GEOLOGICA AND GEOCHEMICAL
ASSESSMENT REPORT
ON THE MONS CLAIM GROUP
GOLDEN MINING DIVISION
BRITISH COLUMBIA

For
ICEFIELD DIAMOND MINES LTD.
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SUMMARY

The most favorable location for diamond-containing kimberlites is “on-craton”, that is on the Archean part of the craton such as in the Kimberly area of South Africa. However the discovery of diamond bearing lamproites at Argyle has revealed a new primary source rock as a target for diamond exploration. This recognition of diamondiferous lamproites in such widely separated areas suggests that this variety of magmatism may be a more widespread phenomenon than is commonly accepted. The discovery also has raised the question as to what other mantle-derived igneous rocks may also be diamondiferous.

The Golden-Columbia Icefields Area represents a rare environment for locating diamond occurrences related to a mobile zone geologic setting unlike the stable cratonic setting of South Africa.

Previous mineral exploration on the Mons Claim Group by Gwen Resources Ltd consisted of field examination; geological mapping, thin section, and heavy media stream sediment sampling was successful to identify 114 chromites and high chromium clinopyroxene grains. Although the chromites were interpreted as products of harzburgite source, none of the chromites analyzed are high chrome chromites comparable to compositions in the diamond stability field.

The 2001 prospecting, and heavy mineral concentrates-sampling program completed by Icefield Diamond Mines Ltd was also successful to identify fifty-three diamond indicator minerals (forty-one chromite, and twelve Chrome Diopside) were extracted from sample Mons-01 HMC 1, twenty Chromite grains were extracted from sample Mons-01 HMC 2, and forty-eight Chromite and one Chrome Diopside were extracted from sample Mons-01 HMC 3. According to Tahera Lab interpretation, both indicator minerals (Chromite and Chrome diopside) are most likely originated from a lamproitic source. These results suggest good potential for finding diamondiferous lamproitic source rock within the Mons Claim Group.

It is concluded that the Mons Claim Group is considered to be a prime target for locating diamondiferous source rocks and a second phase of exploration program is recommended for a total budget of $54,000.
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1.0 INTRODUCTION

Between July 15 and August 25, 2001, Icefield Diamond Mines Ltd. conducted a mineral exploration program on the Mons Claim Group in the Golden-Columbia Icefield area, British Columbia. The main purpose of this report is to evaluate the Diamond potential of the property, as well as to interpret the 2001 results of geological, geochemical and heavy minerals sampling program carried out on the property. The report also describes the regional geology and the past exploration activities in the area, and outline a budget proposed for next phase exploration program.

Fayz Yacoub, P.Geo, Alex Burton, P.Eng, and Carl Kwasnicki, Party chief, performed the work program from a camp located on the Valenciennes River, approximately 13 kilometers west of the sampling sites.

This report is based upon the geological, geochemical data collected during the 2001 exploration activities on the property, and on a review of previous assessment reports, regional geological maps, and claim data from the Mineral title office. The writer was on the property on July 15th, July 30th, and on August 3rd, 2001.

2.0 LOCATION, ACCESS & PHYSIOGRAPHY (Figure 1)

The Mons Claim Group is located in the Golden-Columbia Icefield Area near the Alberta-British Columbia border, approximately 65 kilometers north of Golden in the Golden Mining Division NTS map sheet 82N/14E, and 82N/15 W.

Access to the camp area is usually achieved by traveling along highway #1 from Golden for approximately 21 kilometers to the Big Bend highway, then follow the main logging road going northeast for 65 kilometers, then follow the Bush road for 6.5 kilometers, then the Valenciennes road for approximately 13 kilometers to the camp. Access to the property can be gained only by helicopter.

The area of the Mons Claim Group exhibits the characteristics of typical glaciated Physiography. These include wide U-shaped, drift-filled valleys flanked by steep rugged mountains and deeply incised V-shaped upland valleys, and hanging valleys.

Elevations within the property range from 4500 feet in the valley of the Mons Creek, located at the northwest corner of Mons 2 claim to 9000 feet at the northeast corner of Mons 3 claim. Vegetation consists mainly of scrub brush in the valleys. The highest parts
of the property support only moss and lichen. Water sufficient for heavy mineral concentrates samples processing and drilling is available from several creeks within the claim group, also from lakes and ponds located in the central part of Mons 3 and Mons 4 claims.

3.0 PROPERTY STATUS (Figure # 2)

The subject property is comprised of six mineral claims totaling 70 units. Two claims Mons 1 and 2 were located in September 6th 2000 and are currently under option by Icefield Diamond Mines Ltd., Kelowna, B.C. The other four claims Mons 3,4,5,and 6 were located on July 15th 2001, and owned by Icefield Diamond Mines Ltd.

