

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY
STATE OF UTAH UTAH GEOLOGICAL AND MINERAL SURVEY

RED POINT QUADRANGLE
UTAH-EMERY CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

INTRODUCTION

Red Point quadrangle, in Emery County in central Utah, was mapped in 1979 as part of the U.S. Geological Survey's program to evaluate lands in the public domain for potential coal leasing. Mapping was done using U.S. Forest Service color aerial photographs at a scale of 1:15,840 and U.S. Geological Survey black-and-white aerial photographs at a scale of 1:30,000. The quadrangle was mapped previously by Spieker (1931) at a scale of 1:62,500.

GEOGRAPHY

The quadrangle is named for Red Point, which is a steep-sided, eastern extension of the Wasatch Plateau about 9 km west of Huntington, Utah. Altitudes are from 1,755 m in the southeastern part of the quadrangle to 2,820 m in the northeastern part. The two major streams are the eastward-flowing Huntington Creek draining the northern part of the area and the eastward-flowing Cottonwood Creek draining the southern part.

Resistant sandstones and limestones form cliffs throughout the area, with less resistant shales forming gentler slopes. Badlands have been formed in the shales of the Upper Cretaceous Mancos Shale. Extensive pediments slope into the valleys from the plateau cliffs.

Access to the northern and southern boundaries of the quadrangle is by Utah State Routes 31 and 29, respectively. Access to most of the central part of the quadrangle is by improved (light-duty dirt) or unimproved roads; some areas in the badlands or on the plateau escarpment are accessible only by foot.

Annual precipitation varies from 40 to 50 cm and increases with altitude. Vegetation species found in this area are the Upper Sonoran, Transition, Canadian, and Hudsonian (U.S. Forest Service, 1978).

STRATIGRAPHY

Sedimentary rocks total about 1,100 m in thickness and range in age from Late Cretaceous to Tertiary. Lithology and thickness of the units are shown in the stratigraphic sequence of exposed rocks.

The part of the marine Mancos Shale that occurs in this area has been divided into five units: the upper part of the Blue Gate Shale Member, the upper, middle, and lower parts of the Emery Sandstone Member, and the lower part of the Blue Gate Shale Member. This terminology is a modification of the work of Peterson and Ryder (1975), who reclassified parts of the Mancos Shale in southeastern Utah. The threshold breakdown of the Emery Sandstone Member follows that of Spieker (1931), who first mapped the Mancos Shale in this area.

Blackhawk Formation is a deltaic facies and contains the major coal deposits of the area. The Blackhawk is predominantly sandstone, with lesser amounts of shale, siltstone, and coal. The sandstone is thicker and more extensive in the upper part of the formation than in the lower part. The economically valuable coal beds occur in the lower part.

Price River Formation contains a distinct marker bed approximately 20 m thick about 30 m below the top of the formation. This marker bed, informally named the great white sandstone, is lithologically similar to the Castlegate Sandstone in that it is very pale orange to pinkish gray, medium to coarse grained, massive, and locally conglomeratic. The great white sandstone forms a prominent cliff in this and adjacent quadrangles.

North Horn Formation is a flood-plain lacustrine facies, well known for its vertebrate fossils. Fossils of reptiles and mammals, in particular, have been described from North Horn Mountain, southeast of the quadrangle, by researchers from the Smithsonian Institution (Gazin, 1941; Gilmore, 1946) and from various universities (for example, Jensen, 1966).

STRUCTURE

The rocks in this area generally dip northward. A broad, gently dipping anticline that trends north-northeastward is present at Red Point and a larger, gently dipping anticline that trends northward is present in Castle Valley. Several north-trending faults transect the western part of the area; these faults are part of the north-trending fault systems that extend throughout much of the Wasatch Plateau and adjacent areas.

ECONOMIC GEOLOGY

Three active coal mines exist on the flanks of the Wasatch Plateau.

Coal.—The coal beds in the area that meet current classification standards (Beas and others, 1970) are, in ascending order, in the Hiawatha, Blind Canyon, and Bear Canyon zones in the lower part of the Blackhawk Formation. These coal beds are generally lenticular. The lowest coal bed of the Hiawatha zone is usually the thickest and the most laterally extensive, although it may be cut locally by paleochannels. Coal beds in the Blind Canyon and Bear Canyon zones tend to be less consistent in thickness than those in the Hiawatha zone.

Coal analyses from the Hiawatha zone in this quadrangle (Doelling, 1972) show average values for high-volatile B bituminous coal to be 12,448 Btu/lb; moisture 5.5 percent; volatile matter 41.2 percent; fixed carbon 44.8 percent; ash 8.2 percent; and sulfur 0.67 percent.

Coal analyses from the Blind Canyon zone in this quadrangle (Doelling, 1972) show average values for high-volatile B bituminous coal to be 12,803 Btu/lb; moisture 5.1 percent; volatile matter 42.3 percent; fixed carbon 44.8 percent; ash 7.4 percent; and sulfur 0.52 percent.

Doelling (1972) reported reserves of 110,165,420 tons of coal in this quadrangle—an estimate based on limited data.

