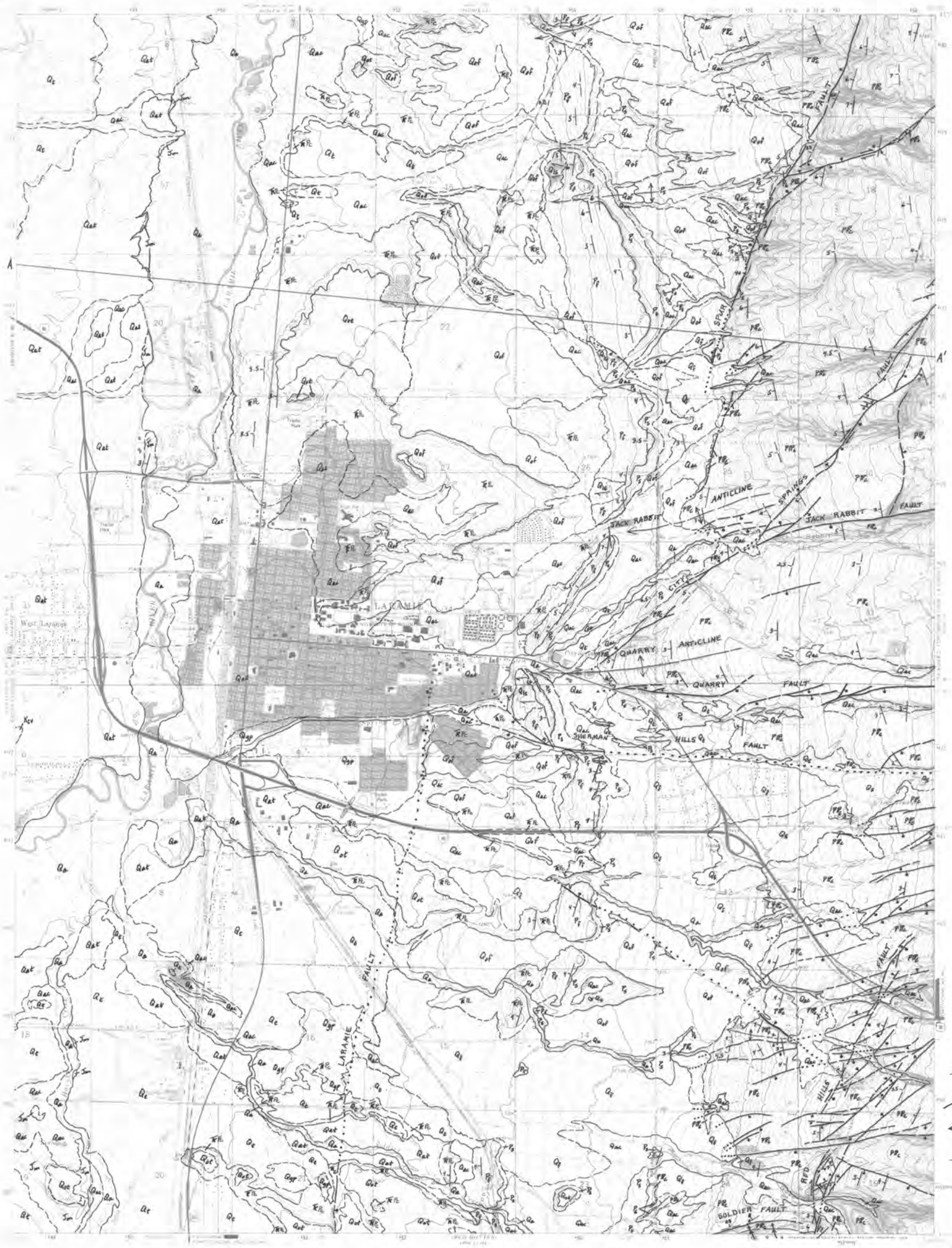


EXPLANATION

SEDIMENTARY ROCKS AND SURFICIAL DEPOSITS

QUATERNARY

Qa Alluvial deposits
Unconsolidated and poorly consolidated clay, silt, sand, and gravel, mainly in floodplains and lowest stream terraces. Thickness 0 to 25 feet.

