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*Revised*

**Report on a bulk sampling and mineral processing  
test program for calcium feldspar in a specialty  
mineral filler application**

**Warren Township Anorthosite Project  
Foleyet, Ontario**

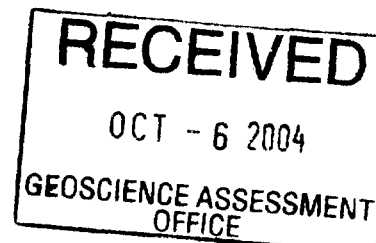
**NTS 42B02W  
48°7'94"N 82°47'20" W**

**Claim Numbers 3003642, 3003643, 3003644**

**2 . 28568**

**Donald H. Hains, P.Geol.**

**Toronto, Ontario  
September 30, 2004**



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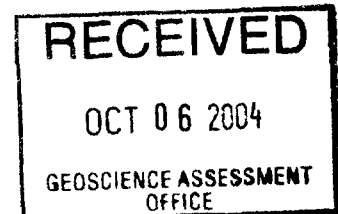
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**Donald H. Hains, P.Geo.**

**Toronto, Ontario  
September 30, 2004**

## EXECUTIVE SUMMARY

The Warren Township Anorthosite Project is an advanced industrial minerals development opportunity located near the village of Foleyet, 100 km west of Timmins, Ontario. The project consists of three mining claims totaling 1800 acres that are 100% owned by Avalon Ventures Ltd. Anorthosite is an unusual mafic igneous intrusive rock consisting of greater than 90% plagioclase feldspar. The three claims cover an area of anorthosite hosting a large resource (in excess of 800,000 tonnes) of a high purity calcium feldspar.

Previous work has demonstrated that the calcium feldspar can be readily extracted and processed by dry milling to produce a high quality raw material for the manufacture of reinforcing glass fibre and other industrial products. The location of the property near both road and rail transportation infrastructure and its proximity to markets in southern Ontario and the northeastern U.S. offers the potential for development of a low-cost, profitable industrial minerals operation.

The current bulk sampling program was designed to produce a two tonne test sample of the calcium feldspar product for evaluation in a specialty mineral filler application that required a white product, free of dark particles and free silica while having a hardness exceeding other commercially available white mineral fillers. Results from a small scale sample prepared for the potential customer in March, 2004 were positive, leading to the receipt of an order for a larger test sample in June, 2004.

Ten tonnes of broken ore were collected from a stockpile on the property, cleaned and shipped to the pilot plant of Polymet Resources in Cobalt, Ontario for crushing to 100% passing -40mesh. The crushed material was then shipped to SGS Lakefield Research Limited for final processing by screening and magnetic separation to a final - 100+200mesh product free of dark particles. A final report on the results of the customer's evaluation of the product is pending, but a visual inspection prior to shipping indicated that the material should meet the required specifications.

Further work is recommended to optimize the process in order to improve product yields and define a final process flowsheet once customer approval of the sample is received.

## TABLE OF CONTENTS

Executive Summary.....	i
Introduction.....	1
Mineral Tenure.....	1
Property Location & Access.....	2
Local Topography.....	3
Previous Exploration Development Work.....	3
Geology of the Shawmere Anorthosite Complex.....	4
Property Geology.....	6
Ore Petrology.....	7
Resources.....	8
2004 Bulk Sampling Program.....	9
Conclusion and Recommendations.....	12
References.....	13
Appendix 1.....	14

### List of Figures

Figure 1. Location Map.....	2
Figure 2. Geology of Shawmere Anorthosite Complex.....	6
Figure 3. Areas of high-grade calcium feldspar.....	7
Figure 4. General Geology and site plan.....	8

### List of Tables

Table 1 - Measured and Indicated Resources.....	9
Table 2 – WRA of anorthosite feed material.....	10
Table 3 – WRA of final product.....	11

## **INTRODUCTION**

The Warren Township Anorthosite project is an advanced industrial minerals development opportunity located near Foleyet, Ontario. The anticipated mineral product is a high purity calcium feldspar with potential applications in glass, ceramics, refractories and specialty fillers.

In 2003, Avalon completed a prefeasibility study based on a similar study conducted in 2000 by Hains Technology Associates (“Hains”) for a private company that previously held title to the claims. The study contemplates developing the property as a producer of a calcium feldspar mineral product, primarily as a raw material for reinforcing glass fibre manufactured by Owens Corning Canada at a plant in Guelph, Ontario. Subsequently, a new potential market for the material in a specialty filler application was identified by Amalgamet Canada (“Amalgamet”), a firm specializing in marketing industrial minerals. Following a positive laboratory evaluation of a small (3kg) sample of the material prepared in April, 2004 at SGS Lakefield Research Limited (“Lakefield”), a purchase order for a minimum 2 tonne production trial sample of the product was received from the customer through Amalgamet.

This report documents the work done and results obtained to date from a bulk sampling program initiated in June, 2004 to produce the trial sample requested by the customer and develop a production process flowsheet. Most of the processing testwork was carried out at Lakefield under the supervision of Geoff Lane and Lionel Magumbe. Initial crushing of the material to 100% passing minus 40 mesh was conducted at Polymet Resources pilot plant facility in Cobalt, Ontario because Lakefield do not have production-sized dry grinding equipment. Les Heymann Consulting provided consulting to Polymet to assist in configuring the process circuit for the anorthosite material.

Hains provided overall project management for the bulk sampling program with assistance from D. S. Bubar & Associates, Consulting Geologists to Avalon. A separate Progress Report from Lakefield is appended to this report. The work was scheduled for completion in early October, 2004, with follow-up work planned once the customer has provided some initial feedback.

## **MINERAL TENURE**

The Warren Township Anorthosite Project consists of three mining claim blocks of 15 units each recorded as Claim Nos. P3003642, P3003643 and P3003644 on Claim Map

#G1228 of the Porcupine Mining District, of the Ontario Ministry of Northern Development and Mines. Full title to these claims is recorded to Avalon Ventures Ltd. The claims cover a total area of approximately 1800 acres or 720 ha and are renewable by October 25, 2004. The principal area of interest for potential future development is located on claim #P3003643.

### PROPERTY LOCATION AND ACCESS

The property is located near Foleyet, Ont. in the southwest portion of the unsurveyed township of Warren, Porcupine Mining District. The centre of the property is more particularly located at NTS 42B02W, Latitude  $48^{\circ} 7' 94''$ N and Longitude  $82^{\circ} 47' 20''$ W. (Figure 1).

