Report to:

Canada Carbon Inc.

Technical Report and Preliminary Economic Assessment for the Miller Graphite and Marble Property, Grenville Township, Quebec, Canada

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CANADA CARBON INC.

TECHNICAL REPORT AND PRELIMINARY ECONOMIC ASSESSMENT FOR THE MILLER GRAPHITE AND MARBLE PROPERTY, GRENVILLE TOWNSHIP, QUEBEC, CANADA

EFFECTIVE DATE: MARCH 4, 2016

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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

GLOSSARY

Units of Measure

above mean sea level	amsl
acre	ac
ampere	A
annum (year)	a
billion	B
billion tonnes	Bt
billion years ago	Ga
British thermal unit	BTU
centimetre	cm
cubic centimetre	cm^3
cubic feet per minute	cfm
cubic feet per second	ft^3/s
cubic foot	ft^3
cubic inch	in^3
cubic metre	m^3
cubic yard	yd^3
Coefficients of Variation	CVs
day	d
days per week	d/wk
days per year (annum)	d/a
dead weight tonnes	DWT
decibel adjusted	dBa
decibel	dB
degree	°
degrees Celsius	°C
diameter	ø
dollar (American)	US$
dollar (Canadian)	Cdn$
dry metric ton	dmt
foot	ft
gallon	gal
gallons per minute (US)	gpm
Gigajoule	GJ
gigapascal	GPa

gigawatt	GW
gram	g
grams per litre	g/L
grams per tonne	g/t
greater than	>
hectare (10,000 m^2)	ha
hertz	Hz
horsepower	hp
hour	h
hours per day	h/d
hours per week	h/wk
hours per year	h/a
inch	in
kilo (thousand)	k
kilogram	kg
kilograms per cubic metre	kg/m^3
kilograms per hour	kg/h
kilograms per square metre	kg/m^2
kilometre	km
kilometres per hour	km/h
kilopascal	kPa
kilotonne	kt
kilovolt	kV
kilovolt-ampere	kVA
kilovolts	kV
kilowatt	kW
kilowatt hour	kWh
kilowatt hours per tonne	kWh/t
kilowatt hours per year	kWh/a
less than	<
litre	L
litres per minute	L/m
megabytes per second	Mb/s
megapascal	MPa
megavolt-ampere	MVA
megawatt	MW
metre	m
metres above sea level	masl
metres Baltic sea level	mbsl
metres per minute	m/min
metres per second	m/s
microns	µm
milligram	mg
milligrams per litre	mg/L
millilitre	mL

millimetre	mm
million	M
million bank cubic metres	Mbm^3
million bank cubic metres per annum	Mbm^3/a
million tonnes	Mt
minute (plane angle)	'
minute (time)	min
month	mo
ounce	oz
pascal	Pa
centipoise	mPa·s
parts per million	ppm
parts per billion	ppb
percent	%
pound(s)	lb
pounds per square inch	psi
revolutions per minute	rpm
second (plane angle)	"
second (time)	s
short ton (2,000 lb)	st
short tons per day	st/d
short tons per year	st/y
specific gravity	SG
square centimetre	cm^2
square foot	ft^2
square inch	in^2
square kilometre	km^2
square metre	m^2
three-dimensional	3D
tonne (1,000 kg) (metric ton)	t
tonnes per day	t/d
tonnes per hour	t/h
tonnes per year	t/a
tonnes seconds per hour metre cubed	ts/hm^3
volt	V
week	wk
weight/weight	w/w
wet metric ton	wmt

Abbreviations and Acronyms

Agroforestry	AF
Anorthosite-Mangerite-Charnockite-Granite	AMCG
Canada Carbon Inc.	Canada Carbon

Canadian Institute of Mining, Metallurgy and Petroleum	CIM
Caribou King Resources Inc.	Caribou King
cold vapor atomic absorption	CVAA
Commision de la Protection du Territoire Agricole du Quebec	CPTAQ
Diamond drillhole	DDH
differential global positioning system	DGPS
digital evaluation model	DEM
electromagnetic	EM
Equivalent Boron Content	EBC
Evans Analytical Group	EAG
geographic information system	GIS
GEOVIA Whittle™	Whittle™)
global positioning system	GPS
glow discharge mass spectrometer	GDMS
graphitic carbon	Cg
ground time-domain electromagnetics	TDEM
Horizontal Magnetic Gradiometer	HGrad
hydrofluoric acid	HF
Induced polarization	IP
inductively couple plasma-optical emission spectrometry	ICP-OES
inductively coupled plasma	ICP
internal rate of return	IRR
International Organization for Standardization	ISO
Lerchs-Grossmann	LG
life-of-mine	LOM
light detecting and ranging	LIDAR
loss on ignition	LOI
methyl isobutyl carbonal	MIBC
Ministère de l'Énergie et des Ressources Naturelles's (Ministry of Enerfy and Natural Resources)	MERN
Ministère du Développement Durable et de a Lutte Contre les Changement Climatiques	MDDLCCC
National Instrument 43-101	NI 43-101
National Topographic Series	NTS
net present value	NPV
net production return	NPR
net smelter royalty	NSR
North American Datum	NAD
Nouveau-Monde Mining Enterprises Inc.	Nouveau-Monde
preliminary economic assessment	PEA
probability	prob
Qualified Person	QP
Quality assurance	QA
quality control	QC
rapid thermal upgrading	RTU
Regional County Municipality	MRC

SGS Canada Inc.	SGS
smallest mining unit	SMU
sodium hydroxide	NaOH
sulphuric acid	H_2SO_4
the Miller Graphite and Marble Project	the Project
total carbon	C(t)
total organic carbon	C(o)
versatile time-domain electromagnetic survey	VTEM
very-low frequency	VLF
x-ray diffraction	XRD

1.0 SUMMARY

1.1 INTRODUCTION

Canada Carbon Inc. (Canada Carbon) retained Tetra Tech to prepare a National Instrument 43-101 (NI 43-101) preliminary economic assessment (PEA) for the Miller Graphite and Marble Project (the Project), located in the developed Outaouais region of southern Quebec, Canada. The Project contemplates the extraction of graphite and marble from three proposed open pits, and the planned production of approximately 1,500 t of high-purity graphite and 150,000 t of marble blocks per annum.

This study is intended to assist Canada Carbon in determining potential future plans for the Project, and the approach to high-purity graphite production and marble block extraction.

The effective date of this report is March 4, 2016 and the effective date of the Mineral Resource estimate is February 16, 2016.

1.2 PROPERTY DESCRIPTION

The Miller Property is composed of 31 contiguous claims located on the eastern side of the Rouge River and covers an area of 1,863.09 ha. The surface footprint for the proposed mining pits, processing plant, and infrastructure is estimated to utilize 100 ha of the Miller Property, with the exploration work conducted to-date limited to 22 ha of that area. The 40 claims on the western side of the Rouge River that make up the Miller West Property are not included in the PEA.

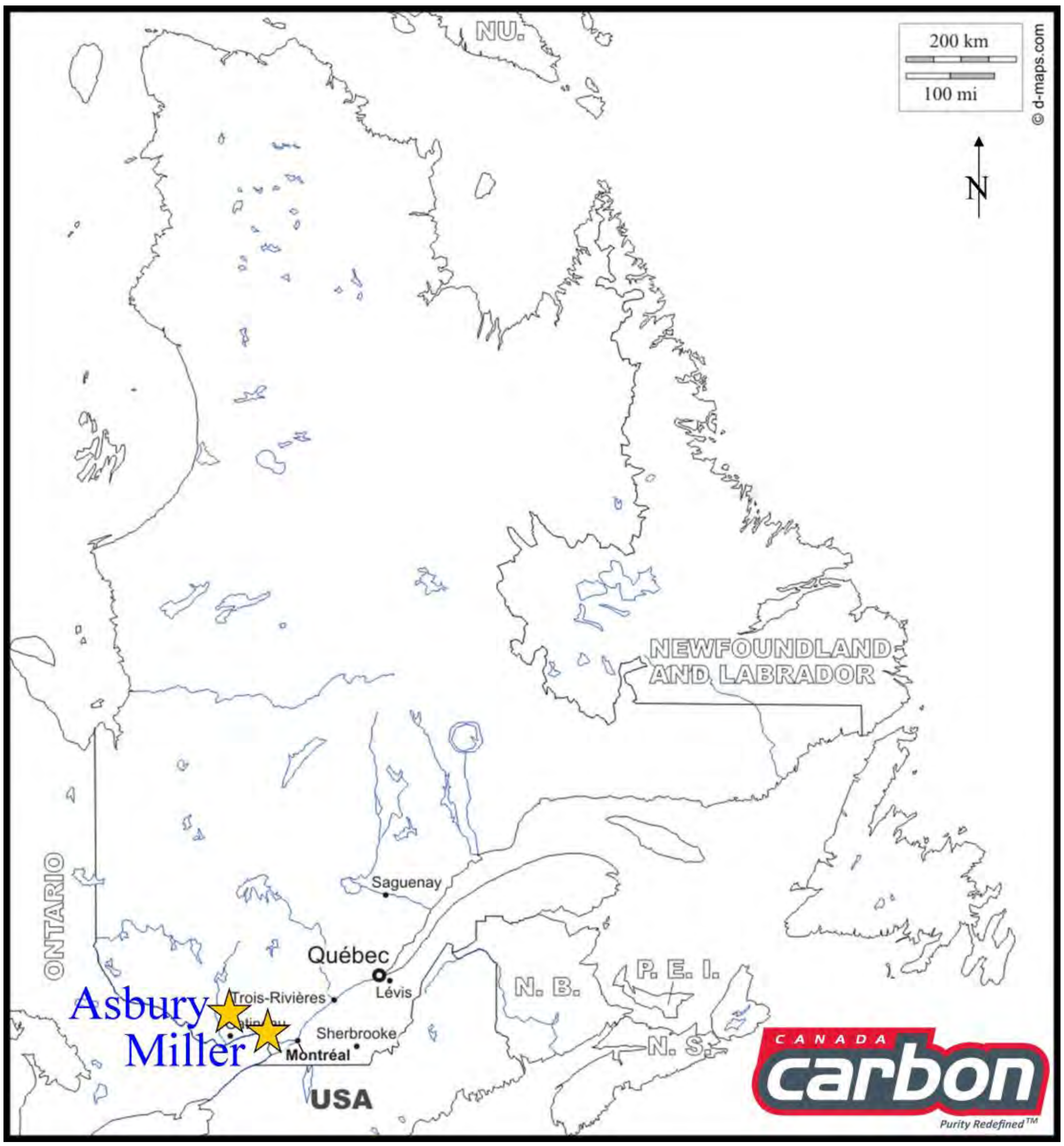
The Miller Property is located in the well-developed Outaouais region of southern Quebec, approximately 75 km west of Montreal, Quebec, and 90 km east of Ottawa, Ontario (Figure 1.1). The approximate geographic centre of the Miller Property is located at 530,385 m east and 5,056,900 m north. The closest cities are Grenville, Quebec (5 km to the south), and Hawkesbury, Ontario (8 km to the south). The Miller Property is located within the boundaries of the Argenteuil Regional County Municipality and is within the territory of Grenville-sur-la-Rouge municipality.

All-year access roads are available to access the Project site. The site is easily accessible from Highway 50, which runs on the southern part of the Property. Highway 50 is a provincial road linking the greater Montreal area to the greater Ottawa area. A railroad passes through the Ottawa Valley near the town of Grenville.

A local paved road, Scotch Road, traverses the Miller Property from south to north. The Miller Property is accessible from Scotch Road via a network of bush trails, which runs more or less east to west. Many existing forestry roads are present in, and around, the Miller Property, which allow alternate access routes.

The graphite materials mined from the proposed pits will be processed at the Miller site. The flotation concentrate produced at the Miller site will be shipped to the Asbury site for further upgrading. The Asbury site is located approximately 150 km northwest of the Miller site (Figure 1.1). The Asbury site is easily accessible via Chemin du Ruisseau Serpent Road, which passes south of the Asbury site and connects with the nearby Notre-Dame-Du-Laus village, which is a municipality in the Laurentides region of Quebec, Canada.

Figure 1.1 Locations of the Miller and Asbury Sites



1.3 GEOLOGICAL SETTING AND MINERALIZATION

Sir William Logan described the graphite occurrence, on Lot 10 of Range V of the Grenville Township, in 1845-1846, and R.V. Harwood of Vaudreuil (Ells 1904; Cirkel 1907) subsequently initiated mining operations. The Project area lies in the Grenville Geological Province; which is recognized as a deeply exhumed Mesoproterozoic Himalayan-type collision orogenic belt that extends over thousands of kilometres and is interpreted as a collage of gneissic terranes that were subjected to high-grade metamorphism. The Project area is included in the south portion of the Morin Terrane, composed of supracrustal rocks, commonly at granulite metamorphic facies, and intruded by several bodies of granitic to anorthositic composition. The well-banded quartzo-feldspathic gneisses were divided into two groups and quartzites were documented as very massive, well-jointed, white or pinkish rocks. Crystalline limestone appeared to correspond to two large beds. Graphite is observed as dissemination and pods/veins in the marble, skarn, and paragneiss units of the Miller Property. Since the acquisition of the Miller Property in 2013, SL Exploration Inc. has been conducting exploration on behalf of Canada Carbon. Several pods and veins have been identified and explored and multiple new graphite showings; including nine surface graphite showings of high-grade, and large, lower-grade dissemination of graphite in marble and skarn units have been discovered.

1.4 DRILLING

Canada Carbon performed a number of drilling campaigns between 2013 and 2015 to test geophysical targets (conductors) and to extend identified surface graphite mineralization to depth. A total of 95 holes were drilled on the Miller Property for a total 5,283.53 m.

1.5 MINERAL RESOURCE ESTIMATES

The Mineral Resource estimate was conducted following the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definitions Standards for Mineral Resources in accordance with NI 43-101 Standards of Disclosure for Mineral Projects. Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. Inferred Mineral Resources are exclusive of the Measured and Indicated Mineral Resources. The Mineral Resource estimation work for the Project was conducted by Jean-Philippe Paiement, M.Sc., P.Geo, of SGS Canada Inc. (SGS). The 3D modelling, geostatistics, and grade interpolation of the block model was conducted using Genesis© software developed by SGS. The optimized pit shells and cut-off grade estimation were conducted by Tetra Tech. These pit shells were used to report Mineral Resources. Two independent types of Mineral Resources were estimated and are exclusive of each other (Table 1.1). Given the results from the metallurgical testing of low-grade graphite samples, and the price of the commodity, disseminated and vein (pod) hosted graphite can be considered as Mineral Resources.

Table 1.1 Graphite and Architectural Marble Mineral Resources

Mineral Resources with the Two Graphite Pit Shells				
Cut-off Grade (Cg%)	Category	Tonnage	Average Cg%	Graphite (t)
0.8	Inferred	952,000	2.00	19,000

Mineral Resources within the Marble Pit Shell							
Cut-off Grade		Category		Tonnage	Average		Marble or Graphite (t)
0.6	Prob	Marble	Inferred	1,519,000	0.82	Prob	1,519,000
0.4	%Cg	Graphite	Inferred	1,180,000	0.53	%Cg	6,200

Notes: The Mineral Resource estimate was conducted using the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definitions Standards for Mineral Resources in accordance with NI 43-101, Standards of Disclosure for Mineral Projects.
Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability.
Inferred Mineral Resources are exclusive of the Measured and Indicated Mineral Resources.
A fixed density of 2.81 t/m³ was used to estimate the tonnage from block model volumes.
Mineral Resources are constrained by the pit shell and the topography of the overburden layer.
Effective date February 16, 2016
Prob – probability; Cg – graphitic carbon

1.6 MINERAL PROCESSING AND METALLURGICAL TESTING

Five flotation metallurgical test programs were conducted on samples originating from the Miller deposit, covering a range of head grades from 0.53% graphitic carbon to 61.2% graphitic carbon. The five programs consisted of four laboratory scale evaluations including a flowsheet development program and one pilot plant campaign processing approximately 127 t of a bulk sample.

