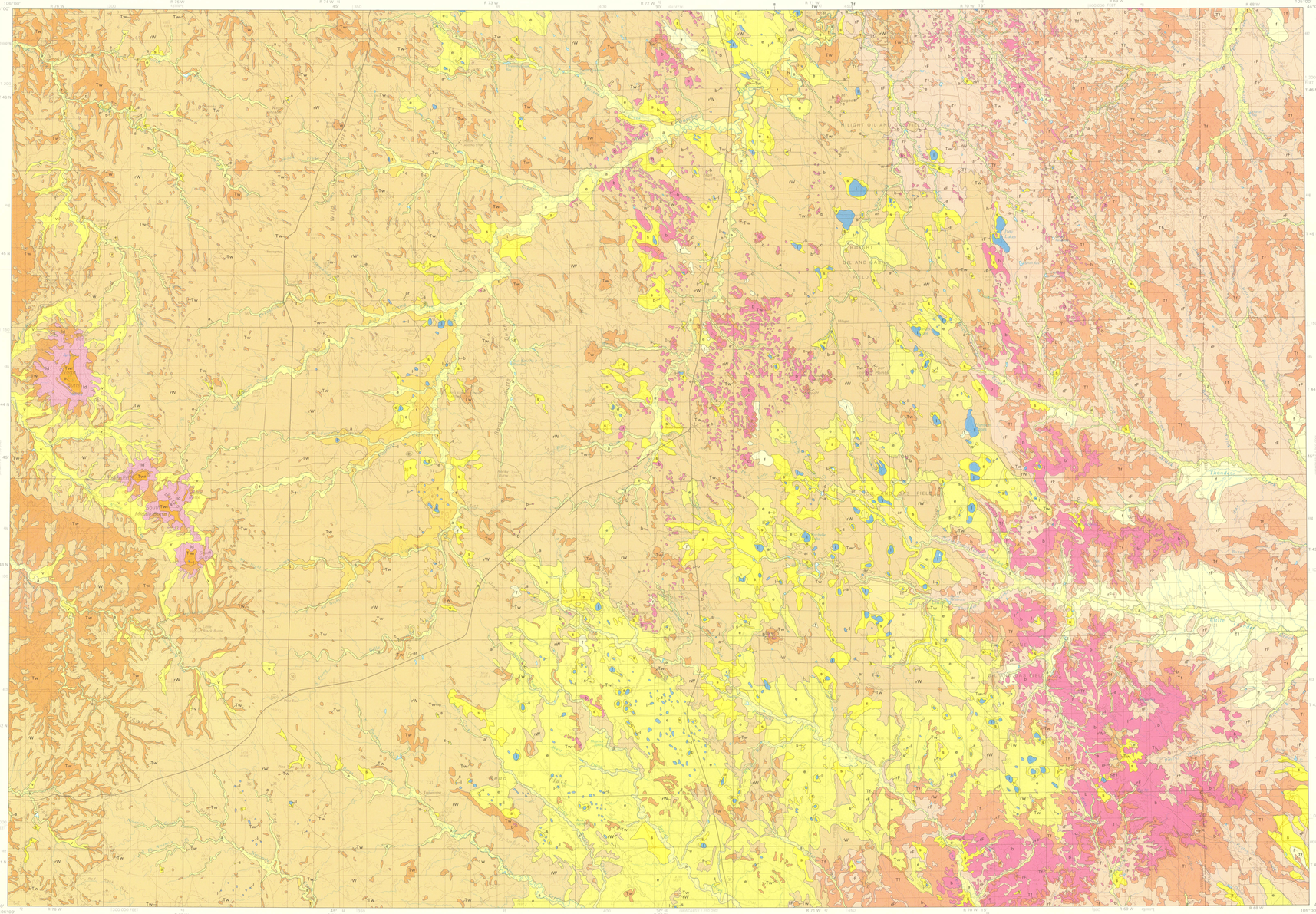


Base from U.S. Geological Survey, 1974
10,000-meter Universal Transverse Mercator grid, zone 13
50,000-foot grid ticks based on Wyoming coordinate system, east zone

