0830 0010

by Joe Tingley
March 1980

Horseshoe-Bonanza Claims (Turquoise)

Bullion Mining District

Lander County, Nevada

Location, Land Status

The Horseshoe-Bonanza claim group, consisting of 55 unpatented lode claims, is located in portions of Sections 2, 3, 10, 11, 15, and 16, Township 27 North, Range 46E, Lander County, Nevada. The claims cover the lower western slopes of Squaw Butte, a topographic landmark in the northern Shoshone Range south of the old gold camp of Gold Acres.

The claims making up the property, are in the names of Robert Leighton, P.O. Box 22, Cortez, Colorado, Louis Gower, and D. C. Tate (G.T.L. Mining Co.). The property consists of Horseshoe Claims 1-3, located Oct. 10, 1972, Horseshoe 4-6, located June 20, 1973, Bonanza 1-6, located Oct. 10, 1972, Bonanza 7-30, located June 20, 1973, Bonanza 31-37, located Jan. 25, 1974, Bonanza 38-46, located June 11, 1974, and Bonanza 47-49, located Oct. 18, 1979. Assessment work for 1979 was filed on August 17, 1979, and consisted of "work of geologist", and "sampling". The 1979 proof of labor statement shows the work was performed by Robert Leighton and Robert Smith, witnesses were Mary Winship and Garth Davis. Records show that most of the Bonanza location certificates were recorded at the request of the Notah Dineh Trading Company.

There are apparently three additional claims related to the claim group (Blue Bonnet 1, 2, 3) which are not shown on the map. These claims may lie to the east of the main claim group, and cover the area of the adit, west of Pit 1.

Geologic Setting, Mineralization

Rocks exposed on the western flank of Squaw Butte consist of the Ordovician Valmy Formation and Silurian Elder Sandstone. Both of these units lie in the upper plate of the Roberts Mountains thrust sheet. The area is structurally complex and both units are complexly folded and are cut by imbricate thrust faults. Most rocks exposed in cuts and pits within the claim group are argillically altered, and consist of resistant chert bands, alternating with bands of white clay and bleached, silicified shale. This alteration may be due to the intrusion of small bodies of quartz latite similar to the cropping out north of the claim area.

Turquoise occurs as small nodules and pods in argillized rocks along fault zones. All of the thin seams and pods seem were very pale blue to green, and were chalky in appearance. Published descriptions of turquoise mined from other properties in the district indicates some good quality spider web turquoise has been produced from the area (Stager, p. 75).

Mining on the property was done by open pits and cuts, and the product must have been hand sorted at each pit. With the exception of faint stains and "paint" on some fracture surfaces and small chalky pods along fault zones very little evidence of turquoise was seen within the limits of the property. There apparently has been no mining on the property for one or two years.

Economic Potential

The Horseshoe-Bonanza property has little apparent economic potential. Should the turquoise market improve, there will, no doubt, be additional turquoise mined from the property. It is felt, however, that this activity will be very small scale. The general geology of the property, in the upper plate of the Roberts Mountains thrust and the alteration, argillization

with some jasper, limonite, and hematite occuring along faults, are both somewhat favorable settings for disseminated (Carlin-type) gold deposits. Favorable host rocks for this type of occurrence would be below the main thrust contact, and may be at excessive depths below surface.

It is felt that the economic potential of the property would not be worth the annual expenditure necessary to maintain the claim group.

References

1. Morrissey, Frank R. (1968) Turquoise Deposits of Nevada, NBMG Report 17.

2. Stager, Harold K. (1977) Geology and Mineral Deposits of Lander Co., Nevada, Part II, Mineral Deposits, NBMG Bulletin 88.

View toward the northeast, showing Adit area (left),
Pit] (right), and Squaw Butte (in background)

Pit 1, looking northeast

Adit northwest of Pit 1, looking north-northeast

Pit 2 (deep shadow), Pit 3 (sunlight), looking northeast

Pit 2 (dumps at left), Pit 3 (center), looking north-northeast

Bench face, Pit 2, showing highly folded Valmy formation

View to southwest from Section 2 through claims in Sections 10 and 11

Limonite-hematite gossan in argillized rock along fault zone, Pit 2

Continuation of fault zone in upper bench of Pit 2, small turquoise nodules occur in and along the fault (near rock pick)

0830 0010

HORSESHOE-BONANZA CLAIMS

Pit 3

Pit 2

Pit 1, adit

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CARICO LAKE QUADRANGLE
NEVADA—LANDER CO.
15 MINUTE SERIES (TOPOGRAPHIC)

2564 I (MCCOY) · 2664 IV (MT. LEWIS) · 2664 I (CRESCENT VALLEY) · 2564 II (THE CEDARS) · 2664 II (CORTEZ)

117°00′ · 116°45′ · 40°15′ · 40°00′

R. 44 E. · R. 45 E. · R. 46 E.

T. 28 N. · T. 27 N. · T. 26 N. · T. 25 N.

470 000 FEET · 410 000 FEET

1 930 000 FEET

4454 000m N. · 4428 000m N.