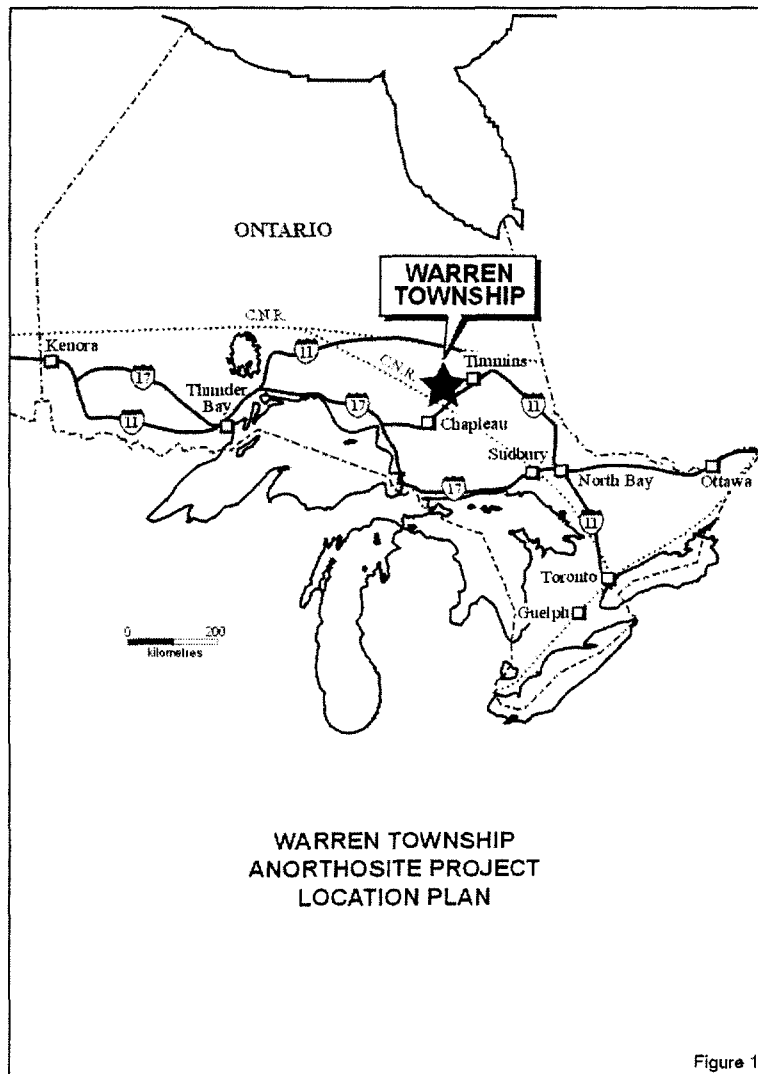


Figure 1

The centre of the property is located at approximately kilometre 13 on the Carty-Warren Road, an all-weather logging road maintained by Domtar Inc. The road crosses the central part of the property, providing excellent access for exploration and development work. There is no other industrial development activity within the logging concession held by Domtar, and the nearest community infrastructure is at least 20 km from the property. Access to the Carty-Warren Road is from Highway 101 at a point approximately 20 km southwest of Foleyet, Ont. Timmins is located 100 km east of this point and Chapleau is located 67 km west.

Foleyet is a small community of approximately 300 persons. Foleyet is a major maintenance point on the CN Rail main line and is the site of loading operations for the Luzenac talc operation and several logging companies. Rail siding facilities and land are available from CN on a lease basis at the Foleyet rail yard for construction of a process and ore storage building and load out facility. A construction contracting firm (C. D'Amours Contracting Ltd.) maintains a large camp and maintenance facility on Highway 101 at Foleyet.

### **TOPOGRAPHY AND VEGETATION**

The project site is typical of much of northeastern Ontario and the Canadian Shield. The property is relatively flat, with the anorthosite outcrops on the property forming local topographic highs. The average elevation on the property is approximately 390 metres ASL. Local topographic relief is in the order of 20-30 metres. Within the claim boundary, outcrop exposure is approximately 40%, with the area of immediate mining potential (Area B) being approximately 80% exposed. The Carty-Warren road overlies the centre of the deposit area known as Area A from Km 13 to Km 14. Thin glacial deposits and soils, with some swampy areas cover the remainder of the property.

### **PREVIOUS EXPLORATION AND DEVELOPMENT WORK**

There is no record of any mineral development work other than government-sponsored surveys on the Warren Township property prior to the staking of the original claims by Purechem Limited in 1993. In 1994, Purechem conducted an exploration program consisting of 33 km of grid lines, surface mapping and sampling; approximately 350 m of trenching and 150 m of percussion drilling; XRF and ICP chemical analysis of over 300

samples; and the extraction of a 15 tonne bulk sample from two locations. This work was followed by the preparation of ore reserve estimates and development of a preliminary quarry operation plan. In total, approximately \$100,000 was spent on geological exploration and development in 1994. An additional \$100,000 was spent in 1995 on the completion of a feasibility study for the production of aluminum chemicals from the calcium feldspars, which, unlike other feldspars, are acid-soluble. Although the study was positive the concept was subsequently abandoned after a development partner abruptly withdrew from the project.

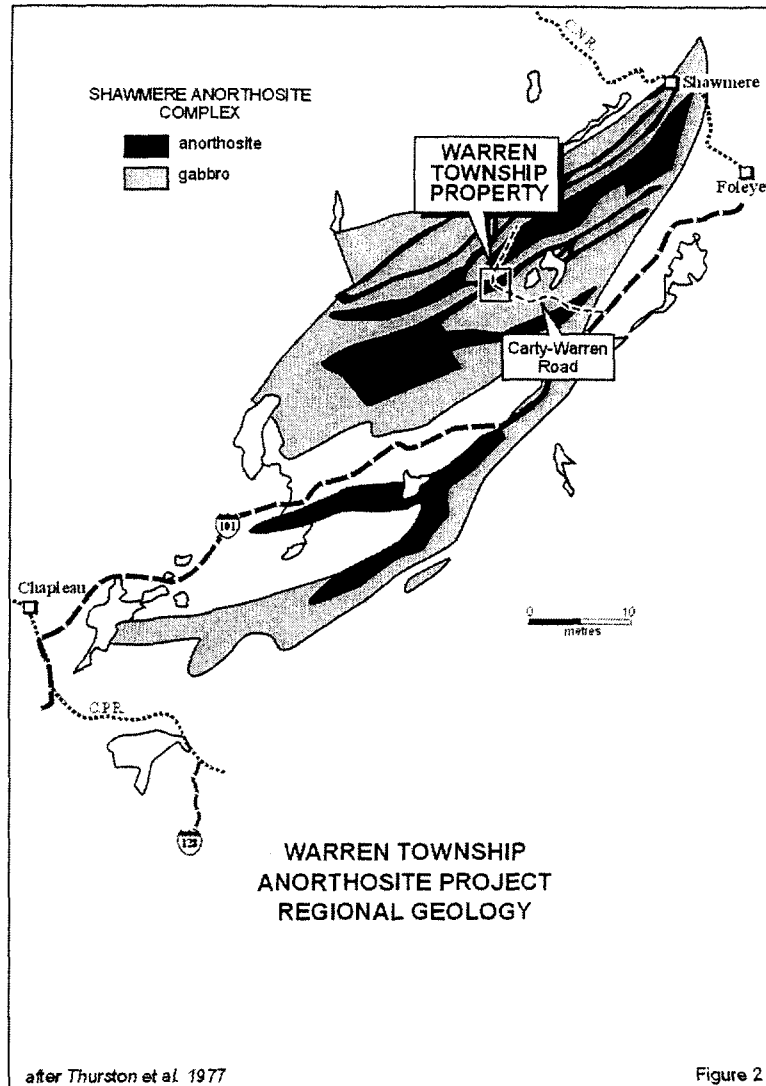
In 2000 – 2001, Purechem re-evaluated the project as a potential supplier of calcium feldspar to Owens Corning Canada as a raw material for reinforcing glass fibre production at its Guelph, Ontario facility. Approximately \$20,000 was spent on laboratory test work at Lakefield Research Ltd. and on a pre-feasibility study prepared by Hains Technology Associates. Approximately 500 tonnes of ore from Site B was blasted in preparation for processing for delivery of a 320 bulk product sample to Owens Corning. The processing was not carried out due to a lack of financing.

Previous government-sponsored geological investigations of the claims and the immediate area consisted of regional geological mapping and 1:100,000 scale mapping of the Shawmere Anorthosite complex, (Thurston et al, 1977; Percival, 1981; Dolan, 1991) and an evaluation of the high calcium/aluminum plagioclase feldspar, as a source of aluminum chemicals and other industrial mineral products (Veldhuyzen, 1995).

