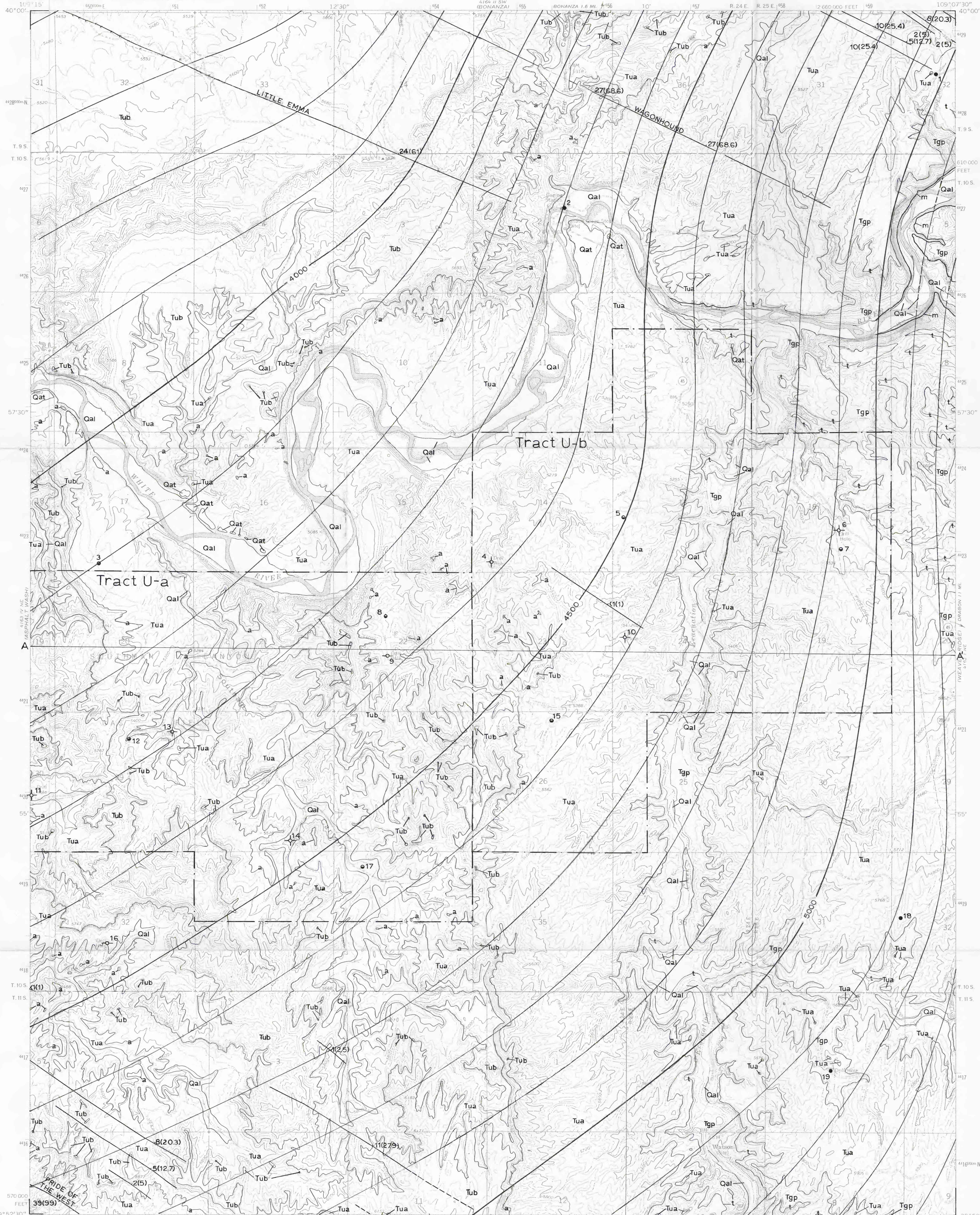


DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES  
MAP MF-579



CORRELATION OF MAP UNITS		
Qal	Holocene	QUATERNARY
Qat	Holocene and Pleistocene	
Tub	Eocene	TERTIARY
Tua		
a		
Tgp		
t		
Tgd		
Tw		

