MAP SHOWING LOCATION OF DRILL HOLES AND MEASURED SECTIONS

Base from U.S. Geological Survey, Water Hollow Ridge, 1966; Acord Lakes, 1968; Emery West, 1968

APPROXIMATE MEAN DECLINATION, 1983

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1983—G82137

Geology from Hayes and Sanchez (1979) and Spieker (1931)

Table 1.—*Identified coal resources in the Upper Cretaceous Blackhawk Formation, Convulsion Canyon and Wash Rock Canyon Areas, Salina 30' x 60' Quadrangle, Wasatch Plateau coal field, Sevier and Emery Counties, Utah, as of December, 1980*

[In millions of short tons. Totals rounded to 3 significant figures; coal assumed to weigh 1800 tons per acre foot; 1 short ton = .9072 metric ton; 1 foot = 0.3048 m; 1 inch = 2.54 cm. Leaders (---) indicate no resources]

	Location		Coal under less than 1000 ft of overburden						Coal overlain by 1000 ft to 2000 ft of overburden						
			Demonstrated			Inferred			Demonstrated			Inferred			
			Thickness of coal bed, in inches			Thickness of coal bed, in inches			Thickness of coal bed, in inches			Thickness of coal bed, in inches			
County	Township (South)	Range (East)	14-28	28-42	>42	14-28	28-42	>42	14-28	28-42	>42	14-28	28-42	>42	Total
Last Chance coal zone															
Sevier	21	4	---	---	---	---	---	---	2.4	0.5	1.4	---	---	---	4.3
Sevier	22	3	0.3	---	---	---	---	---	0.5	---	---	---	---	---	0.8
Sevier	22	4	10.8	---	---	---	---	---	16.6	2.4	12.3	---	---	---	42.1
Last Chance coal zone totals			11.1	---	---	---	---	---	19.5	2.9	13.7	---	---	---	47.2
Upper Last Chance coal zone															
Sevier	21	3	---	---	---	---	---	---	0.2	---	---	---	---	---	0.2
Sevier	21	4	3.7	---	---	---	---	---	1.0	---	---	---	---	---	4.7
Sevier	22	3	---	---	---	---	---	---	1.3	0.1	---	---	---	---	1.4
Sevier	22	4	10.8	---	---	---	---	---	16.6	2.4	12.3	---	---	---	42.1
Upper Last Chance coal zone totals			14.5	---	---	---	---	---	19.1	2.5	12.3	---	---	---	48.4
Knight coal zone															
Sevier	21	3	---	---	---	---	---	---	0.1	0.1	---	---	---	---	0.2
Sevier	21	4	---	---	0.5	---	---	---	4.7	4.0	13.9	2.5	---	---	25.6
Sevier	21	5	---	1.3	10.5	---	---	---	1.3	1.3	10.1	0.7	---	---	25.2
Sevier	22	3	0.1	0.6	---	---	---	---	0.4	1.4	---	---	---	---	2.5
Sevier	22	4	5.2	4.4	14.5	2.4	---	---	3.4	1.1	18.9	0.7	---	---	50.6
Sevier	22	5	2.7	0.5	5.1	---	---	---	0.3	---	---	2.1	---	---	10.7
Knight coal zone totals			8.0	6.8	30.6	2.4	---	---	10.2	7.9	42.9	6.0	---	---	114.8
Acord Lakes coal zone															
Sevier	21	4	---	---	1.0	0.3	---	---	2.3	2.5	24.7	2.2	---	---	33.0
Sevier	21	5	0.6	2.1	80.9	0.3	0.3	1.3	1.2	1.9	31.8	1.4	0.2	8.0	130.0
Sevier	22	4	7.0	3.9	28.5	2.6	---	4.7	3.4	3.4	33.8	0.3	---	---	87.6
Sevier	22	5	0.2	1.1	15.5	1.1	---	---	0.1	0.1	1.4	0.6	---	---	20.1
Emery	21	6	0.5	0.6	1.3	0.3	0.2	0.3	---	---	---	---	---	---	3.2
Acord Lakes coal zone totals			8.3	7.7	127.2	4.6	0.5	6.3	7.0	7.9	91.7	4.5	0.2	8.0	273.9
Hiawatha coal zone															
Sevier	21	4	---	---	---	---	---	---	0.2	0.1	---	---	---	---	0.3
Sevier	21	5	8.2	2.4	8.8	---	---	---	2.2	2.1	13.6	---	---	---	37.3
Emery	21	5	2.7	---	---	---	---	---	---	---	---	---	---	---	2.7
Sevier	22	5	1.8	0.1	0.1	---	---	---	0.2	0.1	---	---	---	---	2.3
Hiawatha coal zone totals			12.7	2.5	8.9	---	---	---	2.6	2.3	13.6	---	---	---	42.6
Other unnamed coal beds															
Sevier	21	3	---	---	---	---	---	---	0.2	---	---	---	---	---	0.2
Sevier	21	4	1.6	1.1	0.5	---	---	---	14.7	7.3	0.6	---	---	---	25.8
Sevier	21	5	34.3	9.0	1.9	---	---	---	23.7	7.5	14.5	---	---	---	90.9
Sevier	22	3	1.7	---	---	---	---	---	4.5	---	---	---	---	---	6.2
Sevier	22	4	5.5	---	---	---	---	---	19.7	6.9	3.6	---	---	---	35.7
Sevier	22	5	6.7	2.6	2.2	---	---	---	---	---	---	---	---	---	11.5
Emery	21	6	4.1	1.9	0.6	---	---	---	---	---	---	---	---	---	6.6
Emery	22	6	0.4	0.1	0.1	---	---	---	---	---	---	---	---	---	0.6
Other coal bed totals			54.3	14.7	5.3	---	---	---	62.8	21.7	18.7	---	---	---	177.5
Grand total			108.9	31.7	172.0	7.0	0.5	6.3	121.2	45.2	192.9	10.5	0.2	0.2	704.4

