PLATE 3 of 3

Utah Geological Survey
Geologic Map No. 180
Geologic Map of the Moab and eastern part of the San Rafael Desert 30'x60' Quadrangles, Grand and Emery Counties, Utah, and Mesa County, Colorado

UTAH GEOLOGICAL SURVEY
a division of the
UTAH DEPARTMENT OF NATURAL RESOURCES
in cooperation with the
U. S. GEOLOGICAL SURVEY
COGEOMAP Agreement No. 1434-92-A-1087
STATEMAP Agreement No. 1434-98-HQAG-2067

The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either express or implied, of the U. S. Government.

CITED AND SELECTED MAP REFERENCES

References, preceded by numbers and shown with colors and patterns, are those used in figure 4, Sources of Geologic Data.

Baker, A.A., 1933, Geology and oil possibilities of the Moab district, Grand and San Juan Counties, Utah: U.S. Geological Survey Bulletin 841, 95 p., scale 1:62,500.

Baker, A.A., 1946, Geology of the Green River Desert-Cataract Canyon region, Emery, Wayne, and Garfield Counties, Utah: U.S. Geological Survey Bulletin 951, 122 p., scale 1:62,500.

Baker, A.A., Duncan, D.C., and Hunt, C.B., 1952, Manganese deposits of southeastern Utah: U.S. Geological Survey Bulletin 979-B, plate 2, scale 1:62,500; plate 3, scale 1:12,000.

Bates, C.E., 1955a, Photogeologic map of the Moab-11 (Jug Rock) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-107, scale 1:24,000.

Bates, C.E., 1955b, Photogeologic map of the Moab-10 (Merrimac Butte) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-116, scale 1:24,000.

Bates, C.E., and Sable, V.H., 1955, Photogeologic map of the Tidwell-9 (Tennile Point) quadrangle, Emery and Grand Counties, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-114, scale 1:24,000.

Bergquist, W.E., 1955, Photogeologic map of the Moab-13 (Mineral Canyon) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-118, scale 1:24,000.

1 Case, J.E., 1991, Geologic map of the northwestern part of the Uncompahgre uplift, Grand County, Utah, and Mesa County, Colorado, with emphasis on Proterozoic rocks: U.S. Geological Survey Miscellaneous Investigations Map I-2088, scale 1:24,000.

2 Chitwood, J.P., 1994, Provisional geologic map of the Hatch Mesa quadrangle, Grand County, Utah: Utah Geological Survey Map 152, 16 p., scale 1:24,000.

Cole, R.D., Young, R.G., and Willis, G.C., 1997, The Prairie Canyon Member, a new unit of the Upper Cretaceous Mancos Shale, west-central Colorado and east-central Utah: Utah Geological Survey Miscellaneous Publication 97-4, 23 p.

Colman, S.M., and Hawkins, F.F., 1985, Surficial geologic map of the Fisher Valley-Professor Valley area, southeastern Utah: U.S. Geological Survey Miscellaneous Investigations Map I-1596, scale 1:24,000.

Dane, C.H., 1935, Geology of the Salt Valley anticline and adjacent areas, Grand County, Utah: U.S. Geological Survey Bulletin 863, plate 1, scale 1:62,500.

Dettermann, J.S., 1955a, Photogeologic map of the Moab-5 (Dee Pass) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-57, scale 1:24,000.

Dettermann, J.S., 1955b, Photogeologic map of the Moab-4 (Hatch Mesa) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-85, scale 1:24,000.

Dettermann, J.S., 1955c, Photogeologic map of the Moab-6 (Valley City) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-86, scale 1:24,000.

3 Doelling, H.H., 1985, Geologic map of Arches National Park and vicinity, Grand County, Utah: Utah Geological and Mineral Survey Map 74, 15 p., scale 1:50,000.

4 Doelling, H.H., 1988-1995, Unpublished preliminary mapping for Utah Geological Survey, Grand County project.

5 Doelling, H.H., 1995, Interim geologic map of the Fisher Towers quadrangle, Grand County, Utah: Utah Geological Survey Open-File Report 313, 81 p., scale 1:24,000.