Pertinent claim data is as follows:

<table>
<thead>
<tr>
<th>CLAIM</th>
<th>UNITS</th>
<th>RECORD NUMBER</th>
<th>EXPIRY DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mons 1</td>
<td>20</td>
<td>380240</td>
<td>September 6, 2003*</td>
</tr>
<tr>
<td>Mons 2</td>
<td>20</td>
<td>380241</td>
<td>September 6, 2003*</td>
</tr>
<tr>
<td>Mons 3</td>
<td>12</td>
<td>388443</td>
<td>July 15, 2003*</td>
</tr>
<tr>
<td>Mons 4</td>
<td>12</td>
<td>388449</td>
<td>July 15, 2003*</td>
</tr>
<tr>
<td>Mons 5</td>
<td>3</td>
<td>388447</td>
<td>July 15, 2003*</td>
</tr>
<tr>
<td>Mons 6</td>
<td>3</td>
<td>388448</td>
<td>July 15, 2003*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Date up to which 2001 assessment report is accepted by the Gold Commissioner to be applied to the claims.

The total area of the property is 17.5 square kilometers (1750 hectares, 4322.5 acres). The writer located all legal corner posts of Mons 1-6 claims during the 2000, and 2001 fieldwork programs.
4.0 DIAMOND HISTORY IN EASTERN BRITISH COLUMBIA (Figure # 3)  
After J.Pell

Three petrologically, and geographically distinct suites of ultrabasic diatremes were recognized in eastern British Columbia. The first is found in the Bull River area. The second suite was found north of Golden and in the Ospica River area. Both types represent the deeply eroded root zones of diatremes (J.Pell U.B.C). The third petrologically distinct rock type is represented by the Cross kimberlite, located at Crossing Creek, north of the town of Elkford.

These diatremes have been targets for diamond exploration since the mid 1970s (Grieve, 1981; 1982; Dummet et al., 1985; Pell, 1986).

The Bull River – Elk River Area

Forty or more breccia pipes and related dyke rocks occur within the Bull, White and Palliser River drainages east of the towns of Cranbrook and Invermere (Grieve, 1981). The Ordovician/Silurian Beaver foot Formation hosts the majority of these pipes. Diatremes in southern British Columbia are typified by those in the Russell Peak vicinity, and is morphologically similar to a model kimberlite pipe but petrologically dissimilar (Clement and Reid, 1986; Dawson, 1980; Hawthorn, 1975).

Golden-Colombia Ice fields Area and the Ospika River Area

Several diatremes are located along the Alberta-British Columbia border between 50 and 90 kilometers north of the town of Golden, most are hosted by Upper Cambrian strata. Characteristics of the pipes suggest that they represent deep erosional levels in a model pipe root zone, (Clement and Reid, 1986). Micro-diamonds have reportedly been recovered from heavy mineral separates taken from two of the pipes. Preliminary investigations suggest that these rocks are not true kimberlites.

Upper Cambrian rocks near the headwater of the Valenciennes River host four diatremes and numerous dykes.

The Jack breccia zone underlies a narrow ridge trending northwest between two permanent snowfields situated between Lyell Creek and the British Columbia-Alberta border, about 70 kilometers north of Golden. Sedimentary rocks in the Jack occurrence consist of an Upper dolomite sequence, a middle limestone and shale sequence, and a lower massive limestone unit.

At Mons Creek and Lens Mountain, the dominant intrusive lithology consists of a buff-weathering, weakly foliated breccia similar to diatremes at the Valenciennes River. At Mons Creek, a small light green strongly foliated fine-grained intrusive breccia crops out.
Crossing Creek Area

The Cross kimberlite lies north of Crossing Creek. It is intruded into Pennsylvanian and Permian Rocky Mountain Group carbonate rocks. Recent work indicates the body is about 300 by 30 meters. The Ice property currently hosts 6 diatremes breccias, one of which is the Cross kimberlite. One 363 tonne sample was taken from the Ram pipe yielded one diamond of near gem quality about 2 millimeters in size. One clear gem quality diamond fragment measuring 0.65 millimeters has been found in another bulk sample taken from the Ram 6.5 pipe (George Cross News Letter No. 225, 1994).

5.0 AREA HISTORY (Figure # 4)

Bulk sampling and processing of outcrop exposures by C.F. Mineral on the Jack pipe located northeast of the Mons Claim Group is diamondiferous, and a gem quality octahedral macro diamond weighing 37,320 x 10^-8 carats was produced from a 29.50 kg rock sample.

In 1983, a thirty-kilogram bulk sample of a diatreme material, collected from the Mark claim approximately five kilometers southeast of the Mons Claim Group by Dia Met Minerals Ltd. resulted in the detection of a single ilmenite grain, thirteen chromites and one 0.00015820-carat micro-diamond fragment.

Diamond indicator minerals such as ilmenite, chromite and chrome diopside were extracted from 10 kilograms stream sediment sample collected from the Mons property (Assessment Report 14748), and high chrome (diamond inclusion field) chromite was reported, with chrome contents in excess of 55 % (Assessment Report 17303).

