

SYSTEM	SERIES	FORMATION	THICKNESS IN FEET	SECTION	LITHOLOGY	TOPOGRAPHY AND GEOLOGIC SETTING	HYDROLOGY
QUATERNARY	Pleistocene and Recent	Alluvium	0-20		Clay, silt, and minor amounts of very fine grained sand and gravel	Forms narrow flood plains in valleys of large streams	Most wells yield enough fresh water for small domestic supply. Water generally is softer and less mineralized than water from bedrock. In 8 samples the water ranged from soft to moderately hard, and 2 samples contained more than 0.3 ppm iron
		Breathitt Formation	0-2500±		Sandstone, siltstone, and shale in alternating beds. Interbedded with lesser amounts of coal, clay, limestone, and chert. Very light to medium-gray, very fine to medium-grained sandstone containing abundant interstitial material, feldspathic in upper part of the formation. Gray micaceous siltstone. Medium- to dark-gray micaceous shale containing zones of ironstone and siltstone or sandstone concretions; shale and concretions are locally calcareous. Clays commonly underlie coal beds	Underlies the Kanawha section northwest of Pine Mountain and most of the Cumberland Mountain section southeast of Pine Mountain. Beds of resistant sandstone cap hills and form prominent ridges; shale forms moderate slopes and round-top hills	All wells drilled in valleys of major perennial streams yield enough fresh water for modern domestic supply (500 gpd). Wells on hillsides generally supply enough water for small domestic supply. Some drilled wells yield as much as 330 gpm. Sandstone beds are the best aquifers, but shale beds probably furnish water to many wells because they form a major part of the bedrock. Most water from the Breathitt Formation is suitable for domestic use, but the chemical quality varies greatly. Samples of water from the Breathitt Formation ranged from soft to very hard and nearly all contained more than 0.3 ppm iron. Some shallow ground water is acid and may contain large amounts of iron and sulfate. One well supplies salty water
PENNSYLVANIAN		Lee Formation	1000-1500±		Light-gray, fine- to coarse-grained, quartzose massive cross-bedded sandstone. The sandstone is conglomeratic at base, and sparsely conglomeratic in upper part. Massive sandstone beds are separated by shale, siltstone, and a few thin coal beds. Shales are medium to dark gray. In middle and upper part sandstone may be wavy to flat bedded	Beds of resistant sandstone form cliffs and high ridges from the crest to the base of the southeast slope of Pine Mountain. Underlies the Breathitt Formation in the Kanawha section and most of the Cumberland Mountain section	Yields enough fresh water for modern domestic supply to wells drilled in valleys of the Cumberland Mountain section. Wells on hillsides or hilltops may yield enough water for minimum domestic supply (100 gpd). Some wells may flow. Sandstone beds are the best aquifers, but shale supplies water to a few wells. Water from the Lee Formation ranges from soft to moderately hard and may contain more than 0.3 ppm iron
		Pennington Formation	550-970±		Grayish-red to greenish-gray shale containing thin layers of siltstone; contains thin beds of light-olive to greenish-gray fine-grained sandstone. Includes a persistent bed of hard, white to light olive-gray fine-grained crossbedded sandstone	Forms moderate slope along northwest slope of Pine Mountain. Resistant sandstone forms cliff and caps ridge near crest of Pine Mountain	Yields little or no water to wells
		Newman Limestone	545-700±		Pale yellowish-brown and light olive-gray to medium-gray massive, locally fossiliferous limestone; incudes zones containing nodules of brown to gray chert, and a few thin beds of grayish-red to green shale. The upper part consists of light-olive to dark greenish-gray shale interbedded with dark-gray siltstone; contains a few thin beds of brown to reddish-gray, very fine grained sandstone	Forms cliff and steep slope near crest and along northwest face of Pine Mountain. Shale in upper part forms more gentle slope	May yield about 10 gpm to springs along northwest slope of Pine Mountain. Wells penetrating limestone in faulted areas may yield as much as 100 gpm. Although no water samples were collected from the Newman Limestone, water from this formation is likely to be very hard and may be salty in the Kanawha section because of its depth
MISSISSIPPIAN	Upper Mississippian	Price and Maccrady Formations	215-520±		Dusky-red to greenish-gray shale interbedded with siltstone or very fine grained hard sandstone. Siltstone beds are more common in lower part; a few are locally fossiliferous	Forms moderate slope along northwest face of Pine Mountain. Beds of siltstone may form prominent bench near base of Pine Mountain	Yield enough fresh water for modern domestic supply to wells near the base of Pine Mountain. One sample of water from these formations was very hard and contained 1.5 ppm iron
		Lower Mississippian					
DEVONIAN		Chattanooga Shale	540-650±		Dark-gray to pale yellowish-brown fissile shale. Contains thin beds of brownish-gray, very fine grained sandstone	Forms moderate slope along base of Pine Mountain. Crops out northeastward from a point about 5 miles southwest of Jenkins. Beds are highly distorted and displaced by numerous small faults	Generally yields little or no water or yields water of poor quality. However, wells penetrating the Chattanooga Shale in its area of outcrop reportedly yield enough fresh water for modern domestic supply. The water from three wells ranged from soft to hard and contained 0.10-5.0 ppm iron. The little evidence available suggests that water from deep wells in the Chattanooga Shale contains more iron than water from shallow wells

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GENERALIZED COLUMNAR SECTION AND WATER-BEARING CHARACTER OF THE GEOLOGIC FORMATIONS IN THE JENKINS-WHITESBURG AREA, KENTUCKY