APPROXIMATE MEAN DECLINATION, 1987

SCALE 1:100 000

MILES

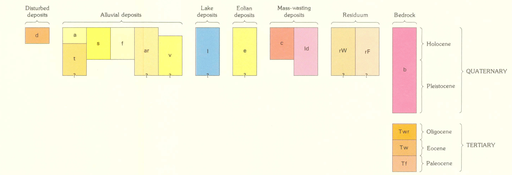
KILOMETERS

CONTOUR INTERVAL 100 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

Surficial geology compiled in 1979-81

CORRELATION OF MAP UNITS



INTRODUCTION

Knowledge of the distribution and properties of unconsolidated surficial materials is essential if informed decisions on land use are to be made. Surficial materials in the Reno Junction 30′ x 60′ quadrangle are derived primarily from underlying bedrock, which consists mainly of soft shale, sandstone, coal beds, and clinker (rock that has been baked when coal beds have burned). Most of these rocks weather to fine-grained material. The physical and chemical properties of the weathered materials depend upon the following: (1) the characteristics of the parent rocks; (2) the chemical and mechanical weathering processes that have acted on the rocks; and (3) the modes of transportation and deposition, whether by wind, water, or gravity, that account for the present position of the weathered materials.

The information on this map was compiled from various sources listed in the Sources of Surficial Geologic Data. The contact between the Fort Union Formation and the Wasatch Formation was mapped by N. E. Dresen (written communs., 1979, 1981). Contacts were extended from the area of detailed field mapping primarily by interpretation of features on vertical aerial photographs; both 1:80,000 scale black-and-white and 1:24,000 scale natural color photographs were used. These contacts were later field checked and adjusted as necessary. Description and extent of bedrock material are modified from Sharp and Gibbons (1964) and Sharp and others (1964). Descriptions of the surficial and bedrock materials and of the processes that formed them are listed in table 1; table 2 shows special characteristics and limitations of these units.

DISCLAIMER

The Surface Mining Control and Reclamation Act (U.S. Congress, 1977) defines "alluvial valley floors" as "the unconsolidated stream laid deposits holding streams where water availability is sufficient for subirrigation or flood irrigation agricultural activities but does not include upland areas which are generally overlain by a thin veneer of colluvial deposits composed chiefly of debris from sheet erosion, deposits by unconcentrated runoff or slope wash, together with talus, other mass movement accumulation and windblown deposits."

Some of the higher terraces, as well as some of the valley bottoms of ephemeral streams, that were mapped as flood-plain and low-terrace alluvium (unit a) on this map may not fit that definition. Although this map shows where "alluvial valley floors" may exist, the geologic definition is different from the legal definition and detailed on-site mapping would be required in order to delineate the boundaries for regulatory purposes.

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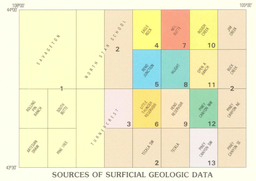
U.S. Congress, 95th, 1977, Surface mining control and reclamation act of 1977: U.S. Public law 95-87, 91 STAT. 516, Title VII, Sec. 701.



SOURCES OF SURFICIAL GEOLOGIC DATA

SOURCES OF SURFICIAL GEOLOGIC DATA

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2. Coates, D. A., 1981, airphoto interpretation and unpublished field reconnaissance.
3. _____1978, Surficial geologic map of the Turnercrest NE quadrangle, Campbell County, Wyoming: U.S. Geological Survey Miscellaneous Field Studies Map MF-1020, scale 1:24,000.
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11. _____1978, Surficial geologic map of the Open A Ranch quadrangle, Campbell County, Wyoming: U.S. Geological Survey Miscellaneous Field Studies Map MF-938, scale 1:24,000.
12. _____1978, Surficial geologic map of the Piney Canyon NW quadrangle, Campbell County, Wyoming: U.S. Geological Survey Miscellaneous Field Studies Map MF-955, scale 1:24,000.
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Table 2.—Special characteristics and limitations of map units

