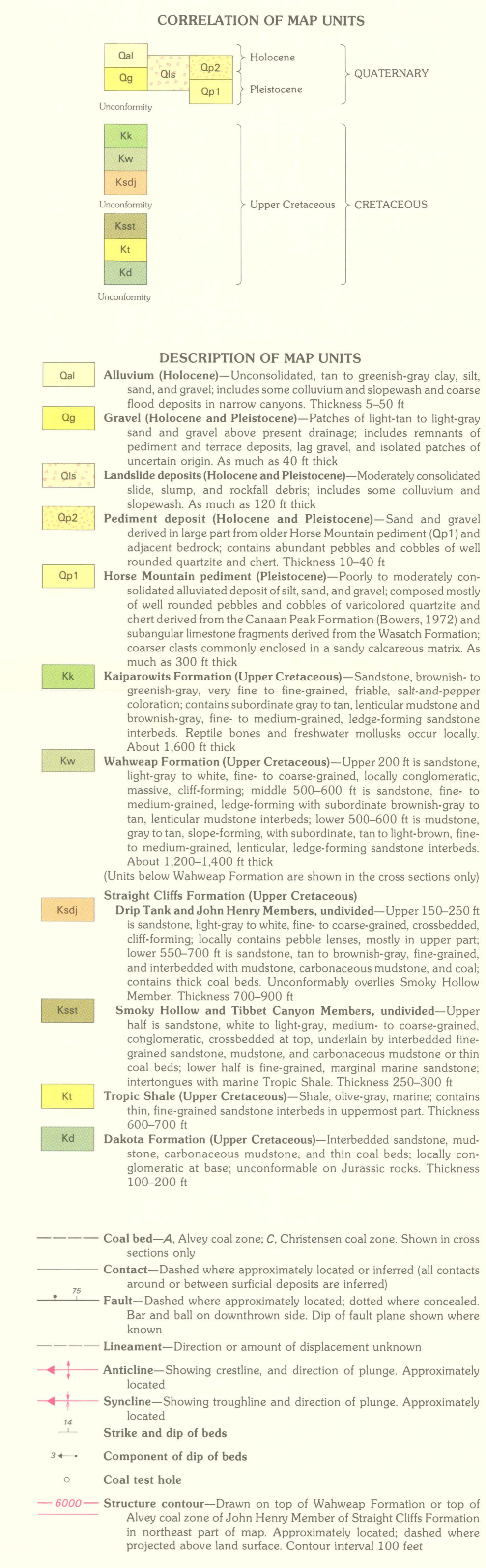
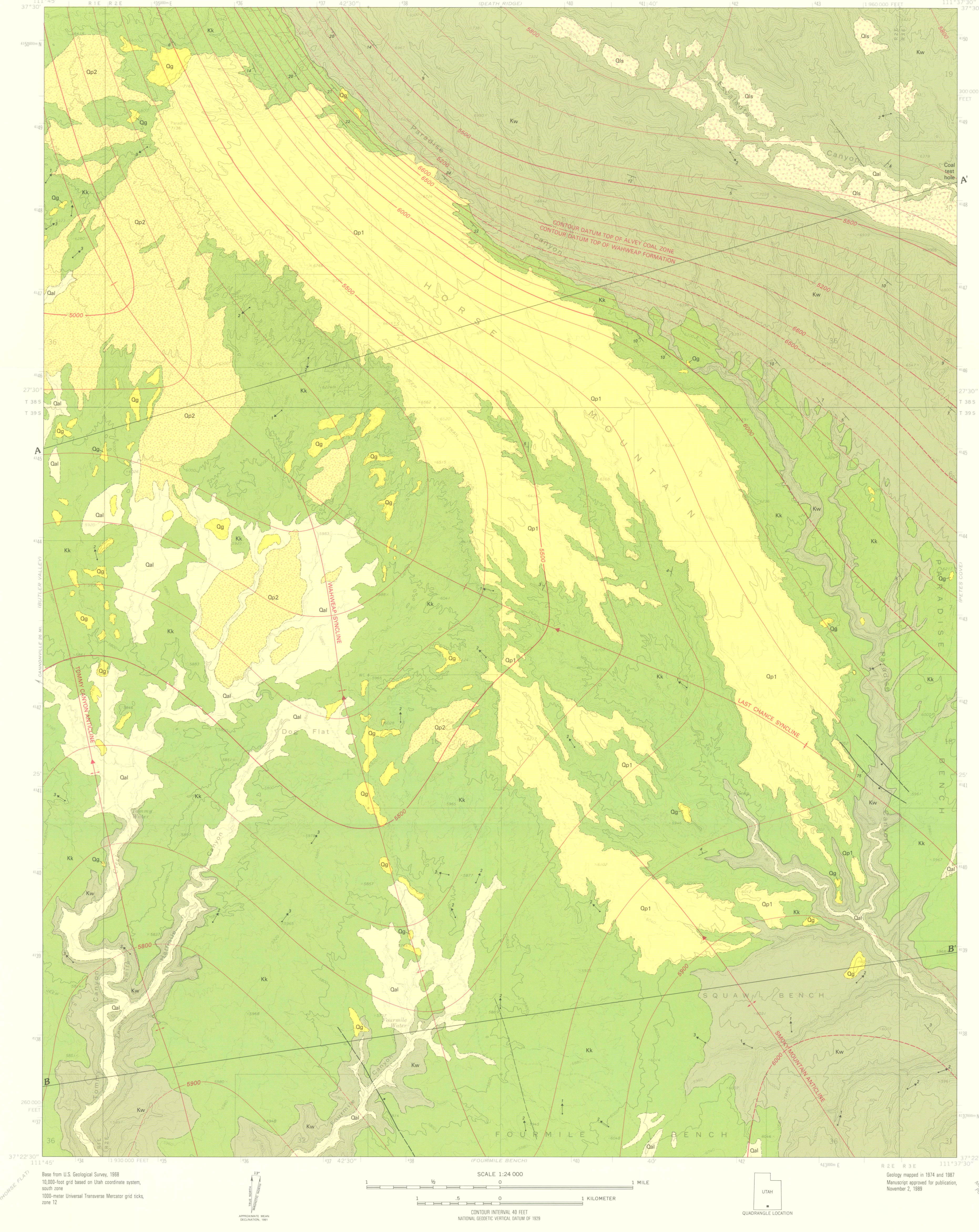
