

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT
12 Glacial till, glacio-fluvial and fluvial sands, silts, and clays

TERTIARY
RAPID FORMATION: conglomerate, sandstone, shale; coal

MISSISSIPPIAN AND (?) PENNSYLVANIAN
UPPER MISSISSIPPIAN AND (?) LATER
9 NIZI FORMATION: limestone, silicified limestone, chert conglomerate, chert
conformable

DEVONIAN AND MISSISSIPPIAN
POST-MIDDLE DEVONIAN, PRE-UPPER MISSISSIPPIAN
7 SYLVESTER GROUP (7,8)
7. Lava, tuff, agglomerate, argillite, greywacke, quartzite, limestone, ribbon chert
8. Metamorphosed volcanic rocks equivalent to 7
conformable

SILURIAN AND DEVONIAN
HIDDEN VALLEY GROUP (5,6)
6 Black, fetid dolomite, limestone, quartzite, calcareous phyllite, may be entirely Middle Devonian
conformable

ORDOVICIAN AND SILURIAN
UPPER ORDOVICIAN AND LOWER SILURIAN
SANDPILE GROUP
4 Limestone, silicified limestone, chert, quartzite

ORDOVICIAN
LOWER AND MIDDLE ORDOVICIAN
WALKER GROUP
3 Calcareous argillite, black slate, calcareous phyllite, argillite, limestone
conformable

CAMBRIAN
LOWER AND MIDDLE CAMBRIAN
ATAN GROUP
1 White and pink quartzite, limestone, dolomite, slate, red shale, argillite

HORSERANCH GROUP
2 Quartzite, feldspathized quartzite, biotite-muscovite-feldspar gneiss, muscovite-biotite-quartz schist, granite, pyroxenite, hornfels, marble, skarn, pegmatite

INTRUSIVE ROCKS

CASSIAR INTRUSIONS
A Granite, granodiorite, quartz monzonite, porphyritic granite, apite, pegmatite

POST-DEVONIAN
POST-MIDDLE DEVONIAN
MCDAME INTRUSIONS
B Dunite, peridotite, pyroxenite, serpentine

Bedding (inclined, vertical, overturned)

Schistosity (inclined)

Fault (position assumed)

Anticline

Syncline

Glacial striae

Drift ridge (showing direction of ice movement)

