U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

CONTOUR INTERVAL 20 METERS NATIONAL GEODETIC VERTICAL DATUM OF 1929 STRUCTURE CONTOUR AND OVERBURDEN MAP OF THE UPPERMOST COAL BED IN THE CHINA BUTTE MEMBER OF THE FORT UNION FORMATION GEOLOGIC MAP OF UPPER CRETACEOUS AND TERTIARY STRATA AND COAL STRATIGRAPHY OF THE PALEOCENE FORT UNION FORMATION, RAWLINS-LITTLE SNAKE RIVER AREA, SOUTH-CENTRAL WYOMING R.D. Hettinger, J.G. Honey, M.S. Ellis, C.S.V. Barclay, and J.A. East





**Table 1.** Coal zones of the China Butte Member of the Fort Union Formation,
 [Lateral continuity is measured along strike and includes areas where the coal is recognized only in drill holes; it may also include small gaps in lateral continuity where the coal is not present] Approximate distance (mi) coal zone was traced along strike in outcrop belt 12 (subsurface) 2+ (possibly 8

Ash yield, sulfur content, heating values, and rank of coal in the China Butte Member were reported on an as-received basis by Dames and Moore (1978b, c, e; 1979a, c, h) and are summarized in table 2. Ash yields range from 4.8 to 14.63 percent, sulfur content ranges from 0.15 to 1.31 percent, heating values range from 7,319 to 9,786 Btu/lb, and apparent rank varies from subbituminous B to subbituminous C. Additional chemical analyses from coal and associated shale

| <b>Table 2.</b> Range of ash yield, sulfur content, and heating values reported on an as-received basis for content in the China Butte Member of the Fort Union Formation, Rawlins–Little Snake River area, Wyoming. |                         |                  |                     |                           |                    |
|--|-------------------------|------------------|---------------------|---------------------------|--------------------|
| 7.5-minute<br>quadrangle   | Source of data          | Ash<br>(percent) | Sulfur<br>(percent) | Heating value<br>(Btu/lb) | Apparent rank      |
| Doty Mountain  | Dames and Moore (1979h) | 4.8–10.1         | 0.2–0.8             | 8,646–9,206               | No information     |
| Fillmore Ranch   | Dames and Moore (1978e) | 5.26–13.7        | 0.19–1.31           | 7,319–8,194               | Subbituminous C    |
| Rawlins Peak SW  | Dames and Moore (1978b) | 6.77–7.18        | 0.15–0.33           | 9,496–9,786               | Subbituminous B    |
| Riner  | Dames and Moore (1979a) | 6.20–12.6        | 0.25–0.59           | 7,332–8,682               | Subbituminous C    |
| Seaverson Reservoir  | Dames and Moore (1979c) | 5.78–11.46       | 0.36–0.61           | 8,337–8,685               | Subbituminous B or |
| Separation Peak  | Dames and Moore (1978c) | 7.12–14.63       | 0.32–0.43           | 7,943–9,345               | No information     |

The Overland Member also contains important deposits of coal in the Cherokee coal zone. The coal zone is exposed in the northern part of the study area near Creston Junction, and in the subsurface it extends westward across the southern part of the Great Divide Basin (Hettinger and Kirschbaum, 1991). Coal outcrops are shown on the geologic map (sheet 1). The Cherokee coal zone is about 450 ft thick near Creston Junction. It thins to the south and pinches out near Coal Bank Wash in sec. 4, T. 18 N., R. 92 W. (fig. 1). Detailed coal correlations are shown on sheet 3 and shown schematically in figure 5. Coal bed mapping and nomenclature are based on Sanders (1974, 1975), Edson (1979), Dames and Moore (1978d, f; 1979a, b), and J.M. Back (U.S. Geological Survey, unpublished coal resource study of the Creston Junction 7.5-minute quadrangle, 1976). The name, maximum thickness, and lateral continuity of each coal bed are summarized in table 3. Coal beds extend about 2-14 mi on outcrop and the thickest bed is about 41 ft thick. Clastic intervals between the coal beds are highly variable and individual coal beds vary in thickness by

| Formation, Rawlins–Little Snake River study area, Wyoming.       |   |  |  |  |  |
|--|---|--|--|--|--|
| [Lateral continuity is measured holes; it may also include small | along strike and includes areas whe<br>areas where coal is not present] | re coal is recognized only in drill                        |  |  |  |
| Coal bed   | Maximum   | Approximate distance (mi)                                  |  |  |  |
|  | thickness (ft) <sup>1</sup>   | along strike in outcrop belt                               |  |  |  |
| High Point   | 5.0 c, 0 p  | Appears intermittently along a<br>distance of about 13 mi. |  |  |  |
| upper Cherokee   | 15.0 c, 3.0 p   | 13   |  |  |  |
| Cherokee   | 41.6 c, 2.6 p   | 4  |  |  |  |
| lower Cherokee   | 36 c, 7 p   | 12   |  |  |  |
| Cow Butte (Includes the upper and lower Cow Butte                | 14.0 c, 1.5 p (upper Cow Butte)<br>16.0 c, 0 p (Cow Butte)              | 14   |  |  |  |
| and Cow Butte beds).   | 9.5 c, 0 p (lower Cow Butte)  |  |  |  |  |
| Horse Butte  | 10.5 c, 0 p   | 2  |  |  |  |

Figure 5. Schematic diagram showing Upper Cretaceous and Tertiary strata in the Rawlins-Little Snake River study area. Abbreviations: Formation (Fm.), Member (Mbr.), Sandstone (Ss).



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Figure 6. Map showing area underlain by uppermost coal bed in the China Butte Member of the Fort Union Formation. The uppermost coal was used as a marker horizon to construct the structure contour and overburden map shown on sheet 2. The uppermost coal is in (1) the Chicken Springs coal zone in the northern part of the study area, (2) the Fillmore Ranch coal zone in the central part of the study area, and (3) the Baggs coal bed in the southern part of the study area. The Chicken Springs zone lies about 50–150 ft above the Fillmore Ranch coal zone. The Baggs and Fillmore Ranch coal zones are at approximately the same stratigraphic position (see Honey and Robinson Roberts, 1989).

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