6 Doelling, H.H., 1996, Geologic map of the Dewey quadrangle, Grand County, Utah: Utah Geological Survey Map 169, 20 p., scale 1:24,000.

7 Doelling, H.H., and Morgan, C.D., 1996, Interim geologic map of the Merrimac Butte quadrangle, Grand County, Utah: Utah Geological Survey Open-File Report 338, 81 p., scale 1:24,000.

8 Doelling, H.H., and Ross, M.L., 1993, Geologic map of the Big Bend quadrangle, Grand County, Utah: Utah Geological Survey Map 171, 29 p., scale 1:24,000.

9 Doelling, H.H., Ross, M.L., and Mulvey, W.E., 1995, Interim geologic map of the Moab quadrangle, Grand County, Utah: Utah Geological Survey Open-File Report 322, 100 p., scale 1:24,000.

10 Doelling, H.H., Yonkee, W.A., and Hand, J.S., 1994, Geologic map of the Gold Bar Canyon quadrangle, Grand County, Utah: Utah Geological Survey Map 155, 26 p., scale 1:24,000.

Dyer, J.R., 1983, Jointing in sandstones, Arches National Park, Utah: Palo Alto, California, Stanford University, Ph.D. dissertation, 202 p., scale 1:24,000.

Eicher, L.J., Hedlund, D.C., and Miller, G.A., 1957, Preliminary geologic map and sections of the western part of the Gateway district, Mesa County, Colorado, and Grand and Emery County, Utah: U.S. Geological Survey Mineral Studies Map MF-122, scale 1:24,000.

Finch, W.I., 1954, Geology of the Shinarump No. 1 uranium mine, Seven Mile Canyon area, Grand County, Utah: U.S. Geological Survey Circular 336, 14 p., plate 1 inset, scale 1:95,000 (also 1954, U.S. Geological Survey Open-File Report 54-82, figure 2, scale 1:2,400).

Fisher, D.J., 1936, Book Cliffs coal field in Emery and Grand Counties, Utah: U.S. Geological Survey Bulletin 852, 104 p., plates 8-11, scale 1:62,500.

Gard, L.M., Jr., 1976, Geology of the north end of the Salt Valley anticline, Grand County, Utah: U.S. Geological Survey Open-File Report 76-303, 35 p., figure 3, scale 1:25,000.

11 Goydas, Mike, 1990, Interim geologic map of Fisher Valley quadrangle, Grand County, Utah: Utah Geological and Mineral Survey Open-File Report 167, 48 p., scale 1:24,000.

Gualtieri, J.L., 1981, Geologic map of parts of Negro Canyon and Thompson quadrangles, Utah, showing coal zones and adjacent rocks: U.S. Geological Survey Open-File Report 81-553, scale 1:50,000.

Gualtieri, J.L., 1982, Geologic map of parts of Crescent Junction and Floy Canyon quadrangles, Utah, showing coal zones and adjacent rocks: U.S. Geological Survey Open-File Report 82-584, scale 1:50,000.

Hackman, R.J., 1959a, Photogeologic map of the Coach Creek NE (Marble Canyon) quadrangle, Grand County, Utah and Mesa County, Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-279, scale 1:24,000.

Hackman, R.J., 1959b, Photogeologic map of the Coach Creek SE (Steamboat Mesa) quadrangle, Grand County, Utah and Mesa County, Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-278, scale 1:24,000.

Harper, M.L., 1960, The areal geology of Castle Valley, Utah: Lubbock, Texas Tech University, M.S. thesis, 121 p., scale 1:12,000.

Hemphill, W.R., 1955, Photogeologic map of the Moab-16 (Moab) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-83, scale 1:24,000.

Hintze, L.F., (compiler), 1980, Geologic map of Utah: Utah Geological and Mineral Survey Map A-1, scale 1:500,000.

Hintze, L.F., and Stokes, W.L., (compilers), 1963, Geologic map of Utah (southeast quarter): Utah Geological and Mineralogical Survey, scale 1:250,000.

Hite, R.J., 1977, Subsurface geology of a potential waste emplacement site, Salt Valley anticline, Grand County, Utah: U.S. Geological Survey Open-File Report 77-761, 26 p.

