UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the
ROUTT COUNTY REGIONAL PLANNING COMMISSION
ROUTT COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

WATER-RESOURCES INVESTIGATIONS OPEN-FILE REPORT 80-956
PLATE 1 (SOUTH SHEET)

Base from U.S. Geological Survey
1:50 000 Routt County, 1975

Table 1.--PHYSICAL AND HYDROLOGIC CHARACTERISTICS OF THE GEOLOGIC UNITS
[Modified from Brogden and Giles, 1977]

System	Series	Geologic unit	Symbol	Maximum thickness (feet)	Physical characteristics	Hydrologic characteristics
QUATERNARY	Holocene Pleistocene	Unconsolidated surficial deposits	Qsd	100 (estimated)	Unconsolidated surficial deposits include alluvial, landslide, glacial, and talus deposits. Material ranges in size from clay to large boulders and consists of both angular and well-rounded to sub-rounded rocks, depending primarily upon type of deposit, rock type, and source material.	Reported well yields are as much as 900 gal/min from alluvial deposits. Well depths range from 8 to 100 ft. Depths to water in 27 wells ranged from 0 to 46.8 ft in 1978; two wells were flowing.
TERTIARY	Pliocene	Extrusive and intrusive rocks	Tei	Unknown	Extrusive rocks are primarily olivine basalt with some light-colored tuffs and bouldery volcanics present. The basalts are both massive and vesicular in texture. Intrusive rocks vary from granodiorite to gabbro in composition.	No information available. Not considered an aquifer.
	Miocene	Browns Park Formation	Tbp	2,000	Varying proportions of semiconsolidated siltstone, sandstone, and conglomerate. Volcanic ash present locally. The sandstones are yellowish brown to chalky white, soft, friable, and lightly calcareous. Other beds are more resistant and weather with a characteristic lumpy or jagged surface.	Reported well yields are as much as 25 gal/min. Well depths range from 15 to 800 ft. Depths to water in 30 wells ranged from 0.9 to 270 ft in 1978.
	Eocene	Wasatch Formation	Tw	5,000	Varicolored shale and sandstone with interbedded conglomerate and coal. The medium- to coarse-grained fluvial arkosic sandstones form resistant horizons giving a "badlands-type" topography. Occurs only in about a 50-mi² area in northwestern part of Routt County.	No wells known to be completed in Wasatch Formation in Routt County. Reported well yields are as much as 25 gal/min in Moffat County.
	Paleocene	Fort Union Formation	Tfu	1,500	Interbedded sandstone, shale, and lignitic coal. Sandstones are light brown to gray, fine to medium grained, and locally ferruginous. A basal chert-pebble conglomerate conformably overlies the Lance Formations. Occurs only in three small areas totaling about 3 mi² in west-central part of Routt County.	No wells known to be completed in Fort Union Formation in Routt County. Reported well yields are as much as 25 gal/min in Moffat County.
CRETACEOUS	Upper Cretaceous	Lance Formation	Kl	1,500	Interbedded gray shale, sandstone, and coal. The sandstones vary from a light-brown, soft, fine-grained sandstone in the eastern part of the area to a white to gray, coarse-grained, ledge-forming sandstone in the western part. Fossil identification in the lower part of the formation indicates a marine environment similar to that of the Lewis Shale as opposed to the overlying fresh-water deposits.	Little information available. Reported well yields are no greater than 5 gal/min or less.
		Lewis Shale	Kls	1,900	Dark-gray to blue, homogenous, marine shale with several thin interbedded sandstones and calcareous concretions.	Reported well yields are less than 5 gal/min. Well depths range from 15 to 200 ft. Depths to water in three wells ranged from 0.7 to 16 ft in 1978.
		Mesaverde Group: Williams Fork Formation	Kmv	2,100	Sandstone, light-brown to grayish-white, with interbedded gray carbonaceous shale, coal, and clinker beds. The coal beds are of economic importance and more numerous that those of the Iles Formation. The very fine to fine-grained light-gray to white, massive, crossbedded Twentymile Sandstone Member is a prominent ledge-forming sandstone about 800 to 900 ft above the base of the formation.	Reported well yields are as much as 100 gal/min, but average less than 10 gal/min. Well depths range from 12 to 1,100 ft. Depths to water in six wells ranged from 1.8 to 150 ft in 1978.
		Mesaverde Group: Iles Formation		1,500	Interbedded light-brown to white, massive, fine-grained, ledge-forming sandstone, brown to black carbonaceous shale, sandy shale, and coal. The Trout Creek Sandstone Member, a 50- to 100-ft thick, light-brown to light-gray, fine-grained, massive sandstone, is located at the top of the formation.	
	Upper and Lower Cretaceous	Mancos Shale	Km	5,300	Light-gray to dark-gray fossiliferous marine shale with interbedded sandstones and limestones. The sandstones are generally thin bedded, fine grained, tan, and fossiliferous, and form resistant ledges in ledges in the basal and upper parts of the formation. The overall area occupied by the Mancos Shale is characterized by a rolling hummocky topography.	Reported well yields are less than 5 gal/min. Well depths range from 12 to 466 ft. Depths to water in 18 wells ranged from 1.0 to 190 ft in 1978.
CRETACEOUS TO PRECAMBRIAN	Cretaceous to Precambrian	Dakota Sandstone Morrison Formation Sundance Formation Chinle Formation Chugwater Formation Sawatch Quartzite and crystalline rocks undivided	KpCu	Unknown	Sedimentary rocks in this age category have a wide range of character, but consist primarily of interbedded and vari-colored sandstones, shales, limestones, and conglomerates. Igneous and metamorphic rocks also vary considerably, with felsic and biotite gneisses, amphibolites, and granitic rocks being predominant.	Little information available. Yields are estimated to be less than 10 gal/min. Well depths ranged from 7 to 2,500 ft. Depths to water in four wells ranged from 3 to 12 ft in 1978; 2,500-ft well was flowing.

EXPLANATION

CONTACT

28 WELL SAMPLED IN 1978 – Shows water-quality data obtained at site and chemical analysis listed in table 5 by corresponding number

90 WELL SAMPLED IN 1978 – Shows water-quality data obtained at site listed in table 6 by corresponding number

71 SPRING SAMPLED IN 1978 – Shows water-quality data obtained at site listed in table 6 by corresponding number

SYMBOL FOR CONSTITUENT THAT EXCEEDED WATER-QUALITY STANDARDS FOR PUBLIC-WATER SUPPLIES

As	Arsenic
Cl	Chloride
F	Fluoride
Fe	Iron
Mn	Manganese
N	Nitrite plus nitrate as N
pH	pH
Se	Selenium
SO_4	Sulfate
FC	Fecal coliform
DS	Dissolved solids

1 ½ 0 1 2 3 4 5 MILES
1 .5 0 1 2 3 4 5 KILOMETERS

Geology modified from Miller, 1975

MAP SHOWING LOCATION OF PRINCIPAL AQUIFERS AND WELLS AND SPRINGS FOR WHICH WATER-QUALITY DATA WERE DETERMINED IN 1978, ROUTT COUNTY, NORTHWESTERN COLORADO (SOUTH SHEET)

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