REPORT ON

WOLLASTONITE PROSPECTING PROJECT

SOUTHEASTERN ONTARIO

OPAP FILE NO. OP90-463

BY

CAROLYN HORNER

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Wollastonite Prospecting Project-Tudor Tp, scale 1:10,000
Introduction

The following report describes a prospecting program for wollastonite and gold in the Grenville Province in southeastern Ontario. The funding was obtained from the Ontario Prospectors Assistance Program (OPAP). This report is part of the Final Submission required by OPAP.

Research on wollastonite occurrences in southeastern Ontario suggested that prospecting should concentrate on calcitic, siliceous marbles located within the thermal metamorphic aureoles surrounding plutons in areas of regional greenschist metamorphism. In areas of high regional metamorphism, the periphery of late intrusives that post-date the regional high grade metamorphic event should also be investigated. There appears to be a spatial relationship between occurrences of wollastonite and gold in Marmora Township. Gold-bearing arsenopyrite-quartz veins occur in the felsic intrusive. Known metasomatic iron occurrences along the margin of the Deloro Pluton may be useful wollastonite targets. Based on this information, two areas were selected for wollastonite prospecting and the possible gold association was kept in mind.

The main area of interest was in the southeast section of Lake Township. This area is underlain by marbles that have been intruded by granite and gabbro. In addition there was mention of a wollastonite occurrence in marble within one of the gabbroic intrusions. The second area of interest was in the northeast section of Tudor Township near the village of Gilmour. In this location the Wadsworth Trondhjemite intrudes the surrounding marble and there is a metasomatic iron deposit, the Emily mine, located within a small re-entrant of the marble (Lumbers, 1969).

The other factor determining the selection of these two areas was the presence of land open for staking in case significant showings of wollastonite or gold were found.
Location and Access

The main wollastonite project concentrated on the southeast section of Lake Township, Hastings County, Southern Ontario Mining Division. In addition, a few grab samples were collected from the northeast corner of Tudor Township, located east of Lake Township, near the village of Gilmour. The author and an assistant were based in Madoc. Access to the project area was along Highway 62 north to the Millbridge Road and then 5 kilometers west of Highway 62 on a gravel road and then on foot along various bush roads.

Access to the Gilmour area samples is north along Highway 62 to the Gilmour Road, then about 2.5 kilometres northeast of Gilmour along the Gunter Road. The samples were collected on the north side of the road west of the gravel pit.

Geology

General

Lake Township lies within the Hastings Basin structural subdivision of the Haliburton-Bancroft area of the Grenville province of the Canadian Shield. Tudor Township adjoins Lake Township on the east side. The bedrock formations in the area are of Precambrian and Paleozoic age. The oldest Precambrian rocks are metasediments and metavolcanics. The metasediments are mainly marble, paragneiss, and metarock. The metavolcanics include greenstone schists, amphibolites, and rhyodacite flows and tuffs. The rocks were folded and metamorphosed during the Grenville orogeny and intruded by gabbro, granite, and syenite.

After mountain building, the area was eroded to a peneplane. During Paleozoic times, seas covered Lake Township, and consequently an outlier of Black River limestone of Ordovician age occurs at Vansickle in Lake Township.
The main axial trends of the folds in Lake Township are northeast-southwest, parallel to the regional pattern of folding. Crossfolds have also developed almost perpendicular to the main fold axis.

Project Area Geology

The rock types encountered during the course of the prospecting activity were marble, granite, and gabbro. The property is underlain by marble that had been intruded by granite in the central area and by gabbro to the northeast and southwest. The marble outcrops were generally poorly exposed. The granite outcrops had poor to excellent exposure and the gabbro outcrops had poor to moderate exposure. The vegetation in the area consisted of mature maple and oak with some ironwood, beech, balsam fir, white pine and cedar. The terrain was generally well-drained and hilly with some low swampy areas.

