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COAL RESOURCE OCCURRENCE AND COAL DEVELOPMENT

POTENTIAL OF THE  
ADOBE SPRINGS QUADRANGLE,  
MOFFAT COUNTY, COLORADO  
[Report includes 1 plate]

Prepared for  
UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

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

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## INTRODUCTION

### Purpose

This text is to be used in conjunction with Coal Resource Occurrence and Coal Development Potential Maps of the Adobe Springs quadrangle, Moffat County, Colorado. This report was compiled to support the land planning work of the Bureau of Land Management (BLM) and to provide a systematic coal resource inventory of Federal coal lands in Known Recoverable Coal Resource Areas (KRCRA's) in the western United States. This investigation was undertaken by Dames & Moore, Denver, Colorado, at the request of the U.S. Geological Survey under contract number 14-08-0001-15789. The resource information gathered for this report is in response to the Federal Coal Leasing Amendments Act of 1975 (P. L. 94-377). Published and unpublished public information was used as the data base for this study. No new drilling or field mapping was performed as part of this study, nor was any confidential data used.

### Location

The Adobe Springs quadrangle is located in central Moffat County in northwestern Colorado, approximately 19 miles (30 km) northwest of Craig and 41 miles (66 km) north of Meeker, Colorado. The area within the Adobe Springs quadrangle is relatively unpopulated.

### Accessibility

The Adobe Springs quadrangle is approximately 7 miles (11 km) north of U.S. Highway 40 (also known as Colorado Highway 2). Several light-duty, all-weather roads pass through the northern half of the quadrangle. The southern half of the quadrangle and some of the northern areas are accessible along a number of unimproved roads and jeep trails.

Railway service for the Adobe Springs quadrangle is provided by the Denver and Rio Grande Western Railroad from Denver to the railhead at Craig. The rail line follows U.S. Highway 40, terminating approximately 1.5 miles (2.4 km) west of Craig and approximately 18 miles (29 km) southeast of the quadrangle. The rail line is the major transportation route for coal shipped east from northwestern Colorado.

### Physiography

The Adobe Springs quadrangle lies in the southern part of the Wyoming Basin physiographic province, just off the northeastern edge of the Colorado Plateau physiographic province, as defined in Howard and Williams (1972). The quadrangle is approximately 64 miles (103 km) west of the Continental Divide.

Approximately 740 feet (226 m) of relief is present in the Adobe Springs quadrangle. Altitudes range from approximately 7,120 feet (2,170 m) in the northeastern corner of the quadrangle to approximately 6,380 feet (1,945 m) in the Spring Creek valley at the west-central edge of the quadrangle.

The landscape within the Adobe Springs quadrangle is characterized by hill and valley topography. Moderate slopes and stream valleys are dominant throughout the quadrangle, although the topography steepens slightly toward the south.

Drainage in the Adobe Springs area is primarily into the Yampa River through Spring Creek and its tributaries. Spring Creek flows across the quadrangle from the northeastern edge to the west-central edge, draining into the Yampa River approximately 8 miles (13 km) south-southwest of the quadrangle. The dendritic tributaries of Spring Creek flow intermittently, mainly in response to snowmelt in the spring.

### Climate and Vegetation

The climate of northwestern Colorado is semiarid. Clear, sunny days prevail in the Adobe Springs area, and daily temperatures vary from 0° to 35° F (-18° to 2° C) in January to 42° to 80° F (6° to 27° C) in July. Annual precipitation in the area averages about 20 inches (51 cm), most of which occurs as snowfall during the winter months. The dominant type of vegetation in the Adobe Springs quadrangle is sagebrush.

### Land Status

The Adobe Springs quadrangle lies at the northwestern edge of the Yampa Known Recoverable Coal Resource Area (KRCRA), and only the

southeastern and southwestern corners of the quadrangle lie within the KRCRA. The coal rights of that entire area are Federally-owned (plate 1). There are no coal leases in the Adobe Springs quadrangle that are within the KRCRA.

