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RADIOMETRIC INVESTIGATIONS AT ANNINGIE, UTOPIA, AND THE BUNDEY RIVER MINERAL FIELDS, NT 1949

by

J. Daly and D.F. Dyson

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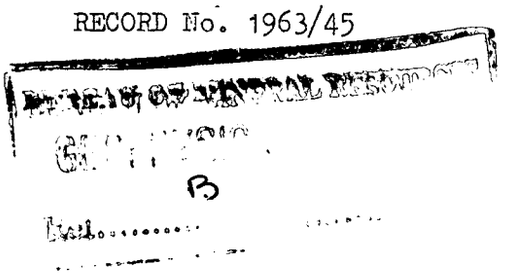

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SUMMARY

Brief radiometric surveys were made at Anningie, Utopia, and Bundey River areas, near Alice Springs. The tests showed slight radioactivity, generally associated with showing of tantalite. None of the areas warrants further consideration as a possible source of radioactive minerals.

1. INTRODUCTION

This Record includes reports on three brief radiometric investigations in the Alice Springs district. They were made in 1949, by members of a geophysical party working in the Harts Range mica field (Daly & Dyson, 1956).

The three areas, viz. at Annangie, Utopia, and Bundey River, have produced small amounts of cassiterite and tantalite. Attention was directed to the possible presence of radioactive minerals by the following facts:

(a) during the testing of Museum specimens for radioactivity (Daly, 1955), samples of tantalite from Anningie were found to be radioactive

(b) an occurrence of the rare radioactive mineral griphite had been reported from the Bundey River area (Jaffe, 1946)

(c) representations were made to officers of the Bureau by Mr L.J. Davis of Alice Springs. Mr Davis had inspected several areas in the Alice Springs district, with a view to working eluvial material for cassiterite and tantalite, using a large dry-blower. He had collected from Utopia and Bundey River samples of tantalite which on examination were found to be slightly radioactive.

Reports were prepared on the results of the examinations, but were not published at the time, as none of the areas appeared worthy of further consideration as a possible source of radioactive minerals. They are presented hereafter for purposes of record. As Mr Davis' proposals did not lead to any mineral production, and none of the areas has attracted any attention in later years, no purpose would be served by bringing the reports up to date. They are therefore presented substantially in their original form. Plate 1 shows the location of the three areas.

2. ANNINGIE TIN FIELD

The Anningie tin field is about 140 miles north of Alice Springs, and about 25 miles north-west of Central Mount Stuart. Mining for tin and tantalite has been carried on in a desultory fashion for some years, but the total production has been insignificant. At the date of the survey, no miners were on the field, the work performed being limited to a little fossicking by natives.

The field consists of a small area of hills, about four miles by two miles, surrounded on all sides by extensive soil plains. The relief is low, the hills not rising more than 150 feet above plain level. The country rock consists mainly of mica schist, with smaller areas of slate, amphibolite, and quartzite.

Tin and tantalite occur, both in eluvial material and in greisen and pegmatite outcrops. It is understood that eluvial material all over the field carries a little tin, but as no water is available for sluicing, the tin content is far below payable grade. Local information is that lode workings were sunk on outcrops in many cases showing tin ore of specimen quality, but in no case did the ore persist at depth. No working seen on the field was deeper than 10 feet.

The field has never been geologically examined in detail, nor has it been mapped. A brief inspection was made by Dr H.I. Jensen during the war period, and a summary report drawn up by him. This report has not been published, but a copy was made available to the members of the geophysical party by the NT Mines Branch, Alice Springs.

Technical details

Tests were made over all worked areas, and over outcrops generally, using portable Geiger-Muller ratemeters manufactured by Austronic Engineering Laboratories, Melbourne. In conjunction with this work, sketch maps were prepared of the areas covered. Plate 1 is a general map of the Anningie tin field showing the layout of workings, etc. This is based on several traverses made on foot. It is only roughly to scale. The length of the area shown on the map from north to south is about four miles.

Particular attention was paid to the Reward claim as this appears to have been the most extensively worked area on the field. Plate 2 is a map of this area, prepared by theodolite and stadia.

It should be noted that rock types shown have been identified visually only. As far as is known, no proper laboratory determinations have been made.

