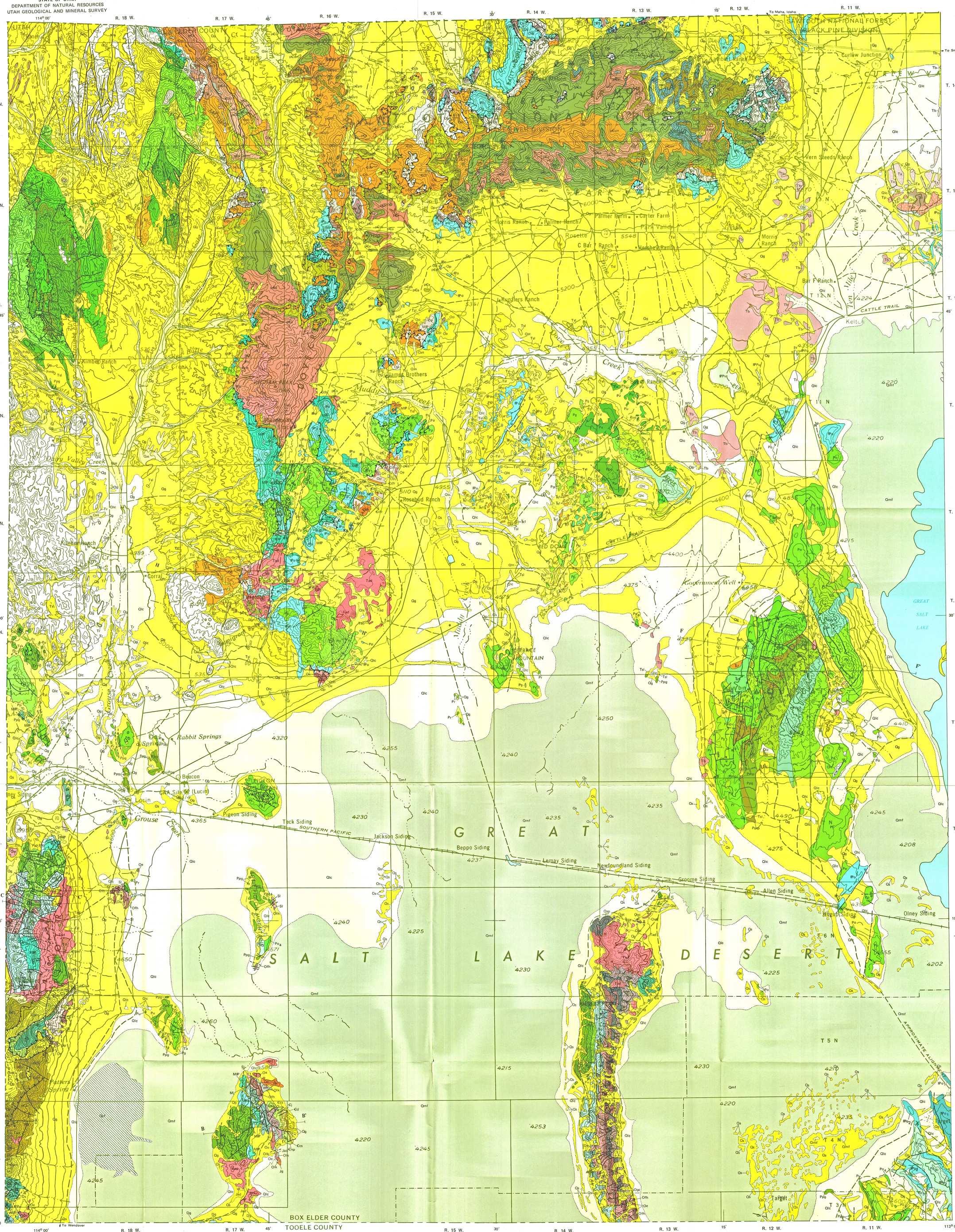
PLATE 2
Bulletin 115,
Hellmut H. Doelling, Geology and Mineral
Resources of Box Elder County, Utah