The laboratory and pilot scale flotation programs demonstrated that the Miller graphite mineralization is amenable to processing using typical mineral processing technologies such as grinding and flotation. A simple reagent regime consisting of fuel oil No. 2 as the graphite collector and methyl isobutyl carbinol (MIBC) as the frother proved suitable to achieve good graphite concentrate grades and overall carbon recoveries.

The laboratory and pilot scale programs produced graphite concentrates that consistently exceeded combined concentrate grades of 95% total carbon. The majority of the impurities reported to the small size fractions and the medium and large graphite flakes yielded concentrate grades of approximately 97% total carbon or higher. This metallurgical performance was consistent for all samples tested despite the large range of head grades.

The pilot plant campaign reached steady state operation in a short period of time, thus attesting to the overall robustness of the proposed flowsheet. The pilot plant campaign helped to identify a number of areas for optimization to further enhance the metallurgical results.

Preliminary graphite concentrate upgrading tests, including hydrometallurgical and thermal purifications, were conducted on graphite flotation concentrates that were generated on a laboratory or pilot scale. The flotation concentrate samples responded well to both purification processing methods, although the samples yielded higher purities with the thermal treatment. The thermal purification tests employing a proprietary thermal treatment process indicate that a graphite concentrate produced from the pilot plant trials can be directly upgraded to a high-purity specialty graphite containing 99.9998% graphitic carbon.

A block of marble weighing approximately 1 t was extracted and shipped to a local architectural stone processor for cutting, polishing, and assessment. There are no detailed physical and chemical characteristic test work reports available for the review.

1.7 MINING METHODS

Tetra Tech prepared an open pit mining study for the Project based on a target annual production of 1,500 t of refined graphite and 150,000 t of marble blocks. Canada Carbon provided Tetra Tech with a signed letter of intent with a potential mining contractor for mining graphite material, crushing to finer than 20 mm, and hauling to the mill and handling waste rock. Canada Carbon also provided rental rates for the leased supporting and ancillary mining equipment to be utilized for both the graphite and marble pits.

This PEA proposes a 19-year life-of-mine (LOM) for graphite recovery, including 1 year of preproduction, 11 years of active mining operations, and 7 years of stockpile re-handling. Graphite material will be mined from two open pits (the western pit and the eastern pit) and marble will be quarried from a separate pit. Marble pit production will start one year ahead of graphite pit production.

The graphite pit will be mined using conventional truck/loader open pit mining. The production cycle will include drilling, blasting, loading, and hauling, and will be performed by a mining contractor.

Marble will be cut into blocks using chain saws. First a horizontal bottom section, with a length of 20 m and a depth of 2.25 m, will be cut. Second, a back vertical section, with a length of 20 m will be cut at a depth of 2.25 m. Wood blocks will be used to prevent the marble blocks from falling. Vertical cross sections will be cut at approximately 2-m intervals to produce 2.25 m by 2.25 m by 2 m marble blocks. The marble blocks will then be separated and pushed down over a prepared cushion layer of crushed rocks using hydraulic block pushers. A fork loader will be used to load the marble blocks into a flatbed truck for off-site transportation.

Key mining results are summarized in Table 1.2.

Table 1.2 Summary of Key Mining Results

Item	Units	Value
Graphite Pits		
LOM	years	10
Graphite Material	t	890,805
LOM Average Grade	Cg%	1.87
Waste	t	1,479,770
Overburden Removed	t	158,279
LOM Average Stripping Ratio	-	1.8
Marble Pit		
LOM	years	8
Marble	t	1,182,037
Graphite Material	t	1,206,051
LOM Average Grade	Cg%	0.53
Waste	t	5,031,758
Overburden Removed	t	210,468
LOM Average Stripping Ratio	-	2.2

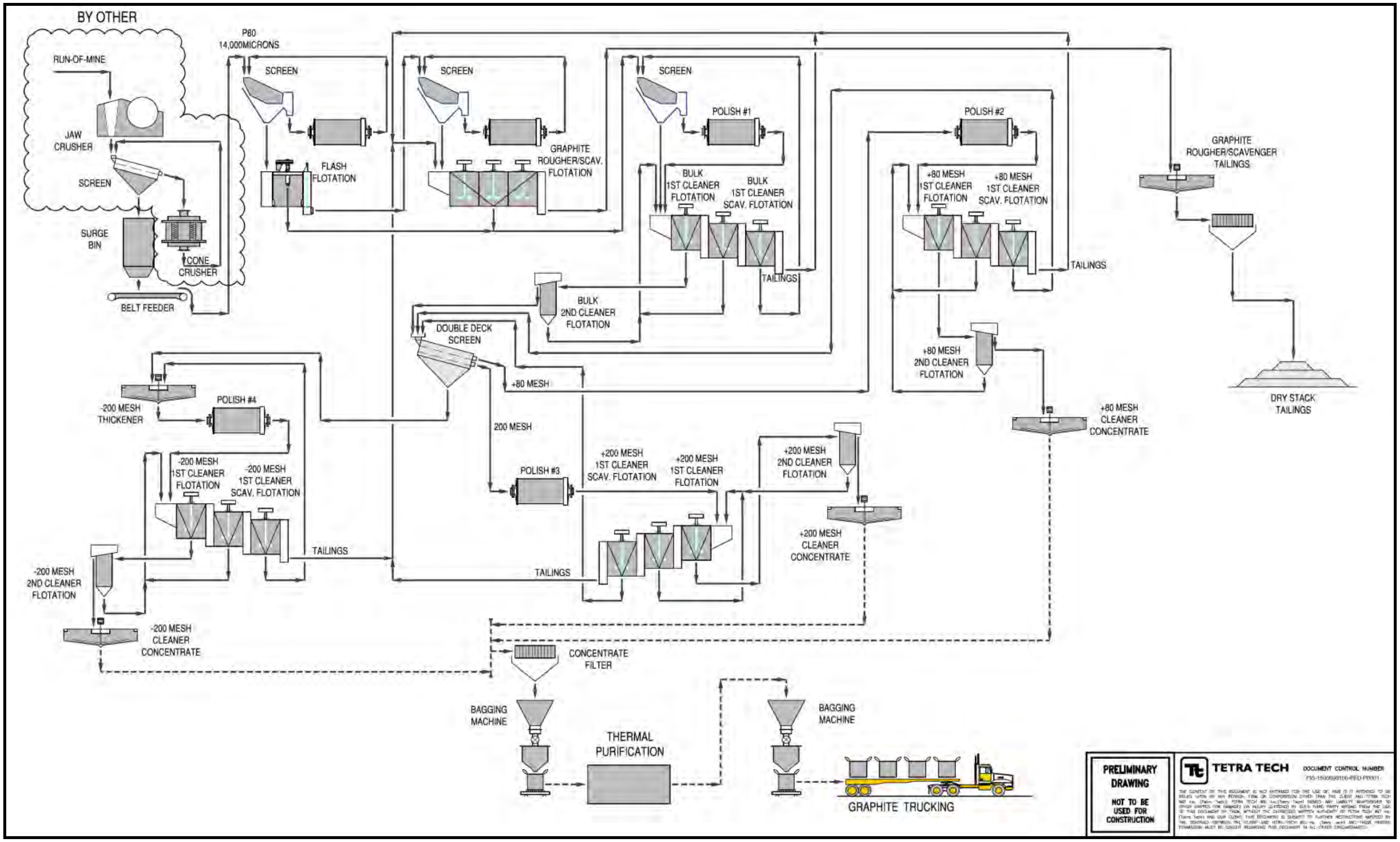
1.8 RECOVERY METHODS

The proposed graphite concentration plant will process the Miller graphite mineralization using conventional froth flotation. The processing method is based on the pilot plant test results conducted by SGS Canada Inc. (SGS) in Lakefield, Ontario. The proposed flotation plant will be located at the Miller site. The plant will include two stages of primary grinding by rod mills in conjunction with a flash flotation circuit. The ground mill feed will be concentrated by bulk rougher and scavenger flotation followed by bulk cleaner flotation. The bulk cleaner concentrate produced will be classified into three particle fractions and refloated separately for further upgrading. Polishing regrinding is designed ahead of each of the cleaner flotation treatments to further liberate gangue minerals from the graphite. The final concentrates with different particle sizes will be dewatered separately and bagged prior to being shipped to the Asbury site for further purification treatment. The proposed grinding and flotation flowsheet is shown in Figure 1.2.

The flotation tailings produced from the rougher/scavenger flotation circuit will be dewatered by thickening and filtration. The filtration cakes will be trucked to the tailings stacking facility located adjacent to the graphite pits at the proposed mine site.

The concentrate produced will be upgraded by a proprietary thermal treatment process to generate a high-value, high-purity specialty graphite product, which is anticipated to contain higher than 99.99% graphitic carbon. The thermal treatment plant will be located at the Asbury site. The designed annual production rate of the high-purity graphite product is approximately 1,500 t.

Figure 1.2 Simplified Flotation Process Flowsheet



1.9 PROJECT INFRASTRUCTURE

MILLER SITE

The proposed mining and the flotation operation at the Miller site will consist of the following main facilities:

- two graphite pits, one marble pit, and related service facilities
- various storage pads for:
  - top soils
  - waste rocks
  - extracted marble blocks
  - crushed mill feeds
  - dewatered tailings
- a mill feed handling system, including a dumping pocket and a conveyor to transport the crushed material from the dumping pocket to a 200-t mill feed surge bin
- a main processing complex, including processing plant, assay/metallurgical laboratories and offices
- power supply and distribution systems
- a water treatment plant, including a contact water sediment pond
- overall mine site water management systems
- overall site service roads.

Electrical power will be supplied from the grid power line which runs along the Scotch Road. The estimated overall site power requirement is approximately 1 MW. The grid power line will be able to supply sufficient electricity required by the mining and processing operations.

The flotation tailings produced from the graphite concentration is approximately 97 to 99% of the mill feed. The tailings will be dewatered at the processing plant by thickening and filtration processes, to a moisture content of approximately 15% w/w. The dewatered cakes will be trucked and placed onto the tailings dry stacking storage pad adjacent to the graphite pits. When the western graphite pit and the marble pit are mined out, the dewatered tailings will be placed directly into the excavated pits. At the end of the operations, the stacked tailings will be backfilled into the excavated graphite and marble pits. A further tailings management plan, including tailings characterizations, should be conducted and reviewed in the next phase study.

ASBURY SITE

The proposed graphite thermal treatment plant will be used to upgrade the graphite concentrates produced at the Miller flotation plant to an average grade of higher than 99.99% graphitic carbon. The Asbury thermal treatment plant site will include:

- a thermal upgrading facility, including concentrate receiving and storage; a wet scrubbing for off-gas handling; an inert gas storage and handling system; and a cooling system
- a water treatment plant
- a final graphite product storage and distribution facility
- a maintenance workshop
- power supply and distribution systems
- overall site service roads.

The total power demand for the thermal upgrading plant is estimated to be approximately 5 MW. Electrical power will be supplied from the grid power line along Chemin du Ruisseau Serpent Road. The grid power line will be able to supply the electrical power required by the thermal upgrading operation.

1.10 ENVIRONMENTAL STUDIES

Various environmental baseline studies were conducted in 2015 and will continue in 2016 on both the Miller and Asbury sites. Information sources include publicly available literature, site specific surveys, and government information. The various permitting processes for each site are ongoing.

The 2015 and early-2016 baseline studies focused on the evaluation of sugar bushes with maple production potential, soil characterization for agricultural suitability, wetland assessment, and plant and wildlife inventories. The results of the soil surveys indicate that the Miller site is not suitable for agricultural use due to poor soil quality, stoniness, and areas with steep slopes and uneven ground. The evaluation of the potential of maple syrup production from the sugar bushes indicates that one area is covered by a stand with maple production potential if the bushes remain undisturbed. Effort was made to limit the Project’s impact over that particular area.

Baseline studies planned for 2016 include geochemical rock characterization, air quality, soil suitability for reclamation, hydrogeology, hydrology, water quality, and spring and summer wildlife and vegetation surveys. Other studies planned for 2016 also include noise impact, and evaluation of water management options and strategies.

The portion of the Miller Property included in the Project includes at least six wetland areas comprised of treed swamps, shrub swamps, treed peatbogs, and marshes with ecological significance ranging from low to high and terrestrial environments including previously harvested uneven-aged hardwood and mixed forest stands (partial cuts). The majority of the property is covered by hardwood and mixed forest stands comprised of both first and second growth, currently under management as a woodlot. There were 259 different plant species identified during the vegetation inventory conducted at the Miller Property, including 14 with special status or species of interest. One animal species with special status was observed at the Miller Property.

Previous disturbance at the Miller Property is evident by the presence of several abandoned mine pits and mine waste materials related to historical mine operations.

The Asbury site is on land which was disturbed by previous mining activities. There are 13 separate wetland areas (including treed swamps, shrub swamps, treed peat bogs, fen-type (open) peatlands, and marshes and ponds) of low to high ecological value (artificial lakes are also present) found on the Asbury Property. Most of the Asbury Property is wooded, covered by uneven-aged hardwood and mixed forest stands that have been harvested (partial cuts). There were 200 different plant species identified during the plant inventory conducted around the Asbury site, including two plant species with special status or species of interest (both which are designated as vulnerable to harvesting). The thermal treatment plant is not expected to have any adverse impacts on any sensitive environments.

Avoidance, mitigation, and compensation measures will be evaluated, developed, and implemented to minimize impacts from project development and operations on the environmental and social conditions at the Miller and Asbury sites.

Monitoring plans will be developed for each site including monitoring of project-related noise, air, and dust emissions; effluent and sediment generation; and impacts on groundwater, surface water, soil quality, vegetation, wetlands, and wildlife. Results from the Project design, baseline studies, and monitoring programs will be used to evaluate project effects and to develop suitable environmental management and closure plans.

Mine development and operations are expected to have a positive effect on local employment (Table 1.3) and economy. Supplies and labour are expected to be sourced from southern Quebec with a priority to local citizens. Potential issues of social concern may include annoyance from noise and vibration generation; air emissions; increased traffic, landscape, and visual impacts; and disturbance or destruction of heritage resources as applicable.

Table 1.3 Estimated Required Manpower

Project Component	Construction	Operations
Miller Graphite and Marble	40	87
Asbury Upgrading and Distribution	18	16

Canada Carbon has designed a project that will minimize negative social effects, while creating new jobs for residents in nearby communities and providing economic benefits from the purchase of supplies and services.

Mine closure and rehabilitation costs are estimated at $1 million. Closure plan costs were estimated based on the rehabilitation of the tailings disposal area (pit backfilling work) and the sedimentation pond. Demolition of the mill and other infrastructures is assumed to be covered by the salvage values of the process equipment, and the waste rock will be sold during the LOM. There will be no waste rock left to manage on site at closure.

