CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

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MINES BRANCH INVESTIGATION REPORT IR 58-162

# MINERALOGICAL REPORT ON A LOW GRADE URANIUM ORE SAMPLE K-5 FROM BRITISH NEWFOUNDLAND EXPLORATION LIMITED, MAKKOVIK AREA, LABRADOR

## Reference No. 6/58-24

by

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RADIOACTIVITY DIVISION

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## SUMMARY

Very finely disseminated pitchblende occurs in small veinlets following the bedding in a dark-coloured, fine-grained, siliceous rock. An amphibole, probably hornblende, is the most abundant gangue mineral. Metallic minerals are scarce, pyrrhotite and pyrite being the most common.

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## INTRODUCTION

In a letter dated June 27, 1958 from Dr. A.P. Beavan, general manager, British Newfoundland Exploration Limited, 1980 Sherbrooke St., W., Montreal 25, Quebec, it was requested that the Radioactivity Division of the Mines Branch undertake electronic sorting and acid consumption testwork on a low grade ore sample. Forty-nine bags of lump ore weighing approximately 4200 lbs were received on June 27, 1958. The sample is designated K-5 by the company and was reported to be from the A-zone of the company's Kitts uranium project in the Makkovick area of Labrador. Table 1 shows a comparison of chemical assays between the present A-zone sample and previous samples from the B-zone.

This report is based on a mineralogical investigation of representative lump specimens of the ore. The ore treatment testwork is covered in another Mines Branch report.(1)

## CHEMICAL ANALYSES

The results of chemical assays and specific gravity tests of head samples of the present sample from the A-zone and two previous samples from the B-zone are shown in the following table:

TABLE 1

Analyses of Head Samples

| | B-Zone | | A-Zone |
|---|---|---|---|
| | K-2, 2/58-14 | K-4, 4/58-12 | K-5, 6/58-24 |
| $U_3O_8$ | 0.74% | 1.36% | 0.089% |
| $CO_2$(evolution) | 2.94 % | 1.10% | 0.85 % |
| $CO_2$(combustion) | 7.08 % | 10.01% | 4.13 % |
| $U_3O_8$ (secondary)* | 0.74 % | 0.031% | 0.12 % |
| S (total) | 2.18 % | 3.04 % | 0.89 % |
| Specific gravity (-10 mesh O.H.S.) | 2.92 | 2.86 | 3.02 |

*dissolved in hot 10% sodium carbonate solution

## ROCK COMPOSITION

Most of the rock in the present sample from the A-zone consists of greenish-black, fine-grained amphibole with smaller amounts of pyroxene, feldspar, quartz, and traces of calcite, epidote, and chlorite. Small amounts of graphitic argillite, the chief rock type in previous samples from the B-zone, are also present. Metallic minerals, also in lesser abundance, include pyrrhotite, pyrite, pitchblende, ilmenite, hematite, and chalcopyrite. Bedding is much less distinct in the amphibole-rich rock than in the graphitic argillite.

Table 2 compares the mineralogical composition of the present sample from the A-zone with two previous samples from the B-zone. Table 1 shows a decrease in total sulphur, and in carbonate by the evolution method and by the combustion method, indicating less sulphides, calcite, and graphite in the A-zone ore.

TABLE 2

A Comparison of the Mineralogical Composition of the Present Sample from the A-Zone with Two Previous Samples from the B-Zone.

| Specific Gravity | B-Zone K-2, 2/58-14 Wt. % | Minerals | B-Zone K-4, 4/58-12 Wt. % | Minerals | A-Zone K-5, 6/58-24 Wt % | Minerals |
|---|---|---|---|---|---|---|
| <2.96 | 71 | feldspar and quartz with minor calcite, graphite and chlorite | 71 | feldspar and quartz with minor calcite, graphite and chlorite | 27 | feldspar and quartz with minor calcite, graphite and chlorite |
| 2.96 to 3.70 | 23 | amphibole plus traces of epidote | 16 | amphibole and pyroxene with minor biotite | 70 | amphibole and pyroxene with minor biotite and epidote |
| >3.70 | 6 | pyrrhotite with pitchblende and pyrite plus traces of molybdenite, chalcopyrite and secondary uranium-bearing minerals | 13 | pyrrhotite and pitchblende with minor chalcopyrite, arsenopyrite and pyrite | 3 | pyrrhotite, pyrite, and pitchblende with minor ilmenite, hematite, and chalcopyrite |

