

Pine Hall Formation: Type section designated - Dan River basin, Stokes Co., North Carolina

Jeffrey C. Reid¹, Katherine J. Marciniak¹, Walter T. Haven¹, and Kenneth B. Taylor¹

¹North Carolina Geological Survey (NCGS)

ABSTRACT

The Late Triassic (Norian) Dan River basin, is a continuous gas assessment unit (AU). The rift-lacustrine basin, formed from the opening of the Atlantic Ocean, basin is filled with Triassic strata divided into five formations that in ascending stratigraphic order are: 1) the Pine Hall, 2) Walnut Cove, 3) Dry Fork, 4) Cow Branch and 5) Stoneville formations. The NCGS' 2015 "Town of Walnut Cove" (SO-C-01-15) was continuously cored to a depth of 1,477 ft ending in metamorphic basement rocks (Reid and others, 2015). The core hole investigated the basin's unconventional hydrocarbon resource potential, apparently cored all the Pine Hall Fm., and afforded the opportunity to designate its type section. We designated the Pine Hall Fm. type section from a depth of 423.7 ft to 1,451.2 ft, including a basal pebble conglomerate from a depth of 1,414.5 ft to 1,451.2 ft immediately above the unconformable Paleozoic metamorphic basement contact. Most of the Pine Hall Fm. consists of recurring fining upward "packages" of gray, medium- to coarse-grained sandstone (frequently calcareous) deposited as 4-6-inch high foreset cross bed packages (~1-10 ft-thick) capped by either red siltstone, or gray- to black, organic-rich siltstone or mudstone with diverse pedogenic features. Moderate porosity and permeability suggests the Pine Hall Fm. as a potential reservoir for continuous hydrocarbon accumulations. The shale and siltstone beds that are interbedded with coarser-grained strata may act as effective seals. Previous workers did not designate a type section due to lack of stratigraphically informative, continuous sections. Olsen and others (2015) designated a lectostratotype from 573.0-806.2 ft core depth in nearby core hole SO-C-02-81, where it consists primarily of red clastic rocks with abundant carbonate nodules and mottled strata of pedogenic origin.