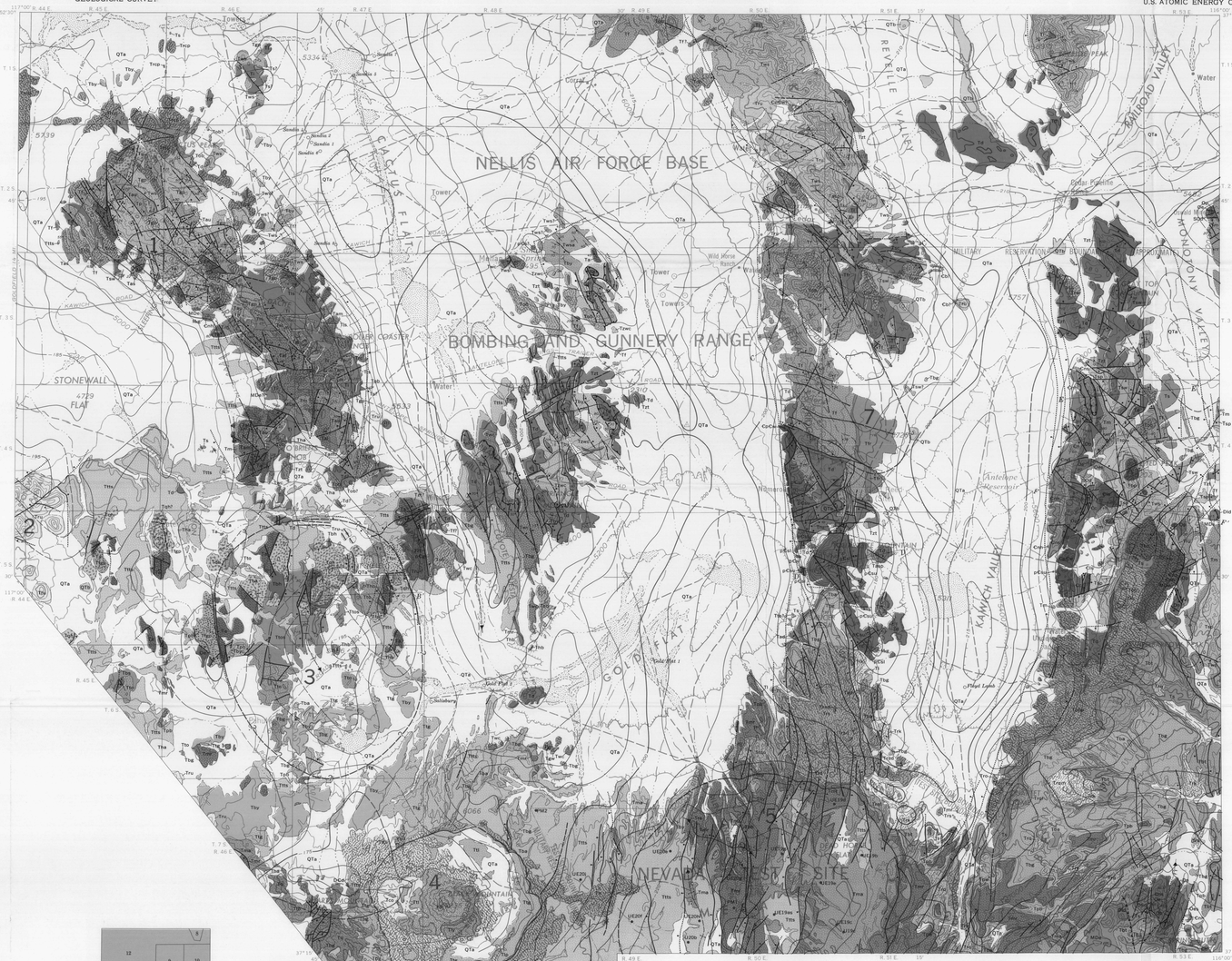
PREPARED ON BEHALF OF THE
U.S. ATOMIC ENERGY COMMISSION



Base from U.S. Geological Survey
Goldfield 1:250,000, 1954

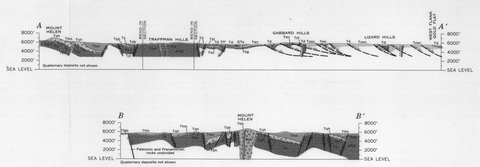
SCALE 1:125 000

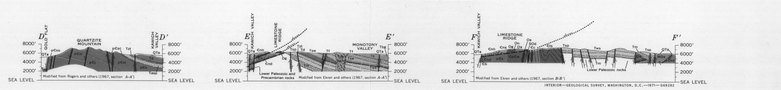
CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

Gravity contours by D. L. Healey
and C. H. Miller, 1962–63

INDEX TO GEOLOGIC MAPPING

1. Noble and Christiansen (1968)
2. Christiansen and Noble (1968)
3. Ekren, Anderson, Orkild, and Hinrichs (1966)
4. Noble, Khrushmanky, McKay, and Ege (1967)
5. Sargent, Luft, Gibbons, and Hoover (1966)
6. Rogers and Noble (1969)
7. O'Connor, Anderson, and Lipman (1966)
8. Noble (unpublished)
9. Rogers, Anderson, Ekren, and O'Connor (1967)
10. Ekren, Rogers, Anderson, and Botinelly (1967)
11. Rogers, Ekren, Noble, and Weir (1968)
12. E. B. Ekren, R. E. Anderson, C. L. Rogers, Theodore Botinelly, and J. E. Weir, 1962–64





WASHINGTON—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1971—G65282

EXPLANATION

QUATERNARY

- **QTa** — Alluvium and colluvium
- **Qco** — Colluvium
- **QTb** — Basalt

TERTIARY

Pliocene

- **Tbs** — Basalt of Basalt Ridge
- **Tbl** — Labyrinth Canyon Member
- **Tbg** — Gold Flat Member
- **Tbts** — Trail Ridge, Spearhead, and Rocket Wash Members
- **Tbw** — Basalt of Stonewall Mountain area
- **Tbn** — Basalt of Nellis Range
- **Tbe** — Younger rocks of Mount Helen
  - Tba, *alluvium*
  - Tbb, *porphyritic basalt*

Miocene

Thirsty Canyon Tuff

- **Tp** — Trachyte of Hidden Cliff
- **Tpp** — Rhyolite of Pillar Spring
- **Tpc** — Trachyte of Yellow Cleft
- **Tpr** — Rhyolite of Ribbon Cliff

