

Introduction

**Tertiary coals in South Texas: Anomalous
cannel-like coals of Webb County (Claiborne Group, Eocene)
and lignites of Atascosa County (Jackson Group, Eocene)
(AAPG - EMD Field Trip, April 14-15, 1999)**

By Peter D. Warwick, Robert W. Hook*, and John R. SanFilipo

U.S. Geological Survey, 956 National Center, Reston, VA 20192

*Consultant, 1301 Constant Springs Drive, Austin, TX 78746

The coal-bearing Gulf of Mexico Coastal Plain of North America contains a variety of depositional settings and coal types. The coal-bearing region extends westward from Alabama and Mississippi, across Louisiana to the northern part of the Mississippi Embayment, and then southward to eastern Arkansas, Texas and northern Mexico (fig. 1). Most of the coal currently mined in Texas is lignite from the upper part of the Wilcox Group (Paleocene-Eocene) and, in Louisiana, lignite is mined from the lower part of the Wilcox (fig. 2). Gulf Coast coal is used primarily as fuel for mine-mouth electric plants. On this field trip we will visit the only two non-Wilcox coal mining intervals in the Texas-Louisiana Coastal Plain; these include the San Pedro - Santo Tomas bituminous cannel-like coal zone of the Eocene Claiborne Group, and the San Miguel lignite coal zone of the Eocene Jackson Group (fig. 2). Other coal-mining areas in northern Mexico are currently producing bituminous coal from the Cretaceous Olmos Formation of the Navaro Group (fig. 2).

The Claiborne-Jackson coal-bearing intervals of south Texas are very different from the Wilcox coal-bearing intervals found in central and northeastern Texas and

northwestern Louisiana. The cannel-like coal deposits of south Texas are unique and are one of the few mined cannel-like coal deposits in the world. This field guidebook contains papers that focus on the regional geologic setting of south Texas (Chapter 1), and papers on the Santo Tomas and San Pedro coal deposits and San Miguel lignite deposits (Chapters 2 and 3). Finally, there is an overview paper on the anomalous coal-rank changes of south Texas, and a discussion of the source-rock and coal-bed methane potential for the south Texas coal fields (Chapter 4).

The field trip will visit two active mines in South Texas and will provide the participants an opportunity to observe the mining operations and coal geology of the surface mines. The older Claiborne Group coals that occur near the U.S.-Mexico border (fig. 1), are long-known for their cannel-like character and will be seen in workings of the Farco Mining Company. These unusual nonbanded coals have high calorific values (3800 to 6000 kcal/kg or 6800 to 10,800 btu, dry basis) and substantial oil and gas yields upon distillation. Recent petrographic and geochemical investigations have shown that these coals are bituminous in rank, hydrogen

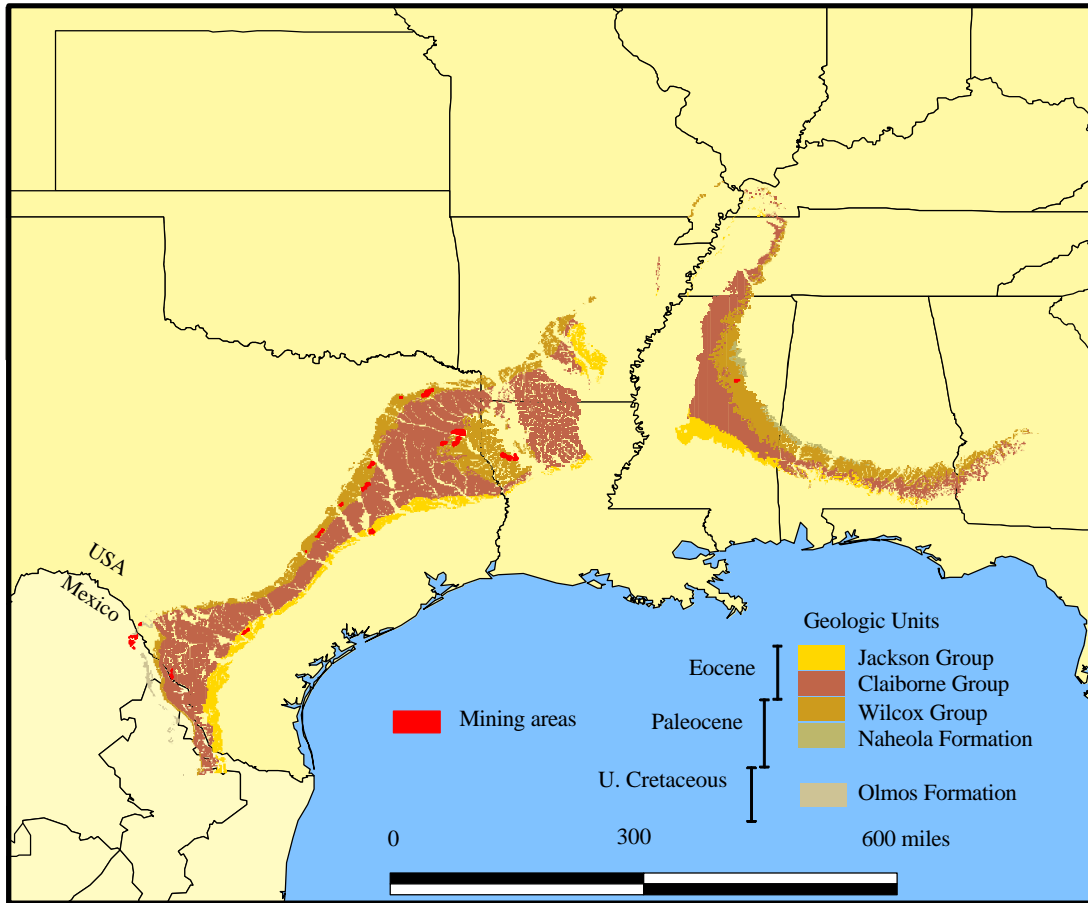


Figure 1. Map showing outcrop of coal-bearing formations in the U.S. Gulf of Mexico coastal area. Active, recent and proposed mining areas are shown in red.

rich, contain abundant green algae remains, and are potential sources of hydrocarbon. The field trip leaders will discuss the depositional setting, petrology, geochemistry, and regional geology of these coal deposits.

