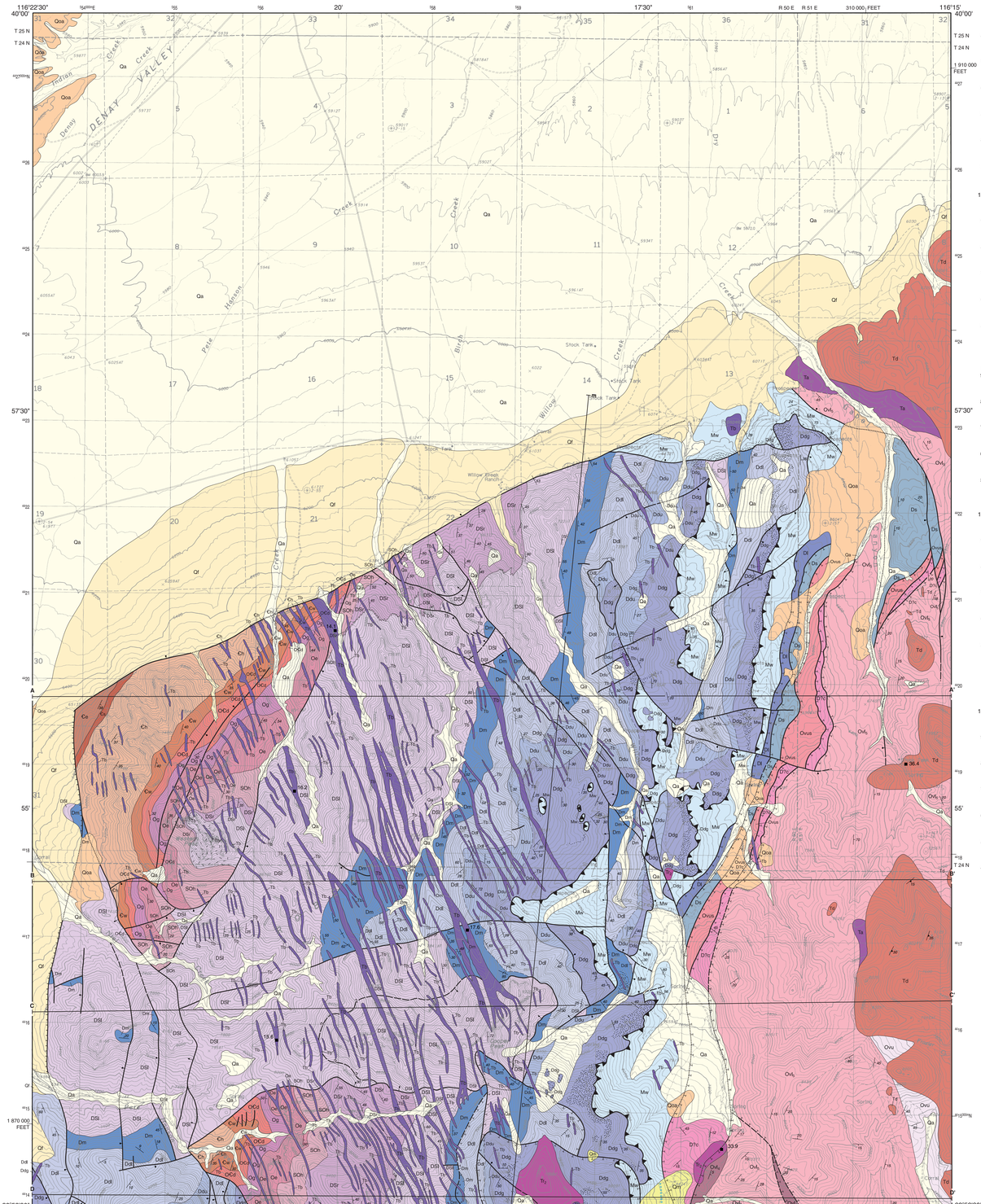

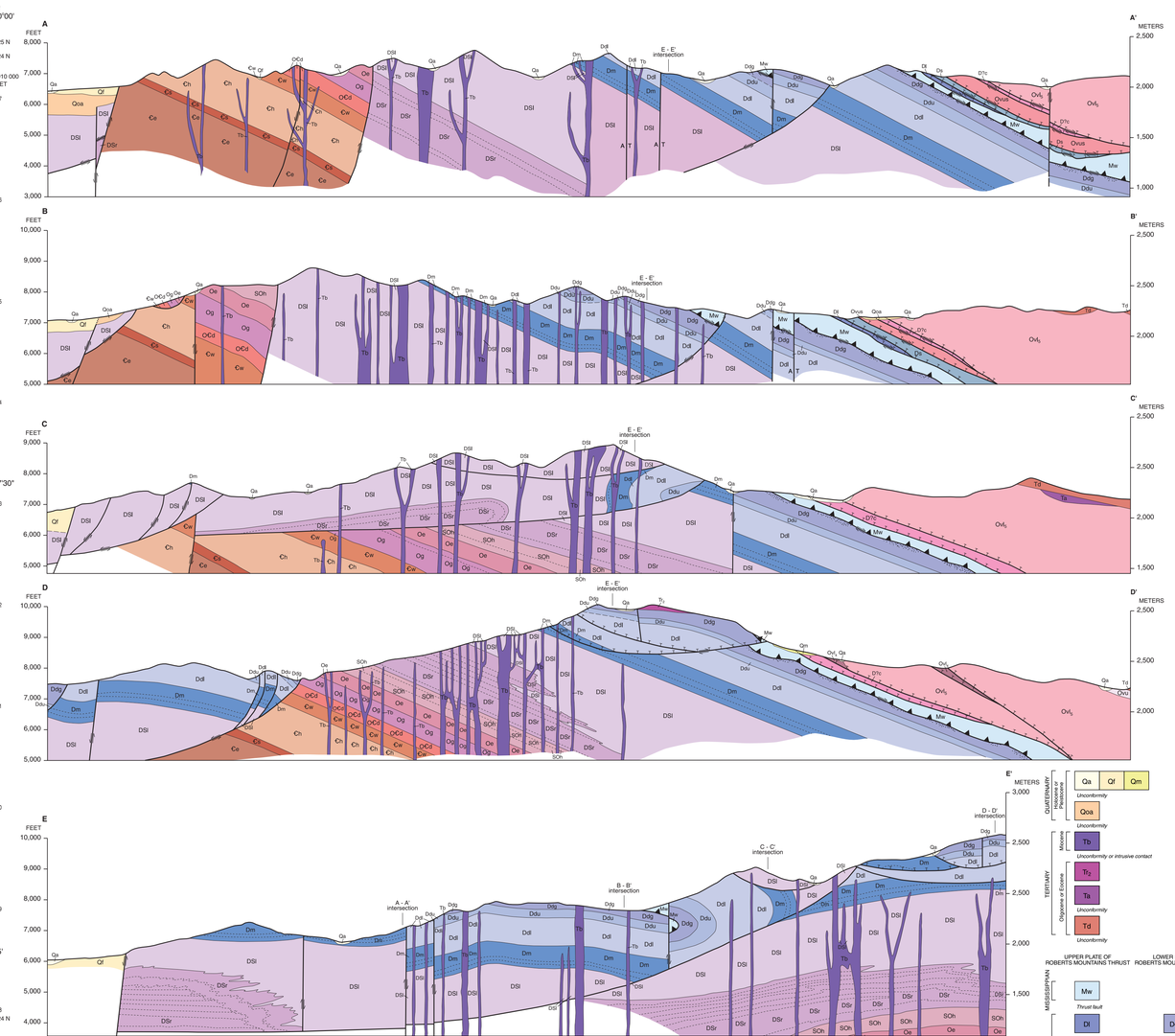

GEOLOGIC MAP OF THE COOPER PEAK QUADRANGLE, EUREKA COUNTY, NEVADA

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2007

Qa **Alluvium, colluvium and talus** Mostly stream sand and gravel and intermontane fans.

Qf **Alluvial fans** Young fan deposits, undissected or slightly dissected, mostly in the process of formation.

Qm **Moraine** Unsorted glacial moraine deposits on the east side of Roberts Creek Mountain. Two terminal moraines separated on map by small blue circles.

Qoa **Older alluvial deposits** Unconsolidated alluvium in the process of dissection.

Tb **Basalt (Miocene)** Lava flows and dikes. Mostly fine grained, some dikes have ophitic texture. K-Ar ages from 13.6±0.4 to 18.6±0.7 Ma.

Tr$_2$ **Rhyolite (Oligocene–Eocene)** Crystal poor, smoky quartz, plagioclase, sanidine- and biotite-bearing lava, ash-flow and intrusive rocks. Includes some air-fall tuffs and tuffaceous sedimentary rocks. K-Ar ages range from 28.8±1.0 to 35.5±0.8 Ma.

Ta **Andesite (Oligocene–Eocene)** Fine-grained to aphanitic flow rocks, coarse-grained and porphyritic intrusive rocks. K-Ar ages range from 31.5±1.0 to 33.9±1.0 Ma.

Td **Dacite (Eocene)** Massive pink to brown porphyritic dacite lava flows. Contains phenocrysts of plagioclase, hornblende, and some quartz. K-Ar age of 36.4±1.2 Ma.