Results

No evidence of high radioactivity was observed in the area. Readings over soil cover, alluvial workings, and outcropping sediments and basic rocks were not greater than normal background. On pegmatite outcrop, readings generally were about 1½ times background, reaching twice background over contact zones at a few spots. The highest activity observed was on the greisen band shown near the western edge of Plate 2. This band consists of a greenish micaceous rock, carrying small patches of a black mineral which is possibly tantalite. Readings over this band were generally twice background and higher, reaching a maximum of four times background on the dump beside the pit. The greisen band is exposed in the wall of the pit, which is about 10 feet deep. A sample of this material tested in the laboratory, showed activity consistent with a uranium content of 0.024 percent U_3O_8.

Conclusions

Although the Anningie tin field is of interest on geological grounds, it does not appear worthy of further investigation as a possible source of radioactive minerals. The only radioactive occurrence located is the greisen band on the Reward claim. This is up to two feet wide, and can be traced on the ground over a length of about 70 feet. It is exposed in one pit to a depth of about 10 feet, and the sample taken indicates a uranium content of about 0.02 percent. Considering the geographical situation of the deposit, the poorness of the grade, and the limited extent of the exposure, it does not appear of interest as an ore of uranium.

3. UTOPIA TANTALITE FIELD

The Utopia tantalite field is about five miles west of Utopia Homestead, and about 150 miles north-east of Alice Springs.

Geology and mineral deposits

The district is one of low relief, with extensive areas of soil and scattered outcrops. The country rocks show variety in character and there are outcrops of gneisses, amphibolites, and schists. These are numerous pegmatite outcrops which range in size from small veins in the country rock to dykes of considerable size. The workings are on, and around, a dyke of this type, which strikes approximately north-west, concordant with metamorphosed sediments.

The main workings (see Plate 3) consist of two small open-cuts in the outcrop and a number of small pits along the edges and in the eluvial material beside the pegmatite. No tantalite was seen in the outcrop, the accessory minerals seen being biotite, tourmaline, magnetite, beryl, and bismuth minerals. A few pieces of tantalite were collected from the eluvial workings.

An outcrops about a mile south-east of the main workings was also examined. From a small working here, a little tantalite and some specimens of quartz showing native bismuth and bismutite were collected.

It was understood that the lessees proposed to work the eluvial material for tantalite by dry-blowing. Some testing by pits appeared to have been done, but no information was available as to the grade of the deposit.

Field Work

Tests were made with portable Geiger-Muller counters over outcrops and workings, particular attention being paid to pits in the eluvial material. No evidence of radioactivity was observed, except on one patch of biotite-rich rock in the wall of the pegmatite outcrop, where a reading of twice background was obtained. Occurrences of this type are frequent in the Harts Range area and the one encountered appears very similar to them. It has no apparent connexion with any concentration of tantalite.

It was hoped that readings taken over the eluvial material would show some radioactivity corresponding to the tantalite content, and that it might be possible, by detailed coverage of the area, to outline richer portions. No such effects were found, the readings on the eluvial material being no greater than the normal background.

Laboratory tests on samples collected, as well as on the bulk material in Mr Davis' possession, confirmed the radioactivity of the Utopia tantalite. The activity is weak, and the samples collected were insufficient to show whether activity is due to uranium or thorium, although absorption tests suggest that the active element may be thorium.

Conclusions and Recommendations

The tantalite from Utopia contains, in small concentration, a radioactive mineral, the nature of which is uncertain.

No tantalite was visible in the outcrop, nor was any evidence of a useful concentration of radioactive minerals disclosed by Geiger-Muller-counter readings, either on the outcrop or on the eluvial material. The eluvial material is the prospective source of the ore, but no information as to the grade is available.

No further investigation of the deposit as a source of radioactive minerals is warranted at the present time. It is recommended that, if production commences, laboratory tests should be made on the product to determine the nature and concentration of the radioactive mineral present.

4. BUNDEY RIVER MINERAL FIELD

The Bundey River Mineral Field lies between Mount Ida and the Bundey River about 100 miles north-east of Alice Springs and about 40 miles north of the Harts Range.

Geology and mineral deposits

Several small mines in the field have been worked at different times for mica and tantalite, but production has been insignificant. The mica workings are at the north-western end of the field, in an area of moderate relief. The remaining workings are in flat country, with extensive areas of soil cover and scattered outcrops.

The mica workings, known as Poloni's mine, are on the most westerly of a series of large and persistent quartz outcrops. The workings consist of an open-cut of moderate size and some shallow shafts. The mine has not been worked for many years and most of the workings have fallen in, but it does not appear to have been as large as the general run of mines in the Harts Range area.

