MAP SHOWING COAL DEPOSITS, OIL AND GAS WELLS AND SEEPS, AND TAR SANDSTONE OCCURRENCES IN THE BASIN AND RANGE PROVINCE

U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 83-549

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By B. T. Brady

U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 83-549

UNITED STATES DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS

For use of readers who prefer to use metric units, conversion factors for terms used in this report are listed below:

Multiply	By	To Obtain
foot (ft)	0.3048	meter (m)
inch (in.)	25.40	millimeter (mm)
British thermal unit per pound (Btu/lb)	2.326	kilojoules per kilogram (kJ/kg)
tons (short)	0.907	metric tons (t)
miles	1.609	kilometers

Introduction

This map report is one of a series of geologic and hydrologic maps for States in the Basin and Range province. The map reports contain detailed information on subjects including ground-water hydrology, ground-water quality, surface distribution of selected rock types, tectonic conditions, areal geophysical data, Pleistocene hydrologic features, and mineral resources that characterize the Basin and Range province. This work is a part of the U.S. Geological Survey's program for geologic and hydrologic evaluation of broad physiographic provinces to identify potentially suitable environments for storage of high-level nuclear waste (Bedinger, Sargent, and Reed, 1983).

This map and companion text were prepared from published, or otherwise publically available information, no proprietary data were used in these compilations. Geologic information, that pertains to the occurrence of resources on Indian lands or local fee lands, was used in its compilation, wherever these data were readily available.

Coal data shown on the map include the location of prospects, mines and principal fields. No attempt was made to determine the extent of coal-bearing strata in the subsurface by using data from coal test holes. Occurrences of coal or potentially coal-bearing rock were plotted outside of the Basin and Range boundary when these areas occur within hydrologic units that are included as part of the project study area. The coal data summaries provide a very general description of the geologic character for each mapped occurrence of coal. No attempt was made to outline the producton history for individual areas, or to tabulate coal quality data.

Oil and gas wells were mapped as producing wells or dry holes. Holes with shows of oil or gas were not mapped separately, because the task of verifying this information is beyond the present scope of the project. Published sources, which describe similar data, are commonly contradictory and frequently not verified. The most recent posting date for wells in each State is as follows:

Arizona	June 1, 1982
California	April 18, 1981
Idaho	January, 1982
Nevada	September 22, 1982
New Mexico	March 10, 1983
Oregon	April 1, 1982
Texas	July 1, 1981
Utah	January, 1982

Oil and gas seeps and tar sandstone occurrences were also plotted as an indication of petroleum or hydrocarbon impregnated rock deposits.

The classification of leasable mineral lands within the public domain was not depicted, because these areas are continually redefined.

Bedinger, M. S., Sargent, K. A., and Reed, J. E., 1983, Geologic and hydrologic characterization and evaluation of the Basin and Range Province relative to the disposal of high-level radioactive waste--Part I, Introduction and guidelines: U.S. Geological Survey Circular 904-A, 67 p.

Summary of selected data for coal fields

Arizona:

Chiricahua Mountains

Location: Cochise County, at the northern end of the Chiricahua Mountains near Cochise Head.

Age: Originally described to be Carboniferous (Dumble, 1902, p. 230); now believed to be Cretaceous (Hayes in Averitt and O'Sullivan, 1969, p. 67).

Rank: No analyses available; coal described as glossy-black graphitic anthracite.

Comments: High ash content, difficult to ignite. Thickness locally exceeds 12 ft.

Selected References:

Averitt, Paul, and O'Sullivan, R. B., 1969, Coal, in Mineral and water resources of Arizona: Arizona Bureau of Mines Bulletin 180, p. 59-69.

Blake, W. P., 1898, Anthracite coal in Arizona: American Geologist, v. 21, p. 345-346.

Dumble, E. T., 1902, A carboniferous coal in Arizona: American Geologist, v. 30, p. 270.

Arizona:

Deer Creek Field

Location: Pinal County (eastern).

Age: Late Cretaceous.

Rank: Bituminous. Coal makes a low-grade coke: ash content is high (18.7-54.4 percent), Campbell (1904, p. 254-256).

Comments: Two principal beds 24 in. to 30 in. thick. Beds of clean coal average 12 in. to 15 in. maximum thickness. Several thin beds. Coal is not laterally extensive.

Selected References:

Averitt, Paul, and O'Sullivan, R.B., 1969, Coal, in Mineral and water resources of Arizona: Arizona Bureau of Mines Bulletin 180, p. 59-69.

Campbell, M.R., 1904, The Deer Creek coal field, Arizona: U.S. Geological Survey Bulletin 225-G, p. 240-258.

Devereaux, W.B., 1881, The Deer Creek coal fields, Arizona: Engineering Mining Journal, v. 32, p. 404-405.

Ross, C.P., 1925, Geology and ore deposits of the Aravaipa and Stanley Mining districts, Graham County, Arizona: U.S. Geological Survey Bulletin 763, 120 p.

Simons, F. S., 1964, Geology of the Klondyke Quadrangle, Graham and Pinal Counties, Arizona: U.S. Geological Survey Professional Paper 461, 173 p.

Walcott, C. D., and Bannon, Michael, 1885, Deer Creek coal field, White Mountain Indian Reservation, Arizona: U.S. 48th Congress, 2d Session, Senate Executive Document 20, p. 2-7.

Willden, Ronald, 1964, Geology of the Christmas Quadrangle, Gila and Pinal Counties, Arizona: U.S. Geological Survey Bulletin 1161-E, 64 p.

Arizona:

Mogollon Rim

Location: Gila County (northwest part), between Fossil Creek Canyon (to northwest) and Canyon Creek (to southwest).

Age: Permian (lower Wolfcampian), 3 "coaly" units occur within a 30 ft section of light gray shales about 600 ft to 800 ft below Fort Apache Member of Supai Formation (McGoon, 1962, p. 89).

Rank: Estimated to be lignite (Ransome, 1916). Bituminous (10,000 Btu/lb.) for oxidized material (McGoon, 1962, p. 89). Likely to be highly variable throughout extent of occurrence.

Comments: Maximum coal bed thickness 15 in. Associated with minor amounts of copper and uranium.

Selected References:

Averitt, Paul, and O'Sullivan, R. B., 1969, Coal, in Mineral and water resources of Arizona: Arizona Bureau of Mines Bulletin 180, p. 59-69.

Gerrard, T. A., 1964, Environmental studies of the Fort Apache Member, Supai Formation (Permian), east-central Arizona: Tucson, Arizona, University of Arizona, Unpublished Ph.D. thesis, 187 p.

McGoon, D. O., Jr., 1962, Occurrences of Paleozoic carbonaceous deposits in the Mogollon Rim region, in Weber, R. H., and Peirce, H. W., eds., Mogollon Rim region, east-central Arizona: Arizona: New Mexico Geological Society Annual Field Conference, 13th, 1962, Guidebook, p. 89-91.

