

Qac ALLUVIUM AND COLLUVIUM (Quaternary) Unconsolidated sand and gravel, alluvial fan, talus, and slopewash deposits.

Qi TALLUS DEPOSITS (Quaternary) Unconsolidated sandy to gravely talus deposits.

Qls LANDSLIDE DEPOSITS (Quaternary) Unconsolidated landslide deposits generally composed of underlying or adjacent units.

QTac OLDER ALLUVIUM AND COLLUVIUM (Quaternary and/or Tertiary) Consolidated and unconsolidated sand and gravel, alluvial fan, talus, and slopewash deposits.

Tb BASALT AND BASALTIC ANDESITE (Pliocene and/or Miocene) Dark-gray to black aphanitic flows; phenocryst-poor lavas contain small (1 mm or less) plagioclase phenocrysts.

Ts SEDIMENTARY ROCKS (Pliocene and/or Miocene) Fine-grained volcanogenic lacustrine sediments and partially consolidated fluvial gravels and sandstones.

Tr RHYODACITE (Pliocene and/or Miocene) Intrusive rhyodacite, locally massive and locally containing well-developed cooling joints.

Tu UNDIFFERENTIATED TUFF (Miocene)

Ta ANDESITE (Miocene) Extrusive andesite flows, breccia, and local hypabyssal intrusive bodies. Locally interbedded with thin volcanogenic sedimentary units.

Tts SINGATSE TUFF (Oligocene) Brown to red brown, moderately to densely welded, and crystal rich; contains abundant lithic fragments. Crystals are plagioclase, quartz, sanidine, biotite, and hornblende. Dated locally with K-Ar (biotite) as 27.2 ± 1.1 Ma (Proffett, 1977).

Tgm GUILD MINE MEMBER OF THE MICKKEY PASS TUFF (Oligocene) Dense to moderately welded, basal vitrophyre. The tuff typically contains abundant pumice fragments throughout. Crystals are plagioclase, quartz, sanidine, and biotite. Dated locally with K-Ar (biotite, sanidine) as 27.2 ± 0.9 Ma and 26.0 ± 1.0 Ma (Proffett, 1977); and 27.6 ± 0.8 Ma (Ekren and others, 1980).

Tlu BETTLES LAVA (Oligocene) Siliceous lava underlying andesite unit (Ta). Stratigraphic relationship with the Singatse and Guild Mine tuffs unknown. Dense, well-foliated, crystal-rich lava containing sparse lithic fragments. Crystals are plagioclase and biotite. Undated.

TKp FELDSPAR PORPHYRY (Tertiary and/or Cretaceous) Light-gray porphyry intrusive rocks containing phenocrysts of feldspar.

Kg1 GRANITOID (Cretaceous) Granite to quartz monzonite intrusive.

Kg2 GRANITIC INTRUSIVE (Cretaceous) Undifferentiated and undated granitic intrusive rocks.

Jd DUNLAP FORMATION (Jurassic) Terrigenous clastic rocks and locally minor interbedded carbonate rocks. Terrigenous clastic rocks are characterized by coarse chert breccia, carbonate breccia, volcanic breccia, and abundant quartz and/or feldspar sandstone in an argillite matrix. The formation resides in numerous thrust nappes and may represent diverse ages and sites of deposition (Oldow and Bartel, 1987).

L LUNING FORMATION (Upper Triassic) Consists of interbedded members of carbonate and terrigenous clastic rocks (Oldow, 1981). Carbonates are generally thin- to medium-bedded gray to black limestone and locally dolomite. Terrigenous clastic rocks are interbedded chert-quartz sandstone, chert-pebble conglomerate, and argillite. Three stratigraphic members, in descending stratigraphic order: Tlu, Tm, and Tl are recognized in parts of the map area. In other areas, lithologic divisions have no stratigraphic significance (Tlc and Tls).

Tlu Upper Member: medium bedded carbonate (80%), consisting of limestone passing upward into dolomite, with about 20% interbedded argillite.

Tlm Middle Member: chert-pebble and boulder conglomerate, chert-quartz arenite and wacke, and massive sandy mudstone.

Tll Lower Member: thin- to thick-bedded limestone, commonly very fossiliferous, with up to 80% interbedded argillite.

Tlc Undifferentiated carbonate rocks of the Luning Formation.

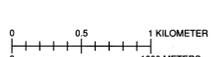
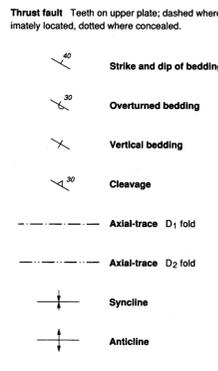
Tls Undifferentiated siliclastic rocks of the Luning Formation.