10 MI. TO NEV. 8A · 21 MI. TO NEV. 8A · 16 MI. TO NEV. 21 · 41 MI. TO NEV. 8A · BEOWAWE 31 MI.

HALL CREEK RANCH 8.7 MI. · (HALL CREEK) 2663 IV · CORTEZ 24 MI. · (WALTI) HOT SPRINGS 2663 I

SHOSHONE RANGE · CARICO LAKE VALLEY · TOIYABE RANGE · CRESCENT VALLEY

Smith Flat · Spring · Springs · Wilson Canyon · Cooks Creek · Grave · Horse Ranch · Elder Creek · Dry Hill Spring · Squaw Butte · JEEP TRAIL · BM 4923 · Well · Spring · Carico Lake Ranch · Rocky Pass · BM 4959 · BM 5064 · Moss Creek · Granite Spring · Cottonwood Cr. · Rattlesnake Canyon · Prospect · Carico Lake · Elephant Head · Stone Cabin Basin · Stone Cabin Canyon · Elephant Head Spring · Tub Spring · Placer Gulch Spring · Wholey Ranch · Wholey Spring · Laborde Well · Prospects · Wholey Spring No 2 · Carico Peak 7992 · Red Mtn · Red Mtn Spring · Red Mtn Spring No 3 · Wholey Well No 2 · Filippini Well · Wood Springs · Blind Spring · Upper Canyon Wood Spring No 2 · Upper Wood Spring · Wood Spring Canyon · Mud Spring · Dry Canyon Summit · Summit Spring · Dry Canyon

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1962

Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

Where omitted, land lines have not been established

UTM GRID AND 1962 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
GN · MN · 0°05′ 1 MIL · 17½° 311 MILS

SCALE 1:62500

1 0 1 2 3 4 MILES
3000 0 3000 6000 9000 12000 15000 18000 21000 FEET
1 5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Light-duty · Unimproved dirt

