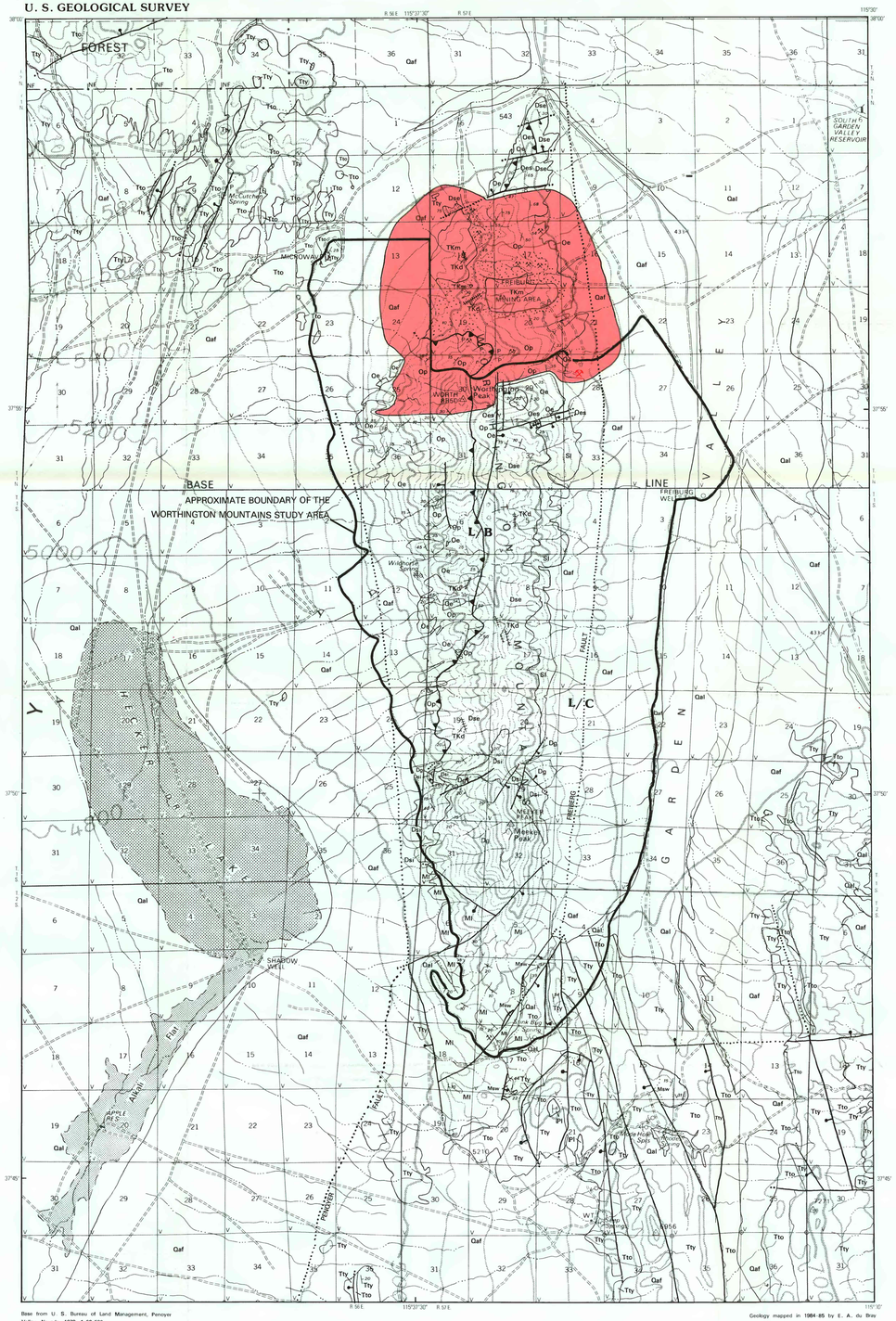
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

BULLETIN 1728-A
PLATE 1



Base from U. S. Bureau of Land Management, Pancyer Valley, Nevada, 1973, 1:63,500

Geology mapped in 1984-85 by E. A. du Bray

A. MINERAL RESOURCE POTENTIAL, IDENTIFIED RESOURCES, AND GEOLOGY

EXPLANATION OF MINERAL RESOURCE POTENTIAL AND IDENTIFIED RESOURCES

[The entire study area contains identified resources of carbonate rock, quartzite, and sand and gravel, not shown on this map]

Geologic terrane having moderate potential for base (Cu, Pb, Zn)- and precious (Au, Ag)- metal replacement deposits and (or) tungsten in scheelite-bearing tactite deposits, with certainty level B

Mine having identified resources of copper, lead, zinc, silver, and minor gold

L/C **Geologic terrane having low potential for metallic mineral commodities, with certainty level C**