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
UTAH GEOLOGICAL AND MINERAL SURVEY



QUATERNARY

- **Qmf** — MUDFLAT. *Lake bed sediments, mostly clay, with high salt content, nearly barren of vegetation.*
- **Qlc** — LAKE CLAYS. *Chiefly clay or silt deposits of Lake Bonneville, with minor, mostly fine deposits of alluvial, colluvial or aeolian origin.*
- **Qas** — ALLUVIAL SOILS. *Mostly soils, clays, silts of alluvial origin with subordinate sands and gravels.*
- **Qg** — GRAVEL. *Gravel-ferous deposits of all types not necessarily suitable for commercial use, subordinate sand, silt, and clay.*
- **Qs** — SANDY DEPOSITS. *Larger deposits of gypsite, oolite, or siliceous sand.*

UNCONFORMITY

TERTIARY

- **Tsl** — SALT LAKE GROUP. *Light-colored fanglomerate, conglomerate, and tuffaceous sandstone and limestone, occasional inter-bedded volcanic flows (Oligocene?, Miocene, Pliocene).*

UNCONFORMITY

TRIASSIC

- **TRt** — THAYNES FORMATION. *Thin-bedded silty limestone with subordinate dark brown to gray bioclastic limestone.*
- **TRd** — DINWOODY FORMATION. *Mostly gray, thin-bedded limestones inter-bedded with olive, green, brown, or maroon shales and siltstones.*

GUADALUPE

- **Pg** — GERSTER FORMATION. *Gray crystalline and bioclastic limestone, silty and cherty limestone and bedded chert, may contain productid brachiopod coquinae.*
- **Pr** — REX CHERT. *Gray and brown thin-bedded to massive chert, cherty siltstone and cherty mudstone.*
- **Pmp** — MEADE PEAK MEMBER. *Dark mudstone, silty and cherty carbonate rock, shale, contains phosphatic intervals.*
- **Ppg** — GRANDEUR MEMBER. *Light to medium gray dolomite, silty and sandy dolomite, cherty dolomite and sandstone.*
- **Pu** — UNDIFFERENTIATED OR UNNAMED STRATA. *Generally inter-bedded sandstones, limestones, dolomites, and cherts of Leonardian age. Includes interval between Grandeur Member and Pequop Formation and often includes parts of those formations. In the Terrace Mountains this interval has been named the Loray? Formation and the Diamond Creek? Sandstone.*
  - **Pl?** — LORAY? FORMATION. *Yellow to gray, fine-grained, calcareous sandstone and silty, cherty limestone and dolomite.*
  - **Pdc?** — DIAMOND CREEK? SANDSTONE. *Tan to yellow cross-bedded, friable, calcareous sandstone and orthoquartzite, subordinate sandy or silty limestone or dolomite.*

LEONARD

- **Pp** — PEQUOP FORMATION. *Thin-bedded silty and cherty limestone with subordinate thick dary gray bioclastic limestone, siltstone, and sandstone; strata often appear deformed. Upper part of Pp in Terrace Mountains in Pequop Formation.*

WOLFCAMP

- **Po** — UPPER OQUIRRH FORMATION. *Strata of Wolfcampian age; descriptions of 3 units below are representative of combined unit.*
  - **Po5** — OQUIRRH FORMATION UNIT 5. *Inter-bedded dark gray blocky, limestone, fine-grained, thin-bedded, lavender weathering limestone and occasional sandstone or siltstone*
  - **Po4** — OQUIRRH FORMATION UNIT 4. *Inter-bedded tan and yellow sandstone or orthoquartzite and dark gray bioclastic limestone, occasional conglomeratic units.*
  - **Po3** — OQUIRRH FORMATION UNIT 3. *Tan and yellow, thick-bedded to massive sandstones and orthoquartzites, occasional crinoidal, fusulinid bearing limestones.*

