

Operator: Clinchfield Coal Corp.

Farm: Arch Rose

Well No.: 105

Location: Dickenson County

7,050' S of 37°10'

12,000' W of 82°20'

Elevation: 1431.3'

Total Depth: 5364'

Remarks: Samples have been studied by James Wm. Smith, Virginia Division of Mineral Resources, and by Mary Beth McFarlan, Kentucky Geological Survey. The geologic summary below represents an attempt to recognize and distinguish the Lee quartzose sands upon which stratigraphic boundaries are now determined. The summaries of Smith and McFarlan are sufficient and, unless notations are included in the summary below, should otherwise be referred to for all other formational descriptions. Correlations by Marshall Miller, 1970-74, VDMR.

<u>Depth</u>	<u>Thickness</u>	<u>Description</u>
210-212	2'	Coal, some loose silty coal fragments present in well cuttings in interval 209-214; driller notes coal 210-212
308-311	3'	Coal, traces of coal present with siltstone, in interval 304-311; driller notes coal 308-311
447-450	3'	Coal, estimated thickness, abundant traces of coal in interval 447-450
679-747	68'	Sandstone, white, quartzose, fine to medium grained, becoming coarser grained downward and conglomeratic in basal 40' (707-747), sandstone is subangular to subround, with secondary quartz as cementing, very little clay matrix material, only in the upper intervals, scattered dark green and gray rock fragments; 90% quartz, 5% matrix, 5% rock fragments
830-871	41'	Sandstone, white, quartzose, fine to medium grained, iron stained, subangular to subround, minor amounts of clay-silica matrix and scattered dark rock fragments, 90% quartz, 5% matrix, 5% rock fragments

989-998	9'	Sandstone, white, quartzose, mostly fine grained, subrounded, well sorted, with some clay matrix material and rare dark rock fragments; 90% quartz, 8% clay matrix; 2% rock fragments, grades downward to a coarse grained siltstone with a high matrix percentage
1030-1055	25'	Sandstone, white, quartzose, fine to medium grained, occasionally coarse grained and granular, conglomeratic quartz fragments in upper 7', minor calcareous clay matrix and dark rock fragments; 90% quartz
1084-1091	7'	Sandstone, white, quartzose, medium to coarse grained, subround to subangular, visible secondary quartz overgrowths and rare matrix material; 95% quartz
1173-1174	1'	Coal, noted by McFarlan and Smith, traces of coal in interval 1164-1174
1391-1472	81'	Sandstone, white, quartzose, fine to coarse to granular to conglomeratic, becomes generally coarser grained downward, subround to angular, with some calcareous clay matrix in upper intervals that is absent in lower intervals, secondary quartz increasingly apparent downward; most of interval 1407-1472 contains large conglomeratic quartz fragments; sand is 90 to over 95% quartz, 5% or less rock and mineral fragments and/or matrix material
1472-1479	7'	Sandstone, light gray, fine to coarse grained, subangular, poorly sorted with scattered micas, dark rock fragments, trace of feldspar, and clay-silt matrix; about 80% quartz
1479-1484	5'	Sandstone, white, quartzose, medium to coarse grained, subangular, with very little to no matrix material; 90% quartz

1484-1506	22'	Sandstone, light gray to light tan, fine to coarse grained, poorly sorted, subangular with abundant rounded rock fragments, muscovite, biotite and clay matrix, trace of feldspar, 60% quartz
1506-1525	19'	Sandstone, white, quartzose, fine grained, subround, well sorted, no matrix material
1525-1608	83'	Sandstone, white, quartzose, medium to coarse grained to conglomeratic, subangular to subround, moderately sorted, little to no matrix material; 90 to 95% quartz, conglomeratic in intervals 1523-1530, 1590-1608
1608-1620	12'	Sandstone, light gray to white, fine to coarse grained, subangular, poorly sorted, with scattered dark rock fragments, rare mica, and traces of feldspar, about 85% quartz
1620-1625	5'	Sandstone, gray, light gray, fine grained, interstitially silty, micaceous, slightly feldspathic, abundant clay-silt-matrix material, 65% quartz
1625-1706	81'	Sandstone, white, quartzose, fine to medium grained in upper intervals, becoming coarser grained and conglomeratic downward, rare matrix and rock fragments, about 90 to 95% quartz, conglomeratic 1681-1703
1706-1712	6'	No samples
1712-1743	31'	Shale, light gray to dark gray, silty, locally calcareous, with minor amounts of pastel green sandstone, reddish brown siltstone.
1743-1751	8'	No samples
1751		Red, green and gray calcareous shales