UNCONFORMITY

- **Tmg** — Ammonia Tanks Member

Timber Mountain Tuff

- **Tmr** — Rhyolite lavas of Timber Mountain caldera moat
- **Tmc** — Rainier Mesa Member
- **Tpb** / **Tpw** — Paintbrush Tuff
  - Tpb, *ash-fall and reworked tuff*
  - Tpw, *Shoshone Wash Member*
- **Tpa** — Rhyolite of Area 20 (Pahute Mesa)
- **Tpy** — Rhyolite of Sauser Mesa
  - Tpy, *rhyolite*
  - Tpsd, *feeder dike*
- **Tpt** — Trachyte of Sauser Mesa
- **Tpk** — Rhyolite of Kawich Valley
- **Tpf** — Fangleomerate of Trappman Hills
- **Tpl** — Latite of south Kawich Valley
- **Tpq** / **Tpqu** / **Tpqm** / **Tpql** — Rhyolite of Quartet Dome
  - Tpqu, *upper rhyolite*
  - Tpqt, *associated tuff*
  - Tpqm, *middle rhyolite*
  - Tpql, *lower rhyolite*
- **Tbg** / **Tbt** — Belted Range Tuff
  - Tbg, *Grouse Canyon Member*
  - Tbt, *Tub Spring Member*
- **Tq** — Rhyolite of Quartz Mountain
- **Tbp** / **Tbu** — Tuff of Tolicha Peak
  - Tbu, *tuff*
  - Tbm, *sedimentary rocks and tuff*
- **Tbo** — Rhyolite of Ocher Ridge and Belted Peak
  - *Near Wheelbarrow Peak the rhyolite of Ocher Ridge is younger; elsewhere, it is interbedded with the rhyolite of Belted Peak*
  - Tbo, *rhyolite of Ocher Ridge*
  - Tbp, *rhyolite of Belted Peak*
  - Tobp, *rhyolites of Ocher Ridge and Belted Peak*
  - *Stippled where intrusive*
- **Tb** — Ash-fall and reworked bedded tuff
- **Tt** — Sedimentary rocks and bedded tuff
- **Tbk** — Rhyolite of O'Briens Knob
  - *Mostly intrusive into Fraction Tuff and older strata*
  - *Stippled where intrusive*
- **Tf** — Fraction Tuff and related rocks
  - Tf, *welded and nonwelded ash-flow tuff*
  - Tfc, *tuffaceous conglomerate and debris flows; stippled where predominantly debris flow*
- **Tbw** / **Tbc** — Rhyolite of White Ridge and tuffaceous rocks
  - Tbw, *tuffaceous sedimentary rocks; include agglutinate and ash-flow tuff, siltstone, mudstone, sandstone, and ash-flow tuff in Cactus Range*
  - Tbc, *rhyolite; stippled where intrusive*

INTRUSIVE ROCKS IN CENTRAL CORE OF CACTUS RANGE

- **Tcs** — Andesite of Stonewall Flat
  - *Age uncertain; predates Thirsty Canyon Tuff; relation to other post-Fraction strata unknown*
- **Tcp** — Rhyolite of Cactus Peak
  - *Stippled where intrusive*
- **Tcr** — Rhyolite of Cactus Range
  - *Stippled where intrusive*
- **Tcc** — Coarse-grained porphyritic rhyolite
- **Tcr** — Rhyolite
- **Tcu** — Rhyolite and coarse-grained rhyolite of uncertain age
  - *Stippled where intrusive*
- **Tcg** — Rocks of basic and intermediate composition
  - Ti, *high-silica granodiorite, rhyodacite, low-silica granodiorite, biotite lamprophyre, and melanodiorite; patterned where phaneritic*
  - Tp, *quartz latite porphyry*
- **Tzc** — Tuff of Wilsons Camp and bedded tuff
  - *Both commonly zeolitized. Include units Tzt and Twc, and possibly welded tuffs older than, but lithologically resembling, Twc*
- **Tzl** — Lavas of intermediate composition
  - Tz, *lavas of intermediate composition exclusive of those of Mount Helen; stippled where intrusive*
  - Twc, *tuff of Wilsons Camp*
- **Tzt** — Zeolitized bedded tuff and sedimentary rocks
- **Tzo** — Older rocks of Mount Helen
  - Tzb, *quartz latite; include rhyodacite; stippled where intrusive*
  - Tzb, *andesitic basalt*
- **Tgf** — Tuff and rhyolite of Gold Flat
  - Tgr, *rhyolite*
  - Tgw, *welded tuff*
  - *Age is uncertain*
- **Tw** — Lacustrine sedimentary rocks of the Cactus Range

UNCONFORMITY

- **Twn** — Tuff of White Blotch Spring
- **Twsa** — Tuff of White Blotch Spring and tuffs of Antelope Springs undivided
  - *Mapped in area of poor exposures between Mellan and Gold Flat*