URANIUM MINERALOGY

Pitchblende, the uranium-bearing mineral in this ore, occurs as very fine grains in the order of a few microns in diameter, segregated into a network of small veinlets along the bedding of the rock (Figure 1). This is similar to the occurrence of pitchblende in the graphitic argillite of the B-zone, although the concentration of pitchblende in the veinlets in the A-zone is much lower and the veinlets are more widely

scattered. The width of individual veinlets in the A-zone ore varies from 1/4 mm up to 2 mm although 1/2 mm is most common. Usually several veinlets will occur close together paralleling each other with total widths of 4 or 5 mm.

The pitchblende usually occurs in parts of either the graphitic argillite or the amphibole rich rock where the other metallic minerals, particularly pyrrhotite, pyrite, ilmenite, and hematite, are found.

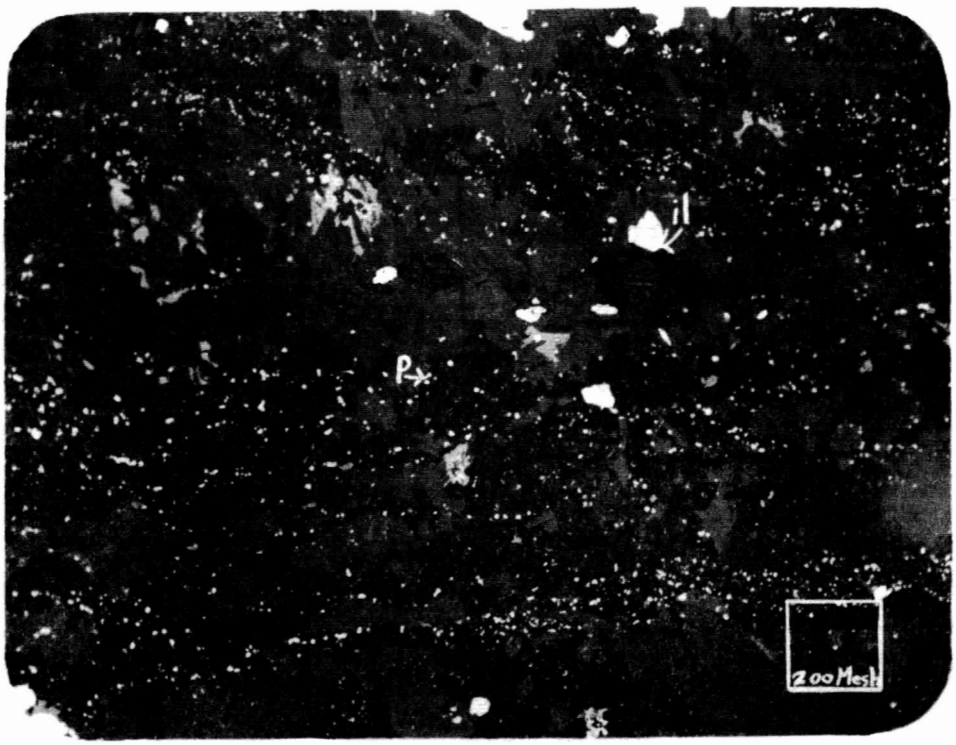


Figure 1 - Fine-grained pitchblende (p) occurring in small veinlets. A few grains of ilmenite (il) are also present. X150.

## CONCLUSIONS

The A-zone sample described in this report differs from the B-zone samples previously examined in that there is little of the graphitic argillite which composes so large a part of the B-zone sample. A rock composed mostly of amphibole and to a lesser extent pyroxene, which contains considerably less metallic mineralization, makes up the bulk of the A-zone sample. Carbonates are less abundant as well as graphite which occurs in the argillite.

## REFERENCES

1. W.R. Honeywell, Electronic Sorting and Leach Tests of a Uranium-Bearing Ore (K-5) from the Kitts Property of British Newfoundland Exploration Limited, Newfoundland, Sample No. 6/58-24. Mines Branch Investigation Report No. IR 58-168, Department of Mines and Technical Surveys, Ottawa, Canada.
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