DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-912
FIGURE FOUR SPRING QUAD., CO.

Base from U. S. Geological Survey, 1971

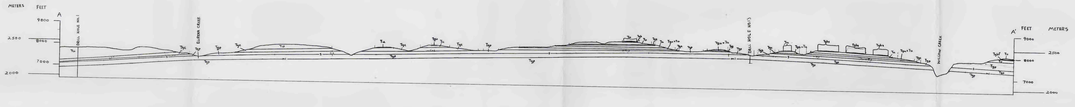
Geology mapped in 1975-76; assisted by James Turpan 1975, Stephen and Sarah Weaver 1976

SCALE 1:24000

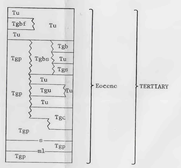
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION



CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal ALLUVIUM (HOLOCENE)

Tu UINTA FORMATION (EOCENE)—Mostly massive, gray, fresh, limonitic brown weathering mudstone, siltstone, and sandstone. Locally the sandstone has medium- to large-scale low-angle crossbedding

GREEN RIVER FORMATION (EOCENE)

Tgbf Marlstone at Bull Fork—Buff weathering, laminated marlstone with some massive, gray, fresh, limonitic brown weathering mudstone, siltstone, and sandstone. Marlstone generally averages less than 5 gallons of oil per ton (21 L/tonne). Found only in the south-central part of the quadrangle. Grades to the north into Uinta Formation. About 10 to 15 meters thick

Tgb Marlstone at Barnes Ridge—Buff weathering laminated marlstone generally averaging less than 5 gallons of oil per ton (21 L/tonne); joins with the Stewart Gulch Tongue in the southeastern part of the quadrangle and with the Parachute Creek Member in the southeast (fig. 1). About 5 to 8 meters thick

Tgs Stewart Gulch Tongue—Buff weathering laminated marlstone averaging about 5 gallons of oil per ton (21 L/tonne) with thin zones averaging as much as about 20 gallons of oil per ton (83 L/tonne). Oil content generally increases to the south. Joins with the marlstone at Barnes Ridge in the southeast part and with the Parachute Creek Member in the southwest part of the quadrangle (fig. 2). Commonly contains concretions of radiating intergrowths of calcite and quartz as much as 20 cm in diameter. About 7 meters thick

Tgbo Marlstone at Barnes Ridge and Stewart Gulch Tongue—Combined unit of Stewart Gulch Tongue, marlstone at Barnes Ridge, and the intervening thin tongue of Uinta lithology. Joins the Parachute Creek Member in the southwest. About 20 meters thick

Tgu Unnamed tongue—Buff weathering laminated marlstone intercalated with some gray, fresh, limonitic brown weathering massive mudstone, siltstone, and sandstone. Marlstone averages less than 5 gallons of oil per ton (21 L/tonne) in the north but becomes richer to the south, averaging about 10 gallons of oil per ton (42 L/tonne) on the south end of Red Point. Grades northward into Uinta Formation and joins with the Parachute Creek Member to the south (fig. 3). Locally removed by channeling. About 3 to 20 meters thick and thickens to the north

Tgc Coughs Creek Tongue—Laminated buff weathering marlstone intercalated with gray, fresh, limonitic brown weathering mudstone, siltstone, and sandstone. Thin zones of marlstone average as much as about 30 gallons of oil per ton (125 L/tonne). Beds which may be equivalent to the Black Sulphur Tongue of the Green River are included in the Coughs Creek Tongue in the extreme northern part of the quadrangle (fig. 4 and measured sections). The Coughs Creek Tongue appears to be removed by channeling for about 2 miles along East Town Creek and was not mapped. Joins the Parachute Creek Member in the southwestern corner of the quadrangle (fig. 4). Only the top is shown. From about 10 to 80 meters thick and thickens northward

Tgp Parachute Creek Member—Main body of Green River Formation mostly buff weathering laminated, oil-rich marlstone with some gray, fresh, limonitic yellow weathering mudstone, siltstone, and sandstone. The upper contact rises stratigraphically to the southwest (see measured sections). The base is not exposed

