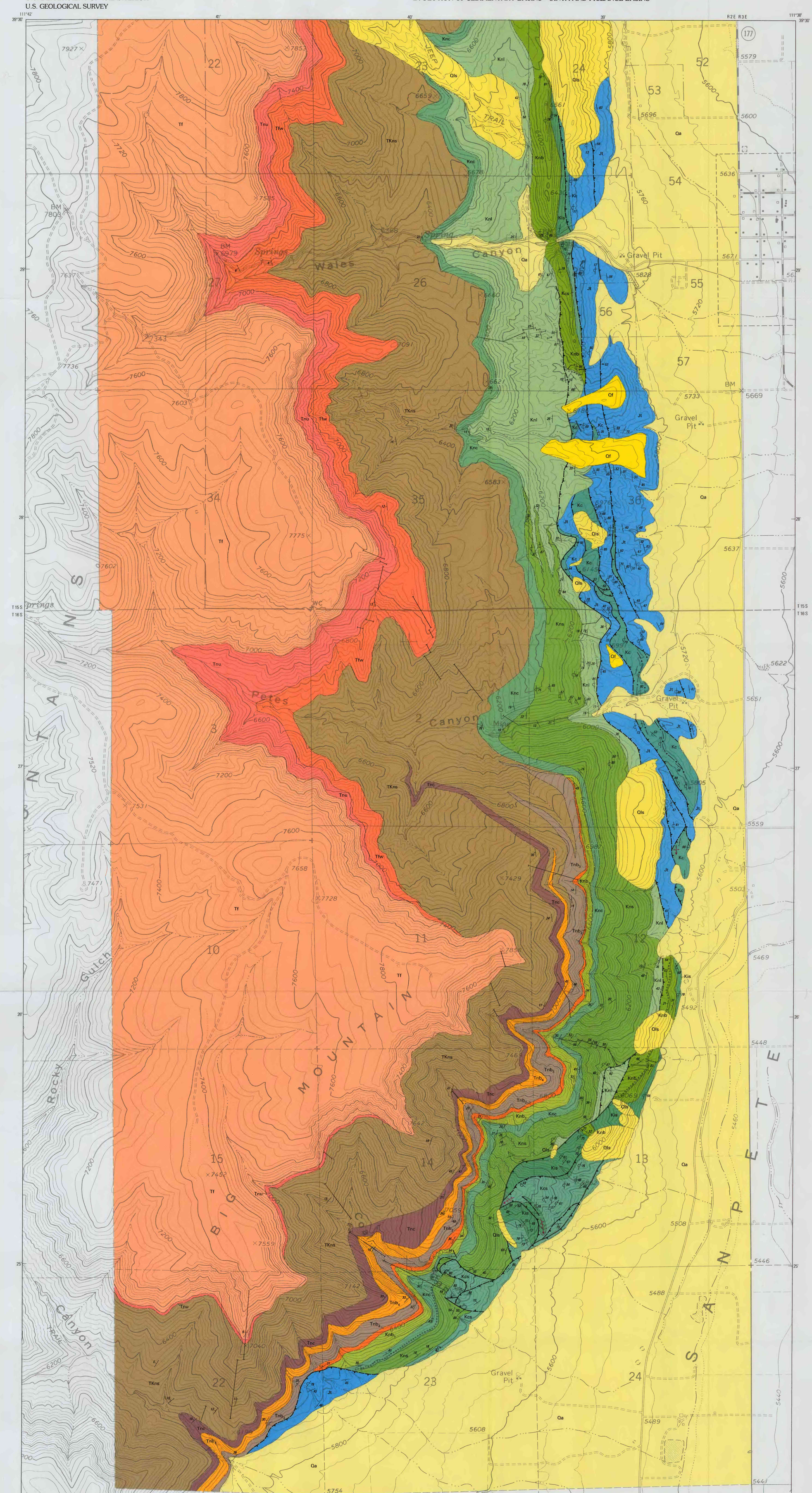

Base from U.S. Geological Survey, 1965, 1:24,000
Polyconic projection. 1927 North American datum

APPROXIMATE MEAN DECLINATION, 1993

SCALE 1:12 000

½ 0 1 MILE

5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTAH
MAP LOCATION

Mapping by Lawton 1988-1990 and Lawton and Weiss 1991

CORRELATION OF MAP UNITS

Units	Epoch	Period
Qa, Qls	Holocene and Pleistocene	QUATERNARY
Qf	Pleistocene	QUATERNARY
Unconformity		
Tf, Tnu, Tfw	Eocene	TERTIARY
Tnc, TKns, Tnb_4, Tnb_3, Tnb_2, Knb_1	Paleocene	TERTIARY
Knc, Kns, Knl, Knb	Upper Cretaceous	CRETACEOUS
Unconformity		
Kis, Kcs, Kc	Lower Cretaceous	CRETACEOUS
Unconformity		
Jt	Middle Jurassic	JURASSIC

DESCRIPTION OF MAP UNITS

Qa — **Alluvium (Holocene and Pleistocene)**—Undifferentiated, unconsolidated sand, gravel and clay of Sanpete Valley. Alluvium in modern stream courses and arroyos not depicted on map

Qls — **Landslide deposits (Holocene and Pleistocene)**—Unsorted deposits of mass-wasting origin. Typically clay and sand and unoriented blocks of sandstone

Qf — **Fan deposits (Pleistocene)**—Poorly sorted debris of dissected surface at mouth of drainage basin between Wales and Petes Canyons. Composed of blocks of Flagstaff and North Horn strata in light-gray, clay-rich matrix