[A, generally or always; B, sometimes; leaders (---), rarely or never]

Symbol unit	Suitable for aggregate	Potential source of sand	Subject to seasonal flooding or high water table	Forms deep gumbo when wet	Contains swelling clay	Generally rough terrain	Arable land	Steep slopes likely to be unstable	Subject to wind and sheet erosion	Difficult to excavate
d	---	---	---	B	B	---	---	B	B	---
a	B	B	A	---	---	---	B	---	B	---
s	---	---	B	B	B	---	B	---	B	---
f	---	---	B	B	---	---	---	---	---	---
ar	B	B	---	---	---	---	B	---	B	---
v	---	---	B	---	---	---	B	---	B	---
t	B	A	---	---	---	---	A	---	B	---
l	---	---	A	A	B	---	---	B	B	---
e	A	---	---	---	---	---	B	B	A	---
c	---	---	---	---	---	A	---	A	---	---
ld	---	---	---	---	---	A	---	A	---	A
rW	---	B	---	B	---	---	B	---	B	---
rF	---	---	---	A	B	---	---	B	B	---
b	A	---	---	---	B	---	B	B	---	A
Twr	A	B	---	---	---	A	---	A	B	A
Tw	---	B	---	B	B	A	---	B	---	B
Tf	---	---	---	A	B	A	---	A	---	B

Table 1.—Characteristics of map units

[Leaders (---) indicate that thickness and slope of deposit were not measured]

