

EXPLANATION A-3

Dyco Petroleum Corporation Mesager Federal 25-1 Drill hole or measured section--Showing name of drill hole or reference KB:7385, GL:7367, for measured section. Kelly bushing (KB), ground level (GL), and TD: 8002 total depth (TD) in feet above sea level Sec. 25, T. 7 S., R. 101 W. SP SFLA Geophysical log traces used for correlation--SP, Spontaneous potential; GR, Gamma Ray; R, Resistivity; SFLA, Averaged spherically focused induction log; RILD, Deep induction log; RFLI, Shallowfocused induction log; RLL8, Dual induction laterolog. Numbers indicate depth in feet Sandstone--Correlated sandstone units are stippled. Includes minor siltstone and shale Conglomeratic sandstone Unconformity Coal--Some coal beds are not indicated because the logs necessary for positive coal identification were not available Unknown lithology Approximately 3,200 ft of Mancos Shale not shown A~F> Correlation line--Dashed where approximately located, queried where **Note:** To convert feet to meters multiply by 0.3048. To convert miles to kilometers multiply by 1.609

INTRODUCTION

Cross sections A-A' and B-B' show the stratigraphic framework of Upper Cretaceous rocks in part of the Piceance basin, northwestern Colorado. This Laramide basin is asymmetric in shape and has a gently dipping western flank and a steeply dipping eastern flank. The basin is bounded by the Uinta uplift to the north, the northwest, the Douglas Creek arch to the west, the Axial Basin uplift to the north, the White River uplift to the cast, the Gunnison uplift and the Sawatch-Elk range to the southeast, and the Uncompahgre uplift to the southwest.

The cross sections were made from measured sections and geophysical well logs. Data points B-1 and B-2 are measured sections modified from Fisher and others (1960). All the other data points are geophysical well logs. Correlations of the major sandstone units and marine shale tongues are based on information from the entire suite of well logs available for each drill hole. Only the two most significant log traces are shown for each drill hole on the cross sections. Coal beds were picked using neutron-density or gamma-neutron logs. Coal beds are indicated on the right side of

STRATIGRAPHY

the log trace for each drill hole. Coal beds are not indicated for drill holes that do not

have adequate logs for coal identification.

Upper Cretaceous rocks in this study include, in ascending order, the Dakota Sandstone, the Mancos Shale, and the Mesaverde Group or Formation. These marine and nonmarine sediments were deposited in transgressional and regressional sequences along the shore of the intercontinental seaway. The Dakota Sandstone unconformably overlies the Lower Cretaceous Burro Canyon Formation and contains quartzitic and conglomeratic sandstone and thin carbonaceous beds, which indicate marginal-marine, fluvial, and paludal depositional environments. The Dakota is gray to yellow brown and weathers to a rusty-brown color. It ranges from 100 to 200 ft (30 to 61 m) in thickness. The Mancos Shale conformably overlies the Dakota Sandstone and consists primarily of gray to black shale with minor sandstone and siltstone. The Mancos ranges from about 4,000 to 6,000 ft (1,219 to 1,829 m) thick. The upper part of the Mancos Shale intertongues extensively with the lower sandstone beds in the Mesaverde Group or Formation. These Mancos tongues commonly contain sandy and silty intervals and thin from east to west. The tongues between the Rollins Sandstone and the Cozzette Members of the Mount Garfield or Mesaverde Formations and between the Corcoran Member of the Mount Garfield or Mesaverde Formations and the upper part of the Sego Sandstone pinch out west of long 108°30' W. The tongue of Mancos Shale between the Cozzette and Corcoran Members of the Mount Garfield or Mesaverde Formations pinches out just east of long 108°30' W. The Anchor Mine Tongue of the Mancos Shale, which separates the upper and lower parts of the Sego Sandstone of the Mesaverde Group, thickens from west to east and joins the main body of Mancos Shale east of long 108°30' W. The Mesaverde Group conformably overlies the Mancos Shale and contains sandstone, siltstone, and shale of continental and marine origin, and coal. The Mesaverde ranges from about 2,000 to 6,500 ft (610 to 1,981 m) thick. Stratigraphic nomenclature for units in the Mesaverde is complicated and varies from one worker to another. Previous workers have used different names from adjacent areas for units in the study area, which has caused some miscorrelations. Stratigraphic nomenclature used by various authors in and adjacent to the study area is shown in the accompanying chart. In this study, the Mesaverde Group includes (in ascending order) the Sego Sandstone, the Mount Garfield Formation, and the Hunter Canyon Formation in the western and central parts of the study area; the Mesaverde Formation includes partly equivalent rocks in the eastern part of the study area

Sandstone of the Mesaverde Group. Formation names and the boundary for the change in nomenclature from Mesaverde Group to Mesaverde Formation (west to east) are shown on both cross sections. The contact between the Mount Garfield and Hunter Canyon Formations of the Mesaverde Group is shown only on the measured sections (B-1 and B-2).