NEVADA
QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

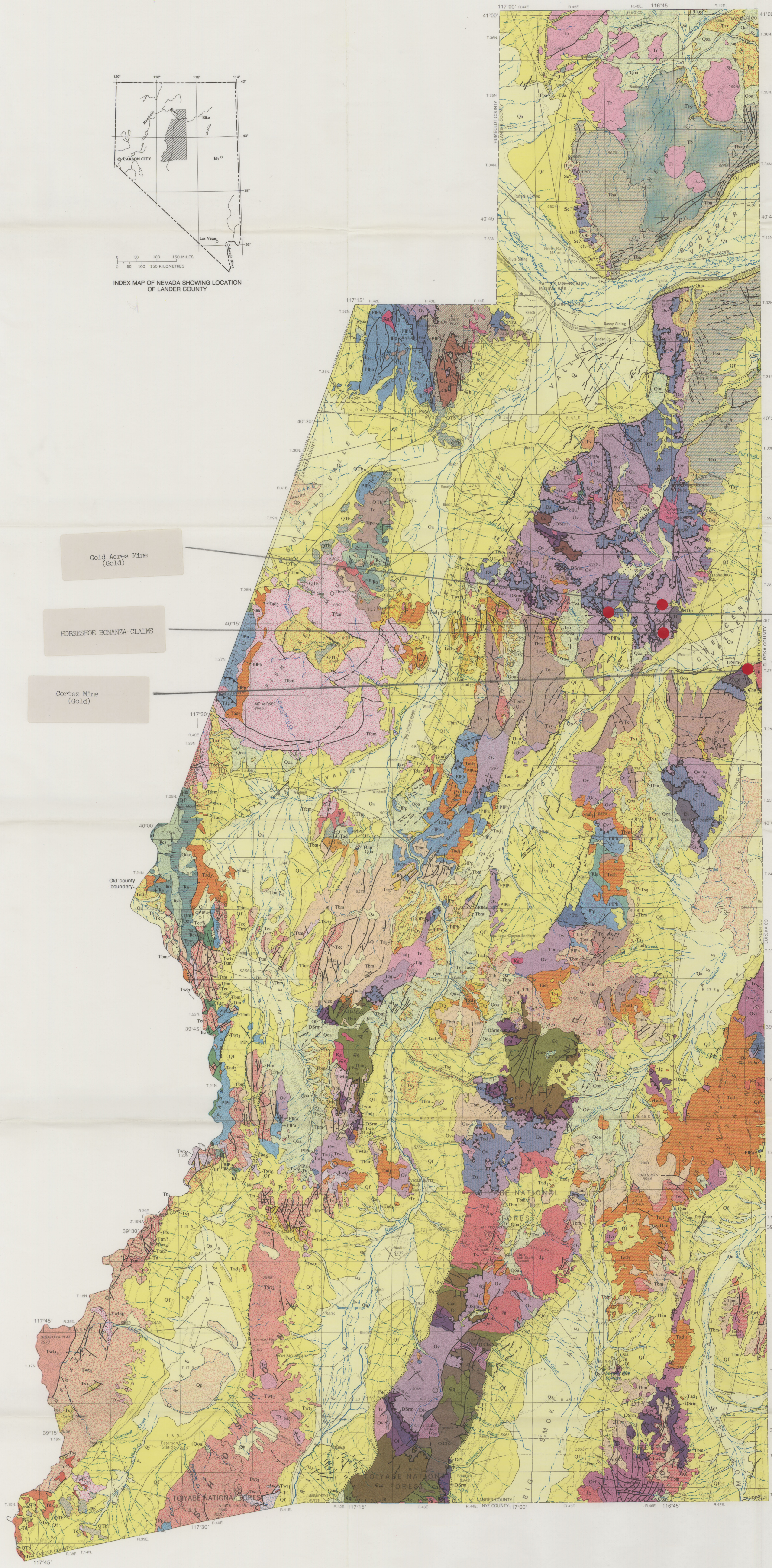
CARICO LAKE, NEV.
N4000—W11645/15

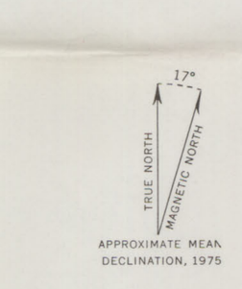
1962

AMS 2664 III—SERIES V796

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964-T

Prepared cooperatively by the
U.S. GEOLOGICAL SURVEY





EXPLANATION

QUATERNARY (Pleistocene and Holocene)

- Qa — Valley alluvium and stream deposits
- Qf — Alluvial fan deposits
- Qp — Playa deposits
- Qtl — Talus and landslide deposits
- Qs — Calcareous and siliceous sinter
- Qm — Morainal deposits
- Qoa — Older alluvial deposits

NORTHERN AREA

Pliocene or Pleistocene

- QTb — Basalt and olivine basalt lava flows, cinder cones, and shallow dikes

Miocene

- Tb — Olivine basalt. *K-Ar age 10.0 ±0.3 m.y.*
- Tv — Rhyolite, dacite, and diorite porphyry intrusive and extrusive rocks in the Mount Lewis area
- Tad_2 — Andesite or dacite flows and intrusive rocks. *Age uncertain*
- Ts_5 — Tuffaceous sedimentary rocks
- Tr — Rhyolite flow domes in Sheep Creek Range. *K-Ar age 13.8 m.y. (average of two dates). Also includes rhyolite flows of uncertain age on west side of Fish Creek Mountains*
- Tba — Basaltic andesite. *K-Ar age 15.5 m.y. (average of two dates)*
- Ts_4 — Tuffaceous sedimentary rocks
- Tbm — Bates Mountain Tuff. *Crystal-poor rhyolite ash-flow tuff. K-Ar age 23.3 m.y. (locality at north end of Antelope Valley). Fission-track age 24.0 m.y. (average of seven dates; locality in west-central Fish Creek Mountains)*
- Tfcm — Fish Creek Mountain Tuff. *Crystal-rich rhyolitic ash-flow tuff. At base in northwest part of Fish Creek Mountains includes cooling unit that contains lithic fragments*

Oligocene or Miocene

- Tec — Edwards Creek Tuff. *Crystal-poor to moderately crystal-rich rhyolite ash-flow tuff. Age is Oligocene or Miocene*

