INTRODUCTION

In 1971, the author was retained to investigate the coal reserves in the Fort Union (Paleocene) Formation of the Grass Creek coal field, Hot Springs County, Wyoming. The project was of a preliminary nature in that the only available information was from early published works of the U. S. Geological Survey and sixteen unsurveyed core holes, then recently completed.

The Grass Creek coal field was initially discussed in a very thorough publication, Professional Paper 145, Geology and Oil and Coal Resources of the Oregon Basin, Metaeteet, and Grass Creek Basin Quadrangles, Wyoming (Hewett, 1926). In the following discussion, this basic reference is used extensively in arriving at what appears to be a reasonable coal reserve estimate. It should be pointed out that the Grass Creek Quadrangle covers a large area, and Hewett's original work included two additional quadrangles. All the quadrangles were prepared to present the surface geology, subsurface contours, and to discuss the location of coal and oil and gas areas of known or potential production. In the original publication, coal reserve figures were not determined.

The coal geology included in the Grass Creek Quadrangle discussed several areas and several coal seams in the Upper Cretaceous and the Tertiary. This presentation is related only to the Tertiary Fort Union coal units, and specifically to those located in Sections 16, 21, 22, 23, 25, 26 and 36 of T46N-R99W, Hot Springs County, Wyoming.

A note of caution is required. If this review and the accompanying maps are used for future evaluations, it must be remembered that the topographic information was derived from surveys made in 1912 and 1913, and the geology is based on work completed in 1919. This is not to imply that any of this early work was inaccurate, but it is to alert fellow workers that some of the more recent surveys indicate that the location of coal outcrops, topography, and the mine entrance may be 100-200 feet in error.

The reason the decision was made to place a preliminary evaluation of this area in the Guidebook was two-fold: First, recent publicity (Fawcett, 1975) reports that a mining permit has been requested for this area. It is felt that an opportunity is available to inform interested persons of the amount of coal reserve under consideration, and the extent of the area to be mined. Second, this paper is used to show how a coal reserve estimate and property evaluation can be completed with a limited amount of data.

LOCATION

The area is 32 miles northwest of Thermopolis, Wyoming, and three miles west of the Grass Creek oil camp. The closest railhead is at Kirby, Wyoming, approximately 40 miles by road to the southeast.

GEOLOGY

The Grass Creek coal field is in the southwestern Bighorn Basin. The Fort Union coal is in a small structural basin immediately west of the large oil and gas productive Grass Creek anticline. On Grass Creek anticline, the Cretaceous Cody Shale is exposed at the crest, and younger beds are encountered in every direction from the top of the structure.

Grass Creek syncline (Fig. 1) essentially parallels the anticline on the west and trends in a northwest-southeast direction. The Tertiary Fort Union is present in the syncline and has been deeply eroded, leaving only part of the coal deposit preserved. The beds on the east flank of the syncline dip sharply to the west with values as high as 60 degrees in the Cretaceous Lance Formation. On the west flank of the syncline, the coal beds dip to the east at six to ten degrees.

This portion of the Grass Creek coal field is one of the few areas in the western Bighorn Basin that have significant coal reserve in Tertiary rocks. The coal-bearing horizons in the Fort Union (Paleocene) occur in the lower 400 to 500 feet of the formation and have been designated in this paper as the Mayfield and Gwynn seams. This designation is essentially consistent with Hewett except that he indicated the Mayfield equivalent, in those coal deposits centered around Section 21, was possibly stratigraphically higher (Hewett, p. 101) than the Mayfield seam to the east. To avoid introducing a third coal seam terminology, the lower bed is referred to as the Gwynn, and the upper bed is the Mayfield in both areas (A and B) under discussion. The Gwynn seam is not shown for Area A (Figs. 1 and 2) because all measured outcrops indicate thin beds (1 to 3 feet), and therefore the Gwynn seam is considered to be of no commercial value. The thickness of the Mayfield coal seam in Area A (Fig. 2) ranges from 15 to 35 feet. The maximum thickness of the seam occurs along the Grass Creek syncline. The major coal area is west of the syncline.

The overburden thickness (Fig. 2) was determined by subtracting the structural elevation on top of the Mayfield seam from the surface elevation. The maximum overburden is 200 feet, and the average is 100 feet. It should also be noted that even minor changes in the coal structure will readily alter the area of thickest overburden, but the overall relationship will remain essentially the same. The character

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