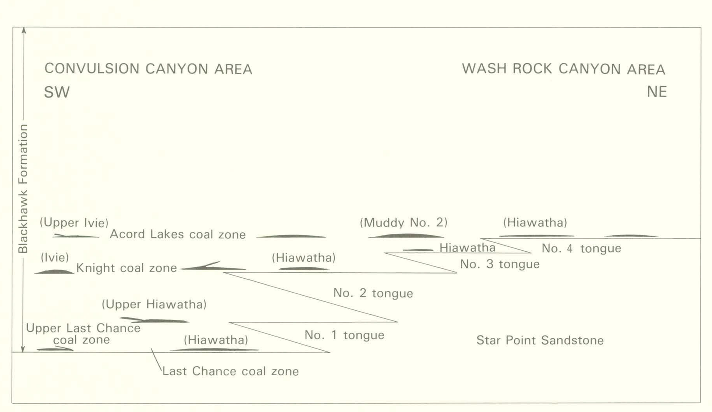


Figure 1.—DIAGRAMMATIC SECTION SHOWING THE STRATIGRAPHIC RELATIONSHIP BETWEEN TONGUES OF STAR POINT SANDSTONE AND COAL ZONES IN THE BLACKHAWK FORMATION. COAL BED NAMES IN PARENTHESES ARE USED LOCALLY

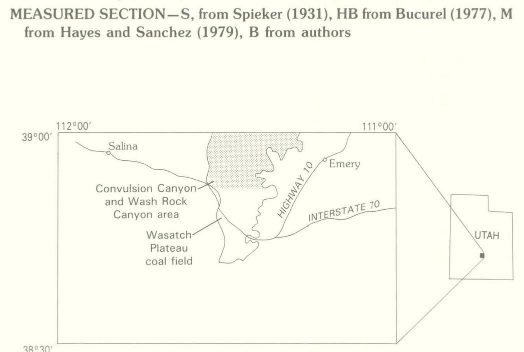
MAP EXPLANATION

CONTACT—Between Star Point Sandstone and overlying Blackhawk Formation. Dotted where concealed. Chevrons enclose zone of intertonguing.

U/D NORMAL FAULT—Dashed where approximately located; dotted where concealed; queried where location is approximate. U, upthrown side; D, downthrown side

USGS-5 DRILL HOLE—Drilled by U.S. Geological Survey (USGS), Utah Geological and Mineral Survey (UGMS), and Coal Search Corporation (CSC)

B58 MEASURED SECTION—S, from Spieker (1931), HB from Bucurel (1977), M from Hayes and Sanchez (1979), B from authors



INDEX MAP OF THE SALINA 30'x 60' QUADRANGLE SHOWING THE SOUTHERN PART OF THE WESTERN PLATEAU COAL FIELD, UTAH. PATTERN INDICATES AREA OF THIS REPORT

DISCUSSION

INTERTONGUING

Intertonguing between the Upper Cretaceous Star Point Sandstone and Blackhawk Formation of the Mesaverde Group has been previously mapped and described in the Muddy Canyon and Emery areas by Sanchez and Hayes (1979), Hayes and Sanchez (1979), Marley and Flores (1979), and Flores and others (1979).