- **IPPu** — UNDIFFERENTIATED PENNSYLVANIAN PERMIAN UNIT. *Formations, Morrow to Guadalupe in age, not yet differenciated into mappable units*
- **IPo** — LOWER OQUIRRH FORMATION. *Strata of Desmoinesian to Virgilian age; descriptions of 2 units below are representative of combined unit.*
  - **IPo2** — OQUIRRH FORMATION UNIT 2. *Tan to brown red, thin-bedded siltstone and silty limestone and subordinate tan or yellow fine-grained sandstone (Virgil).*
  - **IPo1** — OQUIRRH FORMATION UNIT 1. *Cherty gray, thick-bedded, medium-grained, cherty limestone, minor tan siltstone and silty limestone are also present (Desmoinesian).*

UNCONFORMITY

MISSISSIPPIAN

- **MIP** — CHAINMAN-DIAMOND PEAK FMS., UNDIVIDED. *Black fissile shale, grit and fine pebble conglomerate, brown quartzite and sandstone.*
- **Mj** — JOANA LIMESTONE. *Light to dark gray, generally thick-bedded to massive fossiliferous limestone.*
- **Dg** — GUILMETTE FORMATION. *Mostly dark gray, thick-bedded to massive limestone with subordinate gray thick-bedded dolomite, thick beds of quartzite and dense black platy limestone.*
  - **Dsg** — GUILMETTE - SIMONSON FMS. UND.

DEVONIAN

- **Ds** — SIMONSON DOLOMITE. *Light to dark gray, laminated, medium- to thick-bedded dolomite.*

SILURIAN

- **Sl** — LAKETOWN DOLOMITE. *Light to dark gray, medium to thick-bedded, cliff-forming, occasionally cherty dolomite.*
- **Ofh** — FISH HAVEN DOLOMITE. *Gray to black, mostly medium-bedded to massive, often cherty dolomite.*
- **Oe** — EUREKA QUARTZITE. *Siliceous white-weathering quartzite; includes the dark gray to black Crystal Peak Dolomite at the base in the Newfoundland Mountains.*
- **Osp** — SWAN PEAK FORMATION. *Upper yellow to gray massive quartzite, lower part interbedded silty, thin-bedded limestone, shaly calcareous siltstone, and fine-grained sandstone; only present in eastern part of area, lower part correlate with Lehman-Kanosh? Formation as found in the southwestern part of the area.*

ORDOVICIAN

- **Olk** — LEHMAN-KANOSH? FORMATION. *Dark gray argillaceous thin-bedded limestone and orange brown siltstone and shale, often fossiliferous.*
- **Ogc** — GARDEN CITY FM. POGONIP FORMATION. *Light gray, silty, locally cherty limestone with abundant intraformational conglomerate. Pogonip has similar lithology, may includes Lehman-Kanosh? lithology.*
  - **Op**

- **€u** — UNDIFFERENTIATED CAMBRIAN ROCKS. *Dark gray, silty limestones, greenish to black phyllites or shales, and metamorphosed equivalents of units listed below.*
  - **€np** — NOTCH PEAK FORMATION. *Gray, cherty, cliff-forming limestone and dolomite; mostly dolomite in upper part.*
  - **€cs** — CORset SPRINGS SHALE. *Interbedded thin beds of light gray to yellow brown shale and light gray limestone, thin cherty units near top.*
  - **€j** — JOHNS WASH FORMATION. *Upper unit of platy argillaceous white-weathering limestone and dolomite, lower unit of slope-forming green and brown siltstone.*
  - **€d** — DUNDERBERG SHALE. *Greenish shale and thin-bedded limestone.*
  - **€lu** — LOWER UPPER CAMBRIAN. *Mostly blue gray ledge-forming limestone and dolomitic limestone.*

CAMBRIAN — UPPER CAMBRIAN

PILOT RANGE AREA

- **€p** — PIOCHE SHALE. *Black phyllite, with minor silty limestones.*
- **€pm** — PROSPECT MOUNTAIN QUARTZITE. *Light-colored thin- to thick-bedded, medium- to coarse-grained quartzite.*

PRECAMBRIAN

- **p€u** — UNDIFFERENTIATED PRECAMBRIAN ROCKS; McCOY CREEK GROUP. *Sequences of quartzites, argillites, phyllites, schists, metaqpristone with subordinate slate and marble*