Hudec, M.R., in preparation, The Onion Creek diapir, Paradox basin, Utah: An exposed analog for salt-fall structures in the Gulf of Mexico: Houston, Texas, Exxon Production Research, 19 p.

Hunt, C.B., 1958, Structural and igneous geology of the La Sal Mountains, Utah: U.S. Geological Survey Professional Paper 294-I, p. 305-364, plate 39, scale 1:63,360; plate 40, scale 1:20,000.

12 Huntoon, P.W., Billingsley, G.H., Jr., and Breed, W.J., 1982, Geologic map of Canyonlands National Park and vicinity, Utah: Moab, Utah, Canyonlands Natural History Association, scale 1:62,500.

McKnight, E.T., 1940, Geology of the area between Green and Colorado Rivers, Grand and San Juan Counties, Utah: U.S. Geological Survey Bulletin 908, 147 p., plate 1, scale 1:62,500.

Miller, W.D., 1959, The general geology of Moab Valley, Moab, Utah: Lubbock, Texas Technological University, M.S. thesis, 121 p., scale 1:12,000.

Orkild, P.P., 1955, Photogeologic map of the Tidwell-16 (Bowknot Bend) quadrangle, Emery and Grand Counties, Utah: U.S. Geological Survey Miscellaneous Investigations Map I-115, scale 1:24,000.

Parr, C.J., 1965, A study of primary sedimentary structures around the Moab anticline, Grand County, Utah: Salt Lake City, University of Utah, M.S. thesis, 102 p., scale 1:48,000.

Pipiringos, G.S., and O'Sullivan, R.B., 1978, Principal unconformities in Triassic and Jurassic rocks, western interior United States — A preliminary study: U.S. Geological Survey Professional Paper 1035-A, 29 p.

Probasco, W.T., 1959, Regional geologic aspects of the Moab Valley area, Grand County, Utah: Lubbock, Texas Technological University, M.S. thesis, scale 1:12,000.

Richmond, G.M., 1962, Quaternary stratigraphy of the La Sal Mountains, U.S. Geological Survey Professional Paper 324, 135 p., plate 1, scale 1:48,000.

13 Ross, M.L., 1988-93, unpublished geologic map of the Warner Lake quadrangle, Grand County, Utah: Utah Geological Survey, scale 1:24,000.

14 Ross, M.L., 1988-93, unpublished geologic map of the Mount Waas quadrangle, Grand County, Utah: Utah Geological Survey, scale 1:24,000.

Sable, V.H., 1955a, Photogeologic map of the Moab-12 (Dubinky Wash) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-117, scale 1:24,000.

Sable, V.H., 1955b, Photogeologic map of the Moab-15 (Gold Bar Canyon) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-128, scale 1:24,000.

Sable, V.H., 1955c, Photogeologic map of the Tidwell-8 (Green River SE) quadrangle, Grand and Emery Counties, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-89, scale 1:24,000.

Sable, V.H., 1955d, Photogeologic map of the Tidwell-7 (Horsebench East) quadrangle, Emery and Grand Counties, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-12, scale 1:24,000.

Sable, V.H., 1955e, Photogeologic map of the Moab-14 (The Knoll) quadrangle, Grand County, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-119, scale 1:24,000.

Sable, V.H., 1956, Photogeologic map of the Tidwell-2 (Green River) quadrangle, Emery and Grand Counties, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-162, scale 1:24,000.

15 Shoemaker, E.M., 1952, Preliminary geologic map of the Sinbad Valley-Fisher Valley anticline, Colorado and Utah: U.S. Geological Survey Open-File Report 52-138, scale 1:31,680.

Shoemaker, E.M., 1954, Structural features of southeastern Utah and adjacent parts of Colorado, New Mexico, and Arizona, *in* Stokes, W.L., editor, Uranium geology and general geology of southeastern Utah: Utah Geological Society Guidebook, no. 9, plate 2, scale 1:25,000.

Stokes, W.L., 1952, Uranium-vanadium deposits of the Thompsons area, Grand County, Utah: Utah Geological and Mineralogical Survey Bulletin 46, plate 1, scale 1:82,000; plate 2, scale 1:12,000.