In 1989, the whole rock / mineral chemistry and heavy mineral concentrates were described by Nassichuk, and a total of 114 chromites and one high chromium clinopyroxene grain were analyzed. Although the chromites were interpreted as a harzburgite source, none of the chromites analyzed are high chrome chromites comparable to compositions in the diamond stability field.

Heavy mineral fraction includes spinel, ilmenite, and diopside. Further more tourmaline and high chrome chromites were identified from Mons Creek. The origin of these grains is expected to be relating to undetected diatreme of lamproitic affinity (Fipke 1989).

In 1993, Gwen Resources conducted a fieldwork program on the Mike occurrences, now located within the Mons Claim Group. The program consisted of geological mapping, heavy mineral concentrates, and petrographic analysis. A 53.3-kilogram mini bulk
Mons Claim Group
Diatremes Location Map
Scale 1:20,000
Fig # 4
sample collected from diatreme float material within the Mons 4 claim. The sample was shipped to Loring Laboratories Ltd. in Calgary. No electron microprobe analysis was completed due to section 35 complaint filed against the Mons claims.

In 1994, an electron microprobe analysis was conducted on a hand picked heavy mineral concentrate sample MON 93-1. Quantitative analysis has been determined on 43 garnets, 20 pyroxenes and 37 opaque minerals including chromite, spinels, and picroilmenite. Of 45 garnets analyzed, 29 are G3 and 14 are G5 garnets. None have high MgO values.
6.0 AGE, ORIGIN & EMLACEMENT OF DIAMONDS
(Summarized from Melissa B. kirkley & John J. Gurney, 1991)

Most diamonds were formed more than 990 million years ago, deep within the earth from either of two rock types, peridotite or eclogite. They were stored below the base of cratons for varying periods of time, some as long as 3,200 million years before being transported to the surface. Kimberlite and Lamproite, the two rock types usually associated with diamonds, are only the mechanisms that brought diamonds to the surface and are in no way related to the formation of most diamonds.

6.1 AGE OF DIAMONDS

Age dating of diamonds assists in understanding their origin, which is a significant factor in diamond exploration. Although diamonds themselves cannot be dated, some of the minute inclusions such as pyroxene and garnet can be dated. These minerals contain measurable quantities of the elements involved in radioactive delay systems; some inclusions (e.g. garnet) were formed at the same time and in the same place as their mineral host (e.g. diamond) so that the age of the inclusion is also the age of the host (table 1).

Diamonds are usually much older than the kimberlite that brought them to the surface. For example, diamonds from Kimberley pipe are as much as 3,200 My older than the age of kimberlite emplacement (i.e. when the pipe reached the surface about 100 My ago). This example implies that diamonds can be stored deep within the earth for an extended period of time before being carried to the surface by the kimberlite; and kimberlite is merely the transporting medium for bringing diamonds (as well as other materials) to the surface.
TABLE 1
Ages of Diamonds and Emplacement of Associated Kimberlite Pipes in My (million of years)
And Type of Inclusions

<table>
<thead>
<tr>
<th>Location (Mine)</th>
<th>Age of Diamonds (My)</th>
<th>Age of Emplacement (My)</th>
<th>Type of Inclusions in Diamonds</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kimberley, South Africa</td>
<td>3,300</td>
<td>100</td>
<td>Peridotitic</td>
<td>Richardson et al (1984)</td>
</tr>
<tr>
<td>Finsch, South Africa</td>
<td>3,300</td>
<td>100</td>
<td>Peridotitic</td>
<td>Richardson et al (1984)</td>
</tr>
<tr>
<td>Finsch, South Africa</td>
<td>1,580</td>
<td>100</td>
<td>Eclogitic</td>
<td>Richardson et al (1990)</td>
</tr>
<tr>
<td>Premier, South Africa</td>
<td>1,150</td>
<td>1,100-1,200</td>
<td>Eclogitic</td>
<td>Richardson (1986)</td>
</tr>
<tr>
<td>Argyle, Australia</td>
<td>1,580</td>
<td>1,100-1,200</td>
<td>Eclogitic</td>
<td>Richardson (1986)</td>
</tr>
<tr>
<td>Orapa, Botswana</td>
<td>990</td>
<td>100</td>
<td>Eclogitic</td>
<td>Richardson et al (1990)</td>
</tr>
</tbody>
</table>

In the case of the Argyle, the pipe is a lamproite.

6.2 ORIGIN OF DIAMONDS

Kimberlite and lamproite are only the transporting mechanisms for bringing diamonds to the surface, and not genetically related to diamonds.

Xenoliths of diamond-bearing ultramafic rocks in kimberlites and lamproites represent fragments of wall rock adjacent to an intrusion that have broken off and have been incorporated into the magma as it works its way along fractures or cracks to the surface. Thus, xenoliths may represent blocks of buried crustal formations brought closer to the surface, such as metamorphic rocks derived from deep-seated terrains within the earth’s lower crust, or sedimentary rocks in the upper crust and, perhaps most importantly, both types of rocks are believed to be derived from the earth’s upper mantle. Kimberlites and
Lamproites are the only means of obtaining samples of such deep rock types. The pressure and temperatures at which mineral inclusions in diamond crystallized ranges from 900 degrees to 1,300 degrees centigrade and pressure from 45 to 60 kbar, the approximate depths within the earth are 100,150 and 200 kilometers.