RAFT RIVER - GROUSE CREEK MOUNTAIN AREA

CAMBRIAN

- **€cb** — QUARTZITE OF CLARKS BASIN AND SCHIST OF MAHOGANY PEAKS. *Gray to white flaggy quartzite and dark micaceous staurolite schist.*

PRECAMBRIAN

- **p€s** — SCHIST OF STEVENS SPRING. *Muscovite and hornblende schist with phyllite lenses*
- **p€yo** — QUARTZITE OF YOST. *Moderately micaceous, white, thin-bedded quartzite.*
- **p€un** — SCHIST OF THE UPPER NARROWS. *Mostly dark schist with lenses of phyllite, some feldspathic fine-grained gneiss.*
- **p€e** — ELBA QUARTZITE. *Thin- to medium-bedded white or green quartzite and fine-grained mica-feldspar-quartz schist.*

UNCONFORMITY

- **p€os** — OLDER SCHIST. *Dark mica schists, semischistose cross-bedded sandstone, pebbly and cobbly mudstone.*

IGNEOUS ROCKS

EXTRUSIVE ROCKS

- **Tb** — BASALT
- **Td** — DACITE *(welded tuff)*
- **Tr** — RHYOLITE
- **Ta** — ANDESITE
- **Tp** — PERLITE

INTRUSIVE ROCKS

- **Tad, Jad** — ADAMELLITE
- **Tg, Jg** — GRANODIORITE, DIORITE, OTHER INTRUSIVE VARIETIES OF TERTIARY AGE
- **p€ia** — ADAMELLITE GNEISS
- **p€ig** — GRANITE PORPHYRY GNEISS
- **p€t** — TRONDHJEMITE, PEGMATITE, MAFIC IGNEOUS ROCK GNEISSES AND SCHISTS

Base from U.S. Army topographic maps, Brigham City, Utah; Idaho, 1:250,000, and Tooele, Utah, 1:250,000.

SYMBOLS

- CONTACT. *Surficial where dotted*
- FAULT. *Dashed where inferred; U, upthrown side; D, downthrown side*
- THRUST FAULT. *Dashed where inferred, saw-teeth on side of upper plate*

TRUE NORTH
MAGNETIC NORTH
12°
DECLINATION AT CENTER OF SHEET

SCALE 1:125,000
1 ½ 0 1 2 3 4 5 6 7 8 9 10 MILES
1 ½ 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