## **GEOLOGY OF THE SHAWMERE ANORTHOSITE COMPLEX**

Anorthosites are mafic igneous intrusive rocks containing greater than 90% plagioclase feldspar, 5-10% ferro-magnesian minerals, accessory iron or titanium oxide minerals and garnet, but little or no quartz. Plagioclase feldspar is a solid solution between two end member compositions, albite (sodic, low alumina,  $\text{NaAlSi}_3\text{O}_8$ ) and anorthite (calcic, high alumina,  $\text{CaAl}_2\text{Si}_2\text{O}_8$ ). Calcic anorthosites are geological rarities, being restricted to the oldest Precambrian rocks. The Shawmere Complex is one of only two such occurrences presently known in the Precambrian Shield of Ontario: the other being the Bad Vermilion complex located near Fort Frances, Ontario. The Shawmere Anorthosite Complex covers an area of approximately 800 square kilometres, centered 15 km west of the village of Foleyet (Figure 2).





The intrusion is of economic interest due to its unique chemical composition, especially the ratio of Al:Si:Ca, in the plagioclase and its unusually consistent composition within individual layers. In addition, the intrusion is highly accessible, being located within a few kilometres of major road and rail transportation routes, and is not excessively remote from potential industrial minerals markets.

The geology of the Shawmere Complex is described by Dolan (1991) as follows:

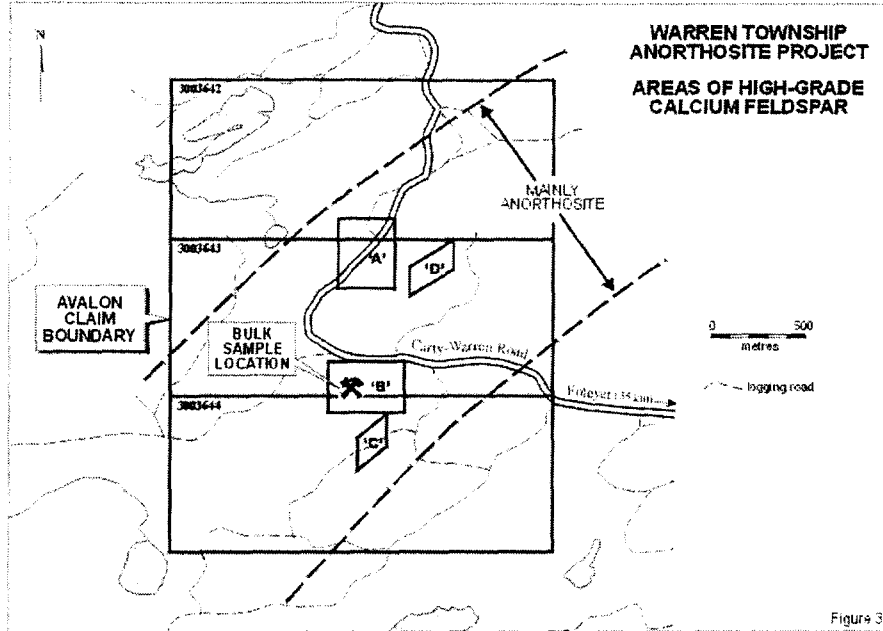
*The Shawmere Complex is of Archean age and is situated at the southern end of the Kapuskasing Structural Zone, in the Superior Province. The complex trends northeasterly, with a length of 84 km and a maximum width of 24 km. Strong regional metamorphism and deformation are imprinted on the surrounding rocks.*

*The complex exhibits wide compositional variability. There is an anorthosite core which contains leuco to mela-gabbroic zones. Gabbro and troctolite are concentrated to the north and south of the core units and garnetiferous amphibolite occurs around the margins (Riccio, 1979). It is the anorthositic core that represents the highest  $Al_2O_3$  and alkali potential.*

*Anorthosite occurs in layers, often gradational to gabbro. Thicknesses of actual anorthosite units are estimated at 300 m and comprise approximately 50% of the complex (Thurston et al, 1977). Lithological layering is often accompanied by textural variations. The plagioclase textures in the anorthosite range from recrystallized granoblastic (1 to 5 cm diameter), to cataclastic, to relict megacrystic (i.e. crystals up to 8 to 13 cm by 45 cm) (Thurston et al, 1977). Plagioclase compositions are bytownite to labradorite, An60-85 (Thurston et al, 1977). Garnet, pyroxene and amphibole coronas occur around the plagioclase (Thurston et al, 1977). Matrix material varies in texture, composition and proportion (5 to 50%). Plagioclase, hornblende, cummingtonite, anthophyllite, hypersthene, augite, and garnet with accessory sphene, rutile and epidote occur as fine-grained interstitial material and as coarse patches (Thurston et al, 1977). Less common accessory minerals include sapphirine and Al-spinel (Phinney et al, 1988). Primary olivine, orthopyroxene and clinopyroxene occur in the least deformed parts of the complex (Phinney et al, 1988). Minor crosscutting shears are composed of scapolite, epidote (clinozoisite), carbonate, quartz and minor hematite along with crushed feldspar (Thurston et al, 1977). Other crosscutting features include semiconcordant sheets of quartzofeldspathic gneisses (Thurston et al, 1977), quartz-hornblende pegmatites and olivine diabase dikes (Riccio, 1979).*

## **PROPERTY GEOLOGY**

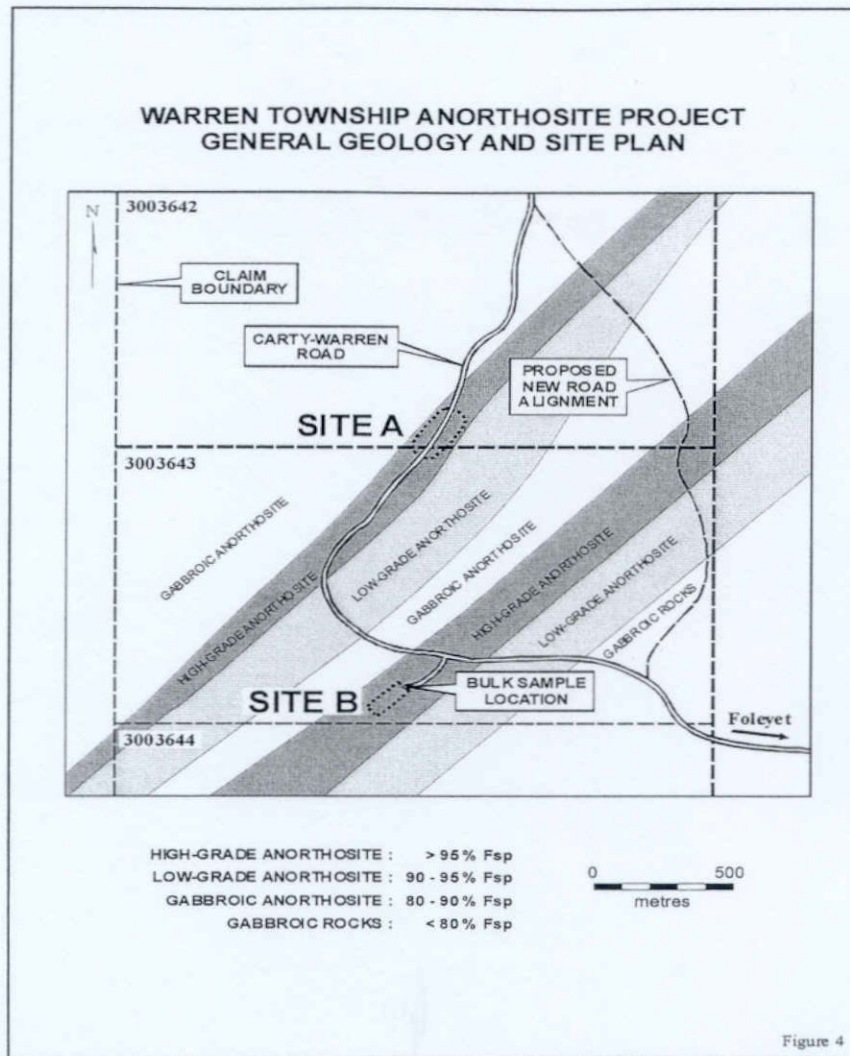
In September, 1994, Veldhuyzen (1994) carried out a detailed geological mapping program on the property for Purechem. Resource estimates and a preliminary plan and costs for development of the quarry were prepared by Mr. Peter A. Bevan, P. Eng., mining geologist.



