GM 06294

REPORT ON GEOLOGY, PRODUCTION AND MARKETING WITH 7 CERTIFICATES OF ANALYSES OF THE VAN REET MINE

Report on

Baker Talc Ltd.,

Highwater, P.Q.

Introduction

The writer surveyed and examined the Van Reet mine of Baker Talc Limited in April, 1957. Plans of the mill buildings and surroundings were also prepared at that time. A screening circuit has been added since then.

This report is a description of the mine and mill operation. Information given is obtained from personal observations and reports and data obtained from Company officials.

Properties & Location

Baker Talc Limited owns the mineral rights on Lots 111 and 112, Range II, Potton Twonship, Brome County, Que, and part of the surface rights on lot 112 where the mill and original mine are situated.

The present mine called the "Van Reet", operated on a royalty basis, is located on Lots 606 and 607, Range X, Potton Twp., Quebec. Lt 28/V

The mill site and original mine are adjacent to the C.P.R. line from Montreal to Boston, Mass., one and a half miles (1½) west of Highwater, Que., and connected to Provincial Highway number 39 by a good gravel road. The "Van Reet" mine is one and a half (1½) miles west of South Bolton and fifteen miles (15) north of Highwater. Highwater is 80 miles southeast of Montreal.

History

In 1938, a grinding mill was built at the site west of Highwater by Baker Mining and Milling Co, Ltd. to treat ore from the adjoining deposit. Ore from this source supplied the mill until 1949 when, after partial caving and flooding, operations were curtailed. Approximately 25,000 tons were mined and processed from this source.

From 1949 to 1952 ore milled, on a royalty basis, came from the "Marcoux" mine, located on lots 352, 353 and that part of 571 west of the highway, Potton Twp, seven miles north of the mill. This deposit had produced approximately 3000 tons when operations ceased due to a decrease in quality of the ore.

The company was reorganized in 1952 under its present name and, since 1953, the chief source of ore has been the "Van Reet" mine also operated on a royalty basis.

3 maps

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Geology of Area

The geology of this part of the Eastern Townships has been described by Ambrose (1) and Cooke (2), both of the Geological Survey of Canada.

The region is mostly underlain by Sutton schists of Cambrian Age which grade eastward into the less metamorphosed quartzites, greywackes and slates from which they are derived. The impure quartzites are altered to quartz-sericite-chlorite schists and slates to phyllites in which chlorite is prominent. Some bands of chlorite schists are found and are probably of volcanic origin.

Intruding the schists are serpentine dykes or sills in which talc and soapstone occur. These dykes are probably related in age and origin to large bodies of peridotite, pyroxenite and gabbro occurring east of the Sutton series. These intrusive bodies are post-ordovician and possibly post-Devonian in age.

The schists have been folded into a broad anticline with the peaks of the Sutton mountains forming its crest rising about 1800 feet above the St. Lawrence Lowlands to the west. The Sutton series strikes about N.15°E and is part of the northern Appalachians.

Four periods of orogeny are suggested in this region. A post-Cambrian period is represented by folding of the quartzites, greywackes, slates and derived Sutton schists. Intense folding and subsequent faulting with intrusions of peridotite, pyroxenite and gabbro dykes followed the Ordovician period. Folding also occurred in Middle Devonian time and is presumably related to Acadian orogeny. Finally, faulting occurred in a post-Devonian epoch but cannot be definitely dated because of the lack of formations between the Devonian and Tertiary Monteregian intrusions.

Geology of Deposits

The talc and soapstone deposits are found in dykes or sills as an alteration product of serpentine, mainly due to intense folding and faulting combined with reaction with silica contained in circulating hydro-thermal solutions. The dykes usually parallel the formations with a strike about N20°E and an easterly dip varying between 45° and 70°.

The walls of the serpentine dykes are commonly altered to soapstone and talc. Where the dykes are faulted or folded, the alteration may occupy the full width. They vary in width from a few inches up to

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(1) Ambrose, J.W., Preliminary Map, Mansonville, Que; G.S.C. Paper 42-1, 1942.