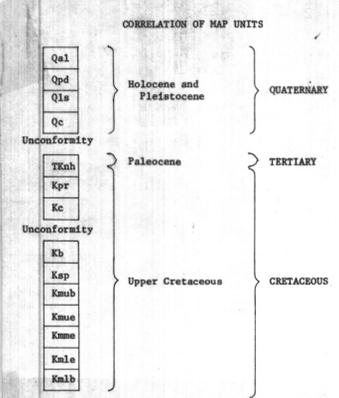
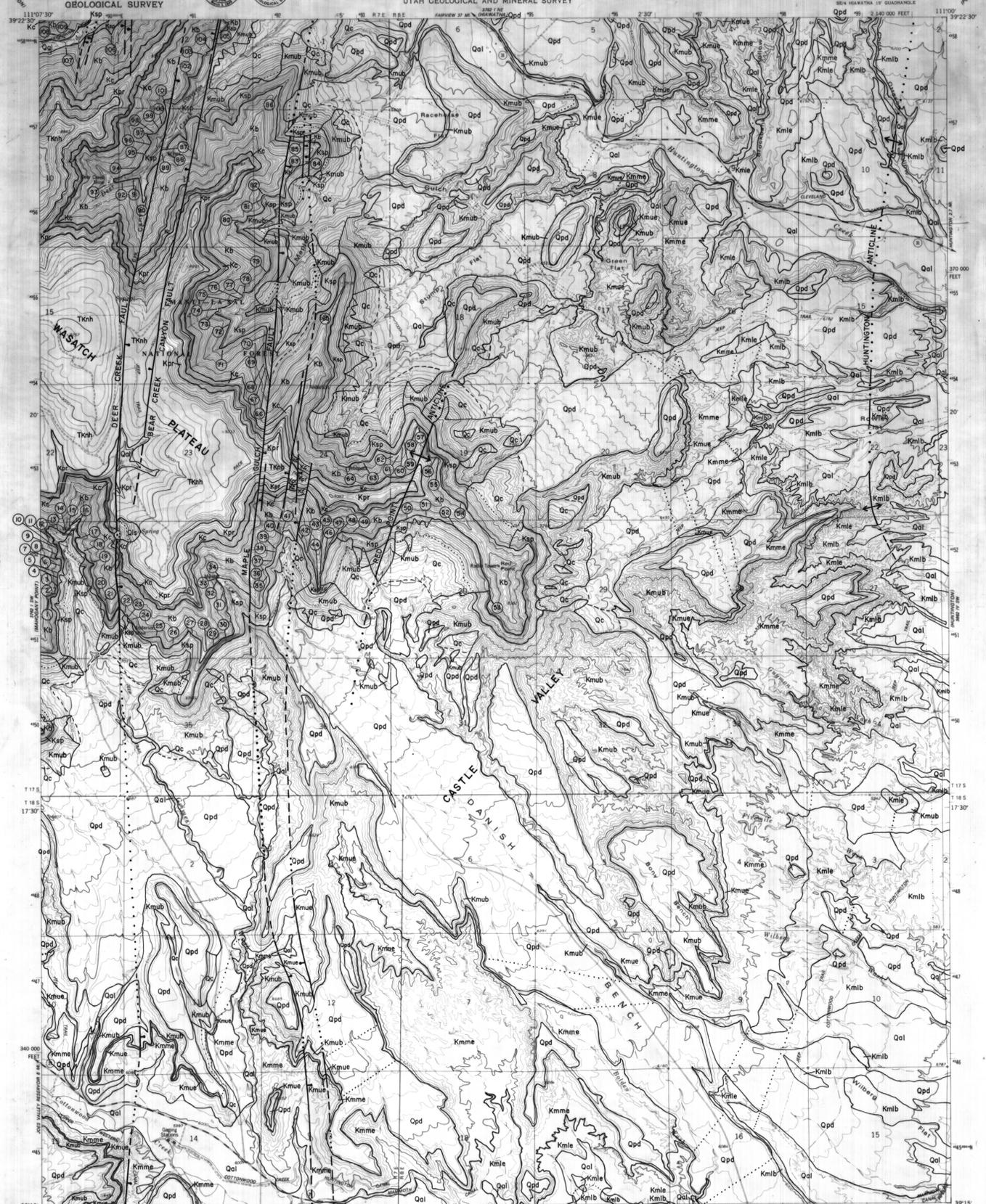
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CONVERSION TABLE

To convert	Multiply by	To obtain
METRIC UNITS		ENGLISH UNITS
Centimeters	0.3937	Inches
Meters	3.281	Feet
Kilometers	.6214	Miles

This report has not been edited for conformity with U.S. Geological Survey editorial standards.