## GENERAL GEOLOGY

### Previous Work

The first geologic description of the general area in which the Adobe Springs quadrangle is located was published by Emmons (1877) as part of a Survey of the Fortieth Parallel. The decision to build a railroad into the region stimulated several investigations of coal between 1886 and 1905, including papers by Hewett (1889), Hills (1893), and Storrs (1902). These publications are all of a very general nature and do not detail the Adobe Springs area. There are no recent publications regarding the geology of the Adobe Springs area, except for the generalized geologic map by Tweto (1976) which covers the quadrangle at a scale of 1:250,000.

### Stratigraphy

Rocks which crop out in the Adobe Springs quadrangle are Tertiary in age and include the Wasatch and Green River Formations. A composite stratigraphic section is shown in figure 1.

The Eocene-age Wasatch Formation is exposed throughout the Adobe Springs quadrangle. According to Tweto (1976), the main body of the Wasatch Formation crops out in the southern half of the quadrangle. Bordering the main body of the Wasatch Formation on the north, Tweto mapped the east-west-trending Tipton Tongue of the Green River Formation. Stratigraphically above the Tipton Tongue in the northern half of the quadrangle, Tweto indicates that the Cathedral Bluffs Tongue of the Wasatch Formation crops out. The generalized description of each formation which follows is taken from Tweto (1976) because of the lack of published data for the Adobe Springs quadrangle.

The main body of the Wasatch Formation is generally composed of light-colored arkosic sandstone interbedded with siltstone, shale and