Qac Mixed alluvium and colluvium
Sand, silt, clay, and gravel deposited mainly along intermittent streams; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium. Thickness approximately 0 to 20 feet.

Qat Mixed alluvium and terrace deposits
Unconsolidated and poorly consolidated clay, silt, sand, and gravel, representing a transition zone between alluvium and terrace deposits, mainly adjacent to the Laramie River. Thickness approximately 0 to 30 feet.

Qs Windblown sand deposits
Active and stabilized dunes, made up of very fine- to fine-grained sand. Although numerous unmapped small-scale examples occur within the map area, the only mapped example occurs in the south portion of the Sherman Hills development east of Laramie. Thickness approximately 0 to 15 feet.

Qf Alluvial fan deposits
Poorly sorted clay, silt, and gravel; crudely bedded to nonbedded. Appear to be active receiving sediments from intermittent streams flowing off of the Laramie Range. May have some debris flow component. Grade into terrace deposits toward west, approaching the Laramie River. Locally, grade into alluvium and colluvium. Thickness approximately 0 to 25 feet.

Qt Terrace deposits
Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Includes fragments of weathered granite and limestone cobbles, predominance varies depending on source of feeding stream. Occur along present drainages, a few feet to over 35 feet above modern flood plains. Thickness approximately 0 to 10 feet.

Qls Landslide deposits
Blocks of bedrock or loose slope debris; arrows point in the inferred direction of movement. Occur in the Forelle Limestone, detaching at the contact with the underlying Satanka Shale.

Qgp Gypsite deposits
Unconsolidated clay-sized gypsum interbedded with red clay, sand, gravel, and limestone cobbles. Located in stream valleys immediately west of the Laramie Fault, probably related to erosion of gypsum beds of the lower Chugwater Formation which were brought to the surface or near surface by the Laramie Fault. These deposits were mined for cement plaster near the turn of the century. Thickness 0 to 10 feet.

Qof Older alluvial fan deposits
Poorly sorted clay, silt, sand and gravel; crudely bedded to nonbedded with some debris flow component. Limestone cobbles are common. Currently inactive and dissected, often occurring as erosional remnants. Grade into older terrace deposits toward the west, in the northern part of the map area. Thickness 0 to 30 feet.

Qot Older terrace deposits
Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Limestone cobbles are common. Often occur as erosional remnants ranging from 20 to 100 feet above present stream floodplains. Some remnants may actually be older alluvial fan remnants. Thickness 0 to 10 feet.

UNCONFORMITY

LOWER CRETACEOUS

Kcv Cloverly Formation (Lower Cretaceous)
Basal tan to white coarse-grained sandstone and chert pebble conglomerate, locally crossbedded and overlain by varigated buff and purple claystones interbedded with thin black shale beds, and an upper gray to buff to brown, fine- to coarse-grained sandstone, crossbedded in lower portion. Thickness 100 to 120 feet.

UNCONFORMITY

JURASSIC

Jm Morrison Formation (Upper and Middle Jurassic)
Pale-green, olive-green, blue-green to maroon and chalky white variegated calcareous and bentonitic claystones interbedded with thin drab limestones and buff, non-resistant sandstones. Limestone, locally, contains orange to brown chert inclusions. A thin section of Sundance Formation may exist in the area, but due to few and poor exposures, it is mapped with the Morrison. Thickness 300 to 375 feet.

UNCONFORMITY

TRIASSIC

TRPc Chugwater Formation (Triassic and Permian)
Red shale and siltstone with interbedded red to salmon to buff, fine-grained sandstone. Lower portion of section contains red shale interbedded with thin to thick gypsum beds and banded wavy gypsiferous thin limestone, sometimes mistaken for part of the Forelle Limestone. This portion of the Chugwater along with the underlying Forelle Limestone and Satanka Shale would be mapped as Goose Egg Formation, west of the Laramie Basin. Locally, some possible Jelm Formation sandstone erosional outliers may occur, but due to their lack of persistence they are mapped with the Chugwater. Thickness 650 to 800 feet.

