

SCALE 1:100,000  
 Contour interval 40 meters  
 Supplementary contour interval 10 meters

0 2 4 6 8 10 Kilometers

0 1 2 3 4 Miles

Base from U.S.C.S. Tule Valley, Ely, Fish Springs, and Kern Mountains 30' x 60' quadrangles

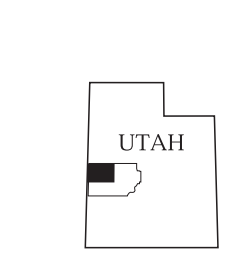
2002 MAGNETIC DECLINATION  
 AT CENTER OF SHEET

133° 30'

260 METERS

**GEOLOGIC MAP OF THE TULE VALLEY 30' x 60' QUADRANGLE  
 AND PARTS OF THE ELY, FISH SPRINGS, AND KERN MOUNTAINS 30' x 60' QUADRANGLES,  
 NORTHWEST MILLARD COUNTY, UTAH**

by  
**Lehi F. Hintze and Fitzhugh D. Davis**  
 2002



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Plate 1 of 2  
 Map 186  
 Utah Geological Survey  
 a division of  
 Utah Department of Natural Resources  
 in cooperation with U.S. Geological Survey  
 State-map Agreement No. 00HQAG109

GIS compilation: Basia Matyszk and Angela Wolman  
 Cartographer: James Parker  
 Project Manager: Jim King

PLATE 2 of 2  
Map 186  
Geologic Map of the Tule Valley 30' x 60' Quadrangle,  
and parts of the  
Ely, Fish Springs and Kern Mountains 30' x 60' Quadrangles,  
Northwest Millard County, Utah  
by  
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UTAH GEOLOGICAL SURVEY  
a division of  
UTAH DEPARTMENT OF NATURAL RESOURCES  
in cooperation with  
THE UNITED STATES GEOLOGICAL SURVEY  
STATEMAP Agreement No. 09HQAG109