6.3 EMPLACEMENT OF DIAMONDS  (Figure # 5)

Diamonds were carried to the surface (i.e., emplaced) by kimberlite and lamproite. Kimberlite is a dark-colored (referred to as “blue-ground” when fresh) hybrid rock; that is, it is a mixture of the crystallization products of the kimberlite magma itself (e.g. olivine, phlogopite) plus xenocrysts and xenoliths of peridotite and eclogite derived from the upper mantle.

Kimberlites are intruded from the mantle into the earth’s crust, near the surface, and most commonly occur as carrot-shaped pipes, dykes, or more rarely, as sills. Three zones have been recognized within kimberlite pipes, the crater diatreme and root zones. Kimberlite pipes vary in size up to 216 hectares. The present surface area of kimberlite bodies not only reflects the nature of the eruption but also the degree of erosion within the kimberlite pipe (Figure # 5).

Lamproite has a characteristic gray to greenish, mottled appearance and, like kimberlite, is a hybrid rock. The primary magmatic crystallization products, most notably olivine, occur both as phenocrysts and as groundmass constituents.

In contrast to kimberlites, lamproite bodies are much shallower. All known occurrences are less than 0.5 kilometers deep. This difference is due to the lack of development of an extensive kimberlite-style diatreme and related root zone in lamproites. As a result, lamproites appear to comprise only a crater, and a small vent or feeder. Many lamproites have champagne-glass shaped craters with shallow, irregular pipe-wall contacts, (see Figure # 6).
Figure 5. Model of an idealised kimberlite magmatic system, illustrating the relationship between crater, diatreme, and hypabyssal facies (not to scale). Hypabyssal facies include sills, dykes, root zone and "blow". Reproduced from Mitchell (1986).
Figure 6. Schematic cross-section of a lamproite pipe illustrating the characteristic champagne glass shape. Note that the magmatic lamproite (hypabyssal facies) intrudes the crater facies pyroclastic material. After Scott-Smith and Skinner (1984b).
6.4 WHERE EMIPLACEMENT OCCURRED

The geographic distribution of primary diamond deposits, predominantly kimberlites, is not random but is confined to regions of the continental crust that are old cratons.

A craton is part of the earth's that has attained stability and has been little deformed for a very prolonged period of time (generally more than 1,500 My). Effectively, the term applies to extensive, stable continental areas.

The most favorable location for diamond-containing kimberlites is "on-craton" as opposed to "off craton", that is, "on" the Archaean part of the craton (including the sedimentary platform rocks above) as opposed to "off" it. The later location includes any younger part of the craton and adjoining mobile belts (i.e. linear regions adjacent to cratons). For example, the Argyle lamproite, the largest producer of diamonds in the world today, is in a mobile belt that became part of a craton 1,800 My ago.

6.5 WHEN EMIPLACEMENT OCCURRED

Diamond-bearing kimberlites and probably lamproites have intruded into the earth's crust for a very long period, as evidenced by the occurrence of diamonds in the 2,600 million years old Witwatersrand conglomerate in South Africa. The presence of diamonds in this alluvial deposit requires that a still older kimberlite or lamproite exists.

Although information on lamproites is less readily available, they are known to cover a range from the Argyle pipe which was intruded ~ 1,200 million years ago to the lamproites of Wyoming which may have been emplaced within the last one million years.

6.6 THE LAMPROITE SOURCES COMPARED WITH KIMBERLITES

The target area for the early diamond explorers were initially selected by analogy with the cratonic association of economic kimberlite sources of diamond in southern Africa (Clifford 1966). These sources are restricted to cratonic areas, which have been stable for 1,500 million years, and although kimberlites are known outside of these nuclei, all of these are barren. The discovery at Ellendale of diamondiferous rocks with kimberlitic affinities in a mobile belt resulted in the extension of exploration into the adjacent mobile zone and the subsequent discovery of the richly diamondiferous Argyle pipe, which is mineralogically and chemically similar to the Ellendale bodies. The classification of the
Figure 7. This model for the genesis of diamond is simplified from Haggerty (1986). The stable craton and subcratonic areas today are as much as 200 km thick (heavy solid line) and are bounded by mobile belts. The isotherms (lines connecting points of equal temperature) in the craton are concave downwards. The diamond stability field (area in which diamond is stable) is convex upward. The K1 kimberlite pipe is likely to have P-type diamonds because it sampled diamonds in the diamond "storage area" (shaded zone) at the keel of a craton, where this type of diamond is presumed to be present. Pipe K2 may have E-type diamonds. Kimberlite pipe K3 will be barren of diamonds. L1 is the possible location for Argyle-type lamproite pipes.
diamondiferous rocks as varieties of lamproite recognized the existence of a new primary source of diamonds.