-s- Stillwater oil shale zone—Only top is shown

-m1- Mahogany oil shale ledge—Only top is shown. Equivalent to Mahogany zone in subsurface

DRILL HOLE—Queried where approximately located

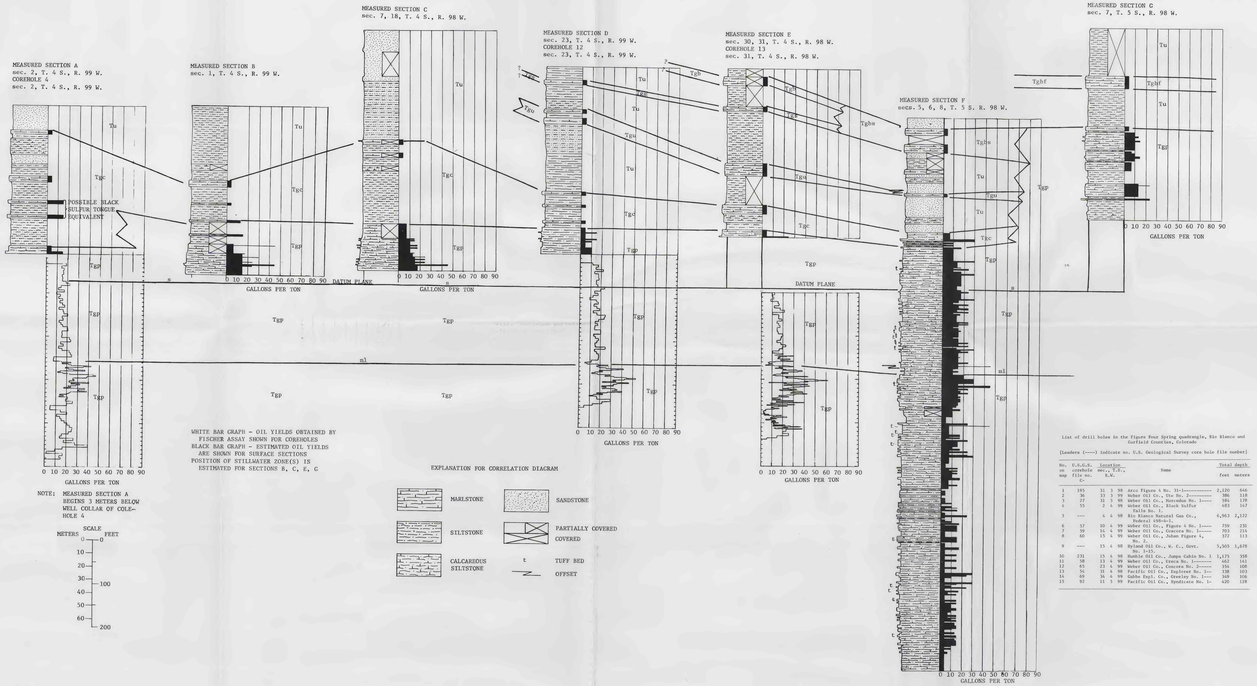
CONTACT

ANTICLINE—Showing crestline and direction of plunge

SYNCLINE—Showing troughline and direction of plunge

8000 — STRUCTURE CONTOURS—Drawn on top of Mahogany ledge. Contour interval 100 feet (30.5m)

A TRACE OF MEASURED SECTION



WHITE BAR GRAPH - OIL YIELDS OBTAINED BY FISCHER ASSAY SHOWN FOR COREHOLES
BLACK BAR GRAPH - ESTIMATED OIL YIELDS ARE SHOWN FOR SURFACE SECTIONS
POSITION OF STILLWATER ZONE(S) IS ESTIMATED FOR SECTIONS B, C, F, G

NOTE: MEASURED SECTION A BEGINS 3 METERS BELOW WELL COLLAR OF COLE-HOLE 4

SCALE
METERS 0 — FEET 0
10
20
30 — 100
40
50
60 — 200

EXPLANATION FOR CORRELATION DIAGRAM

MARLSTONE
SANDSTONE
SILTSTONE
PARTIALLY COVERED
COVERED
CALCAREOUS SILTSTONE
TUFF BED
OFFSET

List of drill holes in the Figure Four Spring quadrangle, Rio Blanco and Garfield Counties, Colorado.

