U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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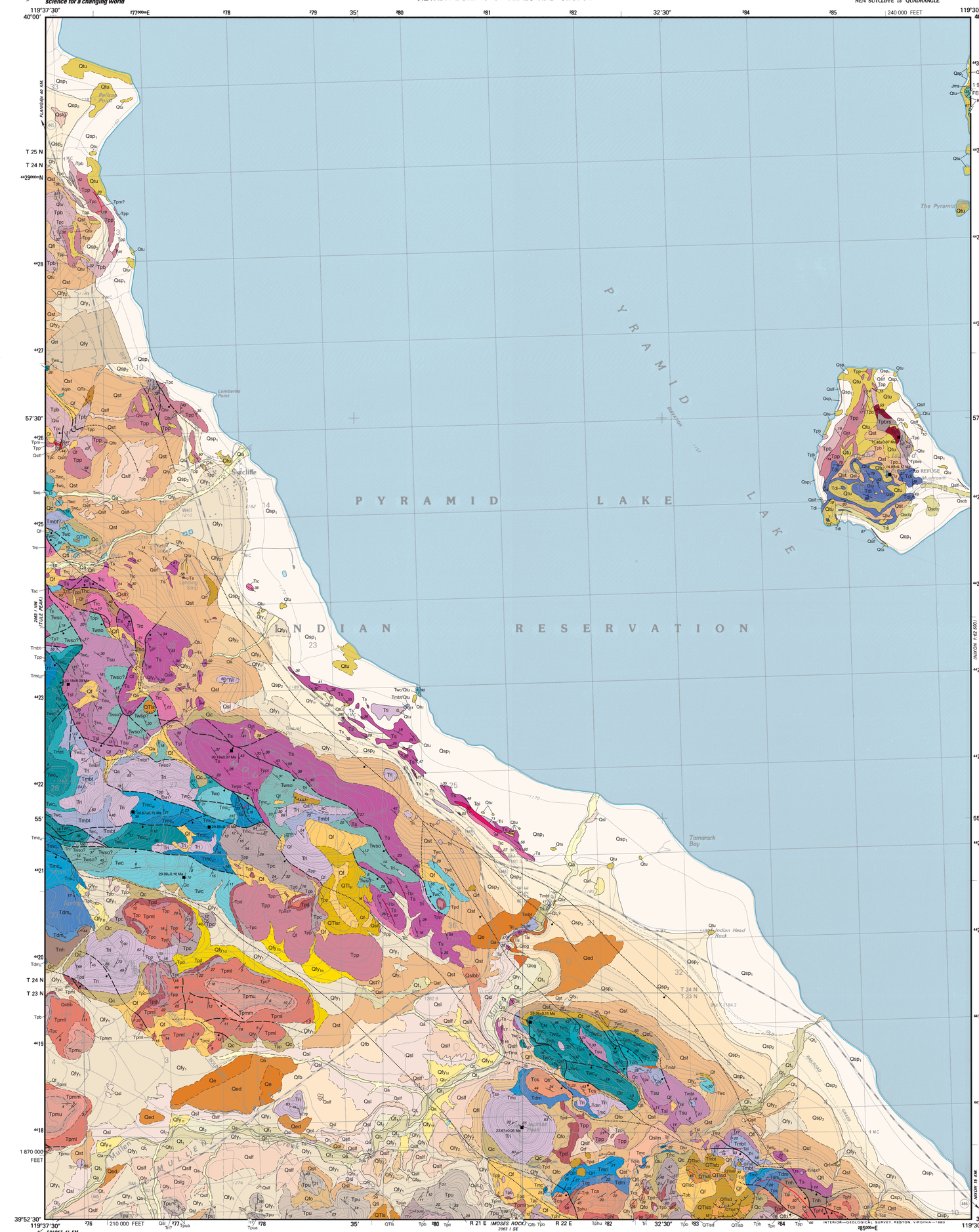
STATE OF NEVADA
NEVADA BUREAU OF MINES AND GEOLOGY