Miller, H. W., Jr., 1962, Cretaceous rocks of the Mogollon Rim area in Arizona, in Weber, R. H., and Peirce, H. W., ed.s, Mogollon Rim region, east-central Arizona: New Mexico Geological Society Annual Field Conference, 13th, 1962, Guidebook, p. 93.

Ransome, F. L., 1916, Some Paleozoic sections in Arizona and their correlation: U.S. Geological Survey Professional Paper 98-K, p. 113-166.

Arizona:

Pinedale Field

Location: Navajo County, extends into northern part of the Fort Apache Indian Reservation.

Age: Cretaceous, Mesaverde Group, Mancos Shale equivalent (Miller, 1966, p. 93).

Rank: Variable. Impure, subbituminous to high-volatile bituminous coal. High sulfur, volatile content. Cooper (1947, p. 32).

Comments: Coals are generally 3 ft to 4 ft thick, and locally very dirty coal may attain 6 ft thickness within a 12 ft thick section of bony coal and carbonaceous materials.

Selected References:

Averitt, Paul, and O'Sullivan, R. B., 1969, Coal, in Mineral and water resources of Arizona: Arizona Bureau of Mines Bulletin 180, p. 59-69.

Cooper, H. M., Snyder, N. H., Abernathy, R. F., Tarpley, E. C., and Swingle, R. J., 1947, Analyses of mine, tipple, and delivered samples, in Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, p. 27-47.

Darton, N. H., 1925, A resume of Arizona geology: Arizona Bureau of Mines Bulletin 119, 298 p.

Finnell, T. L. , 1966, Geologic map of the Cibecue Quadrangle, Navajo County, Arizona: U.S. Geological Survey Geologic Quadrangle Map GQ-545, scale 1:24,000.

Miller, H. W., Jr., 1962, Cretaceous rocks of the Mogollon Rim area in Arizona, in Weber, R. H., and Pierce, H. W., eds., Mogollon Rim region, east-central Arizona: New Mexico Geological Society, Annual Field Conference, 13th, Guidebook, p. 93.

Moore, R. T., 1968, Mineral deposits of the Fort Apache Indian Reservation, Arizona: Arizona Bureau of Mines Bulletin 177, 84 p.

Reagan, A. B., 1911, Coal near Pinedale, Navajo County, Arizona: Science, v. 34, New Series, p. 271-272.

Veatch, A. C., 1911, Coal deposits near Pinedale, Navajo County, Arizona: U.S. Geological Survey Bulletin 431-B, p. 239-243.

Wilson, E. D., Moore, R. T., and O'Haire, R. T., 1960, Geologic map of Navajo and Apache Counties, Arizona: Arizona Bureau of Mines, scale 1:375,000.

Arizona:

Whetstone Mountains

Location: Pima County, southwestern part of Whetstone Mountains (Schrader, 1915).

Age: Early Cretaceous

Rank: Lignite. No analyses available.

Comments: Coal occurs within a 40 ft section of sandstone, shale, and siliceous claystone. Exploratory workings were developed for 1,000 ft along outcrop of 4 in. thick beds. Animal and plant remains, as well as large petrified trees, occur near the coal-bearing rocks.

Selected References:

Schrader, F. C., 1915, Mineral deposits of the Santa Rita and Patagonia Mountains, Arizona with contributions by J. M. Hill: U.S. Geological Survey Bulletin 582, 373 p.

General References Selected for Coal in Arizona

Andrews, D. A., Hendricks, T. A., and Huddle, J. W., 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, p. 4-6.

Averitt, Paul, 1969, Coal resources of the United States, January 1, 1967: U.S. Geological Survey Bulletin 1275, 116 p.

Peirce, H. W., Keith, S. B., and Wilt, J. C., 1970, Coal, oil, natural gas, helium, and uranium in Arizona: Arizona Bureau of Mines Bulletin 182, 289 p.

Pike, W. S., Jr., 1947, Intertonguing marine and non-marine Upper Cretaceous deposits of New Mexico, Arizona, and southwestern Colorado: Geological Society of America Memoir 24, 103 p.

Reagan, A. B., 1925, Late Cretaceous formations of Black Mesa, Arizona: Pan-Am Geologist, v. 44, p. 285-294.

Rubel, A.C., 1916, Coal in Arizona: Arizona Bureau of Mines Bulletin 17, 12 p.

U.S. Bureau of Mines, 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, 83 p.

California:

Colorado Camp Group (Gerbracht Camp, French Deposit, Randsburg Coal).

Location: Kern County, El Paso Mountains, SE1/4 sec. 36, T. 28 S., R. 38 E.

Age: Paleocene and Eocene (lower part of Goler Formation)

Rank: Sandy lignite. No analyses available.

Comments: Four beds of coal 22 in., 26 in., 14 in., and 18 in., were mined from 3 shafts at depths of 60 ft, 100 ft, and 145 ft. Production was limited to 220 tons in 1898.

Selected References:

Boalich, E. S., 1922, Bibliography of coal in California, in Report XVIII of the State Mineralogist: California State Mining Bureau, v. 18, p. 152-157.

California Division of Mines and Geology, 1976, History of coal in California: California Geology, v. 29, no. 9, p. 202-203.

Dibblee, T. W., Jr., 1952, Geology of the Saltdale Quadrangle, Kern County, California: California Division of Mines Bulletin 160, p. 19-25.

Troxel, B. W., and Morton, P. K., 1962, Mines and mineral resources of Kern County, California: California Division of Mines and Geology, County Report 1, 370 p.

General References Selected for Coal in California

Andrews, D. A., Hendricks, T. A., and Huddle, J. W., 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, p. 4-6.

Averitt, Paul, 1969, Coal resources of the United States, January 1, 1967: U.S. Geologial Survey Bulletin 1275, 116 p.

Goodyear, W. A., 1877, The coal mines of the western coast of the United States: San Francisco, California, S. F. Bancroft and Company, 153 p.

Hill, J. H., 1923, Clay deposits of the Alberhill Coal and Clay Company, in Report XIX of the State Mineralogist: California State Mining Bureau, v. 19, no. 4, p. 185-210.

Jennings, C. W., 1957, Coal, in Wright, L. A., ed., Mineral commodities of California: California Division of Mines Bulletin 176, p. 153-164.

Karp, S. F., 1949, California coal: Compass, v. 26, no. 4, p. 341-344.

Moore, G. W., and Stephans, J. G., 1954, Reconnaissance for uranium-bearing carbonaceous rocks in California and adjacent parts of Oregon and Nevada: U.S. Geological Survey Circular 313, p. 5-7.

Smith, G. O., 1900, The Pacific Coals coal fields: U.S. Geological Survey Twenty-second Annual Report, pt. 3, p. 473-513.

Turner, H. W., 1893, The coal deposits of California: U.S. Geological Survey Mineral Resources of the United States, p. 308-310.

U.S. Bureau of Mines, 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, 83 p.

Idaho:

Goose Creek Field

Location: Cassia County Idaho.