[Leaders (----) indicate no. U.S. Geological Survey core hole file number]

No. on map	U.S.G.S. core hole file no.	Location Sec.	T.S.	R.W.	Name	Total depth feet	meters
1	195	31	3	98	Arco Figure 4 No. 31-1	2,130	644
2	27	11	5	98	Weber Oil Co., Cole No. 1	1,000	305
3	21	31	5	98	Weber Oil Co., Horsebar No. 1	386	118
4	55	2	4	99	Weber Oil Co., Black Sulfur Fed. No. 1	683	517
5	----	4	4	98	Rio Blanco Natural Gas Co., Coughs No. 1	6,863	2,127
6	57	30	4	99	Weber Oil Co., Figure 4 No. 1	759	231
7	59	31	4	99	Weber Oil Co., Genesee No. 1	703	214
8	60	15	4	99	Weber Oil Co., Johns Figure 4, No. 1	572	174
9	----	15	4	98	Hyland Oil Co., W. C., Govt. No. 1	5,905	1,678
10	231	15	4	98	Pumbia Oil Co., Jumpo Cabin No. 1	4,171	398
11	58	13	4	99	Weber Oil Co., Trees No. 1	662	161
12	56	23	4	99	Weber Oil Co., Coughs No. 1	1,000	305
13	52	31	4	98	Pacific Oil Co., Gulfport No. 1	338	103
14	49	34	4	99	Gabbs Expl. Co., Greeley No. 1	348	106
15	52	11	3	99	Pacific Oil Co., Speakman No. 1	420	128

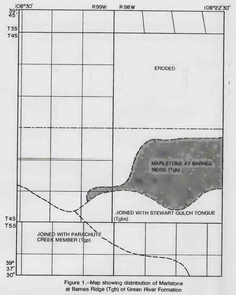


Figure 1.--Map showing distribution of Marlstone at Barnes Ridge (Tgb) of Green River Formation

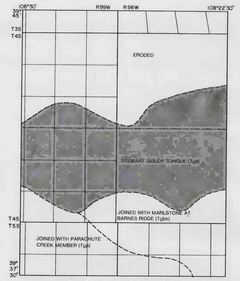


Figure 2.--Map showing distribution of Stewart Gulch Tongue (Tgs) of Green River Formation

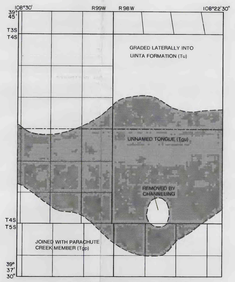


Figure 3.--Map showing distribution of unnamed tongue (Tgu) of Green River Formation

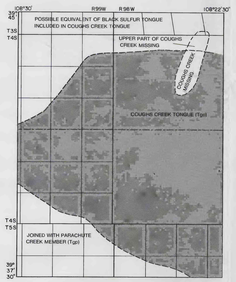
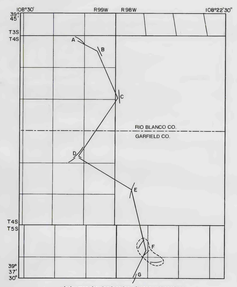


Figure 4.--Map showing distribution of Coughs Creek Tongue (Tgc) of the Green River Formation



Index map showing location of measured sections

PRELIMINARY GEOLOGIC MAP OF THE FIGURE FOUR SPRING QUADRANGLE, RIO BLANCO AND GARFIELD COUNTIES, COLORADO

By
Ronald C. Johnson

1977

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