7.0 REGIONAL GEOLOGY & STRUCTURE  
After M.E. McCallum Nassichuk 1989  
(Figure # 8)

The major thrust fault in the regional area is the Mons fault. The upper plate of this thrust consists of a moderately thick (more than 1300 meters), carbonate-dominated sequence of Cambro-Ordovician sediments in a southeast trending anticline with a steep overturned northeast limb (most beds dipping 60-85 degrees southwest). This anticline, informally referred to as the Valenciennes Anticline, has overridden a steeply dipping (70-80 degrees south-southwest) west-northwest trending package of Devonian (?) Mississippian (?) carbonates that apparently exceeds 1400 meters in thickness.

The Lower Plate Devonian (?) - Mississippian (?) sequence is comprised predominantly of buff, gray, and black thin to thick-bedded limestone and dolomite. In the lower part of the sequence, gray limestone and dolomites contain progressively more interlayers of thin buff to tan beds of calcareous siltstone, shale and sandy dolomite.

The upper plate Cambro-Ordovician carbonate sequence contains considerably greater proportions of shale, siltstone and mudstone. These have been tentatively correlated with the Middle Ordovician Owen Creek and Skoki Formations, the Lower Ordovician Outram Formation, and the lower Ordovician-Upper Cambrian Survey Peak Formation. Informal members (upper, middle and lower) have been established for the Outram (?) and Survey Peak (?) Formations based on calcareous mudstone, shale and/or siltstone content of the carbonate. The later units, along with thin-bedded limestone commonly exhibit complex folding within the core of the Valenciennes Anticline, especially where they are bounded by more competent thick-bedded carbonates. The less competent units also generally are characterized by a well-developed axial plane cleavage, which strikes approximately 45-60 degrees northwest and dips 60-80 degrees southwest. Axial plane cleavage is best developed in the lowermost member of the Survey Peak Formation (?) and the upper and the lower members of the Outram Formation (?). These same units were more susceptible to failure during thrusting and shear cleavage is commonly locally, especially in proximity to fault traces. Slippage within more argillaceous units is well expressed by apparent fault repetition of the upper member of the Outram Formation (?). This sequence exhibits intense shearing and strongly oxidized planar zones are common.
General geology and diatreme locations in the Golden-Columbia Icefield area. Geology modified from Wheeler (1962) and Price (1967a, b).
- indicates diatremes or dykes

Figure #8
8.0 THE 2001 FIELDWORK PROGRAM (figure # 9)

8.1 SCOPE AND PURPOSE

From July 15 to August 25, 2001, Icefield Diamond Mines Ltd carried out a fieldwork program consisting of prospecting and heavy minerals sampling over the area of the Mons Claim Group. The fieldwork was focused on sampling creeks draining all previous diamond targets within the property.

The main purpose of the program was to:

1) Perform heavy mineral concentrates sampling of creeks draining the property.

2) Delineate possible new target areas for diamonds by prospecting for lamproitic source rock of magmatic origin.

3) Evaluate the diamond potential of the Claim Group

Indicator minerals sampling is an indirect search technique for diamond source-rock, which focuses on the associated resistant minerals, which usually accompany diamonds and are more common than diamonds themselves. Among the more common indicator minerals that are most resistant to weathering is zircon, followed in order of decreasing resistance by chromite, ilmenite, garnet, and chrome diopside and olivine.

Indicator minerals in the primary dispersion haloes from the source rock can be detected in small volume samples (10-20 kilograms) at a distance of 40 to 50 kilometers from source. The 2001 heavy mineral sampling area is located at the central east portion of Mons 3 claim. The average sample weight was 90 kilograms, collected from clast supported, tightly packed, poorly sorted gravel materials accumulated along banks of creeks draining the claim group. Clast sizes was mainly boulders, cobbles, pebbles, granules, matrix contains sand, silt and clay on top of rounded to sub-rounded clasts. Sample sites were located at deep points in the active part of the creek with associated bedrock traps. All samples went through ¼ inch screen, and then went through a variety of process in the laboratory to extract the heavy minerals.

Because as few as one or two indicator grains in a single heavy mineral sample may provide the vital clue to the presence of a diamond source rock, it was critical for all samples to be collected and processed with high degree of care especially picking the sample site in the field.
Three heavy mineral samples were collected and sent to Tahera Corporation Lab in North Vancouver B.C for processing and hand picking. (See heavy mineral sample locations on Figure # 9 and the GPS locations of all samples on table # 2).

Since the expected target is a diamondiferous source rock of lamproitic origin, all magnetic and none magnetic fractions were processed and observed for diamond indicator minerals.