Age: Miocene and Pliocene(?), Payette Formation; Miocene and Pliocene, Salt Lake Formation.

Rank: Lignite.

Comments: Lignite has been mined in small quantities for local use from both formations. High ash content. Some uranium mineralization occurs locally in lignite (Idaho, T. 16 S., R. 21 E.) along the flanks and trough of a shallow syncline.

Selected References:

Bowen, C. F., 1913, Lignite in the Goose Creek district, Cassia County, Idaho: U.S. Geological Survey Bulletin 531-H, p. 252-262.

Breckenridge, R. M., Bennett, E. H., and Harbour, J. L., 1980, Energy resources of Idaho: Idaho Bureau of Mines and Geology, Map 3, scale 1:1,000,000.

Doelling, H. H., and Graham, R. L., 1972, Southwestern Utah coal fields--Alton Kaiparowits Plateau and Kolob-Harmony: Utah Geological and Mineralogical Survey, Monograph Series, no. 1, 333 p.

Mapel, W. J., and Hail, W. J., Jr., 1956, Tertiary stratigraphy of the Goose Creek district, Cassia County, Idaho, and adjacent parts of Utah and Nevada, in Geology parts of northwestern Utah: Utah Geological Society Guidebook 11, p. 1-16.

---- 1959, Tertiary geology of the Goose Creek district, Cassia County, Idaho, Box Elder County, Utah, and Idaho County, Nevada: U.S. Geological Survey Bulletin 1055-H, p. 217-254.

Stokes, W. L., 1962, Geologic map of Utah, northwest quarter: Idaho State Land Board, scale 1:250,000.

Idaho:

Willow Creek-Caribou District

Location: Bingham, Bonneville Counties.

Age: Early Cretaceous; Bear River and Wayan Formation.

Rank: Lignite.

Comments: Carbonaceous shale and lenticular units of lignite occur as thin beds, that range in thickness from a few inches to more than 7 ft. Coals are very high in ash and moisture content. Exploration in the area occurred during the early 1900's. The Cloward, Brimson [Miller mine of Schultz (1918)], and Croley mines were adits that were driven for short distances to explore carbonaceous and lignitic shales. Thickest coal encountered in any of these prospects was about 1 ft. No production has been recorded from any of these mines.

Selected References:

Breckenridge, R. M., Bennett, E. H., and Harbour, J. L., 1980, Energy resources of Idaho: Idaho Bureau of Mines and Geology, Map 3, scale 1:1,000,000.

Mansfield, G. R., 1921, Coal in eastern Idaho: U.S. Geological Survey Bulletin 716-F, p. 123-153.

Pampeyan, E. H., Schroeder, M. L., Schnell, E. M., and Cressman, E. R., 1967, Geologic map of the Driggs Quadrangle, Bonneville and Teton Counties, Idaho and Teton County, Wyoming: U.S. Geological Survey Mineral Investigations Map MF-300, scale 1:31,680.

Vine, J. D., and Moore, G. W., 1952, Uranium-bearing coal and carbonaceous rocks in the Fall Creek area, Bonneville County, Idaho: U.S. Geological Survey Circular 212, 10 p.

---- 1959, Geology and uranium deposits in carbonaceous rocks of the Fall Creek area, Bonneville County, Idaho: U.S. Geological Survey Bulletin 1055-I, p. 255-294.

General References Selected for Coal in Idaho

Andrews, D. A., Hendricks, T. A., and Huddle, J. W., 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, p. 4-6.

Averitt, Paul, 1969, Coal resources of the United States, January 1, 1967: U.S. Geological Survey Bulletin 1275, 116 p.

Breckenridge, R. M., Bennett, E. H., and Harbour, J. L., 1980, Energy resources of Idaho: Idaho Bureau of Mines and Geology, Map 3, scale 1:1,000,000.

Ross, C. P., The metal and coal mining districts of Idaho with notes on the nonmetallic mineral resources of the state: Idaho Bureau of Mines and Geology, Pamphlet 457, 263 p.

Schultz, A. Z., 1918, A geologic reconnaissance for phosphate and coal in southwestern Idaho and western Wyoming: U.S. Geological Survey Bulletin 680, 84 p.

Staley, W. W., 1945, Coal in Idaho: Idaho Bureau of Mines and Geology, Mineral Resources Report no. 1, 3 p.

Storrs, L. S., 1902, The Rocky Mountain coal fields: U.S. Geological Survey Twenty-second Annual Report 1900-1901, pt. 3-j, p. 415-471.

U.S. Bureau of Mines, 1947, Analyses of Arizona, California, Idaho, Nevada, and Oregon coals: U.S. Bureau of Mines Technical Paper 696, 83 p.

Nevada:

Bald Mountain

Location: Humboldt County, southern end of the Humboldt Range.

Age: Mississippian; Diamond Peak Formation.

Rank: Subbituminous; high ash and volatile content.

Comments: Coal bed thickness is generally between 2 to 7 in. Workings are limited to a single adit about 160 ft deep. Mississippian outcrops in the vicinity of Bald Mountain are limited in areal extent to a few square miles. No resource or production information is currently available for coal at Bald Mountain.

Selected References:

Hose, R. K., Blake, M. C., and Smith, R. M., 1976, Geology and mineral resources of White Pine County: Nevada Bureau of Mines and Geology Bulletin 85, 105 p.

Nevada:

Carlin

Location: Elko County, south side of the Humboldt River, 2.5 miles east of Carlin. T. 33 N., R. 53 E., section 13.

Age: Tertiary.

Rank: Not available.

Comments: The Humboldt Coal Company was formed in 1870 to develop this property. A short adit was driven 15 ft below the surface into the river bank. No production is reported from the area.

Selected References:

Lee, W. T., Stone, R. W., Gale, H. S., and others, 1915, Guidebook of the western United States, Part B, the Overland Route: U.S. Geological Survey Bulletin 612, 244 p.

Mining and Scientific Press, 1873,Nevada coal: Nevada State Journal, v. 4, no. 51, p. n/a.

Smith, J. F., Jr., and Ketner, K. B., 1976, Stratigraphy of Post Paleozoic rocks and summary of resources in the Carlin-Pinyon Range area, Nevada: U.S. Geological Survey Professional Paper 867-B, 48 p.

Smith, R. M., 1976, Mineral resources of Elko County, Nevada: U.S. Geological Survey Open-File Report 76-56, 194 p.

Storrs, L. S., 1910, The Rocky Mountain coal fields: U.S. Geological Survey Twenty-second Annual Report, pt. 3, Coal, oil, cement, p. 415-471.

Nevada:

Cherry Creek

Location: White Pine County, southern end of the Cherry Creek Range, NE1/4 section 24, T. 25 N., R. 62 E.

Age: Mississippian.

Rank: High-volatile C bituminous.

Comments: Limited workings in single adit. No resource or production information is presently available.

Selected References:

Poole, F. G., 1982, U.S. Geological Survey, Oral communication.