SUTCLIFFE QUADRANGLE
NEVADA–WASHOE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 SUTCLIFFE 15' QUADRANGLE

PRELIMINARY GEOLOGIC MAP OF THE SUTCLIFFE QUADRANGLE, WASHOE COUNTY, NEVADA

James E. Faulds, Craig M. de Polo, and Christopher D. Henry

2007 (2nd Edition)
OPEN-FILE REPORT 03-17



Quaternary Deposits

- Qa — Active alluvium
- Qaf — Fine-grained active alluvium
- Qc — Colluvium
- Qt — Talus deposits
- Qrf — Recent rockfall deposits
- Qt_1 — Youngest alluvial terrace/floodplain
- Qt_2 — Late Holocene terrace deposits
- Qt_3 — Mid-Holocene terrace deposits
- Qt_4 — Early(?) Holocene terrace deposits
- Qtu — Tufa deposits
- Qf — Alluvial fan deposit (undifferentiated)
- Qfy — Latest Quaternary fan deposits
  - Qfy_1 — Late young fan deposits
  - Qfy_2 — Early young fan deposits
    - Qfy_{1f} — Fine-grained late young fan deposits
    - Qfy_{1b} — Basaltic late young fan deposits
    - Qfy_{1d} — Dacitic late young fan deposits
- Qe — Eolian deposits
- Qed — Dune-form eolian deposits
- Qsl — Sehoo Formation—lacustrine deposits (undifferentiated)
- Qslf — Sehoo Formation—fine-grained lacustrine deposits
- Qslg — Sehoo Formation—gravelly lacustrine deposits
- Qslbs — Sehoo Formation—beach sands
- Qslbb — Sehoo Formation—beach bar deposits
- Qscb — Sehoo Formation—cemented beach deposits
- Qst — Sehoo Formation—cut and terrace shoreline deposits
- Qsp_1 — Sehoo Formation and youngest wave-platform deposits (Mud Slough sill)
- Qsp_2 — Sehoo Formation—second highest wave-platform deposits (Emerson Pass sill)
- Qsp_3 — Sehoo Formation—third highest wave-platform deposits
- Qsp_4 — Sehoo Formation—fourth highest wave-platform deposits
- Qfl — Interfingering Lahonton sediments and alluvial fan deposits
- Qbr — Rock avalanche deposit (late to mid Pleistocene)
- Qlog — Older lacustrine gravel deposits
- Qol — Older lacustrine deposits
- Qslm — Sehoo Formation—lacustrine muds and silts
- Qslb — Sehoo Formation—Lahonton beach (high stand)
- Qfo — Alluvial Fan Deposit mid to early Pleistocene)
- Qfb — Basalt-clast fan deposit
- QTls — Landslide deposit
  - QTlsc — composed primarily of Tpc
  - QTlsd — composed primarily of Tpd
  - QTlsb — composed primarily of Tpb
  - QTlsr — composed primarily of Tri
  - QTlst — composed primarily of ash-flow tuff
- QTs — Late Tertiary-Pleistocene conglomerate and sandstone

Pyramid Sequence

- Tpb — Basalt to basaltic andesite lavas
- Tpp — Porphyritic basaltic andesite lavas
- Tpd — Diatomite
- Tpc — Conglomerate and sandstone
- Tpbrs — Sedimentary breccia
- Tpt — Tuffaceous rocks
- Tpbr — Basaltic breccia
- Tpm — Tuff of Mullen Pass (undifferentiated)
  - Tpmu — Upper tuff of Mullen Pass
  - Tpmm — Middle tuff of Mullen Pass
  - Tpml — Lower tuff of Mullen Pass
- Tbi — Basalt and basaltic andesite dike
- Tppi — Porphyritic basalt dike
- Tdi — Porphyritic dacite intrusion