1.11 CAPITAL AND OPERATING COST ESTIMATES

The capital and operating costs for the Project are summarized in Table 1.4 and are discussed in greater detail in Section 21.0.

Table 1.4 Summary of Capital and Operating Costs

Cost Type	Total ($ million)	Unit Cost ($/t milled)	Unit Cost ($/t)
Capital Cost			
Marble Mining	3.6	-	-
Graphite Mining/Flotation	18.1	-	-
Graphite Upgrading/Thermal Plant	22.7	-	-
Total Initial Capital Costs	**44.4**	-	-
Total Sustaining Capital for LOM	**3.6**	**-**	**-**
Operating Costs			
Total LOM Average Operating Costs – Graphite	-	76.11	8,327
Total LOM Average Operating Costs – Marble	-	-	22.27

Note: The initial and sustaining capital costs do not include land acquisition costs ($1.05 million), mine reclamation/closure costs ($1.04 million), or working capital costs.
Operating costs do not include transport costs to customers and royalties.

All costs are reflected in Q4 2015/Q1 2016 Canadian dollars unless otherwise specified. The expected accuracy range of the cost estimates is +45%/-25%. For the equipment quoted in US dollars, the prices were converted from US dollars to Canadian dollars based on the exchange rates when the quotations were received.

1.12 ECONOMIC ANALYSIS

A PEA should not be considered to be a prefeasibility or feasibility study, as the economics and technical viability of the Project have not been demonstrated at this time. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Furthermore, there is no certainty that the conclusions or results as reported in the PEA will be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Tetra Tech prepared an economic evaluation of the Project based on a pre-tax financial model. The net present value (NPV) was estimated at the beginning of the one-year construction period.

As indicated in Section 19.0 of this report, the graphite and marble prices used in the economic analysis are as follows:

- graphite: USD13,000/t
- marble: $184/t
- exchange rate (USD:CAD): 0.75:1.00

The following pre-tax financial results were calculated:

- 100.2% internal rate of return (IRR)
- 1.9-year payback on $44.4 million initial capital costs
- $149.7 million NPV at an 8% discount rate.

Canada Carbon and its external advisors prepared the tax calculations for use in the post-tax economic evaluation of the Project with the inclusion of Canada and Quebec income taxes, and the Quebec Mining Tax (see Section 22.5 for more details).

The following post-tax financial results were calculated:

- 85.0% IRR
- 2.0-year payback on the $44.4 million initial capital costs
- $110.0 million NPV at an 8% discount rate.

Analyses were conducted to evaluate the sensitivity of the Project merit measures (NPV, IRR and payback periods) to the following key variables:

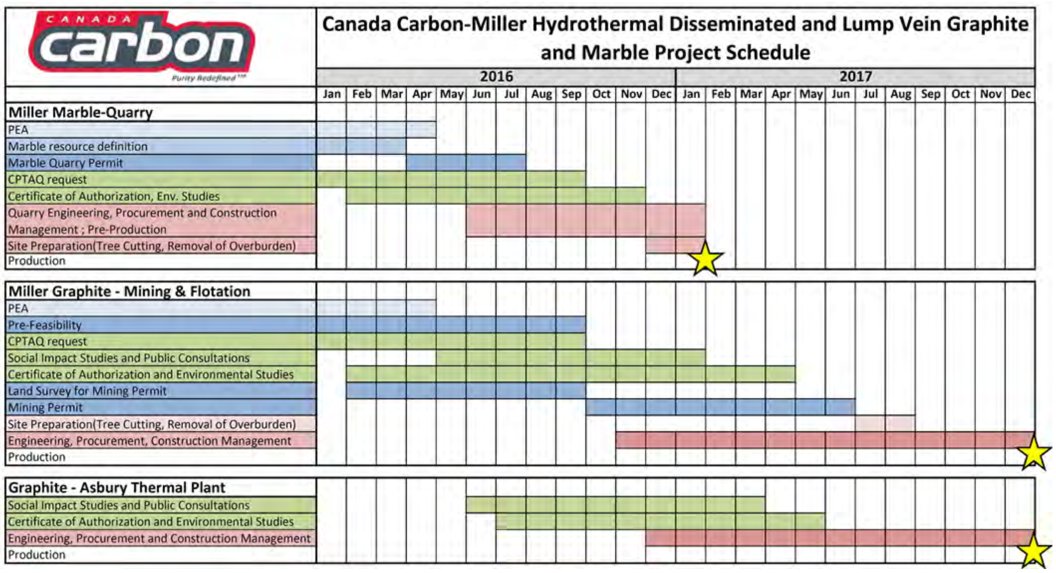
- graphite price
- marble price
- exchange rate
- capital costs
- operating costs

Using the base case as a reference, each of the key variables was changed between -30% and +30% at a 10% interval while holding the other variables constant. The pre-tax NPV, calculated at an 8% discount rate, is most sensitive to exchange rate and, in decreasing order, graphite price, marble price, operating costs, and capital costs. The Project's pre-tax IRR is most sensitive to the capital costs followed by marble price, graphite price, exchange rate, and operating costs. The payback period is most sensitive to marble price followed by capital costs, graphite price, operating costs, and exchange rate.

1.13 PROJECT DEVELOPMENT PLAN

The preliminary project execution schedule was developed to provide a high-level overview of all activities required to complete the Project. The project execution plan is summarized in Figure 1.3.

Figure 1.3 Preliminary Project Execution Plan



1.14 RECOMMENDATIONS

Based on the results of the PEA, it is recommended that Canada Carbon continue with the next phase of the Project, a prefeasibility study, in order to identify opportunities and further assess the Project viability.

A detailed list of recommendations, along with the estimated costs to execute each recommendation, is outlined in Section 26.0.

2.0 INTRODUCTION

In March 2015, Canada Carbon retained Tetra Tech to complete a PEA for the Project, located in Grenville Township, Quebec. In addition, Canada Carbon retained SGS to complete the geological and Mineral Resource portions of the PEA.

The effective date of this study is March 4, 2016 and the effective date of the Mineral Resource estimate is February 16, 2016.

2.1 QUALIFIED PERSON SITE VISITS

A summary of the Qualified Persons (QPs) responsible for this report is provided in Table 2.1. The following QPs conducted site visits of the Property:

- Jean-Philippe Paiement, P.Geo., visited the site from August 5 to 6, 2015.
- Jianhui (John) Huang, Ph.D., P.Eng., visited the site on December 3, 2015.
- Sabry Abdel Hafez, Ph.D., P.Eng., visited the site on December 3, 2015.

Table 2.1 Summary of QPs

Report Section		Company	QP
1.0	Summary	All	Sign-off by Section
2.0	Introduction	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
3.0	Reliance on Other Experts	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
4.0	Property Description and Location	SGS	Jean-Philippe Paiement, P.Geo.
5.0	Accessibility, Climate, Local Resources, Infrastructure and Physiography	SGS	Jean-Philippe Paiement, P.Geo.
6.0	History	SGS	Jean-Philippe Paiement, P.Geo.
7.0	Geological Setting and Mineralisation	SGS	Jean-Philippe Paiement, P.Geo.
8.0	Deposit Types	SGS	Jean-Philippe Paiement, P.Geo.
9.0	Exploration	SGS	Jean-Philippe Paiement, P.Geo.
10.0	Drilling	SGS	Jean-Philippe Paiement, P.Geo.
11.0	Sample Preparation, Analyses and Security	SGS	Jean-Philippe Paiement, P.Geo.
12.0	Data Verification	SGS	Jean-Philippe Paiement, P.Geo.
13.0	Mineral Processing and Metallurgical Testing	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
14.0	Mineral Resource Estimates	SGS	Jean-Philippe Paiement, P.Geo.
15.0	Mineral Reserve Estimates	Tetra Tech	Sabry Abdel-Hafez, Ph.D., P.Eng.

table continues...

Report Section		Company	QP
16.0	Mining Methods	Tetra Tech	Sabry Abdel-Hafez, Ph.D., P.Eng.
17.0	Recovery Methods	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
18.0	Infrastructure	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
19.0	Market Studies and Contracts	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
20.0	Environmental Studies, Permitting and Social or Community Impact	Tetra Tech	Hassan Ghaffari, P.Eng.
21.0	Capital and Operating Costs	Tetra Tech	Sabry Abdel-Hafez, Ph.D., P.Eng. Jianhui (John) Huang, Ph.D., P.Eng.
22.0	Economic Analysis	Tetra Tech	Sabry Abdel-Hafez, Ph.D., P.Eng.
23.0	Adjacent Properties	Tetra Tech	Jean-Philippe Paiement, P.Geo.
24.0	Other Relevant Data and Information	Tetra Tech	Jianhui (John) Huang, Ph.D., P.Eng.
25.0	Interpretation and Conclusions	All	Sign-off by Section
26.0	Recommendations	All	Sign-off by Section
27.0	References	All	Sign-off by Section
28.0	Certificates of Qualified Person	All	Sign-off by Section

2.2 Sources of Information

All sources of information for this study are located in Section 27.0.

2.3 Units of Measurement and Currency

All units of measurement used in this technical report are in metric.

All currency is in Canadian dollars, unless otherwise noted.

3.0 RELIANCE ON OTHER EXPERTS

Sabry Abdel Hafez, Ph.D., P.Eng., relied on:

- Steven Lauzier, P.Geo, Consultant Geologist of Canada Carbon on matters relating to:
  - mineral tenure and mining rights permits and surface rights
  - leased mining equipment rates (disclosed and applied in Section 21.0) and transportation logistics rates (disclosed and applied in Section 22.0); the rates are based on confidential negotiations between Canada Carbon and prospective service providers.
  - a letter of intent showing the pricing information of a potential mining contractor (this pricing is disclosed and applied in Section 21.0).
- Olga Nikitovic, CPA, CA, Chief Financial Officer of Canada Carbon on:
  - estimate of applicable royalties on the Project (this estimate is disclosed in Section 22.0)
  - tax matters relevant to this PEA, and disclosed in Section 22.0.

Jianhui (John) Huang, Ph.D., P.Eng., relied on:

- Dr. Pieter J. Barnard, Ph.D., MBA, B.Sc. (Hons), Director of Canada Carbon, on a summary of market information disclosed in Section 19.0.

Hassan Ghaffari, P.Eng.. relied on:

- Ly-Shu Ramos, B.Sc., R.P. Bio, a mining environmental permitting specialist with Tetra Tech for information provided in Section 20.0. Ms. Ramos is a registered Professional Biologist working in the fields of environment and geology-ecology since 1991. She has over 24 years' experience in coordinating, conducting, and participating in environmental baseline studies, environmental impact assessments (EIAs), environmental cumulative effects assessments (CEAs), environmental management plans (EMPs), and environmental audit nationally and abroad.
- Steven Lauzier, P.Geo, Consultant Geologist for Canada Carbon on matters relating to the environment and environmental permitting provided in Section 20.0.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION

The Miller Property is located in the Outaouais Region of southern Quebec about 75 km west of Montreal, Quebec and 90 km east of Ottawa, Ontario (Figure 4.1). The Miller Property is located in a highly-accessible area of the Quebec province; the closest cities are Grenville (5 km to the south) and Hawkesbury, Ontario (8 km to the south). The Miller Property is easily accessible from Highway 50, which runs on the southern part of the Property, and Scotch Road, which traverses the Miller Property from south to north (Figure 4.2). Highway 50 is a provincial road linking the greater Montreal area to the greater Ottawa area. The immediate vicinity of the Miller Property is thinly populated and the settlements are mainly concentrated along Scotch Road with relatively limited local traffic. The deposit is accessible from Scotch Road via a network of bush trails, which run more or less east-west. Many existing forestry roads are also present in and around the Miller Property, which allow alternate access routes. The Miller Property is located within the boundaries of the Argenteuil Regional County Municipality and is within the territory of Grenville-sur-la-Rouge municipality.

4.2 PROPERTY DESCRIPTION

The Miller Property is located within the National Topographic Series (NTS) Map references 31G10. The approximate geographic centre of the Miller Property is located at 530,385 m east and 5,056,900 m north, Zone 18 North American Datum (NAD) 83.

The Miller Property is composed of 31 contiguous claims located on the eastern side of the Rouge River and covers an area of 1,863.09 ha. The surface footprint for the proposed optimized pits, processing plant, and infrastructure utilizes 100 ha of the Miller Property with the exploration work conducted to-date limited to 22 ha of that area. The 40 claims on the western side of the Rouge River that make up the Miller West Property are not included in the PEA.

4.3 OWNERSHIP

The Miller Property is 100% held by Canada Carbon and exploration work has been conducted by SL Exploration Inc. since its acquisition. SGS verified the Miller Property title and mineral rights on the Ministère de l'Énergie et des Ressources Naturelles's (MERN) website. The 31 claims associated with the Miller Property, as registered with the MERN, are 100% owned by Canada Carbon and are in good standing with expiry dates ranging from May 10, 2016 to December 8, 2017.

In September 2013, Canada Carbon entered into a surface access agreement (the Agreement) with two landholders who are affiliated with each other. The Agreement provides Canada Carbon with surface access for an initial period of five years and allows Canada Carbon to carry out regular graphite prospecting and exploration programs including, but not limited to, conducting topographic, geological, geochemical and geophysical surveys, conducting underground or surface excavations, exploration and drilling, digging and trenching, and obtaining and testing geochemical or metallurgical samples. The Agreement covers most of the area of interest on which Canada Carbon is working at this time. The Agreement grants Canada Carbon an exclusive and irrevocable option to acquire from the landholder all or part of the Miller Property deemed reasonably necessary for the extraction of mineral substances. If Canada Carbon exercises this option, by either acquiring or leasing all or part of the Miller Property prior to the expiry of the five-year term, the term will be extended through the period of commercial production.

Pursuant to the Agreement, Canada Carbon has agreed to issue 40,000 common shares in the capital of Canada Carbon to the landholders for the first year of the term, and for each subsequent year of the term and until Canada Carbon begins operating in commercial operation (not including milling for the purposes of testing, e.g. pilot plant testing), either 40,000 additional common shares or $5,000 payable in cash, at the option of the landholder. Should Canada Carbon begin commercial production during the term, the payments outlined above will cease and the landholder will be entitled to a 2.5% net smelter royalty (NSR) upon and subject to the terms of definitive royalty agreements. The NSR is applicable to all mineral commodities, including marble.

The initial acquisition of Miller claims from 9228-6202 Quebec Inc. (nine claims) included a 2% net production return (NPR) that was later reduced to 1.5% with an exchange of 100,000 shares. The NPR is applicable to graphite production only and is not applicable to other extractions or productions (i.e. marble). This claimed land has been explored for potential graphite and marble values to date and hosts the major discoveries.

Canada Carbon acquired five claims from Nouveau-Monde Mining Enterprises Inc. (Nouveau-Monde). Two Nouveau-Monde claims are currently pending due to exploration restrictions and will be transferred once the MERN allows it. Canada Carbon has also granted Nouveau-Monde a 2% NSR royalty which can be reduced at any time to 1% by paying $1,000,000 to Nouveau-Monde.

Eight claims (4.8 km^2) belonging to Caribou King were acquired. The later claims are subject to an existing 2% net of processed material returns royalty in favor of a third party, which can be reduced at any time to 1% by paying $1,000,000 to the royalty holder. The NSR is applicable to all mineral commodities, including marble. Canada Carbon also entered into agreements with Marksman Geological Ltd. to purchase 14 other claims. The Project is not located on any of the claims acquired from Caribou King or Marksman Geological Ltd.