Work Done

The wollastonite prospecting concentrated in the area of recently lapsed claims that were centred on a granitic intrusion in marbles. To the northeast and southwest were large gabbroic intrusions. This area was selected on the basis of recommendations made in the Ontario Geological Survey Open File Report 5715 Wollastonite in Southern Ontario 1990 by A. MacKinnon. In addition the presence of wollastonite had been identified (Allen, 1976) in a calc-silicate xenolith of unknown size in the Tudor Gabbro somewhere in the area of lot 12 (W 1/2), concession 11, and lot 12 (E 1/2), concession 10, Lake Township. Two attempts were made by the author to find this wollastonite occurrence but without success. MacKinnon had described the access to this occurrence as extremely poor and had not attempted to locate it.

The second day in the project area was spent visiting the Resident Geologist Office at Tweed. The staff geologist Steve van Haaften took us to the known wollastonite showing on Highway 7 near Marmora. First we examined gold-bearing, quartz-arsenopyrite veins within the Deloro pluton near the contact with the marbles. Then within the marbles not
far from the contact with the Deloro pluton is the roadcut containing wollastonite. Photographs and reference samples of wollastonite were taken. The most notable feature of the wollastonite in outcrop was the distinct weathering pattern. The ovoid nodules containing bladed crystals of wollastonite were weathered in low relief in contrast to the surrounding calcite.

Traditional prospecting methods were used in the project areas. Air photos at a scale of 1:10 000, claim maps, scale 1 inch to 1/2 mile, and Ontario Base Maps, scale 1:10 000, were used for ground control. Pace and compass traverses, old claim lines, bush roads and a hip chain were used to tie in the location of outcrops and grab samples. An approximately east-west trending bush road traversing the marbles south of the granitic intrusive was used as a baseline. Using the hip chain, a piece of flagging was posted at 50 metre intervals using Beaver Creek as the starting point. Marble outcrops were examined for the presence of an accicular to bladed mineral. If such a mineral was found more of the outcrop would be stripped of moss and grab samples were collected. Samples of fine-grained marble were also collected in case the wollastonite was very fine grained. The marble outcrops were generally poorly exposed. The granite outcrops had poor to excellent exposure and the gabbro outcrops had poor to moderate exposure.

A total of 44 samples were collected from the Lake Township project area and submitted to Lakefield Research for wollastonite determination by X-Ray diffraction. Five samples were collected for gold analysis by fire assay. A total of 5 samples were collected from the Gilmour area. All five samples were sent for wollastonite analysis by X-Ray diffraction. Descriptions of all samples are included in an appendix.

Results and Recommendations

A total of 44 samples were collected from the Lake Township project area and submitted to Lakefield Research for wollastonite determination by X-ray diffraction. According to the Lakefield Research report nine
samples appeared to contain minor amounts (less than 5 percent by weight) of wollastonite. These were sample numbers; W13-3, W19-3, W19-5, W23-4, W23-5, W25-1, W26-2, W27-2, and W28-1. The positive identification of small amounts (<5% CaSiO3) in these samples was made difficult by the high-intensity of calcite and pargasite (edenite) diffraction peaks adjacent to wollastonite peaks. Detailed descriptions of the samples are included in Table 1 and the sample locations are shown on the map.

TABLE 1
GRAB SAMPLES WITH WOLLASTONITE DETECTED BY X-RAY DIFFRACTION

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W13-3</td>
<td>light grey, m.g., crystalline marble containing ovoid clusters of parallel pale green needles (tremolite?). -moderate reaction to HCl. -medium grey, knobby weathered surface.</td>
</tr>
<tr>
<td>W19-3</td>
<td>generally medium grey, f.g., marble with white to rusty patches of coarser crystalline mineral (calcite &amp; ankerite?) -strong reaction to HCl. -knobby weathering but more rusty than usual, some brown weathering spots.</td>
</tr>
<tr>
<td>W19-5</td>
<td>medium grey, f.g., slightly foliated marble with scattered phlogopite and 2-3% m.g., dark amphibole crystals. -strong reaction to HCl.</td>
</tr>
<tr>
<td>W23-4</td>
<td>light grey, needles, some radiating wollastonite? nodules (&lt;4 cm diam.). -host rock marble, white to pale green, f.g., crystalline, moderately reactive with HCl. -thin (5 mm), parallel bands of higher relief, brown weathered surface.</td>
</tr>
<tr>
<td>W23-5</td>
<td>2-3 cm wide bands of radiating needles (blades) up to 2 cm long of wollastonite? -host rock is hard (silicified) marble-similar to W23-3. -reacts strongly with HCl. -accessory minerals-some white mica, possible minor sulphide.</td>
</tr>
<tr>
<td>W25-1</td>
<td>medium grey, f.g. with m.g. dark mica and amphibole. -well-bedded, some calcitic (white &amp; crystalline) bands in amphibolitic marble. -rusty weathering common. -minor sulphides. -strongly reactive with HCl.</td>
</tr>
</tbody>
</table>
W26-2
- whitish, medium to c.g., crystalline marble.
- 2-3% py, rusty fracturing common
- some greenish bands, a few brownish, hard blebs.
- strong reaction with HCl.

