WYOMING STATE GEOLOGICAL SURVEY
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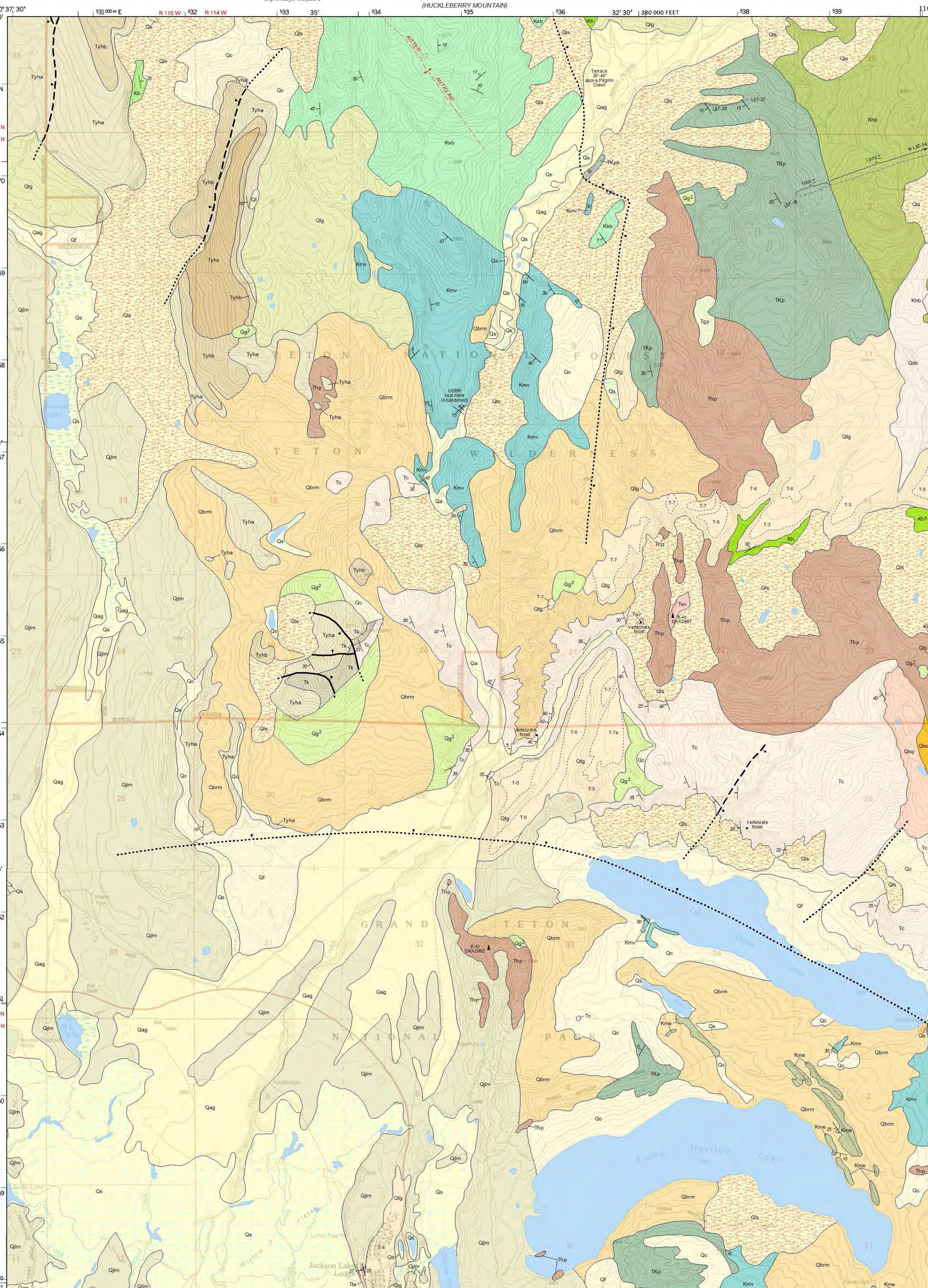
Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY

J. DAVID LOVE HISTORICAL GEOLOGIC MAP SERIES
GEOLOGY OF THE TETON - JACKSON HOLE REGION
Map LMS-8
Two Ocean Lake Quadrangle, Teton County, Wyoming