CORRELATION OF GEOLOGIC UNITS

DESCRIPTION OF GEOLOGIC UNITS

- Q** Quaternary surficial units, undivided—Cross section only; for included units see correlation chart and descriptions.
- Qlf** Fine-grained lacustrine deposits—Grayish tan, and light-gray, calcareous silt; that are deep-water sediments of Lake Bonneville, Lake Tule, Lake Gunnison (all late Pleistocene), and Sevier Lake (when it contained surface water in the Holocene); locally includes younger alluvium; thickness 10 to 3 m or less.
- Qll** Lacustrine lagoon deposits—Sand, silt, clay, and silty mud that accumulated in lagoons behind gravel barrier beaches of Lake Bonneville; locally includes younger alluvium; generally less than 10 feet (3 m) thick.
- Qlt** Lacustrine tuff—White to light-gray, shore-zone tuff deposited in Lake Tule; 1 to 16 feet (0.3–1.2 m) thick.
- Qlm** Lacustrine marl—Fine-grained, thin bedded to laminated, white to light-gray, offshore to deep water mud deposited in Lake Bonneville; ostracode abundant throughout marl and, locally, gastropods present at top and base of marl; 0 to 30 feet (0–9 m) thick.
- Qla** Lacustrine and alluvial deposits on piedmont slopes; grades from pebbly sand and silt to sandy pebble gravel; 0 to 12 feet (0–3.7 m) thick, but may be thicker locally.
- Qlg** Lacustrine gravel—Shore-zone gravel deposited in Lake Bonneville, Lake Tule, and Lake Gunnison; and Sevier Lake; chiefly silty, fine to coarse-grained sand and gravel; gravel content is generally greater than 50 percent; 0 to 18 feet (0–5.5 m) thick; gravel of Lake Bonneville, Lake Tule, and Lake Gunnison is late Pleistocene. Beach gravel of Sevier Lake is adjacent to plays mud (Qpm) and is Holocene.
- Qlk** Lacustrine carbonate sand—Lacustrine sand and pebbly sand that consists of white and light gray, carbonate pellets, carbonate coated gastropods, and ooids deposited in Lake Bonneville; 0 to 10 feet (0–3 m) thick.
- Qls** Lacustrine sand—Fine to coarse-grained sand, marly sand, and pebbly sand deposited in Lake Bonneville as beaches, spits, and offshore bars; 0 to 30 feet (0–9 m) thick.
- Qal** Alluvium, late Holocene—Youngest alluvium in the channel and floodplain of Baker Creek; consists of sand, silt, and clay with poorly lenses of gravel; generally 0 to 20 feet (0–6 m) thick, but may be thicker locally.
- Qaf** Younger alluvial-fan deposits—Poorly sorted silt, sand, and pebble, cobble, and boulder gravel deposited by streams, sheetwash, debris flows, and flash floods on alluvial fans, and in canyons and mountain valleys; post-Bonneville shoreline in age; generally 0 to 40 feet (0–12 m) thick, but locally may exceed 60 feet (18 m).
- Qaz** Older alluvial-fan deposits—Poorly sorted silt, sand, and pebble, cobble, and boulder gravel deposited by streams, debris flows, and flash floods on alluvial fans, and in canyons and mountain valleys; mostly Pleistocene and pre-Lake Bonneville in age, but locally includes younger material; up to 200 feet (60 m) or more in thickness.
- Qac** Alluvium and colluvium, undivided—Mixed alluvial and colluvial deposits that consist of fluviially reworked, coarse-grained colluvium and alluvium with a significant colluvial component; also includes talus; only mapped on margins of Tule Valley; generally 0 to 50 feet (0–15 m) thick, but may be thicker locally.