Spieker (1931), correlated the coal beds in the study area on the assumption that the top of the Star Point Sandstone was a continuous horizontal surface. This is not the case. Previously unmapped intertonguing of the Blackhawk Formation and the Star Point Sandstone in the Convulsion Canyon area necessitates assignment of new coal zone names. The top of the Star Point Sandstone rises stratigraphically eastward in a series of intertonguing relationships with the overlying nonmarine strata. The shallow marine sandstone tongues of the Star Point Sandstone, referred to as the No. 1, No. 2, No. 3 (Sanchez and others, 1983), and No. 4, stratigraphically offset the continuity of coal zones, as illustrated on the accompanying sections of the Convulsion Canyon and Wash Rock Canyon areas.

COAL ZONES

The Last Chance coal zone (Sanchez and others, 1983) in the Johns Peak and Old Woman Plateau areas is stratigraphically equivalent to the Hiawatha coal bed (Spieker, 1931) in the Convulsion Canyon area. This zone is not widespread and further exploration and development of the zone may be limited.

The Upper Last Chance coal zone (Sanchez and others, 1983) in the Johns Peak and Old Woman Plateau areas is stratigraphically equivalent to the Upper Hiawatha coal bed (Spieker, 1931) in the Convulsion Canyon area. This zone is not widespread and further exploration and development of the zone may be limited.

The Hiawatha coal zone here named is stratigraphically equivalent to the Hiawatha coal bed (Spieker, 1931) that is limited in areal extent to the Link Canyon and the Pines areas. The coal beds in the zone are commonly thicker than 42 in. (107 cm) in the Link Canyon area.

The Knight coal zone of Sanchez and others (1983) in the Johns Peak and Old Woman Plateau areas is stratigraphically equivalent to the Hiawatha and Ivie (Spieker, 1931) coal bed in the Convulsion Canyon-Wash Rock Canyon areas. Its greatest thickness is in the area of intertonguing between the No. 1 and No. 2 tongues of the Star Point Sandstone. The coal beds in the zone are commonly thicker than 42 in. (107 cm).

The Acord Lakes coal zone of Sanchez and others (1983) in the Johns Peak and Old Woman Plateau areas is stratigraphically equivalent to the Upper Ivie, (Spieker, 1931), Muddy No. 2 (Spieker, 1931) in the Convulsion Canyon area, and Hiawatha (Spieker, 1931) coal bed, in the Link Canyon and Wash Rock Canyon areas. The coal beds in the zone are commonly thicker than 42 in. (107 cm). Its lateral continuity is very persistent in the Acord Lakes, Convulsion Canyon, and Wildcat Knolls areas. It is presently being mined at the Southern Utah Fuels Company underground mine in East Spring Canyon, near the head of Convulsion Canyon.

COAL RESOURCES

The total identified coal resources in the Convulsion Canyon and Wash Rock Canyon areas of the Wasatch Plateau coal field is 704.4 million short tons (639 million metric tons; see table 1). The coal-bearing sequence, which is approximately 1,000 feet thick, is included in the lower part of the Upper Cretaceous (Campanian) Blackhawk Formation. The entire resource area lies within the Fishlake and Manti-La Sal National Forests.

All coal beds are identified by zones because of lateral discontinuities (pinch outs) and bifurcations. Some beds occur as localized lenses that cannot be correlated, and are placed in the "other beds" category in the resource analysis (table 1). Although the resources were tabulated as zones, the coal resources were calculated by individual coal bed, according to the coal classification system of the U.S. Bureau of Mines and U.S. Geological Survey (1976). All resources are classed as identified and are further subdivided in the Demonstrated and Inferred classes of geologic assurance. Demonstrated coal resources for most coal beds were estimated to extend not more than 0.75 mile (1.2 km) from the point of measurement on the outcrop or from a drill hole. Inferred coal resources were calculated for a few of the more persistent coal beds. As further exploratory drilling is done in the area, more coal will undoubtedly be found and the figures will need to be revised upward.

As can be seen on the accompanying coal sections, the thickest and most persistent coal beds in the study area (those of the Acord Lakes and Knight coal zones) occur within the lower 180 ft (55 m) of the Blackhawk Formation. These offer the greatest potential for development. Because of the great thickness of overburden associated with these coal beds, they will be most suitable for underground mining methods.

COAL ANALYSES

Five analyses of coal are available in the Johns Peak and Old Woman Plateau Area (Hatch and others, 1979). On the basis of these analyses, plus additional analyses of Blackhawk coals from nearby areas (Hatch and others, 1979), the coal in the study area ranges from high-volatile B or C bituminous to subbituminous A. Sulfur content ranges from .96 to 1.47 percent on an as-received basis.

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STRATIGRAPHIC FRAMEWORK AND COAL RESOURCES OF THE UPPER CRETACEOUS BLACKHAWK FORMATION IN THE CONVULSION CANYON AND WASH ROCK CANYON AREAS OF THE WASATCH PLATEAU COAL FIELD, SALINA 30' x 60' QUADRANGLE, SEVIER AND EMERY COUNTIES, UTAH

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1983

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