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Size in mm</th>
<th>Chromite</th>
<th>Chrome Diopsite</th>
<th>GPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mons-01 HMC #1</td>
<td>(0.28-0.52)</td>
<td>41</td>
<td>12</td>
<td>5741920 N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>497782 E</td>
</tr>
<tr>
<td>Mons-01 HMC #2</td>
<td>(0.28-0.52)</td>
<td>20</td>
<td>None</td>
<td>5741935 N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>497776 E</td>
</tr>
<tr>
<td>Mons-01 HMC #3</td>
<td>(0.28-0.52)</td>
<td>48</td>
<td>1</td>
<td>5741992 N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>497690 E</td>
</tr>
</tbody>
</table>

9.0 THE 2001 FIELDWORK RESULTS

9.1 PROPERTY GEOLOGY

The Mons Claim Group is underlain by sedimentary rocks belongs to the Middle Ordovician Skoki Formation, the Lower Ordovician Outram Formation and the Uppermost part of the Lower Ordovician Survey Peak Formation. Rocks consist of sequences of upper dolomite, middle limestone and shale, and a lower massive limestone. They characterized by well defined bedding striking northwest and dipping southwest.

The limestone is light to dark brown to gray in color, thin to thick bedded, fine-grained with sandy to silty interlayers, the dolomite is dark brown to buff in color, thinly bedded with silty layers. Both limestone and dolomite are Ordovician in age, the limestone correlate with the Outram and Survey Peak Formations, while the dolomite correlate with the Skokie Formation.

Previous investigation of the Mike diatremes suggests that the hypabyssal breccias described in the area of the claims may be breccias of igneous origin.
The 2001 geological investigation by Icefield Diamond Mines team was performed over the area of the Mike diatremes. The field investigation indicated that all of the occurrences previously described as diatremes are in fact diatreme like bodies of tuff breccia, contains fine to medium limestone, dolomite, siltstone, and quartzite rounded to sub-rounded clasts. The sedimentary clasts are angular to sub-angular brown to red or maroon weathering breccia, reacts weakly with cold dilute HCL when powdered.

During the 2001 work program, Mr Alex Burton, consulting geologist and the writer has investigated three areas known as the North diatreme, the East diatreme, and the Southeast diatreme.

The first area was located on the north side of upper Mons creek where a "diatreme" had been previously reported. Mr. Burton interpreted the site as red beds caused by an erosional pause in the deposition of the sediments. There may also be a certain amount of erosional cut and infill stream sediments at this horizon with some of the sediments coarse enough to approach a conglomerate in character. All of these sediments in the area previously called a pipe had been exposed to oxidation shortly after deposition and were colored red by iron in the higher valence state. No evidence of cross cutting structures (other than fractures) was seen in this locality to support the presence of a pipe. The individual grains and cobbles were consistent with what would be found during a pause and infill period of the sedimentation. Startigraphically above and below the red beds there was no evidence of any significant angular discordance.

The second area was to the southeast of the head of Mons Creek close to 9,000 feet elevation on the top of ridge where another "diatreme" had been previously reported. Here there was a relatively thin (about 3 to 7 meters) red bed of the type associated with a temporary pause in the sedimentation with a small cut and fill type of material. The apparent size of this material is much larger than its thickness would justify, as the dip of the beds and the slope of the ridge are close, so the amount of the red bed exposure is greater than one would normally find. Again no evidence for any cross cutting features was found to support the intrusive nature of a lamproitic or kimberlitic pipe. Without the exceptional climbing ability of the Bell 407 helicopter it would have been difficult to land on the spot, and even harder to do the later pick up at this site. The site could not be reached by climbing on foot from the valley floor. This red bed appeared to be close to the same horizon of the first red bed.

The third outcrop, where the main southeast diatreme had been reported. This outcrop is located at the southern corner of Mons 4 claim. Here a sequence of interbedded sandstones and conglomerates are within the general calcareous sequence. At various places within the section it is possible to see conglomerate beds being succeeded by finer grained sediments in a "fining Upwards" manner, even being able to see bed tops.
There is modest oxidation (apparently during sedimentation time, or shortly thereafter) of the beds, but generally they are creamy in color rather than having a red bed aspect. The cobbles and fragments are the same composition as the sands and finer material. No exotic materials were noted in the sediments. No cross cutting structures were seen other than ordinary fracture sets. At the time of the original observation (1980's) these beds were partially exposed under the base of a bergschrund below an icefall of the glacier. Today the ice has shrunk considerably, but cascading blocks of ice falling off the bergschrund still made close access difficult.

None of the three previously reported diatremes found of igneous origin. However they may look similar from a distance. Two outcrops are red beds from infill cut and fill sedimentation during a pause in the normal sedimentary cycle, and the third is simply sandstone – conglomerate sequence. Several small size (15 cm x 20 cm) green weathering, brecciated boulders were located below and around the southeast outcrop. The boulders are similar in color, and texture to the boulders collected from the Mark claim approximately five kilometers southeast of here by Dia Met Minerals Ltd and resulted in the detection of a single ilmenite grain, thirteen chromites and one 0.00015820-carat micro-diamond fragment. These boulders look hybrid, and contain angular broken brecciated fragments.