- Qes** Eolian sand—Windblown sand in sheets, less irregular mounds, shrub-covered dunes, and narrow, northeast-trending ridges that are largely stabilized by vegetation; mostly silt, well-sorted, fine-grained quartz sand; 0 to 10 feet (0–3 m) thick.
- Qed** Eolian dunes—Chiefly parabolic, linear, and dome dunes in Tule Valley that are active and not stabilized by vegetation; mostly well-sorted, fine-grained quartz sand, but some calcite and gypsum sand is present; 30 feet (1–9 m) thick.
- Qeg** Eolian gypsum—Sand-sized gypsum deposited in windblown sand sheets in the central and eastern parts of Tule Valley; 0 to 10 feet (0–3 m) thick.
- Qdm** Deltaic mud—Holocene mud of the Sevier River delta at the northeastern end of the Sevier Lake plays; likely 0 to 30 feet (0–9 m) thick.
- Qpm** Plays mud—Laminated, silty fine sand, silt, and clayey silt that are infused with variolous, chiefly gypsum and calcium carbonate; saline mud is as much as 900 feet (274 m) thick beneath the Sevier Lake plays but the uppermost few feet are Quaternary; thickness of silty mud in the other plays is probably 20 feet (6 m) or less.
- Qms** Mass movements, slides, and slumps—Primarily mapped in the Sweeney Peak area of the northern House Range where limestone blocks of the Dome Limestone and Marjum Formation have slumped or slid downlope on the less resistant Chisholm Formation and Wheeler Shale, respectively; small, isolated slides or slumps are present in many mountainous areas, but are too small to show at a 1:100,000 scale; generally 0 to 120 feet (0–37 m) thick, but may be thicker in places.
- Qsm** Marsh deposits associated with springs—Gray to black, organic silt, clayey silt, and sandy silt; Tule Valley marsh deposits tend to be carbonate-rich and saline; possibly up to 20 feet (6 m) thick.
- Qtl** Fine-grained lacustrine deposits of Sevier Desert—Brown and light-olive gray, calcareous, lacustrine silt and silty clay with minor sand; offshore to deep-water sediments that are Pleistocene to middle Pleistocene in age; 0 to 872 or more feet (0–265+ m) thick.
- Qtin** Near-shore lacustrine limestone of Sevier Desert—Light gray limestone and conglomeratic limestone that comprise the shoreline facies of QTL; up to 90 feet (27 m) thick.
- Tvs** Tertiary volcanic and sedimentary units, undivided—Cross section only; for included units see correlation chart and descriptions.
- Tr** Rhyolite of Whirlwind Valley—Light gray, flow-layered, microfissile, devitrified rhyolite that may be a Miocene intrusive dome similar to 6 Ma teph rhyolite to north in Juab County.
- Tcs** Conglomerate and tuffaceous sandstone—Weakly consolidated, pebble to cobble conglomerate and sandstone with interbedded tuffaceous sandstone on the northern flank of the House Range; dips valleyward about 10 degrees; about 1,000 feet (300 m) exposed.
- Tct** Conglomerate and tuff of Confusion Range—Light gray, tuffaceous sandstone, sandstone, limestone, and conglomerate and all-fall, micaceous tuff; dips 20 degrees into valley; up to about 2,000 feet (600 m) thickness exposed.
- Tnu** Upper Needles Range Group—Crystalline, dacitic ash-flow tuff, mainly of the Wah Wah Springs Tuff; age about 30.5 Ma; thickness up to 400 feet (120 m).