Nevada:

Coal Creek

Location: Washoe County, Pah Rah Range.

Age: Tertiary.

Rank: Lignite.

Comments: A single coal bed, which is 4 ft thick, is reported to occur 30 ft below the surface. This coal is associated with carbonaceous shale, and the coal-bearing strata is overlain by ash-flow tuffs.

Selected References:

Moore, J. G., and Archbold, N. L., 1969, Geology and mineral resources of Lyon, Douglas, and Ormsby Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 75, p. 40-41.

Nevada State Journal, 1875, Vein of coal southeast of Carson Sink, Nevada: Nevada State Journal, v. 3, no. 12, p. n/a.

Nevada:

Coaldale Field

Location: Esmeralda County.

Age: Tertiary.

Rank: Bituminous. High percentage of ash, sulfur, and volatile matter.

Comments: Thin coals are associated with volcanic ash, bentonite and shale. Coal beds are usually between 3 ft and 7 ft thick, and occur at 4 horizons in moderately inclined, extensively fractured and faulted rocks. Production was very limited.

Selected References:

Duncan, D. C., 1952, Preliminary report on a uranium-bearing rhyolitic tuff deposit near Coaldale, Esmeralda County, Nevada: U.S. Geological Survey Trace Element Memorandum Report 336, p. 7.

Ferguson, H. G., Muller, S. W., and Cathcart, S. H., 1953, Geologic map of the Coaldale Quadrangle, Nevada: U.S. Geological Survey Geologic Quadrangle Map GQ-23, scale 1:24,000.

Hance, J. H., 1913, The Coaldale coal field, Esmeralda County, Nevada: U.S. Geological Survey Bulletin 531-K, p. 313-322.

Hutchings, W., 1862, Pioneer Company's coal mine: Mining and Scientific Press, v. 5, no. 3, p. 1.

Johnson, V. H., and Robeck, R. C., 1944, Geology of the Coaldale mining district, Esmeralda County, Nevada: U.S. Geological Survey Files, unpublished manuscript and maps, p. n/a.

Knapp, M. A., 1873, The coal fields of Esmeralda County, Nevada: Mining and Scientific Press, v. 74, no. 7, p. 133.

---- 1897, The coal fields of Esmeralda County Nevada: Mining and Scientific Press, v. 54, no. 7, p. 133.

Mining and Scientific Press, 1913, Nevada coal from Coaldale, Esmeralda County, Nevada: Mining and Scientific Press, v. 106, no. 8, p. 325.

Spurr, J. E., 1904, Coal deposits between Silver Peak and Candelaria, Esmeralda County, Nevada: U.S. Geological Survey Bulletin 225-G, p. 289-292.

Nevada:

Coaldale Field

References: (continued)

Toenges, A. L., Turnbull, L. A., Schopf, J. M., Yancy, H. F., Johnson, K. A., Geer, M. R., and Newman, L. L., 1946, Exploration, composition, and washing, burning, and gas-producer tests of a coal occurring near Coaldale, Esmeralda County, Nevada: U.S. Bureau of Mines Technical Paper 687, 79 p.

Turner, H. W., 1900, The Esmeralda Formation, a fresh-water lake deposit, with a description of the fossil plants by F. H. Knowlton, and of a fossil fish, by F. R. Lucas: U.S. Geological Survey Twenty-first Annual Report, 1899-1900, pt. 2, p. 191-226.

Nevada:

Easton Coal Mining district (Buckland's Station)

Location: Churchill County, 1.5 miles south of Fort Churchill.

Age: Tertiary.

Comments: This occurrence is mentioned in a newspaper article. No information for the rank or mode of occurrence of this reported coal is available in the original description.

Selected References:

Mining and Scientific Press, 1862, Nevada Territory (coal): Mining and Scientific Press, v. 5, no. 9, p. 5.

Nevada:

Eldorado Canyon Mine

Location: Carson City area. Southeast of Dayton, section 6, T. 14 N., R. 22 E.

Age: Tertiary, Miocene.

Rank: Lignite.

Comments: Coal beds are asssociated with claystones, tuffs, and andesites. The property has been developed by 2 shafts. No production data have been published to date.

Selected References:

Carson Tribune, 1875, Coal: Mining and Scientific Press, v. 3, no. 51, p. n/a.

Gold Hill News, 1874, Black Diamond coal mine: Mining and Scientific Press, v. 29, no. 8, p. 122.

---- 1874, Nevada coal: Mining and Scientific Press, v. 29, no. 6, p. 86.

---- 1875, Coal in Nevada: Mining and Scientific Press, v. 30, no. 19, p. 302.

Mining and Scientific Press, 1862, Coal at Virginia City, Nevada: Mining and Scientific Press, v. 5, no. 11, p. 5.

---- 1862, Coal fields 12 miles southeast of Virginia City, Nevada: Mining and Scientific Press, v. 4, no. 20, p. 5.

---- 1862, Coal mine in Carson Valley, Nevada: Mining and Scientific Press, v. 4, no. 8, p. 4.

---- 1862, Dayton coal deposit: Mining and Scientific Press, v. 4, no. 11, p. 8.

---- 1862, Dayton, Lyon County, coal deposit: Mining and Scientific Press, v. 5, no. 11, p. 3.

---- 1862, El Dorado Canyon coal deposit: Mining and Scientific Press, v. 5, no. 14, p. 5.

---- 1862, Mining claims in the Whitman coal field, Lyon County, Nevada: Mining and Scientific Press, v. 4, no. 23, p. 1.

---- 1862, Pioneer Coal Company: Mining and Scientific Press, v. 5, no. 6, p. 5.

Nevada:

Eldorado Canyon Mine

References: (continued)

---- 1862, Silver City, Nevada coal for fuel: Mining and Scientific Press, v. 4, no. 15, p. 5.

Territorial Enterprise, 1862, Coal localities in Nevada: Mining and Scientific Press, v. 5, no. 16, p. 5.

---- 1862, Nevada Territory coal mines: Mining and Scientific Press, v. 5, no. 12, p. 5.

---- 1873, Washoe Coal: Mining and Scientific Press, v. 27, no. 8, p. 122.

---- 1874, The Washoe Coal Mine: Mining and Scientific Press, v. 28, no. 21, p. 330.

---- 1874, Virginia City Coal Company: Mining and Scientific Press, v. 29, no. 8, p. 374.

---- 1875, A wonderful coal discovery near Dayton, Nevada: Mining and Scientific Press, v. 30, no. 10, p. 150.

Thompson, T. H., and West, A. H., 1881, History of Nevada: Berkeley, California, Howell-North Books, 664 p.

Virginia Chronicle, 1875, Nevada Coal Mines: mining and Scientific Press, v. 30, no. 5, p. 70.

Virginia Enterprise, 1874, A singular geological freak: Mining and Scientific Press, v. 29, no. 9, p. 134.

---- 1874, The El Dorado Canyon coal mines: Mining and Scientific Press, v. 29, no. 14, p. 214.