Geology -- Interpreting the past to provide for the future



North American Datum (NAD27). Projection 10,000-foot grid ticks: Wyoming coordinate system, west zone (Lambert conformal conic). Blue 1000-meter Universal Transverse Mercator ticks, zone 12

Hydrography, hypsography, public land survey, and transportation base by U.S. Geological Survey, various years

Digital raster base files prepared by Wyoming State Geological Survey, 2002

GN MN 0°18' 5 MILS 14°18' 254 MILS

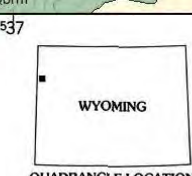
SCALE 1:24,000

1 0.5 0 1 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

CONTOUR INTERVAL 40 FEET
SUPPLEMENTARY CONTOUR INTERVAL 20 FEET



QUADRANGLE LOCATION

Geology mapped by J. David Love, 1950, 1954, 1957, 1971, 1972, and 1974; W.R. Keefer, 1950

Digital cartography by Phyllis A. Ranz

GEOLOGIC MAP OF THE TWO OCEAN LAKE QUADRANGLE, TETON COUNTY, WYOMING

by
J. David Love
2002

EXPLANATION

CORRELATION OF MAP UNITS

Holocene: Qa, Qc, Qf, Qls, Qlsy, Qlso, Qsb, Qs, Qt

Holocene and Pleistocene: Qag, Qtg, Qlg

UNCONFORMITY

Pleistocene: Qjlm
UNCONFORMITY
Qbrm
UNCONFORMITY
Qg2

QUATERNARY

UNCONFORMITY

Pliocene: Tyhc, Tyhb, Tyha
UNCONFORMITY
Tk

UNCONFORMITY

Miocene: Tte
UNCONFORMITY
Tgp, Tc

UNCONFORMITY

Oligocene: Twr

UNCONFORMITY

Eocene: Twi
UNCONFORMITY
Thp

TERTIARY

UNCONFORMITY

Paleocene: TKp, TKps

UNCONFORMITY

Upper Cretaceous: Kh, Khb
UNCONFORMITY
Kme
Kmv
Ksb, Kb

CRETACEOUS

MAP SYMBOLS

Formation contact

Normal fault - Dashed where approximately located, dotted where concealed; ball and bar on downthrown side

Anticline - Showing crestline; approximately located

Strike and dip of beds

22 **Inclined** - dip on unlabelled symbols was not determined

Horizontal

Measured stratigraphic section - Offsets shown by dotted line

L67-27 **Location and number of marker bed in measured stratigraphic section**

K-Ar **Location of sample taken for potassium-argon (K-Ar) age dating—number and designation of sample shown (where known)**

Mappable conglomerate beds - In Meeteetse Formation

Vertebrate fossil **Vertebrate fossil locality**

Mine or prospect

T-2 T-1 **Terrace sequence** - Located in alluvial gravel (Qag) and terrace gravel (Qtg); dots mark outer boundary of surface where it can be distinguished; T-3 is youngest; T-7a is oldest; still younger terraces T-1 and T-2 are present in adjacent quadrangles

T-3 - 15 to 50 feet (4.5 to 15 m) above adjacent major drainages

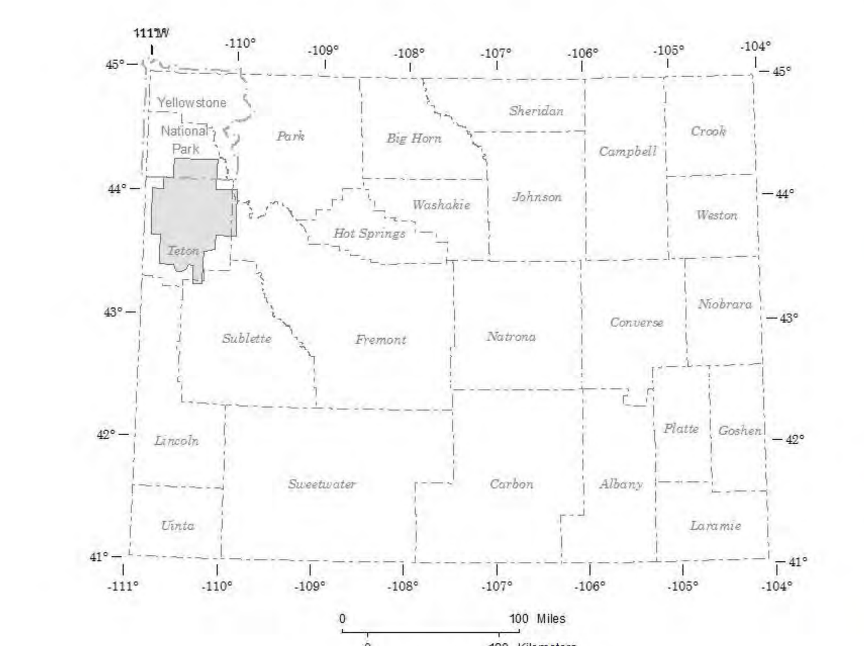
T-4 - 20 to 50 feet (6 to 15 m) above T-3. A surface which is 40 to 60 feet (12 to 18 m) higher than T-4 mapped to south of quadrangle but 20 feet (6 m) higher than T-3 terrace to north is 1/2 mile along highway just north of Jackson Lake Lodge and is outwash from adjacent Jackson Lake moraines. Because of south tilt of surface, it would actually be 50 feet (15 m) above T-3 and hence, probably T-4 terrace