- Tsr** Skull Rock Pass Conglomerate—Unconsolidated, boundary conglomerate of Paleozoic clasts that lies above Tunnel Spring and Red Knolls Tuffs and beneath tuffs of the Needles Range Group; matrix is locally tuffaceous and contains dolomite rock clasts; as much as 320 feet (98 m) thick.
- Tl** Lacustrine limestone and breccia—Light gray limestone that locally contains plant and fresh-water small fossils; as much as 100 feet (30 m) thick in House Range and up to 200 feet (60 m) thick in Mile-and-a-Half Canyon in Confusion Range. Thinner siltstone lenses in Confusion Range are included in unit Tt. Basal cemented breccia of Cambrian dolomite and limestone fragments, as much as 115 feet (35 m) thick, is present only in House Range.
- Twb** Windows Butte Tuff—Pink, rhyolite ash-flow tuff, small exposures at Tons Canyon in the Conger Range, and south of Wheeler Amphitheater in the House Range; Ar/Ar age 31.4 to 5 Ma; may be younger than unit Tt; less than 20 feet (6 m) exposed.
- Tt** Tunnel Spring Tuff—White, crystal-rich, poorly welded, rhyolite ash flow tuff that contains abundant xenoliths of Paleozoic rocks; characterized by well-formed, small, doubly terminated, quartz crystals; K-Ar age 35.4 Ma; maximum thickness, as much as 620 feet (189 m) thick.
- Trk** Red Knolls Tuff—Grayish-pink, crystal rich, dacite ash-flow tuff found east of the House Range; Ar/Ar age 36.5 Ma; about 200 feet (60 m) thick.
- Tdc** Volcanic sequence of Dennison Canyon—Mostly a volcanic conglomerate of sub-rounded boulders, cobbles, and pebbles in an ash volcanic matrix; includes basal pink ash-flow tuff about 500 feet (150 m) thick, overlain by 1,500 feet (460 m) of andesitic volcanic debris flows with 500 feet (150 m) of interbedded rhyolite-andesite lava flows and lesser debris flows at top of sequence; Ar/Ar ages 36.7 to 37.1 Ma; thickness about 2,000 to 2,500 feet (600–760 m).
- Ta** Altered Cambrian and Tertiary rocks—Includes altered Cambrian strata on the west side of House Range. Age of alteration is thought to be about 36 Ma, the same as the Tertiary rocks in the Drum Mountains and elsewhere, but the age is Tertiary(?) in Cambrian strata elsewhere on the map.
- Tdi** Drum Mountains intrusions—Two small intrusive bodies of dark gray, finely crystalline diorite in the Drum Mountains.
- Tid** Diorite dikes in the House Range—Two northeasterly trending dikes, one between Marjum Pass and Wheeler Amphitheater, and the other in Sawtooth Canyon east of North Peak.
- Timl** Mt. Laird intrusive—Rhyodolite porphyry dikes that cut the Drum Mountains Rhyodolite in the Little Drum Mountains; age 37 Ma; as much as 900 feet (275 m) thick.
- Tld** Little Drum Formation—Intercalated andesitic tuff and bouldery volcanic breccia; thickness 400 to 2,325 feet (120–708 m).
- Tdr** Drum Mountains Rhyodolite—Rusty, and maroon-weathering flows and breccias, and dark gray, vesicular lavas; Ar/Ar ages 37 Ma, but may be reset by Mt. Laird and Drum Mountains intrusions; thickness about 2,000 feet (600 m). Pyroxene latite of Black Point, about 1,000 feet (300 m) thick, also included in this map unit.
- Tgt** Welded tuff near Gandy—Unconsolidated, small outcrop of brown, glassy, crystal-poor, welded tuff; about 50 feet (15 m) thick; age unknown.
- Kbm** Breccia along tear faults in the House Range—Breccia with horizontal slickensides is present along most of the east-southeasterly tear faults in the northern sand—Windblown sand in sheets, less irregular mounds, shrub-covered dunes, and narrow, northeast-trending ridges that are largely stabilized by vegetation; mostly silt, well-sorted, fine-grained quartz sand; 0 to 10 feet (0–3 m) thick.
- Jg** Noach Peak quartz monzonite—Coarsely crystalline, porphyritic, quartz monzonite stock with silt that intrude Middle Cambrian strata; K-Ar age 170 Ma.
- Rt** Thaynes Formation—Yellowish-gray claystone, plate siltstone, fine-grained sandstone, and brown limestone; maximum thickness about 1,935 feet (590 m).
- Pu** Upper Permian, undivided—Cross section only; for included units see correlation chart and descriptions.
- Pg** Geester Limestone—Light brownish-gray, ledge-forming, bioclastic limestone interbedded with silty limestone; abundant invertebrate marine fossils; maximum thickness about 1,100 feet (333 m).
- Pp** Plympton Formation—Yellow or olive gray, fine-grained, cherty dolomite with interbeds of siltystone, sandstone, and gypsum in upper half; thickness 690 feet (210 m).
- Pk** Kalbab Limestone—Massive, light-gray, cherty, bioclastic limestone and limy dolomite; thickness 480 to 600 feet (146–180 m).
- Pa** Arcatus Formation—Mostly fine-grained, poorly indurated, yellowish-gray sandstone, with some 6–10 foot (2–3 m) interbeds of limestone and limy dolomite that are cyclically graded; more than 2,700 feet (820 m) thick.
- PIPMe** Ely Limestone—Cyclic alternating medium gray, ledge-forming, bioclastic limestone and slope-forming, platy siltstone; chert common throughout as nodules, concretions, and irregular beds; corals, brachiopods, crinoids, and other invertebrate fossils are common; thickness 1,850 to 2,000 feet (560–610 m).
- M** Mississippian, undivided—Cross section only; for included units see correlation chart and descriptions.
- Mc** Chattanooga Formation—Interbedded mudstone, clayey limestone, siltstone, black shale, sandstone, and gritstone; mostly thin-bedded but with some thick-bedded, resistant limestone beds; generally forms low topography in the poor exposures; thickness 1,600 to 1,800 feet (490–550 m), thinning northward.
- Ml** Joana Limestone—Medium gray, thick-bedded to massive limestone; common fossils are corals, gastropods, crinoids, and brachiopods; cherty beds in lower third; thinns from 300 feet (90 m) in the southern part of the map area to zero at Granite Mountain north of map area.
- D** Devonian, undivided—Cross section only; for included units see correlation chart and descriptions.
- MDp** Pilek Shale—Yellow-weathering, platy, calcareous siltstone and shale with thin beds of dolomitic siltstone; generally non-resistant and poorly exposed; 830 feet (250 m) thick.
- Dg** Gullinite Formation—Chertless, gray dolomite and limestone that forms resistant ledges and cliffs; stromatolites abundant in some beds, contains thin sandstone beds in upper third; basal 650 feet (200 m) is massive solution-cavern limestone breccia; thickness is 2,550 to 2,650 feet (775–810 m).

