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LEGEND

PROTEROZOIC

ATHABASCA GROUP (7, 8)

8 Arkose

7 Conglomerate; minor arkose and siltstone

6a,6d Gabbro, diabasic gabbro, and basalt dykes and sills; 6a, represents several narrow dykes separated by country rocks

ARCHAEAN(?)

TAZIN GROUP (1-5)

5 Metasomatic red granite, massive to faintly gneissic; pegmatite; 5a, coarsely to roughly gneissic; 5b, impure, hybrid, rich in mafic minerals; 5c, brecciated; 5d, in part quartzitic; 5e, in part granitic banded gneiss; 5f, includes some amphibolite; 5g, in part grading into granitized chlorite-sericite schist

4 Interbedded mixture of augen-like chlorite-sericite schist and gneiss and chlorite-rich dark quartzite; minor granitic rocks; 4a, mainly chlorite-rich dark quartzite; 4b, includes areas of granitic rocks

3 Amphibolite, hornblende-feldspar gneiss, hornblende gneiss, minor granite dykes and masses; 3a, includes several dykes, sills, and irregular masses of granitic rocks; 3b, porphyritic (feldspar); 3c, serpentinized; 3d, chloritized; 3e, granitized; 3f, garnetiferous; 3g, includes some quartzitic rocks

2 Quartzitic banded gneiss, minor quartzite areas; 2a, garnetiferous; 2b, in part granitic banded gneiss; 2c, thinly bedded and schistose, includes a few beds high in mafic minerals; 2d, includes some feldspar-quartz-biotite granulitic rocks; 2e, mainly quartzite; 2f, brecciated; 2g, includes some amphibolite; 2h, carrying some diopside or actinolitic amphibole

1 Granitic banded gneiss; minor granite areas and pegmatites; 1a, very finely banded; 1b, pyrite-rich feldspar-quartz-biotite granulitic rocks; 1c, includes some quartzitic rocks; 1d, includes some feldspar-quartz-biotite granulitic rocks and also some rocks rich in mafic minerals; 1e, includes some granite areas and locally pegmatite dykes and sills; 1f, brecciated; 1g, contorted

Drift-covered area
Area of gravel and sand
Area of rock outcrop
Geological boundary (defined, assumed)
Bedding (inclined, vertical, dip unknown)
Schistosity (inclined, vertical, dip unknown)
Foliation (inclined, vertical, dip unknown)
Lineation (plunge known, plunge unknown)
Drag-fold (arrow indicates plunge)
Small fold (arrow indicates plunge)
Fault (defined, assumed)
Anticline (trace of axial plane)
Syncline (trace of axial plane)
Glacial striae
Rock trench and stripped area (radioactive)
Mineral occurrence x U

MINERAL SYMBOLS

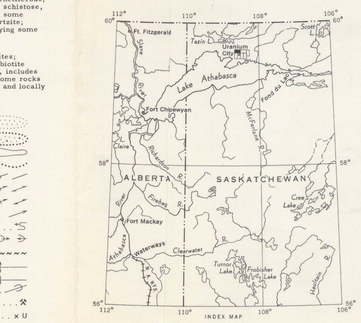
Fluorite ..... fl	Pitchblende .. U
Garnet ..... gt	Pyrite ..... py
Hematite .. hem	Tourmaline .. tl

Geology by L. P. Tremblay, 1956, 1957

Road
Buildings
Stream (position approximate)
Rapid
Marsh
Contours (interval 50 feet)

Approximate magnetic declination, 25° 24' East

Cartography by the Geological Cartography Unit, 1958



MAP 12-1958

URANIUM CITY

SHEET 7

SASKATCHEWAN

Scale: One Inch to 800 Feet = 1/9,600

Feet
800 0 800 1600 2400

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

12-1958

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.

DESCRIPTIVE NOTES

The Beta Gamma shaft at the north end of **Bellegarde** Lake and about the centre of the area is 3 miles in direct line from Uranium City, and about 5 miles by road. Although the road in general is fairly good, the part from the west end of Foot Lake to the Beta Gamma camp is very rough and barely passable by car. Local relief is between 200 and 300 feet. In a few places, however, as north of Don Lake and north of Fault Lake, hilltops are around 450 feet above the adjoining lakes. All drainage is to the south. The area is dissected into broad northeasterly trending ridges, which are themselves traversed by pronounced easterly trending valleys.

The succession of the formations of the Tazin group as shown in the legend is based on scanty structural information. This information suggests that the formations near the western boundary of the area are the oldest, whereas those in the area northeast of Jean Lake are the youngest. Repetition due to folding and possibly faulting is probably present in many parts of the area, particularly between **Bellegarde** Lake and Jean Lake.

The granitic banded gneiss (1) is the commonest rock in the area. Although it has been placed at the bottom of the succession in the legend, some of it is definitely younger than units placed above it. It is a well-banded rock composed mainly of quartz and feldspars with about 25% chlorite and/or biotite and/or hornblende. Each band has adjoining bands of slightly different composition and is generally less than a couple of inches thick. The most common bands and also generally the thickest are granite-like, being composed mainly of quartz and feldspars. The others, which are generally narrow and somewhat richer in mafic minerals, are more varied in composition. These are generally more gneissic and darker in colour. Some of these dark coloured bands are no thicker than pencil lines (1a).

The quartzitic banded gneiss (2) is a white weathering, coarse-grained, banded rock with generally less than 15% mafic minerals, commonly biotite. The quartz content of these rocks is generally high, a few bands, held to be relict beds, are indeed made up almost entirely of quartz. Locally these rocks have a somewhat higher feldspar content than normal and also are more massive or only roughly banded, then they are granite-like. In other places they are more glassy and quartzite-like (2e). In all cases these rocks appear at one time to have been of quartzitic composition. All are somewhat garnetiferous (2a), but it is only north, west, and east of **Bellegarde** Lake that garnet is readily apparent. Elsewhere it may be seen only after close inspection and at times with great difficulty.