Veldhuyzen identified four areas (A,B,C,and D) of massive anorthosite on the property as having the purity and extent to be considered for development. Generally, these fall within two northeast-striking 60-90 m thick layers within a 1200m wide band of anorthositic rocks ranging from gabbroic anorthosite (80-90% plagioclase) to high purity anorthosite (>95% pure) (Figure 3). The layering dips to the northwest at a moderate to steep angle. Minor folds are observed in the anorthositic gabbro layers and small-scale faults appear to cause occasional minor offsets in the anorthosite layers. These are often recognized as thin clinozoisite or scapolite-filled seams. The rock is generally massive with a few widely-spaced joints.

## ORE PETROLOGY

Petrographic analysis of the high-purity anorthosite from Sites 'A' and 'B' by Lakefield Research determined that it consists of 95% - 98% plagioclase as bytownite( $An_{75-80}$ ). The grain size ranges from 0.5 to 3 mm. The major contaminant minerals are amphibole (hornblende) as disseminated interstitial grains of approximately 1 mm, pyroxene (augite) as interstitial grains up to 800 microns, and Fe oxyhydroxides associated with the interstitial amphibole. The hornblende and pyroxene are also present in very minor amounts as delicate acicular inclusions in the plagioclase. Rutile is present as a minor accessory mineral. Overall, the massive anorthosite is described as very clean material with few deleterious mineral constituents.



## RESOURCES

Peter A. Bevan, P. Eng, prepared resource estimates for Purechem in 1994. Area A contains Measured Resources of 380,440 tonnes of anorthosite based on a single bench of 10 metre height, pit length of 273 metres and pit width of 63 metres and an allowance for 20% dilution. An additional 280,725 tonnes of Indicated Resources are estimated to be available if a second 10 metre bench was constructed, again with a 20% dilution factor. Total resources for Area A are therefore 661,665 tonnes, or approximately 30 years quarry life based on annual requirements of 20,000 tonnes. Area A lies adjacent and under the Carty-Warren Main Haul Road and is therefore not accessible for large-scale sampling and production until a bypass is constructed. Domtar has indicated it will be reconstructing the road within the next five years. The reconstruction will result in a bypass of Area A, rendering it open for development.

Resource estimates for Area B were prepared assuming a single bench of 10 metre height, pit length of 133 metres and pit width of 24 metres. Measured Resources are 125,768 tonnes allowing for 10% dilution. An additional 71,071 tonnes of anorthosite are classified as Indicated Resources if a second 10 metre bench was constructed. Total estimated resources for Area B are therefore 196,840 tonnes, or approximately 10 years life based on initial annual anorthosite requirements of 20,000 tonnes.

**Table 1. Measured and Indicated Resources  
(tonnes)**

<u>Area</u>	<u>Measured</u>	<u>Indicated</u>	<u>Total</u>
Area A	380,440	280,725	661,665
Area B	125,768	71,071	196,840
<b>Total</b>	<b>506,208</b>	<b>351,796</b>	<b>858,505</b>

Although this resource estimate was prepared prior to the introduction of new resource and reserve reporting guidelines under National Instrument 43-101, the resource is understood to have been calculated in compliance with the new policy.

## **2004 BULK SAMPLING PROGRAM**

### **Product specifications and process flowsheet**

The original request from an anonymous client of Amalgamet was based on the requirement for a filler material which was white in colour, containing no dark particles or any free silica, yet having a hardness greater than other commonly available mineral fillers such as calcium carbonate. The particle size distribution was initially specified as -80+200 mesh. Based on limited previous experience with the material, anorthosite was judged by Amalgamet to be a good potential fit due to its hardness and lack of free quartz. A 2kg product sample was requested and this was prepared in March, 2004 at SGS Lakefield Research. There was no chemical specification defined. In May, it was confirmed through Amalgamet that following some additional screening by the customer at 140mesh, an acceptable quality product could be produced.

The process flowsheet developed to make this material is similar to that conceived for the glass fibre application. It essentially involves crushing to -40 mesh and de-dusting to

remove the -200mesh material followed by magnetic separation to remove the ferromagnesian minerals, then finally screening to size. The final screening removes the remaining dark particles which are actually coarse calcium feldspar grains that appear dark due to their unusual optical properties, at coarser particle sizes. The optimum screen size for this work has not been determined. 120 mesh was assumed initially, but the final product was screened at 100 mesh at the request of the customer.

Five passes were required through the hi-intensity magnetic separator to achieve 100% removal of the ferro-magnesian minerals. Further work is required to optimize the process. The following whole rock analysis on the crushed anorthosite feed material was reported by Lakefield:

**Table 2. Whole Rock Analysis of anorthosite ore feed material (XRF).**

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	MnO	Cr <sub>2</sub> O <sub>3</sub>	V <sub>2</sub> O <sub>5</sub>	LOI	Sum
%	%	%	%	%	%	%	%	%	%	%	%	%	%
48.8	32.6	0.17	< 0.05	15.8	2.44	0.03	< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.42	100.3

The order for the bulk sample received through Amalgamet specified supply of roughly 2 tonnes of the anorthosite material screened to -80 +200mesh and “having no black specks”. The optimum particle size distribution remained to be defined as it is not yet known at precisely what particle size threshold the dark colour in the feldspar disappears.

### Sample Collection

Following confirmation of receipt of the customer order in June for a two-tonne custom-prepared product sample, a field crew consisting of the author and Avalon geologist Don Bubar, was mobilized to the project site to organize and supervise the collection of approximately 10 tonnes of ore from the previously blasted material stockpiled at Site B. The UTM co-ordinates for the Site B stockpile location is 366360mE, 5332180mN. This work was carried out on June 22 and 23.

C. D’Amours Contracting Ltd was contracted to provide the necessary equipment consisting of a loader with a two-yard bucket. Maximum 6 inch sized material was sorted by hand into the bucket and transported to the side of the Carty-Warren road for loading

into 45 gallon drums. These were then transported to the contractor's yard in Foleyet where the material was then steam-cleaned to remove any soil and organic material adhering to the rock. The material was then re-packed in drums and sealed for shipping by truck to the Polymet Resources pilot plant in Cobalt, Ontario.