Certain claims, designated in the claims list located in Appendix A, are limited by a fauna habitat conservation area and hydroelectric lines that pass through the Miller Property

(Figure 4.2). Other than those listed in the claims list (Appendix A), there are no other encumbrances on the Miller Property.

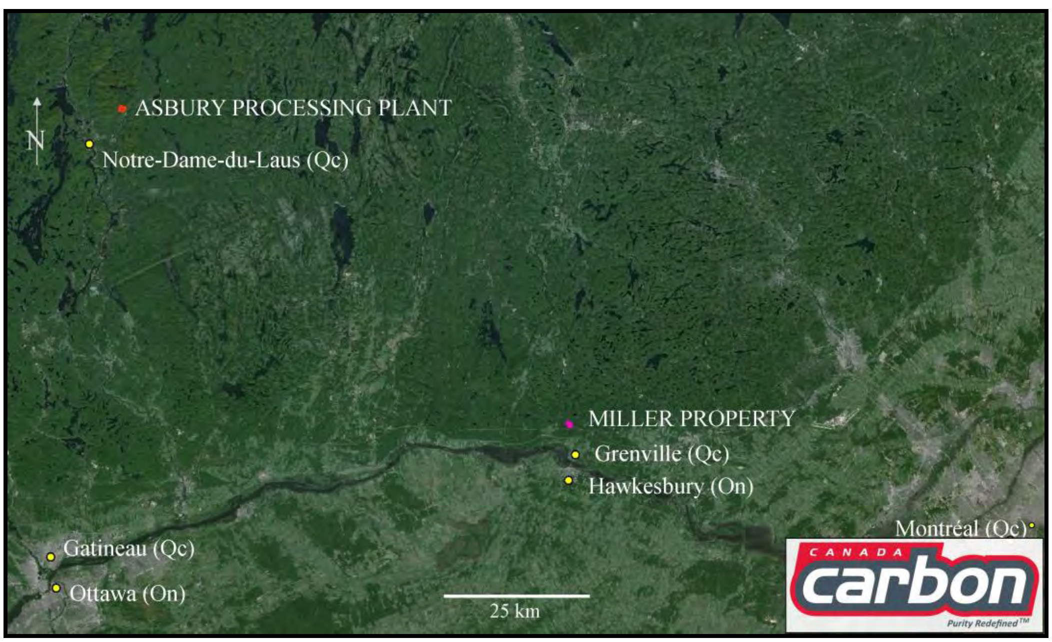
4.4 RESTRICTIONS

The Miller Property is located on private land and the surface right owners must be kept informed about upcoming exploration programs. Additionally, Canada Carbon must obtain their permission before initiating any exploration program. Canada Carbon has been meeting these requirements successfully to date and maintains an open and positive relationship with the land owners.

Four land category status’ can be found in the Grenville area (Figure 4.4). Certain restrictions may be imposed on exploration activities:

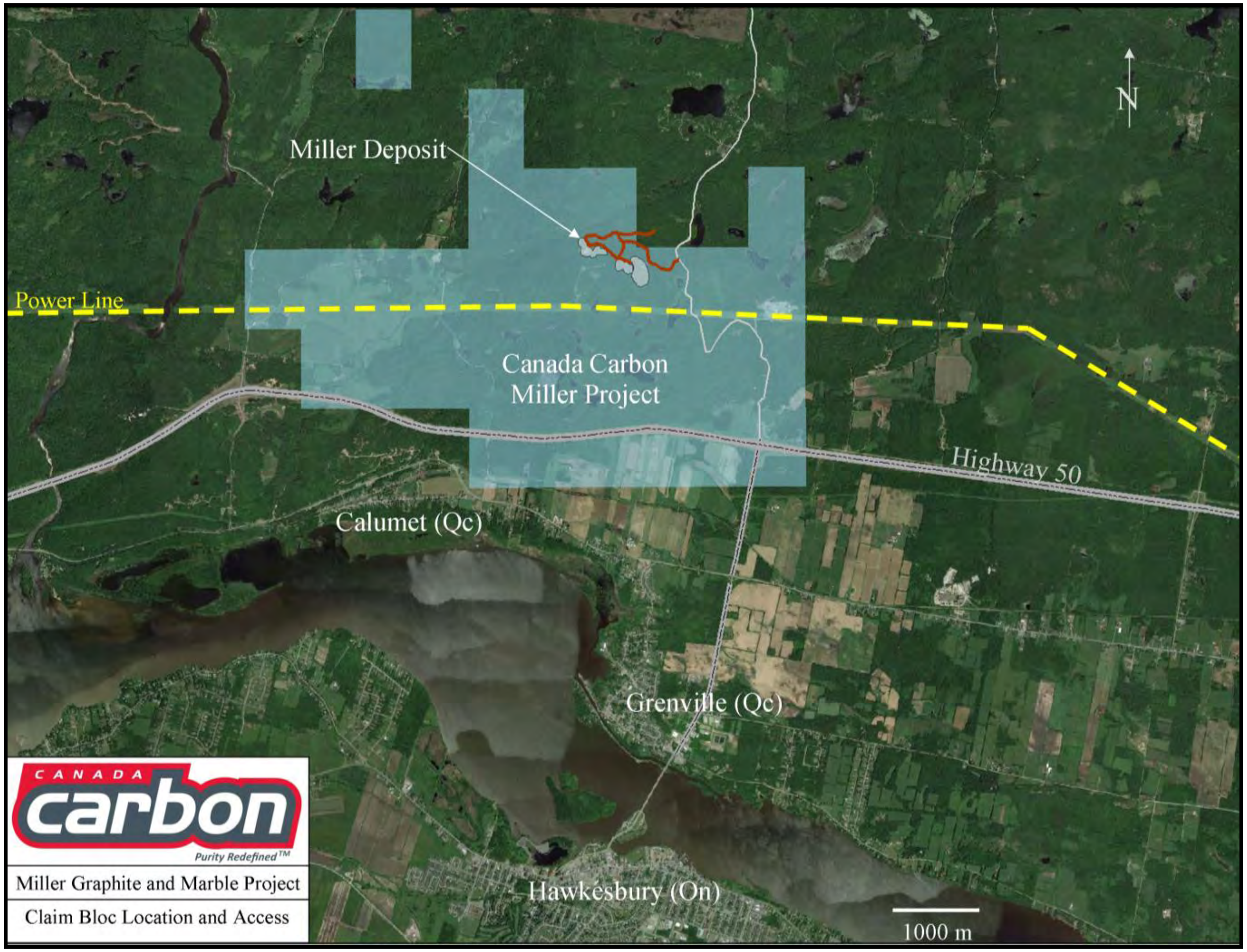
- Large areas dedicated to resort and recreational activities (“territoire affecté à la villégiature”) that are not available for map staking: land affected by those restrictions surrounds and limits the staking play.
- Ecological reserves area where exploration is prohibited: two such reserves occupy small areas on the west side of the Rouge River.
- Wildlife habitat areas in which activities are forbidden (with exceptions) to any activities that can modify a biological, physical or chemical component associated with the habitat (only applicable to public land): a large area of white-tailed deer (Odocoileus virginianus) habitat overlaps the eastern part of the Miller Property. The restriction is however not applicable to the Project’s exploration work because this particular area is on private land.

Figure 4.1 Property Location



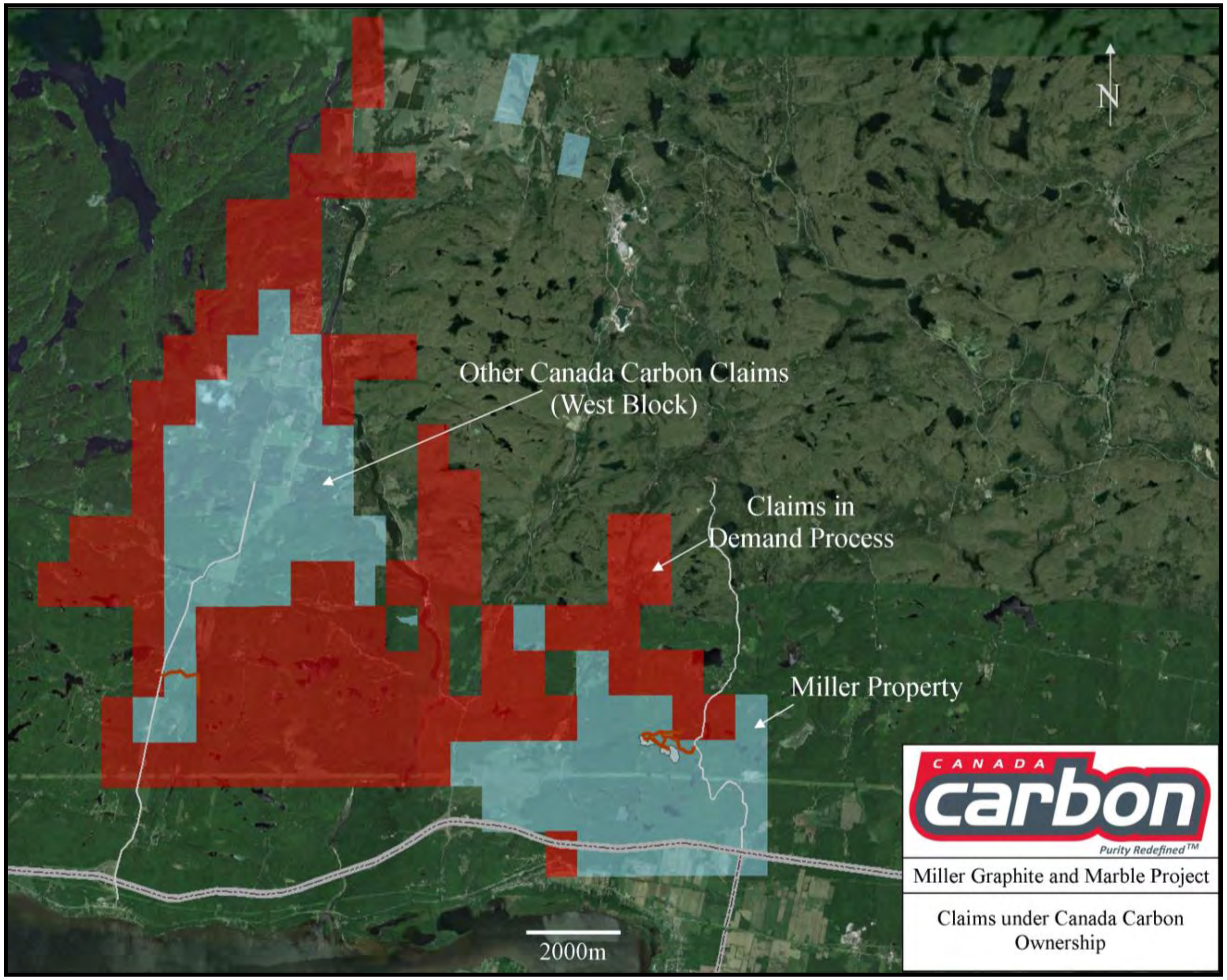
Source: Google Earth January 26 2015

Figure 4.2 Claim Block Location and Access



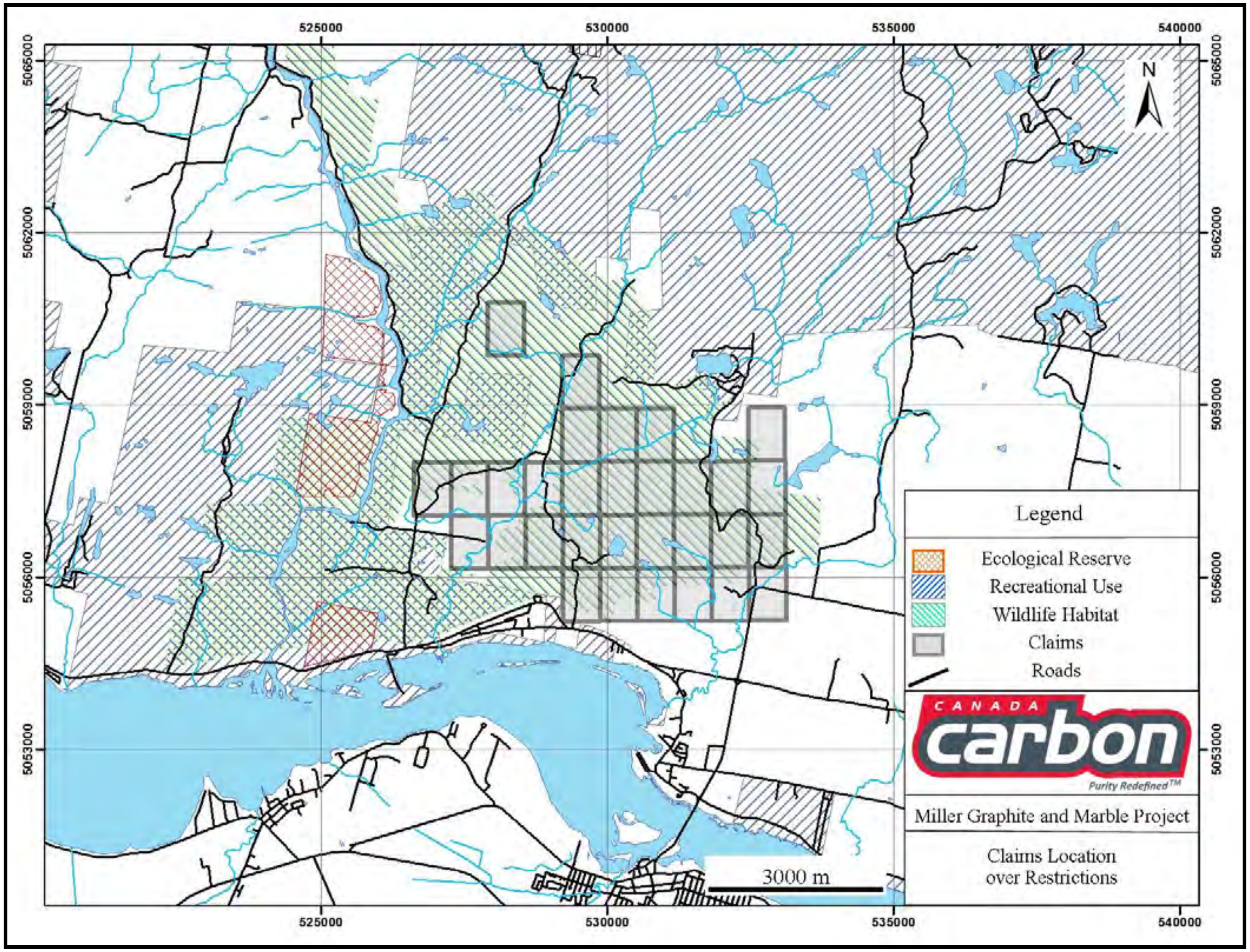
Source: Google Earth January 26 2015

Figure 4.3 Miller Property and Other Claims under Canada Carbon Ownership



Source: Google Earth January 26 2015

Figure 4.4 Restrictions Affecting the Miller Property



5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESS

5.1.1 MILLER PROPERTY

The Property is well served by a public and private road network (Figure 5.1), owing to its proximity to Highway 50, Road 148, and the municipality of Grenville. The Property is accessible year-round by a network of maintained arterial and forest service roads, as well as unmaintained logging roads, skid trails, deactivated roads, and various other access roads. The Miller Property is accessible from Scotch Road connecting from Grenville town to McGillivray Lake, approximately 7 km away. From this public access, a private road leads westward for approximately half a kilometre and provides full access to the Miller deposit. During the winter season, vehicle access via the private road only requires a snow removal service, which is currently supplied by the land owner.

