

**Footnotes**

- 1 Bailey (1985)
- 2 Clark (1958)
- 3 Cole and others (1987)
- 4 Franzyk and others (1990)
- 5 Hampton and others (1986)
- 6 Kellogg (1977)
- 7 Lashin (1983)
- 8 Lashin (1988)
- 9 McLaurin and Steel (2000)
- 10 O'Brien and Steel (1992)
- 11 Olsen (1985)
- 12 Taylor and Lovell (1995)
- 13 Van Wagner (1997a)
- 14 Van Wagner (1997b)
- 15 Van Wagner (1998)
- 16 Van Wagner and others (1990)
- 17 Van Wagner and others (1996)
- 18 Young (1995)

**Sedimentary structures**

- Hummocky cross stratification
- Trough cross stratification
- Tabular planar cross stratification
- Ripple lamination
- Wave ripples
- Horizontal lamination
- Wavy bedding
- Lenticular bedding
- Breccia bedding
- Flaser bedding
- Grain size shown on measured sections

**Lithologic and depositional interpretations**

- Upper and middle shoreface; predominantly sandstone
- Lower shoreface sandstone and mudrock
- Offshore; predominantly mudrock
- Estuarine sandstone and mudrock
- Inferred estuarine sandstone and mudrock in the Mesaverde Group
- Coastal plain sandstone and mudrock; coal zones are darker green
- Beaked fluvial; predominantly sandstone
- Fluvial sandstone and mudrock in the Mesaverde Group
- Fluvial and lacustrine sandstone, limestone, and mudrock in the North Horn, Wasatch, and Green River Formations

**Abbreviations**

- Fm. Formation
- Mbr. Member
- Ss. Sandstone
- Sh. Shale
- seq. sequence
- bdy. boundary
- sb. sequence boundary

**Contacts**

- Conformity—Dashed where approximate, quartered where uncertain
- Contact that rises stratigraphically—Dashed where approximate, quartered where uncertain
- Datum—Represents surface of maximum marine transgression (maximum flooding surface)
- Sequence boundary—Dashed where approximate, quartered where uncertain
- Disconformity—Dashed where approximate, quartered where uncertain

**Drill hole information (additional information provided in table 1)**

- 25—Drill hole locality number shown on cross section and on figure 1
- Coal Gulch 15-9—T. 13 S., R. 10 W.
- Geophysical logs—Gamma ray (GR) or spontaneous potential (SP) logs are shown to the left of the columnar section; resistivity log (RES) is shown to the right of the columnar section. Resistivity logs are plotted using a logarithmic scale.
- Columnar section showing coal beds (black) penetrated by drill hole. Down-hole depths are shown at 100-ft intervals and labeled at 500-ft intervals. Thickness of beds is shown in feet on left side of column. Thickness of interval represents total coal in an interval that also contains partings; the partings are thicker than the adjacent coal seams and are not included in the recorded coal thickness.

**Scale**

- Vertical scale: 0, 50, 100 feet
- Horizontal scale: 0, 5, 10 miles

**CONVERSION FACTORS**

Multiply	By	To obtain
feet (ft)	0.3048	meters (m)
meters (m)	1.0936	feet (ft)