### Sample Processing

The sample was received at Polymet Resources in early July and processed intermittently over the next three weeks before being shipped to Lakefield on July 29. At Polymet, the anorthosite ore was weighed, crushed in a jaw crusher, then milled in a small ball mill and screened at 40 mesh. The sample weight was measured at 9.825 tonnes. The oversize was re-circulated until all the material passed through a 40mesh screen. The -40mesh product was re-packaged in plastic-lined drums for shipping to Lakefield. Unfortunately some of the material received at Lakefield was found to be +40mesh and this material had to be shipped back to Polymet for further milling before the magnetic separation at Lakefield could be completed. This delayed completion of the work by approximately one month beyond the original August 31 target completion date.

Once at Lakefield, the crushed material was screened to remove the -200mesh fines and homogenized to ensure a consistent particle size distribution in the feed for the magnetic separator. The material was then subjected to a five pass magnetic separation process. The final non-magnetic product had the following chemical analysis as determined by XRF:

**Table 3. Whole Rock analysis of fifth pass non-mag product (XRF)**

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	MnO	Cr <sub>2</sub> O <sub>3</sub>	V <sub>2</sub> O <sub>5</sub>	LOI	Sum
%	%	%	%	%	%	%	%	%	%	%	%	%	%
48.6	32.6	0.16	<0.05	15.4	2.5	0.03	0.03	0.04	<0.01	0.02	<0.01	0.82	100.3

The fourth pass material had a similar iron content while the third pass iron analysis was unavailable. Since the final product specification is based on visual inspection to ensure that the material was free of dark particles it remained to be determined whether this was attainable at the third or fourth pass and whether the magnetic separates could be re-processed to improve overall product yields.

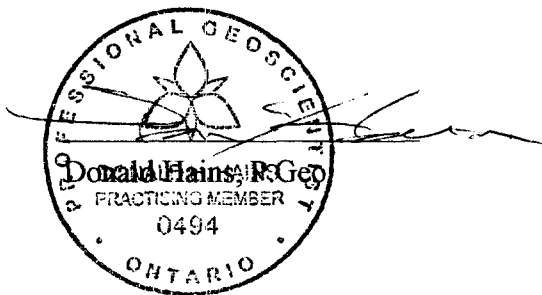
Finally, the fifth pass non-magnetic product was screened at 100 mesh with the minus – 100 mesh fraction retained as the final product for delivery. The final screening parameters require further optimization work in order to maximize product yields which (if the fifth pass non-mag separate is used) amount to just 10% of the feed. A brief description of the work done at Lakefield and the chemical analyses carried out on both the ore and the product are provided in the Progress Report#1, which is included in Appendix 1.

### Results

Visual inspection of the final –100+200 mesh product by Hains indicated a complete absence of dark particles suggesting that the product will be satisfactory. However, final confirmation will be provided by the customer following the completion of its own internal evaluation of the material.

### CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the anorthosite process flowsheet developed for this test can produce a calcium feldspar product that will meet the customer's requirements for its mineral filler application. Further work is required to optimize the process to maximize product yields and define a final process flowsheet. This work should be initiated as soon as the customer has reported on the results of his in-plant evaluation of the product and indicated its approval of the test sample.



September 30, 2004



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**APPENDIX 1**

**SGS Lakefield Research Limited Progress Report**



## **SGS Lakefield Research Limited**

**ANORTHOSITE PROCESSING**  
prepared for

***AVALON VENTURES***

LR8901-441 – Progress Report #1

**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 SGS Lakefield Research Limited.

### **Lakefield Research**

SGS Lakefield Research Limited

P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0  
Tel: (705) 652-2000 Fax: (705) 652-6365 [www.sglakefield.com](http://www.sglakefield.com) [www.sgs.com](http://www.sgs.com)

Member of SGS SA Group



## *Introduction*

The following report presents results obtained by SGS Lakefield Research from a test work program on Anorthosite processing by magnetic separation.

The program was initiated at the request of Mr. Don Bubar of Avalon Ventures Limited after submission of an initial proposal by SGS Lakefield outlining costs for completion of a magnetic separation program.

This report is presented as a stand-alone document and is based on results of the study by SGS Lakefield Research.

The scope of work initially agreed was outlined in SGS Lakefield Research quotation issued August 10<sup>th</sup>, 2004.

Lionel Magumbe P. Eng.,  
Senior Metallurgist

Chris Martin C.Eng.,  
Group Leader-Mineral Technologies

Report Preparation by: L. Magumbe

Testwork by:  
Kevin Ball  
Guy Rose  
Richard Heilmann



### **Description of Testwork Program**

- Twenty-six drums of ore sample weighing about ten metric tonnes were received and screened at 200 mesh.
- A particle size analysis of the as received sample was completed.
- Due to processing problems on the +200 mesh sample this fraction was re-screened at 40 Mesh, to yield an undersize weighing 3144-kg. The +40 mesh fraction was returned to Polymet for regrinding.
- The – 40 Mesh material was subjected to a five pass magnetic separation process on an Outokumpu 1.5m dry roll separator with a magnetic strength of 14 000 gauss.
- A whole rock and Fe<sub>2</sub>O<sub>3</sub> analysis was completed on the non-magnetic fractions.

### **Results**

Table 1 shows the whole rock chemical analysis of the first pass feed and fifth pass non-magnetic fraction. The product yield and Fe<sub>2</sub>O<sub>3</sub> analysis is shown in Table 2. The size analysis of the sample as received is shown in table 3 and figure 1. The process flow diagram is shown in figure 2. The particle size distribution of the third pass non-magnetic fraction is shown in Figure 3.



**Table 1: Whole Rock Analysis**

Parameter	Assay %	
	1 <sup>st</sup> Pass Feed	5 <sup>th</sup> Pass Non Mags
SiO <sub>2</sub>	47.8	48.6
Al <sub>2</sub> O <sub>3</sub>	32.4	32.6
Fe <sub>2</sub> O <sub>3</sub>	1.19	0.16
MgO	0.29	< 0.05
CaO	15.9	15.4
Na <sub>2</sub> O	2.39	2.5
K <sub>2</sub> O	0.04	0.03
TiO <sub>2</sub>	0.05	0.03
P <sub>2</sub> O <sub>5</sub>	< 0.01	0.04
MnO	0.02	< 0.01
Cr <sub>2</sub> O <sub>3</sub>	0.01	< 0.01
V <sub>2</sub> O <sub>5</sub>	< 0.01	< 0.01
LOI	0.8	0.82
Sum	100.9	100.3

**Table 2 Product Yield (-40 Mesh)**

	Total	Magnetics		Non Magnetics		
	kg	kg	%	kg	Wt %	% Fe <sub>2</sub> O <sub>3</sub>
1st Pass	3144.5	852	27.1	2292.5	72.9	0.46
2nd Pass	2292.5	1202.5	52.5	1090	47.5	0.36
3rd Pass	1083.5	381.5	35.2	702	64.8	N/A
4th Pass	657	216	32.9	441	67.1	0.19
5th Pass	435	43	9.9	392	90.1	0.16



