UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

PROFESSIONAL PAPER 651
PLATE I

NELLIS AIR FORCE BASE

BOMBING AND GUNNERY RANGE

NEVADA TEST SITE

INDEX TO GEOLOGIC MAPPING

1. Noble and Christiansen (1968)
2. Christiansen and Noble (1968)
3. Ekren, Anderson, Orkild, and Hinrichs (1966)
4. Noble, Khrushensky, McKay, and Ege (1967)
5. Ekren, Anderson, Whitbeck, and Hoover (1966)
6. Rogers and Noble (1968)
7. O'Connor, Anderson, and Lipman (1966)
8. Cornwall (1967)
9. Rogers, Anderson, Ekren, and O'Connor (1967)
10. Ekren, Rogers, Anderson, and Scott-Orkild (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

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

EXPLANATION

QUATERNARY

- Alluvium and colluvium
- Basalt
- Colluvium

TERTIARY

Upper Miocene

- Basalt of Basalt Ridge
- Labyrinth Canyon Member
- Thirsty Canyon Tuff
- Gold Flat Member
- Trail Ridge, Spearhead, and Rocket Wash Members
- Rhyolite of Pillar Spring
- Trachyte of Yellow Cleft
- Rhyolite of Ribbon Cliff
- Trachyte of Hidden Cliff
- Basalt of Stonewall Mountain area
- Pangiomerate of Trappman Hills
- Younger rocks of Mount Helen
  - Tha, *alluvium*
  - Thb, *porphyritic basalt*

Middle Miocene

- Timber Mountain Tuff
- Ammonia Tanks Member
- Rainier Mesa Member
- Paintbrush Tuff
  - Tpb, *ash-fall and reworked tuff*
  - Tpw, *Stockade Wash Member*
- Rhyolite lavas of Timber Mountain caldera moat
- Rhyolite of Area 20 (Pahute Mesa)
- Rhyolite of Saucer Mesa
  - Trs, *rhyolite*
  - Trst, *feeder dike*
- Trachyte of Saucer Mesa
- Rhyolite of Kawich Valley
- Latite of south Kawich Valley
- Rhyolite of Quartet Dome
  - Trqu, *upper rhyolite*
  - Trqt, *associated tuff*
  - Trqm, *middle rhyolite*
  - Trql, *lower rhyolite*
- Ash-fall and reworked bedded tuff
- Belted Range Tuff
  - Tbg, *Grouse Canyon Member*
  - Tbt, *Tub Spring Member*
- Rhyolite of Quartz Mountain
- Tuff of Tolicha Peak
  - Tto, *tuff*
  - Ttos, *sedimentary rocks and tuff*
- Rhyolite of Ocher Ridge and Belted Peak
  - *Near Wheatharvey Peak the rhyolite of Ocher Ridge is a single unit that is interbedded with the rhyolite of Belted Peak*
  - Tro, *rhyolite of Ocher Ridge*
  - Trbp, *rhyolite of Belted Peak*
  - Trbpo, *rhyolites of Ocher Ridge and Belted Peak*
  - *Stippled where intrusive*
- Rhyolite of O'Briens Knob
  - *Mostly intrusive into Fraction Tuff; in part a lava or tuff*
  - *Stippled where intrusive*
- Fraction Tuff and related rocks
  - Tf, *welded and unwelded ashflow tuff*
  - Tfc, *tuffaceous conglomerate and debris flows; stippled where predominantly debris flow*
- Sedimentary rocks and bedded tuff
- Rhyolite of White Ridge and tuffaceous rocks
  - Trw, *tuffaceous sedimentary rocks; include agglutinate of White Ridge and rare rhyolite, ignimbrites, and ash-flow tuff in Cactus Range*
  - Trwr, *rhyolite; stippled where intrusive*
- Tuff of White Blotch Spring
- Shingle Pass Tuff
- Tuffs of Antelope Springs
  - Tau, *upper ash-flow tuffs; include some bedded tuff*
  - Tam, *middle ash-flow tuffs*
  - Tal, *lower ash-flow tuffs*
- Sedimentary rocks of Cedar Pass area
- Monotony Tuff
- Pangiomerate