Map unit	Name and age of unit	Description of unit	Origin of unit	Typical position in landscape	Common thickness (meters)	Common slope (percent)
			DISTURBED DEPOSITS			
d	DISTURBED DEPOSITS (HOLOCENE)	Primarily artificial fill consisting of disturbed soil and rock.	Mining and construction operations. Mapped only where terrain modifications obscure nature of natural surficial deposits.	Coal mines, drilling sites, and fill. Unit more extensive than shown owing to mining after completion of mapping.	---	---
			ALLUVIAL DEPOSITS			
a	FLOOD-PLAIN AND LOW-TERRACE ALLUVIUM (HOLOCENE)	Sand and silt interbedded with crossbedded gravel lenses. Pebbles of sandstone, ironstone, fossil wood, and lithologies derived from White River Formation (Twr) are common.	Deposition of channel and overbank sediments by streams. Some sediments occur as terraces isolated by incision of streams. Modern flood plains generally flooded at least every 2–3 years; the lowest terrace may be inundated by exceptionally large floods.	Flood plains and low terraces as much as 3 m above streambeds.	1.5–8	0–4
s	SHEETWASH ALLUVIUM (HOLOCENE)	Sand, silt, and clay with minor interbeds of gravel. Mostly reworked material derived from higher slopes. Includes small areas of residuum (rF, rW) and eolian deposits (e).	Deposition by unchanneled flow of water (sheetwash) on lower hillslopes and in depressions.	In gently sloping valley bottoms and in upland depressions. Commonly associated with eolian deposits.	0.3–1.5	1–4
f	FAN AND PEDIMENT DEPOSITS (HOLOCENE)	Upper 0.3–3 m commonly sheetwash alluvium (s); commonly grades downward into stream alluvium of sand and silt containing abundant small lenses of angular to subangular gravel. On pediments, sheetwash alluvium may overlie bedrock.	Deposited by ephemeral streams and by sheetwash. Fan-shaped surface formed primarily by deposition, but some areas were cut on bedrock and thinly veneered with alluvium.	Gently sloping fan-shaped or coalescing fan-shaped surfaces at base of moderate to steep slopes.	1–5	1–5
ar	RESIDUAL GRAVEL (HOLOCENE AND PLEISTOCENE?) AND WEATHERED BEDROCK	Discontinuous patches of stream deposits composed of sand, silt, and gravel which occur with residuum. Pebbles of sandstone, ironstone, fossil wood, and lithologies derived from White River Formation (Twr) are common.	Deposited by streams before valleys were incised to their present levels. Some deposits may be remnants of alluvium mapped elsewhere as unit t.	On rolling terrain and upper parts of valley sides in southeast part of quadrangle. Caps bluffs or hills 15–25 m above present stream courses of Belle Fourche River drainage.	1–5	3–10
v	VALLEY-FILL DEPOSITS (HOLOCENE AND PLEISTOCENE?)	Silt, clay, and some sand, occasionally interbedded with gravel lenses. Gravels consist of small, commonly iron stained pebbles of sandstone, ironstone, and locally lithologies derived from the White River Formation (Twr). Close to Pumpkin Buttes, boulders of conglomerate from White River Formation commonly found at surface, but may also occur at depth, interbedded with finer sediments.	Sediments filled valleys cut in Wasatch Formation (Tw), and at times lapped onto aggrading valley bottom from valley walls. Deposition was primarily by streams and sheet wash, although near Pumpkin Buttes, conglomerate boulders suggest landslides from flanks of buttes. After deposition, fill was incised. In most valleys, a second younger fill was deposited within cuts in older fill, and was then reincised by streams.	Surrounding Pumpkin Buttes, mainly on west side. Some valley fills grade headward into bouldery fan-shaped deposits.	1.5–20	0–15
t	HIGH-TERRACE ALLUVIUM (HOLOCENE AND PLEISTOCENE?)	Sand and silt interbedded with crossbedded gravel lenses. Pebbles of sandstone, ironstone, fossil wood, and lithologies derived from White River Formation (Twr) are common.	Deposition of channel and overbank sediments by streams before their incision to present levels. Above level of present-day flooding.	Unit includes alluvium on two terrace levels cut on bedrock or older alluvium. Lower terrace lies 5–25 m above Belle Fourche River, and 3–20 m above smaller tributaries. Upper terrace lies 5–7 m above the lower terrace. Greater heights above present streambed occur on uppermost reaches of Belle Fourche River, and decrease rapidly to lesser heights downstream. Two terrace levels on Pumpkin Creek drainage north of Pumpkin Buttes lie about 7 and 30 m, respectively, above present streambeds. Terraces in valleys draining to the southeast lie 3–10 m above streams.	1.5–8	0–4
			LAKE DEPOSITS			
l	LAKE AND POND DEPOSITS (HOLOCENE AND PLEISTOCENE?)	Massive to thinly bedded gray clay and silt; white alkali visible in some places.	Deposition of sediments in ephemeral lakes that formed in natural depressions. Sediments transported by wind and sheetwash.	Natural closed depressions in gentle terrain, commonly associated with eolian deposits (e).	1–5	0–1
			EOLIAN DEPOSITS			