**Table 3: Size Distribution Analysis-As Received Sample**

**Company**

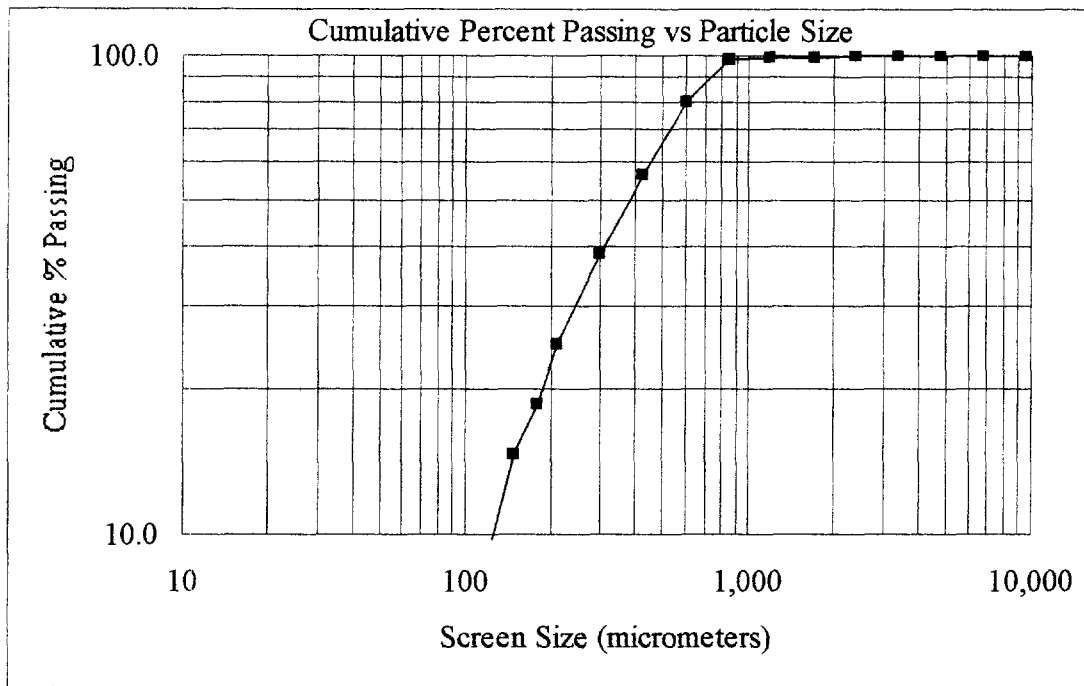
**Lakefield Research  
Size Distribution Analysis**

**MI5003-AUG04**

**Sample:** MI5003-AUG-04

**Test No.:**

Mesh	Size	Weight grams	% Retained		% Passing
	µm		Individual	Cumulative	Cumulative
3/8"	9,525	0.0	0.0	0.0	100.0
3	6,700	0.0	0.0	0.0	100.0
4	4,750	0.0	0.0	0.0	100.0
6	3,350	0.4	0.1	0.1	99.9
8	2,360	0.8	0.2	0.3	99.7
10	1,700	1.3	0.3	0.6	99.4
14	1,180	2.6	0.6	1.2	98.8
20	850	2.8	0.6	1.8	98.2
28	600	80.5	18.2	20.0	80.0
35	425	105.9	24.0	44.0	56.0
48	300	77.4	17.5	61.5	38.5
65	212	60.7	13.7	75.3	24.7
80	180	26.7	6.0	81.3	18.7
100	150	18.1	4.1	85.4	14.6
150	106	36.0	8.2	93.5	6.5
200	75	19.4	4.4	97.9	2.1
Pan	-75	9.1	2.1	100.0	0.0
<b>Total</b>	-	<b>441.7</b>	<b>99.9</b>	-	-
<b>K80</b>	<b>619</b>				



**Figure 1 As Received Particle Size Distribution Curve**



## AVALON VENTURES ANORTHOSITE PROCESSING

Date: August 12/04  
Project #: 8901-441  
LIMS#: MI5003-AUG04

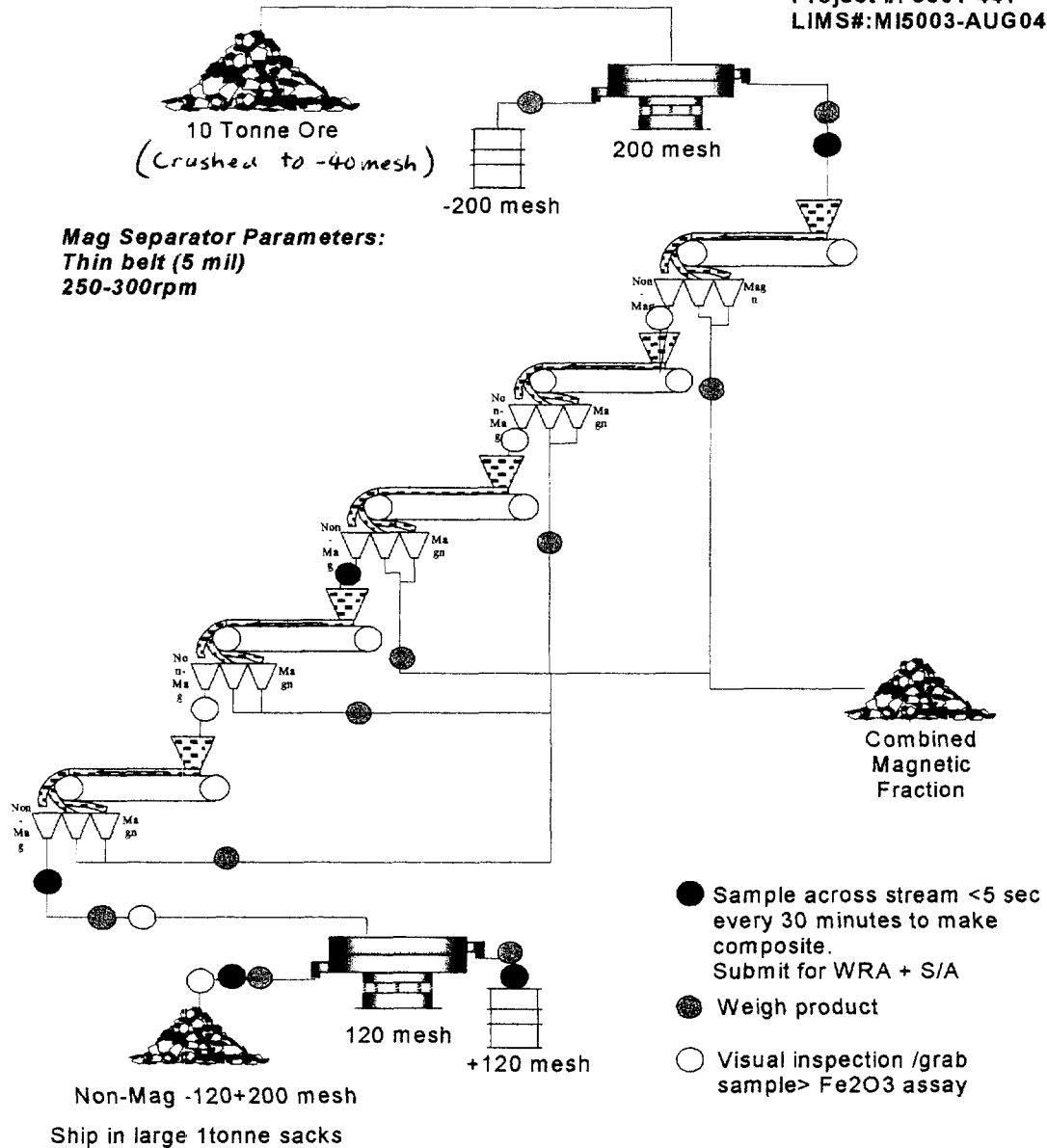


Figure 2: Arnothosite Process Flow Diagram



Company

Lakefield Research  
Size Distribution Analysis

MI5003-AUG04

Sample: 3rd pass Non Mags

Test No.: Mag sep.