About ½-mile east of Poloni's mine several pegmatite outcrops on the flat have been opened by shallow pits, mainly for tantalite. Very little work has been done, but it is understood that a little surface tantalite was collected. The mineral griphite had been found near one of these outcrops, in the form of a number of black reniform masses, one of whichhad weighed about 50 lb. The geophysical party collected all visible material, amounting to about 10 lb in weight, but it is possible that further samples might be obtained by opening the outcrop.

Saunder's mine is about ½ mile east of the last-mentioned workings. It consisted of two small open-cuts about 10 feet deep. Although it is understood that a small amount of tantalite was obtained, none was visible when the mine was examined.

Results

The usual series of tests on outcrops and workings was made, using Geiger-Muller counters of the ratemeter type. No radioactivity was observed at Poloni's Mine. On the pegmatite outcrops near the griphite occurrence, slight increases in reading were obtained in a few places, the maximum being about 1½ times background count. In every instance the high reading was obtained in close proximity to pieces of tantalite or griphite. The radioactivity of the griphite was very weak, and even large specimens affect the counter only when it was almost in contact with them. The tantalite is somewhat more radioactive, but very few specimens were observed. No general increase in reading was found that might be due to a significant tantalite content in the eluvial material.

Readings at Saunders' workings did not exceed normal, except in two places. A vein of bluish quartz associated with a white earthy mineral gave readings of three times background. The white mineral was chemically tested by the Government Assayer, Alice Springs, and the presence of bismuth was confirmed. A sample of this mineral was tested in the geophysical laboratory, and showed radioactivity consistent with a uranium content of 0.005 percent.

Readings of up to five times background were observed over a small area of the dump at the western end of the workings. The activity was associated with a green micaceous greisen, similar in appearance to the tantalite-bearing greisen at Anningie. Similar material exposed in the workings showed no activity. A sample from the dump was tested in the geophysical laboratory and showed radioactivity consistent with a uranium content of 0.022 percent.

Conclusions and recommendations

Considering the small size of the radioactive occurrences, and the remote position of the field, it does not appear that this area is worthy of further investigations as a possible source of radioactive minerals. There is no evidence to suggest the possibility of a large production of tantalite from the field. It is recommended, however, that in the event of Mr Davis carrying out any mining operations, his production should be systematically tested for radioactive minerals.