- Ds** Simonson Dolomite—Interbedded dark brownish-gray, sugary dolomite and light-gray, laminated dolomite; poorly preserved stromatolites abundant in some beds; typically about 660 feet (200 m) thick.
- Dsy** Sevy Dolomite—Light to medium-bedded, locally laminated, unfossiliferous dolomite; locally contains frosted quartz sand grains; typically about 1,300 feet (400 m) thick.
- SO** Situation Upper Ordovician, undivided—Cross section only; for included units see correlation chart and descriptions.
- SOU** Laketown and Ely Springs Dolomites, undivided—Mapped in the vicinity of Mile and a Half Canyon in the Confusion Range, where the geology is structurally complex, and near Gandy.
- SI** Laketown Dolomite—Banded dark- and light-brownish-gray, cherty, cliff-forming dolomite; silicified corals and brachiopods common in upper part; 920 to 1,100 feet (280–336 m) thick.
- Oes** Ely Springs Dolomite—Dark brownish-gray, generally unfossiliferous, ledge- and cliff-forming dolomite; 572 to 620 feet (168–189 m) thick.
- O** Middle and Lower Ordovician, undivided—Cross section only; for included units see correlation chart and descriptions.
- Ocw** Eureka-Crystal Peak-Watson Ranch Formations, undivided—These formations are too thin to show individually at the 1:100,000 scale; listed from the top downward. Eureka Quartzite is light gray, medium to fine-grained quartzite that weathers reddish-brown; characteristically pitted with peck-marks about 0.5 inch (1.3 cm) across; forms orange cliffs conspicuous among the gray carbonate rocks; thickness 450 feet (137 m). Crystal Peak Dolomite is interbedded, thin-bedded, light-gray dolomite and bluish-gray, silty limestone; *Erythraea* coral fossils are common; thickness 90 feet (27 m). Watson Ranch Quartzite is interbedded orange-brown, light-gray dolomite and bluish-gray siltstone and dolomite; thickness 200 feet (60 m).
- Opu** Upper Pogoip Group, undivided—Consists of four formations too thin to show individually at the 1:100,000 scale; listed from the top downward. Lehman Formation—Interbedded, bluish-gray, siltstone and shale; abundant ostracodes, brachiopods, trilobites, and other fossils; thickness is 200 feet (60 m). Kanosh Shale—Light gray, medium to fine-grained, silty limestone interbedded with olive shale; forms orange cliffs conspicuous among the gray carbonate rocks; thickness 450 feet (137 m). Crystal Peak Dolomite is interbedded, thin-bedded, light-gray dolomite and bluish-gray, silty limestone; *Erythraea* coral fossils are common; thickness 90 feet (27 m). Watson Ranch Quartzite is interbedded orange-brown, light-gray dolomite and bluish-gray siltstone and dolomite; thickness 200 feet (60 m).
- Of** Fillmore Formation—Medium gray, thin to medium-bedded limestone and intraformational, flat-bedded, limestone conglomerate interbedded with light-olive and yellowish-gray shale; about 1,800 feet (550 m) thick.
- Oh** House Limestone—Medium bluish-gray, thick-bedded to massive, cherty limestone; thickness about 500 feet (152 m).
- Cu** Upper Cambrian, undivided—Cross section only; for included units see correlation chart and descriptions.
- Ocn** Noach Peak Formation—Dark brownish-gray dolomite and gray limestone that commonly contain stromatolites; some beds cherty; forms massive cliffs; about 1,700 feet (520 m) thick.
- Cou** On Formation, upper members, undivided—Consists of four members, in descending order: Snooker Limestone Member, Corset Spring Shale Member, Joana Limestone Member, and Cannonville Shale Member; shale members carry several trilobite zones, aggregate thickness about 860 feet (260 m) where exposed in House Range.
- Cob** On Formation, Big Horse Limestone Member—Medium to dark gray, mottled limestone, oolitic and bioclastic in upper half, which bears *Cryopeltodus* sp. trilobites; barren in lower half; forms ledges and cliffs; 715 feet (218 m) thick where exposed in House Range.
- Cm** Middle Cambrian, undivided—Cross section only; for included units see correlation chart and descriptions.
- Cw** Lamb Dolomite and Tripple Limestone, or Weeks Limestone, undivided—Weeks Limestone is a trilobite-bearing, platy siltstone found only in the central House Range; 1,200 feet (366 m) thick; equivalent strata in other areas are mostly barren limestone and dolomite of the Lamb and underlying Tripple Formations, which include a number of distinctive, white, laminated dolomite beds; thickness 1,180 to 1,290 feet (360–395 m).
- Cmp** Marjum or Pierson Cove Formation—in the central House Range the Marjum Formation is a sequence of trilobite-bearing, dark gray limestone and limy shale; 530 to 1,410 feet (162–430 m) thick; equivalent strata elsewhere are dark gray, mottled, massive, dolomitic limestone and thin-bedded, light-gray dolomite of the Pierson Cove; 900 to 1,200 feet (243–370 m) thick.
- Cww** Wheeler-Sweeney-Whirlwind Formations, undivided—Listed from top downward. Wheeler Shale is olive, gray, calcareous shale about 460 to 900 feet (140–275 m) thick, with abundant *Erythraea* trilobites; Sweeney Limestone is a gray, massive, cliff-forming limestone 180 to 250 feet (55–76 m) thick; Whirlwind Formation is interbedded, thin-bedded limestone and shale, with conifers of *Emanuelia* trilobites, and is about 140 feet (43 m) thick.
- Cdh** Dome Chisholm-Howell Formations, undivided—Listed from top downward. Dome Limestone is massive, forms cliffs, and is about 320 feet (98 m) thick; Chisholm Formation is thin-bedded, fossiliferous limestone and olive shale, and is about 215 feet (66 m) thick; Howell Limestone forms a massive cliff that is dark gray in the lower half and light-gray above, and is 330 to 645 feet (101–196 m) thick.
- Cl** Lower Cambrian, undivided—Cross section only; for included units see correlation chart and descriptions.
- Cp** Pioche Formation—Dark green, micaceous phyllite interbedded with light-brown to greenish-black quartzite; trace-fossil tubular trails and vertical *Stolobites* tubes are common; orange-weathering dolomite beds common in uppermost Pioche; thickness about 415 to 600 feet (127–183 m).
- Cpm** Prospect Mountain Quartzite—Pinkish-gray, medium to coarse-grained quartzite; small-scale cross-bedding and thin beds of grit and pebble conglomerate are common; estimated thickness 400 feet (120 m) or more.
- pC** Precambrian, undivided—Cross section only.