W27-2
- white to translucent, acicular, some radiating clusters of needles to blades (3-15 mm long)
- wollastonite? in marble.
- rusty colouration occurs near weathered margins.
- knobby bands in higher relief with needle habit evident.
- strongly reactive with HCl.

W28-1
- medium grey, f.g., well bedded (bed 1 cm wide)
- marble.
- a few later, white, cross-cutting calcite veinlets.
- weathers light grey

It should noted from the above descriptions that wollastonite was tentatively identified in only three of the nine samples. Other samples suspected of containing wollastonite in hand specimen did not contain any according to X-Ray diffraction analysis. Wollastonite was not easily identified in hand specimen with any great assurance.

Five samples were collected from the Gilmour area and sent for wollastonite analysis by X-Ray diffraction. None of these samples contained wollastonite.

A total of five samples were collected for gold analysis by fire assay. These samples were either rusty quartz veins in granite or granite that contained sulphides. The most promising looking sample, G16-7, was collected from a 30 cm wide rusty zone at the granite-marble contact. The sample contained 5-10% very fine-grained arsenopyrite and minor coarse-grained pyrite in a pale grey, aphanitic, siliceous rock. None of these samples contained gold above the detection limit of 0.02 g/tonne.

In summary, nine samples in the Lake Township prospecting area contained wollastonite in small amounts (less than 5 percent by weight) as detected by X-Ray diffraction. The sample location maps shows that five of these samples are widely spaced. It is interesting that four of the wollastonite-bearing samples occur in one outcrop area in the central part of the prospected area. This outcrop of marble appears to be at
the top of a "finger" of marble that is enclosed on three sides by the central granite intrusive. Although the amounts of wollastonite detected are too low to be of economic interest in this location, it confirms that the conditions necessary for the formation of wollastonite existed in this area.