Oligocene

- Andesite of Stonewall Flat
  - Apx, *uncertain; predates Area 20 and Belted Tuff; relation to other post-Fraction strata unknown*
- Rhyolite of Cactus Peak
  - *Stippled where intrusive*
- Rhyolite and coarse-grained rhyolite of uncertain age
  - *Stippled where intrusive*

INTRUSIVE ROCKS IN CENTRAL CORE OF CACTUS RANGE

- Coarse-grained porphyritic rhyolite
- Rhyolite
- Rocks of basic and intermediate composition
  - Ti, *high-silica granodiorite, rhyodacite, low-silica granodiorite, biotite leucogabbro, and melanodiorite; patterned where phaneritic*
  - Tp, *quartz latite porphyry*
- Tuff of Wilsons Camp and bedded tuff
  - *Both commonly zeolitized. Include units Tct and Twc, and possibly welded tuffs older than, but lithologically very similar to unit Twc*
- Tuff and rhyolite of Gold Flat
  - Tgr, *rhyolite*
  - Tgw, *welded tuff*
  - Agx *is uncertain*
- Lacustrine sedimentary rocks of the Cactus Range
- Tuff of White Blotch Spring and tuffs of Antelope Springs undivided
  - *Mapped in area of poor exposures between Mellan and Gold Flat*
- Lavas of intermediate composition
  - Td, *lavas of intermediate composition exclusive of those of Mount Helen; stippled where intrusive*
  - Twc, *tuff of Wilsons Camp*
- Zeolitized bedded tuff and sedimentary rocks
- Older rocks of Mount Helen
  - Tqh, *quartz latite; includes rhyodacite; stippled where intrusive*
  - Tah, *andesitic basalt*
- Shingle Pass Tuff and tuffs of Antelope Springs undivided

UNCONFORMITY

Upper Jurassic

- Leucogranite

Middle Jurassic

- Limestone and dolomite

Lower Jurassic

- Dolomite of the Spotted Range

Upper Ordovician to Lower Devonian

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

Middle Ordovician

- Eureka Quartzite

Lower Ordovician

- Pogonip Group
  - *Shown in sections only*
  - Oa, *Antelope Valley Limestone*
  - On, *Nicolett Hills Limestone*
  - Op, *Goodwin Limestone*

Upper Cambrian

- Nopah Formation
  - Cns, *Smoky Member*
  - Cnh, *Halfpint Member*
  - Cnd, *Dunderberg Shale Member*

Middle Cambrian

- Bonanza King Formation
- Limestone, silty limestone, and shale

Lower Cambrian

- Carrara(?) Formation
- Zabriskie Quartzite and Wood Canyon Formation

Upper Precambrian

- Stirling Quartzite
  - pCsu, *upper part*
  - pCsc, *member C (shown in sections only)*
  - pCsl, *lower part*
- Johnnie Formation
  - *Shown in section D–D' only*
- Gneiss and schist of Trappman Hills area

UNCONFORMITY

Upper Devonian

- Eleana Formation
  - *Query indicates possible Eleana rocks in Curtis Ridge*

Middle Devonian

- Nevada Formation

Silurian

- Ely Springs Dolomite

Ordovician

- Dolomite
  - *Isolated exposure north of Quartz Mountain*

Mississippian

Carboniferous

PRECAMBRIAN

- 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. Teeth on upper plate*
- Anticline
  - *Showing crestline and direction of plunge of axis. Dashed where approximately located*
- Syncline
  - *Showing trough line 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*
- Inclined
- Vertical
- Overturned
- Strike and dip of beds
- Inclined
- Vertical
- Overturned
- Horizontal
- Strike and dip of compaction foliation in ash-flow tuffs, and of flow foliation in lavas
- Gravity contours
  - *Dashed where approximately located. Interval 5 milligals. Hachures indicate closed area of low gravity*
- UE19d
  - Exploratory drill hole
  - *Showing number*
- Scotia 4
  - 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. Silent Canyon (Pahute Mesa) caldera (boundary by P. P. Orkild)
6. Timber Mountain caldera (boundary by P. 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