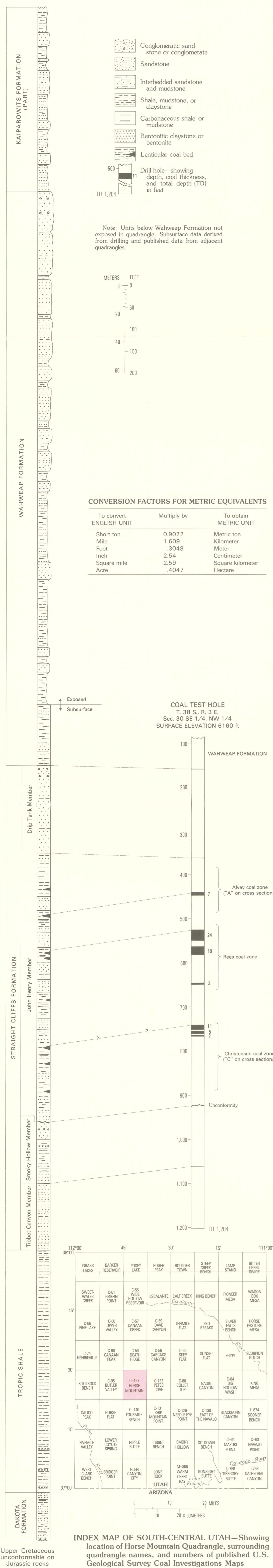


