SHERRITT GORDON

SUMMARY OF SURFACE GEOLOGY AND OUTCROP
CARGILL PHOSPHATE PROPERTY

LOCATION AND ACCESS

The Cargill Phosphate Deposit is located in Cargill Township, Cochrane District, Ontario, 20 air miles WSW of Kapuskasing. Figure 1 depicts the location of the property. It is approximately 500 road miles Northwest of Toronto.

At present, access to the property is via a 26 mile gravel road from Kapuskasing. Most of this road is owned by Spruce Falls Power and Paper Company. A road is presently being constructed which will, when completed, run North of the property approximately 11 miles and intersect route 11 a few miles east of Opasatika.

LEGAL POSITION

At present the property consists of 147 unpatented claims held by International Mineral and Chemical Canada Ltd., Easterhazy, Saskatchewan, and 21 mining leases held by Continental Copper Mines Ltd., Suite 303, 330 Bay St., Toronto, Ontario, which are held under option by IMC. The entire property is, in turn, held by Sherritt Gordon Mines Ltd., under an option agreement with IMC.

PROPERTY HISTORY

Initial interest in the property was caused by the discovery of a magnetic anomaly in Cargill Township. In 1954, Continental Copper staked the anomalous area, and conducted ground geophysical and geochemical surveys. This was followed in 1955 by trenching and 3,102 feet of diamond drilling. Nothing of economic interest was found. CCM obtained leases on the 21 claims as a result of this work.

Aeromagnetic maps released in 1963 showed the shape of the Cargill complex and suggested that it might be an alkaline-carbonatite intrusive body.

Several small exploration programs took place during the 1960's on the CCM claims, and the surrounding area, including work by Union Carbide and Kennco Explorations.
SHERRITT GORDON MINES LIMITED

International Mineral and Chemical just became interested in the property in 1974. By 1976, they had drilled 192 boreholes on the property totalling well over 50,000 feet, outlining a phosphate deposit, developed as a weathering residuum on top of carbonatite. IMC subsequently undertook various feasibility studies, which indicated the deposit might be profitably mined. However, phosphate prices were at an all time high when the studies were done. The price dropped before a production decision was reached, and IMC postponed their plans for development indefinitely.

Sherritt Gordon acquired an exclusive option on the property from IMC in February, 1979, and initiated an exploration program and feasibility studies. Sherritt’s main exploration program included the drilling of 82 large-diameter sonic boreholes, totalling nearly 15,000 feet. Studies assessing the economic viability of the phosphate deposit are in progress.

GEOLOGIC WORK

GEOLOGIC WORK

Summary

The phosphate deposit of the Cargill property has been sampled, analyzed and studied extensively by geologists of IMC, Sherritt and the Ontario Ministry of Natural Resources. This work has been based almost exclusively on interpretation of geophysical data and study of samples recovered from boreholes. However, the purpose of this report is to document the rock types found in the area for the purposes of this report. The writer has seen these outcrops and verify the accuracy of locations and report which are included as Appendix 1.

The phosphate deposit of the Cargill property has been sampled, analyzed and studied extensively by geologists of IMC, Sherritt and Sherritt Gordon acquired an exclusive option on the property in February, 1979. They initiated a large-scale exploration program which included the drilling of 82 large-diameter sonic boreholes, for a total of 15,000 feet, and analyzed the rock types found in the area. The purpose of this report is to document the rock types found in the area for the purposes of this report. The writer has seen these outcrops and verify the accuracy of locations and report which are included as Appendix 1.

The phosphorof deposit of the Cargill property has been sampled, analyzed and studied extensively by geologists of IMC, Sherritt and Sherritt Gordon acquired an exclusive option on the property in February, 1979. They initiated a large-scale exploration program which included the drilling of 82 large-diameter sonic boreholes, for a total of 15,000 feet, and analyzed the rock types found in the area. The purpose of this report is to document the rock types found in the area for the purposes of this report. The writer has seen these outcrops and verify the accuracy of locations and report which are included as Appendix 1.

The phosphorof deposit of the Cargill property has been sampled, analyzed and studied extensively by geologists of IMC, Sherritt and Sherritt Gordon acquired an exclusive option on the property in February, 1979. They initiated a large-scale exploration program which included the drilling of 82 large-diameter sonic boreholes, for a total of 15,000 feet, and analyzed the rock types found in the area. The purpose of this report is to document the rock types found in the area for the purposes of this report. The writer has seen these outcrops and verify the accuracy of locations and report which are included as Appendix 1.
rocks which would be expected in the fault zone have not been found, but this does not necessarily rule out a fault contact, as both the boreholes and interpretation of borehole results, but as this report is confined to surface geology and interpretation of geophysical data, contacts between rock units can be inferred from geophysical data.

The gneiss is generally white or faintly pink, medium grained, and is composed predominately of feldspar (60-80%) quartz (20-30%) and a variety of minor and accessory minerals. The gneissic banding generally consists of 1-3 cm light colored layers irregularly separated by 1-5 mm stringers and lenses of dark colored minerals. A few outcrops are fenitized.