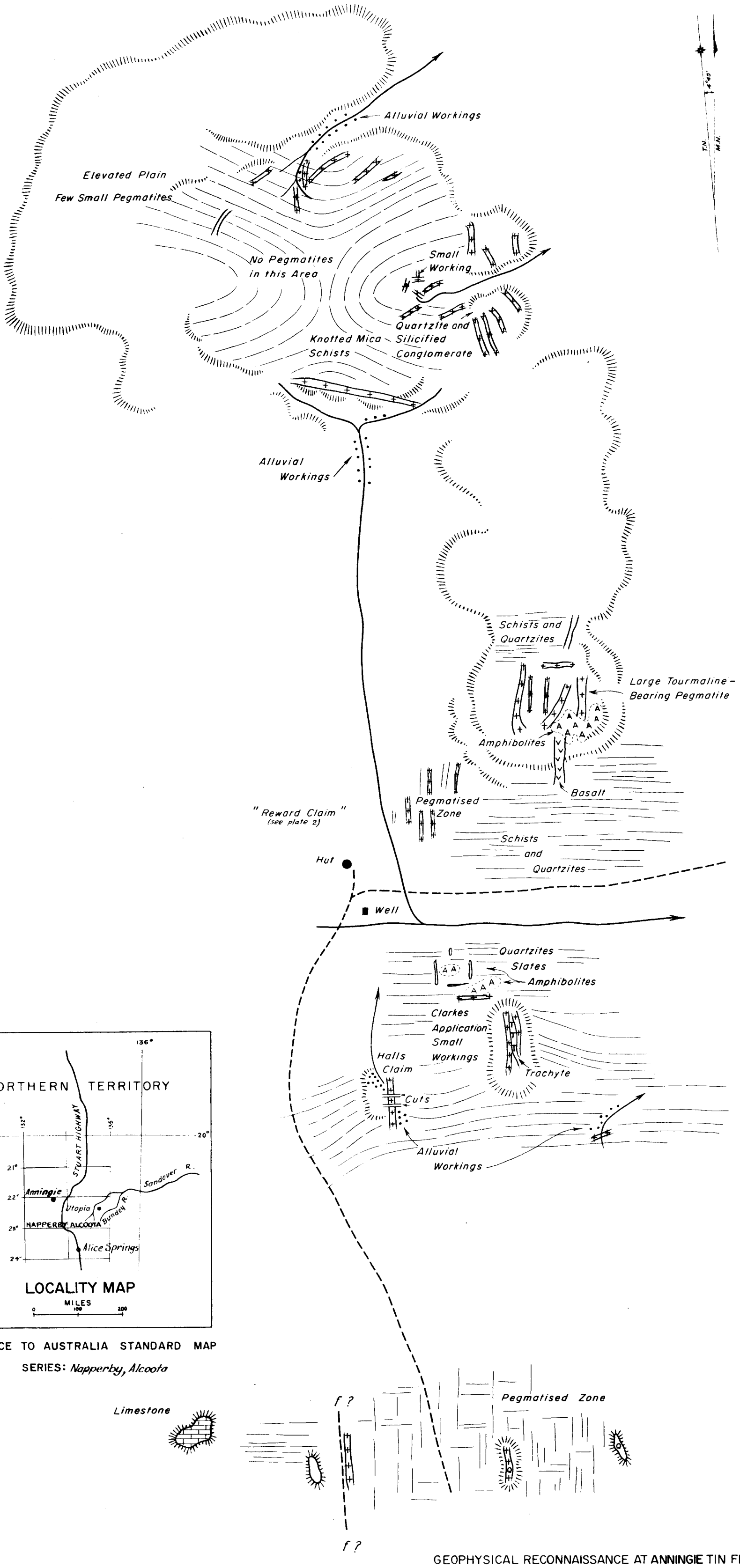
5. REFERENCES

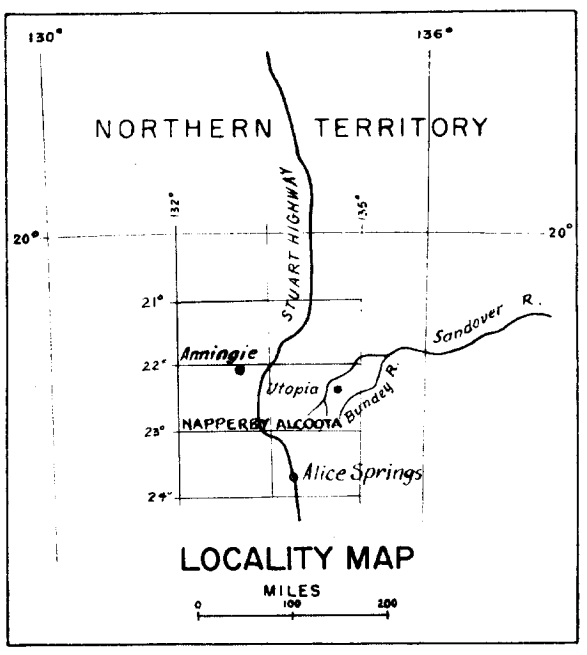
DALY, J. 1955 Examination of museum speciments for radioactivity. Bur. Min. Resour. Aust. Rec. 1955/18 (unpubl.)

DALY, J. and DYSON, D.F. 1956 Geophysical investigations for radioactivity in the Harts Range area, Northern Territory. Bur. Min. Resour. Aust. Rep. 32

JAFFE, H.W. 1946 A new occurrence of griphite, Amer. Miner. 31, 404.

PLATE I





REFERENCE TO AUSTRALIA STANDARD MAP

SERIES: *Napperby, Alcoota*

GEOPHYSICAL RECONNAISSANCE AT ANNINGIE TIN FIELD, NT

GEOLOGICAL SKETCH MAP

SHOWING

MAIN WORKINGS

(NOT TO SCALE)