GEOLOGY OF BOX ELDER COUNTY, UTAH
WEST HALF

compiled by Hellmut H. Doelling
1980

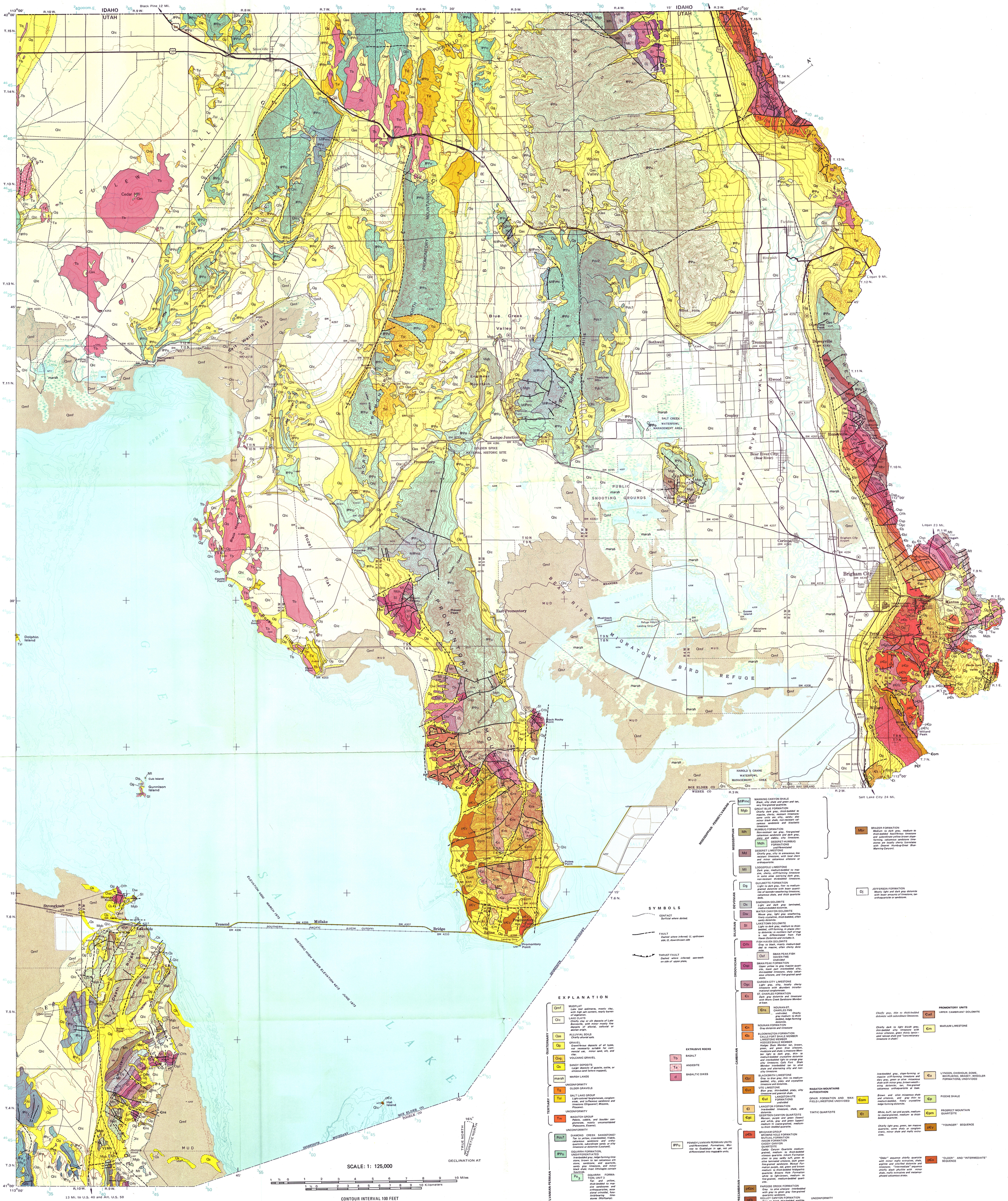
Appropriations Number: 016103
Approval Number: 7900288

Drafted by: B. Jones, S. Stewart & D. Powers

See Plate 3 for cross sections

STATE OF UTAH
Department Of Natural Resources
Utah Geological And Mineral Survey

PLATE 1
Bulletin 115,
Hellmut H. Doelling, Geology and Mineral Resources of Box Elder County, Utah



Base from U.S. Geological Survey, Great Salt Lake And Vicinity, Utah, 1974, with Utah Geological And Mineral Survey additions.

Appropriations Number 016103
Approval Number 7900288

See page 81 and figure 41 on page 82 for authors of source work.

GEOLOGY OF BOX ELDER COUNTY, UTAH
EAST HALF

compiled by Hellmut H. Doelling

1980

Drafted By: B. Jones, G. McLaughlin, S. Stewart and D. Powers.