(2) Cooke, H.C., Geology of Southwestern Part of the Eastern Townships of Quebec; G.S.C. Memoir 257, 1950.

Geology of Deposits (cont'd.)

100 feet and consequently produce orebodies of irregular shape but generally in the form of lenses.

The dykes are usually zoned having a slightly talcose serpentine core which is fractured. The fractures are filled with magnesite, talc and ferruginous dolomite.

The serpentine core is surrounded by a zone of massive talc and magnesite with small amounts of chlorite accounting for the pale green to grey color of the talc. This green or grey tint makes the talc unsuitable for a product where color is important.

This zone is in sharp contact with a schistose, pale green, magnesite-free talc zone which in turn is in sharp contact with the soapstone zone adjacent to the wall-rock. This wall-rock is quartz-sericite-chlorite schist, graphitic in places.

The soapstone or talc-chlorite schist sometimes contains quartz in blobs and stringers. It also contains streaks of sulphides and crystallized magnetite in minor amounts.

Zoning in the same sequence also occurs adjacent to cross-cutting faults and would suggest two periods of chemical alteration. One contemporaneous with folding and the other associated with later faulting.

The greatest length of serpentine dyke yet explored is about 500 feet in the underground workings and 1000 feet by surface exploration.

Mining

At the Van Reet mine, two talc deposits, offset by a transverse fault are reached by an adit driven along the hanging wall of the ore body following its configuration.

The first deposit, was worked by room and pillar methods with backs up to 25 feet. This deposit is about 150 feet long and from 15 up to 50 feet wide and seems to be open at depth.

The second deposit, with a flatter dip is mined chiefly by glory-hole methods and raises and cross-cuts driven on both the footwall and hanging wall. The developed portion is approximately 70 x 75 x 250 feet above drift level and is open to the south. It contains roughly 120,000 short tons of which 75% should be recoverable. It indicates a life expectancy of about 10 years at the present annual output.

The talc ore is mined selectively to meet varying specifications at an average daily rate of 38 tons of ore based on a five-day week of 10 hours per day. Since water contaminates the ore by affecting

Mining (cont'd)

its milling and bagging characteristics and customers specifications, the broken ore is removed as soon as possible from the different stopes. For this reason, the two glory-holes are inactive during winter months.

The talc and waste are mechanically mucked and trammed to loading bins at the adit portal whence the ore is hauled 15 miles to the mill by truck. Waste is discarded to a dump a short distance from the loading bins.

Milling

Talc ore is dumped in surge bins whence it is conveyed to a primary jaw crusher reducing it to minus 3". Secondary crushing is done by a hammer mill set at minus three-quarter inch (¾).

After crushing it either goes to fine ore bins or directly to a Williams or Raymond Roller Mill, installed early in 1957, which grinds the product to the required mesh size. These are air-swept mills, in which the material is pulverized until fine enough to be removed by the air stream.

Variations in fineness are achieved by adjustments to vanes or Whizzer blade speeds in separators above the grinding units. The material fine enough to pass the separator is carried over to a cyclone collector. From the cyclone collector, ground talc goes to an automatic bagger where it is packed in 50 lb multi-wall paper bags.

In the middle of 1957, after exhaustive tests, a Sweco circular screen with a centrifugal separating action was installed to take advantage of a throw-out device on the Raymond Mill which produces a coarser material having a seemingly bright future in roll-roofing and shingle manufacture.

Sometime in 1958, it is planned to install a rotary, oil-fired dryer with a capacity of 8 to 10 tons per hour to dry the minus 1½" run of mine ore prior to final grinding. This will permit greater flexibility and economy in the mining operation by permitting storage of broken ore in stopes. It will also improve the ore picture by adding those reserves contained in the original mine behind the mill and which are now too wet to be treated by the present flow-sheet.

The present mill capacity varies greatly according to the different grades produced and is believed to reach a capacity in excess of 150 tons per working day of the coarser grades.