Oligocene

- Twt — Undifferentiated welded ash-flow tuffs. *Rhyolitic to quartz-latitic composition. Includes one ash-flow that is 31.8 m.y. old (fission-track dating methods)*
- Tbio — Biotite-bearing quartz-latite ash-flow tuff. *Fission-track age 30.6 m.y. (average of five ages)*
- Ts_2 — Tuffaceous sedimentary rocks. *Age uncertain*
- Tc — Caetano Tuff. *Crystal-rich quartz-latite ash-flow tuff. K-Ar and fission-track age 33.0 m.y. (average of 11 dates)*
- Tad_1 — Andesite or dacite flow and shallow intrusive rocks. *May include some rocks of Miocene age. Includes local basalt in Shoshone Range*
- Ts_1 — Tuffaceous sedimentary rocks

Eocene and (or) Oligocene

- Tg — Granitic intrusive rocks. *Includes some aphanitic types. K-Ar ages range from 38.2 to 34.4 m.y. on different bodies*

SOUTHWESTERN AREA

- QTb — Basalt and olivine basalt lava flows
- Ti — Intrusive rocks. *Includes rhyolite, dacite, andesite, and basalt. Age uncertain*
- Ts_5 — Tuffaceous sedimentary rocks. *Age uncertain*
- Td — Dacite to andesite lava flows and intrusive rocks. *Age uncertain but similar rocks 3 miles south of Lander County are about 19 m.y. old (K-Ar methods). Includes some tuffs and tuffaceous sedimentary rocks locally*
- Twt_7 — Moderately crystal-rich ash-flow tuff. *Age uncertain but probably early Miocene*
- Tt — Toiyabe Quartz Latite. *Crystal-rich ash-flow tuff. K-Ar age south of map is 22.6 m.y. (average of two dates)*
- Twt_4 — Crystal-poor rhyolite ash-flow tuff. *Includes zones of vitrophyre*
- Twt_2/Tr — Rhyolite intrusive and extrusive rocks. *Twt_2, lava flows, ash-flow tuff, and sedimentary rocks. Tr, shallow intrusive rocks*
- Twt_1 — Crystal-poor ash-flow tuff

WEST-CENTRAL AREA

- QTb — Basalt and olivine basalt lava flows
- QTad — Andesite and dacite flows. *Age uncertain*
- Tad_2 — Andesite or dacite flow and intrusive rocks. *Age uncertain*
- Ts_5 — Tuffaceous sedimentary rocks. *Includes some nonwelded ash-flow tuff and air-fall tuff. Age uncertain*
- Tr — Rhyolite intrusive rocks. *Age uncertain*
- Twt_6/Ts_3 — Crystal-poor rhyolite ash-flow tuff. *K-Ar age 23.6 ±0.9 m.y. Includes a local biotite-bearing, ash-flow tuff. Ts_3, tuffaceous sedimentary rocks*
- Tn — New Pass Tuff. *Crystal-rich rhyolite ash-flow tuff. K-Ar age 22.0 ±0.9 m.y.*
- Tbm — Bates Mountain Tuff. *Crystal-poor rhyolite ash-flow tuff. K-Ar age 24.3 m.y. (average of two dates)*
- Twt_{5a} — Crystal-rich biotite-bearing ash-flow tuff. *K-Ar age 24.1± 1.0 m.y.*
- Twt_{5b} — Crystal-rich ash-flow tuff. *Age uncertain*
- Twt_4 — Crystal-poor rhyolite ash-flow tuff. *Includes zone of vitrophyre and probably some intrusive rocks. K-Ar age 25.1 m.y. (average of three dates)*
- Ttm — Tuff of McCoy mine. *Crystal-rich biotite-bearing quartz latite ash-flow tuff. K-Ar age 26.3 m.y. (average of two dates)*
- Tec — Edwards Creek Tuff. *Crystal-poor to moderately crystal-rich rhyolite ash-flow tuff. Several cooling units. K-Ar ages of 27.0 ±1.0 and 26.9 ±1.0 m.y. on two cooling units*
- Twtu — Undifferentiated ash-flow tuffs. *Probably includes some Ttm and Tec. Includes some tuffs older than Ts_3*
- Tts — Crystal-poor rhyolite ash-flow tuff. *Includes two cooling units. Includes some tuffaceous sedimentary rocks. Age uncertain*
- Ts_2 — Tuffaceous sedimentary rocks. *Age uncertain*
- Twt_3 — Ash-flow tuffs. *Includes three different ash-flow sheets. One is a strongly eutaxitic unit that contains lithic fragments, another is a crystal-poor tuff. K-Ar age on the latter unit is 29.4 m.y. (average of two dates)*
- Twt_2 — Rhyolite flows, local ash flows, flow breccias, and intrusive rocks
- Tad_1 — Andesite to dacite extrusive and intrusive rocks. *Age uncertain*