MAP SYMBOLS

Contact Dashed where approximately located.

High-angle Fault Dashed where approximately located, dotted where concealed; ball on downthrown side where relative displacement known; arrows indicate relative lateral displacement when known; A and T indicate away and toward relationships of strike slip faults on cross sections.

Thrust fault Teeth on upper plate; dashed where approximately located, dotted where concealed.



Scale 1:24,000

CONTOUR INTERVAL 40 FEET

Base map: U.S. Geological Survey Bettles Well 7' Quadrangle, 1980

REFERENCES

Ekren, E. B., Byers, F. M., Jr., Hardyman, R. F., Marvin, R. F., and Silberman, M. L., 1980. Stratigraphy, preliminary petrology, and some structural features of Tertiary volcanic rocks in the Gabbs Valley and Glass Ranges, Mineral County, Nevada: U.S. Geological Survey Bulletin 1464, 54 p.

Oldow, J. S., 1981. Structure and stratigraphy of the Luning allochthon and the kinematics of allochthon emplacement, Pilot Mountains, west-central Nevada: Geological Society of America Bulletin, v. 92, Part 1, p. 888-911, Part 2, p. 1647-1669.

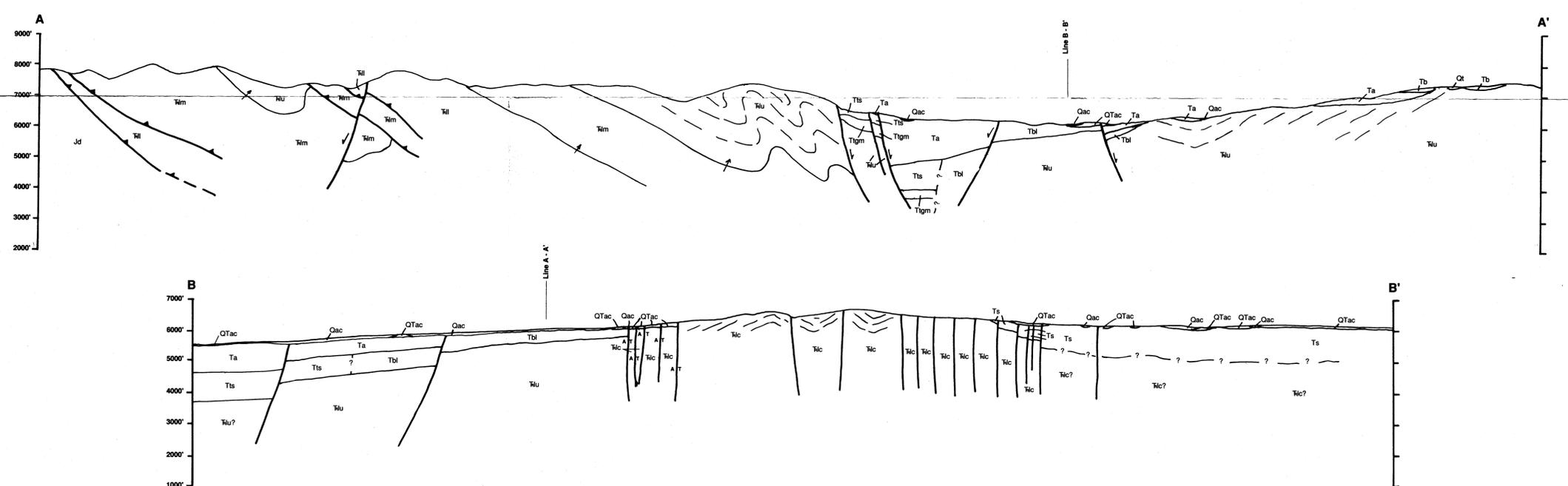
Oldow, J. S., and Bartel, R. L., 1987. Early to Middle(?) Jurassic extensional tectonism in the western Great Basin: Growth faulting and synorogenic deposition of the Dunlap Formation: Geology, v. 15, p. 740-743.

Proffett, J. M., Jr., 1977. Cenozoic geology of the Yerington district, Nevada, and implications for the nature and origin of Basin and Range faulting: Geological Society of America Bulletin, v. 88, p. 247-266.

Draft reviewed by:
R. F. Hardyman, USGS
L. J. Garbide, NBMG
D. A. Davis, NBMG

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Printed by A. Carlisle, Reno, NV
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Nevada Bureau of Mines and Geology
University of Nevada, Mail Stop 178
Reno, Nevada 89557-0088



GEOLOGIC MAP OF THE BETTLES WELL QUADRANGLE, NEVADA

John S. Oldow and Javan N. Meinwald

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