STATE OF UTAH
Department Of Natural Resources
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PLATE 3
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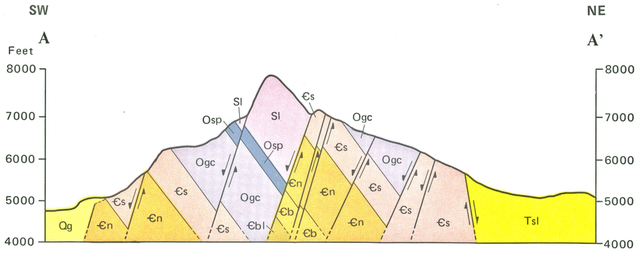
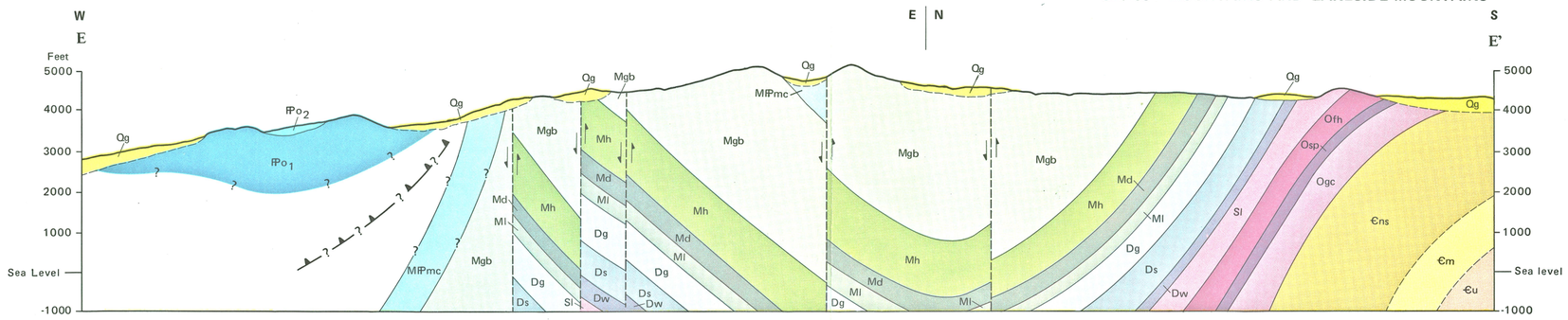
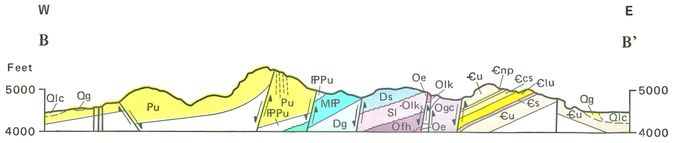
CLARKSTON MOUNTAIN



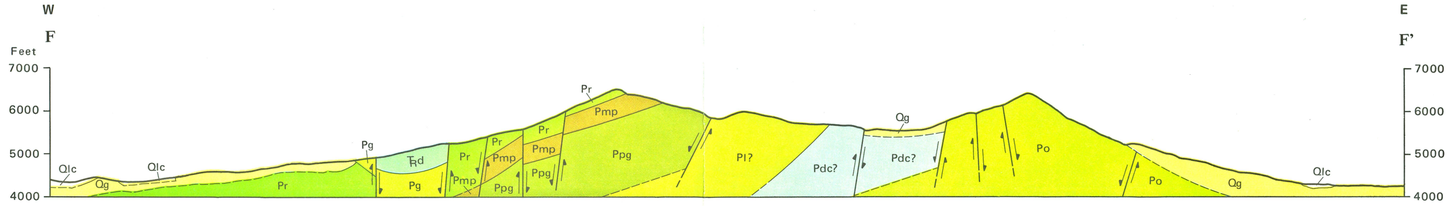
GRASSY MOUNTAINS AND LAKESIDE MOUNTAINS



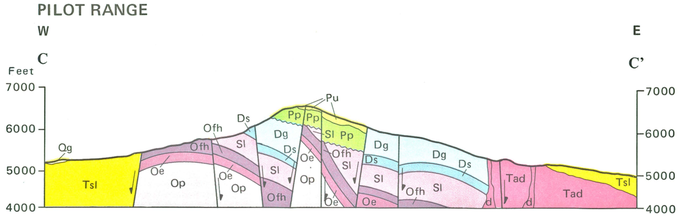
NORTHERN SILVER ISLAND MOUNTAINS (CRATER ISLAND)