SOUTHEASTERN AREA

- Tb — Basalt flows and intrusive rocks. *Age uncertain*
- Tv — Undifferentiated volcanic rocks in the southern Toiyabe Range. *Age uncertain*
- Ts_5 — Tuffaceous sedimentary rocks. *Age uncertain*
- Tr — Rhyolite, felsite, and quartz porphyry intrusive rocks. *Age uncertain*
- Tbm — Bates Mountain Tuff. *Crystal-poor rhyolite ash-flow tuff. K-Ar age 23.3 m.y. (average of three dates)*
- Twt — Ash-flow tuff. *Includes biotite-bearing tuff that is 30.8 m.y. old (K-Ar methods; average of two ages). Three other units are 29.4, 31.3, and 34.0 m.y. old (K-Ar methods). Other units are of uncertain age*
- Ts_2 — Tuffaceous sedimentary rocks. *Age uncertain*
- Tc — Caetano Tuff. *Crystal-rich quartz latite ash-flow tuff. K-Ar age 33.5 ±1.1 m.y.*
- Tdi — Porphyritic dacite to quartz latite intrusive rocks. *Age uncertain*
- Tth — Tuff of Hall Creek. *Massive ash-flow tuff and tuff breccia*
- Tad_1 — Andesite to dacite flows, flow breccias, and hypabyssal rocks. *K-Ar ages on two units are 34.5 and 35.4 m.y. Includes rock ranging in age from pre-Ts_1 to post-Ts_2*
- Ts_1 — Tuffaceous sedimentary rocks

QUATERNARY — TERTIARY OR QUATERNARY — TERTIARY

JURASSIC TO TERTIARY

- TJg — Granitic rocks. *Mostly quartz monzonite and granodiorite*

CRETACEOUS

- Kg — Granitic rocks

JURASSIC

- Jg — Granitic rocks. *Mostly quartz monzonite*

TRIASSIC

Upper Triassic

- ŦRo — Osobb Formation. *Quartz sandstone, minor amounts of limestone, shale, and conglomerate*
- ŦRcs — Cane Spring Formation. *Thick-bedded to massive limestone and dolomite, sparse shale and conglomerate*

Middle Triassic

- ŦRa — Augusta Mountain Formation. *Massive limestone, sparse dolomite, shale, and conglomerate. Limestone is generally bioclastic*
- ŦRls — Limestone, conglomerate, and shale in Toiyabe Range. *Temporal equivalent of Augusta Mountain Formation*
- ŦRpc — Panther Canyon Formation. *Impure dolomite and limestone, interbedded shale, sandstone, and conglomerate. Present only in northern part of Fish Creek Mountains*
- ŦRf — Favret Formation. *Thin-bedded limestone; interbedded calcareous shale and siltstone*

Lower and Middle(?) Triassic

- ŦRc — Massive conglomerate. *Purple siltstone and tuff in lower part*

Lower Triassic

- ŦRk — Koipato Formation. *Yellow-gray felsite*

UNCONFORMITY

PERMIAN

- Pp — Pablo Formation. *Altered and silicified andesite and dacite flows. Sparse chert and conglomerate*

PENNSYLVANIAN AND PERMIAN

ABOVE GOLCONDA THRUST FAULT

- PPh, PPp, PPu — Havallah sequence. *PPh, Havallah Formation; Middle Pennsylvanian and Lower Permian; shale, sandstone (or quartzite), chert, limestone, and conglomerate. PPp, Pumpernickel Formation, Pennsylvanian(?); chert and siltstone, sparse greenstone flows, and pyroclastics. PPu, Havallah and Pumpernickel Formations, undifferentiated*

BELOW GOLCONDA THRUST FAULT

- PPa — Antler sequence. *Consists, from bottom to top, of Battle Formation, Middle Pennsylvanian, conglomerate, minor sandstone, shale, and limestone; Antler Peak Limestone, Upper Pennsylvanian, limestone and shaly limestone; and Edna Mountain Formation, Upper Permian, calcareous sandstone with conglomerate and limestone*

UNCONFORMITY

SILICEOUS AND VOLCANIC ASSEMBLAGE (ABOVE ROBERTS MOUNTAINS THRUST FAULT)

Middle and Upper(?) Devonian

- Ds — Slaven Chert. *Dark-gray to black chert, sparse siltstone*

THRUST FAULT

- Se — Elder Sandstone. *Feldspathic sandstone and minor amounts of thin-bedded chert and shale*