Pyroxenite - The carbonatite is apparently bounded to the east and south by coarse-grained green-black clinopyroxene. The pyroxenite is composed of clinopyroxene, olivine, magnetite and biotite, and the contact zone between carbonatite and pyroxenite is marked by a zone of vermiculite.

Carbonatite - The solubility of carbonatite is responsible for the residual concentration of apatite in the phosphate deposit and accounts for the fact that there are very few outcrops of carbonatite. The phosphate deposit accounts for the fact that there are very few outcrops of carbonatite. The contact zone between carbonatite and pyroxenite is marked by a zone of vermiculite.

The gneiss is generally white or faintly pink, medium grained, and is composed predominately of feldspar (60-80%) quartz (20-30%) and a variety of minor and accessory minerals. The gneissic banding generally consists of 1-3 cm light colored layers irregularly separated by 1-5 mm stringers and lenses of dark colored minerals. A few outcrops are fenitized.

Pyroxenite - The carbonatite is apparently bounded to the east and south by coarse-grained green-black clinopyroxene. The pyroxenite is composed of clinopyroxene, olivine, magnetite and biotite, and the contact zone between carbonatite and pyroxenite is marked by a zone of vermiculite.

Carbonatite - The solubility of carbonatite is responsible for the residual concentration of apatite in the phosphate deposit and accounts for the fact that there are very few outcrops of carbonatite. The carbonatite is composed of 80% calcite and/or dolomite, 5-10% apatite, 5-20% magnetite and minor phosphates. It is white or tan when fresh, but carbonatite which is white or tan when fresh, but carbonatite which is weathered to a dark tan or brown color.

Outcrops in the Cargill area are scarce and generally less than 10m² in area. Areas not shown as outcrops on the map (Fig. 2) are covered by a spruce and birch forest which grows in a brown-black soil rich in decayed vegetation.
omitted from the outcrop map accompanying this report (Fig. 2).
The following report and accompanying map briefly names and locates numerous outcrops discovered during the summer of 1975 in the Cargill project area. The map does not include previously known outcrops in the project area.

Areas that were systematically traversed by "foot" are indicated by red ruled lines. The rock makes up a small 25 foot hill 1000 feet west of an unnamed creek 1 mile west of the Cargill lake road and 600 feet north of the Rock Creek road and 600 feet east of the Rock Creek road.

1. Carbonatite - located along the southeast shore of a 45 foot (estim.) carbonatite. The carbonatite is exposed some 150 feet along the shore as a low (less than 10 feet high) partially vegetated knob.

2. Carbonatite - located approximately 300 feet northeast of the first Bradley Brothers campsite. The carbonatite is exposed in a 2 foot road cut on the west side of the Cargill lake road.

3. Pyroxenite - located approximately 1200 feet south southeast of the first Bradley Brothers camp. The pyroxenite is exposed in the road (muskeg road) leading from Marilyn Lake to Ecclestone Road.

4. Vermiculite - located along a ridge (estim. 60 feet in relief) trending northeast. Numerous chunks of weathered pyroxenite were found on the north face. Vermiculite was especially abundant in the soil at this location. Partially weathered and pyroxenite were found on the north trending northeast. Numerous chunks of pyroxenite were found on the north.

5. Gneiss - located along the east bank of the Lost River approximately 350 feet north of the Ecclestone road. This is a fairly extensive outcrop of gneiss. The rock crops out along the southeast side of a 45 foot (estim.) hill.

6. Fenitized - located 1500 feet north of the Ecclestone road and 1300 feet west of an unnamed creek 1 mile west of the Cargill lake road and 700 feet north of the Cargill lake road.

By a number of correspondences to a description below, red ruled lines. Outcrops are located by the letter "X" and identified by the project area. The map does not include previously known outcrops in the area that were systematically traversed by "foot" areas indicated on the map. The following report and accompanying map provide details of areas and outcrops.
rock ridge which cuts across Beaver Creek Valley.

One of the beaver dams is situated along a 5 foot
gneiss. Gneiss exposures of the gneiss rock in its bed.
and has good exposures of the gneiss rock along this road.
Slopes of a hill making the south valley wall at
Gneiss. The rock is exposed on the north and northeast
slopes. The exact location of this outcrop
Gneiss. This area affords good exposures of gneiss rock which
- located in the valley floor of Beaver Creek. This

Gneiss. Exposure is good.

Located southeast of a small beaver dam on Beaver

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Approximately located along a muskeg road leading to

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

The exact location of this outcrop

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver

Gneiss. Exposure is good.

Located along a claim line approximately 2 and 1/2
 claims north of the Eccleston Township Boundary.

Gneiss. Exposure is good.

Located along a muskeg road leading to Beaver
Outcrop Map
Cargill Project
(includes only outcrops found during July & Aug 1973)
by: Ron Eales

\[\text{X}\] - indicates location of outcrop,
number corresponds to description in "Log"

indicates area covered by ground traverses (lines do not locate individual traverses)