Mesh	Size	Weight grams	% Retained		% Passing
	µm		Individual	Cumulative	Cumulative
48	300	12.1	8.8	8.8	91.2
65	212	37.2	27.0	35.8	64.2
100	150	37.1	26.9	62.7	37.3
150	106	30.8	22.4	85.1	14.9
200	75	14.4	10.4	95.5	4.5
270	53	3.9	2.8	98.3	1.7
400	38	0.2	0.1	98.5	1.5
Pan	-38	2.1	1.5	100.0	0.0
<b>Total</b>	-	<b>137.8</b>	<b>100.0</b>	-	-
<b>K80</b>	<b>261</b>				

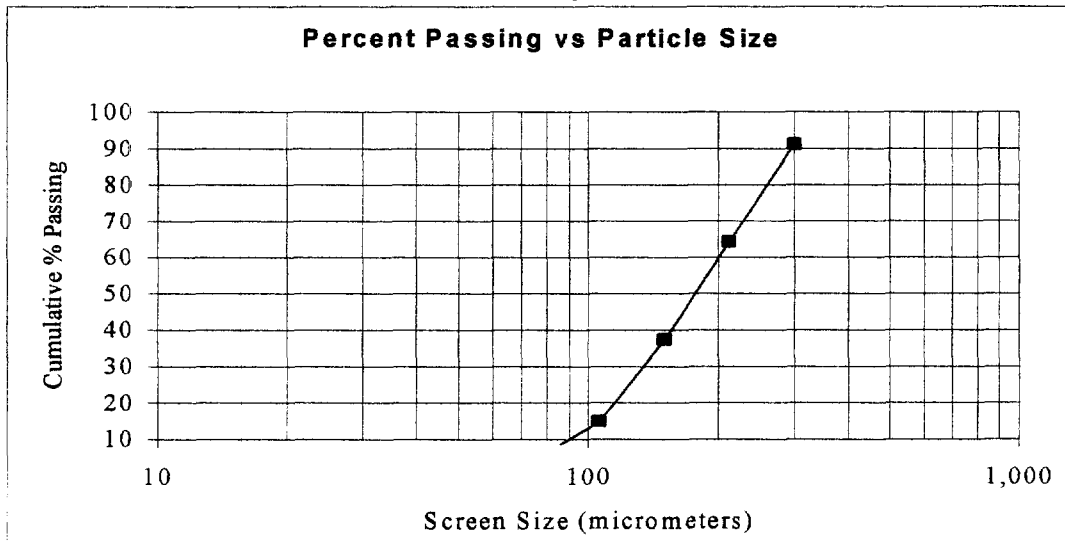


Figure 3: Non Magnetic Particle Size Distribution-3<sup>rd</sup> Pass



## Mineral Technologies

**To:** Don Hains  
**From:** Geoff Lane  
**Date:** March 9, 2004  
**RE:** Magnetic Separation

**Company:** Hains Technology Associates  
**Email:** hainstech@sympatico.ca

Dear Mr. Hains:

Please find included in this letter a cost estimate for processing the 3kg sample of anorthosite you have submitted. The processing will be carried out as per your instructions. The proposed test program will include the following:

- Roll crush the sample to 90% passing 28mesh.
- Wet screening at 28/80/200 mesh
- Magnetic separation – 5 passes
- Regrind non-magnetic concentrate
- Size analysis of re-grind product
- Magnetic separation of –80+200 mesh composite > 5 passes
- WRA of final non-magnetic concentrate

The following cost estimate further details the test program.

### COST ESTIMATE PER SAMPLE (Canadian \$)

Roll Crush 90% -28mesh	\$60
Screen 28/80/200 mesh	\$250
Magnetic separation – 5 passes	\$110
Re-grind product (ceramic mill)	\$150
Size analysis – (size distribution curve)	\$110
Magnetic separation – 5 passes	\$110
Whole Rock Analysis of final concentrate	\$34
Reporting & project management	<u>\$260</u>
<b>Total</b>	<b>\$1089</b>

*\*All shipping charges will be passed on at cost.*

Actual charge = \$895.<sup>00</sup>

**Certificate**

To accompany the Report entitled  
**“Report on a bulk sampling and mineral processing test program for calcium  
feldspar in a specialty mineral filler application”**  
dated September 30, 2004

I, **Donald H. Hains**, do hereby certify that:

1. I reside at E1/2Lot 6, Conc. 1 EHS, Mulmur Twp., Ont. L0N 1S8.
2. I am a graduate of Queen’s University, Kingston, Ontario with a B.A. (Hons) degree in Chemistry (1974).
3. I am a graduate of Dalhousie University, Halifax, Nova Scotia with a Master of Business Administration in Finance and Marketing (1976).
4. I am a registered Professional Geoscientist (Practising Member No. 0494) in Ontario and am registered with the Association of Professional Geoscientists of Ontario.
5. I am a consultant specializing in evaluation of industrial minerals properties and markets and have practiced my profession continuously since 1986.
6. I have specific knowledge of the Warren Township anorthosite property through prior work on the subject property during the period 1993 – 2003.
7. I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report.
8. Neither I, nor any affiliated entity of mine, is at present, or under agreement, arrangements or understanding expects to become, an insider, associate, affiliated entity or employee of Avalon Ventures Ltd. or any associated or affiliated entities.
9. Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Avalon Ventures Ltd. or any associated or affiliated companies.
10. Neither I, nor an affiliated entity of mine, have earned the majority of our income during the preceding three years from Avalon Ventures Ltd. or any associated or affiliated companies.

Donald H. Hains, P. Geo. B.A. (Hons), MBA  
September 30, 2004



The seal is circular with the text "PROFESSIONAL GEOSCIENTIST" around the top and "ONTARIO" around the bottom. In the center is a stylized flower or leaf design. Below the seal, the text "DONALD H. HAINS" and "REGISTERED MEMBER 0494" is visible.

**Work Report Summary**

Transaction No: W0460.01580 Status: APPROVED (D)

Recording Date: 2004-OCT-06 Work Done from: 2004-MAR-01

Approval Date: 2005-JAN-04 to: 2004-SEP-30

Client(s):

301086 AVALON VENTURES LTD.

Survey Type(s):

BENEF

Work Report Details:

Claim#	Perform	Perform Approve	Applied	Applied Approve	Assign	Assign Approve	Reserve	Reserve Approve	Due Date
P 3003642	\$0	\$0	\$18,000	\$18,000	\$0	0	\$0	\$0	2007-OCT-25
P 3003643	\$59,332	\$59,332	\$18,000	\$18,000	\$36,000	36,000	\$5,332	\$5,332	2007-OCT-25
P 3003644	\$0	\$0	\$18,000	\$18,000	\$0	0	\$0	\$0	2007-OCT-25
	\$59,332	\$59,332	\$54,000	\$54,000	\$36,000	\$36,000	\$5,332	\$5,332	

External Credits: \$0

Reserve:

\$5,332 Reserve of Work Report#: W0460.01580

\$5,332 Total Remaining

Status of claim is based on information currently on record.



42B02NW2003 2.28568

WARREN

900

Date: 2005-JAN-05

GEOSCIENCE ASSESSMENT OFFICE  
933 RAMSEY LAKE ROAD, 6th FLOOR  
SUDBURY, ONTARIO  
P3E 6B5

AVALON VENTURES LTD.  
SUITE 1005  
111 RICHMOND STREET WEST  
TORONTO, ONTARIO  
M5H 2G4 CANADA

Tel: (888) 415-9845  
Fax: (877) 670-1555

**Submission Number:** 2.28568  
**Transaction Number(s):** W0460.01580

Dear Sir or Madam

**Subject: Deemed Approval of Assessment Work**

We have approved your Assessment Work Submission with the above noted Transaction Number(s) as per 6(7) of the Assessment Work Regulation. Only eligible assessment work is deemed approved for assessment work credit. The attached Work Report Summary indicates the results of the approval.