Virginia Independent, 1874, A valuable coal mine: Mining and Scientific Press, v. 29, no. 8, p. 114.

Whitman, G. W., 1862, Coal beds in Washoe County, Nevada: Mining and Scientific Press, v. 4, no. 4, p. 5.

Nevada:

Elko

Location: Elko County, NW1/4 NE1/4 section 27, T. 34 N., R. 55 E.

Age: Tertiary.

Rank: Lignite.

Comments: A thin coal bed, which is 0.5 ft thick, is associated with an oil shale sequence in the Eocene and Oligocene(?) Elko Formation. Coal-bearing strata are overlain by a thick tuff unit.

Selected References:

Schilling, J. H., 1980, A preliminary first stage study of Nevada coal resources: Nevada Bureau of Mines and Geology Open-File Report 80-05, 73 p.

Solomon, B. J., and Moore, S. W., 1982, Geologic map and oil shale deposits of the Elko West Quadrangle, Elko County, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1410, 1 sheet, scale 1:24,000.

Nevada:

Gamma Prospects (Gamma No. 1, Gamma No. 2)

Location: Churchill County, west side of the Desatoya Mountains, T. 16 N., R. 37 E.

Age: Tertiary.

Rank: Lignite; very high ash content, which ranges from 59 to 75 percent.

Comments: Coal-bearing strata generally strike east and dip north from 2 to 21 degrees. Folding and faulting are not common in the area. The coals are associated with claystones and sandstones, and extend laterally along the outcrop for 1285 ft. There are five thin beds exposed near the base of the sedimentary section. Thicknesses for these lignite beds from top to bottom are: 0.3 ft, 0.1 ft, 0.6 ft, 0.1 ft, and 3.5 ft. The thickest coal bed is associated with varying amounts of uranium.

Selected References:

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Smedman, Gunilla, 1969, An investigation of the diatoms from four Tertiary lake bed deposits in western Nevada: University of California, Museum of Paleontology, Berkeley, California, Paleobios, no. 9, 16 p.

Nevada:

Goose Creek Field

Location: Elko County, Nevada.

Age: Miocene and Pliocene(?); Payette Formation; Miocene and Pliocene; Salt Lake Formation.

Rank: Lignite.

Comments: Lignite has been mined in small quantities for local use from both formations. High ash content. Some uranium mineralization occurs locally in lignite (Idaho, T. 16 S., R. 21 E.) along the flanks and trough of a shallow syncline.

Selected References:

Bowen, C. F., 1913, Lignite in the Goose Creek district, Cassia County, Idaho: U.S. Geological Survey Bulletin 531-H, p. 252-262.

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Stokes, W. L., 1962, Geologic map of Utah, northwest quarter: Idaho State Land Board, scale 1:250,000.

Nevada:

Lewis Coal Mine

Location: Lyon County; Coal Valley south of Yerrington, and 18 miles north of Aurora. Section 36, T. 8 N., R. 27 E., and section 1, T. 7 N., R. 27 E.

Age: Tertiary.

Rank: Subbituminous. Ash content averages 16 percent, moisture 14 percent, and volatile hydrocarbons 30 percent.

Comments: Coal beds vary from 3 ft to 8 ft thick. The Nevada Coal and Oil Company developed the property with 2 adits 700 ft and 900 ft long, and an inclined shaft 400 ft deep. No coal production data are available at present.

Selected References:

Anonymous, 1862, Coal on the Walker River, Nevada: Mining and Scientific Press, v. 5, no. 5, p. 2.

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Mining and Scientific Press, 1862, Nevada Territory, Walker River coal: Mining and Scientific Press, v. 5, no. 15, p. 5.

Papke, K. J., 1965, Coal deposits in Washington district, Lyon County, Nevada: Reno, Nevada, University of Nevada, K. J. Papke Unpublished Report, Nevada Bureau of Mines and Geology, p. n/a.

Nevada:

Pahranagat

Location: Lincoln County; 15 miles from Hiko.

Rank: No data available. Originally described as anthracite. Ash residue less than 3 percent after burning in a muffle furnace.

Comments: Surface exposure of 15 ft thick bed mentioned in original description. No additional information is currently available.

Selected References:

Mining and Scientific Press, 1862, Formation of a new coal company: Mining and Scientific Press, v. 4, no. 24, p. 4 and p. 8.

---- 1867, Coal in Pahranagat: Mining and Scientific Press, v. 15, no. 8, p. 123.

---- 1869, Coal on the Pacific Railroad, Nevada: Mining and Scientific Press, v. 17, no. 7, p. 97.

Nevada:

Palisade

Location: Eureka County; T. 32 N., R. 51 E, section 25.

Age: Tertiary.

Rank: Not available; possibly lignite.

Comments: The area was explored by a 30 ft shaft and a drift 175 ft long. No information pertaining to the extent, quality, or production of coal is available.

Selected References:

Eureka Sentinel, 1877, The Palisade coal vein: Mining and Scientific Press, v. 34, no. 26, p. 410.

Eureka Sentinel, 1878, Palisade Coal Company: Engineering and Mining Journal, v. 25, no. 13, p. 223.

Nevada:

Pancake Coal Mine

Location: Western White Pine County.

Age: Mississippian.

Rank: No analyses available; probably bituminous.

Comments: Thin coals, generally 10 to 18 inches thick crop out for 150 ft along strike. The maximum thickness of coal is reported to be 5 ft. Coal and the enclosing strata are fractured and displaced by faulting. Some mining has occurred; however, no production information is available at present.

Selected References:

Brown, A. J., 1874, Carboniferous coal in Nevada: Engineering and Mining Journal, v. 18, no. 1, p. 2-3.

Ely Daily Times, 1976, Coal deposit reinvestigated: Ely, Nevada, Ely Daily Times, October 1, 1976.

Emersley, J. D., 1875, Pancake coal mine: Engineering and Mining Journal, v. 19, no. 10, p. 150.

Hague, Arnold, 1892, Geology of the Eureka district, Nevada: U.S. Geological Survey Monograph 20, p. 95-98.

Hose, R. K., Blake, M. C., and Smith, R. M., 1976, Geology and mineral resources of White Pine County: Nevada Bureau of Mines and Geology Bulletin 85, 105 p.

Nevada State Journal, 1873, Coal prospects at Pancake Mountain: Nevada State Journal, v. 3, no. 37.

---- 1873, Coal vein near Eureka, Nevada: Nevada State Journal, v. 3, no. 34.

---- 1873, Pancake coal mine: Nevada State Journal, v. 3, no. 44.

---- 1875, Coal discovery, Pyramid Lake area: Nevada State Journal, v. 3, no. 136.

White Pine News, 1874, Pancake coal mine: Nevada State Journal, v. 62, no. 1.

Nevada:

Table Mountain

Location: Not known.

Age: Tertiary.

Rank: Lignite.