PERMIAN

Pf Forelle Limestone (Permian)
Gray to purple, thin bedded, sparsely fossiliferous limestone locally interbedded with red siltstone and thin gypsum laminations. Wavy outcrops resembling algal structures common. Landslides are common on Forelle dip slopes with the unit detaching from the underlying Satanka Shale. Thickness 10 to 30 feet.

Ps Satanka Shale (Permian)
Red siltstone and shale (often banded with white and ocher color zones), soft sandstone, thin limestones, and local gypsum beds, especially near the top. Buff to orange to red, fine-grained sandstone with ripple marks common near base of unit. Gypsum beds in the Satanka are currently being mined near Red Buttes south of this map. Thickness 250 to 300 feet.

UNCONFORMITY

PENNSYLVANIAN

PPc Casper Formation (Permian and Pennsylvanian)
Buff to reddish, calcareous to quartzitic, very fine- to coarse-grained, well cemented subakosic sandstone interbedded with buff to purplish-gray limestone and dolomite beds, usually micritic and locally fossiliferous. Sandstone often exhibits large-scale festoon cross-bedding, increasing toward the south. As many as 10 different limestone or dolomite beds, which are locally quarried for cement or gravel uses, have been identified in the Laramie area. The Casper Formation serves as the prime aquifer in the Laramie area. Intertongues with underlying Fountain Formation, which is less than 50 feet thick and does not crop out in the map area. Thickness 600 to 700 feet.

MAP SYMBOLS

Formation contact
Dashed where approximately located.

Fault
Dashed where approximately located, dotted where concealed. Bar and ball on downthrown block; arrows indicate relative direction of oblique-slip movement.

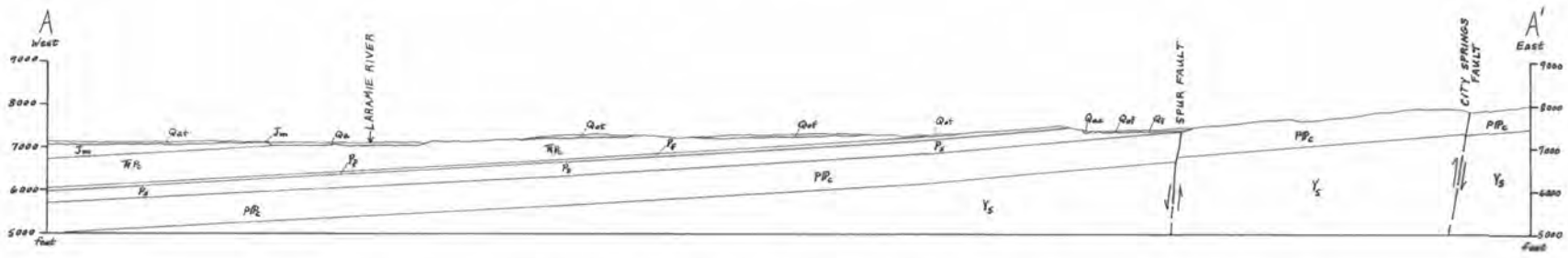
Anticline
Trace of axial plane and direction of plunge determined by field dip measurements and by photo interpretation. Dashed where approximately located.

Monocline
Trace of axial plane as determined by field measurements and by photo interpretation. Dashed where approximately located. Short arrow denotes steeper dipping limb.

Strike and dip of beds, showing angle of dip.

Strike and dip measurements from Lundy (1978).

A—A' **Cross section location**
Line of section. Sherman Granite (Middle Proterozoic)-**Ys**-is shown on the cross section only as it does not crop out in map area. Coarsely crystalline pink granite ranging in age from 1,414 to 1,435 Ma.



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PRELIMINARY GEOLOGIC MAP OF THE LARAMIE QUADRANGLE, ALBANY COUNTY, WYOMING

by
Alan J. Ver Ploeg

1995