The lignites of the San Miguel deposit (Jackson Group, Eocene), differ greatly from the coals of the border area. Four principle lignite beds comprise the San Miguel deposit. The beds are separated by reworked volcanic ash partings (generally less than 0.25 m or 0.75 ft thick). Drill records and in-mine studies indicate that these lignites were deposited in environments that were partially marine influenced. The geochemistry and

depositional setting for these lignites, and regional South Texas/Northeastern Mexico coal geology will be discussed. The field trip will spend the first night in Laredo, a U.S.-Mexico border town, and will visit the two surface mines the next day.

ITINERARY

This is a tentative schedule based upon ideal weather and traffic conditions.

Wednesday, 14 April

4:30 PM - depart H.B. Gonzalez Convention

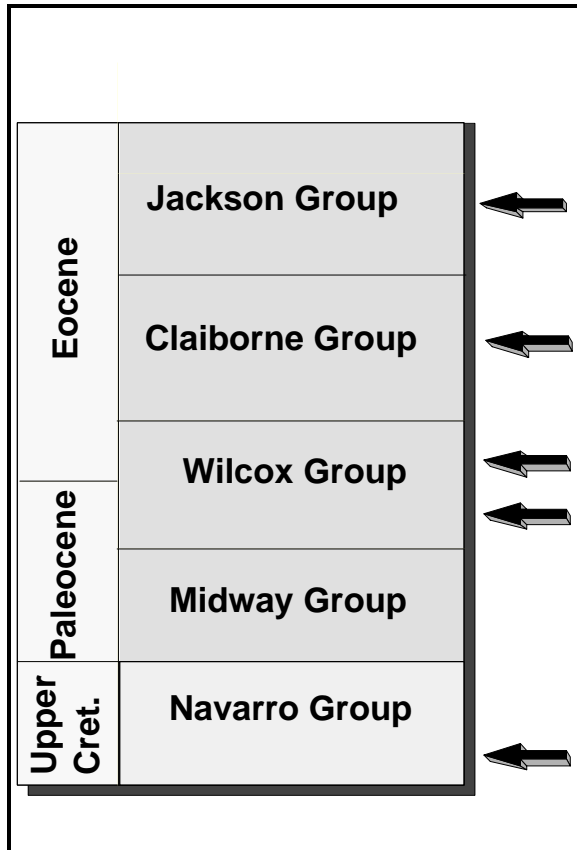


Figure 2. Simplified stratigraphy of coal-bearing intervals in the U.S. Gulf of Mexico Coastal Plain. Arrows indicate stratigraphic position of major coal-bearing intervals.

Center in San Antonio for Laredo, a nonstop drive of approximately 2.5 hours.

7:00 PM - check-in at La Posada Hotel, downtown Laredo.

7:30 PM - short (less than 30 min.) meeting at La Posada. We will provide an overview of South Texas coal geology and give suggestions for dinner.

Thursday, 15 April

7:00 AM - depart La Posada for Palafox, an

approximately 30 minute drive.

8:00 AM - arrive at Farco Mining's Palafox Mine Office. David Wadsack and Gustav Holm, hosts. Safety training in office.

Stop 1: Trevino Mine. Observe San Pedro Coal (Bigford Formation) and overlying tidal deposits. Discuss unique mining methods.

Stop 2: Palafox Mine. Observe San Pedro Coal, overlying sandstone and mudstone deposits, and thin coal seam.

Stop 3: Coal yard. Discuss coal preparation and utilization.

10:30 AM - return to Farco office for convenience stop; depart for San Miguel Mine at 10:45 AM.

Optional Stop A: FM 1472 roadcut east of Santo Tomas. Observe coastal-barrier facies in El Pico Clay (10 minutes).

12:15 PM - lunch stop (30 minutes), Picnic Area south of Cotulla at Mile Marker 59 on I-35 North. This is a no-toilet rest area.

1:00 PM - convenience and gas stop (15 minutes) at Mobil station in Cotulla at junction of Business I-35 and Texas Route 97.

2:15 PM - arrive North American Coal's San Miguel Mine Office. Roger Fish, Engineering Manager, host. Safety certification and mine overview at office.

Stop 4: E area final pit. Observe completed highwall exposure of Jackson Group from spoil bank. Discuss lithofacies overlying coal, ash disposal, and reclamation methods.

Stop 5: E area, active pit. Observe coal seams and splits, discuss unique mining methods.

Optional Stop B: B area.

4:30 PM - depart San Miguel Mine for San Antonio.

OTHER INFORMATION

Both Farco Mining and North American Coal require hard hats, safety glasses, and steel-toe boots.

Exercise extreme caution at all times when on mine property. *Do not approach highwall exposures without the consent of company personnel.*

Coal sampling and photography are permitted by both operators. Later publication of coal-quality data or mine photographs requires company consent and acknowledgment.

We will stop at a mandatory U.S. Border Inspection station north of Laredo on Thursday morning. *No illegal substances or firearms should be on your person or in your belongings.* Non-U.S. citizens should have the appropriate travel papers available for presentation.