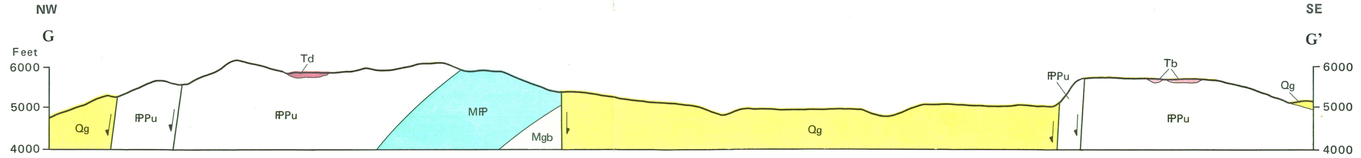
WESTERN TERRACE MOUNTAINS



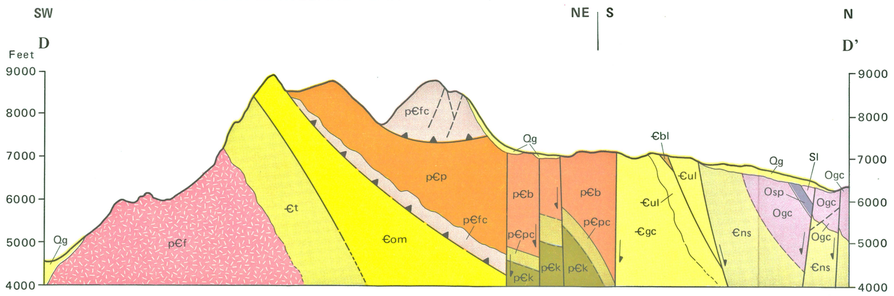
PILOT RANGE



SUMMER RANCH AND NORTHERN PROMONTORY MOUNTAINS



NORTHERN WASATCH RANGE-WILLARD PEAK

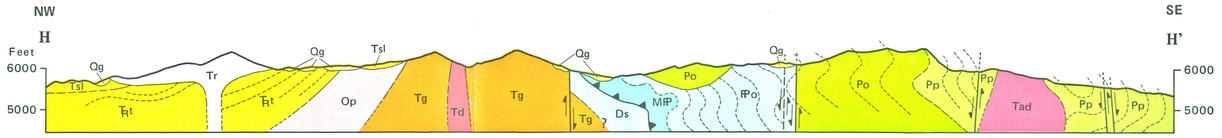


1 0 1 2 Miles

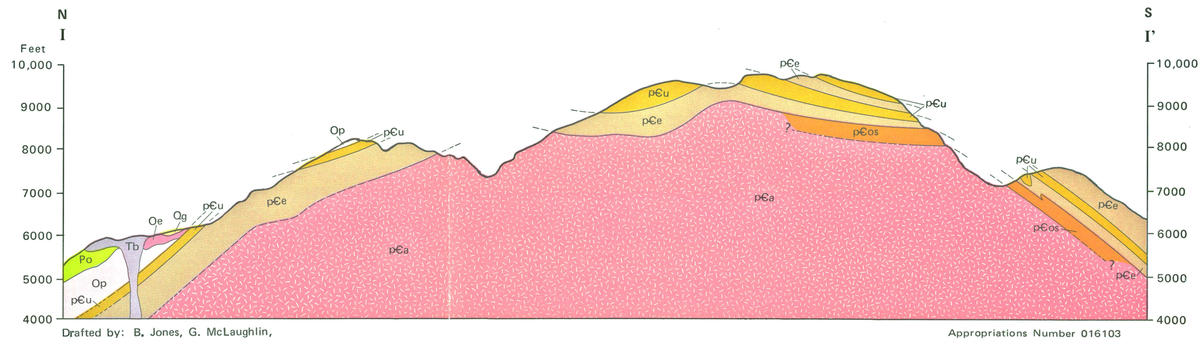
1 0 1 2 Kilometers

2X VERTICAL EXAGGERATION

SOUTHERN GROUSE CREEK MOUNTAINS



EASTERN RAFT RIVER MOUNTAINS



CROSS-SECTIONS OF SELECTED MOUNTAIN RANGES, BOX ELDER COUNTY, UTAH

See page 81 and Figure 41 on page 82 for authors of source work.

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