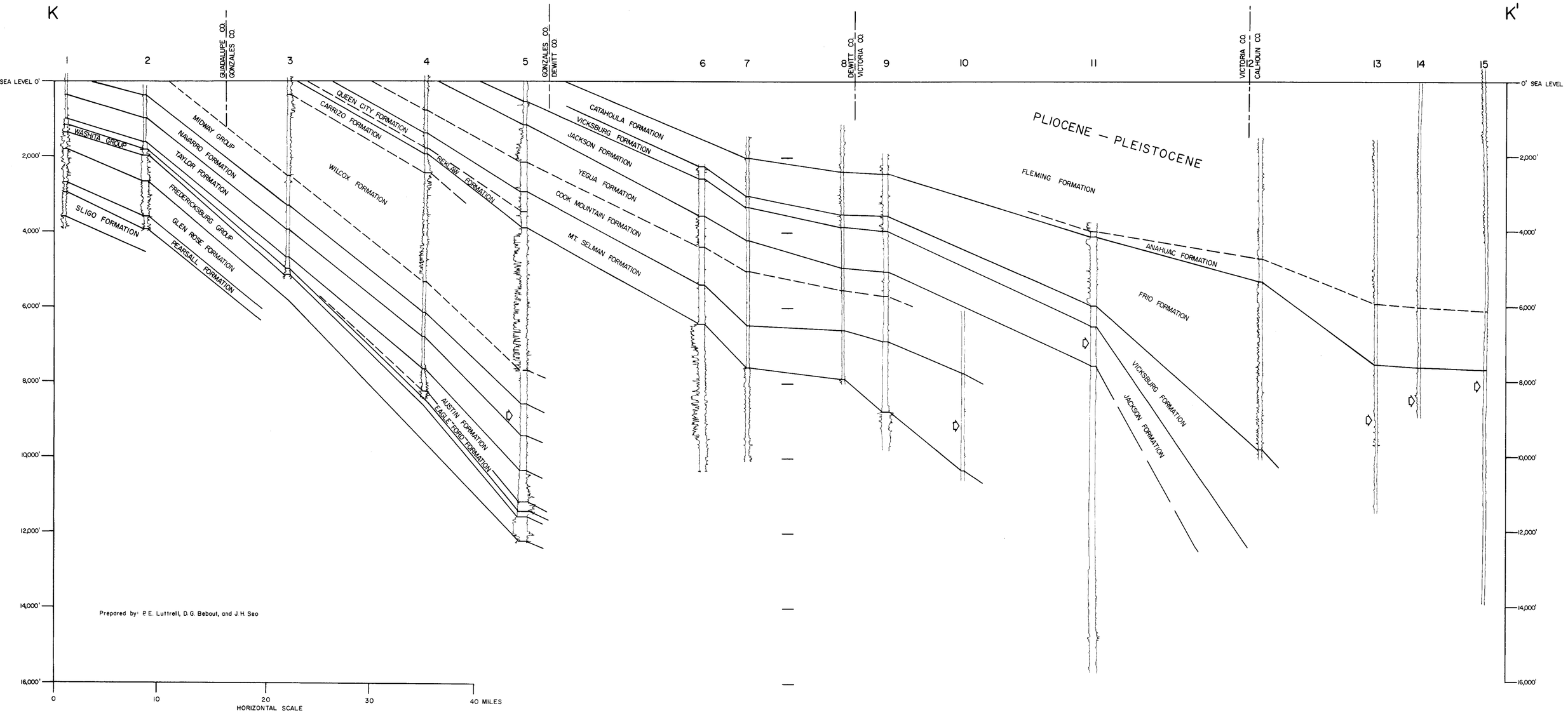

Figure 5. Regional cross section K-K'.