NOTE: The report has not been reviewed for technical deficiencies and reported expenses were not evaluated based on the Industry Standard.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

If you have any question regarding this correspondence, please contact BRUCE GATES by email at [bruce.gates@ndm.gov.on.ca](mailto:bruce.gates@ndm.gov.on.ca) or by phone at (705) 670-5856.

Yours Sincerely,



Ron C. Gashinski  
Senior Manager, Mining Lands Section

**Cc:** Resident Geologist  
Avalon Ventures Ltd.  
(Claim Holder)

Donald S. Bubar  
(Agent)

Assessment File Library  
Avalon Ventures Ltd.  
(Assessment Office)

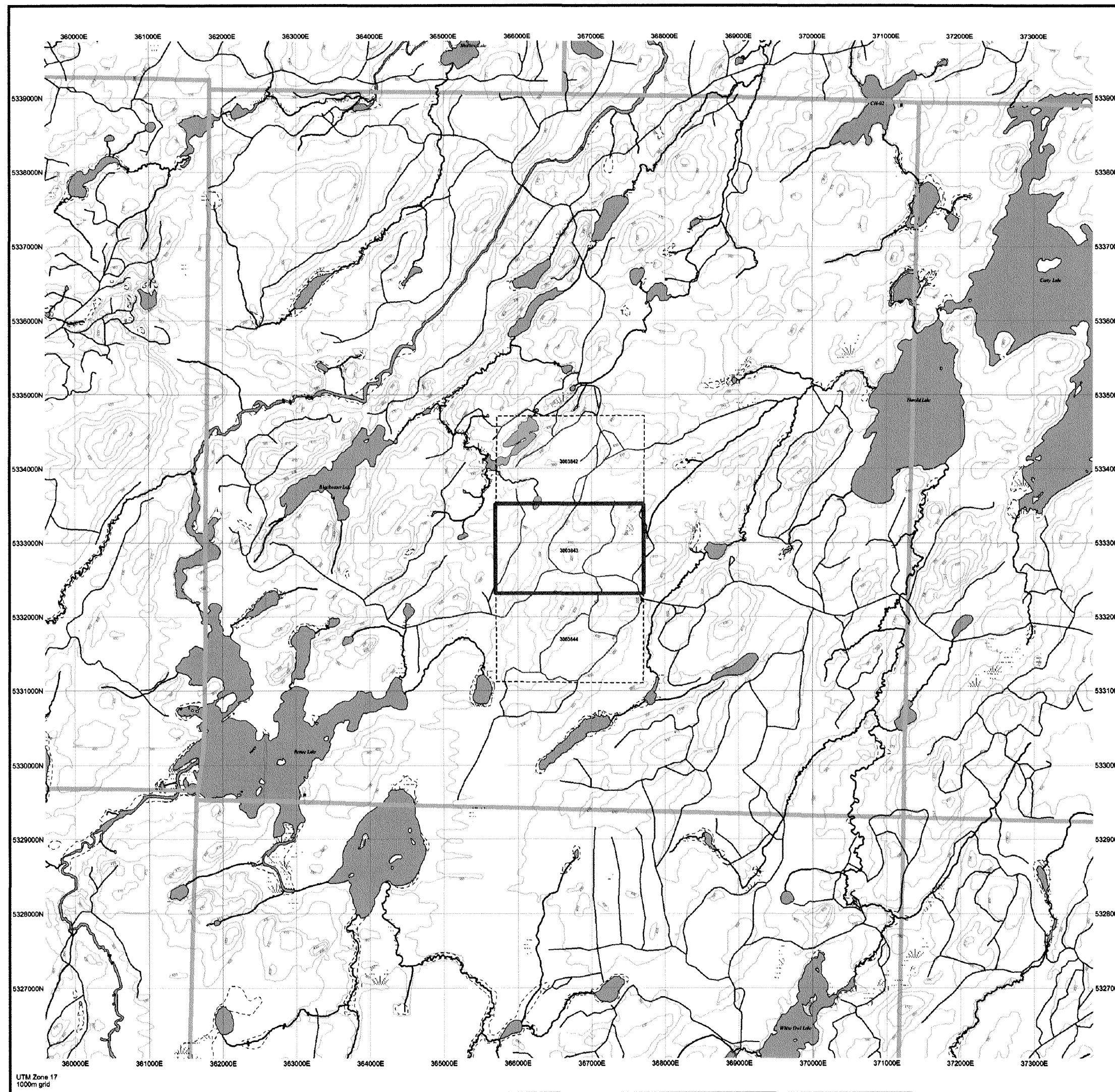
Date / Time of Issue: Wed Jan 05 11:19:03 EST 2005

TOWNSHIP / AREA  
WARREN

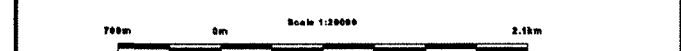
PLAN  
G-1228

ADMINISTRATIVE DISTRICTS / DIVISIONS

Mining Division Porcupine  
Land Titles/Registry Division SUDBURY  
Ministry of Natural Resources District CHAPLEAU



TOPOGRAPHIC	Land Tenure
Administrative Boundaries	Freehold Patent
Township	Surface And Mining Rights
Concession Lot	Surface Rights Only
Provincial Park	Mining Rights Only
Indian Reserve	Lesserhold Patent
CR, PA & File	Surface And Mining Rights
Contour	Surface Rights Only
Mine Shafts	Mining Rights Only
Mine Headframe	License of Occupation
Railway	Uses Not Specified
Road	Surface And Mining Rights
Trail	Surface Rights Only
Natural Gas Pipeline	Mining Rights Only
Utilities	Land Use Permit
Tower	Order In Council (Not open for staking)
	Water Power Lease Agreement
	Mining Claim
	1234567
	Place Only Mining Claims
	1234567
	LAND TENURE WITHDRAWALS
	1234
	Areas Withdrawn from Disposition
	Mining Act Withdrawal Types
	W'm
	W's
	W'm
	Order In Council Withdrawal Types
	W'm
	W's
	W'm
	IMPORTANT NOTICES
	No



LAND TENURE WITHDRAWAL DESCRIPTIONS

Mineral	Type	Date	Description
4021	W'm	Jan 1, 2005	400 FEET SURFACE RIGHTS RESERVATION AROUND ALL LAKES & RIVERS
W-LL-1207	W'm	Feb 1, 2004	see http://www.mnd.gov.on.ca/mnd/mrba/lands/land/2004/0401/withdrawal/wll-1207-04_s.asp~W-LL-1207-04T-M&S- withdrawn @ 30 Mining Act RSC 1995, c1 (2) (4) boundary severity depicts area withdrawn. Click to view actual area (s)

**2.28568**  
**BENEF**

42B02NW2003 2.28568  
WARREN

Those wishing to stake mining claims should consult with the Provincial Mining Recorder's Office of the Ministry of Northern Development and Mines for additional information on the status of the lands shown herein. This map is not intended for navigation, survey, or land title determination purposes as the information shown on this map is compiled from various sources. Completeness and accuracy are not guaranteed. Additional information may also be obtained through the local Land Titles or Registry Office, or the Ministry of Natural Resources.

General Information and Limitations

This map may not show unregistered land tenure and interests in land including certain patents, leases, easements, right of ways, floating mortgages, mortgages, or other forms of disposition of rights and interests from the Crown. Also, it may not show land tenure and land use that restricts or prohibits free entry to staking mining claims, may not be illustrated.