THRUST FAULT

- Ov — Valmy Formation. *Dark-gray, black, green, and red chert, vitreous quartzite, and subordinate greenstone, pillow lavas, and shale*
- Ovi — Vinini Formation. *Chert and shale, sparse limestone, quartzite, and greenstone*

THRUST FAULT

Middle and Upper Cambrian

- Ꞓh — Harmony Formation. *Micaceous sandstone, arkose, shale, and subordinate calcareous shale and limestone*

THRUST FAULT

Lower or Middle Cambrian

- Ꞓsc — Scott Canyon Formation. *Chert, shale, and argillite, subordinate greenstone flows, pillow lavas, and pyroclastic rocks*

CARBONATE AND TRANSITIONAL ASSEMBLAGES (BELOW ROBERTS MOUNTAINS THRUST FAULT)

MISSISSIPPIAN

- MDp — Pilot Shale. *Dark-gray limy shale that weathers pink or light yellowish brown*

DEVONIAN

- Dl — Limestone. *Thick-bedded to massive limestone, subordinate silty limestone. Consists of Wenban Limestone north of 40th parallel and of unnamed limestone in Toiyabe Range south of Austin*

SILURIAN

- DSrm — Roberts Mountains Formation. *Platy silty limestone and limy siltstone. Black chert locally at base*

ORDOVICIAN

- Ol — Limestone and subordinate shale, dolomite, and quartzite. *Consists of the Eureka Quartzite and Hanson Creek Formation north of 40th parallel, and of the Goodwin Limestone, Ninemile Formation, Antelope Valley Limestone, and strata equivalent to the Copenhagen and (or) Hanson Creek Formation south of 40th parallel*

CAMBRIAN

Middle Cambrian

- Ꞓs — Shwin Formation. *Argillite, phyllite, greenstone, slate, and limestone*

Middle and Upper Cambrian

- Ꞓha — Hamburg Dolomite. *Massive dolomite*

Middle and Upper Cambrian

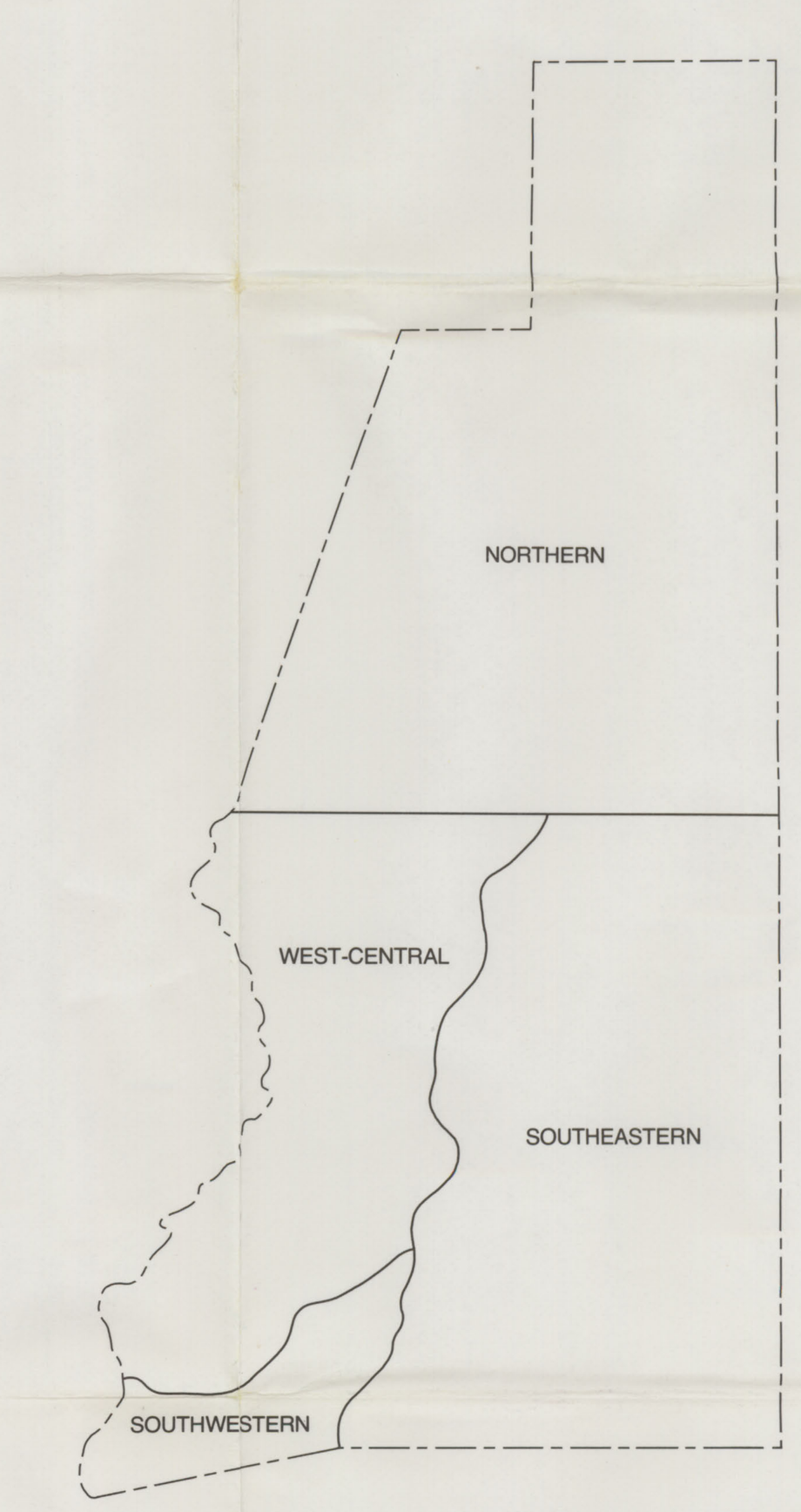
- Ꞓcc — Crane Canyon sequence of Means (1962). *Laminated limestone and subordinate black shale. Locally includes strata of probable Ordovician age*
- Ꞓq — Quartzite and subordinate shale. *Ledge-forming limestone at top*