5.1.2 ASBURY MINE SITE

The site of the historic Asbury Mine was selected as the location of an eventual concentrate refining plant. The site is located approximately 150 km northwest of the Project via Highway 50 and Provincial Road 309 (Figure 5.1).

Access to the site is easy, due to its location in developed areas of southern Quebec. From the nearby Notre-Dame-Du-Laus village, the Chemin du Serpent road passes south of the Property. From this point, the Chemin de la Mine, a four-wheel track trail allows access to the north part of the Property, up to the historical mine site infrastructure that Canada Carbon intends to use. During winter, site access via this dirt road may be conditional to the removal of snow by a private contractor.

The author has not visited this site.

5.2 CLIMATE

Southern Quebec is characterized by a continental climate (Figure 5.2 and Table 5.1). The land is usually free of snow from May to November. The summer lasts from June to September with average temperatures from 15°C to 20°C. Precipitation in the summer months averages 106 mm per month with extreme events capable of dumping 80 mm of rain in a day. The soil is normally frost free for 140 consecutive days after May 12 on average. As the autumn progresses, colder days are more frequent, and snow may start as early as late September. More commonly, snow only stays on the ground after mid-November. Autumn is quite variable with abrupt shifts from almost summery conditions to frost and back in 48 hours. Winter is cold with very short daylight and temperatures reaching as cold as -40°C, but averaging -7°C from December to end of March. Snow may come in storms with up to 50 cm snowfalls. The spring months (April to June) see an increase in temperatures coinciding with the thaw, with average temperatures from 6°C to 13°C.

Figure 5.1 Asbury Site Location in Relation to the Miller Project

Source: Google Earth, February 2016

5.3 LOCAL RESOURCES AND INFRASTRUCTURE

5.3.1 MILLER PROPERTY

A wide range of local resources are available in the town of Grenville and in the nearby cities of Hawkesbury (Ontario) or Lachute, located respectively 10 km south and 20 km east of the Property. Specific activities such as tree cutting, excavating, drilling, blasting, as well as other main services (emergency services, equipment maintenance shops, transport companies, mobile electricians, mobile mechanics, security firms, IT firms, engineering, environmental and geological consultants, restaurants and hotel rooms) are available near the Property. Transportation and housing are available nearby and the local skilled labor force would be able to support a mining operation. A power line crosses the southern part of the Property and a railroad passes through the Ottawa Valley near Grenville.

The Uniroc Quarry, which owns excavation equipment and operates in a syenite rock body, is also located on Scotch Road. Uniroc produces ballast, abrasives, high performance rock, crushed rock and manufactured sand. Four other quarries are located in the vicinity of the Miller Property. These quarries are operated using mobile equipment. Two limestone quarries are located on the Quebec and Ontario side of the Outaouais River. Canada Carbon has developed business partnerships with all of these quarries for equipment supply and expertise that were needed for the production of the bulk samples for its pilot plant program. Most of these quarries operate all year round and inclement weather does not stop their activities.

5.3.2 Asbury Mine Site

Local resources are available at the nearby cities of Notre-Dame-Du-Laus, Buckingham and Mont-Laurier, located respectively 11 km, 85 km, and 74 km from the site, along paved road. Similar services to the Grenville town are available in Notre-Dame-Du-Laus. The graphite producer Imerys is located in Lac-Des-Iles in a neighbouring city and could provide additional technical help.

5.4 Physiography

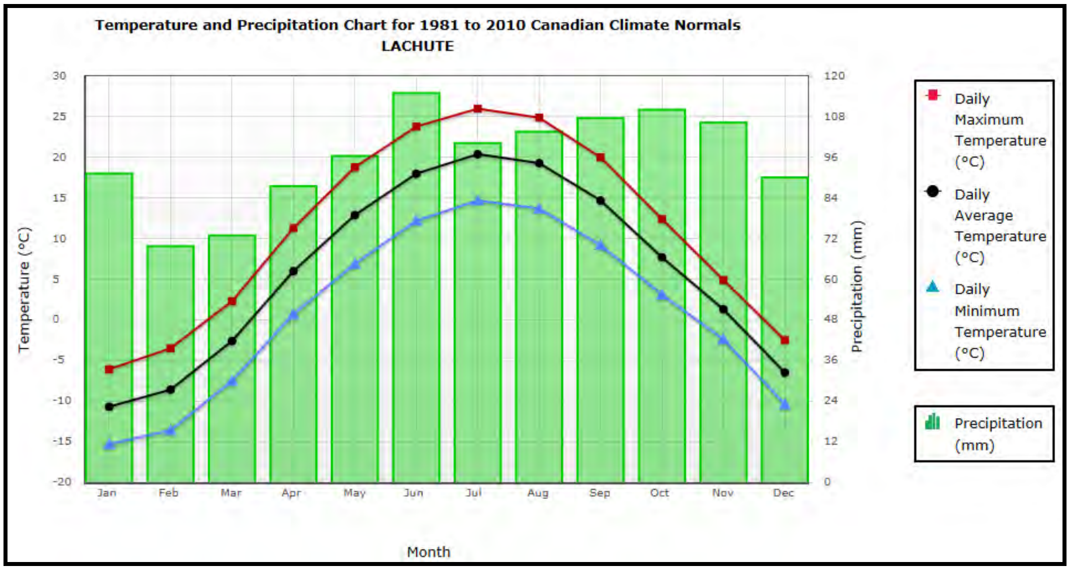
5.4.1 Miller Property

The Property is characterized by rolling to steep topographic relief consisting of smooth-sided hills with altitudes ranging from 100 to 240 masl. It is primarily vegetated by leafy trees, which mainly consist of maple, birch and aspen, with a few firs that have been partly cleared or selectively logged and replanted. Small swamps and peat lands are scattered all over the flat areas, whereas steeper hillsides and ridge tops display large rock outcrops. Valley areas are largely covered by extensive glacial or fluvial deposits up to 4 m thick. The drainage is dominated by the south-flowing Rouge River that runs west of the Property, and by the Calumet River that passes immediately north of the former Miller Mine. Some small lakes are found within and in the neighbourhood of the Property (e.g., Ogilvy Lake). Hillsides and ridges displaying ice flow indicators are observed throughout the Property and provide good evidence for south-east ice flow in the last glacial event.

5.4.2 Asbury Mine Site

The Asbury plant area shows the result of previous historical production. Hills made of waste material are scattered in the area and a tailings pond is present; both partly control drainage of the rivers that flow towards the south. The elevation on the Property ranges between 259 and 320 masl.

Figure 5.2 Average Yearly Weather in the Project Area



Source: http://climate.weather.gc.ca/climate_normals/ on January 15, 2016

Table 5.1 Summary of Lachute Weather Station Climate

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature													
Daily Average (°C)	-10.7	-8.6	-2.6	6.0	12.9	18.0	20.4	19.3	14.7	7.7	1.3	-6.5	6.0
Daily Maximum (°C)	-6.1	-3.5	2.3	11.3	18.8	23.8	26.0	24.9	20.0	12.4	4.9	-2.5	11.0
Daily Minimum (°C)	-15.4	-13.6	-7.5	0.7	6.9	12.2	14.7	13.7	9.2	3.1	-2.4	-10.4	0.9
Extreme Maximum (°C)	10.5	12.5	22.0	31.5	34.8	35.0	35.0	35.5	34.0	27.5	20.0	13.5	-
Extreme Minimum (°C)	-37.0	-35.0	-30.5	-15.0	-6.7	-1.5	3.5	0.0	-5.0	-8.9	-20.6	-34.5	-
Precipitation													
Rainfall (mm)	35.3	29.7	38.3	80.7	95.8	115.0	100.2	103.6	107.6	108.1	88.4	37.6	940.1
Snowfall (cm)	55.9	40.0	34.6	6.9	0.0	0.0	0.0	0.0	0.0	2.0	17.9	52.5	209.9
Precipitation (mm)	91.2	69.7	72.9	87.5	96.4	115.0	100.2	103.6	107.6	110.1	106.3	90.1	1150.5
Average Snow Depth (cm)	30.0	39.0	33.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	15.0	10.0
Extreme Daily Rainfall (mm)	56.9	51.1	38.4	38.1	49.8	62.2	68.0	56.0	81.8	69.4	57.0	34.6	-
Extreme Daily Snowfall (cm)	29.5	41.1	45.0	22.6	14.0	0.0	0.0	0.0	0.0	16.0	26.7	48.8	-
Extreme Daily Precipitation (mm)	62.2	51.1	45.0	40.0	49.8	62.2	68.0	56.0	81.8	69.4	57.0	48.8	-
Extreme Snow Depth (cm)	91.0	92.0	140.0	92.0	0.0	0.0	0.0	1.0	0.0	16.0	32.0	75.0	-

6.0 HISTORY

6.1 MILLER PROPERTY

The graphite occurrence on Lot 10 of Range V of the Grenville Township was described by Sir William Logan in 1845-1846, and mining operations were subsequently initiated by R.V. Harwood of Vaudreuil (Ells 1904; Cirkel 1907). This initial period of exploitation may be the first graphite operation in Canada (Ells 1904; Spence 1920). Following a 25-year period of inactivity, the site was operated again for a short period of time around 1870 as the Miller Mine (Cirkel 1907) and was taken over in 1889 by Messrs. Rae & Co. without extensive work (Spence 1920). The most important episode of mining apparently occurred from 1899 to 1900, as reported in Obalski 1900:

> *Keystone Graphite Co.-This Company, composed of Americans, began last year to work on lot 10, range V of Grenville (county of Argenteuil) at a distance of 6 miles from Calumet station (C.P.R.). The deposit worked was formerly known under the name of the McVeity Mine. The graphite is found in a pretty pure state, in small veins or masses, in a crystalline rock. It is hand-picked on the spot and put in bags for shipment to the United States where it is treated and concentrated. The lots sent contain an average of 35 to 55 per cent of pure graphite and it is paid for according to the grade. Since the company has been working, about 25 carloads have been shipped; from 16 to 22 men have been employed throughout the year. The work consists of a cutting about thirty feet deep joining the main deposit where, it is stated, a thickness of 2½ feet of solid graphite has been found at times. The work is done by hand without the aid of machinery. The same company has done some other prospecting on a small scale.*

Later in his report, Obalski reported that a total of 388 short tons of raw graphite were produced in 1900 in Quebec, while other graphite companies were almost inactive (Obalski 1900, p. 15-16); suggesting that an important part of this total production was derived from the Miller operations.

A database search for "McVeity" yielded several mentions of a prospector actively exploring for iron and mica in the late 1800s in the Ottawa region. One former phosphate mine near Gatineau (Quebec) also bears that same name and it is thus possible that an episode of activity at Miller took place under the name "McVeity". It is also reported that graphite was mined in 1900 on adjacent Lot 9 of the same range by the National Graphite Co. (Ells 1904) and further south, near the Pacific railroad station by the Calumet Graphite Co. (Obalski 1900; Ells 1904).

Figure 6.1 Mineralization Found in the Historic Miller Mine Wall

The mine site area was claimed by Glen Blair (independent prospector) in late 1980s who performed limited ground geophysics and found a new occurrence of graphite on the southwest corner of Lot 10 as well as some graphite boulders, about 100 m to the east (Blair 1988, 1989).

No previous work has ever been done on the Miller Property regarding quarrying marble for monument purposes or any other use.

6.2 ASBURY MINE SITE

Although this PEA only assesses the Asbury Property as the chosen location to build a treatment plant, historical exploration by various companies and subsequent resource evaluations lead to an historical production by Asbury Graphex from 1974 to 1988 on the Asbury Property. Open pit mining allowed the extraction of 875,000 t of graphite ore at a cut-off grade of 6%, on the current Asbury Property. After closing, the Asbury processing plant was leased to Stratmin Graphite Inc. The Municipality of Notre-Dame-Du-Laus now owns the land and processing plant.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The Project area lies in the same locality where observations by Sir William Logan (1863) led to the recognition of the “Grenville Series”, which was later extended and redefined as a geological province.

The Grenville Province is recognized as a deeply exhumed Mesoproterozoic Himalayan-type collision orogenic belt that extends over thousands of kilometres and is interpreted as a collage of gneissic terranes that were subjected to high-grade metamorphism (Martignole and Friedman 1998; Corriveau and van Breemen 2000; Corriveau et al. 2007). High-grade metamorphic terrane stacking occurred along deep-level ductile shear zones and resulted in the main crustal build-up.

The Project area is included in the south portion of the Morin Terrane (Figure 7.1), composed of supracrustal rocks, commonly at granulite metamorphic facies, and intruded by several bodies of granitic to anorthositic composition (1.14 Ga). The intrusive suite is grouped into the Morin Anorthosite-Mangerite-Charnockite-Granite (AMCG) Suite (Corriveau et al 1998), as depicted in Figure 7.1. To the west, the Morin Terrane is bounded by the Central Metasedimentary Belt along the Labelle deformation zone, which runs more or less north-south (Martignole et al. 2000). The Morin Terrane is bounded to the south along a major normal fault by the St Lawrence Lowlands, which constitutes a younger (early Paleozoic to the end of the Ordovician) geological province.

7.2 LOCAL GEOLOGY

The southern portion of the Grenville Township was mapped by Philpotts (1961) who detailed the folded sequence of quartzo-feldspathic gneiss, quartzite and crystalline limestone (marble); this sequence is characteristic of the Grenville Series from Logan (1863).

The well-banded quartzo-feldspathic gneisses were divided into two groups on the basis of whether they contain biotite or pyroxene, which rarely occur together in the area. Philpotts determined that gneisses are not the dominant lithology, occurring as remnants between the various intrusives of the Morin Series, which includes gabbro, monzonite, mangerite, granite and syenite. Quartzites were documented as very massive, well jointed, white or pinkish rocks. Crystalline limestone appeared to correspond to two large beds (Figure 7.2).

Microscope examination of the marble unit revealed twinned calcite, sphene, zircon, diopside, serpentine (after olivine), graphite, quartz, microcline and grossularite. Wollastonite was only noted near igneous contacts. Various pegmatite units were observed and seem to be affected by scapolite alteration of feldspar where they intrude crystalline limestone. Finally, Philpotts also noted younger diabase and lamprophyre dykes cutting through all units.

Graphite is observed as dissemination and pods/veins in the marble, skarn and paragneiss units of the property (Figure 7.2), several pods and veins have been identified and explored by Canada Carbon and are named with the VN prefix (Figure 7.2). Each of these showings are described in greater details in Section 9.2 of this report.