T-5 - 190 feet (58 m) above T-3 southwest of Pilgrim Creek (no T-4 recognizable here)

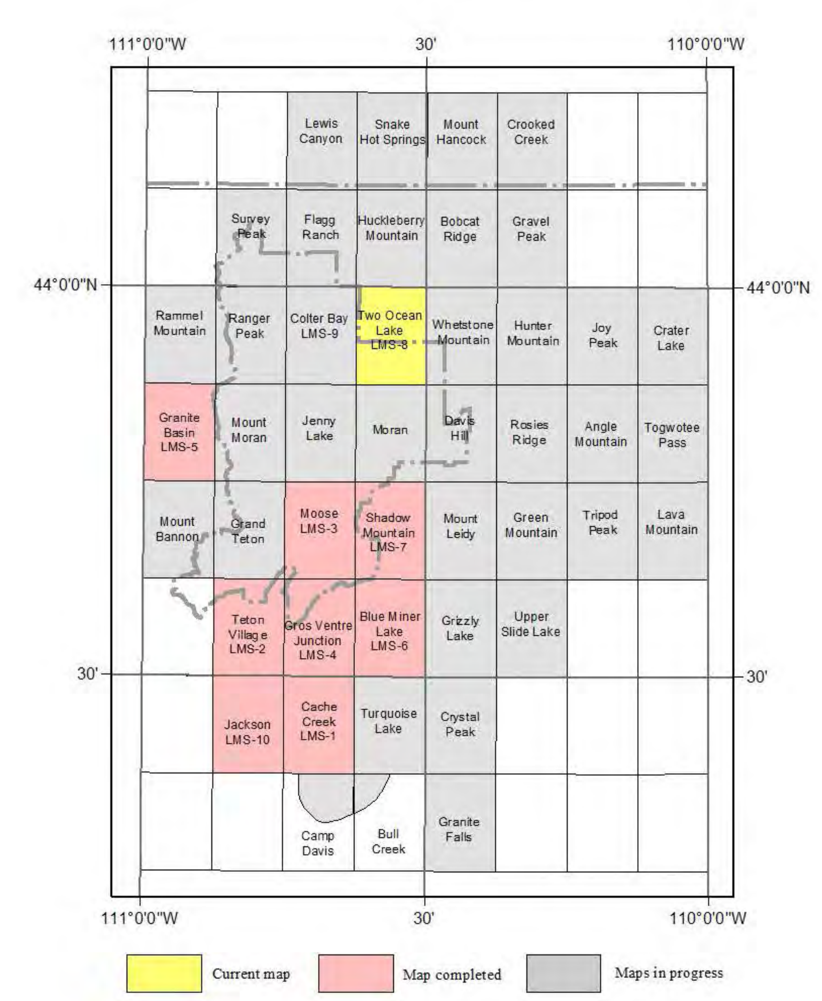
T-6 - 50 to 80 feet (15 to 24 m) above T-5 terrace