L/B **Geologic terrane having low potential for petroleum and geothermal resources, with certainty level B**—Applies to entire study area

CORRELATION OF MAP UNITS

Qaf Qal	QUATERNARY
Unconformity	
Tty	TERTIARY
Tto	
Unconformity	
TKd, TKm	TERTIARY OR CRETACEOUS
Unconformity	
Pl	PENNSYLVANIAN
Msw	MISSISSIPPIAN
Fault	
Ml	
Fault	
Dg	DEVONIAN
Dsi	
Dse	
Sl	SILURIAN
Oes	ORDOVICIAN
Oe	
Op	

DESCRIPTION OF MAP UNITS

Surficial deposits

Qaf **Alluvial-fan deposits (Quaternary)**—Poorly sorted, braided-distributary deposits including angular material that ranges from silt to boulder size. Forms aprons around topographic highs

Qal **Alluvium (Quaternary)**—Undifferentiated surficial deposits, principally active sediment in stream channels but includes minor talus and colluvium. Locally includes minor windblown sand, silt, and evaporite deposits

Extrusive igneous rocks

Tty **Younger welded ash-flow tuff (Tertiary)**—Distinctly reddish-brown-weathering, welded, porphyritic ash-flow tuff; basal unit is a distinctive 1- to 5-ft-thick black vitrophyre. Tentatively correlated with the Shingle Pass Tuff (Ekren and others, 1971). Several cooling units present; most underlie subdued hills and ridges. Youngest cooling unit, occurring only at the crest of several high ridges in southeast corner of wilderness study area, forms prominent, resistant cliffs that weather grayish orange pink. Phenocrysts 8-20 percent, apportioned as follows: quartz, 0-5 percent; biotite, 2-5 percent; and hornblende, 0-2 percent; the rest are alkali feldspar and plagioclase in ratios that vary from 1:6 to about 1:4 (Ekren and others, 1977). Total thickness between 100 and 300 ft

Tto **Older welded ash-flow tuff (Tertiary)**—Pinkish-gray to yellowish-gray-weathering, welded, porphyritic ash-flow tuff. Tentatively correlated with tuff in Needles Range Formation (Ekren and others, 1971). Multiple cooling units present. Underlies subdued hills and ridges. Phenocrysts 35 percent, apportioned as follows: quartz, 18 percent; alkali feldspar, 3 percent; plagioclase, 57-62 percent; biotite, 10-14 percent; hornblende, 7 percent; and opaque oxides, 3 percent (Ekren and others, 1977). Total thickness several hundred feet

Intrusive igneous rocks

TKd **Diabase dikes (Tertiary or Cretaceous)**—Dark-reddish-brown, fine-grained diabase. Intersertal diabase consists of subhedral to euhedral laths of intermediate plagioclase (about 60 percent), with smaller subhedral grains of augite (about 30 percent) and subhedral magnetite (about 5 percent) in interstices between plagioclase grains. Groundmass includes secondary biotite (about 5 percent) and trace of very fine grained olivine. Rare olivine phenocrysts occur in some samples. Thickness 1-10 ft

TKm **Monzogranite of the Worthington Mountains (Tertiary or Cretaceous)**—Very light gray to grayish-orange-pink-weathering, fine- to medium-grained, inequigranular to porphyritic monzogranite. Texture and modal composition somewhat variable. Average modal mineralogy, based on 500-point counts of seven stained slabs, is quartz, 19 percent; potassium feldspar, 47 percent; plagioclase, 28 percent; and biotite, 6 percent. Medium-grained hypidiomorphic granular phenocrysts of quartz, plagioclase, and potassium feldspar are enclosed in xenomorphic granular, locally myrmekitic, groundmass principally composed of potassium feldspar and quartz. Biotite is subhedral and fine grained. Accessory minerals are zircon and magnetite. Forms two small stocks at northern end of Worthington Mountains. Locally weakly altered and mineralized

Sedimentary rocks

Pl **Limestone (Pennsylvanian)**—Medium-bluish-gray, fine-grained, massive limestone. Weathers to form moderate slopes. Some beds contain distinctive corals as long as 12 in. May correlate with Ely Limestone (Kellogg, 1960). Very limited outcrop in map area, south of wilderness study area boundary. Unconformably overlain by Tertiary volcanics

Msw **Scotty Wash Quartzite (Upper Mississippian)**—Distinctly ripple-marked, very light gray, massive to crossbedded quartzite to quartzitic sandstone. Underlies small hills. Very limited outcrop in map area, south of the wilderness study area boundary. Unconformably overlain by Tertiary volcanics