Product Specifications and Uses

Baker Talc Limited produces six grades of pulverized talc and soapstone. The specifications and uses of which are as follows:

(a) Roofing Grade: 100% minus 40 mesh and 70% plus 200 mesh. Used for asphalt roll roofing and shingles.

(b) Asphalt filler Grade: 90% minus 325 mesh with a maximum of 10 to 15% loss on ignition. It is used chiefly in pipe line enamels.

The following three grades are all used as fillers in insecticides, paint, plaster compounds, adhesives and plastics but the degree of fineness varies according to the different customers requirements.

(c) A-1 Grade: minimum 95% minus 325 mesh.

(d) A-2 Grade: minimum 97% minus 325 mesh.

(e) A-3 Grade: minimum 99% minus 325 mesh.

(f) A-4 Grade: 99.9% minus 325 mesh.

Soapstone and soft schistose meet the requirements of the asphalt filler grade. The talc-magnesite zone and the soft schistose talc zone are suitable for the other applications.

Production and Marketing

Baker Talc production has been increasing steadily from around 6000 tons in 1955 to 9760 tons in 1957.

The new roller mill with its good control over the quality of product, namely more consistent fineness, is opening new markets in paper, paints and rubber goods. With the installation of the circular screen, it is now possible to produce a coarser size material which has a good potential in roofing papers, linoleum, tile and some rubber goods.

A sales agreement with St. Lawrence Chemical Co, Ltd. to act as sole distributor for Baker Talc throughout Canada was ratified early in 1957. This agreement should greatly help the company by putting at its disposal their marketing research and sales departments.

Lately, a lower freight rates schedule was worked out with the C.P.R. which will place the different products on a better competitive position with U.S. suppliers.

Respectfully submitted,

P Brosseau

P. Brosseau, P.Eng.

Montreal,1. P.Q.
February 10, 1958.

CERTIFICATION

I, Pierre Brosseau of the city of Montreal in the Province of Quebec, hereby certify:

1. that I am a Mining Engineer and reside at 868 Davaar Street, Montreal,8. Quebec;

2. that I am a graduate of the Ecole Polytechnique (B.A. Sc.) and have been practising my profession as a Mining Engineer for five years;

3. that I am a member of the Corporation of Professional Engineers of Quebec.

4. that I have no interest nor do I expect to receive any interest, either directly or indirectly, in the mining properties or securities of Baker Talc Limited.

5. that the accompanying report is based on documents already mentioned in the above report, personal examination of the properties and on information obtained from Company officials.

P. Brosseau

P. Brosseau, P.Eng.

Montreal,1. P.Q.
February 10, 1958.

Quebec, January 5th, 1955.

(Wi-7384/7385).

Baker Talc Limited,
215, St-James Street, West,
Montreal.

#189	(Wi-7384)	2-oz.	Silica (SiO_2)	4.77%
			Ferrous oxide (FeO)	2.68%
			Lime (CaO)	27.32%
			Magnesia (MgO)	20.83%
			Carbon dioxide (CO_2)	42.01%
				97.[illegible]
#190	(Wi-7385)	7-oz.	Silica (SiO_2)	27.77%
			Ferrous oxide (FeO)	6.24%
			Lime (CaO)	6.55%
			Magnesia (MgO)	29.76%
			Carbon dioxide (CO_2)	25.04%
			Combined water (H_2O+)	2.90%
				98.26

The Analyst:-

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Jean Plamondon

The Director:-

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The Deputy Minister:-

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Quebec, January 14th, 1955.

(W1-7660/7662).

Baker Talc Limited,
Room 301, 215, St-James Street, West,
Montreal, P.Quebec.