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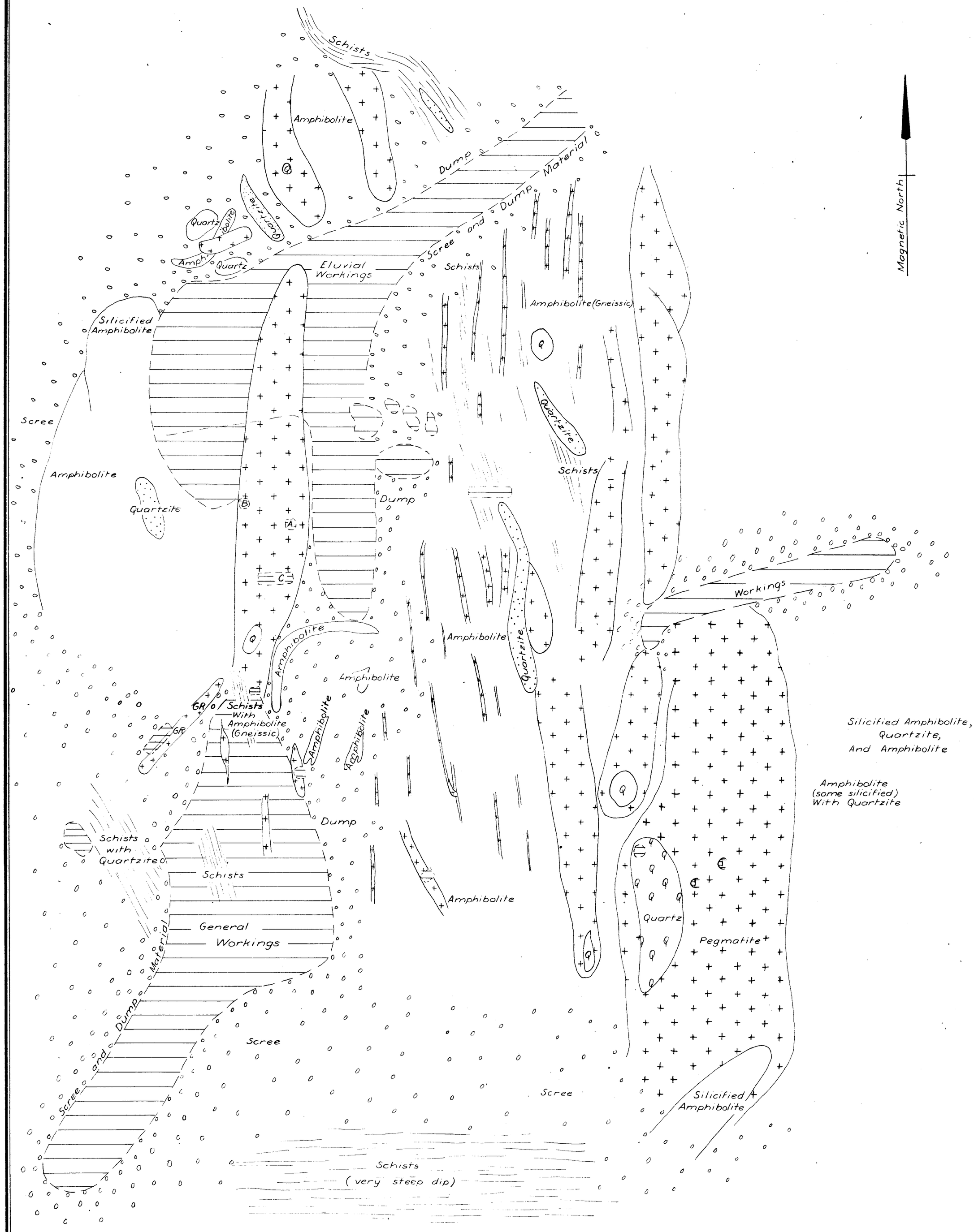

GEOPHYSICAL RECONNAISSANCE AT ANNINGIE TIN FIELD, NT

GEOLOGICAL SKETCH MAP

OF

REWARD CLAIM

Scale

50 0 50 100 feet

LEGEND

- Amphibolite
- Pegmatite
- Quartz
- Quartzite
- Schist
- Scree
- Workings
- GR — Greisen

