Location/Identification

MINFILE Number: 093N 012
National Mineral Inventory Number: 093N9 Cb1
Name(s): **LONNIE**
GRANITE CREEK, BLUE DOT, LONNIE SOUTH, GRANITE CREEK WEST, VIRGIL
Status: Developed Prospect
Mining Division: Omineca
Electoral District: Nechako Lakes
Regions: British Columbia
Resource District: Mackenzie Natural Resource District
BCGS Map: 093N069
NTS Map: 093N09W
UTM Zone: 10 (NAD 83)
Latitude: 55 40 48 N
Northing: 6171318
Longitude: 124 23 01 W
Easting: 413004
Elevation: 1068 metres
Location Accuracy: Within 500M
Comments: Centre of drilling on a carbonatite zone, 250 metres south and east of Granite Creek, 2.5 kilometres north of Manson Lakes, about 140 kilometres north of Fort St. James (Assessment Report 31411).

Mineral Occurrence

Commodities: Niobium, Zirconium, Titanium, Uranium, Thorium, Rare Earths

Minerals
Significant: Pyrochlore, Columbite, Zircon, Ilmenite, Ilmenorutile
Associated: Apatite, Magnetite, Pyrite, Pyrrhotite
Alteration: Aegirine, Microcline, Plagioclase, Calcite, Quartz, Arfvedsonite
Alteration Comments: Sodic amphibole.
Alteration Type: Fenitic
Mineralization Age: Mississippian
Isotopic Age: 339 Ma **Dating Method:** Zircon **Material Dated:** Zircon

Deposit
Character: Podiform, Concordant, Disseminated
Classification: Magmatic, Hydrothermal, Industrial Min.
Type: N01: Carbonatite-hosted deposits
Shape: Tabular
Dimension: 650x50x0 metres **Strike/Dip:** 120/60S
Comments: Carbonatite zone.

Host Rock

Dominant Host Rock: Metaplutonic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Proterozoic	Ingenika	Undefined Formation	------
Proterozoic	------	------	Wolverine Complex
Devonian-Mississipp.	------	------	Unnamed/Unknown Informal

Isotopic Age	Dating Method	Material Dated
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------	------	-
350-370 Ma	Uranium/Lead	Zircon

Lithology: Carbonatite, Aegirine Sovite, Biotite Sovite, Monzodiorite, Monzonite, Syenite, Nepheline Syenite, Fenite, Psammitic Schist, Pelitic Schist
Comments: Carbonatite is emplaced in metamorphosed rocks of the Ingenika Group. Date from R. Parrish (Open File 1987-17).

Geological Setting

Tectonic Belt: Omineca
Physiographic Area: Manson Upland

Terrane: Cassiar, Slide Mountain, Quesnel, Pl

Metamorphic Type: Regional

Grade: Amphibolite

Comments: Lower amphibolite facies.

Inventory

Ore Zone: ROCK

Category: Assay/analysis

Year: 2019

Report On: N

NI 43-101: N

Sample Type: Chip

Commodity	Grade
Niobium	0.58 per cent

Comments: Sample 19LON-14

Reference: Assessment Report 38373

Ore Zone: LONNIE

Category: Inferred

Quantity: 272,000 tonnes

Year: 1991

Report On: Y

NI 43-101: N

Commodity	Grade
Niobium	0.2000 per cent

Comments: Possible reserves; up to 15 per cent zircon.

Reference: Z.D. Hora, personal communication, 1991.

Capsule Geology

The Lonnie occurrence is located on Granite Creek, 2.5 kilometres north of Manson Lakes and approximately 140 kilometres north of Fort St. James. A cat trail, which leads up to the zone from the Manson Creek road, begins just south of Granite Creek.

Syenite, monzonite and carbonatite occur together in single, northwest-striking sill-like horizons within uppermost Proterozoic metasedimentary rocks of the Wolverine Complex (Ingenika Group). The Ingenika Group is represented by quartzites and garnet-biotite-muscovite schists. These rocks have been metamorphosed to amphibolite grade. To the west lie rocks of the Upper Paleozoic Nina Creek Group. Both intrusive rocks and hostrocks have been deformed and metamorphosed to lower amphibolite facies. The hostrocks comprise psammitic to semipelitic mica schists, micaceous quartzites and marble, which strikes southeast (150 to 170 degrees) and dips steeply to the southwest (70 to 80 degrees on average). The various rock units within each intrusive zone are distributed in interfingering lenses. Alkali metasomatism (fenitization) can be detected for a few tens of metres beyond the intrusions. Preliminary uranium/lead systematics suggest that the Lonnie carbonatite was emplaced in the Late Devonian to Early Mississippian; interpreted zircon ages of 350 ±10 million years and 370 ±20 million years were obtained (Open File 1987-17).

Two varieties of carbonatite are present within the Lonnie complex. One is aegirine sovite in which the principal components are calcite, microcline, perthite and aegirine; the other is biotite sovite, comprising calcite, biotite and usually plagioclase. Both the biotite and aegirine sovites are variably foliated and contain apatite (up to 20 per cent), magnetite and pyrochlore as accessory minerals. The biotite sovite may also contain zircon locally; columbite, ilmenorutile and ilmenite have also been reported. The aegirine sovite occurs along the southwestern margin of the complex, the biotite sovite along the northwestern margin. The biotite sovite is variably mylonitized, with the most intense shearing near the contact with the country rocks. Enrichment in zircon, pyrochlore, columbite, pyrite and pyrrhotite has been noted near the contacts of the sovites with syenites.