Stokes, W.L., and Fischer, R.P., 1945, Vanadium deposits in the Gateway area, Mesa County, Colorado, and the adjoining part of Grand County, Utah: U.S. Geological Survey Open-File Report 45-99, scale 1:63,630.

Sumson, C.T., 1970, Geology and water resources of the Spanish Valley area, Grand and San Juan Counties, Utah: U.S. Geological Survey Open-File Report 70-375, figure 1, scale 1:62,500.

Trimble, L. M., and Doelling, H. H., 1978, Geology and uranium-vanadium deposits of the San Rafael River mining district, Emery County, Utah: UGMS Bulletin 113, 122 p.

White, M.A., and Jacobson, M.I., 1983, Structures associated with the southwest margin of the ancestral Uncompahgre uplift, *in* Averett, W.R., editor, Northern Paradox basin-Uncompahgre uplift: Grand Junction Geological Society Field Trip Guidebook, p. 33-40.

Williams, P.L., and Hackman, R.J., 1971, Geology, structure, and uranium deposits of the Salina [1° x 2°] quadrangle, Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-591, scale 1:250,000.

Wood-and-Clyde Consultants, 1984, Geologic characterization report for the Paradox basin study region, Utah study areas, Salt Valley: Columbus, Ohio, Battelle Memorial Institute, for Office of Nuclear Waste Isolation, ONWI Report 290, v. 6, scale 1:62,500.

Yeats, V.L., 1961, The areal geology of the Moab 4 NW (Merrimac Butte) quadrangle, Grand County, Utah: Lubbock, Texas Technological University, M.S. thesis, 96 p., scale 1:24,000.

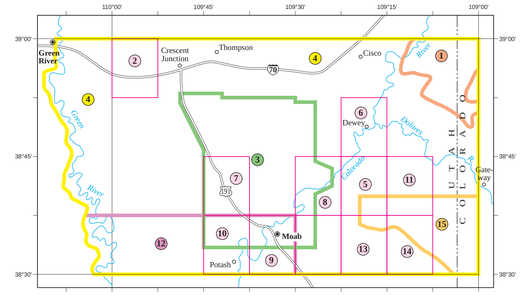


FIGURE 4. Sources of geologic data. Numbered sources, shown by colors, are keyed to "Cited and Selected Map References."

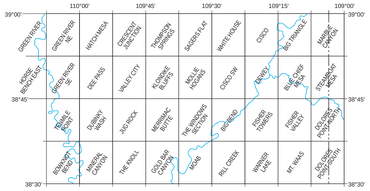
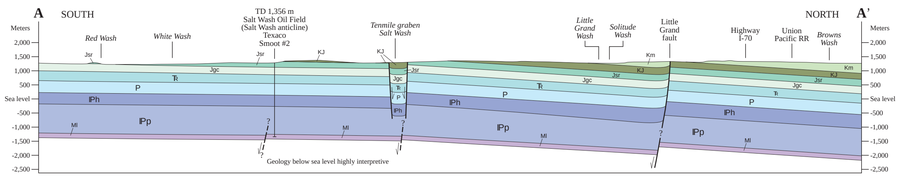
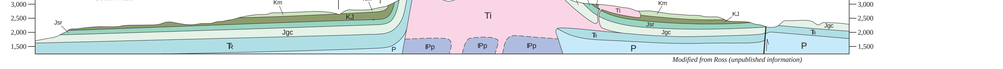


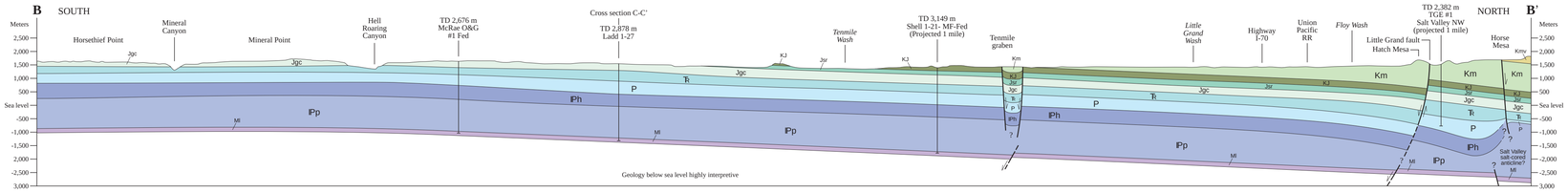
FIGURE 5. U. S. Geological Survey 7.5 minute, 1:24,000-scale topographic map names that cover the map area.