Comments: Coal has been reported from the vicinity of Table Mountain. No surface exposures or evidence of any workings are apparent; however, coal may be present in small amounts in the local Tertiary sediments.

Selected References:

Schrader, F. C., 1947, Carson Sink area, Nevada: U.S. Geological Survey unpublished report, p. 332-333.

Nevada:

Verdi

Location: Washoe County, T. 19 N., R. 18 E., section 9.

Age: Tertiary.

Rank: Lignite. High in ash content and volatile matter.

Comments: The property was explored by the Nevada Carbon Company in the early 1940's. No data are available for coal resources or production.

Selected References:

Anonymous, 1865, Explorations of coal at Crystal Peak, Nevada: Mining and Scientific Press, v. 11, no. 16, p. 242.

Bonham, H. F., and Papke, K. G., 1970, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 70, p. 115.

Engineering and Mining Journal, 1855, Coal discovered at Verdi: Engineering and Mining Journal, v. 40, no. 22, p. 373.

Nevada:

Wilson District (Pine Grove District)

Location: Lyon County, 2 miles from Pine Grove.

Age: Late Miocene to Middle Pliocene; Coal Valley Formation.

Rank: Lignite.

Comments: Coal with numerous claystone partings is associated with shale near Pine Grove.

The thin beds, which are between 6 in. and 2 ft thick, crop out for 100 ft, and there is no evidence of any workings.

Selected References:

Territorial Enterprise, 1867, Important coal discovery, Pine Grove, Wilson district, Nedvada: Mining and Scientific Press, v. 15, no. 19, p. 299.

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Duncan, D. C., 1952, Preliminary report on a uranium-bearing rhyolitic tuff deposit near Coaldale, Esmeralda County, Nevada: U.S. Geological Survey Trace Element Memorandum Report 336, p. 7.

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---- 1862, Chinatown coal beds: Mining and Scientific Press, v. 4, no. 2, p. 5.

---- 1862, Coal at Virginia City, Nevada: Mining and Scientific Press, v. 5, no. 11, p. 5.

---- 1862, Coal fields 12 miles southeast of Virginia City, Nevada: Mining and Scientific Press, v. 4, no. 20, p. 5.

---- 1862, Coal in Humboldt: Mining and Scientific Press, v. 4, no. 8, p. 5.

---- 1862, Coal mine in Carson Valley, Nevada: Mining and Scientific Press, v. 4, no. 8, p. 4.

---- 1862, Dayton coal deposit: Mining and Scientific Press, v. 4, no. 11, p. 8.

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---- 1862, El Dorado Canyon coal deposit: Mining and Scientific Press, v. 5, no. 14, p. 5.

---- 1862, El Dorado Canyon coal discovery: Mining and Scientific Press, v. 5, no. 20, p. 5.

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---- 1862, Pioneer Coal Company: Mining and Scientific Press, v. 5, no. 6, p. 5.

---- 1862, Silver City, Nevada coal for fuel: Mining and Scientific Press, v. 4, no. 15, p. 5.

---- 1865, Coal in Reese River country: Mining and Scientific Press, v. 11, no. 23, p. 354.

---- 1867, Coal in Pahranagat: Mining and Scientific Press, v. 15, no. 8, p. 123.

---- 1868, Discovery of coal on the Humboldt: Mining and Scientific Press, v. 17, no. 20, p. 314.

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---- 1873, Proposed mining legislation, Nevada: Mining and Scientific Press, v. 26, no. 6, p. 88.

---- 1897, Coal discovery near White Horse district, Washoe County, Nevada: Mining and Scientific Press, v. 74, no. 11, p. 211.

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---- 1873, Coal vein near Eureka, Nevada: Nevada State Journal, v. 3, no. 34, p. n/a.

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---- 1902, Coal: in U.S Geological Survey Mineral Resources, of the United States, 1901, p. 279-449.

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Smith, R. M., 1976, Mineral Resources of Elko County, Nevada: U.S. Geological Survey Open-file Report 76-56, 194 p.

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---- 1862, Nevada Territory coal mines: Mining and Scientific Press, v. 5, no. 12, p. 5.

---- 1867, Important coal discovery, Pine Grove, Wilson district, Nevada: Mining and Scientific Press, v. 15, no. 19, p. 299.

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Virginia Independent, 1874, A valuable coal mine: Mining and Scientific Press, v. 29, no. 8, p. 114.

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Whitman, G. W., 1862, Coal beds in Washoe County, Nevada: Mining and Scientific Press, v. 4, no. 4, p. 5.

Winnemucca Silver State, 1876, Nevada coal discovery: Engineering and Mining Journal, v. 22, p. 413.

Mexico:

Carthage Field

Location: East-central Socorro County.

Age: Late Cretaceous; Mesaverde Formation.

Rank: High-volatile C bituminous. This coal makes an excellent coke, and was used by New Mexico smelters during the late 1800's and early 1900's.

Comments: Two coal beds occur in the lower 100 ft of the Mesaverde Formation. The Carthage coal bed, which occurs 40 to 60 ft above the base of the Mesaverde, attains a maximum thickness of 6 ft, and was mined from 1861 through the mid 1950's.

The coal-bearing strata occurs along an extensively faulted nose of a south plunging anticline. Fault-bounded blocks are uplifted, and internally fractured.

Structure controls, mining which is limited to single-fault blocks.

Most easily mined coal has been removed. Additional resources possible, east and south of mined-out areas.

Selected References:

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New Mexico:

Cerrillos Field

Location: South-central Santa Fe County.

Age: Late Cretaceous; Mesaverde Formation.

Rank: Variable; primarily bituminous. Range is from bituminous to anthracite. Most bituminous coal is non-agglomerating: however, some coking coal has been mined.

Comments: The three principal beds that have been mined in the area are, from oldest to youngest: Miller Gulch, Cook and White, and White Ash coal beds. The last two beds were the principal mining targets near Madrid.

The area is structurally complex. Faults, sills and dike swarms are common. The White Ash coal bed has been metamorphosed to anthracite near intrusives. Coal, which was produced from more than 30 mines during the period 1888-1957, was shipped throughout the central and western U.S.

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New Mexico:

Datil Mountain Field

Location: Valencia, Socorro, and Catron Counties.

Age: Late Cretaceous. Gallup Sandstone, and Crevasse Canyon Formation. Lower part of Mesaverde Group.

Rank: Primarily subbituminous; locally bituminous.

Comments: Coal and carbonaceous shale occur at several stratigraphic horizons. Most coal is very thin, and single coal beds rarely exceed 3 ft in thickness. Locally coal may be 5 ft thick. The area is characterized by a synclinal stucture, which has been subjected to folding, faulting, and igneous intrusion. A thick sequence of volcanic rocks covers the coal-bearing rocks toward the south.

Access to the area is very difficult, and little coal has been mined.

Selected References:

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New Mexico:

Engle Field

Location: Central Sierra County.

Age: Cretaceous; lower part of the Mesaverde Group.

Rank: Subbituminous.