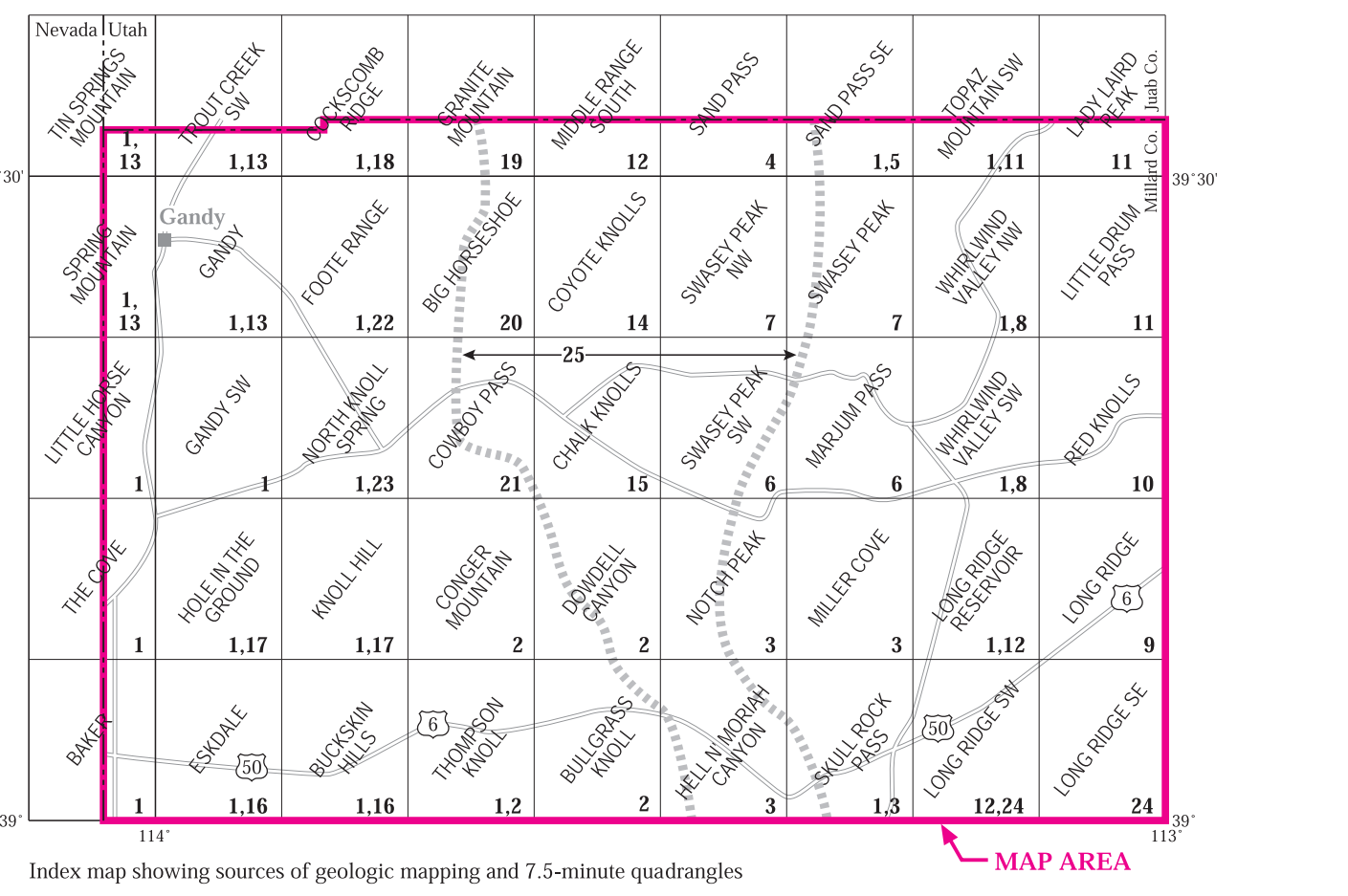
LITHOLOGIC COLUMN

AGE	MAP SYMBOL	MAP UNIT	THICKNESS FEET	METERS	SCHEMATIC COLUMN	OTHER INFORMATION
QUATERNARY	Q	Various	0-200	0-60		Pliocene to mid-Pleistocene
QUATERNARY	Qlf	Fine lake sediments (l)	0-870	0-265		Age uncertain; less than 20 Ma
QUATERNARY	Qll	Lacustrine lagoon deposits	0-1,000	0-300		Includes all-fall tuffs with small biolite flakes
QUATERNARY	Qlt	Lacustrine tuff	0-400	0-120		30.5 Ma ash-flow tuffs
QUATERNARY	Qlm	Lacustrine marl	0-2,000	0-600		31.4 Ma Ar/Ar; Tt 35.4 Ma
QUATERNARY	Qla	Lacustrine and alluvial deposits on piedmont slopes	0-1,000	0-300		36.7-37.1 Ma Ar/Ar
QUATERNARY	Qlg	Lacustrine gravel	0-2,000	0-600		37 and 38.5 Ma Ar/Ar
QUATERNARY	Qlk	Lacustrine carbonate sand	0-1,000	0-300		Age unknown
QUATERNARY	Qls	Lacustrine sand	0-30	0-9		
QUATERNARY	Qal	Alluvium, late Holocene	0-20	0-6		
QUATERNARY	Qaf	Younger alluvial-fan deposits	0-40	0-12		
QUATERNARY	Qaz	Older alluvial-fan deposits	0-200	0-60		
QUATERNARY	Qac	Alluvium and colluvium, undivided	0-50	0-15		
QUATERNARY	Qes	Eolian sand	0-10	0-3		
QUATERNARY	Qed	Eolian dunes	0-30	0-9		
QUATERNARY	Qeg	Eolian gypsum	0-10	0-3		
QUATERNARY	Qdm	Deltaic mud	0-30	0-9		
QUATERNARY	Qpm	Plays mud	0-900	0-274		
QUATERNARY	Qms	Mass movements, slides, and slumps	0-120	0-37		
QUATERNARY	Qsm	Marsh deposits associated with springs	0-20	0-6		
QUATERNARY	Qtl	Fine-grained lacustrine deposits of Sevier Desert	0-872	0-265		
QUATERNARY	Qtin	Near-shore lacustrine limestone of Sevier Desert	0-90	0-27		
QUATERNARY	Tvs	Tertiary volcanic and sedimentary units, undivided				
QUATERNARY	Tr	Rhyolite of Whirlwind Valley				
QUATERNARY	Tcs	Conglomerate and tuffaceous sandstone				
QUATERNARY	Tct	Conglomerate and tuff of Confusion Range				
QUATERNARY	Tnu	Upper Needles Range Group				
QUATERNARY	Tsr	Skull Rock Pass Conglomerate				
QUATERNARY	Tl	Lacustrine limestone and breccia				