Figure 7.1 Regional Geological Map

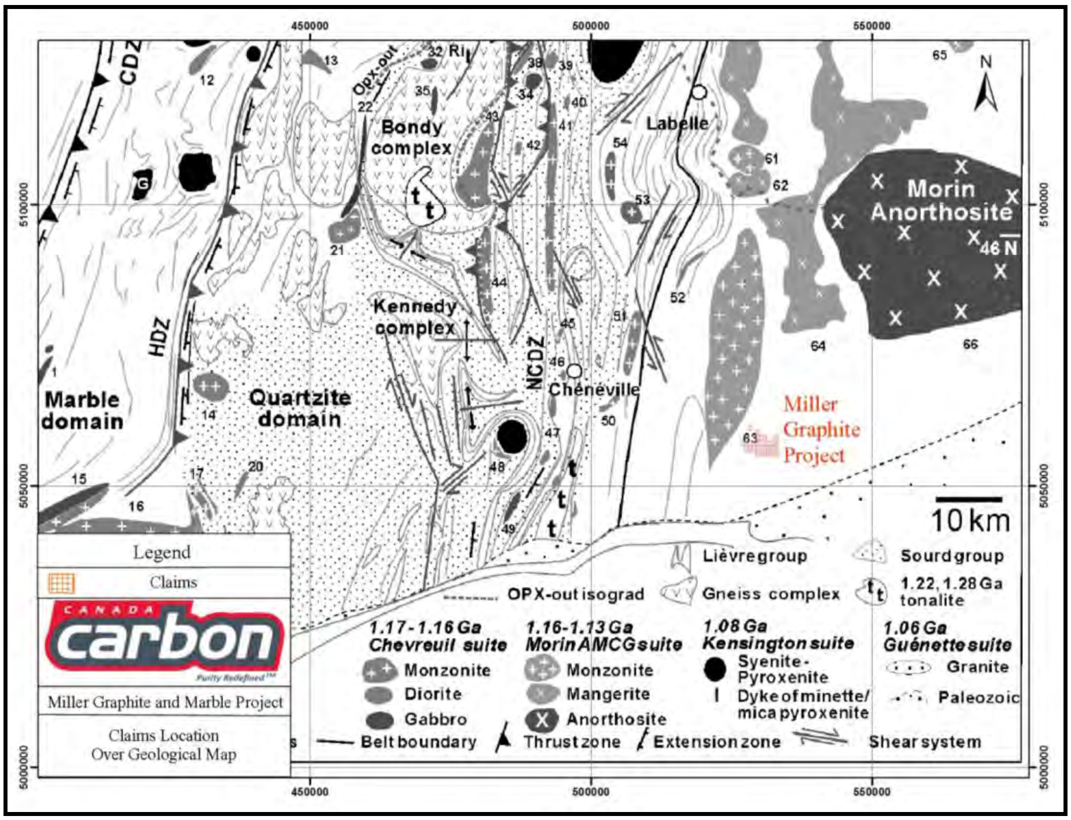
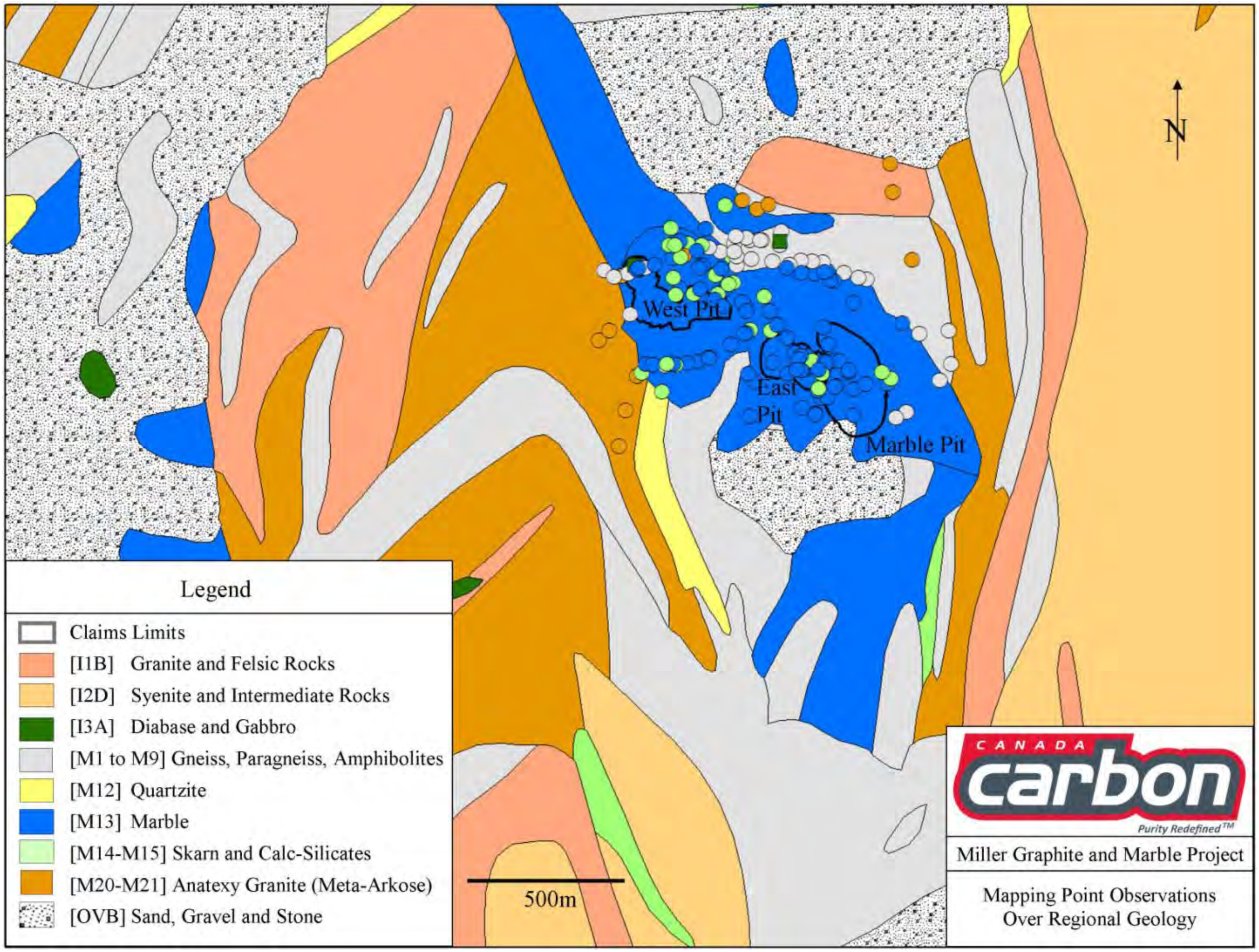


Figure 7.2 Regional Geology Map over the Project Area with Mapping Point Observations



7.2.1 MARBLES

The protolith of the marbles are interpreted to be sandy limestones, with variable amounts of organic matter (which might be the origins of graphite and sulfides observed on the Property). Canada Carbon's interpretation is that the limestone might have reacted with quartz grains within the unit during metamorphism to form marble and calc-silicate dominated rocks. The presence of sand in the marble might have allowed the following reaction: $CaCO_3 + SiO_2 = CaSiO_2 + CO_2$. Presence of contaminants (clay) within the limestone unit could have provided lead, magnesium, sodium, aluminum, and other elements.

The white marbles are medium to coarse grained (1 to 10 mm) and are white to silver-grey (Figure 7.3). Surface alteration has affected the marble for a depth of a few centimeters to half meter, creating a yellowish color and friable layer, which turns easily into sand. Disseminated coarse graphite (about 0.5% in abundance and 1 to 5 mm in size) is present in most of the marble unit. Accessory minerals include apatite (blue or green), chodrodite and diopside (Figure 7.3).

Enclaves are sometime present in the marble (referred to as "dead snakes"; Figure 7.3). They were interpreted by Canada Carbon as skarn layers (quartz-rich horizon or pods in the marble that reacted to create calc-silicates dominated rocks) or skarn shear-zones (units created by the reaction between the marble and fluids brought by shear zones) that were folded and twisted by subsequent convection. The dead snakes are often seen near skarn horizons and they have a similar mineralogical and geochemical composition. Enclaves often contain sulfide and graphite, reaching up to 5% graphitic carbon and/or sulfur. The dead snakes range in size from 5 to 25 cm, yet they can reach up to 10 m in length. However, the dead snakes could also represent deformed, partially melted interbeds of detritical rocks (sandstone and clay rich sedimentary rocks) in the initial carbonate sequence (Figure 7.3), typical of a marine to continental shelf environment. These interbeds are better preserved at the Property (Figure 7.3).

Silicified marbles are also observed and are fine to medium grained (1 to 5 mm), with a white to yellowish color. Slight to intensive silicification of the rock is present. Silicified marbles present a very gradual alteration (rarely sharp contacts). This unit contains little to no graphite or sulfides and is much harder than regular marble units.

7.2.2 SKARNS

Skarns represent the main alteration product of the marble unit. Possible small-scale zoning has been identified, but no large-scale zoning was observed so far. Light chlorite-epidote alteration areas are also observed within the skarn units. The skarn units present many variations in texture, varying in size, content and spatial relationships with other lithologies (Figure 7.3).

Coarse skarns comprise 1 to 25 cm or larger grains. They are primarily composed of quartz and feldspar, with frequent wollastonite pods (5 to 15 cm), pyroxene (up to 25 cm), titanite (up to 5 cm), zircon (1 to 100 mm) and chondrodite. The coarse skarns form long, thin zones (meter-long, 10 cm in width) inside white fine skarn units. No sulfides are observed in this unit. Grey skarns are fine grained (less than 3 mm) and form salt-and-pepper looking rocks. They contain quartz, feldspar and pyroxene with little to no accessory minerals (titanite, zircon). Sulfides are often present (less than 1%) in this unit. Green skarns are fine to medium grained (1 to 5 mm). More than 50% of the mineral content of this rock unit is composed of pyroxene (anhedral diopside), with small amounts of quartz, feldspar and sulfides. The interpreted protolith might have contained the exact amount of limestone and sand to create a complete reaction and modification of the unit to massive diospide. Pink skarns are fine grained (less than 1 mm) and mainly comprise pink feldspar and quartz. They are often present in banded graphite formations.

7.2.3 PARAGNEISS

The phlogopite paragneiss comprises significant amounts of phlogopite that can reach up to 15 cm or more in size. The phlogopite paragneiss has been historically exploited for micas. The paragneiss itself is fine grained (1 to 2 mm) with variable amounts of feldspar, quartz and other mafic minerals (pyroxene, amphiboles, biotite, etc.). The paragneiss ranges from dark brown to black in color (Figure 7.3). The protolith is interpreted to be composed of metamorphosed claystone and siltstone deposited in a shallow environment. White paragneiss is a quartz-feldspar rich gneiss, often partially melted, extruding large quartz-rich veins. The quasi absence of mafic minerals results in a white-to-grey colored gneiss.

7.2.4 META-ARKOSE

Meta-arkose units are composed of red-orange rocks that seem to be composed of fused grains of sand (Figure 7.3). Magnetite crystals are locally observed within the meta-arkose. Pegmatite veins formed by partial fusion of this unit are observed. The protolith is interpreted to be sandstone comprising quartz and potassic feldspar (hence the meta-arkose name).

7.2.5 DYKES

Large lamprophyre dykes (20 to 150 cm) are observed on the Property, oriented northwest-southeast and sometime with east-west offshoots. The dykes often cut through the mineralization and other lithologies. The dykes are sometimes kinked and/or foliated.

Coarse diabase dykes appear to be composed of large feldspar crystals in an aphanitic mafic matrix (Figure 7.3). Sulphides are locally present in filled fractures. Fine diabase dykes are dark-green to green, composed of a mafic aphanitic matrix. Quartz-filled vacuoles are sometime observed near the center of the dykes. Sulfides are sometimes present as fracture filling material. Yellow diabase dykes form khaki to yellow-green aphanitic units. Evidences of numerous intrusive pulses are observed; including layers of different colors near the borders. Sulphides have never been observed in the yellow dykes.

7.2.6 BRECCIA

Hematized breccias have been found near the Du Calumet River. The breccias are mostly composed of iron-manganese carbonates, with the presence of large pyrites and fluorine crystals (Figure 7.3).

7.2.7 PEGMATITE

Conventional pegmatites are rarely observed in the Project area. The only pegmatites might have been observed at VN7 and form 10 to 50 cm wide by 0.5 to 5 m long intrusive bodies (Figure 7.3). The origin of these bodies is interpreted to be local fusion of rocks, producing large pinkish feldspar, in a quartz-feldspar matrix. Zoned tourmaline has been identified and confirmed by geochemical analysis. The pegmatites are heavily folded and dismembered.

Figure 7.3 Typical Rock Units Found on the Property

WHITE MARBLE UNIT

COLORED MARBLE UNIT

DEAD SNAKE EXAMPLE

BANDED MARBLE UNIT

figure continues...

 PARAGNEISS UNIT	 SKARN UNIT
 DYKE UNIT	 META-ARKOSE UNIT
 PEGMATITE UNIT	 BRECCIA UNIT

7.3 MINERALIZATION

Graphite has been found as disseminations in marble, in sulphide-bearing paragneiss, in pods and veins on the Property. In known occurrences, graphite can be alone or in association with other minerals, including pyroxene, scapolite, titanite, zircon and wollastonite (Spence 1920). Through trenching, Canada Carbon has identified many examples of graphite mineralization associated with marble and detritical rock sequences. Numerous variations of the graphite mineralization are observed within the Project area. Graphite primarily occurs in well crystallized euhedral flakes.

7.3.1 GRAPHITE MINERALIZATION

WOLLASTONITE PODS

Wollastonite-graphite mineralization is a frequent association on the Property. This mineralization form often appears in small pods of tens of centimeters in diameter and can reach up to 1.6 m in thickness at the VN1 showing. Both wollastonite and graphite form well crystallized minerals (Figure 7.4) and graphite assays around 15% in these pods. On the VN2 showing, wollastonite appears as a nucleus around which the graphite appears to accumulate.

BANDED GRAPHITE FORMATION

Banded graphite formations are thin (1 to 5 mm) bands of graphite sandwiched between thin (1 to 10 mm) layers of graphite-quartz-feldspar, stacked closely, and reaching thicknesses of many metres (Figure 7.4). The grain sizes of this mineralization type are small (less than or equal to 1 mm). The banded formations are continuous over long distances (10 m and longer) and affected by intense folding. The average graphite content of this unit is between 5 and 10%.

GRAPHITE PODS (MARBLE)

Small pods (tens of centimetres long to a couple of centimetres wide) of pure graphite are often present in the white marble units (Figure 7.4). Pods of metric scales are also present on the VN2 and VN3 showings. The graphite grains are coarse (5 to 50 mm) and form euhedral flakes. Many of the pods are observed along an east-west alignment direction.

DISSEMINATED GRAPHITE (MARBLE)

In all the marble units observed, graphite occurs frequently in well crystallized, euhedral, small (1 to 5 mm) disseminated crystals (Figure 7.4). The chemical reaction between carbonate and silica might have produced calc-silicates and graphite, which seems to precipitate at the boundary of the calc-silicate and marble grains. The average graphite content in the marble is approximately 0.5% graphite.