HUT

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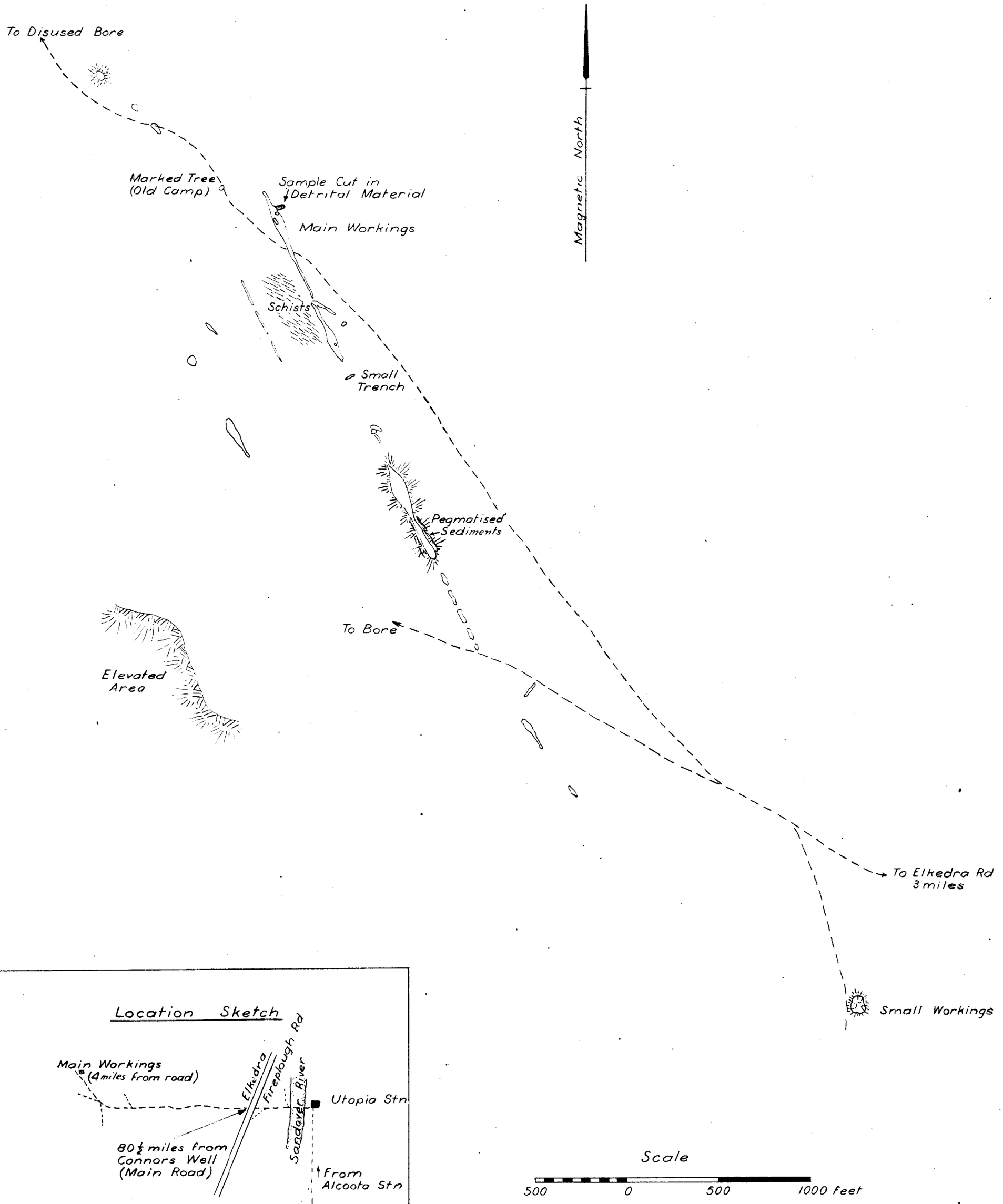

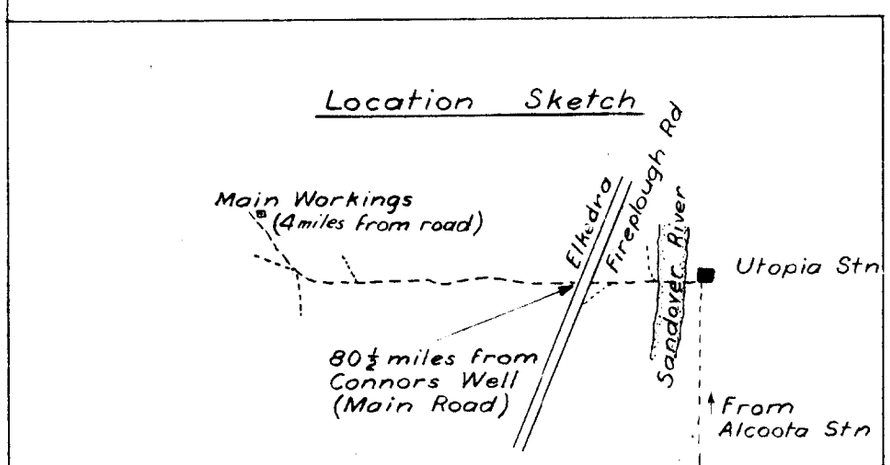

GEOPHYSICAL RECONNAISSANCE AT UTOPIA TANTALITE FIELD, N.T.

SKETCH MAP OF AREA

SHOWING

OUTCROPS AND WORKINGS

LEGEND

- Pegmatite
- Quartz
- Schist

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F 53/B7-10

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