Miscellaneous Intrusions

- Tai — Andesite dike

Rhyolite Group

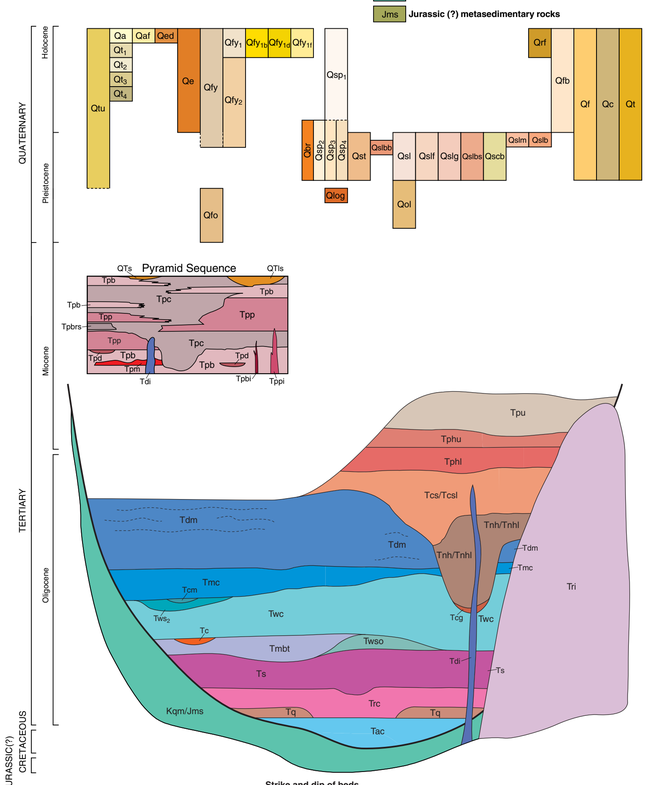
- Tri — Porphyritic rhyolite intrusions

Oligocene Ash-Flow Tuffs

- Tpual — Altered resistant ribs of Tpu
- Tpua — Altered upper tuff of Perry Canyon
- Tpu — Upper ash-flow tuff of Perry Canyon
- Tphu — Upper tuff of Painted Hills
- Tphl — Lower tuff of Painted Hills sanidine-biotite-plagioclase-quartz; poorly welded ash-flow tuff
- Tcs — Tuff of Chimney Spring
  - Tcsl — Lower nonwelded part of tuff of Chimney Spring
- Tnh — Nine Hill Tuff
- Tcg — Conglomerate
- Tdm — Tuff of Dogskin Mountain
  - Tdm_u — Moderately to densely welded part of Tdm
  - Tdm_l — Nonwelded part of Tdm
- Tmc — Tuff of Mine Canyon
  - Tmc_u — Densely welded part of Tmc
  - Tmc_l — Weakly welded to nonwelded basal part of Tmc
- Tcm — Tuff-clast conglomerate
- Tws_2 — Unit 2 of ash-flow tuffs of Whisky Spring (Bt and crystal-rich ash flow tuff)
- Twc — Tuff of Cove Spring
  - Twc_u — upper poorly welded, more biotite rich part of Twc
  - Twc_m — densely welded part of Twc
  - Twc_l — poorly to nonwelded lower part of Twc
- Tc — Tuff-clast conglomerate
- Tmbt — Poorly welded crystal-poor ash-flow tuff
- Twso — Fine-grained sanidine-plagioclase-biotite ash-flow tuff
- Ts — Tuff of Sutcliffe (biotite and crystal rich)
  - Tsu — Upper tuff of Ts
    - Tsu_n — Nonwelded Tsu
  - Tsl — Lower tuff of Ts
    - Tsl_n — Nonwelded Tsl
- Trc — Tuff of Rattlesnake Canyon
  - Trc_n — Nonwelded Trc
- Thc — Tuff of Hardscrabble Canyon (quartz-bearing)
- Tac — Tuff of Axehandle Canyon (lower biotite and crystal-rich ash-flow tuff)

Mesozoic Rocks

- Kqm — Quartz monzonite granite
- Jms — Jurassic (?) metasedimentary rocks



Contact Dashed where approximately located; short dashes indicate internal contact; queried where uncertain; dotted where concealed.

Fault Showing dip of fault and trend of striae on fault surface (arrow); bar and ball on downthrown side; dashed where approximately located, queried where uncertain, dotted where concealed.

Low angle normal fault Dashed where approximately located, hachures on downthrown side.

Landslide Scarp

Strike and dip of beds
47 Inclined

Strike and dip of compaction foliation in ash-flow tuff
45 Inclined 90 Vertical

Strike and dip of flow bands in lava or intrusion
20 Inclined Vertical

Joint
60 Inclined

Sample location for $^{40}Ar/^{39}Ar$ geochronologic determination
■ 29.98±0.11 Ma

Field work done in 2002.

DRAFT
Preliminary geologic map.
Has not undergone office or field review.
May be revised before publication.

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Projection and 10,000-foot grid ticks: Nevada coordinate system, west zone (transverse Mercator)
1000-meter Universal Transverse Mercator grid, zone 11
1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 14 meters north and 87 meters east as shown by dashed corner ticks
There may be private inholdings within boundaries of the National or State reservations shown on this map

UTM GRID AND 1980 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
(GN 1°39' 29 MILS; MN 17° 302 MILS)

SCALE 1:24 000
1 .5 0 KILOMETERS 1 2
1000 0 METERS 1000 2000
1 .5 0 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000 FEET

CONTOUR INTERVAL 10 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

NEVADA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Primary highway, hard surface — Light-duty road, hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route — U. S. Route — State Route

SUTCLIFFE, NEV.
NE/4 SUTCLIFFE 15' QUADRANGLE
N3952.5—W11930/7.5
1980
DMA 2063 I NE—SERIES V896