9.2 INDICATOR MINERALS SAMPLING RESULTS

Three types of chromites are indicative of diamond source rock, these include chromites of diamond inclusion and intergrowth compositions (DI chromites), high content chromite titanium, (Cr-Ti chromites), and high MgO, ad Cr2O3 chromites. DI and Cr-Ti chromites are generally the most useful indicator minerals in exploration for lamproite.

The physical characteristics of chromites can also be distinctive. Chromites from diamondiferous lamproites, occurs as rounded to spherical shaped forms.

Icefield Diamond Mines crew collected three Heavy Mineral Concentrate samples during July 2001. The samples were 80-90 kilogram in weight collected from the gravel materials of the creeks draining the area of the Mons Claim Group. Samples were sent to Tahera Corporation lab in North Vancouver for processing, and re-concentration using the laboratory routines for indicator minerals, and then hand sorted by experienced staff.

Fifty three grains (forty-one chromite, and twelve Chrome Diopside) ranges in size between 0.28-0.52 mm were extracted from sample Mons-01 HMC 1, twenty Chromite grains were extracted from sample Mons-01 HMC 2, and forty eight Chromite and one Chrome Diopside were extracted from sample Mons-01 HMC 3.
Chromite grains are angular, sharp edged, fractured, and often with inclusions. Chrome diopside grains are pale emerald green in color.

According to Tahera Lab interpretations, both indicator minerals (Chromite, and Chrome diopside) are most likely originated from a lamproitic source.

10.0 DISCUSSION & CONCLUSIONS

The discovery of the Argyle lamproite diamond mine in a mobile belt resulted in the extension of exploration into the adjacent Mobile zone, and the classification for the diamondiferous rocks as varieties of lamproite recognized the existence of a new primary source of diamonds.

The Golden-Columbia Icefields Area represents a rare environment for locating diamond occurrences related to a Mobile zone geologic setting unlike the stable cratonic setting of South Africa.

In 1994, an electron microprobe analysis was conducted on a hand picked heavy mineral concentrate sample MON 93-1. Quantitative analysis has been determined on 43 garnets, 20 pyroxenes and 37 opaque minerals including chromite, spinels, and picroilmenite. Of 45 garnets analyzed 29 are G3 and 14 are G5 garnets. None have high MgO values.

The 2001 prospecting, and sampling program was successful to identify a total of one hundred and nine grains of Chromite, and thirteen grains of Chrome Diopside in three Heavy Mineral Concentrate samples.

Green weathering, siliceous, hybrid, brecciated boulders were located below the southeast (diatreme). Similarities exist between these boulders and boulders collected by Dia Met Minerals Ltd from the Mark claim and resulted in the detection of a single ilmenite grain, thirteen chromites and one 0.00015820-carat micro-diamond fragment. This may indicate the possibility of an unidentified diamondiferous lamproitic target within the area of the Mons Claim Group.

It is concluded that the Mons Claim Group is considered a target area for locating diamondiferous source rocks of Lamproitic origin, and a second phase of exploration program is recommended.
11.0 RECOMMENDATIONS

A second phase exploration program consisting of:

1) Detailed study to the geology and the local structure of the area to highlight features such as faults, lineaments, circular bodies and magnetic features. More attention should be paid to the Mons fault, which considered the main structural feature within the area of the claims.

2) Prospecting, and geological investigation should be conducted over the entire area of the claim group in order to locate the origin of the green, hybrid, brecciated boulders previously located and sampled by Gwen Resources during 1994-1995 program, and recently by Icefield Diamond Mines during the 2001 work program. A helicopter air reconnaissance should be considered to cover as much area as possible and to access remote and difficult terrains within the property.

3) In case of finding lamproitic source in place, collect 50-60 kilogram rock sample and process it for micro-diamond.

4) Results from the second phase program will have a good impact on deciding priorities for the following work program.
12.0 PROPOSED BUDGET

Phase 2: Project Geologist, two prospectors, 10 days.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mob/Demob</td>
<td>$6,000</td>
</tr>
<tr>
<td>Field Crew</td>
<td>9,900</td>
</tr>
<tr>
<td>Field Costs, Camp, and food</td>
<td>5,000</td>
</tr>
<tr>
<td>Lab Analysis</td>
<td>10,000</td>
</tr>
<tr>
<td>Consulting</td>
<td>2,000</td>
</tr>
<tr>
<td>Helicopter support</td>
<td>8,000</td>
</tr>
<tr>
<td>Data Compilation and Report</td>
<td>3,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>43,900</strong></td>
</tr>
<tr>
<td>Administration &amp; Supervision @ 15%</td>
<td>6,585</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>50,485</strong></td>
</tr>
<tr>
<td>GST @ 7%</td>
<td>3,534</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>54,019</strong></td>
</tr>
</tbody>
</table>

**SAY** 54,000

Respectfully submitted

Fayz Yacoub, P.Geo., F.G.A.C.
REFERENCES


G.S.C Minefile Report on The Ice, Cross, Ram, Jack, Mark, and Larry.