G-191	(W1-7660)	¾-lb.	Silica (SiO_2)	69.86%
			Alumina (Al_2O_3)	12.53%
			Ferrous oxide (FeO)	3.67%
			Ferric oxide (Fe_2O_3)	0.93%
			Lime (CaO)	0.03%
			Magnesia (MgO)	4.46%
			Combined water (H_2O +)	3.64%
			Sulphur (S)	0.04%
			Carbon dioxide (CO_2)	0.00%
G-192	(W1-7661)	6-oz.	Silica (SiO_2)	27.20%
			Alumina (Al_2O_3)	21.94%
			Ferrous oxide (FeO)	12.41%
			Ferric oxide (Fe_2O_3)	1.87%
			Lime (CaO)	1.57%
			Magnesia (MgO)	21.85%
			Combined water (H_2O +)	11.19%
			Sulphur (S)	0.01%
			Carbon dioxide (CO_2)	0.00%
G-193	(W1-7662)	½-lb.	Silica (SiO_2)	28.79%
			Alumina (Al_2O_3)	16.88%
			Ferrous oxide (FeO)	8.76%
			Ferric oxide (Fe_2O_3)	1.18%
			Lime (CaO)	0.00%
			Magnesia (MgO)	27.18%
			Combined water (H_2O +)	12.15%
			Sulphur (S)	0.02%
			Carbon dioxide (CO_2)	0.03%

The Analyst:-
.....Joseph Gagnon.....

The Director:-
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The Deputy Minister:-
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Quebec, January 14th, 1955.

(W1-7663/65).

BakerTalc Limited,
Room 301, 215, St-James Street, West,
Montreal, P. Quebec.

94	(W1-7663)	½-lb.	Silica (SiO_2)	56.41%	
			Alumina (Al_2O_3)	2.61%	Soft sh.
			Ferric oxide (Fe_2O_3)	1.23%	
			Ferrous oxide (FeO)	4.06%	
		No 1	Lime (CaO)	0.00%	Talc
			Magnesia (MgO)	2[illegible].79%	
			Combined water (H_2O +)	6.09%	
			Sulphur (S)	0.17%	
			Carbon dioxide (CO_2)	0.01%	
95	(W1-7664)	7-oz.	Silica (SiO_2)	47.73%	
			Alumina (Al_2O_3)	1.15%	
			Ferric oxide (Fe_2O_3)	1.03%	Hard
			Ferrous oxide (FeO)	4.38%	
		No 2	Lime (CaO)	0.98%	Talc
			Magnesia (MgO)	30.36%	
			Combined water (H_2O +)	4.33%	
			Sulphur (S)	0.23%	
			Carbon dioxide (CO_2)	5.96%	
96	(W1-7665)	10-oz.	Silica (SiO_2)	40.78%	
			Alumina (Al_2O_3)	0.24%	
			Ferric oxide (Fe_2O_3)	3.54%	
			Ferrous oxide (FeO)	3.09%	Serp[illegible]
			Lime (CaO)	0.00%	
			Magnesia (MgO)	37.86%	
			Combined water (H_2O +)	10.83%	
			Sulphur (S)	0.0[illegible]%	
			Carbon dioxide (CO_2)	2.36%	

The Analyst:-
......Joseph Gagnon.............

The Director:-
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The Deputy Minister:-
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[illegible] May [illegible], 19[illegible].

(S-1000/[illegible])

Baker Talc [illegible]
Att: [illegible]
Room 302-21[illegible] [illegible]
Montreal, P.Q.

[illegible] Copper [illegible]
[illegible]
Zinc (Zn) [illegible]
Lead (Pb) [illegible]
Manganese [illegible]

[illegible] Copper [illegible]
[illegible]
Zinc (Zn) [illegible]
Lead (Pb) [illegible]
Manganese (Mn) [illegible]

[illegible] Far East

[illegible]

Quebec, September 27, 1957.

(Ze-4620/21)

Quebec Smelting & Refining Ltd.,
c/o Dr. J.H.Morgan,
302-215 St James St West,
Montreal,P. .

-716, (Ze-4620) 20-g.