BELOW EASTSIDE THRUST FAULT IN TOIYABE RANGE

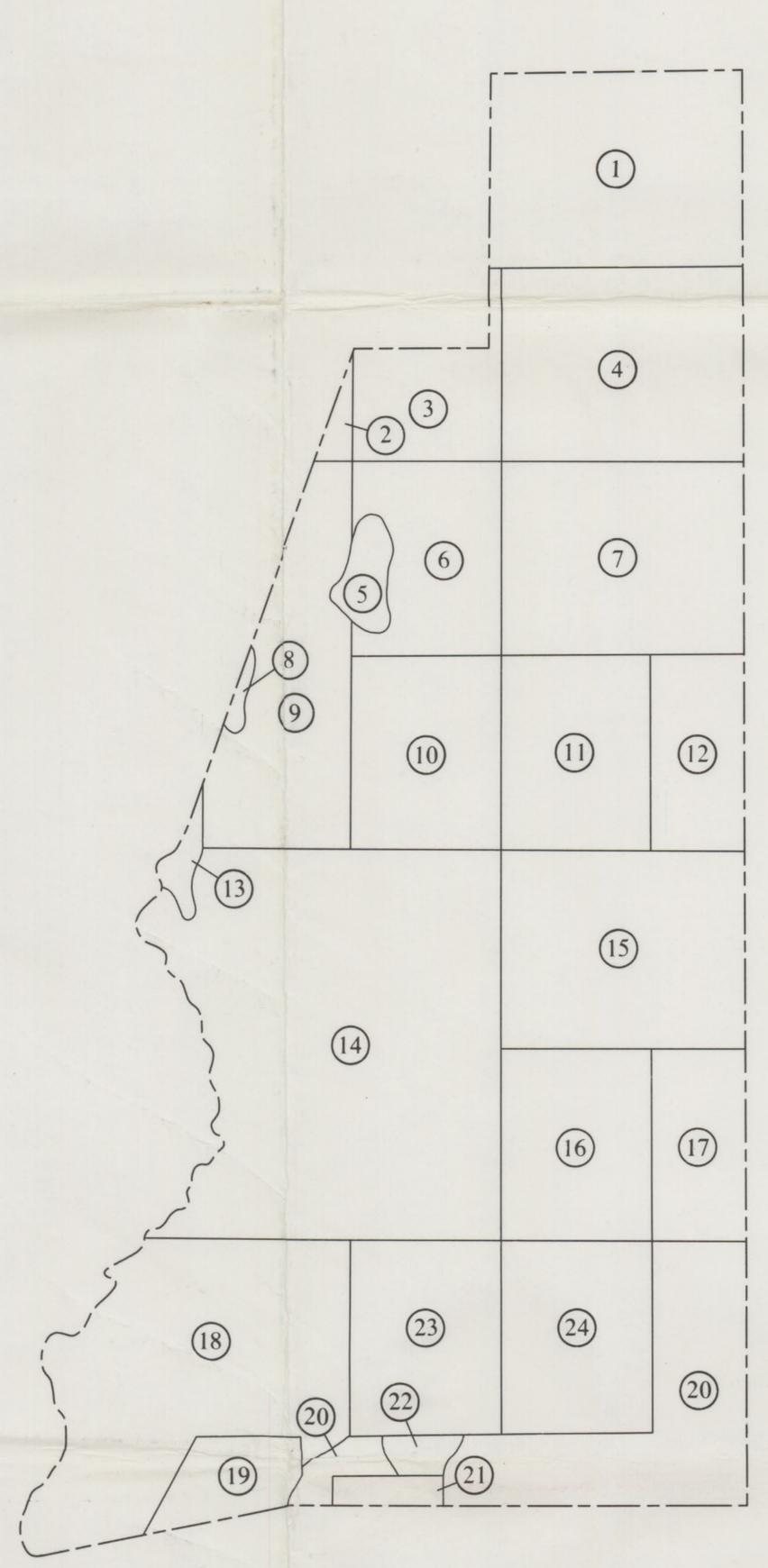
- DSrm — Roberts Mountains Formation. *Platy silty limestone and limy siltstone*
- Oa — Antelope Valley Limestone. *Massive cliff-forming limestone*
- OꞒbc — Broad Canyon sequence of Means (1962). *Dark-gray phyllite and slate; light-gray to dark-gray laminated limestone*
- Ꞓq — Quartzite and subordinate shale. *Ledge-forming limestone at top*