Ml **Limestone (Mississippian)**—Fine-grained, medium-gray limestone. Forms slopes; massive in some places, occurs in beds 1-4 in. thick elsewhere. Contains abundant chert nodules; fossils, including corals and crinoids, are abundant in some areas. Probably correlates with Joana Limestone (Spencer, 1917; Reso, 1963). In fault contact with younger Scotty Wash Quartzite. About 1,000 ft thick

Dg **Guilmette Formation (Upper and Middle Devonian)**—Medium-gray to light-brown, medium-grained limestone. Massive, cliff-forming, locally cavernous. Contains abundant fossils, including many types of corals, brachiopods, and gastropods. In fault contact with Mississippian limestone (unit Ml). About 1,700 ft thick

Dsi **Simonson Dolomite (Middle Devonian)**—Alternating beds of light and dark dolomite in four parts. Basal unit is light tan, medium grained, and cliff forming. Unit above is alternating whitish-gray and aphanitic, and brownish-gray and fine-grained dolomite. Unit above is massive, cliff-forming brown dolomite; contains abundant corals. Highest unit is alternating light and dark dolomite similar to alternating dolomite unit below. Upper contact with Guilmette Formation is conformable and at base of prominent 200-ft limestone cliff. Total thickness about 700 ft

Dse **Sevy Dolomite (Lower Devonian)**—Distinctly whitish-gray to very pale bluish gray unfossiliferous microcrystalline dolomite. Remarkably homogeneous, dense; well bedded in layers 6 in. to 2 ft thick; weathers recessively to steplike slopes. Top of formation marked by distinctly reddish-brown-weathering sandstone or quartzite 20-50 ft thick. Reso (1963) suggested that this sandstone and quartzite unit represents basal part of overlying Simonson Dolomite. Unconformably overlain by Simonson Dolomite (Johnson and Murphy, 1984). About 1,300 ft thick

Sl **Laketown Dolomite (Silurian)**—Light- and dark-gray, fine- to medium-grained crystalline and sandy dolomite. Forms massive, recessive-weathering, three-part outcrop with dark dolomite above and below a band of light dolomite; abundant chert nodules and fossils, including various types of coral, in upper one-third of formation. Unconformably overlain by Sevy Dolomite. About 800 ft thick

Oes **Ely Springs Dolomite (Upper Ordovician)**—Dark-gray to black, fine- to medium-grained, massive dolomite. Forms cliffs; contains abundant chert nodules. Sparsely fossiliferous; contains some brachiopods and distinctive straight-coned cephalopods as long as 2 ft. Basal part includes some reddish-brown sandstone beds. Conformably overlain by Laketown Dolomite; contact is at base of distinctly lighter colored dolomite. Between 300 and 400 ft thick

Oe **Eureka Quartzite (Middle Ordovician)**—Fine- to medium-grained, sugary, massive to crossbedded orthoquartzite. Forms distinctive white to light-gray slopes and cliffs; basal several hundred feet of unit weathers reddish brown. Upper contact with overlying Ely Springs Dolomite is apparently conformable. About 400 ft thick

Op **Pogonip Group (Middle and Lower Ordovician)**—Alternating gray to brown, thick-bedded limestone and yellowish- to brownish-gray thin-bedded, slope-forming silty and shaly limestone. Contains chert nodules in some places. Locally contains abundant fossils, including corals, brachiopods, trilobites, gastropods, and graptolites. Upper contact with Eureka Quartzite sharp, easily recognized, and paraconformable (Reso, 1963). About 3,000 ft thick, base not exposed

Contact—Approximately located

Fault—Approximately located, dotted where concealed. Ball and bar on downthrown side

Thrust fault of compressional or gravity-slide origin—Approximately located, dotted where concealed. Sawteeth on upper plate

Strike and dip of beds

Mine or prospect

Area where carbonate rocks have been converted to marble

B **Aeromagnetic anomaly discussed in text**

Lineament defined by aeromagnetic data

Lineament defined by gravity data (figure 3)—Hachures indicate anomaly low

Aeromagnetic contours—Contour interval 20 nanoteslas

Flight line

LEVEL OF RESOURCE POTENTIAL ↑ / LEVEL OF CERTAINTY →	A	B	C	D
U/A	H/B HIGH POTENTIAL	H/C HIGH POTENTIAL	H/D HIGH POTENTIAL	
UNKNOWN POTENTIAL	M/B MODERATE POTENTIAL	M/C MODERATE POTENTIAL	M/D MODERATE POTENTIAL	
	L/B LOW POTENTIAL	L/C LOW POTENTIAL	L/D LOW POTENTIAL	
			N/D NO POTENTIAL	

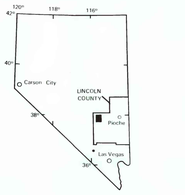
LEVELS OF RESOURCE POTENTIAL

H High mineral resource potential
M Moderate mineral resource potential
L Low mineral resource potential
U Unknown mineral resource potential
N No known mineral resource potential

