

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

GEOLOGIC MAP OF THE WHITE ROCK PEAK QUADRANGLE, LINCOLN
COUNTY, NEVADA, AND BEAVER AND IRON COUNTIES, UTAH

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This map is preliminary and has not been reviewed
for conformity with U.S. Geological Survey editorial
standards and stratigraphic nomenclature.

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DESCRIPTION OF MAP UNITS

- Qa1 ALLUVIUM (QUATERNARY)--Thin, unconsolidated deposits of sand and silt, formed by fluvial processes
- Qc COLLUVIUM (QUATERNARY)--Unsorted, unconsolidated, heterogeneous deposits of coarse gravel and sand that form alluvial fans on the flanks of the White Rock Range. Some rock fragments range as large as 15 cm across. Deposited by sheetwash, and downslope creep
- QT1 LANDSLIDE DEPOSITS (QUATERNARY TO PLIOCENE)--Hummocky terrain consisting of debris from the Isom Formation, and locally from the Ripgut Springs Formation. Covered by soil and vegetation. Occurs along steep slopes near White Rock Peak; age uncertain
- T1 PANACA FORMATION (PLIOCENE)--Flat-lying, varicolored, tuffaceous mudstone, siltstone, and fine-grained sandstone of lacustrine origin

CONDOR CANYON FORMATION (MIOCENE)

- Tcb Bauers Tuff Member--Densely welded, light pink to orange ash-flow tuff containing less than 10 percent, small (less than 1 mm) phenocrysts of subhedral to fragmented plagioclase (strong oscillatory zoning) and biotite, rare sanidine, and 1 to 20 percent light pink pumice fragments 2 to 10 mm long. Basal vitrophyre 3 to 5 m thick is usually present, and contains 15 percent phenocrysts of plagioclase and minor biotite, and 10 to 15 percent flattened pink pumice fragments; the upper part of the vitrophyre contains 10 to 30 percent amygdules 2-3 cm across of chalcedony. Present only in the southern part of map and forms rounded hills and rubble-covered slopes; vitrophyre usually forms a cliff. Average K-Ar age is 22.3 m.y. (million years) (Fleck and others, 1975, age adjusted for new decay constants). Thickness as much as 80 m in southern part of map
- Tcs Swett Tuff Member--Moderately to densely welded reddish purple ash-flow tuff containing 10 percent phenocrysts of euhedral plagioclase 1 to 2 mm long, and minor euhedral biotite and opaque minerals. Contains characteristic light gray flattened pumice that extend for several meters in length. Exposed only in one place along the southeast edge of the map. Average K-Ar age is 23 m.y. (Rowley and others, 1979). Thickness 10 to 15 m

BLAWN FORMATION (MIOCENE)

- Tbr Rhyolite member--Purple, orange, and gray rhyolite flows containing 10-15 percent phenocrysts of quartz, plagioclase, minor sanidine, and a trace of biotite and hornblende. Quartz is dark gray, commonly as large as 6-8 mm and is bipyramidal with euhedral crystal faces. Strong flow foliation locally developed. Extensive limonite, hematite, and pyrolusite alteration pervades most of the outcrops. Flows are exposed in the eastern part of the map area

- Tbt Tuff member--Slightly to moderately welded, ash flow tuff. Tuff is white to whitish gray and contains 15 to 20 percent phenocrysts of subhedral to fragmented plagioclase, sanidine, and quartz (commonly embayed) averaging 2 mm across, minor biotite and opaque minerals, and rare hornblende. Some of the quartz crystals are as large as 6 mm long and have euhedral bipyramidal crystal faces. Tuff contains 5 to 20 percent pumice fragments and as much as 25 percent subangular to subrounded rock fragments, some of which are of the Lund and Wah Wah Springs Formations. Buff to gray tuffaceous sandstone layers occur in the lower portions of the unit and contain some pebble to granule layers. Exposed only in southern part of map area, and usually forms cliffs. Age ranges from 23 to 18 m.y. (Best and Grant, in press). Thickness about 50 m
- Ti ISOM FORMATION (OLIGOCENE)--Reddish purple and orange densely welded lapilli tuff. Contains 5 to 8 percent phenocrysts of euhedral plagioclase 1 to 2 mm long, and minor augite, hypersthene, and magnetite, commonly less than 1 mm long. Characteristic light gray pumice fragments extend to lengths as great as 3 m. Rock commonly contains irregular vugs which may be weathered out pumice or gas cavities partially filled with vapor-phase minerals. Pumice locally ptymatically folded and contorted, especially in northern part of the map near White Rock Peak. Basal vitrophyre is usually present, and is black, 3 to 5 m thick, and contain 5 to 10 percent phenocrysts of plagioclase 2 to 3 mm long. In places, the lower part of the vitrophyre contains 15 to 20 percent inclusions of light-pink, flattened pumice lapilli. Forms densely-jointed, rounded towers and cliffs and is in sharp contact with the underlying tuff of Ripgut Springs. Tuff ranges from 10-20 m thick in the southern portion of map to more than 180 m thick in the northern portion of the map. Average corrected K-Ar age 26.0 m.y. (Fleck and others, 1975). Near White Rock Peak crops out as lava flows as much as 100 m thick (Best and others, 1986)
- Tg TUFF OF RIPGUT SPRINGS (OLIGOCENE)--Crystal-poor, poorly welded, pumice-rich rhyolite ash-flow tuff. Contains less than 5 percent phenocrysts of 1-mm long plagioclase, biotite, and minor opaques, and from 10 to 40 percent pumice. Pumice averages 5 to 10 mm across, but may range up to 5 cm across; ranges in color from white, gray, orange, brown, and pink. Subangular to subrounded clasts comprise as much as 25 percent of the tuff and average 3-8 mm in diameter (range as large as 15 cm). Clasts consist predominantly of red and gray porphyritic volcanic rocks; clasts from the Lund and Wah Wah Formations are common. The formation is sparse in the southern part of the map, and where present occurs in fault blocks or pinches out over short distances. Usually forms cliffs. In the northern part of the map near White Rock Peak, at least three cooling units are present showing varying degrees of welding, mineralogy, and percentage of pumice fragments. To the southeast of White Rock Peak the tuff has a cumulative thickness of at least 100 m