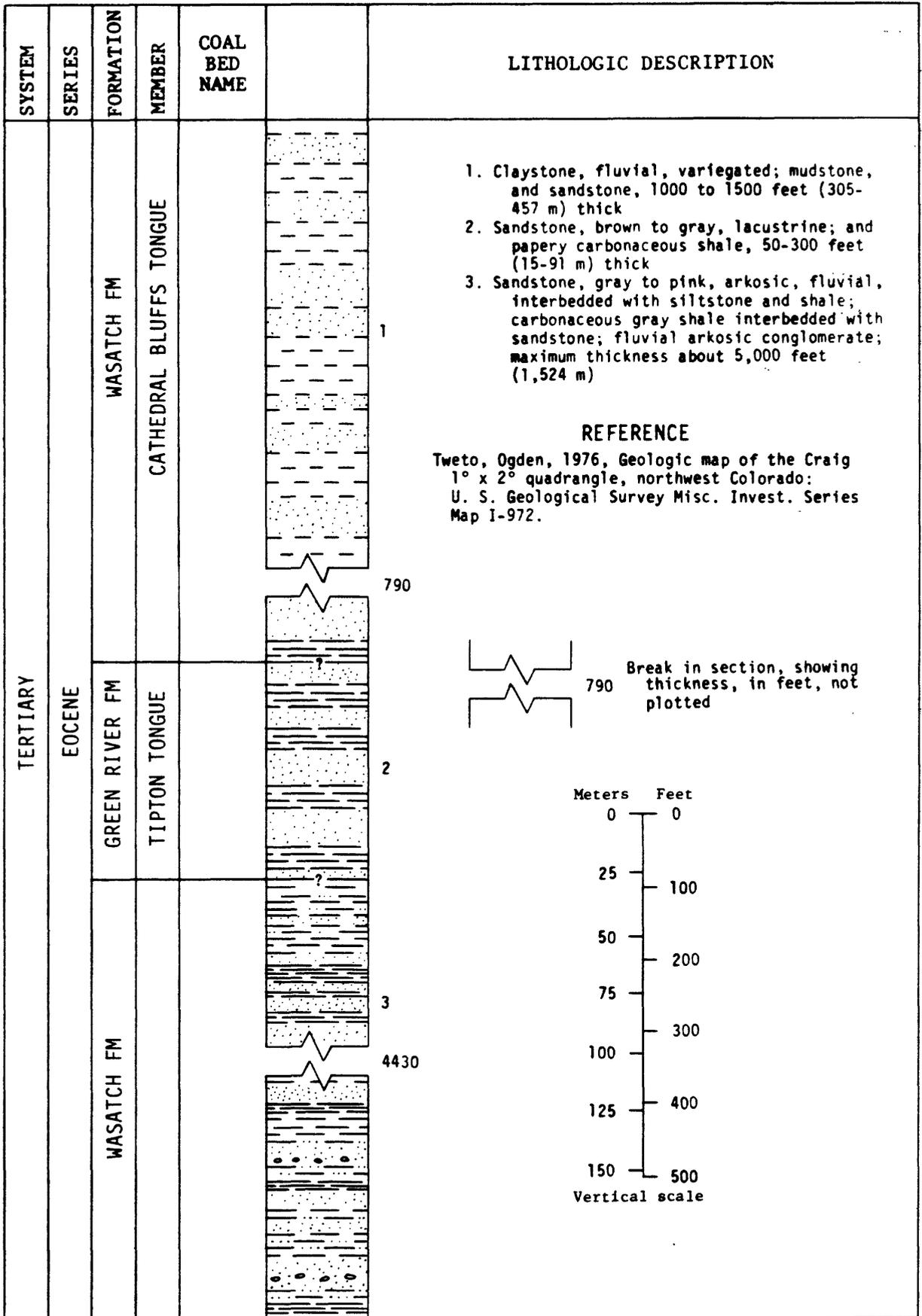


FIGURE 1. — Composite columnar section of the Adobe Springs quadrangle.

conglomerate. The maximum thickness of the main body of the Wasatch Formation is 5,000 feet (1,524 m), however the entire thickness of the Wasatch Formation is not exposed in the Adobe Springs quadrangle.

The Eocene-age Tipton Tongue of the Green River Formation is, characteristically, an interbedded brown to gray sandstone and thin-bedded shale. The thickness of the Tipton Tongue of the Green River Formation ranges from 50 to 300 feet (15 to 91 m).

The Eocene-age Cathedral Bluffs Tongue of the Wasatch Formation consists of variegated claystone, mudstone, and sandstone. The thickness of the Cathedral Bluffs Tongue of the Wasatch Formation ranges from 1,000 feet to 1,500 feet (305 to 457 m).

In general, the environments fluctuated between lacustrine and fluvial during the Eocene Epoch, and this is reflected in Eocene-age sediments (Picard and McGrew, 1955). Tweto (1976) indicates that both the main body and the Cathedral Bluffs Tongue of the Wasatch Formation are predominantly fluvial deposits, while the Tipton Tongue of the Green River Formation is predominantly a lacustrine deposit.

#### Structure

The Yampa KRCRA lies in the southern extension of the Washakie/Sand Wash structural basin of south-central Wyoming. The basin is bordered on the east by the Park Range, some 55 miles (89 km) east of the Adobe Springs quadrangle, and on the southwest by the Axial Basin Anticline, approximately 10 miles (16 km) south of the quadrangle. The Adobe Springs quadrangle lies in the southeastern part of the Washakie/Sand Wash Basin. In general, beds in the quadrangle dip to the north-northwest. Tweto (1976) has not identified any faults in the Adobe Springs quadrangle.

### COAL GEOLOGY

Because of the lack of both surface and subsurface geologic data in the Adobe Springs quadrangle, no coal beds have been identified. However, from the data in the adjacent Iron Springs and Lay SE quadrangles, it appears that several coal beds of the Fort Union Formation, which may be of economic value, possibly extend into the Adobe Springs quadrangle. These may include the FU[20] coal bed, the Emerson bed, and the Blevins bed, which are identified in the Iron Springs and Lay SE quadrangles.

### COAL DEVELOPMENT POTENTIAL

The standard criteria for classifying coal resource development potential by surface and subsurface mining methods were not applied to the Adobe Springs quadrangle because of insufficient data.

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