T-7 - 120 feet (37 m) above T-6 terrace

T-7a - 15 feet (4.5 m) above T-7 terrace



GENERAL LOCATION MAP



INDEX TO LOVE MAP SERIES SHOWING LOCATION OF 7.5 MINUTE QUADRANGLES AND MAPPING PROGRESS

DESCRIPTION OF MAP UNITS

Holocene surficial deposits

Qa **Alluvium** - Stream-laid deposits of gravel, sand, silt, and clay in valley bottoms

Qc **Colluvium** - Slope wash of silt- to boulder-sized fragments derived from underlying and adjacent formations

Qf **Alluvial-fan deposits** - Water-laid gravel, sand, silt, and clay spread from mouths of ravines; shows linear sorting along distributaries; finer grained debris becomes progressively more abundant toward downstream margin of fan

Qls **Landslide debris** - Chaotically mixed boulders and finer grained rock debris emplaced by mass movement

Qlsy **Younger slide debris,** in places still actively moving

Qlso **Older slide debris,** generally stabilized and overgrown with vegetation

Qsb **Slump blocks** - Masses of Harebell Formation, some as much as one-half mile in diameter, relatively coherent, moved only a few tens or hundreds of feet downslope

Qs **Swamp deposits** - Clay, silt, and fine sand, dark-gray and brown; rich in vegetal debris

Qt **Talus** - Locally derived coarse angular rock fragments that accumulated on steep slopes and at the base of cliffs

Holocene and Pleistocene surficial deposits

Qag **Alluvial gravel** - Gravel deposited in front of melting glaciers or along flood plains of major streams; composed chiefly of quartzite roundstones

Qtg **Terrace gravel** - Gravel of quartzite roundstones; deposited by meltwater streams draining headwaters of East Fork of Pilgrim Creek

Qlg **Landslide and glacial debris** - Intermixed or undivided

Pleistocene surficial deposits

Qjlm **Morainal debris of Jackson Lake** - Till that is part of the Jackson Lake moraine or that accumulated at the same time nearby; composed largely of locally derived rock fragments

Qbrm **Morainal debris of Burned Ridge** - Till that is believed to be contemporaneous with the Burned Ridge moraine that was deposited across Jackson Hole 8 miles to the south; only slightly older than the Jackson Lake moraine

Qg2 **Glacial debris of second (Bull Lake) major glaciation** - Very old formless glacial deposits; may include slightly younger morainal debris (capped by loess and soil in many places) with subdued surface topography and older than Burned Ridge morainal debris; both deposits are preserved only at higher elevations or under younger glacial debris

Tertiary sedimentary and volcanic rocks

Huckleberry Ridge Tuff (Pliocene)

Tyhc **Member C** - Brown welded rhyolitic ash flows characterized by abundant small glassy quartz phenocrysts; has conspicuous layering. Thickness about 300 feet (91 m)

Tyhb **Member B** - Light-brown to gray welded rhyolitic ash flows with abundant large quartz phenocrysts; near top has two layers of crystallized pumice, the upper light-gray, the lower dark-gray to brown. Thickness about 100 feet (30 m)

Tyha **Member A** - Brown welded rhyolitic ash flows; black vitrophyric welded tuff at base; above this the rock has 40 to 50% phenocrysts which decrease in abundance upward; widespread less densely welded zone at top. Major unconformity at base. Thickness about 150 feet (46 m)

Tk **Kilgore Tuff (Pliocene)** - Pale-lavender crystal-poor slabby hard rhyolitic welded tuff; black vitrophyric welded tuff at base. Major unconformity at base. Potassium-argon (K-Ar) age date of 5.57±0.19 Ma (Millions of years before present) (Morgan and McIntosh, in press). Thickness 300 feet (91 m) or more. Previously mapped as Conant Creek Tuff

Tte **Teewinot Formation (upper Miocene)** - Tuff, claystone, and marlstone, chalky white, soft; beds of pumicite as much as 60 feet (18 m) thick; nonmarine. Major unconformity at base. Thickness 500 feet (152 m) or more

Tc **Colter Formation (Miocene)**- Light-gray to green and brown water-laid mafic tuff and volcanic conglomerate. Thickness about 7000 feet (2134 m)

Tgp **Gray trachyte porphyry (Miocene?)** - Gray, vesicular; contains abundant plagioclase phenocrysts as long as 0.4 inches (10 mm), pyroxene phenocrysts 0.04 to 0.08 inches (1 to 2 mm) in diameter. In plug cutting Hominy Peak Formation 3 1/2 miles north of Two Ocean Lake