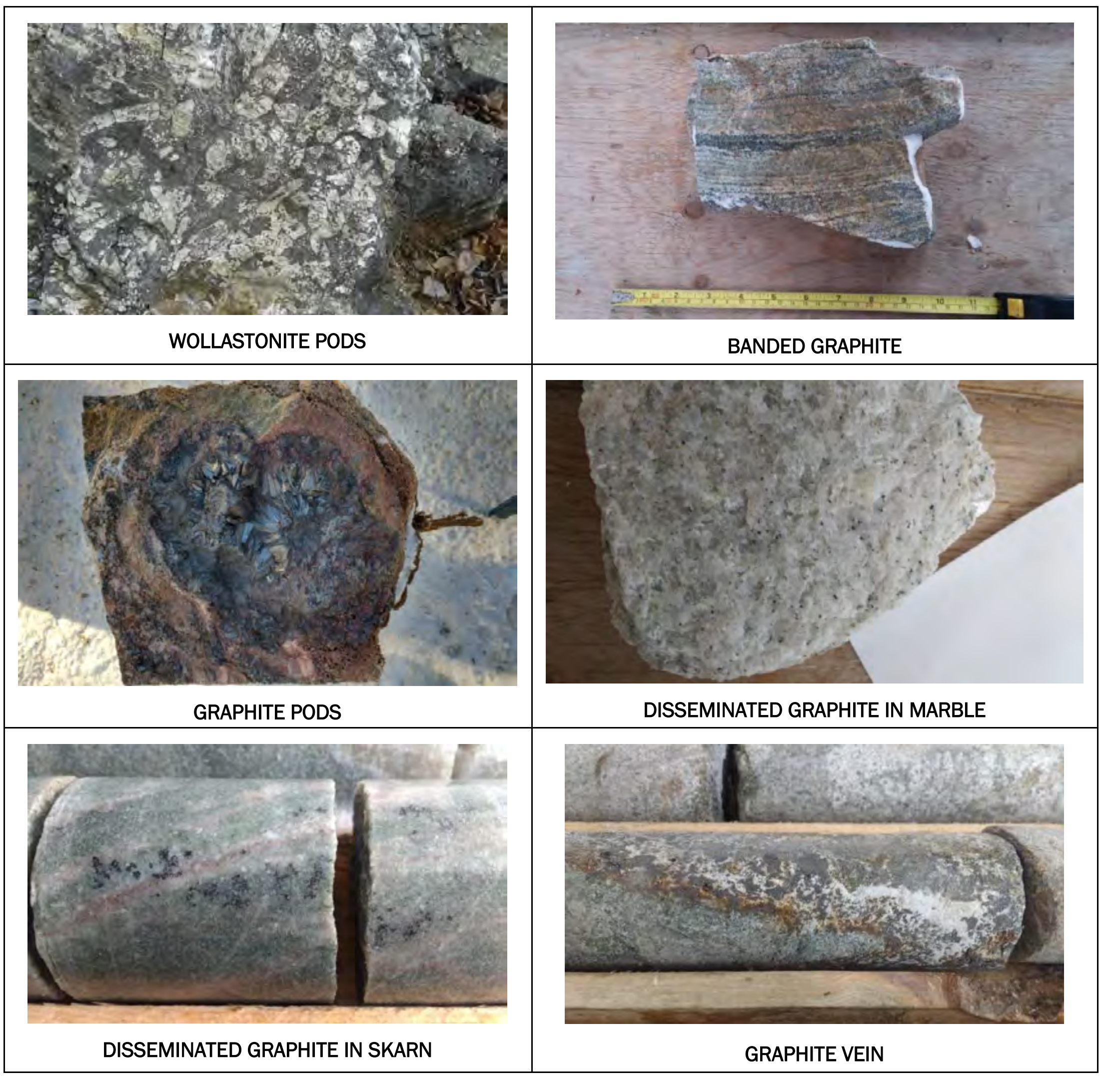
Disseminated Graphite (Skarn)

Similar to disseminated graphite in marble, disseminated graphite in skarn occurs almost everywhere, more frequently close to marble units (Figure 7.4). In skarn units farther from marble units, sulfides are more abundant. Graphite in skarn units is often found in clumps instead of flakes and is far less homogenously distributed than in the marble units.

Graphite Veins

Graphite veins seem to follow shear or fault zones, which might be evidence of structural control of metamorphic hydrothermal fluids (Figure 7.4). They are thin, centimeter-wide, sheets of aphanitic graphite that can cover many square metres. Directions of movement of faults are registered in the graphite veins as strikes and kinks. No general directions have been observed, as they are often following folded structures.

Figure 7.4 Typical Types of Mineralization Found on the Property



7.3.2 MARBLE

The medium to coarse grained white marbles on the Property has demonstrated its visual quality for architectural stone (Figure 7.5). The suitable white color marbles are overlain by a 1 to 4 m-thick surface alteration that creates a yellowish color and friable layer, which is unsuitable for production. Disseminated graphite (less than 0.5% in abundance) and other accessory minerals include apatite (blue or green), chodrodite and diopside, which give an interesting color for the architectural stone market.

Figure 7.5 Typical White Marble Found on the Property

8.0 DEPOSIT TYPE

8.1 GRAPHITE

Canada Carbon is actively exploring for metamorphic-hosted vein-type and disseminated graphite deposits, long known to occur in the Outaouais region of southern Quebec (Cirkel 1907; Simandl and Kenan 1997). Other typical examples, mostly in granulite terrains, are found in Sri-Lanka (Weis et al. 1981, Glassley 1982, Katz87), south India (Radhika et al. 1995, Baiju et al. 2005) and Spain (Rodas et al. 2000), among others.

Generally, graphite occurrences can be grouped into two categories: 1) syngenetic; which are derived from carbonaceous matter in host rocks and 2) epigenetic; which originates from precipitation of solid carbon derived from carbonic content in fluids (mainly carbon dioxide and methane). The latter form of deposit is less common in nature, but represents the more interesting of the two from an economical perspective (Rodas et al. 2000).

The Project represents an example of a granulite-hosted, high temperature graphite deposit, which could be paralleled to the Sierra de Aracena metamorphic belt described by Rodas et al. (2000), where the same type of graphite occurrences are found: I) stratiform graphite associated with gneiss and quartzite interbedded with calc-silicate series; II) disseminated graphite; III) graphite associated with anatectic tonalities and their restitic enclaves and IV) graphite veins. Graphite in all types of occurrences shows high crystallinity as revealed by the x-ray diffraction (XRD) study and thermal properties (Rodas et al. 2000).

Within the Outaouais region of Quebec (Tremblay and Cummings 1987), and particularly at the Miller deposit (Ells 1904, Spence 1920), the mineralogical association of graphite and calc-silicate rocks suggests a proximal source of carbon-rich fluids generated by silicification of nearby carbonate-rich rocks. Many studies have recognized that metasomatism, or more specifically skarnification, is efficient at producing carbon-rich fluids through the following reaction (Rodas et al. 2000; Pope 2004):

carbonate + silica => calc-silicate + carbon dioxide

The geological sequences at the Miller deposit and the geological setting also suggest the presence of a continental margin type environment, which has been affected by high-grade metamorphism. Detritic sedimentary sequences; comprising meta-arkoses and gneiss rocks are interbedded with marble sequences, presenting restites; deformed and dismembered enclaves.

8.1.1 Disseminated Graphite

Disseminated graphite in carbonate sequences (marble) could be explained by both syngenetic and possible epigenetic processes. The presence of small amounts of organic matter in the marble protolith could explain the formation of disseminated graphite in this sequence. However, local skarnification and metasomatic reactions could have produced carbon-rich fluids which percolated through the marble, hence depositing graphite in the grain interstices.

8.1.2 Banded Graphite

Graphite is also observed as banded flakes within gneiss sequences, which have resulted from the metamorphic transformation of organic matter within detritic sequences composed of lidites, sandstones and clay sediments rich in organic matter, within a carbonate sequence.

8.1.3 Graphite Pods Associated with Restites

Some graphite pods are observed in close association with paragneiss enclaves within a carbonate sequence. The anatectic paragneiss show typical igneous textures and include quartz, alkaline feldspar, plagioclase, biotite, sillimanite, cordierite and a variety of accessory minerals, such as muscovite, zircon, apatite and rutile. The graphite deposition is interpreted to be associated with the partial melting of organic matter rich clay sediments interbedded with limestone. High-grade metamorphism caused partial melting of the rock sequences and partial remobilization of the organic matter to graphite pods.

8.1.4 Vein-type Graphite

Graphite vein deposits are interpreted to have originated from the remobilization of carbon as carbon dioxide and methane in metamorphic fluids at the base of the crust or deeper within the mantle (Glassley 1982, Katz 1987, Skippen and Marshall 1991, Simandl and Kenan 1997). The fluids are channelled upward along major fractures where deposition as graphite is triggered by chemical changes in the fluids in response to cooling and dewatering (Luque et al. 2013). Fluid transport and graphite deposition imply that structures played a major role in the location and shape of the resulting deposit. The precipitation of carbon in veins takes place at high temperatures, from 700 to 800°C, which favor the formation of large and well crystallized graphite flakes. Graphite veins are characterized by coarse flakes with a high degree of crystallinity, which is suitable for new technological applications (Luque et al. 2013).

8.2 Marble Architectural Stone

The transformation of limestone to marble by high-grade metamorphism results in a crystalline calcite dominated rock with variable amounts of accessory minerals, depending on the quantity of heterogeneities in the protolith.

Marbles offer different colors and texture with variable amounts of veining and fractures. In the case of the Miller Property, the marble sought by potential buyers is white in color with as few fractures as possible.

9.0 EXPLORATION

Since the acquisition of the Miller Property in 2013, Canada Carbon has discovered multiple new graphite mineralization showings; including nine surface graphite showings of high-grade, and large, lower-grade dissemination of graphite in marble and skarn units. Induced polarization (IP) surveys indicate that multiple anomalies are located along the trends of the current area subject to exploration, most of which were drilled in 2014 and 2015. The geophysical anomalies are open on strike at both extremities and regional airborne geophysics revealed additional targets elsewhere on the Miller Property.

9.1 Initial Prospecting Work

After acquiring the Miller Property in February 2013, Canada Carbon hired SL Exploration Inc. to perform prospecting work. The objective was to locate the old mine site and proceed with an initial assessment of the Miller Property's accessibility and the historical mineralization. The field crew located the mine site approximately 150 m north of the position reported in the MERN database. Field observations in the old mine pit revealed that graphite veins occur in a marble unit near skarn and paragneiss rocks. The larger graphite veins appear to have been at least partially mined in the past and its orientation corresponds to the mine pit's north-south orientation.

Canada Carbon carried out initial prospecting in 2013 to verify historical data and a later prospecting phase to verify ground (MaxMin, very-low frequency (VLF), IP, ground time-domain electromagnetics (TDEM)) and airborne (TDEM) geophysical anomalies. The geophysical surveys were performed by different geophysics companies. Following the prospecting phase on the known anomalies, Canada Carbon proceeded to trench the ground anomalies and test some of them by performing drilling campaigns. Trenching and drilling on a coincident IP – IMAGEM anomaly (in 2013) detected two graphite veins (named VN1 and VN2) along a contact zone. The main focus of Canada Carbon's exploration work then became the investigation of these showings and the contact zone.

The objective of the follow-up prospecting work in March and April 2013 was to obtain samples from the graphite veins for metallurgical testing (Section 13.0) and to better characterize the grade of the vein material. The melted snow cover allowed additional geological mapping in the mine pit and structural measurements were also taken. Veins exposed in the east part of the mine pit were sampled.

9.2 GEOPHYSICS

9.2.1 GROUND ELECTROMAGNETIC (2013)

Géosig Inc. of Quebec City was contracted to perform a ground electromagnetic (EM) survey to test the immediate area of the historical mine pit using various methods, including Max-Min, IMAGEM, IP and Beep Mat. The objective of this work phase was to test the ability of the different methods to detect graphite veins (Simoneau and Boivin 2013). The methods were locally tested over a 500- by 400-m grid consisting of eleven east-west lines spaced 50 m apart, centered over the Miller pit. The various surveys were carried out during the last two weeks of May 2013 by various teams of two to three people including experienced geophysicists, one of which was the creator of the IMAGEM detector.

This initial orientation study revealed several small anomalies, most of them overlapping two or more of the applied EM methods. The Max-Min only returned weak anomalies since this method typically targets deep-seated conductors. The IMAGEM method detected near-surface anomalies that where followed-up by Beep Mat surveys, allowing individual graphite veins to be pinpointed and exposed after removing the thin cover of glacial till. The most significant results from this initial EM survey is a series of anomalies located about 200 m west of the pit where subsequent mechanical trenching revealed new graphite occurrences (VN-1 and VN-2), as detailed in Section 9.4.1.

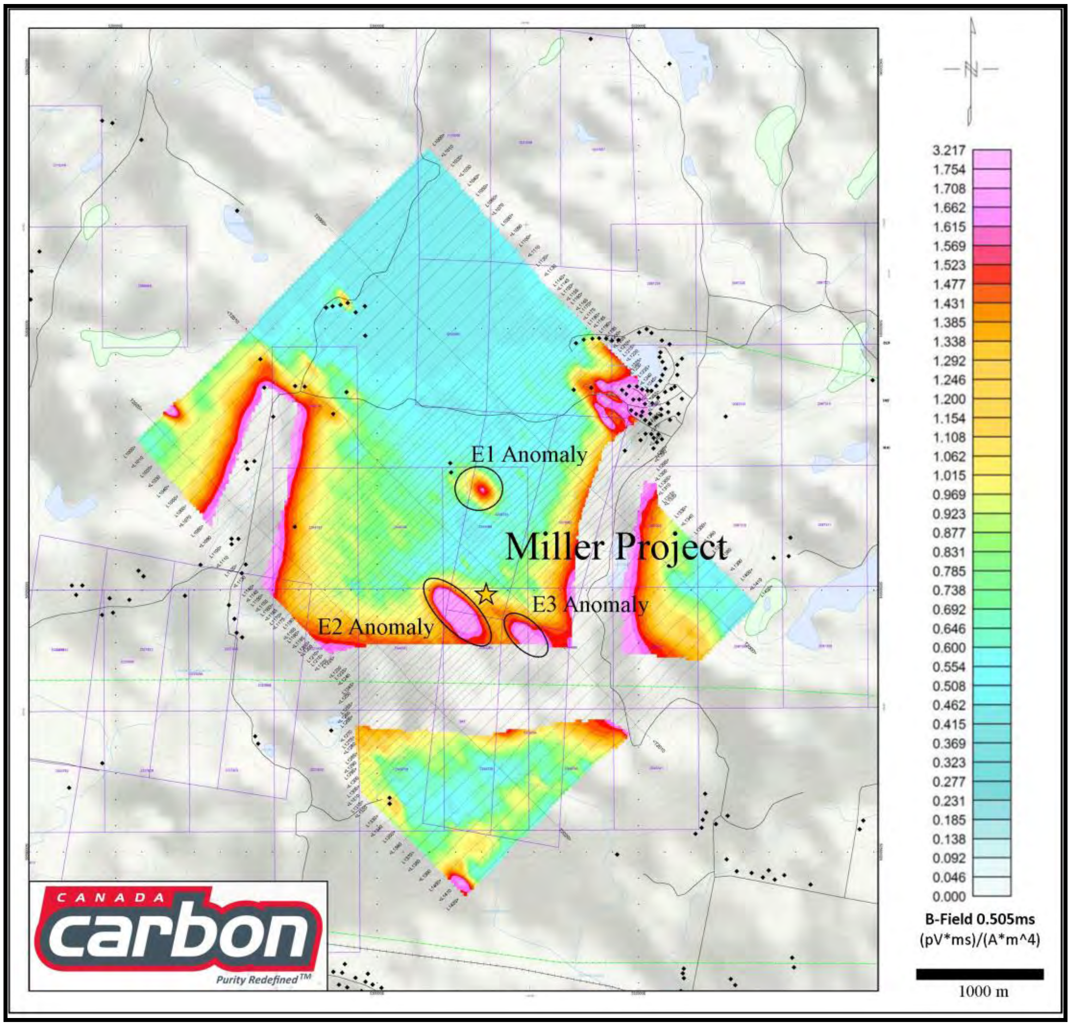
9.2.2 AIRBORNE VERSATILE TIME-DOMAIN ELECTROMAGNETIC SURVEY (2013)

In the spring of 2013, Canada Carbon commissioned Geotech Ltd. of Aurora, Ontario to complete a helicopter-borne versatile time-domain electromagnetic survey (VTEM Plus) and a Horizontal Magnetic Gradiometer (HGrad) geophysical survey over the two claim blocks of the Miller Property. The survey was flown on June 13, 2013 over an area of 25 km^2, yielding a total of 336 line-km of geophysical data. Positioning was provided by a global positioning system (GPS) navigation and radar altimeter. The survey lines were oriented northeast-southwest and generally spaced 100 m apart, with a tighter spacing of 50 m in the central part of the East Block over the areas of historical mining and recent graphite discoveries. The survey lines were flown with an AStar 350 B3 helicopter at an elevation of 91 m above ground at an average speed of 80 km per hour, producing an average terrain clearance of 60 m for the EM bird and a magnetic sensor clearance of 67 m.