Pell, J., Alkalic Ultrabasic Diatremes In British Columbia, 1996.
CERTIFICATE OF QUALIFICATIONS

I, FAYZ F. YACOUB, of 6498-128B Street, Surrey, British Columbia, V3W 9P4, do hereby declare that:

1) I am a graduate in: Geology and Chemistry from Assuit University, Egypt (B.Sc., 1967), and Mining Exploration Geology of the International Institute for Aerial Survey and Earth Sciences (I.T.C.), Holland (Diploma 1978):

2) I am a fellow in good standing with the Geological Association of Canada;

3) I am a professional geologist and a member of the Association of the professional Engineers and Geoscientists of British Columbia.

4) I have actively pursued my career as a geologist for the past twenty two years;

5) The information, opinion, and recommendations in this report are based upon fieldwork carried out by myself, and on published literature. I was present on the subject property on July 15th, July 30th, and August 3rd, 2001.

6) I have no interest in the subject mineral claims, however I am the registered and beneficial owner of Mark 2001 mineral claim and I am the registered and beneficial owner of 50% of Mark 2000 mineral claim, both optioned for 90% interest to Icefield Diamond Mines Ltd.

Fayz Yacoub, P. Geo., F.G.A.C.

The 2001 Fieldwork Program on the
### Cost Statement

**Mons Claim Group**

**Mob/Demob** includes two days of:
- Wages, Transportation, Car rental, Fuel, Food and Accommodation  
  6,540.00

#### Field Crew
- Project Geologist @ $325/day x 2 days  
  650
- Geologist @ $300/day x 3 days  
  900
- Prospector @ $250/day x 4 days  
  1,000
- Field Assistant @ $250/day x 2 days  
  500
- Field Assistant @ $200/day x 2 days  
  400
- Cook @ $200/day x 4 days  
  800

Field Crew total:  
4,250.00

**Food & Accommodation** (17 mandays @ $100/day)  
1,700.00

**Consulting Fees**  
650

**Field Supplies**  
1,250.00

**Rentals**  
400

**Lab Analysis**  
1,284.00

**Helicopter Support**  
9,630.00

**Assessment Report**  
2,942.50

**Subtotal**  
28,646.5

**Administration Fees @ 15 %**  
4,296.98

**TOTAL**  
32,943.48
APPENDIX A

LAB RESULTS
To: Alex Burton  
Tel: 604-526-2396  
Fax: 604-525-8403

Copies: Fayz Yacoub

From: Maja Kiridzija  
Tel: 604-904-9800  
Fax: 604-904-9877

Date: August 21, 2001

SUBJECT: SAMPLE STATUS

Dear Mr. Brunton,

We have finished your sample. We looked at the fine fraction +0.28mm to 0.52mm. The results are listed below.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Size (in mm)</th>
<th>Chromite</th>
<th>Chrome Diopside</th>
<th>Other Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mons 2001 (+0.26-0.52)</td>
<td>41</td>
<td></td>
<td>12</td>
<td>None</td>
</tr>
<tr>
<td>HMC #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The only indicators recovered were chromite and chrome diopside. Chromite grains are angular, sharp edged, slightly resorbed and often with inclusions. Chrome diopside grains are pale emerald green in color. Both indicators are most likely from a lamproitic source.

The background consists of hematite, limonite, epidote, phlogopite, clinopyroxene and staurolite.

COST

The cost for processing a (55KG) sample is as follows:
Processing + Observation $600

Total $600 + Applicable Taxes

Maja Kiridzija  
Bahjat Khoshaba

Laboratory  
Tahera Corporation

File: Lab Techs.doc Date: 08/21/01
To: Alex Burton
Tel: 604-526-2396
Fax: 604-525-8403

Copies: Fazzy Yacoub

From: Maja Kiridzija
Tel: 604-904-8800
Fax: 604-904-9877

Date: September 12, 2001

SUBJECT: SAMPLE STATUS

Dear Mr. Burton,

We have finished your samples. We looked at the fine fraction +0.28mm to 0.52mm. For both the Mags and the Non Mags. The results are listed below.

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Size in mm</th>
<th>Pyrope</th>
<th>Ilmenite</th>
<th>Chromite</th>
<th>Chrome Diopside</th>
<th>Diamonds</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mans-01 HMC 2</td>
<td>(0.28-0.52)</td>
<td>None</td>
<td>None</td>
<td>20/None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Mans-01 HMC 3</td>
<td>(0.28-0.52)</td>
<td>None</td>
<td>None</td>
<td>48/None</td>
<td>1/None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

The only indicators recovered were chromite and chrome diopside.
Chromite grains are mainly fractured and some showing resorbed octahedrons.
Chrome diopside grain is pale emerald in colour.

COST

The cost for processing two Mag samples and two Non Mag samples is as follows:
Processing + Observation $1200

Total $1200 + Applicable Taxes

Maja Kiridzija
Bahjat Khoshaba

Laboratory
Tahera Corporation