LUND FORMATION (OLIGOCENE)

- Tlf Intrusive-lava vent member--Three small bodies along the northeastern margin of the map directly east of White Rock Peak and one body along the northwestern margin of the map. Phenocryst composition of the bodies is similar to the tuff member of the Lund Formation and may be its intrusive equivalent. Eastern bodies are vitrophyre, light to dark gray, and weather to a buff color, strongly foliated, equigranular, have average grain sizes of 3-4 mm, and contain euhedral grains of biotite, hornblende, plagioclase, and quartz, and trace amounts of sphene. Western body is altered and has a porphyritic texture. Densely jointed in outcrop, with northeast- and northwest-trending, near-vertical joints. Bodies may be extrusive domes. Surrounded by colluvium so age relations are unknown
- Tlt Tuff member--Densely welded dacitic ash-flow tuff, containing 44-54 percent phenocrysts of 1-2 mm plagioclase (28 to 35 percent), sanidine (0 to 1.7 percent), biotite (2 to 10 percent), hornblende (2-6 percent), augite (0-2 percent), opaque minerals (1 percent), and trace amounts of sphene and zircon. Medium brownish-gray to white on fresh surfaces but weathers to a characteristic rusty orange-red. Pale-green-yellow and white pumice fragments make up as much as 20 percent of the tuff. Exposures mostly along the western side of the map area. Is highly indurated and generally supports only sparse vegetation; dense jointing has resulted in a slablike weathering of the outcrops. Strongly foliated, and usually strikes northeast, with shallow (20-25⁰) dip. Total thickness unknown because bottom of unit is not exposed in the map area; however, unit is at least 250 m thick. Age is 27.9 m.y. (Best and Grant, in press)
- Ehp HIGHLAND PEAK FORMATION (CAMBRIAN)--Light and dark gray limestone and dolomite as described by Tschanz and Pampeyan (1970)

REFERENCES

- Best, M. G., and Grant, S. K., in press, Stratigraphy of the volcanic Oligocene Needles Range Group in southwestern Utah; Chapter A, Oligocene and Miocene volcanic rocks in the central Pioche-Marysville igneous belt, western Utah and eastern Nevada: U.S. Geological Survey Professional Paper 1433-A.
- Best, M. G., Kowallis, J. B., Willis, J. B., and Best, V., 1986, Geologic map of Northern White Rock Mountains-Hamlin Valley Area, Beaver County, Utah and Lincoln County, Nevada: U.S. Geological Survey Open-File Report 86-0114, scale 1:50,000.
- Fleck, R. J., Anderson, J. J., and Rowley, P. D., 1975, Chronology of mid-Tertiary volcanism in High Plateaus region of Utah: Geological Society of America Special Paper 160, p. 53-61.
- Rowley, P. D., Steven, T. A., Anderson, J. J., and Cunningham, C. G., 1979, Cenozoic stratigraphic and structural framework of southwestern Utah: U.S. Geological Survey Professional Paper 1149, 22 p.
- Tschanz, C. M., and Pampeyan, E. H., 1970, Geology and mineral deposits of Lincoln County, Nevada: Nevada Bureau of Mines and Geology, Bulletin 73, 188 p.
- Willis, J. B., 1985, Petrology and geochronology of early Miocene bimodal volcanism, northern Wilson Creek Range, Lincoln County, Nevada: Provo, Utah, Brigham Young University, M.S. thesis.