LIST OF MAP UNITS

Qal	Alluvium	Ksp	Star Point Sandstone
Qpd	Pediment deposits	Kmb	MANCOS SHALE
Qc	Landslide deposits	Kme	Upper part of Blue Gate Shale Member
Tkh	Colluvium	Kma	Upper part of Emery Sandstone Member
Kpr	North Horn Formation	Kmb	Middle part of Emery Sandstone Member
Kc	Price River Formation	Kma	Lower part of Emery Sandstone Member
Kb	Castlegate Sandstone	Kmb	Lower part of Blue Gate Shale Member
Kmb	Blackhawk Formation		

CONTACT—Dashed where approximately located; dotted where concealed
 FAULT—Dashed where approximately located; dotted where concealed.
 Bar and ball on downthrow side
 ANTICLINE—Dashed where approximately located; dotted where concealed
 COAL SECTION—Circled number refers to measured coal section. Line points to top of coal section

STRATIGRAPHIC SEQUENCE OF EXPOSED ROCKS
NOT TO SCALE

SYSTEM	SERIES	FORMATION	DESCRIPTION
QUATERNARY	Holocene and Pleistocene	Surficial deposits	ALLUVIUM (Qal)—Mostly moderately sorted and stratified subrounded to subangular clay, silt, sand, and gravel; includes some colluvium and alluvial fan deposits, particularly in broad valleys
			PEDIMENT DEPOSITS (Qpd)—Poorly sorted and stratified deposits composed of subangular to subrounded pebbles to boulder-sized clasts of reworked local sediments with interstitial clay, silt, and sand; locally partially cemented by calcium carbonate
			LANDSLIDE DEPOSITS (Qc)—Poorly sorted deposits derived from older surficial deposits and bedrock blocks derived mainly from North Horn Formation
TERTIARY	Paleocene	Unconformity	
		North Horn Formation	NORTH HORN FORMATION (Tkh)—Shale, gray, grayish-purple, moderate-red, or variegated; contains interbeds of light-brown fine- to coarse-grained medium even-bedded and massive lenticular sandstone, and thin- to medium-bedded gray limestone and lenticular conglomerate; slope-forming. Contains vertebrate fossils, particularly reptilian and mammalian. Base conformable and gradational with Price River Formation. Only lower 195 m present in quadrangle. Formation 375 m thick in adjacent areas on Wasatch Plateau
		Price River Formation	PRICE RIVER FORMATION (Kpr)—Sandstone, grayish- to dark-yellowish-orange fine- to coarse-grained medium-crossbedded to massive; massive beds usually white to pinkish-gray; subordinate pinkish-gray to dark-yellowish-orange pebbles to cobble conglomerate; clasts predominantly light-gray quartzite, light-gray quartzitic sandstone, and grayish-black chert; medium-dark- to olive-gray shale, great white sandstone unit (30 m below top) mostly very pale orange to pinkish-gray medium- to coarse-grained massive; locally conglomeratic; stepped-topography-forming. Base conformable and gradational with Castlegate Sandstone. 60-75 m thick
		Castlegate Sandstone	CASTLEGATE SANDSTONE (Kc)—Sandstone, very pale orange to pinkish-gray medium- to coarse-grained massive; locally conglomeratic; local medium-dark-gray siltstone lenses; cliff-forming. Base locally unconformable with Blackhawk Formation; probably low-relief erosional surface. 60 m thick
		Unconformity (local)	
CRETACEOUS	Upper Cretaceous	Blackhawk Formation	BLACKHAWK FORMATION (Kb)—Sandstone, grayish-orange to light-brown fine- to medium-grained medium- to large-crossbedded; moderate-yellowish-brown to medium-dark-gray shale; light-gray to medium-dark-gray siltstone; coal; stepped-topography-forming. Base conformable with Star Point Sandstone; paleochannels into upper Star Point Sandstone locally present. 170-245 m thick
		Star Point Sandstone	STAR POINT SANDSTONE (Ksp)—Sandstone, light-gray very fine grained to fine-grained massive to planar laminated; white to very light gray; "m" locally present; light-gray siltstone; light-gray shale; cliff-forming. 85-145 m thick
		Mancos Shale	MANCOS SHALE—Shale, dark- to light-gray, silty; gray siltstone; and yellow, brown, and gray, very fine grained to medium-grained sandstone. Only upper 500 m present in quadrangle. Total thickness about 1,265 m at Quitcupah Creek 50 km to the south (Spieker, 1931) Upper part of Blue Gate Shale Member (Kmb)—Shale, gray, silty; gray siltstone; and gray very fine grained sandstone. About 300 m thick Upper part of Emery Sandstone Member (Kme)—Sandstone, gray to yellow, very fine grained, thin-bedded; gray silty shale; and gray siltstone. About 25 m thick Middle part of Emery Sandstone Member (Kma)—Shale, gray, silty; gray siltstone; and gray very fine grained sandstone. About 60 m thick Lower part of Emery Sandstone Member (Kmb)—Sandstone, gray to yellow, very fine grained, thin-bedded; gray silty shale; and gray siltstone. About 30 m thick Lower part of Blue Gate Shale Member (Kmb)—Shale, gray, silty; gray siltstone; and gray very fine grained sandstone. Only upper 85 m present in quadrangle. Lower part of member 503 m thick at Quitcupah Creek 50 km to the south (Spieker, 1931)

GEOLOGIC MAP AND COAL SECTIONS OF THE RED POINT QUADRANGLE, EMERY COUNTY, UTAH

By
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