Nickel(Ni)	0.14%
Copper(Cu)	0.01%
Zinc(Zn)	0.00%
Silica(SiO_2)	47.86%
Alumina(Al_2O_3)	1.32%
Ferrous oxide(FeO)	4.07%
Iron sesquioxide(Fe_2O_3)	0.67%
Calcium oxide(CaO)	1.57%
Magnesium oxide(MgO)	30.87%
Manganese(Mn)	0.05%
Water(H_2O)	4.62%
Sulfur(S)	0.12%
Dioxide carbon(CO_2)	8.40%
	99.70

75% Talc
14.7% $MgCO_3$
2% $CaCO_3$

N-717, (Ze-4621) 1-z.

Copper(Cu)	0.01%
Nickel(Ni)	0.18%
Zinc(Zn)	0.00%
Silica(SiO_2)	36.71%
Alumina(Al_2O_3)	2.09%
Ferrous oxide(FeO)	5.41%
Iron sesquioxide(Fe_2O_3)	0.66%
Calcium oxide(CaO)	2.67%
Magnesium oxide(MgO)	31.48%
Manganese(Mn)	0.08%
Water(H_2O)	3.94%
Sulfur(S)	0.23%
Dioxide carbon(CO_2)	16.12%

55% T[illegible]
27.7% $MgCO_3$
4.2% $CaCO_3$

The Analysts:-..............................
Jean Plamondon

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Florian East

The Director:-..............................

The Deputy-Minister:-..............................

Quebec, October 12, 1957.

(Ze-5215/16)

Quebec Smelting & Refining Ltd.,
c/o Dr. J.H. Morgan,
Room 302-215 St-James-Street-West,
Montreal, P.Q.

?-?.1, (Ze-5215) 1-lb.10-z.	Silica (SiO_2)	18.76%
	Alumina (Al_2O_3)	1.56%
	Ferrous oxide (FeO)	6.77%
	Iron sesquioxide (Fe_2O_3)	1.29%
	Calcium oxide (CaO)	4.36%
	Magnesium oxide (MgO)	31.93%
	Water (H_2O)	2.17%
	Dioxide carbon (CO_2)	30.38% 29.5% 57.3%
	Sulfur (S)	0.45%
	Copper (Cu)	0.01%
	Nickel (Ni)	0.14%
	Zinc (Zn)	0.00%
	Manganese (Mn)	0.10%
?2, (Ze-5216) 1-lb.	Silica (SiO_2)	16.09%
	Alumina (Al_2O_3)	0.58%
	Ferrous oxide (FeO)	7.42%
	Iron sesquioxide (Fe_2O_3)	2.26%
	Calcium oxide (CaO)	4.72%
	Magnesium oxide (MgO)	31.30%
	Water (H_2O)	2.27%
	Dioxide carbon (CO_2)	31.77% 25.4% 59.6%
	Sulfur (S)	1.40%
	Copper (Cu)	0.01%
	Nickel (Ni)	0.26%
	Zinc (Zn)	0.00%
	Manganese (Mn)	0.10%

The Analysts:-..................................
Florian East

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Jean Plamondon

The Director:-..................................

The Deputy-Minister:-..................

Quebec, October 12, 1957.

(Ze-5217)

Quebec Smelting & Refining Ltd,
c/o Dr.J.H.Morgan,
Room 302-215 St-James-Street-West,
Montreal,P.Q.

(Z -5217) 10-z.

Silica (SiO_2)	20.98%
Alumina (Al_2O_3)	0.97%
Ferrous oxide (FeO)	7.75%
Iron sesquioxide (Fe_2O_3)	1.79%
Calcium oxide (CaO)	4.29%
Magnesium oxide (MgO)	30.68%
Water (H_2O)	1.63%
Dioxide carbon (CO_2)	[illegible] 33.0%
Sulfur (S)	1.8[illegible]%
Copper (Cu)	0.01%
Nickel (Ni)	0.46% 50.9%
Zinc (Zn)	0.00%
Manganese (Mn)	0.09%

The Analysts:-..
Florian East

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Jean Plamondon

The Director:-..

The Deputy-Minister:-..