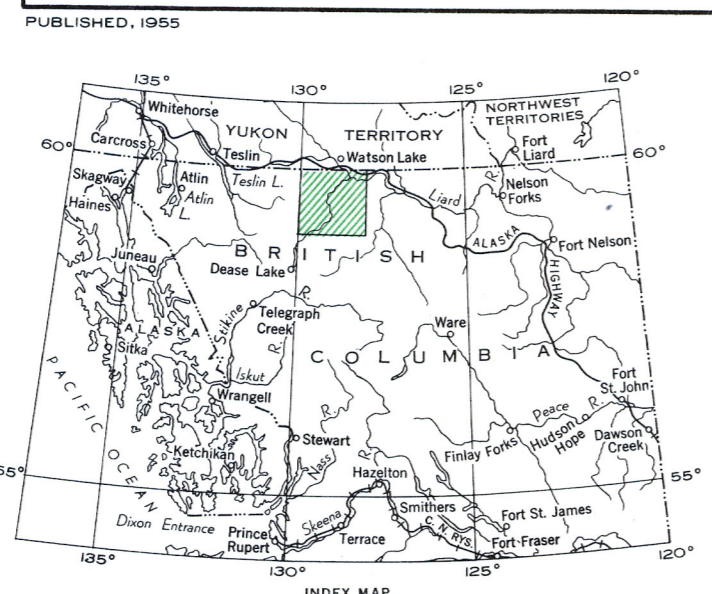
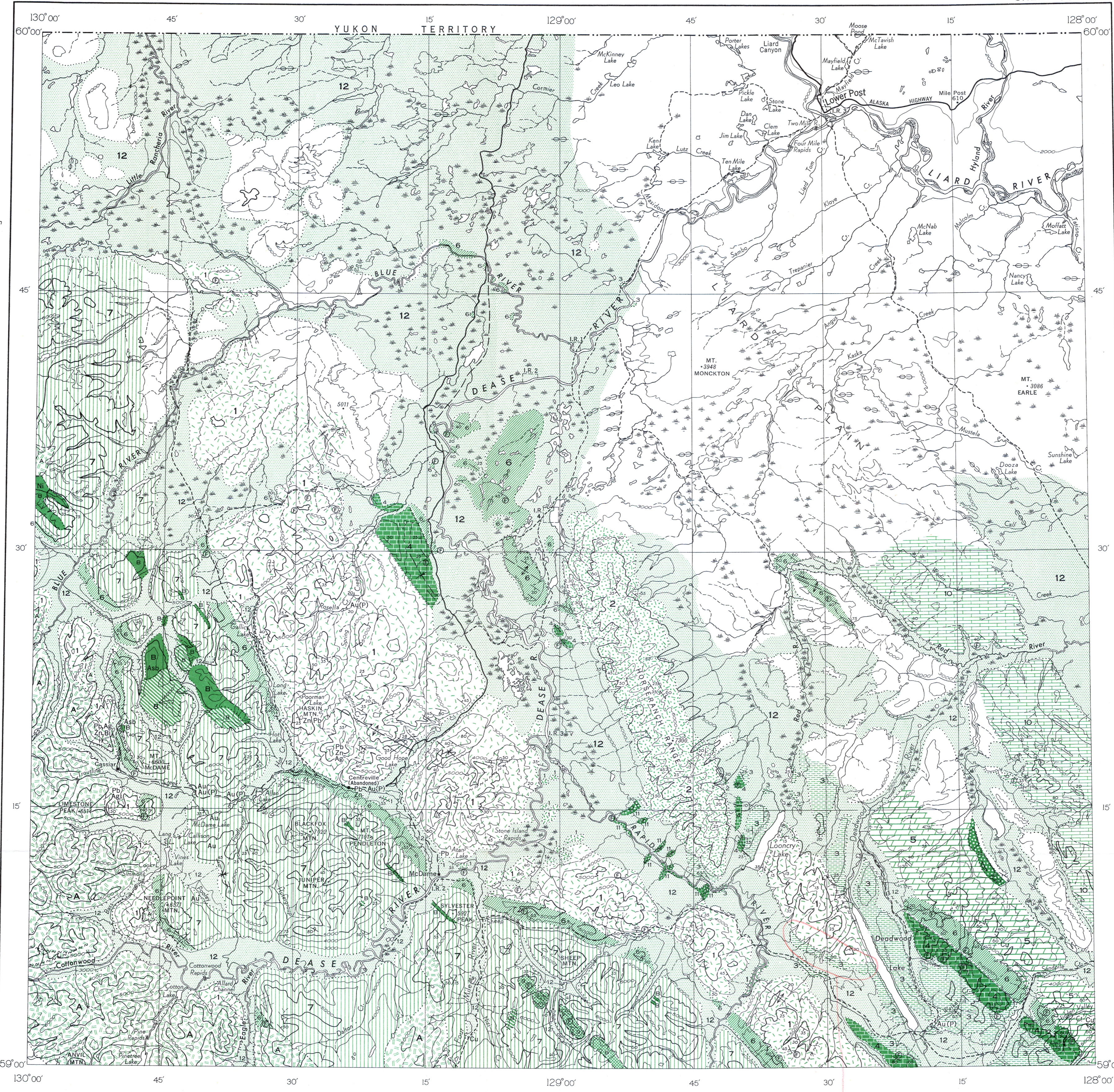
Fossil locality

MINERAL SYMBOLS

Asbestos Asb	Gold (Placer) Au (P)
Bismuth Bi	Lead Pb
Copper Cu	Nickel Ni
Gold Au	Silver Ag
Zinc Zn	

Geology by L. L. Price 1949 and H. Gabrielse 1950, 1951, 1952, 1953

Cartography by the Geological Cartography Division, 1954



PRELIMINARY MAP 54-10
Mc DAME
CASSIAR DISTRICT
BRITISH COLUMBIA

Scale: One Inch to Four Miles = $\frac{1}{253,440}$ Miles
4 2 0 4 8 12
Approximate magnetic declination, 32° 05' East