Comments: Thin coal beds, that are associated with carbonaceous shales crop out along the western edge of the Jornada del Muerto syncline. Coal-bearing strata dip steeply eastward along the eastern side of the Fra Cristobal and Caballo Mountains. Dips flatten eastward toward the central part of the valley. Coal is generally less than 5 ft thick.

The first shaft in the area was sunk in 1905; 3 mines operated briefly during the height of development. The coal was used by miners near Palomas Gap to reduce metallic ores.

Selected References:

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Lee, W. T., 1906, The Engle coal field, New Mexico: U.S. Geological Survey Bulletin 285-F, p. 240.

Tabet, D. E., 1980, Summary of the geology of the Engle coal field: New Mexico Bureau of Mines and Mineral Resources Open-File Report 115, 9 p.

New Mexico:

Hagen Field (Una del Gato)

Location: South-central Sandoval County.

Age: Late Cretaceous; Mesaverde Formation.

Rank: High-volatile C bituminous.

Comments: Development is limited because of very common faulting and abundant intrusions along the coal-bearing homoclinal structure. The maximum coal bed thickness is 5 ft, however, most beds are less than 4 ft thick.

Four small underground mines operated between 1900 and 1939. Production ceased because of transportation problems and difficult mining conditions.

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Keyes, C. R., 1904, The Hagen coal field, Sandoval County, New Mexico: Engineering and Mineral Journal, v. 78, no. 17, p. 670-671.

Jornada del Muerto Field

Location: Eastern Socorro County.

Age: Late Cretaceous; Mesaverde Formation.

Rank: High-volatile C bituminous. Coal from the Law mine makes a poor to fair coke.

Comments: Coal-bearing strata occur along the western limb of the Prairie Springs anticline. Coal beds are lenticular, and are commonly less than 3 ft thick. The southern part of the field is covered by gravel and wind-blown sand. There is no recorded production.

Selected References:

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Kottlowski, F. E., and Beaumont, E. C., 1965, Coal: New Mexico Bureau of Mines and Mineral Resources Bulletin 87, p. 100-116.

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Reynolds, D. A., Davis, J. D., Brewer, R. E., Ode, W. H., Wolfson, D. E., and Birge, G. W., 1946, Carbonizing properties of western coals: U.S. Bureau of Mines Technical Paper 692, 79 p.

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Wilpolt, R. H., and Wanek, A. A., 1951, Geology of the region from Socorro and San Antonio east of Chupadera Mesa, Socorro County, New Mexico: U.S. Geological Survey Oil and Gas Investigations Map, OM 121.

New Mexico:

Pecos River (Gould and Thomas, El Porvenir, Cowles Mines). The majority of these occurrences are immediately adjacent to the Basin and Range study area.

Location: Santa Fe, San Miguel Counties.

Age: Pennsylvanian.

Rank: Bituminous (?).

Comments: Isolated occurrences of bituminous coals, which are generally less than 40 in. thick, occur in the Lower and Middle Pennsylvanian La Pasada Formation east of Santa Fe. These coals were explored by three short drifts called the Gould and Thomas, (section 5, T. 16 N., R. 12 E.) El Porvenir, (sections 12 and 13, T. 17 N., R. 14 E.) and Cowles mines, (section 28, T. 18 N., R. 12 E.). Data for these coals is scarce and no resource information is currently available.

Selected References:

Gardner, J. H., 1910, Carboniferous coal in New Mexico: Mines and Minerals, v. 30, p. 570-571.

_____1910, Isolated coal fields in Santa Fe and San Miguel Counties, New Mexico: U.S. Geological Survey Bulletin 381, p. 447-451.

ew Mexico:

Rio Puerco Field

Location: Bernallilo, Sandoval, and Valencia Counties.

Age: Cretaceous; Gibson Coal Member of the Crevasse Canyon Formation; Menefee Formation; and an undivided Gibson-Menefee unit.

Rank: High-volatile C bituminous.

Comments: The coal field lies west of the Rio Grande depression within the Rio Puerco fault zone. The few faults in the area are usually short, trend northeast, and dip between 45 degrees to 85 degrees westward.

Coal beds are lenticular, and the stratigraphic units, which contain the most coal, are the Menefee Formation and the middle to upper part of the Gibson Coal Member of the Crevasse Canyon Formation. Coals commonly vary from 1 to 3 ft in thickness; however, locally one bed attains a maximum thickness of 12 ft Coal has been produced in small amounts from a few mines for local consumption.

Selected References:

Bryan, Kirk, and McCann, F. T., 1937, The Ceja del Rio Puerco: A border feature of the Basin and Range Province in New Mexico, part 1, Stratigraphy and structure: Journal of Geology, v. 45, no. 8, p. 801-828.

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Hemphill, W. R., 1959, Photogeologic map of the Bernalillo-3 Quadrangle, Bernalillo and Sandoval Counties, New Mexico: U.S. Geological Survey, unpublished map.

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New Mexico:

Rio Puerco Field

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Maxwell, C. H., and Hibpshman, M. H., 1977, Status of mineral resource information for the Canoncito Indian Reservation, New Mexico: Administrative Report of the U.S. Geological Survey to the Bureau of Indian Affairs, 28 p.

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---- 1963, Geologic map of the Mesa Gigante Quadrangle, New Mexico: U.S. Geological Survey Geologic Quadrangle Map GQ-212, scale 1:24,000.

Moench, R. H., and Schlee, J. S., 1967, Geology and uranium deposits of the Laguna district, New Mexico: U.S. Geological Survey Professional Paper 519, 117 p.

Olson, A. B., 1982, Cretaceous formations and coal resources on the Canoncito Indian Reservation in Bernalillo, Sandoval, and Valencia Counties, New Mexico: U.S. Geological Survey Administrative Report, 42 p.

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New Mexico:

Rio Puerco Field

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New Mexico:

Santa Fe

Location: Northeast of Santa Fe, SE1/4, SW1/4, sec. 9, T. 17 N., R. 10 E. This area is just outside of the study area boundary.

Age: Pennsylvanian, upper clastic part of the Sandia Formation of the Magdalena Group.

Rank: Subbituminous. Coal is impure, contains much bone, and carbonaceous shale is also present.

Comments: Kottlowski (in Spiegel and Baldwin, 1963, p. 83) estimated several hundred tons of coal and carbonaceous shale were mined from limited underground workings in the SE1/4 SW1/4 sec. 9, T. 17 N., R. 10 E. The lenticular coal attains a maximum thickness of 5 ft, and dips 44 degrees east. This coal occurrence occupies the same stratigraphic position as coal beds, which occur nearby along the banks of the Pecos River.

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New Mexico:

Sierra Blanca Field

Location: Southwest Lincoln and northern Otero Counties.

Age: Late Cretaceous; Mesaverde Formation.

Rank: Variable; principally bituminous.

Comments: Coal beds from 2 ft to 7 ft thick were mined from several mines between 1885 and 1939. Production declined substantially after 1910. Faulting and intrusions, which are common in the area, have limited development.