Carolyn Horner
B.Sc.
208 Coleridge Ave.
Toronto, Ontario
M4C 4H9
References


APPENDIX A

SAMPLES DESCRIPTIONS
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SAMPLE LOCATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| W-12-1     | N. Wattle Road E 25+72E (see sketch) | - White to light grey, crystalline marble (calcite prevalent) with some small clusters of needles (wollastonite?)  
- "Knobby", medium grey to white weathered surface |
| W12-2      | N. N. of road @ 25+72E | - White to dark grey, poorly bedded fine to medium grained layered marble, pit  
- Small 5-mm white nodules of calcite or acicular needles (wollastonite)  
- Moderately reactive to HCl (10%)  
- Weathered surface "knobby", grey to brown |
| W12-3      | N. W. of road @ 25+72E | - Pale green, some dark green, radiating, needles of tremolite? associated with fine grained crystalline, white marble  
- Oxidized fractures  
- "Knobby", white to brown weathered surface with a 1/2-1 cm wide |
| W13-1      | W. of Claim Post | - Light grey to white radiating clusters of needles (1 cm long) possibly tremolite. Marble (some calcite), moderate reaction to HCl  
- Dark grey, "knobby", weathered surface |
| G13-2      | | - Pink granite with qtz - (minor green epidote?) vein  
- Some e.g., pink plagioclase associated with qtz  
- Granite is mainly pink, m.g., crystalline |
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SAMPLE LOCATION</th>
<th>ROCK SAMPLES</th>
</tr>
</thead>
</table>
| W13-3      |                 | - light grey, m.g.; crystalline marble containing ovoid clusters of parallel pale green needles (tremolite?)  
              |                 | - moderate reaction to HCl  
              |                 | - medium grey, "knobby" weathered surface |
| W13-4      |                 | - white to pale green, finer grained fibrous aggregate of wollastonite? + calcite in marble  
              |                 | - react with HCl  
              |                 | - some darker green parallel fibrous aligned perpendicular to weathered surface (<2 mm width)  
              |                 | - grey, "knobby" weathered surface |
| W14-1      |                 | - white to pale grey, some pale green, small needle aggregate to radiating wollastonite? marble  
              |                 | - moderate reaction to HCl, some crystalline calcite  
| W16-1      | % e 268m on lot North of Claim Post 1-110438B | - Siliceous, light grey, translucent, aphanitic to fine grained, weakly reactive to HCl. Nodule  
              |                 | - pale green, acicular clusters associated  
              |                 | - host rock marble |
| W16-2      |                 | - Knobby weathered surface  
              |                 | - Siliceous nodule surrounded by green, radiating, blades crystals (wollastonite?)  
              |                 | - host rock marble |
| W16-3      |                 | - Parallel irregularly weathered, higher relief lenses containing white, aggregates to radiating needles; calcite association (strongly reactive to HCl)  
              |                 | - Host rock is white to pale grey, fine grained, weakly calcareous, marble |
| W16-4      |                 | - Siliceous Nodules, up to 2 ft diameter, are grey, fine grained with white, radiating clusters (blades up to 1 cm length), strongly reactive to HCl, wollastonite?  
<pre><code>          |                 | - some dark brown needles of hornblend |
          |                 | - Host rock is brownish, fibrous, massive, weakly calcareous marble |
</code></pre>
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
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</tr>
</thead>
</table>
| W16-5      |                | - typical knobby weathering  
- pale green to white, acicular to bladed radiating clusters (up to 2 cm long needles) of wollastonite? in marble  
- minor silicification  
- moderate to strong reaction to HCl. |
| N16-6      |                | Siliceous Marble with white calcite and light green, bladed (some radiating) wollastonite?  
- moderate to strong reaction to HCl.  
- typical weathering |
| G16-7      | Road Cut Near Gravel Pit outside Gilmore | Chilled Margin of (probably) Granite at Granite-Marble Contact  
- Visible width 30 cm; strike exposure for 4 m; trending 266°  
- Pale grey, aphanitic, conchoidal fractures and brittle  
- 5-10% very fine grained arsenopyrite; minor coarser grained Pyrite  
- Distinct rusty weathering + yellow powder staining |
| W17-1      |                | Dark grey, fig.; strongly calcareous Marble  
- strongly bedded  
- Micaeous mineral (possibly phlogopite) along bedding planes  
- 1-3% fine to medium grained sulphides may show ruby coloured alteration; crystals protrude on weathered surface |
| W17-2      |                | Light and dark grey, strongly bedded, medium grained, crystalline marble  