GENERALIZED COLUMNAR SECTION OF UPPER CRETACEOUS ROCKS  
IN THE HORSE MOUNTAIN QUADRANGLE



**ECONOMIC GEOLOGY**

**INTRODUCTION**

The Horse Mountain quadrangle was mapped as part of the U.S. Geological Survey's program for classifying and evaluating mineral lands of the Public Domain. Coal is the principal resource of economic interest in the area and much of the quadrangle has been included in the Kaiparowits Plateau Known Recoverable Coal Resource Area (KRPCRA). The quadrangle is in the west-central part of the Kaiparowits Plateau, about 25 mi south-southwest of Escalante, and 14 mi southeast of the town of Henrieville, Utah.

Eastward access to the area is from the west via The Gut road, a graded dirt road that leaves the Cottonwood Canyon road near Grosvenor Arch and crosses the Wahweap Creek drainage into the southwest part of the quadrangle. The northeast corner of the quadrangle can be reached from Escalante on dirt roads via the Left Hand Collet Canyon and Big Sage area. Access to most of the quadrangle is limited to four-wheel drive vehicles.

The western half of the Horse Mountain quadrangle is drained by Tommy Smith Creek and the stream in Fourmile Canyon, both tributaries of Wahweap Creek, which flows southward into Lake Powell. The eastern half of the quadrangle is drained by streams in Paradise and Escalante Canyons, which drain into Lake Powell via Last Chance Creek. All streams are intermittent and permanent water exists only in springs at Fourmile Water and Tommy Water in the southwest part of the quadrangle. The area is administered by the U.S. Bureau of Land Management and parts of the area are used seasonally for grazing of livestock.

Earliest geologic work in the Kaiparowits region was done by Gregory and Moore (1931). Doelling and Graham (1972) produced a comprehensive report on the coal fields of southern Utah, including the Kaiparowits Plateau. Peterson (1969) described and named four new members of the coal-bearing Straight Cliffs Formation.

Adjacent quadrangles north and east of Horse Mountain quadrangle have been mapped in detail by Zeller (1973 and 1989). Adjacent areas west and northwest of Horse Mountain quadrangle were mapped by Bowers (1981 and 1983).

**COAL**

Although no coal-bearing rocks crop out in the quadrangle, extensive drilling and sampling of coal by private energy companies in areas east of Horse Mountain quadrangle indicate large amounts of coal present at depth (Zeller, 1989). Several coal test holes have been drilled along the eastern border of the quadrangle, but due to the proprietary nature of the information, data are not available for detailed evaluation of coal beds within the quadrangle. Coal thicknesses from one test hole drilled by Sun Oil Co. in section 30 near the northeast edge of the quadrangle are available and are included in this report.

In areas north and east of the Horse Mountain quadrangle, coal beds are in three major coal zones within the John Henry Member of the Straight Cliffs Formation, named from oldest to youngest, the Christensen, Rees, and Alvey coal zones. Individual coal beds within these zones are lenticular and commonly grade laterally into carbonaceous shale or mudstone. Coal beds are more persistent on a trend of about N 20° W, parallel to the Last Chance syncline (Zeller, 1989).

Structure contours for the quadrangle are drawn on the top of the Wahweap Formation or the Alvey coal zone of the John Henry Member of the Straight Cliffs Formation. The highest coal beds in the Straight Cliffs Formation should be about 1,700 ft below the top of the Wahweap Formation. Overburden on the Alvey coal zone varies from a minimum of about 500 ft in Escalante Canyon in the northeast to more than 2,000 ft over much of the central and northern part of the quadrangle. Development potential for most of the eastern half of the quadrangle is rated low to moderate due to thickness of overburden and locally steep dips. Data are not available for evaluation of the western part of the quadrangle, but thickness of total coal is expected to decrease westward.

Kaiparowits coal is generally rated as high volatile subbituminous, non-agglomerating, and low in sulfur and ash. Core samples from all three coal zones obtained from a U.S. Geological Survey test hole about 7 mi north of the quadrangle averaged (as received) 20 percent moisture, 34 percent volatile matter, 38 percent fixed carbon, 7 percent ash, and 0.8 percent sulfur. The samples produced an average heating value of 9,600 Btu/lb (Zeller, 1979).

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**GEOLOGIC MAP AND COAL DEPOSITS OF THE HORSE MOUNTAIN QUADRANGLE, KANE COUNTY, UTAH**

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