



**American Association of Petroleum Geologists Eastern Section Meeting  
September 25-28, 2011  
Hyatt Regency, Crystal City  
Arlington, Virginia**

### **PRE-MEETING TRIP**

## **The Natural Gas Potential of the Sanford sub-basin, North Carolina**

The purpose of this one-day field trip is to provide an overview of the natural gas potential in Triassic strata of the Sanford sub-basin of the Deep River Basin, located in Lee, Chatham and Moore counties of North Carolina, with a focus on the Cumnock Formation. The Cumnock Formation includes a ~800 foot thick interval of Upper Triassic (Carnian) organic-rich black shale and extends across ~59,000 acres, at depths of less than 3,000 feet in the sub-basin. These Triassic strata were deposited in freshwater, shallow lakes in a paleo-equatorial geographic location similar to modern African rift valley lakes. Organic geochemistry and thermal maturation analyses indicate that the black shale in the Cumnock Formation is gas-prone, and that values of total organic carbon (TOC) exceed 1.4 percent in places. The Cumnock Formation contains systematic fracture sets that are observable in outcrop, on 1:24,000-scale geologic maps superimposed on LiDAR data, and possibly in drill cores. The primary fractures trend northwest, while a conjugate fracture set trends northeast. In some places along the west side of the basin, the primary fractures are filled with diabase dikes that locally heated the formation, although mapping in underground coal mines (now closed) has shown that the diabase dikes do not extend far into the basin.

We interpret the Sanford sub-basin as a total petroleum system containing a source rock (the Cumnock Formation), seal (the Sanford Formation), and having both structural and depositional traps. This is a relatively untested exploration area that has about 8,765 acres under lease since January 2010.

**Date and Location:** Saturday, September 24, 7:00 a.m. – departs from and returns (about 7:00 p.m.) to North Carolina Geological Survey's Raleigh Field Office, located at 4100-A Reedy Creek Road, Raleigh, NC 27607-6411. A van will be available to pick up participants from nearby hotels between 6:00am and 7:00am for those lacking ground transportation.

**Leaders:** Jeff Reid and Kenneth Taylor, North Carolina Geological Survey – [jeff.reid@ncdenr.gov](mailto:jeff.reid@ncdenr.gov), [kenneth.b.taylor@ncdenr.gov](mailto:kenneth.b.taylor@ncdenr.gov)

**Fee:** Professional and student, \$125 – includes transportation, lunch, guidebook, and refreshments. Participants have to provide own lodging and transportation to and from Raleigh, NC.

**Limit:** 53 registrants

**No-smoking field trip:** Because of the potential for fire and explosion around a highly pressurized shut-in natural gas well head, smoking is not allowed on the field trip. Participants are expected to strictly follow safety instructions, including turning off cell phones and other electronic devices when required.

**Dress for variable weather:** Dress in layers that can be easily removed or added as weather conditions change: September temperatures can range from the 80's to below freezing. Participants should be prepared to hike moderate distances (up to one-half mile). Heavy-duty hiking boots are not necessary, but sturdy hiking or running shoes should be worn. Several areas are likely to be wet, including a small stream crossing, so waterproof footgear is recommended if dry feet are a priority.

**Nearby Raleigh hotels:** Ramada Blue Ridge, 1520 Blue Ridge Drive, (919-832-4100); Comfort Suites Arena, 1200 Hurricane Alley Way, (919-854-0502); Fairfield Inn & Suites by Marriot Crabtree Valley, 2201 Summit Park Lane (919-881-9800); LaQuinta Inn & Suites Raleigh Crabtree, 2211 Summit Park Ln. (919-785-0071). A van will be available to pick up participants from nearby hotels beginning at 6:00am for those lacking transportation and return them to their hotel after the fieldtrip. Participants needing to be picked up or returned to their hotel must notify the field trip leaders.

The AAPG Eastern Section reserves the right to cancel this field trip if a minimum number of 11 registrations are not received by September 1, 2011. In case of cancellation, all persons who have registered for the trip will be contacted at the email address and phone number provided at the time of registration. Field trip registration costs will be reimbursed. There will be no refunds for cancellation or no show by the registrant after September 15, 2011.