UNCONFORMITY

- **Tsp** — Shingle Pass Tuff
- **Tsp** / **Tsa** / **Tsm** / **Tsl** — Tuffs of Antelope Springs
  - Tsu, *upper ash-flow tuffs; include some bedded tuff*
  - Tsm, *middle-ash flow tuffs*
  - Tsl, *lower ash-flow tuffs*
- **Tsaso** — Shingle Pass Tuff and tuffs of Antelope Springs undivided
- **Tsc** — Sedimentary rocks of Cedar Pass area
- **Tm** — Monotony Tuff
- **Tmc** — Fangleomerate

MESOZOIC

UNCONFORMITY

- **Mzg** — Leucogranite

PALEOZOIC

Upper Devonian

- **MDe** — Elenan Formation
  - *Query indicates possible Elenan rocks in Cactus Range*

Middle Devonian

UNCONFORMITY

- **Dld** — Limestone and dolomite

Lower Devonian

- **Dn** — Nevada Formation

Lower to Upper Silurian

- **SDd** — Dolomite of the Spotted Range

UNCONFORMITY

Upper Ordovician

- **SOd** — Dolomite
  - *Highly altered. Lower part correlates with the Ely Springs Dolomite*
- **Oes** — Ely Springs Dolomite

Middle Ordovician

- **Oe** — Eureka Quartzite

Lower Ordovician

- **Ola** / **Ope** / **Ola** — Pogonip Group
  - *Shown in sections only*
  - Ola, *Antelope Valley Limestone*
  - On, *Nicolella Formation*
  - Og, *Goderich Limestone*
- **Ca** — Dolomite
  - *Isolated exposure north of Quartz Mountain*

Upper Cambrian

- **Cns** / **Cn** / **Cnd** — Nopah Formation
  - Cns, *Smoky Member*
  - Cnf, *Halfpint Member*
  - Cnd, *Dunderberg Shale Member*

Middle Cambrian

- **Cb** — Bonanza King Formation

Lower Cambrian

- **Cbr** — Limestone, silty limestone, and shale
- **Cc** — Carrara(?) Formation
- **CpCz** — Zabriskie Quartzite and Wood Canyon Formation

PRECAMBRIAN

- **pCu** / **pCm** / **pCl** — Stirling Quartzite
  - pCu, *upper part*
  - pCm, *middle part* (*shown in sections only*)
  - pCl, *lower part*
- **pCJ** — Johnnie Formation
  - *Shown in section D-D' only*
- **pCgf** — Gneiss and schist of Trappman Hills area

Contact, showing dip
Dashed where approximately located; queried where doubtful

Fault, showing dip
Dashed where approximately located or inferred; dotted where concealed; queried where doubtful. Bar and ball on downthrown side

Thrust fault or gravity slide fault
Dashed where inferred; queried where doubtful. Sawteeth on upper plate

Anticline
Showing crestline and direction of plunge of axis. Dashed where approximately located

Syncline
Showing troughline and direction of plunge of axis. Dashed where approximately located

Overturned syncline
Showing direction of dip of limbs and plunge. Dashed where approximately located; dotted where concealed

Strike and dip of beds
Inclined — Vertical — Overturned

Strike and dip of compaction foliation in ash-flow tuffs, and of flow foliation in lavas
Inclined — Vertical — Overturned — Horizontal

Gravity contours
Dashed where approximately located. Interval 5 milligals. Hachures indicate closed area of low gravity

Exploratory drill hole
Showing number

Sandia 1

Water well
Showing name and number

6

Major volcanic center

1. Cactus Range
2. Stonewall Mountain
3. Mount Helen caldera
4. Black Mountain caldera
5. Area 20 moat (Pahute Mesa) caldera (boundary by P. P. Orkild)
6. Timber Mountain caldera (boundary by F. M. Byers, Jr.)
7. Cathedral Ridge caldera

GEOLOGIC AND BOUGUER GRAVITY MAP AND SECTIONS OF NORTHERN NELLIS AIR FORCE BASE BOMBING AND GUNNERY RANGE, NYE COUNTY, NEVADA

D-01