UPPER PLATE OF ROBERTS MOUNTAINS THRUST

Mw **Webb Formation (Mississippian)** Thin-bedded, fine-grained siliceous mudstone and shale. Interbedded ribbon chert beds and chert-quartz grits.

Dl **Unnamed limestone and shale (Devonian)** In thrust contact with other units in the thrust plate. Lower part is thin-bedded, platy-splitting gray-black limestone with interbeds of limy shale. Contains the Lower Devonian graptolite *Monograptus hercynicus*. Upper part of the unit is thin- to medium-bedded gray limestone with corals and brachiopods. Lithologically and faunally similar to the Denay Limestone of the lower plate of the Roberts Mountain thrust.

Ds **Unnamed shale and chert (Devonian)** In thrust contact with other units in the thrust plate. Dark-gray, yellow-orange weathering shale with a few interbeds of black chert. Age based on occurrence of Stromatopod (*Angustidontus*) appendages

D?c **Unnamed chert and argillite (Devonian?)** In thrust contact with other units in the thrust plate. Green, brown and black thin- to medium-bedded chert. Some thin-bedded dark limestone stringers. Age based on radiolaria collected outside of the Cooper Peak Quadrangle.

Ovus **Vinini Formation, Upper Member (Upper Ordovician)** In thrust contact with Devonian shale beneath and Devonian (?) chert above. Thin-bedded pastel chert, black organic shale that weathers light gray; graptolites from the Upper Ordovician *Climacograptus bicornis* zone are common locally.

Ovu **Vinini Formation, Upper Member (Upper Ordovician)** Black, organic shale, mudstone, argillite, porcelanite, chert with lenses of quartz arenite, and, at the top, limestone. In stratigraphic contact with lower member of the Vinini Formation.

Ovl$_5$ **Vinini Formation, Lower Member (Middle Ordovician)** Quartz arenite, quartz wacke, calcareous quartz wacke, sandy limestone, siltstone and shale.

Ovl$_4$ **Vinini Formation, Lower Member (Lower Ordovician)** Black to olive shale, fissile, rare interbeds of chert.

LOWER PLATE OF ROBERTS MOUNTAINS THRUST

Ddg **Devils Gate Limestone (Devonian)** Massive- to medium-bedded gray limestone–mostly algal and stromatoporoid wackestone and boundstone and Amphipora packestone. Stippled where silicified.

Ddu **Denay Limestone, upper part (Devonian)** Lower part thin-bedded laminated siliceous dark lime mudstone. Upper part medium-bedded gray lime mudstone, wackestone, and packstone. Stippled where silicified.

Ddl **Denay Limestone, lower part (Devonian)** Thin- to medium-bedded light- to dark-gray lime mudstone and intercalated light-gray calcarenites. Calcarenites mostly bioclastic and are graded. Stippled where silicified.

Dm **McColley Canyon Formation (Devonian)** Includes three members described by Murphy and Gronberg, (1970), but not separated on this map. Lower part is well-bedded, fine-grained silty dolomitic limestone that is cherty in places and moderately fossiliferous. Higher in the formation are alternating thin- to medium-bedded, gray fine-grained limestone, and pale-orange argillaceous limestone. Contains abundant fossils. The upper part is thick-bedded, gray fine-grained crinoidal limestone, with a fauna of horn corals, dacryoconarids, and pelmatozoans. Stippled where secondary dolomitization obscures all sedimentary features.

DSl **Lone Mountain Dolomite (Devonian and Silurian)** Dense light-colored dolomite. Includes fenestral grainstones, peloidal and bioclastic grainstones, and some fine-grained laminated dolomites. Bedding is massive to thin and secondary dolomitization of variable intensity characteristically obscures sedimentary features. The bioclastic dolomite interfingers with limestone units of the Roberts Mountains Formation.

DSr **Roberts Mountains Formation (Devonian and Silurian)** The lowest part of the formation contains thin-bedded dolomite and dark chert overlain by laminated limestone with chert nodules. Thin to medium beds of graded bioclastic limestones are interstratified with the platy splitting, tan-weathering laminated limestone higher in the formation. Thick beds of bioclastic limestone grade laterally and vertically into bioclastic dolomite of the Lone Mountain Dolomite.

SOh **Hanson Creek Formation (Silurian and Ordovician)** Dark thin-bedded limestone and dolomite. The basal part of the formation is pelmatozoan grainstone, overlain by burrow-mottled medium-bedded mudstone. The upper half of the formation is mostly medium- to thick-bedded light-gray mudstone, and contains one interval of bioclastic grainstone. Black chert blebs and stringers are common near the top of the formation. Stippled where secondary dolomitization obscures all sedimentary features.