LEGEND

Main highway

Other roads

Trail

Provincial boundary

Marsh

Sand or gravel

Contours (interval 1000 feet)

Height in feet above mean sea-level

PRELIMINARY MAP 54-10
McDAME
BRITISH COLUMBIA
SHEET 104 P

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

DESCRIPTIVE NOTES

McDame map-area is accessible for motor vehicles by the Alaska Highway and a road that leaves the highway at mile-post 647.5 and extends 80 miles southward through the map-area to Cassiar. A tortuous branch road, usable only by trucks and four-wheel drive vehicles, follows McDame Creek to the old post of McDame on Dease River. Dease River is navigable throughout its course, but Two Mile and Four Mile rapids near the mouth of the river require careful navigation. Pack-horse trails afford access to most of the map-area and horse feed is generally obtainable. Timberline is around 4500 feet above sea-level. The lakes in most parts of the map-area can be used by suitable aircraft for which Watson Lake airport forms the base.

McDame map-area is in parts of three principal physiographic divisions. To the northeast is the Liard Plain, relatively flat and drift covered. The western border of the Rocky Mountain Trench forms a distinct physiographic boundary where it enters the map-area on its eastern edge but merges with the Liard Plain north of Red River. Southwest of Liard Plain, between it and the rugged, northwesterly trending Cassiar Mountains, is Dease Plateau. The most striking feature of this plateau is Horseshoe Range, which extends northward from Looncry Lake as a high unbroken ridge for almost 30 miles. Elsewhere the plateau consists of separate, relatively low ridges.

In Pleistocene time the map-area was covered by glacial ice, up to an elevation of at least 5,500 feet. In the southwest part of the map-area the ice moved in a general northeasterly direction but over the Liard Plain and immediately to the west of it the movement was more directly to the east. Some ice even moved in a southerly direction down the Rocky Mountain Trench.

Fossiliferous rocks of the Atan group (1), comprising over 14,000 feet of sedimentary rocks, occupy a northwesterly trending, complex anticlinorium, and the southwest limb of a large syncline. The Horseshoe group (2) is considered to be in part, but not wholly, of the Atan group (1). The base of the Cambrian strata has not been recognized. Highly contorted rocks of the Walker group (3) overlie the Atan group (1) with little, if any, structural discordance. Their thickness is not known.

Over 1,000 feet of sedimentary rocks comprising the Sandpile group (4) overlie the Walker group with marked structural discordance. The upper division (5) of the Sandpile group (4), or differential folding of the two groups during later deformation. Pyroxene andesite sills and dykes, not shown on the map, intrude both Ordovician and Silurian rocks, particularly argillaceous members.

Contact relations between the Hidden Valley (5, 6) and Sandpile (4) groups are obscured by faults, and the base of the lower division (5) of the Hidden Valley group has not been recognized. The upper division (6) overlies the Atan group (1), unconformably on both limbs of the major syncline in the southwest part of the map-area, but overlies the lower division (5) conformably east of Deadwood Lake. The contact between division (6) and Atan (1) group is not clearly defined and has been arbitrarily drawn at the base of a quartzite member above which lie rocks containing Middle Devonian fossils. Thus defined, division (6) is over 3,500 feet thick.

The Sylvester group (7, 8), comprising at least 18,000 feet of sedimentary and volcanic rocks and metamorphosed equivalent of the volcanic rocks, occupies a southeasterly plunging, complex synclinorium that traverses the map-area from Blue River to beyond Four Mile River. In many places the Sylvester group (7, 8) and the upper division (6) of the Hidden Valley group are in fault contact, but elsewhere they are conformable.

South of Sheep Mountain the Sylvester group (7, 8) is overlain unconformably by the Nizi formation (9). Local chert conglomerate forms the base of the formation and is overlain by over 2,000 feet of strata that contain upper Mississippian and possibly younger fossils. The upper limestone member of the Wadin group (10), exposed southeast of the mouth of Deadwood River, is probably equivalent in age to the Nizi formation (9) but overlies unconformably a thick, undivided, tightly folded assemblage of sedimentary rocks that are probably older.

