

## Geologic Time Scale, Formations and Major Happenings in/around Fremont County, CO

ERA	mya	Period	Epoch	Formation (Natural Resource/Other)	Major Geologic Events	
C E N O Z O I C	2.6	Quarter- nary	Holocene	Recent Alluvium (Sand and Gravel)	Continued down-cutting and a period of mountain glaciation. Many sand and gravel deposits formed in county.	
			Pleistocene	Pinedale and Bull Lake Glaciation		
				Verdos and Rocky Flat Alluvium		
				Nussabaum Alluvium (Sand and Gravel)		
	66	Tertiary	Neogene	Pliocene	Dry Union Formation	Laramide Orogeny at beginning of Period (65 mya) produced much of the present day Rocky Mts. Thick sediments deposited between grabens. Eocene erosional surface formed followed by major volcanism. Neogen Orogeny at end of Period uplifts Sangre deCristos, continued volcanism. <b>Regional uplift late in period starts down-cutting of Royal Gorge</b> and removal of older sediments - present day geography shaped.
				Miocene	Sante Fe Formation	
			Waugh Mountain Andesite			
			Oligocene	Gribbles Park Tuff		
				Thirty-nine Mile Andesite (Cripple Creek Gold)		
				Tallahassee Creek Conglomerate (Uranium)		
Wall Mountain Tuff						
Eocene			Echo Park Alluvium (Uranium)			
Paleocene			*Poison Canyon and Raton Formation			
M E S O Z O I C			145	Cretaceous	*Vermejo Fm (Coal and Fossils)	
	*Trinidad SS (Coal and Fossils)					
	*Pierre Shale (Oil/Gas and Fossils)					
	Whitehorn Granodiorite					
	*Niobrara Formation ("Portland Type" limestone)					
	*Carlile Shale					
	*Greenhorn LS and Graneros Shale					
	*Dakota Sandstone (Skyline Drive/Dinosaur tracks)					
	201	Jurassic	*Morrison Formation (Major Dinosaur discoveries)	Low-flat desert conditions turn to warmer, wetter with swampy conditions.		
			*Ralston Creek Formation (Gypsum)			
252	Triassic	*Lykins Formation (Stromatolites)	Coastal plains with dunes and deltas.			
P A L E O Z O I C	299	Permian	**Sangre de Cristo Formation (Coaldale Gypsum)	Colorado eroded flat with Sahara-like conditions		
	323	Pennsylvanian	**Mintrun Formation	Ancestral Rockies formed west of present mountains - thick sediments deposited in between mountain ranges		
			**Belden Formation			
			*Fountain Formation (Red Canyon Park)			
	354	Mississippian	*Williams Canyon LS **Leadville LS	Sea deepens over most of Western US		
	418	Devonian	**Dyer Dolomite	Sea invades late in Period after much erosion		
			**Parting Formation - Chaffee County			
	444	Silurian	Uplift and erosion - no sediments deposited			
	485	Ordovician	Fremont Limestone (Shelf Road Rock Climbing)	Sea deepens and covers most of Colorado, deposition of sandstones and limestones.		
			Harding Sandstone (Old fish scale fossils)			
Manitou LS/Dolomite (Quarried, decorative rock)						
540	Cambrium	Syenite Intrusions	Minor intrusions and slow encroachment of sea - very little deposition			
		Sawatch Sandstone (Eroded from Fremont County)				
P R E C A M B R I U M	2500	Proterozoic "first life"	Lippillian Interval 400 my of quiet tectonics and extensive erosion. Development of flat surface for Paleozoic sediments.			
			Pikes Peak Granite, Silver Plum Intrusions Boulder Creek Intrusives, Idaho Springs Metamorphic Complex (Micas, Feldspars, Pegmatite, Crushed Aggregate)	Metamorphism of ancient sediments and volcanic rocks - 2 major periods of deformation and 3 periods of intrusion		
	4000	Archean "old life"				
4600	Hadean "no life"	Formation of crust and atmosphere				

\*Major Formation of Cañon City Embayment - found only in Eastern Fremont County and part of Colorado Piedmont/Plains Province

\*\*Major Formation found only in Western Fremont County - part of Southern Rocky Mountain Province

Courtesy of Steve Wolfe; adapted from Masters Thesis - UCCS, 1991 *The Natural History of Fremont County, Colorado*