Feldspathic intrusive rocks, monzodiorite, monzonites and syenites, outcrop as lenticular masses separating the carbonatite units. All phases contain accessory muscovite, biotite, calcite and apatite. Nepheline syenite is also locally present and contains significant amounts of zircon.

Pods and layers of fenite occur within the Lonnie intrusive complex. The fenite is medium- to dark-green in colour with gossanous weathering. It consists of aegirine and sodic amphibole with microcline, plagioclase and calcite in varying amounts. Trace constituents include pyrochlore, magnetite and zircon.

The host psammitic and semipelitic schists are recognizably fenitized for a few tens of metres beyond the intrusive contacts. Microcline, plagioclase and quartz are major constituents, with aegirine and arfvedsonite disseminated throughout, presumably replacing the original mafic silicate minerals. Biotite is present in trace amounts only. Calcite, apatite, magnetite and zircon may be present and coarse-grained arfvedsonite, magnetite and feldspar segregations may be developed locally.

The Lonnie carbonatite zone has been traced by surface trenching for a length of approximately 650 metres, with widths up to 50 metres. It strikes 120 degrees and dips approximately 60 degrees southwest. Inferred (possible) reserves at Lonnie are 272 000 tonnes grading 0.2 per cent niobium and up to 15 per cent zircon (Z.D. Hora, personal communication, 1991).

In 1953, Earnest Floyd first discovered carbonatite along Granite Creek while prospecting for uranium with C.S. Powney, Mr. Almond and Mr. Kay. In 1954, the first claims were staked by C.S. Powney and then sold to Kennecott Explorations. In 1955, Kennecott Explorations completed a trenching program on the property and outlined a zone, 480 by 15 metres, grading 0.15 per cent niobium (Property File Rimfire - Chisholm, E.O., 1960). A zone in the centre of the property averages 0.21 per cent niobium across a width of 7.6 metres and a length of 240 metres (Open File 1987-17). The presence of uranian pyrochlore has been determined from x-ray work by R.M. Thompson (Minister of Mines Annual Report 1954, page A97).

In 1969, Westrim Mining Corp. acquired the property and resampled the 1955 trenches. In 1970, Westrim Mining Corp. dug five trenches at the southwest end of the showing.

In 1976, the claims were restaked by C.S. Powney. In 1978, Moly Mite Mines Inc. optioned the property. In 1979, Moly Mite Mines Inc. drilled three holes in the Lonnie showing but no assays were done on the core. In 1982, H.M. Jones purchased the Wolverine Group claims which encompassed the Lonnie claims. Considerable work was done on the property including mapping, silt and soil sampling and magnetic surveys.

A 1990 survey of the area revealed thorium to be the radioactive element (F. Ferri, personal communication, 1990). The property was dormant from 1991 to 2007. In 2007, Rocher Deboule Minerals Corp. staked the Lonnie property. In 2009, Rocher Deboule Minerals Corp. drilled five holes into the Lonnie 2 showing to the north but only found background values for niobium. In 2010, Rocher Deboule Minerals Corp. was renamed American Manganese Inc. and conducted soil and rock sampling on the Lonnie property. Rara Terra Minerals Corp. optioned the property in late 2010. In 2011, Rara Terra Minerals Corp. conducted an airborne magnetic survey and soil sampling.

In 2019, American Manganese Inc. conducted a 7.05 line-kilometre magnetometer geophysics survey over the Lonnie property and collected 125 soil samples and 39 rock chip samples. Niobium assays ranged from 0.58 per cent (Sample 19LON-14) to 0.0563 per cent (Sample 19LON-31; Assessment Report 38373). Soil sampling outlined a well-defined zone of elevated cerium, lanthanum, niobium, neodymium, praseodymium and yttrium.

Bibliography

EMPR AR *1954-A96,A97; *1955-29,30
EMPR ASS RPT 7515, 10729, 31411, 32998, *38373
EMPR BULL *91
EMPR EXPL 1977-E202; 1979-237
EMPR FIELDWORK 1987, pp. 169-180
EMPR GEM 1970-181
EMPR MAP 22; 65, 1989
EMPR OF *1987-17, pp. 37-41; 1988-12; 1990-32; 1992-1; 1992-9
EMPR PF Chevron (Unknown (unknown): Fig. 2 - Index map showing locations of carbonatite and nepheline syenite gneiss complexes; Unknown (unknown): Fig. 8 - Geological map of the Lonnie - Granite Creek - carbonatite complex; Chevron Standard Ltd. (1977): Nation River - geochemical map, Virgil, Lonnie)
EMPR PF Rimfire (E.O. Chisholm (1960): Re - Lonnie Columbian Deposit)
EMR MP CORPFILE (Moly Mite Mines Inc.; Golden Slipper Resources Inc.)
EMR MIN BULL MR 223 B.C. 251
GSC BULL 239, pp. 119-121
GSC EC GEOL 16 (Rev.), p. 233; 18, pp. 29,31; 29, pp. 71,134
GSC MAP 876A; 907A; 971A; 1424A; 5249G
GSC OF 551
GSC P 41-5; 42-2; 45-9; 75-33
GCNL #131, 1982
PR REL Rocher Deboule Minerals Corp. Nov.5, 2009; American Manganese Inc. Oct.1, 2010; Rara Terra Minerals Corp. Mar.*27, 2012
WWW http://raraterra.com

Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	Y
Date Revised:	2021/04/14	**Revised By:**	Nicole Barlow (NB)	**Field Check:**	Y