LEVELS OF CERTAINTY

A Available data not adequate
B Data indicate geologic environment and suggest level of resource potential
C Data indicate geologic environment, give good indication of level of resource potential, but do not establish activity of resource-forming processes
D Data clearly define geologic environment and level of resource potential and indicate activity of resource-forming processes in all or part of the area

Diagram showing relationships between levels of mineral resource potential and levels of certainty. Shading shows levels that apply to this study area

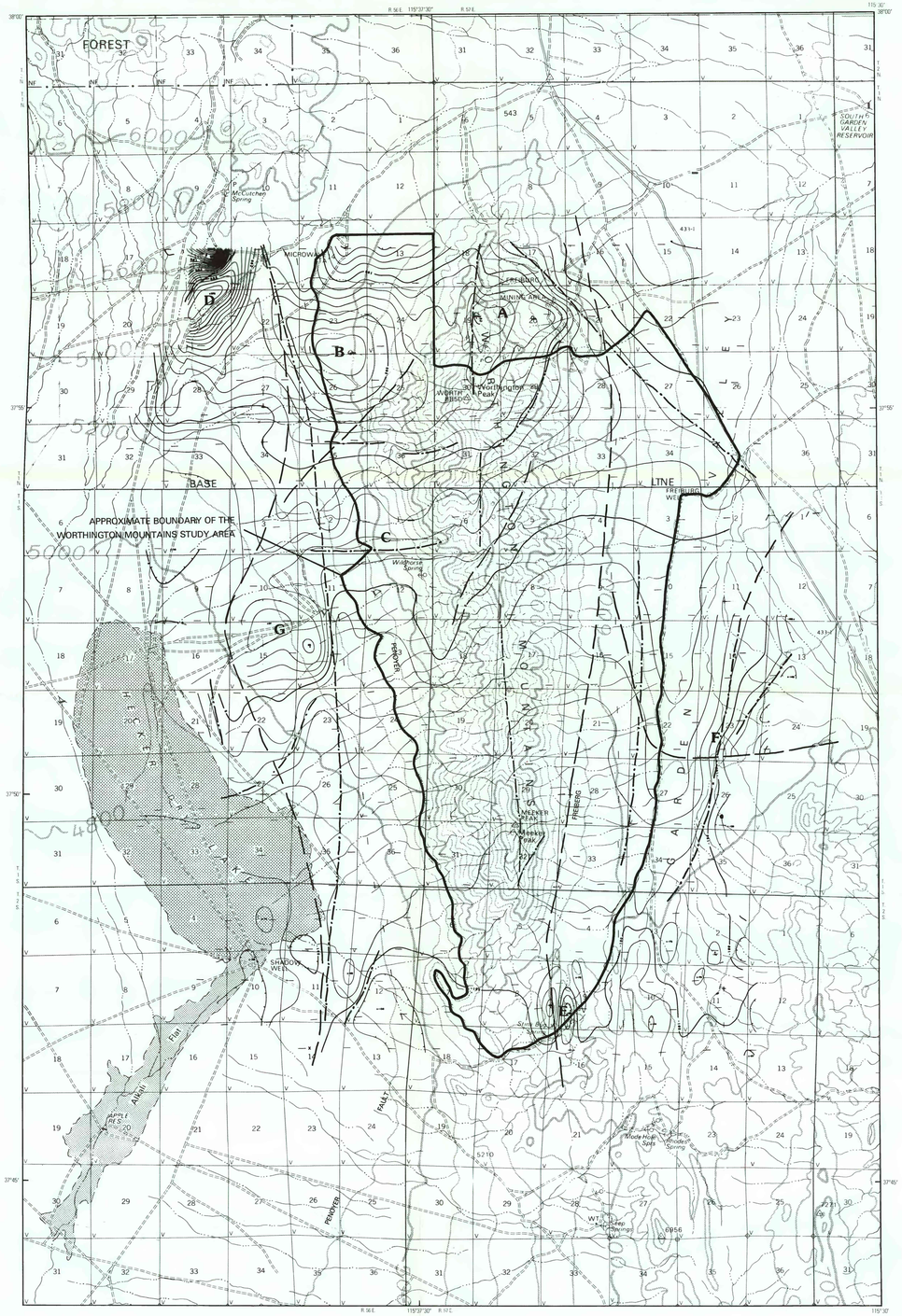


SCALE 1:50 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 200 FEET



B. AEROMAGNETIC DATA

MINERAL RESOURCE POTENTIAL, GEOLOGIC, AND AEROMAGNETIC MAPS OF THE WORTHINGTON MOUNTAINS STUDY AREA, LINCOLN COUNTY, NEVADA