DESCRIPTION OF MAP UNITS

- Qal ALLUVIUM (HOLOCENE)—Unconsolidated silt, sand, and gravel
- Qat TERRACE DEPOSITS (HOLOCENE AND PLEISTOCENE)—Cobbles and pebbles of gray and tan quartzite and chert in a matrix of fine sand
- UNITA FORMATION (EOCENE)
- Unit B—Yellow-gray massive very fine grained to medium-grained sandstone, greenish-gray siltstone, and a few lenses of pebble conglomerate. A sequence of red shale and siltstone about 30 feet (9 m) thick occurs approximately 450 feet (137 m) above base. Unit weathers to yellow-brown cliffs and ledges and greenish-gray slopes. Basal contact of unit is at the base of a yellow-orange-weathering tuffaceous bed 2-6 feet (0.6-1.8 m) thick that caps prominent benches and buttes. This bed is evidently the uppermost part of the columnar sandstones of Riggs (1912). The basal contact is approximately the same as the contact between unit A and unit B as selected by Osborn (1929, fig. 63). Lower 600 feet (183 m) of unit is exposed in the quadrangle
- Unit A—Yellow-gray very fine grained sandstone, yellow-gray siltstone, and gray marlstone. Sandstone is medium to massively bedded and many sandstone beds in lower 200 feet (61 m) are contorted. Unit A weathers to yellow-brown and yellow-orange cliffs and ledges and gray slopes. Lower contact is conformable with Green River Formation although contact is undulatory. Uneven contact is result of plastic flowage or foundering of tuffaceous basal sandstones that rest on marlstone. Unit A is about 740 feet (226 m) thick
- Tuffaceous bed—Massive, yellow-orange weathering; about 6 feet (1.8 m) thick; occurs about 185 feet (56 m) below top of unit A and crops out prominently in cliffs and benches. Lower contact only is shown on map but not on cross section
- GREEN RIVER FORMATION (EOCENE)
- Tgp Parachute Creek Member—Gray and yellow-brown marlstone and dark-gray and brown oil shale; numerous thin beds of yellow-brown tuff and some thin beds of yellow-brown siltstone. Upper part contains small pods and lenses of nahcolite (NaHCO<sub>3</sub>) as indicated by solution cavities on outcrop. Most strata are laminar to thin bedded with many varved oil-shale sequences. A rich oil-shale sequence, the Mahogany zone (Mahogany ledge on outcrop), is about 100 feet (30 m) thick and occurs 500 feet (152 m) below top of the member. Member includes all strata formerly assigned to the Evacuation Creek Member (Cashion and Donnell, 1974). Weathers to light-gray and yellow-brown slopes and blue-gray and yellow-brown cliffs and ledges. Upper 700 feet (213 m) of member is exposed in quadrangle
- Yellow-orange-weathering ledge-forming sequence—Interbedded marlstone and contorted tuffaceous beds 10-50 feet (3-15 m) thick about 400 feet (122 m) above the Mahogany oil-shale bed. Only the base is shown on map and section
- Mahogany oil-shale bed—The richest bed in the Mahogany zone; approximately 10 feet (3 m) thick; lies about 40 feet (12 m) below top of Mahogany zone
- Tgd Douglas Creek Member—Yellow-brown and gray algal and oolitic limestone, gray and brown sandstone and siltstone; some gray ostracodal shale and limestone. Contains some thin beds of oil shale. Lower part includes beds equivalent to the Garden Gulch Member in the Piceance Creek basin. Shown on section only
- Tw WASATCH FORMATION, MAIN BODY (EOCENE)—Gray and red claystone and mudstone, and brown and gray sandstone and siltstone. Intertongues with the Green River Formation. Shown on section only

- CONTACT—Boundaries of Quaternary alluvium (Qal) and terrace deposits (Qat) approximately located
- 14(355) GILSONITE VEIN—Showing measured width, in inches (centimeters). Identified by name on map. Dashed where indefinite
- STRUCTURE CONTOURS—Drawn on top of Mahogany oil-shale bed. Dashed where bed is eroded. Contour interval 100 feet. Datum is mean sea level
- 18 CORE HOLE—Drilled to evaluate oil-shale beds. Oil-shale assay results reported by Stanfield and others (1964). Number keyed to list of core holes and exploratory wells
- 12 CORE HOLE—Drilled to evaluate oil-shale beds in tracts selected for prototype oil-shale leasing program. Oil-shale assay results confidential. Number keyed to list of core holes and exploratory wells
- 5 DRY HOLE—Oil and gas test. Number keyed to list of core holes and exploratory wells
- SHUT-IN GAS WELL—Number keyed to list of core holes and exploratory wells
- TRACT BOUNDARY—Selected for prototype oil-shale leasing program. Boundary approximately located. Tracts are designated U-a and U-b (U.S. Dept. of the Interior, 1973)