Tf — **Flagstaff Limestone, main body (Eocene)**—Light-gray to tan micrite and dolomicrite in beds several centimeters to 2 m (6 ft) thick. Limestone mottled, locally abundantly fossiliferous

Tfw — **Wales Tongue (Paleocene)**—Upper part, thick beds of white to very light gray micrite and dolomicrite, commonly weathering orange. Lower part, interbedded medium-gray shale and fossiliferous light-brown micrite

North Horn Formation (Eocene, Paleocene, and Upper Cretaceous)—Sedimentary rocks of diverse lithology. Nonmarine. Defined by E.M. Spieker (1946) from exposures at North Horn Mountain in the Wasatch Plateau

Tnu — **Upper redbed unit (Eocene)**—Red siltstone and brown lenticular sandstone

TKns — **Calcareous siltstone unit (Paleocene and Upper Cretaceous)**—Siltstone and sandy siltstone containing subordinate tabular and lenticular beds of brown sandstone and conglomerate. Siltstone ranges from drab ochre to bright red and purple, the latter colors commonly in association with calcareous paleosols

Tnc — **Coal Canyon unit (Paleocene)**—Pebbly sandstone and sandstone, locally having foresets as much as 2 m (6 ft) thick. Interfingers westward and northward with calcareous siltstone unit

Big Mountain unit (Paleocene and Upper Cretaceous)

Tnb_4 — **Subunit 4, upper conglomerate (Paleocene)**—Cliff-forming mixed quartzite-clast (20 percent) and carbonate-clast (80 percent) cobble and pebble conglomerate. 0–60 m (0–200 ft) thick

Tnb_3 — **Subunit 3, upper sandstone (Paleocene)**—Cliff-forming, light-brown sandstone and pebbly sandstone with subordinate interbeds of calcareous, light-gray sandy siltstone

Tnb_2 — **Subunit 2, lower conglomerate (Paleocene)**—Pebble and cobble conglomerate with subequal quartzite-clast and carbonate-clast populations. 0–10 m (0–30 ft) thick

Knb_1 — **Subunit 1, lower sandstone (Upper Cretaceous)**—Cliff-forming, light-brown sandstone with large-scale trough crossbeds

Knc — **Coal-bearing unit (Upper Cretaceous)**—Interbedded light- to dark-gray siltstone, coal, fossiliferous limestone and subordinate brown sandstone. Intraformational unconformity present at base in southern part of map area

Kns — **Sheet sandstone unit (Upper Cretaceous)**—Ledge-forming sandstone beds 2–4 m (6–13 ft) thick interbedded with thicker intervals of drab olive-gray to gray siltstone. Sandstone units are continuous for lateral distances of more than 1 km (0.6 mi)

Knl — **Lower redbed unit (Upper Cretaceous)**—Interbedded red sandy siltstone and conglomerate. Conglomerate beds tabular in lower part, lenticular in upper part. Siltstone contains numerous intervals of gray micrite nodules

Knb — **Basal conglomerate unit (Upper Cretaceous)**—Pebble to boulder conglomerate and subordinate sandstone. Forms discontinuous exposures at Big Mountain and Wales Canyon. Contains numerous intraformational unconformities

Indianola Group (Upper Cretaceous)—Coarse-grained nonmarine strata consisting of conglomerate and sandstone. Approximately 2,800 m (9,300 ft) thick on west side of San Pitch Mountains, but much thinner in exposures of map area as a result of truncation beneath North Horn

Kis — **Sanpete Formation**—White to light-gray beds of medium- to coarse-grained sandstone interbedded with drab sandy siltstone. Sandstone is quartzarenite and forms ledges, whereas siltstone is generally poorly exposed. Sandstone beds contain abundant crossbeds and commonly have pebbly bases

Kcs — **Unnamed conglomerate and siltstone (Lower Cretaceous)**—Interbeds of cobble to pebble conglomerate and reddish-brown sandy siltstone. Subordinate beds of reddish-brown sandstone are present in some exposures. Middle(?) part of formation, exposed in the vicinity of Coal Canyon, consists of massive boulder and cobble conglomerate containing abundant red and green quartzite clasts. Other conglomerates contain as much as 20 percent carbonate clasts.

Kc — **Cedar Mountain Formation (Lower Cretaceous)**—Purple to gray claystone, red quartzose sandstone, cobble to pebble conglomerate, and rare beds of light-gray oncolitic micrite. Red chert grains are abundant in sandstone

Conglomerate marker bed

Jt — **Twist Gulch Formation (Middle Jurassic)**—Light-brown to brick-red shale and siltstone and subordinate interbeds of very fine grained, white to tan quartzose sandstone

Contact—Dashed where inferred or approximately located

Fault—Bar and ball on downthrown side

Thrust or reverse fault—Showing dip azimuth and dip. Dashed where inferred or located approximately

Intraformational unconformity

Anticline—Showing direction of plunge

Antiformal syncline—Showing direction of plunge

Strike and dip of beds

Inclined

Vertical

Overturned

Measured section

REFERENCE CITED

Spieker, E.M., 1946, Late Mesozoic and early Cenozoic history of central Utah: U.S. Geological Survey Professional Paper 205-D, p. 117–161.

GEOLOGIC MAP OF EAST-CENTRAL RANGE FRONT, SAN PITCH MOUNTAINS, UTAH

By
Timothy F. Lawton and Malcolm P. Weiss
1993