QUATERNARY	Twb	Windows Butte Tuff				
QUATERNARY	Tt	Tunnel Spring Tuff				
QUATERNARY	Trk	Red Knolls Tuff				
QUATERNARY	Tdc	Volcanic sequence of Dennison Canyon				
QUATERNARY	Ta	Altered Cambrian and Tertiary rocks				
QUATERNARY	Tdi	Drum Mountains intrusions				
QUATERNARY	Tid	Diorite dikes in the House Range				
QUATERNARY	Timl	Mt. Laird intrusive				
QUATERNARY	Tld	Little Drum Formation				
QUATERNARY	Tdr	Drum Mountains Rhyodolite				
QUATERNARY	Tgt	Welded tuff near Gandy				
QUATERNARY	Kbm	Breccia along tear faults in the House Range				
QUATERNARY	Jg	Noach Peak quartz monzonite				
QUATERNARY	Rt	Thaynes Formation				
QUATERNARY	Pu	Upper Permian, undivided				
QUATERNARY	Pg	Geester Limestone				
QUATERNARY	Pp	Plympton Formation				
QUATERNARY	Pk	Kalbab Limestone				
QUATERNARY	Pa	Arcatus Formation				
QUATERNARY	PIPMe	Ely Limestone				
QUATERNARY	Mc	Chattanooga Formation				
QUATERNARY	Mj	Joana Limestone				
QUATERNARY	MDp	Pilek Shale				
QUATERNARY	Dg	Gullinite Formation				
QUATERNARY	Ds	Simonson Dolomite				
QUATERNARY	Dsy	Sevy Dolomite				
QUATERNARY	SO	Laketown Dolomite				
QUATERNARY	Oes	Ely Springs Dolomite				
QUATERNARY	Ocw	Eureka-Crystal Peak-Watson Ranch Fms, undivided				
QUATERNARY	Opu	Upper Pogoip Group, undivided				
QUATERNARY	Of	Fillmore Formation				
QUATERNARY	Oh	House Limestone				
QUATERNARY	Ocn	Noach Peak Formation				
QUATERNARY	Cou	On Formation, upper members, undivided				
QUATERNARY	Cob	On Formation, Big Horse Limestone Member				
QUATERNARY	Cm	Middle Cambrian, undivided				
QUATERNARY	Cw	Lamb Dolomite and Tripple Limestone, or Weeks Limestone, undivided				
QUATERNARY	Cmp	Marjum or Pierson Cove Formation				
QUATERNARY	Cww	Wheeler-Sweeney-Whirlwind Fms, undivided				
QUATERNARY	Cdh	Dome Chisholm-Howell Formations, undivided				
QUATERNARY	Cp	Pioche Formation				
QUATERNARY	Cpm	Prospect Mountain Quartzite				
QUATERNARY	pC	Precambrian metasedimentary rocks				