ECONOMIC GEOLOGY

Gilsonite, oil, gas, oil shale, and bituminous sandstone occur in and around the Southam Canyon quadrangle, but only gilsonite has been produced in the quadrangle. Gilsonite, a solid hydrocarbon which occurs principally in vertical fractures, has been mined from the Little Emma, Wagonhound, and Pride of the West veins. The characteristics of gilsonite veins are described by Cashion (1967, p. 30-36). Part of a small gas field, the Southam Canyon field, lies within the quadrangle. Gas occurs in lenticular sandstones of the Wasatch Formation, and gas and oil occur in sandstones of the Mesaverde Formation. There are two shut-in wells in the quadrangle, and no producing wells. Of the numerous oil-shale zones in the Parachute Creek Member of the Green River Formation, the thickest and richest is the Mahogany zone (Mahogany ledge on outcrop). In the northwestern part of the quadrangle, a 100-foot-thick (30.5 m) sequence in the Mahogany zone may yield as much as 25 gallons (94.6 liters) of oil per ton. Minor deposits of bitumen occur in sandstones of the Uinta Formation. Most of these occurrences are associated with gilsonite veins, and impregnations extend only short distances outward from vein walls. Nahcolite found thus far in the quadrangle is in the form of small pods and thin lenses and probably has no value. Analclime is found in some thin tuffaceous beds in the quadrangle, but no other zeolite has been noted.

REFERENCES

- Cashion, W. B., 1967, Geology and fuel resources of the Green River Formation, southeastern Uinta Basin, Utah and Colorado: U.S. Geol. Survey Prof. Paper 548, 48 p.
- Cashion, W. B., and Donnell, J. R., 1974, Revision of nomenclature of the upper part of the Green River Formation, Piceance Creek basin, Colorado, and eastern Uinta Basin, Utah: U.S. Geol. Survey Bull. 1394-G (in press).
- Osborn, H. F., 1929, The titanotheres of ancient Wyoming, Dakota, and Nebraska: U.S. Geol. Survey Mon. 55, v. 1, 701 p.
- Riggs, E. S., 1912, New or little known titanotheres from the lower Uinta formations: Field Museum Pub. 159, Geol. ser., v. 14, no. 2, p. 17-41.
- Stanfield, K. E., Smith, J. W., and Trudell, L. G., 1964, Oil yields of sections of Green River oil shale in Utah, 1952-62: U.S. Bur. Mines Rept. Inv. 6420, 217 p.
- U.S. Department of the Interior, 1973, Final environmental statement for the prototype oil-shale leasing program: Washington, U.S. Dept. Interior, 6 volumes.

List of core holes and exploratory wells drilled in Southam Canyon quadrangle

Map No.	Company	Hole name and No.	Total depth Feet	Meters
1	National Farmers Union Exploration Co.	Core hole 2-----	560	170.7
2	Shell Oil Co.	Core hole 1-----	704	214.6
3	Gulf Mineral Resources Co.	Southam 4-----	(*)	-----
4	Continental Oil	Watson 2-----	3,315	1,010.4
5	Gulf Mineral Resources Co.	Evacuation 1-----	(*)	-----
6	Moab Drilling Co.	Gem 2-----	6,509	1,983.9
7	Gulf Mineral Resources Co.	Evacuation 2-----	(*)	-----
8	-----do-----	Southam 1-----	(*)	-----
9	Moab Drilling Co.	Gem 1-----	6,160	1,877.6
10	Continental Oil	Watson 1-----	4,249	1,295.0
11	El Paso Natural Gas Co.	Southam Canyon 6	7,082	2,158.6
12	Gulf Mineral Resources Co.	Southam 3-----	(*)	-----
13	El Paso Natural Gas Co.	Southam Canyon 4	6,031	1,838.2
14	-----do-----	Southam Canyon 5	7,047	2,147.9
15	Gulf Mineral Resources Co.	Evacuation 3-----	(*)	-----
16	Shell Oil Co.	Southam Canyon 8	7,028	2,142.1
17	Gulf Mineral Resources Co.	Southam 2-----	(*)	-----
18	National Farmers Union Exploration Co.	Core hole 9-----	1,122	342.0
19	Skyline Oil Co.	Watson 1-----	503	153.3

(\*) Confidential information.

GEOLOGIC MAP OF THE SOUTHAM CANYON QUADRANGLE,  
UINTAH COUNTY, UTAH

By  
W. B. Cashion  
1974