Twr **White River Formation (Oligocene)** - Tuff and plastic claystone and siltstone, chalky white to pale-green; nonmarine. Major unconformities at top and base. Exposed locally along East Fork Pilgrim Creek north of west end of Two Ocean Lake. Contains vertebrate fossils; biotitic tuff in the formation to east of quadrangle has K-Ar date of 35.8±0.8 Ma (Love and others, 1992). Thickness 100 feet (30 m) or more

Twi **Wiggins Formation (upper Eocene)(Thorofare Creek Group, Absaroka Volcanic Supergroup)** - Yellow, chalky white, and bright-red claystone, underlain by green and pink waxy claystone; bentonitic, weathering with puffy surface. K-Ar age date from 2-foot (0.6 m)-thick biotite-rich clayey sandstone (USGS sample DKA2887) was 45.9±0.5 Ma (Love and others, 1992). Thickness 0 to 70 feet (21 m)

Thp **Hominy Peak Formation (Eocene)(Absaroka Volcanic Supergroup)** - Brown to dull-green andesitic mudflow breccia, vent breccia, conglomerate, and sandstone; light-gray tuff and thin claystone zones near top and at base; lenses of gold-bearing quartzite boulder conglomerate in lower part; fossil trees common. K-Ar age date from basalt (USGS sample DKA2982) from Grand View Point about 3/4 mile southwest of Two Ocean Lake was 48.6+0.7 Ma (Love and others, 1992). Thickness as much as 2000 feet (610 m) within Teton-Jackson Hole area

Tertiary and Upper Cretaceous sedimentary rocks

Pinyon Conglomerate (Paleocene and uppermost Cretaceous)

TKp **Boulder conglomerate** - Brown, composed of highly rounded quartzite fragments in rusty sandstone matrix; locally contains sparse small gold flakes. Thickness about 1000 feet (305 m)

TKps **Nonconglomeratic facies** - Gray sandstone and dark-gray to black siltstone and claystone containing Paleocene pollen; nonmarine. Thickness at least 200 feet (61 m)

Upper Cretaceous sedimentary rocks

Kh **Harebell Formation (Upper Cretaceous)** - Conglomerate, sandstone, and claystone. Conglomerate is brown, composed of highly rounded quartzite pebbles, cobbles, and boulders; sandstone is brown, gray, and dull green, silty, hard, somewhat tuffaceous; claystone is gray, dark-green, black, and mustard yellow, silty tuffaceous; marine or brackish water in part. Major unconformities at top and base. Thickness 5000 feet (1524 m) or more

Khb **Bobcat Member** - Quartzite conglomerate, gold-bearing, with a few sandstone and claystone beds; comprises upper part of formation. Thickness more than 2000 feet (610 m)

Kme **Meeteetse Formation (Upper Cretaceous)** - Sandstone, chalky white to rusty brown, white and yellow tuff and bentonite, plastic carbonaceous black shale, and quartzite pebble conglomerates containing small sparse gold flakes; largely or entirely nonmarine. Open circles indicate conglomerate beds. K-Ar age date from white biotite-rich tuff along outlet channel (just to south of quadrangle) of Emma Matilda Lake is 73.1±0.7 Ma (Love and others, 1992). Thickness 500 feet (152 m) or more

Kmv **Mesaverde Formation (Upper Cretaceous)**Sandstone, gray to rusty brown, massive to thick-bedded, and dark-gray carbonaceous shale and siltstone; sparse thin coal beds; largely nonmarine. Thickness 800 feet (243 m) or more

Sohare Formation and Bacon Ridge Sandstone (Upper Cretaceous)

Ksb **Sohare Formation (formerly the "lenticular sandstone and shale sequence")** - Sandstone, gray and brown, fine-grained, interbedded with light- and dark-gray shale and siltstone; largely nonmarine; contains thin coal beds. Mapped together with Bacon Ridge Sandstone over most of quadrangle. Thickness more than 2000 feet (610 m)

Kb **Bacon Ridge Sandstone** - Sandstone, tan to gray, thick-bedded, fine-grained except for quartzite pebble zone near base; interbedded with gray and black shale; several coal and bentonite beds in lower part; abundant marine fossils. Mapped separately only in small area near extreme northwestern corner of quadrangle. Thickness about 1000 feet (305 m)

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