Diagram is schematic—no fixed thickness scale

MAP AND CROSS-SECTION SYMBOLS

- CONTACT**—Dashed where location inferred.
- NORMAL FAULT**—Dashed where location inferred; dotted where concealed; queried where speculative on cross section; bar and ball on downthrown side; arrows show relative movement on cross section.
- NORMAL FAULT**—Inferred and delineated from gravity data; concealed; bar and ball on downthrown side.
- TEAR FAULT**—High-angle fault with strike-slip offset; dotted where concealed; arrows show relative movement on map. T means toward and A means away on cross section A-A'.
- REVERSE FAULT**—Dotted where concealed; R on upthrown side; arrows show relative movement on cross section.
- STEEPLY DIPPING FAULT**—Includes faults where sense of motion not known or complex; dashed where location inferred; dotted where concealed; arrows show relative movement on cross sections.
- THRUST FAULT**—Dashed where location inferred; dotted where concealed; queried where speculative on cross section; balls on upper plate; arrows show relative movement on cross sections.
- ATTENUATION FAULT**—Younger over older rocks with strata thinned or cut out between; balls on upper plate; arrows show relative movement on cross section; C-C'.
- LINEAMENT**—Linear features visible on aerial photographs; present in Drum Mountains Rhyodolite in Little Drum Mountains; probably joints or steeply dipping faults with small offset.
- FOLD AXES**—Location approximate; arrows on axes show plunge; dotted where concealed.
- anticline**
- syncline**
- overturned syncline**
- STRIKE AND DIP OF BEDDING**—Inclined, overturned.
- ROCK AND DIP OF PLANAR FEATURES IN VOLCANIC**
- DEEP EXPLORATION WELL**—Map symbol on left, cross-section symbol on right.
- SINKHOLE**—In Ely Limestone on east side of Snake Valley (section 8, T. 19 S., R. 18 W.); host unit uncertain on east flank of House Range (N1/2 section 35-36 line, T. 18 S., R. 13 W.).
- SHORELINES**—Dashed where inferred, dotted where concealed.
- Lake Gunnison shoreline**
- Provo shoreline of Lake Bonneville**
- Bonneville shoreline of Lake Bonneville**
- Qlf/QTlf**—Indicates thin cover of the first unit overlying the second unit.



TULE VALLEY 30' x 60' source list for geologic mapping

- Davis, F.D., 1990-1995, unpublished mapping of surficial geology of the valley areas for this publication, scales 1:24,000, 1:48,000, 1:96,000, 1:192,000, and 1:384,000, except those parts covered by Oviatt (1989) and back (1990).
- Hintze, L.F., 1974, Preliminary geologic map of the Conger Mountain (15) quadrangle, Millard County, Utah; U.S. Geological Survey Miscellaneous Field Studies Map MF-638, scale 1:48,000.
- Hintze, L.F., 19