- Strongly reactive to HCl  
- Micaeous mineral (phlogopite?) along bedding planes |
| W17-3      |                | Predominately light grey with darker grey bands, fine to medium, Marble  
- strongly reactive to HCl  
- Weathered surface shows minor bedding |
| W17-4      |                | White to light grey, fig.; marble with some dk grey bands  
- strongly reactive to HCl  
- strongly bedded with micaeous mineral (phlogopite?) along bedding planes  
- <1% sulphides, some rusty |
<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>W17-5</td>
<td>Grant Rd, 2 km</td>
<td>Medium to dark grey, strongly calcareous (reactive to HCl), fine grained bedded marble, some micaeous mineral along bedding planes, some rusty patches associated with fine grained sulphides.</td>
</tr>
<tr>
<td>W18-1</td>
<td>25 m W of 1.5</td>
<td>Marble with irregular lenses and nodules of higher relief Wollastonite? Wollastonite is bladed (up to 2 cm in length) , some radiating, white to brown, weathered surface, moderate to strong reaction to HCl.</td>
</tr>
<tr>
<td>W18-2</td>
<td>3.7 m W of 1.5</td>
<td>Medium grey, m.g., acicular aggregate, massive appearance, with some white patches. Dark brown, weathered rind, up to 3 cm thick (acicular habit evident), strong reaction to HCl.</td>
</tr>
<tr>
<td>G18-3</td>
<td>3.2 m W of 1.5</td>
<td>Possible chilled margin of Granite - marble contact or siliceous vein. White fine grained quartz with some pink, medium to coarse grained plagioclase. No sulphides, minimal exposure (2-3 ft along strike); apparent trend @ 60°.</td>
</tr>
<tr>
<td>W18-4</td>
<td>3.5 m E 337°</td>
<td>Pale green, acicular, radiating clusters of Tremolite? Bands are more resistant to weathering host rock marble.</td>
</tr>
<tr>
<td>W19-1</td>
<td>3.5 m E 337° from Rapids</td>
<td>Medium grey, fine grained, thin beds 1-2 mm thick, fissile - foliated Marino.</td>
</tr>
<tr>
<td>W19-2</td>
<td>3.1 m E 337°</td>
<td>White and black, medium to coarse grained. Marble with clumps of black biotite and black hornblende needles.</td>
</tr>
<tr>
<td>SAMPLE NO.</td>
<td>SAMPLE LOCATION</td>
<td>DESCRIPTION</td>
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<tr>
<td>W19-3</td>
<td>25m W of Pond E</td>
<td>Generally medium grey, fine grained Marble with white to rusty features. Obtained as coarse crystalline mineral (calcite &amp; ankerite?). Strong reaction to HCl at some brown weathering spots.</td>
</tr>
<tr>
<td>W19-4</td>
<td></td>
<td>Medium grey, fine to medium grained Marble with abundant scattered biotite and pods of vugs of calcite common. Strong reaction to HCl. Knobby weathering. Medium to dark grey.</td>
</tr>
<tr>
<td>W19-5</td>
<td></td>
<td>Medium grey, fine grained, slightly foliated Marble with scattered phlogopite and 2-3% medium grained, dark amphibole? crystals. Strong reaction to HCl.</td>
</tr>
<tr>
<td>W21-1</td>
<td>Large outcrop N. of Claim Post 1-104, 918, Storing 8 Hm</td>
<td>Medium green, acicular needles weathered in higher relief - Tremolite? Strongly reactive to HCl. Host rock Marble.</td>
</tr>
<tr>
<td>W21-2</td>
<td>Near Granite - Marble Contact</td>
<td>Light grey and green, crystalline, bladed to prismatic crystals, some radiating Wollastonite. 3% anhedral brown-gray blebs (iron oxides?) Light grey to white weathered surface.</td>
</tr>
<tr>
<td>W21-3</td>
<td>Optional Analysis</td>
<td>Medium grey, fine grained, crystalline Marble with white calcitic and rusty ankerite? nodules and vugs. Moderate reaction to HCl, possibly weakly silicified. Grey weathering.</td>
</tr>
<tr>
<td>W21-4</td>
<td></td>
<td>White to pale green, medium grained, acicular needles of Wollastonite?; some rusty alteration near weathered surface. Host rock Marble.</td>
</tr>
<tr>
<td>SAMPLE NO.</td>
<td>SAMPLE LOCATION</td>
<td>ROCK SAMPLES</td>
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</table>
| W23-1      | N33m W of main  | - White to pale green needles, up to 1 cm long, strongly reactive to HCl. Wollastonite.  
|            | fault          |              |
|            |                 | - A band of parallel needles adjacent to weathered surface.  
|            |                 | - Wollastonite boudins in higher relief; buff coloured weathering. |
| W23-2      | N35m W of middle | White to pale brown, fine grained, equigranular, massive, reacts weakly to HCl, possibly Dolomitic Marble.  
|            | trap            |              |
|            |                 | - Weathered orange-brown.  
|            |                 | - Fresh Wollastonite boudins. |
| W23-3      | N35m E of W23-1 | Light grey needles of radiating blades up to 1 cm long, softer than knife Wollastonite?; some green acicular crystals.  
|            |                 | - Grey weathered surface.  
|            |                 | - Sample collected from band 2 to 12 cm wide, more resistant weathering.  