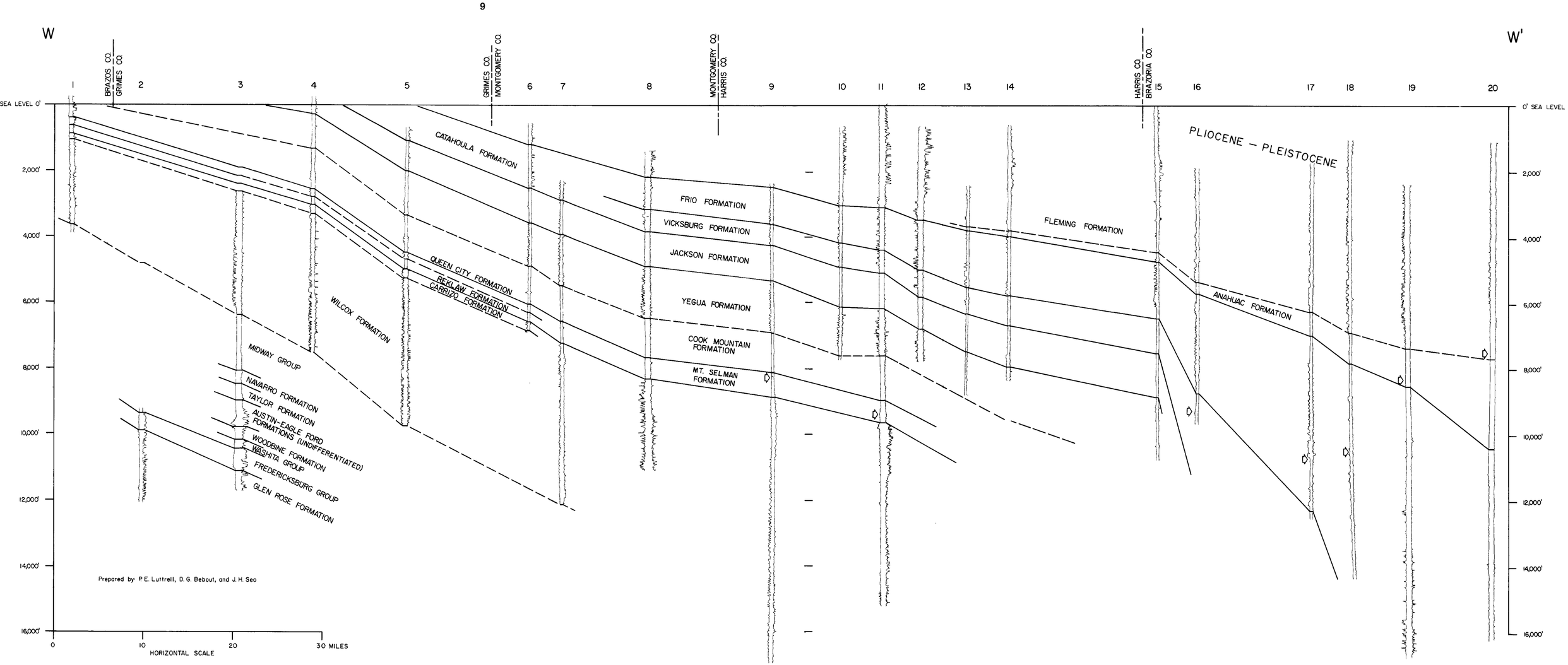

Figure 6. Regional cross section W-W'.

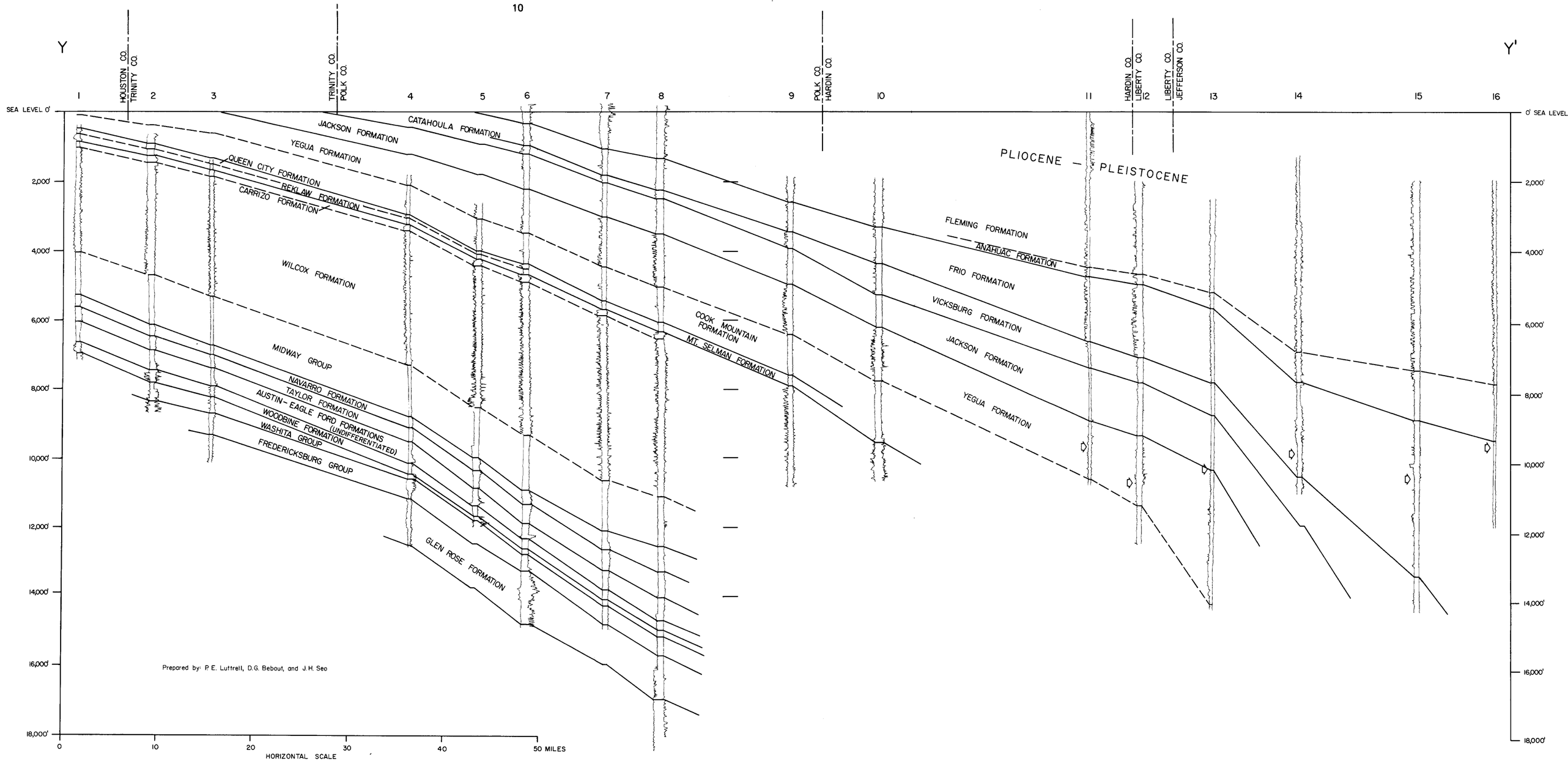

Figure 7. Regional cross section Y-Y'.