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U.S. Geological Survey, 1913, Miscellaneous analyses of coal samples from various fields of the United States: U.S. Geological Survey Bulletin 531-M, p. 331-355.

Wegemann, C. H., 1914, Geology and coal resources of the Sierra Blanca coal field, Lincoln and Otero Counties, New Mexico: U.S. Geological Survey Bulletin 541, p. 419-452.

New Mexico:

Tijeras Field

Location: Northeastern Bernalillo County.

Age: Late Cretaceous; Mesaverde Formation.

Rank: Bituminous.

Comments: Coal-bearing strata occur in a syncline within the Tijeras graben. The coal beds are generally 1 to 2.5 ft in thickness. Three small mines produced small quantities of coal for local use during the early 1900's.

Selected References:

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Oregon:

Lignitic units, generally less than 1 meter thick, presumably occur in the Miocene and Pliocene(?) Payette Formation equivalents in the area of the Alvord Desert, where they yield natural gas shows when penetrated by drill holes (Fouch, T. D., 1983, personal communication). There is currently no commerical production of coal in the Basin and Range province in Oregon.

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Texas:

Eagle Spring

Location: Hudspeth County, Eagle Mountains.

Age: Late Cretaceous, Chispa Summit Formation of Adkins (1933).

Rank: Probably bituminous. Information scarce, contradictory. High ash and volatite content. Some coal metamorphosed to anthracite.

Comments: Four principal coal beds which range from 20 in. to 7 ft in thickness. Average thickness, 3.5 ft.

Coal was most likely deposited in stagnant lagoons. The area is structurally complex, and the coal-bearing strata dip steeply. A 230 ft shaft was driven along "Big Seam Number II", which was the only coal bed developed in this area. Production prior to 1887 was about 100 tons.

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Texas:

Eagle Spring

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Texas:

Eagle Spring:

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---- 1963, Geology of Eagle Mountains and vicinity, Hudspeth County, Texas: University of Texas, Austin Bureau of Economic Geology Quadrangle Map 26, scale 1:48,000.

Texas:

San Carlos Field

Location: Presidio County, near San Carlos, 21 miles NNW of Candelaria.

Age: Late Cretaceous, San Carlos Formation.

Rank: Bituminous. High volatile content.

Comments: The San Carlos Coal Company, which was formed in 1893, mined coal for 6 months during 1896. The area, which is structurally complex, was developed by an adit 100 ft deep, and a 175 ft shaft. Coal in the area is generally 8-10 in. thick, and was most likely deposited in a shallow lagoon or estuary.

Selected References:

Adkins, W. S., 1932, The Mesozoic systems in Texas, in Sellard, E. H., Adkins, W. S., and Plummer, F. B., eds., The Geology of Texas, v. 1, Stratigraphy: University of Texas Bulletin 3232, p. 239-518.

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Texas:

San Carlos Field

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Udden, J. A., 1913, Report on the San Carlos coal lands in Block 3, D. & P. Railway land, Presidio County, Texas: Austin, Texas, University of Texas, Bureau of Economic Geology, Letter to Director, 15 p.

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Wollenben, J. A., 1966, Biostratigraphy of the Ojinaga and San Carlos Formations of west Texas and norhteastern Chihuahua: Austin, Texas, University of Texas, Ph.D. dissertation, 63 p.

Texas:

Terlingua Field (Big Bend area)

Location: Brewster County.

Age: Late Cretaceous, Gulfian Series.

Rank: Variable. Unoxidized material from the Chisos mine is subbituminous coal with a high content of moisture, ash, sulfur. Resinous pods are common. Locally, near shallow intrusives, coal is anthracite.

Comments: Coal beds generally range from a few inches to 3 ft in thickness. Maximum bed thickness is about 4 ft. Coals are locally associated with carbonaceous shale sections 20 ft thick. Coals were probably formed in coastal swamp deposits. The Chisos Mining Company attempted to mine coal in this area during the 1930's and 1940's; however, no production information is available.

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Texas:

Terlingua Field (Big Bend Area)

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Utah:

Coalville Field

Location: Summit, Salt Lake Counties.

Age: Cretaceous. Spring Canyon Member and Coalville Member, Frontier Formation, and Dry Hollow Member, Wanship Formation.

Rank: Subbituminous. Low ash, moderate sulfur content.

Comments: The extreme western extension of the Coalville field lies within the project study area. The Cretaceous rocks may be coal-bearing in the area shown on the accompanying map.

The principal mining activity in the area has occurred in a small area east of Coalville, where Cretaceous rocks are exposed through a window in the Tertiary rocks. The Wasatch coal bed occurs in the Coalville Member of the Frontier Formation, and was the primary mining target with a thickness commonly between 8 and 10 ft. Other beds are too thin to be of economic importance. This coal is of importance only to local markets.

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Utah:

Goose Creek Creek

Location: Box Elder, Utah.

Age: Miocene and Pliocene, Salt Lake Formation; Miocene and Pliocene(?), Payette Formation.

Rank: Lignite.

Comments: Lignite has been mined in small quantities for local use from both formations. High ash content. Some uranium mineralization occurs locally in lignite (Idaho, T. 16 S., R. 21 E.) along the flanks and trough of a shallow syncline.

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Utah:

Harmony Field

Location: Northern Washington County, southern Iron County.

Age: Late Cretaceous; Dakota Sandstone and Tropic Shale, undivided.

Rank: Variable. Locally metamorphosed to semianthracite.

Comments: At least 6 coal beds are known to occur in the units correlative with the Tropic Shale and Dakota Sandstone. The coal-bearing strata were severely deformed by igneous intrusions in the Pine Valley Mountains. The coal beds, which range from 1 to 7 ft thick, contain a high percentage of ash.

Numerous prospect pits, adits and shafts have been dug, however, production has been insignificant.

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Utah:

Kolob Field

Location: Southeast Iron, northeast Washington Counties.

Age: Late Cretaceous. Dakota Sandstone - Tropic Shale undifferentiated unit, Straight Cliffs Formation, Wahweap Formation.

Rank: Subbituminous to bituminous.

Comments: During the early stages of mining, coal was used primarily in local mining districts. Pacific Utilities Company operated a steam plant with local coal between 1948-1969. Coal from the Kolob field is generally of poor quality, and is high in sulfur and ash.

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Utah:

Wales Field

Location: Juab, Sanpete Counties.

Age: Paleocene and Late Cretaceous, North Horn Formation.

Rank: Subbituminous.

Comments: The area shown on the accompanying map represents Cretaceous strata that may contain thin coal beds. The productive part of the Wales field lies outside of the project study area. Coal in the Wales field is generally 3 to 4 ft thick, and is overlain and underlain by limestones and oil shale. The coal beds are lenticular, and contain common shale and bony interbeds. The coal is low in moisture and high in ash and sulfur. Mines operated intermittently between 1855 and 1955; however, production was not substantial.

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