Mountainous Volcanic Region			
Period	**Phase**	**Stratigraphic Unit**	**Hydrogeologic Unit**
Quaternary	Modern	Alluvium associated with present rivers	Alluvial Aquifer
	Glaciation	Glacial deposits	Glacial deposits
Neogene	Extension	Basalt of bimodal suite	Volcanics/ Crystalline bedrock
		Granitic rocks of bimodal suite	Crystalline bedrock
		Inter-volcanic sedimentary deposits	Local aquifers
Paleogene	Transition	Ash-flow tuffs Pre-ash flow volcanics	Volcanics
Cretaceous	Laramide	Laramide aged formations in extensions of adjoining Laramide Basins may be found in small structural blocks	Local aquifers
	Interior Seaway	Regional Cretaceous Seaway shale-dominated formations form multiple hydrogeologic units, most are confining units	
Jurassic Triassic	Mesozoic Sandstones	No strata recognized in this area	
Permian Pennsylvanian	Ancestral Rocky Mountains	Ancestral Rocky Mountains event marine and non-marine sedimentary formations form multiple hydrogeologic units	
Mississippian Devonian Silurian Ordovician Cambrian	Paleozoic Carbonates	Older Paleozoic sedimentary formations preserved in the Ancestral Rocky Mountains event Eagle Basin-Central Colorado Trough	
Precambrian	Precambrian	Undifferentiated	Crystalline bedrock aquifer
		Fault zone	
		Coarse-grained intrusive rocks	
		Intrusive rocks	
		Metamorphic rocks	

Table 12b-01. Mountainous volcanic region stratigraphic chart.

Mountainous Volcanic Region

Period	Phase	Stratigraphic Unit	Unit Thickness (ft)	Physical Characteristics	Hydrogeologic Unit	Hydrologic Characteristics
Quaternary	Modern	Alluvium associated with present rivers			Alluvial Aquifer	
	Glaciation	Glacial deposits		Unstratified sand, gravel, and silt within, and at the mouths of, mountain valleys	Glacial deposits	
Neogene	Extension	Basalt of bimodal suite		Basaltic flows and intrusive dikes; recognized as the Hinsdale Basalt in the San Juan Mountains	Volcanics/ Crystalline bedrock	
		Granitic rocks of bimodal suite		Rhyolitic and granitic plugs, dikes, sills, laccoliths and stocks	Crystalline bedrock	
		Inter-volcanic sedimentary deposits		Conglomerate, sandstone, water-laid tuff, silt, and mud-flow breccias that contain locally derived clasts of volcanic rocks; found in both the West Elk Mountains and San Juan Mountains and recognized as the Los Pinos Formation in the eastern San Juan Mountains	Local aquifers	
Paleogene	Transition	Ash-flow tuffs	0-2,000	Multiple ash-flow tuffs erupted from volcanic centers in the San Juan volcanic field to the west between 26 and 30 million years ago; major tuffs include the Treasure Mountain Tuff, Masonic Park Tuff, Fish Canyon Tuff, and Carpenter Ridge Tuff	Volcanics	
		Pre-ash flow volcanics	0- 5,000	Lava flows and volcaniclastic rocks of intermediate composition derived from strato-volcanoes between 30 and 35 million years ago; heterogenous assemblage of flows, flow breccias, debris flow deposits, stream-laid conglomerate and sandstone, and rare ash-flow tuffs; include the Conejos Formation in the San Juan volcanic field and the West Elks volcanic rock		
	Laramide	Laramide aged formations in extensions of adjoining Laramide Basins may be found in small structural blocks			Local aquifers	
Cretaceous	Interior Seaway	Regional Cretaceous Seaway shale-dominated formations form multiple hydrogeologic units, most are confining units				
Jurassic	Mesozoic Sandstones	No strata recognized in this area				
Triassic						
Permian	Ancestral Rocky Mountains	Ancestral Rocky Mountains event marine and non-marine sedimentary formations form multiple hydrogeologic units				
Pennsylvanian						
Mississippian	Paleozoic Carbonates	Older Paleozoic sedimentary formations preserved in the Ancestral Rocky Mountains event Eagle Basin-Central Colorado Trough				
Devonian						
Silurian						
Ordovician						
Cambrian						
Precambrian	Precambrian	Undifferentiated		Crystalline rocks of igneous and metamorphic origin in mountainous region	Crystalline bedrock aquifer	
		Fault zone		Highly fractured crystalline rock within fault zones where fractures interconnect and may be open; host rock may, or may not, show signs of alteration to secondary minerals including clays		
		Coarse-grained intrusive rocks		Intrusive rocks of a variety of composition where coarse-grained crystals are tightly intergrown		
		Intrusive rocks		Intrusive rocks of a variety of composition where fine- to medium-grained crystals are tightly intergrown; can be massive to moderately foliated		
		Metamorphic rocks		Rocks of varying composition that have undergone transformation by intense heat and pressure and are foliated and commonly segregated by composition into layers; gneiss has a low mica content and schist has a high mica content (50% or greater)		

Table 12b-01. Mountainous volcanic region stratigraphic chart, detailed. Colorado Geological Survey ON-010 Colorado Groundwater Atlas.

Sources: Snow (1968); Stevens and Lipman (1975); Huntly (1976); Lawrence (1990); Apodaca and others (1996); Streufert and others (1999); Apodaca and others (2000); Raynolds and Hagadorn (2017)