e	EOLIAN DEPOSITS (HOLOCENE AND PLEISTOCENE?)	Sand occurring in dunes or sand and silt in discontinuous sheets of irregular thickness blanketing the terrain. Massive to faintly bedded. Includes small areas of residuum (rW).	Dunes formed by deposition of sand derived from poorly cemented outcrops of sandstone in Wasatch Formation (Tw) and from alluvium in stream valleys; now stabilized by grass. Sheets of sand and silt (loess) deposited in extensive areas.	Common in gently rolling uplands in southern and east-central parts of map area.	0.5–5	0–15
			MASS-WASTING DEPOSITS			
c	COLLUVIUM (HOLOCENE)	Angular bedrock fragments as large as boulders mostly of baked and fused rock (b) in an unsorted matrix of sand, silt, and clay. Locally includes small areas of baked and fused rock, residuum (rW, rF), and small or indistinct landslide deposits (ld).	Movement downslope by rockfall and sliding over moderate to steep slopes.	Steep slopes flanking hills or plateaus capped by baked and fused rock.	1–7	10–75
ld	LANDSLIDE DEPOSITS (HOLOCENE AND PLEISTOCENE)	Blocks of conglomerate, sandstone, and siltstone that have been moved, broken, and mixed with finer sediments. Characterized by hummocky terrain; bounded upslope by crescentic scarps and downslope by lobate toes.	Movement downslope by slumping and earth flow. Some older landslide deposits are vegetated and their topography has been modified by erosion; younger landslide deposits have fresh scarps and little vegetation.	On steep slopes surrounding Pumpkin Buttes.	5–30	10–50
			RESIDUUM			
rW	RESIDUUM ON WASATCH FORMATION (HOLOCENE AND PLEISTOCENE?)	Sandy and silty with variable clay content. Grades downward into unweathered Wasatch Formation (Tw). May contain sheetwash alluvium (s) or eolian deposits (e) in upper 1 m. May include small areas of Wasatch.	Material derived from weathering of Wasatch Formation in place; may be distributed by sheetwash, soil creep, and erosion or deposition by wind.	Flat to moderately steeply rolling terrain.	1–5	0–15
rF	RESIDUUM ON FORT UNION FORMATION (HOLOCENE AND PLEISTOCENE?)	Gray to brown silty and sandy weathered material with variable clay content. Grades downward into unweathered Fort Union Formation (Tf). In places includes sheetwash alluvium (s) in upper 1 m, and small areas of Fort Union bedrock and colluvium (c).	Material derived from weathering of Fort Union Formation in place; may be modified by sheetwash and soil creep.	Flat to moderately steep disrected terrain.	0.3–2	0–20
			BEDROCK			
b	BAKED AND FUSED ROCK (HOLOCENE AND PLEISTOCENE)	Bedrock altered when coal beds were burned. Mostly hard, dense, red to orange, baked shale and siltstone (porcellanite). Black, bubbly, sometimes glassy rock (buchite); resembles volcanic rocks. Gray or white coal ash occurs as a layer 5 cm to 1.2 m thick at base of baked zone. Locally includes small areas of colluvium (c).	Overlying bedrock baked when coal beds in Wasatch and Fort Union Formations (Tw, Tf) burned.	Thick layer caps relatively flat upland surfaces on Fort Union Formation; occurs as tops of hills and ridges and as narrow bands on hillsides of Wasatch Formation.	1–10	5–50
Twr	WHITE RIVER FORMATION (OLIGOCENE)	Upper part is erosional remnants of white tuff and bentonitic claystone (Sharp and others, 1964). Lower part consists of crossbedded, coarse-grained sandstone and conglomerate cemented by chalcedony; conglomerate pebbles are quartz, quartzite, limestone, chert, and gneiss similar to rocks exposed in the Bighorn Mountains to the west.	Deposited by rivers flowing eastward from headwaters in the ancestral Big Horn Mountains during Oligocene time.	Resistant caps on top of Pumpkin Buttes; part of formerly much more extensive layer of similar rocks, now eroded away.	10–15	5–100
Tw	WASATCH FORMATION (EOCENE)	Brown and gray claystone and siltstone with thick lenses of coarse-grained, crossbedded arkosic sandstone. Generally poorly consolidated but has some well-cemented resistant sandstone beds. Thin beds of coal and carbonaceous shale common locally (Sharp and Gibbons, 1964). May include small areas of residuum (rW) and sheetwash alluvium (s).	Deposited in streams, swamps, and lakes; later consolidated by deep burial; now exposed by erosion.	Steep slopes and hilltops.	0–480	5–50
Tf	FORT UNION FORMATION (PALEOCENE)	Light-gray to yellowish-brown, fine-grained sandstone, light-gray siltstone, mudstone, and shale, brown carbonaceous shale, and coal. Locally includes small areas of residuum (rF), colluvium (c), and sheetwash alluvium (s).	Deposited in streams, swamps, and lakes; later consolidated by deep burial; now exposed by erosion.	Hilltops and steep hillslopes.	0–450	0–100

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1987—[84466]

SURFICIAL GEOLOGIC MAP OF THE RENO JUNCTION 30′ x 60′ QUANDRANGLE, CAMPBELL AND WESTON COUNTIES, WYOMING

By
Marith C. Reheis and Donald A. Coates

1987

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