Oe **Eureka Quartzite (Ordovician)** Thin- to thick-bedded and mostly recrystallized fine- to medium-grained quartz sandstone, in places crossbedded. Lower half of the formation is brown, the upper half is gray to white.

Og **Goodwin Limestone (Ordovician)** Mostly thin- to medium-bedded gray dolomite with some thin-bedded platy limestone. Dolomite is dark fenestral mudstone with chert stringers. The limestone is platy-splitting, light-gray; mottled mudstone with zones of fossil debris.

OCd **Unnamed dolomite (Ordovician and Cambrian)** Dark- to light-gray medium- to thick-bedded laminated dolomitic mudstone.

Cw **Windfall Formation (Cambrian)** Thin-bedded, flaggy to splitting light-gray lime mudstone. Characterized by mottled orange and gray bedding surfaces, and pinch and swell structure. Some interbedded shale. Trilobite fragments common at several horizons.

Ch **Hamburg Dolomite (Cambrian)** Thick-bedded to massive, medium- to coarse-grained, dark- to light-gray dolomite. Much pervasive bioturbation and some fenestral structure. Large areas are recrystallized and secondary dolomite forms a lacework of white veins in the darker coarse-grained dolomite.

Ꞓs **Secret Canyon Formation (Cambrian)** Lower part is dark green to brown finely laminated siliceous argillite and shale. Upper part is thin-bedded, mottled orange and gray, platy splitting limestone. Pinch and swell bedding with irregular bedding surfaces.

Ꞓe **Eldorado Dolomite (Cambrian)** Light-gray to white thin- to medium-bedded laminated dolomitic mudstone. Laminas are nonplanar, wavy, and irregular. Some fenestral structure. Irregular secondary dolomitization gives the rock a mottled aspect in many places.

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Scale 1:24,000

0 0.5 1 kilometer

0 1000 2000 3000 4000 5000 feet

0 0.5 1 mile

QUATERNARY — Pleistocene: Qa, Qf, Qm; Unconformity; Qoa; Unconformity

TERTIARY — Miocene: Tb; Unconformity or intrusive contact; Oligocene or Eocene: Tr$_2$, Ta; Unconformity; Td; Unconformity

UPPER PLATE OF ROBERTS MOUNTAINS THRUST — MISSISSIPPIAN: Mw; Thrust fault; DEVONIAN: Dl, Ds; Thrust fault; SILURIAN AND ORDOVICIAN: D?c; Thrust fault; ORDOVICIAN: Ovus, Ovu, Ovl$_5$, Ovl$_4$; Thrust fault; ORDOVICIAN AND CAMBRIAN: Og, OCd, Cw, Ch, Ꞓs, Ꞓe; Unconformity

LOWER PLATE OF ROBERTS MOUNTAINS THRUST — DEVONIAN: Ddg, Ddu, Ddl, Dm, DSl, DSr; SILURIAN AND ORDOVICIAN: SOh; ORDOVICIAN: Oe

Lithologic contact Dashed where uncertain; dotted where concealed. Short dashes show bedding within units on cross sections. Surficial contacts may be uncertain.

Fault Dashed where uncertain, queried where doubtful, dotted where concealed. Ball on downthrown side. Arrows show relative direction of strike slip movement. In cross section: A, away from observer; T, toward observer

Fault scarp Hachures on downthrown side.

Roberts Mountains thrust Dotted where concealed. A regional fault bringing silicic rocks onto carbonate rocks in late Paleozoic time.

Low angle fault at base of megagravity slide block Dashed where uncertain; dotted where concealed.

Low angle fault Dashed where uncertain; dotted where concealed. Arrow is direction of dip of fault plane, number is inclination from the horizontal of fault plane.

Strike and dip of beds

Inclined — Horizontal — Overturned — Vertical — Crenulated

Strike and dip of compaction foliation

Strike and dip of foliation in volcanic units

15.6 **Sample dated by potassium-argon method** Age in millions of years (ma).

Edge of moraine In southeastern part of quadrangle.

Secondary dolomitization

Silicified carbonate rocks

CONTOUR INTERVAL 40 FEET

Base map: U.S. Geological Survey
Cooper Peak 7.5' Quadrangle, 1986
1927 North American Datum

Adjoining 7.5' quadrangle names

1	2	3
4	5	
6	7	8

1 Rocky Hills
2 Pete Hanson Creek
3 Mineral Hill SW
4 Tonkin Summit
5 Frazier Creek
6 Three Bar Ranch
7 Roberts Creek Mtn.
8 Garden Pass