Symbols

- Contact
- Fault. *Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side*
- Thrust fault. *Dashed where approximately located; queried where uncertain. Sawteeth on upper plate*
- Fault scarp. *Dashed where approximately located or uncertain. Hachures on downthrown side*



INDEX MAP OF LANDER COUNTY SHOWING MAJOR GEOGRAPHIC DIVISIONS



INDEX MAP OF LANDER COUNTY SHOWING SOURCES OF GEOLOGIC DATA

SOURCES OF DATA USED IN COMPILING GEOLOGIC MAP OF LANDER COUNTY

Numbers correspond to those shown on index map

1. J. H. Stewart, unpublished geologic mapping done during 1968, based in part on mapping during 1959-60 by W. A. Oesterling, R. J. Anctil, and G. W. Olcott of the Southern Pacific Land Department
2. J. H. Stewart, photogeologic mapping in 1968
3. Roberts (1964)
4. Stewart (1969)
5. Ferguson, Muller, and Roberts (1951b) with modifications and additions by E. H. McKee in 1968. Shown at 1:62,500 scale by McKee and Stewart (1969a) and McKee (1969)
6. McKee and Stewart (1969a)
7. Gilluly and Gates (1965), slightly modified by J. H. Stewart and E. H. McKee in 1968-69. Mapping in Tenabo-Gold Acres area, and some modifications elsewhere, after C. T. Wrucke, 1972, unpublished mapping
8. Ferguson, Muller, and Roberts (1951b) with modifications by McKee (1969)
9. McKee (1969)
10. McKee and Stewart (1969b)
11. Stewart and McKee (1969a) with modifications by J. H. Stewart in 1969
12. Gilluly and Masursky (1965)
13. Mapping of pre-Tertiary rocks by R. C. Speed in 1967 and 1968 based in part on work of Muller, Ferguson, and Roberts (1951). Mapping of Tertiary rocks by E. H. McKee in 1968. Shown in part on 1:62,500-scale map of Stewart and McKee (1969b)
14. Stewart and McKee (1969b) with additions by J. R. MacMillan, in 1969
15. Stewart and McKee (1969c) with modifications by J. H. Stewart in 1969
16. Stewart and McKee (1968a)
17. McKee (1968a)
18. McKee (1968c)
19. Bonham (1970)
20. Stewart and McKee (1968b)
21. Means (1962). Shown at 1:62,500 scale by Stewart and McKee (1968b)
22. Mapping by J. H. Stewart in 1967 and 1969 based in part on work of D. B. MacLachlan (written commun., 1967; 1972). Slightly modified from Stewart and McKee (1968b)
23. McKee (1973)
24. McKee (1968b)

Base from U.S. Geological Survey
McDermitt, 1955; Millett, 1971;
Winnemucca, 1971

GEOLOGIC MAP OF LANDER COUNTY, NEVADA

By
John H. Stewart and Edwin H. McKee

SCALE 1:250 000

5 0 5 10 15 20 MILES

5 0 5 10 15 20 KILOMETRES

CONTOUR INTERVALS 100 AND 200 FEET
DATUM IS MEAN SEA LEVEL

Geology mapped in 1966-70