The youngest member of the Hunter Canyon or Mesaverde Formations is the Ohio Creek Member (Johnson and May, 1980). It is unconformably overlain by the Tertiary Wasatch Formation. The Ohio Creek contains medium-grained, locally conglomeratic sandstone composed of clasts of feldspar, quartz, and chert. Conglomerate beds are found near the base of the unit in most of the study area, but they are not laterally continuous. The Ohio Creek is white sandstone in outcrop because of the weathering of feldspar to kaolinite. The lower boundary of the Ohio

(Fisher and others, 1960; Gill and Hail, 1975; and Ellis and Freeman, 1984). The boundary for this nomenclature change is determined by the eastern limit of the Sego

Creek is gradational.

Upper Cretaceous sandstone units have been correlated on the cross sections.

The lower sandstone units include not only the main body of marine barrier sandstone but also the associated shoreward fluvial deposits. Major sandstone units in the lower part of the Mesaverde are separated by marine shale tongues, which represent transgressive fluctuations of the shoreline. Where the marine shale tongues are no longer present the barrier sandstone beds are shown undivided. The Rollins Sandstone, Cozzette, and Corcoran Members grade to the west into fluvial sandstone,

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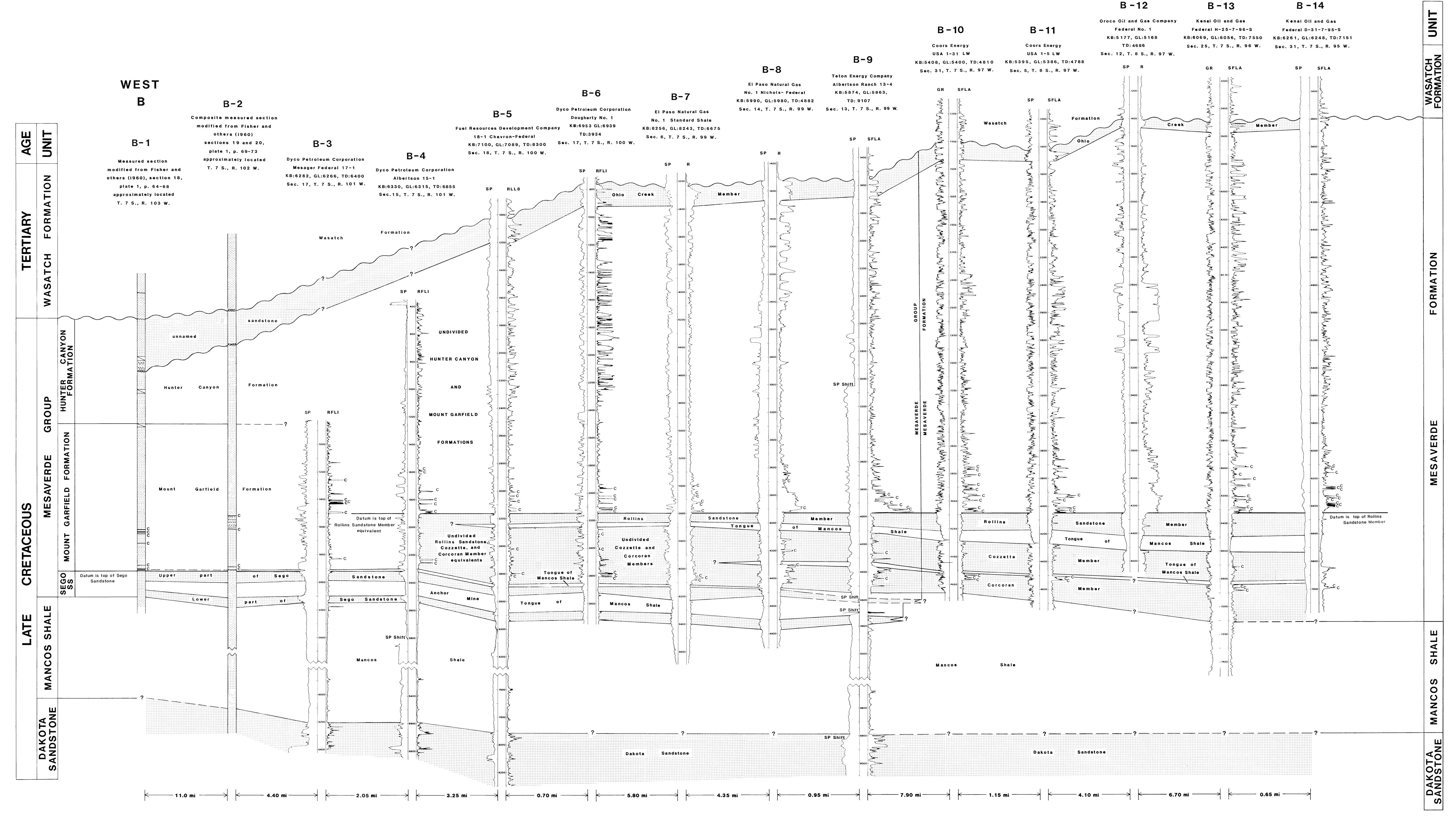
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SHEET 2 OF 2

EAST

B'



SEE SHEET 1 FOR EXPLANATION