|            |                 | - Darker aqua coloured fig. equigranular, moderate to strongly reactive to HCl - Marble. |
| W23-4      | N23-3 East      | Light grey needles, some radiating Wollastonite? nodules (<1 cm diameter).  
|            |                 | - Host rock Marble - while to pale green, fig., crystalline, moderately reactive to HCl.  
|            |                 | - Thin (5mm), parallel bands of higher relief, brown coloured weathered surface. |
| W23-5      | N23-3 West      | 2-3 cm bands of radiating needles (blades) up to 2 cm long. Wollastonite.  
|            |                 | - Host rock is hard (silicified) marble - similar in appearance to W23-3.  
|            |                 | - Slightly strongly to HCl.  
|            |                 | - Accessory minerals 30% white mica, possible minor sulphide. |
| W24-1      | N17m W of N23-1 | White to rusty coloured, fine to medium grained, crystalline, very strongly reactive to HCl - Marble.  
|            |                 | - Zones of subparallel grey (2 cm wide) veins.  
<p>|            |                 | - Some fine grained, rusty grains; possibly rusty sulphides. |
| W24-2      | N155m E of N23-1| Light grey, fine grained, crystalline, slightly silicified, weakly to moderately reactive to HCl - Marble. |</p>
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SAMPLE LOCATION</th>
<th>ROCK DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>W25-1</td>
<td>19m N. of Rapids on W. side of Beaver Creek</td>
<td>- Medium grey, fine grained with medium grains of dark micas and amphiboles? - rusty, weathering common - minor sulphides - highly reactive to HCl</td>
</tr>
<tr>
<td>G25-2</td>
<td>Below &amp; Beaver Creek upstream from little Jordan Creek</td>
<td>- Granitic? or Intrusive Influenced - sheared. - weathers white to rusty - whitish to orange (rusty) coloured, high quartz content, medium to coarse grained, slightly foliated - minor calcite along foliation planes, some muscovite facies, 2-3% sulphides; some rusty to white quartz veins (up to 8cm wide)</td>
</tr>
<tr>
<td>25-3</td>
<td>Same as above</td>
<td>- Quartz vein - white to rusty coloured, up to 8cm wide - host rock same as G25-2.</td>
</tr>
<tr>
<td>W25-4</td>
<td>Between swamp and fort of Small creek (W. of Beaver Creek)</td>
<td>- Medium grey, fine grained, well bedded, highly reactive to HCl Marble. - some rusty, calcite bands, a few quartz veinlets</td>
</tr>
<tr>
<td>W25-5</td>
<td>50m upstream from G25-2 location</td>
<td>- Medium grey and white, medium grained, crystalline, reacts strongly to HCl, well bedded Marble. - weathers light brown to grey</td>
</tr>
<tr>
<td>W26-1</td>
<td>E. side of small swamp creek</td>
<td>- White to orange (rusty), crystalline, strongly reactive to HCl, fairly hard (possibly silicified) Marble - heavily weathered surface</td>
</tr>
<tr>
<td>N26-2</td>
<td>North of W26-4</td>
<td>- Brittle, medium to coarse grained, crystalline, strongly reactive to HCl Marble - 2-3% Py, some rusty - rusty fracturing common - minor greenish bands - a few brownish, hard blebs</td>
</tr>
<tr>
<td>SAMPLE NO.</td>
<td>SAMPLE LOCATION</td>
<td>ROCK SAMPLES</td>
</tr>
<tr>
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</tr>
<tr>
<td>W26-3</td>
<td>44m North of 26-2</td>
<td>Pale to medium green, radiating needles up to 2 cm long, moderate reaction to HCl - Tremolite &amp; Marble. Host rock white Marble</td>
</tr>
<tr>
<td>W26-4</td>
<td>NE of W26-3</td>
<td>Green and white, medium grained, crystalline Marble containing abundant grey quartz veins and nodules. High green mineral - possibly diopside</td>
</tr>
<tr>
<td>W27-1</td>
<td>45m N. of W26-3</td>
<td>Generally light brown, medium grained, crystalline Marble. Some silification possible. Brown weathered surface. Corrected to North Iron west by granite</td>
</tr>
<tr>
<td>W27-2</td>
<td>NW side of W26-3 outcrop</td>
<td>White to translucent, acicular, some radiating clusters of needles to blades (size range 3 to 15 mm). Wollastonite &amp; Marble. Rusty, weathered, occurs near weathered margin. Lenses &amp; bands in higher relief with needles habit evident. Strongly reactive to HCl</td>
</tr>
<tr>
<td>W28-1</td>
<td>1700E N. of Road @ 34 4S</td>
<td>Medium grey, fine grained, well bedded (bafs 1 cm wide) Marble. In thin later white cross-cutting calcite veins. Weathered light grey</td>
</tr>
<tr>
<td>W28-2</td>
<td>West of Bore @ N1.2 S (N of Road)</td>
<td>Grey and orange bands with red on the weathered edge, medium grained, crystalline, some rusty spots, reacts strongly to HCl - Marble. Weathered brown and green bands</td>
</tr>
<tr>
<td>W28-3</td>
<td>West of Bore @ N1.44 S (W of Road)</td>
<td>Medium grey, fine to medium grained, crystalline Marble with black Porphyroblasts? (0.5-1 mm diametre diamond shaped crystal). Reacts strongly to HCl. Weathered grey, smooth, rounded with some apparent bedding</td>
</tr>
</tbody>
</table>
APPENDIX B