The amphibolite (3) is a coarse-grained, dark green rock, composed mainly of hornblende, the alteration product chiefly of white feldspar. It may be massive or well banded. It is found as belts up to 800 feet wide in granitic banded gneiss and commonly interbanded with quartzitic rocks. These amphibolite bands are thought to be lenticular. This shape, together with cross-faulting, results, in places, in much variation in the width of bands. West and southwest of **Bellegarde** Lake they may be locally garnetiferous. As they occur interbanded with rock that appears to be quartzite and as they vary much in composition from place to place, they are held to be of sedimentary origin and to have been derived from a rock resembling a limy shale.

The mixture of chlorite-sericite schist and gneiss, and impure quartzite (4) occupies a zone about 2,500 feet wide that extends across the eastern part of the area. This zone trends northeasterly and is believed to occupy the west flank of a major synclinal structure. The rocks of this zone are schistose to massive and most have a high content of mafic minerals. The chlorite-sericite schist and gneiss commonly show an augen-like structure, are schistose to roughly gneissic, and are a typical light green colour due to the high chlorite content. The impure quartzite is dark grey and generally massive to slightly schistose.

The metasomatic granite (5) is a coarse-grained, red rock composed mainly of quartz and red feldspars with generally less than 5% chlorite or locally hornblende. It is generally massive, but the orientation of the chlorite flakes may locally impart to the rock a pronounced gneissic structure. Such is the case east and west of the north end of Jean Lake where two wide belts of mainly gneissic granite have been mapped. There are also several other small masses of granite throughout the area. Their random distribution and gradational contacts suggest that they formed at the expense of other types of rock. Near the western boundary of the area and also on the west shore of Jean Lake pegmatites were noted in several instances. A few of those west of **Bellegarde** Lake carry black tourmaline.

The gabbro or basalt (6) is a dark green to reddish brown rock. It is generally fine to medium grained and massive. It occurs as dykes and sills mainly around Don Lake and west from there to the north of **Bellegarde** Lake. The dykes strike west to northwesterly, and the sills trend northeasterly about parallel to the formations. To the east, in and around Fredette Lake, the dykes cut the lower members of the Athabasca group, that is, the basal conglomerate and the arkose-siltstone member directly above the basal conglomerate, but nowhere were they noted cutting the upper members of the Athabasca group found in that area. For this reason, in the legend the gabbro is placed below rocks of the Athabasca group.

The rocks of the Athabasca group occur only in the southeast corner of the area where they are separated from the rocks of the Tazin group by the Black Bay fault. The conglomerate (7) is typical of the conglomerate interbedded with the arkose and siltstone lying above the basal conglomerate in other areas to the southeast. It has rounded fragments, most of them smaller than 6 inches in diameter, that form about 30% of the rock. Some of the fragments are arkosic and others are of siltstone. The matrix is arkosic. The arkose (8) is a medium-grained, orange red, massive rock composed mainly of rounded to subrounded grains of red feldspar and quartz. Iron oxide constitutes the main cement.

The rocks of the Tazin group have been complexly folded and faulted. As tops were nowhere determined and no definite markers were traced it was found almost impossible to determine accurately the nature of the folds of the area. However, minor structural features and the attitudes of the foliation, which is assumed to be relict bedded structure, suggest that west of **Bellegarde** Lake the formations are on the eastern limb of an anticline gently overturned to the northwest, whereas slightly east of the north end of Jean Lake a synclinal axis was recognized. It is assumed that in the area from **Bellegarde** Lake to Jean Lake the broad general trend of the formations is almost flat but that, in detail, the formations are deformed into tight isoclinal and irregular minor folds overturned to various degrees in either direction.

The rocks of the area have also been intensely fractured. Joints are ubiquitous and abundant and faults are almost as common. The faults shown on the map are only those that were recognized in the field by apparent offset of formations or could be inferred readily from field work. It is known that they are much more common. This is particularly true of the faults that strike parallel to the trend of the formations as only a few of these were recognized. They are the Black Bay fault in the southeast corner of the area and the inferred extension of the Boom Lake fault slightly west and north of the north end of Jean Lake. The most easily recognized faults are those striking about northwest traversing the formations almost at right angle. These, however, were not traced far. Others striking slightly north of east at a small angle to the trend of the formations are of major significance as they were traced almost across the map-area. Little is known about any of these faults, but their dip is assumed to be steep southerly. Some of the strike faults, such as the Boom Lake fault, are represented by a wide zone of shearing and brecciation. Others are clear cut fractures. The faults striking at right angle to the formations are generally also clear cut fractures with practically no brecciation and shearing associated with them.

Uranium is the only known metal of possible economic interest in the area. It occurs mainly as pitchblende along fractures that trend either northeasterly parallel to or northwesterly at an angle of about 90° to the trend of the formations. All the uranium-bearing fractures are believed to be related to the joint system of the area as they and the joint fractures trend in similar directions and generally both are clear cut fractures. However, those that trend parallel or almost so to the formations may locally be bordered or accompanied by minor shearing suggesting some movement. The pitchblende along these fractures forms veins, generally less than an inch thick but locally up to 3 inches with wide and rapid variation in thickness along strike and and dip. Their length varies greatly but is generally less than a hundred feet. The pitchblende is generally associated with carbonate, hematite and a dense silica. A few such narrow veins were explored underground on the property of Beta Gamma Mines Ltd. by a vertical shaft to a depth of about 125 feet and about 1,500 feet of drifts and crosscuts.

MAP 12-1958
URANIUM CITY
SASKATCHEWAN
SHEET 7