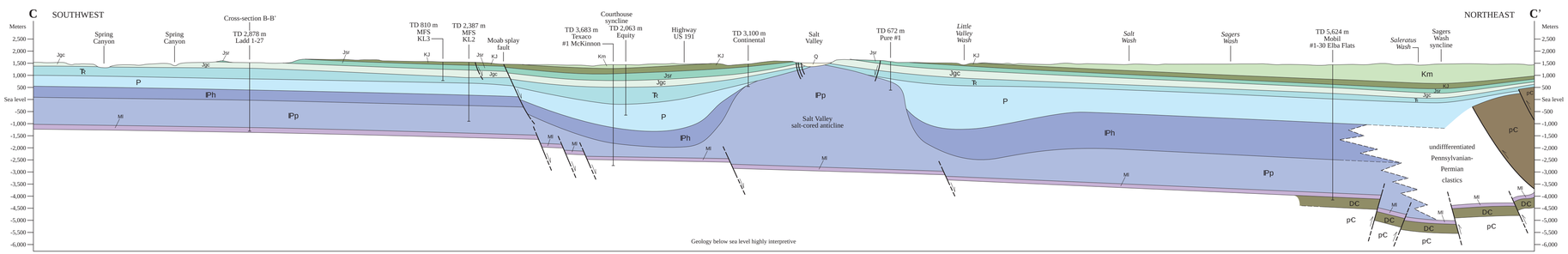
TABLE 1. Wells shown on cross sections.

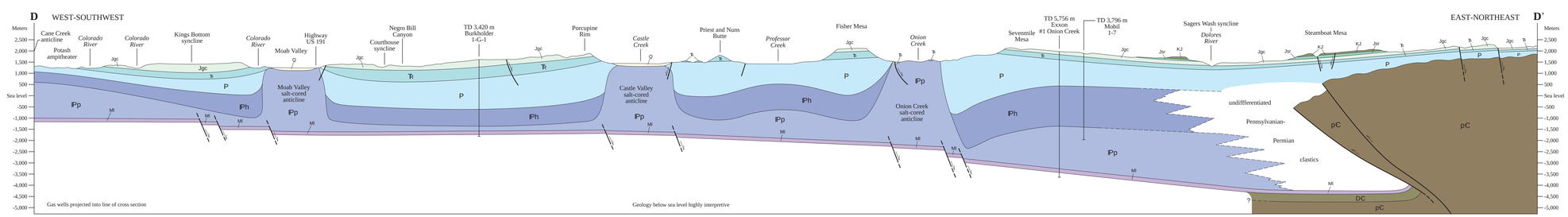
Line	Map and Cross-Section Label	More Complete Designation	Location
A-A'	Texaco Smoot #2	Texaco Inc., No. 2 Government Smoot	NW1/4 SE1/4 section 17, T. 23 S., R. 17 E.
B-B'	McRae O&G #1 Fed	McRae Oil and Gas Corp., No. 1 Federal	SW1/4 SW1/4 section 10, T. 25 S., R. 18 E.
B-B'	Shell 1-21 MF-Fed	Shell Oil, No. 1-21 Mountain Fuel Federal	NW1/4 NW1/4 section 21, T. 23 S., R. 18 E.
B-B'	TGE #1 Salt Valley NW	Texas Gas Exploration, No. 1 Salt Valley NW	SE1/4 NW1/4 section 23, T. 23 S., R. 18 E.
B-B' & C-C'	Ladd 1-27	Ladd Petroleum, No. 1-27 U Federal	SW1/4 NW1/4 section 27, T. 24 S., R. 18 E.
C-C'	MFS KL3	Mountain Fuel Supply Co., No. 3 Klondike	SW1/4 SW1/4 section 31, T. 23 S., R. 19 E.
C-C'	MFS KL2	Mountain Fuel Supply Co., No. 2 Klondike	NE1/4 SE1/4 section 22, T. 24 S., R. 19 E.
C-C'	Texaco #1 McKinnon	Texaco Inc., No. 1 Government McKinnon	SW1/4 SW1/4 section 15, T. 23 S., R. 19 E.
C-C'	Equity	Equity Oil, No. 1 State	NE1/4 SE1/4 section 36, T. 23 S., R. 19 E.
C-C'	Continental	Continental Oil, #1 Govt. Hall-Federal	SW1/4 SW1/4 section 6, T. 23 S., R. 20 E.
C-C'	Pure #1	Pure Oil Co., No. 1 State	SE1/4 NW1/4 section 2, T. 23 S., R. 20 E.
C-C'	Mobil #1-30 Elba Flats	Mobil Oil, No. 1-30 Elba Flats	SW1/4 NE1/4 section 30, T. 21 S., R. 22 E.
D-D'	Burkholder I-G-I	Union Oil of California, No. I-G-I Burkholder	SW1/4 NE1/4 section 1, T. 26 S., R. 22 E.
D-D'	Mobil 1-7	Mobil Oil, No. 1 Federal-Section 7	SW1/4 SE1/4 section 7, T. 24 S., R. 25 E.
D-D'	Exxon #1 Onion Creek	Exxon Corp., No. 1 Onion Creek-Federal	SW1/4 NW1/4 section 18, T. 24 S., R. 25 E.