The youngest consolidated rocks in the map-area are those of the Rapid formation (11). Along Rapid River southeast of Dease River the formation consists of conglomerate, sandstone, shale, and coal, whereas east of Deadwood Lake it consists of red weathering conglomerate and sandstone. Fossil plants suggest that it is of Tertiary age.

Glacial till, glacio-fluvial and fluvial sands, silts, and clays, of Pleistocene and Recent age, form thick deposits in the main valleys and on the Liard Plain. The McDame intrusions (B) occur as lenses, sills, and stocks. They cut rocks of the lower Sylvester group (7, 8) and are in turn cut by granitic rocks of the Cassiar intrusions (A). Along the northeast border of the Cassiar intrusions (A), rocks of both Atan (1) and Hidden Valley (5, 6) groups have been metamorphosed to hornfels, spotted slate, and skarn, whereas rocks of the Sylvester group (7, 8) near the headwaters of Dalton Creek have been little altered near the intrusions.

The fold axes trend northwesterly. Most thick, competent quartzite and limestone members of the Atan (1) and Sandpile (4) groups form open folds, whereas incompetent calcareous argillite, argillite, and thinly bedded limestone of the Walker group (3) and lower members of the Wadin group (10) in most cases are tightly folded and highly contorted. Thin bedded limestone members of the Sylvester group (7, 8) south of Juniper Mountain and north of Dease River, and calcareous limestone members of the Atan group (1) east of Good Hope Lake have been overturned to the northeast.

Northwesterly trending, mostly steep-dipping faults dominate the structure. Generally, the northeast side has been downthrown relative to the southwest. The faults are marked by breccia zones, abrupt changes in dip of strata, and repetition of beds. A highly brecciated zone, over 400 feet wide, marks the trace of a fault at the northwest end of the Horseshoe Range. This fault appears to follow the entire west side of the range. Deadwood Lake lies along a fault zone on which strata to the east have been downthrown relatively at least 2,000 feet. Local fault zones at the contact of the Hidden Valley (5, 6) and Sylvester (7, 8) groups are believed to represent differential movement of rocks consequent on the folding of the main syncline. At least some of the movement on the larger, northwesterly trending faults took place in Tertiary or later time, because rocks of the Rapid group (11) have been greatly affected.

Placer gold was discovered on McDame Creek in 1874 and on Walker Creek in 1877, but since 1887 only McDame Creek has yielded important amounts of gold. During 1948 and 1949 Moccasin Mines Limited used a floating washing plant fed by a dragline shovel east of Centreville. Much of the gold obtained in this operation is reported to have been in gravel immediately overlying lenses and layers of sand. Gold has also been panned on Rosella and Spring Creeks and Dease River. The gold originated from quartz veins in the volcanic rocks of the Sylvester group (7, 8) carrying free gold, pyrite, and tetrahedrite. These veins are particularly abundant in the area between Pooley Creek and the mouth of Quartz Creek.

Sparse, disseminated, chalcocyanite mineralization was noted in five places in a narrow zone in calcareous phyllites extending for at least 12 miles northwesterly from Hidden Valley Creek. Zinc-silver-lead minerals have replaced dolomitized limestone of the Atan group (1) in a zone extending from Haskin Mountain to south of Dease River near Atan Lake. Near Atan Lake galena occurs with barite. Silver-lead-zinc replacement bodies, containing much magnetite, occur 3 miles northwest of Cassiar and 2 miles south of Cassiar. The former deposit contains significant amounts of bismuth. Pyrrhotite and magnetite replacement bodies carrying some molybdenite occur along the contact of the Cassiar intrusions (A) with the Atan group (1).

High-grade chrysotile asbestos is being mined from a serpentinite body 3 miles north of Cassiar and non-commercial bodies of asbestos were noted in most of the ultrabasic bodies in the map-area. Small lenses of chromite occur in dunite bodies and from 0.1 to 0.3 per cent nickel was obtained from samples of the ultrabasic body northwest of Blue River.

Thin, much contorted and faulted seams of lignitic and sub-bituminous coal occur in the Rapid formation (11) along Rapid River.