LAKEFIELD RESEARCH ANALYSIS REPORT
X-Ray Powder Diffractometry
on samples submitted by
CAROLYN HORNER

Project No. L.R. 8900-273

NOTE:

This report refers to the samples as received.

The practice of this Company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of Lakefield Research.

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
August 8th, 1990
The invoice for the work was to be submitted to:

Carolyn Homer
208 Coleridge Avenue
Toronto, ON
M4C 4H9
(416) 429-2996

LAKEFIELD RESEARCH

R. Buchan, P. Eng.
Manager - Mineralogy

R.W. Deane
Mineralogist

Introduction
Samples G13-2, G16-7, G18-3, G25-2 and G25-3 were assayed for gold and each one reported less than 0.02 g/t Au present.

Of the remaining samples, those numbered

W13-3  W19-3  W19-5  W23-4
W23-5  W25-1  W26-2  W27-2
W28-1

appeared to contain minor amounts (less than 5 percent by weight) of wollastonite. The major mineral constituents in each sample were calcite and the sodic amphibole pargasite (edenite).

The positive identification of small amounts (<5% CaSiO₃) in these samples was made difficult by the high-intensity of calcite and pargasite diffraction peaks adjacent to wollastonite peaks.
A portion of each sample was crushed and pulverized. Those portions from samples G13-3, G16-7, G18-3, G25-2 and G25-3 were submitted for fire-assay for gold determination and the remaining forty-nine samples were submitted for x-ray powder diffractometry for wollastonite determination.

Scans from 5° to 75°, 20 were run on samples W12-3, W17-2, W19-1 and on a sample known to contain wollastonite to provide data on non-wollastonite peaks which might interfere with or obscure the dominant wollastonite peaks sought in the diffractometry of each sample examined.

Scans for the identification of wollastonite were run to cover the wollastonite peaks

\[
\begin{align*}
d_1 &= 7.68\text{Å} & l &= 50 \\
d_2 &= 3.84\text{Å} & l &= 60 \\
d_3 &= 3.31\text{Å} & l &= 80 \\
d_4 &= 3.06\text{Å} & l &= 70 \\
d_5 &= 2.179\text{Å} & l &= 70
\end{align*}
\]

The peak \(d = 2.98\) \((l = 100)\) was not used because of the proximity of calcite's strongest peak \((l = 100)\) at 3.035Å.
The 7.68Å and 2.179Å peaks were considered to be sufficiently unique to be characteristic only of any wollastonite in the samples checked. Both peaks were identified only in nine samples, i.e.

W13-3  W19-3  W19-5  W23-4
W23-5  W25-1  W26-2  W27-2
W28-1

In these nine samples the total wollastonite would be less than 5 percent of each sample; more likely less than 3 percent by weight of the sample.

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A Division of Falconbridge Limited
Lakefield, Ontario
August 8th, 1990  /  jm