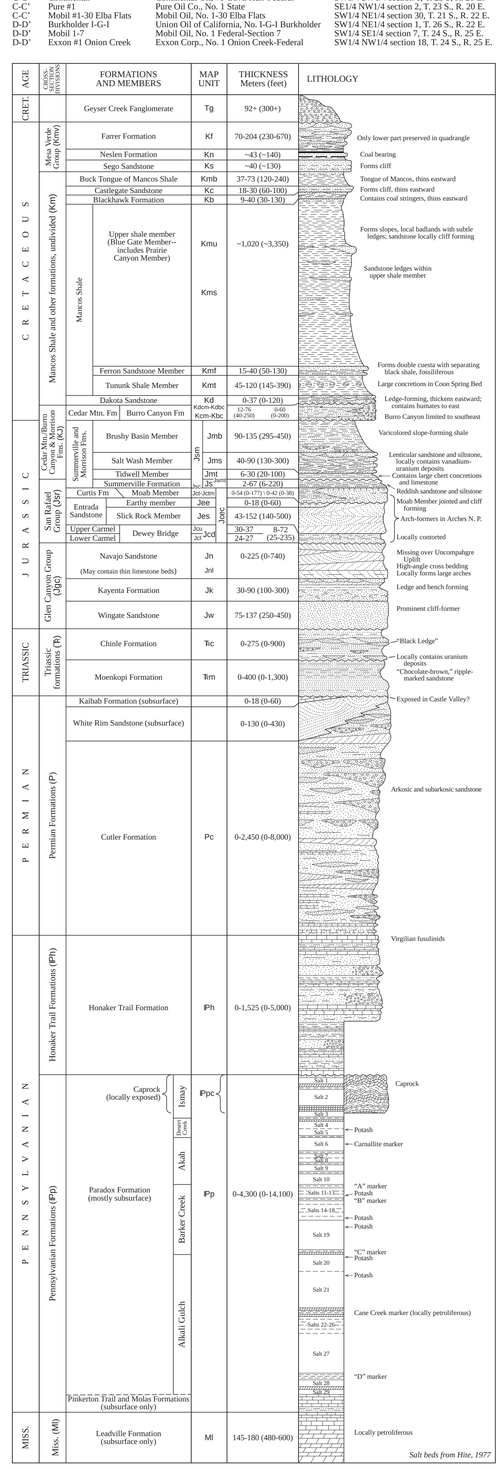












Note: No vertical scale intended. Quaternary, igneous, and Pre-Mississippian rocks are omitted in lithologic column.

Plate 1 cartography by Kelli Bacon, Denise Laes, Kent D. Brown, and James Parker
Plates 2, 3 cartography by James Parker