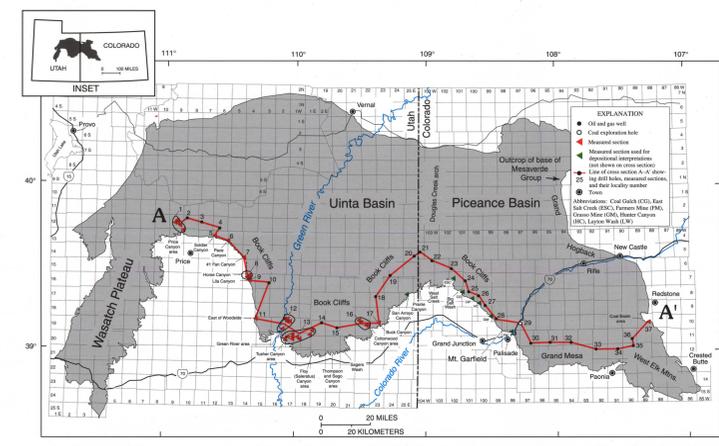
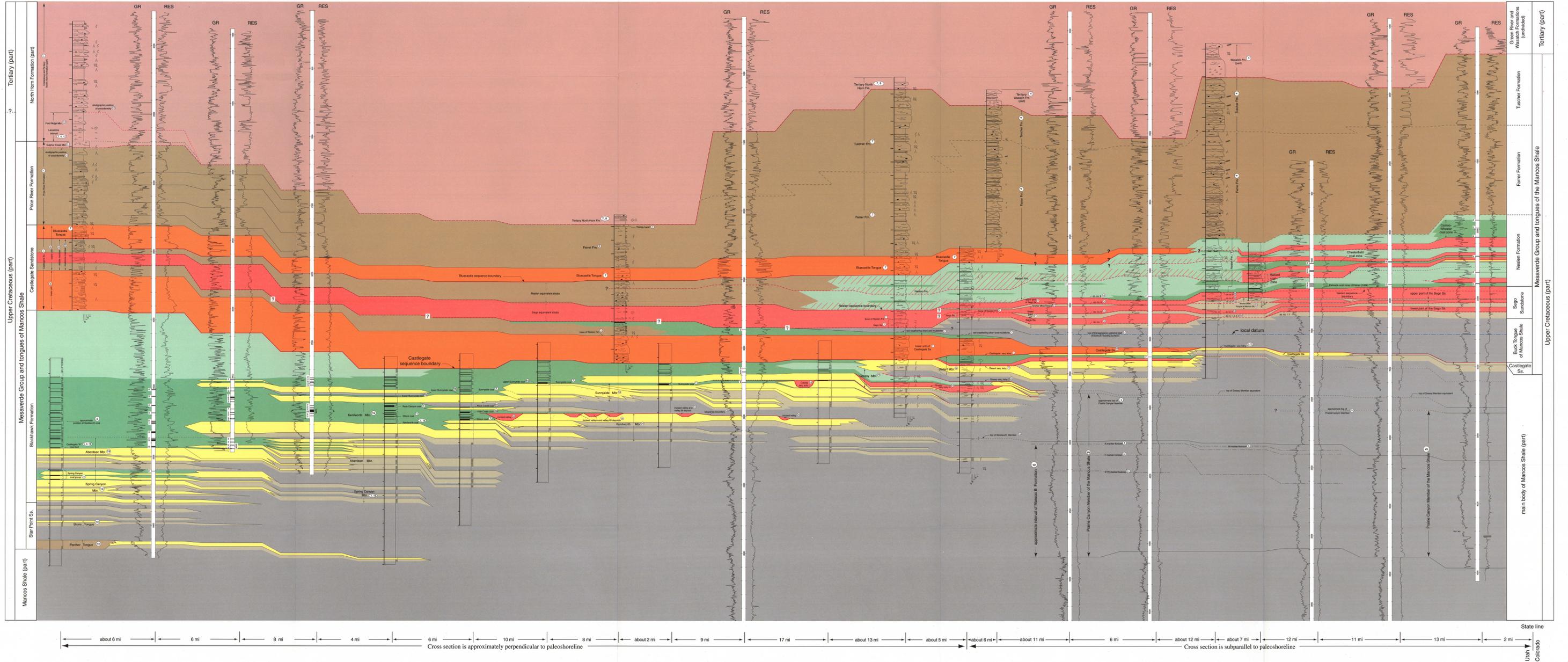


Figure 1. Location of drill holes, measured sections, and geographic features described along cross section A-A'. The line of cross section is located in the southern part of the Uinta and Piceance Basins, which are shown with respect to the States of Utah and Colorado in the inset.

Locations are shown in figure 1. Abbreviations: American Petroleum Institute number (API No.), Formation (Fm.), Member (Mbr.), Sandstone (Ss.), Shale (Sh.). n.a., not applicable where locality is represented by a measured section.

