

Geological Model of the Red Basin area in Catron County, New Mexico

Permian Period

The Permian Period lasted from 290 to 248 million years ago.

The global geography of the Permian included massive areas of land and water. By the beginning of the Permian, the motion of the Earth's crustal plates had brought much of the total land together, fused in a supercontinent known as **Pangea**. Many of the continents of today in somewhat intact form met in Pangea (only Asia was broken up at the time), which stretched from the northern to the southern pole. Most of the rest of the surface area of the Earth was occupied by a corresponding single ocean, known as **Panthalassa**, with a smaller sea to the east of Pangea known as **Tethys**.

At the outset of the Permian Period, a deep basin was formed in the area that we know today as Catron County and an area of uplift to the north-east provided a source for clastic material. Over the ensuing millions of years, sedimentary deposits were laid down on top of the underlying Precambrian terrain. Eventually marine sediments entered the mix resulting in a layer of sandstone and limestone.

Triassic Period

The Triassic Period lasted from 248 to 206 million years ago.

During the early Triassic Period, an uplifted zone of volcanic action developed to the southwest (over what is today Arizona and California). At the same time an area to the north began to subside. This was the beginning of the San Juan Basin.

Jurassic Period

The Jurassic Period lasted from about 200 to 145 million years ago. The area was fairly stable during this period.

Cretaceous Period

The Cretaceous Period lasted from 145 to 65 million years ago.

During this period, a shallow sea moved across the area. Silty shales were laid down over time. Today we call these shales the Crevasse Canyon Shales. Because of the marine type environment, these shales contain organic rich zones (reduced in character). During the latter part of this Period, the area (and in fact much of the Colorado Plateau) was uplifted. This uplift can clearly be seen today in the area. The Red Basin area tilts at about 4 degrees to the South.

Tertiary Period

The Tertiary Period lasted from 65 to 1.6 million years ago.

The uplift event noted above, caused sea levels to gradually retreat. This period was also one of extreme heat. The uplifted Crevasse Canyon shale material underwent oxidative weathering. During the early part of this Period, a layer of conglomerate, sandstone and siltstone was laid down unconformably over these Crevasse Canyon Shales. This material is called the Baca formation.

Uranium in its oxidized state was percolated downwards by meteoric fluids. Where it came into contact with organic rich zones in their reduced state. Today we say that the uranium is present at this Baca/Crevasse Canyon unconformity.

The middle part of this Period, saw volcanic action again. This action is evident today in the form of the Sawtooth Mountains to the south of the area. It is thought that an additional source of uranium comes from this volcanic material. As uranium in its oxidative state was leached downwards from this volcanic material, it too contacted reduced organic rich material where it precipitated.

References:

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