Locality No.	Elev. of hole (ft)	API No.	Company or referenced report	Name of drill hole or measured section	Location (T. 13 S., R. 10 W.)	Comment	Locality No.	Elev. of hole (ft)	API No.	Company or referenced report	Name of drill hole or measured section	Location (T. 13 S., R. 22 E., sec. 32)	Comment
1	n.a.	n.a.	Bailey (1985)	Price River	T. 13 S., R. 9 E., sec. 11	The Blackhawk Fm. and Star Point Ss. were described by Bailey (1985). Price River, and Castlegate Fm. were described by Lashin (1988).	16	n.a.	n.a.	Franzyk and others (1990)	Cottonwood Canyon	T. 19 S., R. 22 E., sec. 32	The Nelson, Farnes, Tusher, and Woodbury Fms. were described by Franzyk and others (1990). The Tongue of the Mancos Sh. was described by Van Wagner (1997a). Sequence boundaries in the Star Point Ss. were described by Van Wagner (1997a).
2	7,333	43-007-30140	Pacific Gas and Elec.	Price Canyon	T. 13 S., R. 9 E., sec. 15, 21, 22, 26		17	n.a.	n.a.	Knapbaum and Steel (1988)	Buck Canyon	T. 19 S., R. 22 E., sec. 3	
3	7,568	43-007-30067	Mountain Fuel Res.	Federal 6-8	T. 12 S., R. 10 E., sec. 8		18	6,595	43-019-30708	Amoco Prod.	Buck Canyon	T. 17 S., R. 22 E., sec. 9	
4	7,343	43-007-30253	Paul T. Walton	Whitmore Unit #1	T. 12 S., R. 11 E., sec. 17		19	6,272	43-047-30708	Amoco Prod.	Blackhawk Canyon	T. 15 S., R. 24 E., sec. 31	
5	n.a.	n.a.	Bailey (1985)	Start Fee #1	T. 12 S., R. 12 E., sec. 28		20	7,287	05-045-02706	Amoco Prod.	Blackhawk Canyon	T. 14 S., R. 10 W., sec. 23	
6	n.a.	n.a.	Bailey (1985)	Soldier Canyon	T. 13 S., R. 12 E., sec. 18		21	6,417	05-045-02712	Targa Energy	Federal 1-23	T. 6 S., R. 10 W., sec. 23	
7	n.a.	n.a.	Bailey (1985)	Place Canyon	T. 12 S., R. 10 E., sec. 20		22	6,417	05-045-02712	Fuel Resources Development	Federal 1-30	T. 6 S., R. 10 W., sec. 30	
8	n.a.	n.a.	Bailey (1985)	#1 Fan Canyon	T. 14 S., R. 14 E., sec. 30, 31		23	7,395	05-045-02629	U.S. Geological Survey	USA-4 BMR	T. 10 S., R. 10 W., sec. 13	
9	n.a.	n.a.	Bailey (1985)	Horse Canyon	T. 12 S., R. 14 E., sec. 3, 10		24	6,030	05-045-02679	Masson Federal 20-1	Coal Gulch 15-9	T. 7 S., R. 10 W., sec. 20	
10	5,863	43-016-30060	Bow Valley Pet.	Book Cliffs	T. 12 S., R. 14 E., sec. 18		25	6,595	05-045-02671	Price Canyon	Coal Gulch 15-9	T. 8 S., R. 10 W., sec. 9	
11	n.a.	n.a.	Bailey (1985)	East of Woodside	T. 19 S., R. 17 E., sec. 4, 5, 7, 8		26	7,116	05-077-08651	Wahler S. Pass	Solo Federal 19-100	T. 9 S., R. 10 W., sec. 19	
12	n.a.	n.a.	Lashin (1988)	Green River area, east of Sand Knolls Canyon and south of Rattlesnake Canyon	T. 19 S., R. 16 E., sec. 26	The upper 200 ft of the Mancos Sh. were described east of Sand Knolls Canyon and the remaining strata were described south of Rattlesnake Canyon.	27	7,116	05-077-08618	Koch Exploration	Winter Flat 1-10-100	T. 9 S., R. 10 W., sec. 10	
13	n.a.	n.a.	Franzyk and others (1990)	Tusher Canyon	T. 20 S., R. 17 E., sec. 9, 13, 16	The Farnes, Tusher, and Woodbury Fms. were described by Franzyk and others (1990).	28	6,472	05-077-08615	Amoco Prod.	USA-4 BMR	T. 10 S., R. 10 W., sec. 8	
14	7,573	43-019-30809	Tenneco Oil	Rattlesnake State 2-12	T. 19 S., R. 18 E., sec. 15	The Castlegate, Soap, and Eagle Fms. were described by Lashin (1988).	29	4,840	05-077-08615	U.S. Geological Survey	CA-7-2	T. 10 S., R. 10 W., sec. 13	False interpretations are from our descriptions of core collected by Enger (1976).
15	8,028	43-019-30734	Tenneco Oil	Bogart Canyon 14-4	T. 19 S., R. 19 E., sec. 2	Dispositional interpretations of the Desert Mbr., Castlegate Ss., Buck Tongue, and Soap Ss. were given by Van Wagner and others (1990; fig. 28).	30	10,009	05-077-08271	Dynco Petroleum	Somersville #1	T. 11 S., R. 9 W., sec. 26	
							31	10,101	05-077-06151	Pacific Natural Gas	Smith 1-C	T. 11 S., R. 9 W., sec. 30	
							32	10,133	05-029-00031	Apache	Michelson-2	T. 11 S., R. 9 W., sec. 34	
							33	9,825	05-029-00001	Sunoco Midcontinent	Colorado Federal C-1	T. 12 S., R. 9 W., sec. 8	
							34	7,699	05-029-00027	Amoco Prod.	Bogart Canyon	T. 12 S., R. 9 W., sec. 15	
							35	7,043	05-051-00003	Price Canyon	Hatchline 3-11	T. 12 S., R. 9 W., sec. 11	
							36	7,469	05-051-00006	Delta Taylor	Pace Spentone 1	T. 11 S., R. 9 W., sec. 27	
							37	n.a.	n.a.	Coleton (1976, 1977)	Coal Basin area	T. 10 S., R. 10 W., sec. 13	



WESTERN PART OF CROSS SECTION A-A', UINTA BASIN, UTAH

STRATIGRAPHY OF THE UPPER CRETACEOUS MANCOS SHALE (UPPER PART) AND MESAVERDE GROUP IN THE SOUTHERN PART OF THE UINTA AND PICEANCE BASINS, UTAH AND COLORADO

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