Following the interpretation work, Geotech identified six conductors (three on the East Block and three on the West Block) based mainly on the Tau decay parameter evaluated from time domain EM data and vertical magnetic gradient contours (Figure 9.1 and Canada Carbon press releases of September 12 and October 8, 2013). All anomalies were later subjected to detailed modelling to determine the orientation and depth of the associated conductors (see Canada Carbon press release of November 14, 2013).

The East Block contains three major anomalies, E1 to E3. Anomaly E1 is located 800 m north of the mine pit, with an approximate diameter of 400 m; E2 is 280 m southeast of the mine pit and 150 m south of Trench #3; E3 is located 545 m southeast of the Miller pit (Figure 9.1). Anomalies E1 and E3 and the north part of E2 are on land covered by Canada Carbon's access agreement for exploration work. Based on the modelling work, anomalies E1 and E2 occur at depths of 100 m and 80 to 100 m, respectively. Anomalies E1 and E2 occur in marble units that are known to contain graphite elsewhere on the Miller Property. Magnetic maps show that E1 is located at the contact of two magnetic anomalies which may correspond to the contact between two geological units, suggesting a potentially similar context to that of the Miller mineralization.

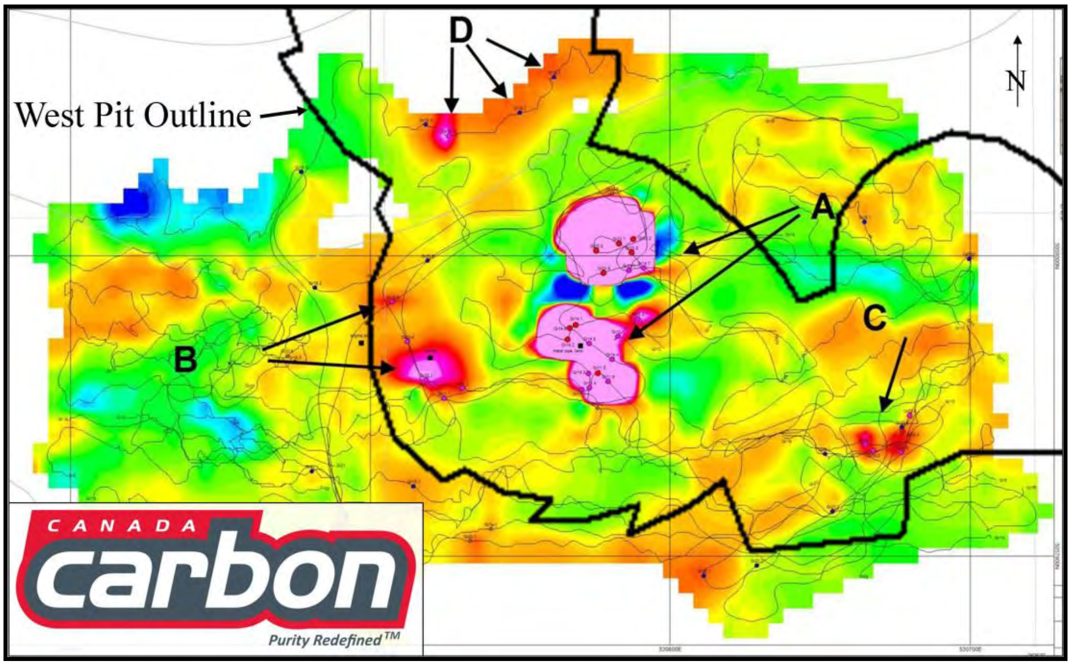
Figure 9.1 Miller Property Airborne TDEM Anomaly Map



9.2.3 IMAGEM SURVEY (2013)

In September 2013, Géosig was contracted to perform a second IMAGEM survey in the vicinity of Trench #3. The detailed mobile TDEM geophysical survey was completed from September 18 to 22, 2013, to investigate in greater detail the previously identified EM anomalies associated with graphite occurrences. The survey operators could not follow the grid lines due to the presence of the trench, and instead followed a meandering path that was precisely recorded by a GPS unit integrated with the IMAGEM detector. This provided complete coverage of the planned area (300 by 150 m) with an irregular spacing of 50 to 200 m. This method increased the density of readings near positive responses, resulting in a better definition of the anomalies. A total of 9.55 line-km were completed with an average spacing of 20 readings per metre. The survey was successful in delineating well-defined anomalies over the known graphite occurrence and revealed new anomalies that required further investigation (Figure 9.2). Although under development, the IMAGEM method appears very promising for the detection of near-surface conductors and seems particularly efficient for graphite vein mineralization.

Figure 9.2 IMAGEM Anomalies Map



9.2.4 PhiSpy Survey (2013)

Following the second drilling campaign and the trenching of the VN3 showing, a PhiSpy survey was performed in December 2013 and March 2014 over the vicinity of the VN3 showing, the E3 anomaly, the mine pit and the Trench #3 area. The PhiSpy system is a versatile exploration tool similar to the IMAGEM method used in the past by Géosig. During the survey, shallow anomalies can then be dug out, investigated, and sampled immediately. Unlike small EM devices such as the Beep Mat, which are usually limited to an investigation depth of about 1 m, PhiSpy can reach much deeper conductors and records full TDEM decay curves that can be post-processed and analyzed to retrieve information about the conductance and geometry of the conductors. Paper letter and map reports on the PhiSpy work have been produced by the contractor.

The PhiSpy survey performed between December and March 2013 revealed 14 anomalies of varying size. Beep Mat prospecting was carried out on each anomaly. Five anomalies of significant size were detected. Two of the anomalies are related to the VN1 and VN2 showings, while another corresponds to the target of the third drill program (Section 10.3) that revealed two graphitic horizons. The results of the survey on Trench #3 detected the southern and eastern extensions to the VN1 and VN2 showings.

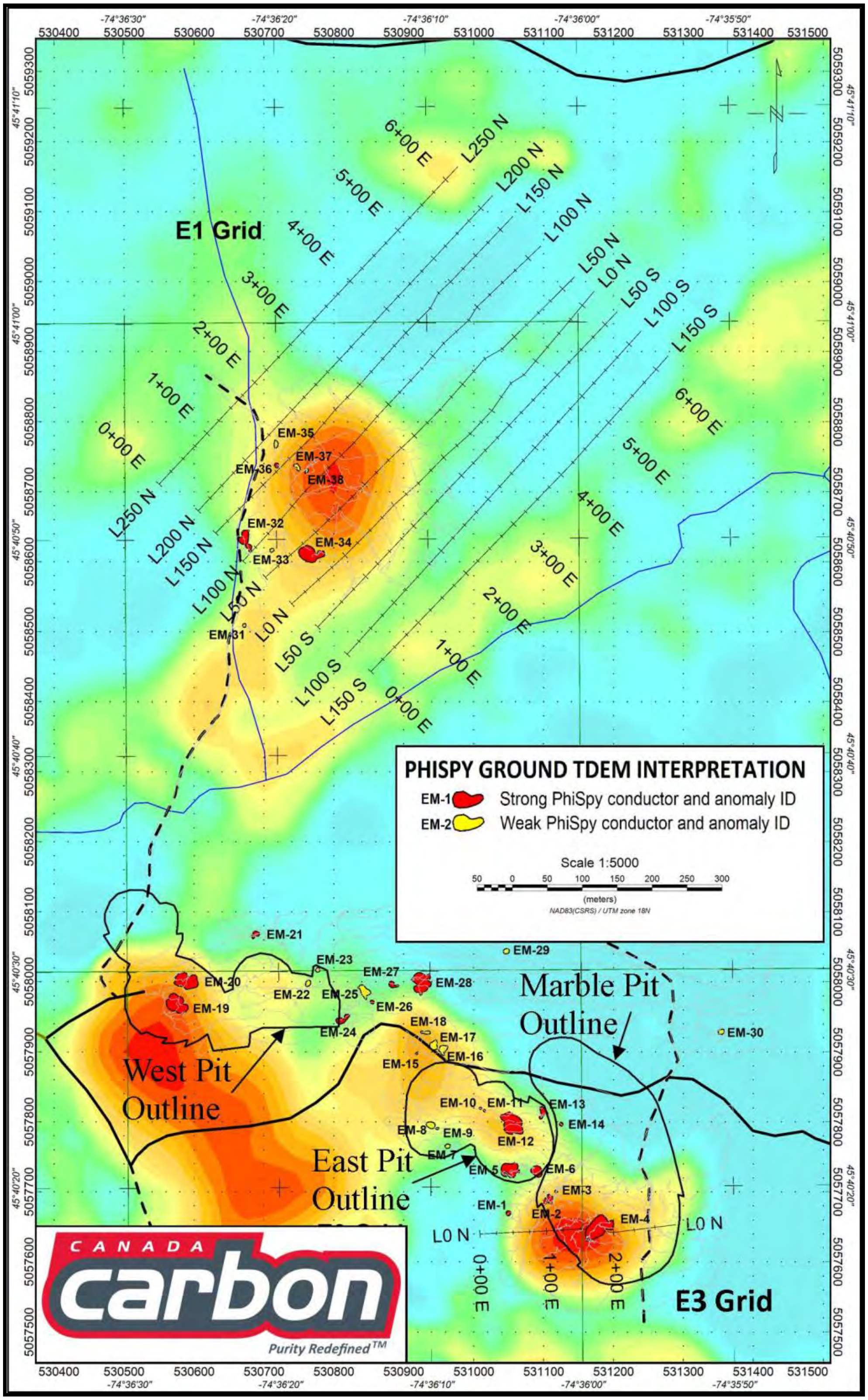
9.2.5 PhiSpy Survey E1 (2014)

In May 2014, a 320 by 320-m geophysics survey was completed over priority target E1, which had been identified by aerial geophysics (VTEM) conducted in 2013. The ground EM survey consisted of a PhiSpy grid with a line spacing of 20 m. This target is located 900 m north of the Miller Mine pit. The area surveyed is centered over a 180 m by 100 m strongly conductive VTEM anomaly that lies at the heart of the 400 m (radius) E1 VTEM target previously reported. The EM PhiSpy resulted in the identification of seven anomalies, ranging in size from a few meters up to 25 m. The near-surface anomalies are primarily located on the southwest part of the grid, whereas the structural features and airborne anomalies are located toward the northeast part of the grid (Figure 9.3).

A portable ground TDEM PhiSpy survey was performed on November 26th, 2014. Given the sparse forest in the area, it was possible to carry out this survey through the bush with no need for a network of lines to be cut. On the day of, a total of 5.6 km of PhiSpy data was acquired. This PhiSpy data was combined with previous PhiSpy data to provide a more robust geophysical interpretation (Figure 9.3).

The survey results show interpreted models of conductivity and chargeability. A total of 28 ground TDEM anomalies located in close proximity to the interpreted structural features were identified, 7 of which are of particular interest (EM-1; EM-3; EM-7; EM-8; EM-9; EM-25; EM-26). The others (EM-2; EM-12; EM-13; EM-14; EM-20 and EM-19) are respectively VN3, VN6, VN5, VN4, VN1 and VN2. Anomalies EM-5; EM-6; EM-21; EM-22 and EM-23 are onto historic pit or stockpiles. Trenching over EM-10, EM-11, EM-15, EM-16, EM-17, EM-18, and EM-24 revealed no visible graphite veins. Anomalies EM-4; EM-27 and EM-28 are in swamp areas and could not be accessed. The eight interesting anomalies revealed either veins of graphite tens of centimeters thick (EM-3; EM-7; EM-8; EM-9; EM-25, EM-26) or metric pods of graphite (EM-1).

Figure 9.3 Ground TDEM PhiSpy Interpretation over Airborne TDEM



9.2.6 IP SURVEY (2014–2015)

A resistivity and IP survey was performed in two different phases. A first phase was performed from September 4 to 7, 2014, over the southern part of the area, and a second phase aimed at covering the northern extensions of several open anomalies occurred from May 3 to 5, 2015. The E3 south grid consists of 14 lines varying from 225 to 475 m in length, for a total of 4.725 km, and the E3 north grid consists of 5 lines of 750 m, for a total of 3.75 km.

The southern IP survey consisted of 14 lines, oriented in a southwest-northeast direction that covered an area of 650 m by 450 m. To fit to the Miller Property, the line lengths varied from 225 m to 475 m long, for a total of 4,725 m. The spacing between the grid lines was 50 m and the distance between pole and dipole was 12.5 m to obtain optimal resolution and depth of penetration. A total of 20 IP anomalies located in close proximity to the interpreted structural features were identified, 8 of which are of particular interest (E3-1; E3-2; E3-9; E3-10; E3-24; E3-25; E3-21 and E3-22; figure 9.4). They all intersect known showings (VN1 to VN9) and seem to follow large conductors.

The northern IP survey consisted of four 480 m lines oriented in a southwest-northeast direction that covered an area of 500 m by 150 m. The spacing between the grid lines was 50 m and the distance between pole and dipole was 12.5 m to obtain optimal resolution and depth of penetration. The survey results show interpreted models of conductivity and chargeability. A total of eight IP anomalies located in close proximity to the interpreted structural features were identified, four of which are of particular interest (E1-4, E1-6, E1-7 and E1-8; Figure 9.5). Anomaly E1-4 is centered over the airborne VTEM anomaly, suggesting that its source could be common to both anomalies. Both the VTEM and the IP anomaly are located within a marble unit which is of interest since both the historic Miller Mine and the VN3 showing are hosted in marble. This anomaly connects at depth, with other anomalies present, and extends the width of the entire grid (150 m) in a northwest-southeast direction. Initial trenching has revealed graphite veins in the exposed bedrock surface. Anomaly E1-6 seems to come close to surface on line L150 (Figure 9.5). This anomaly lies on the contact between marble and paragneiss units. It follows the structural feature over the width of the whole grid (150 m). Both anomaly E1-7 and E1-8 are located in paragneiss outcrops, where graphite exposures were observed (Figure 9.5). Anomaly E1-7 is strong on lines L0 and L100, and seems to be sub-cropping on line 100, but appears to lie at a greater depth on line L0. Anomaly E1-8 is also of interest, but is only poorly defined since it is at the edge of the surveyed grid and its size remains undefined (Figure 9.5).

Figure 9.4 Resistivity and IP Interpretation over Airborne TDEM on the Southern IP Grid

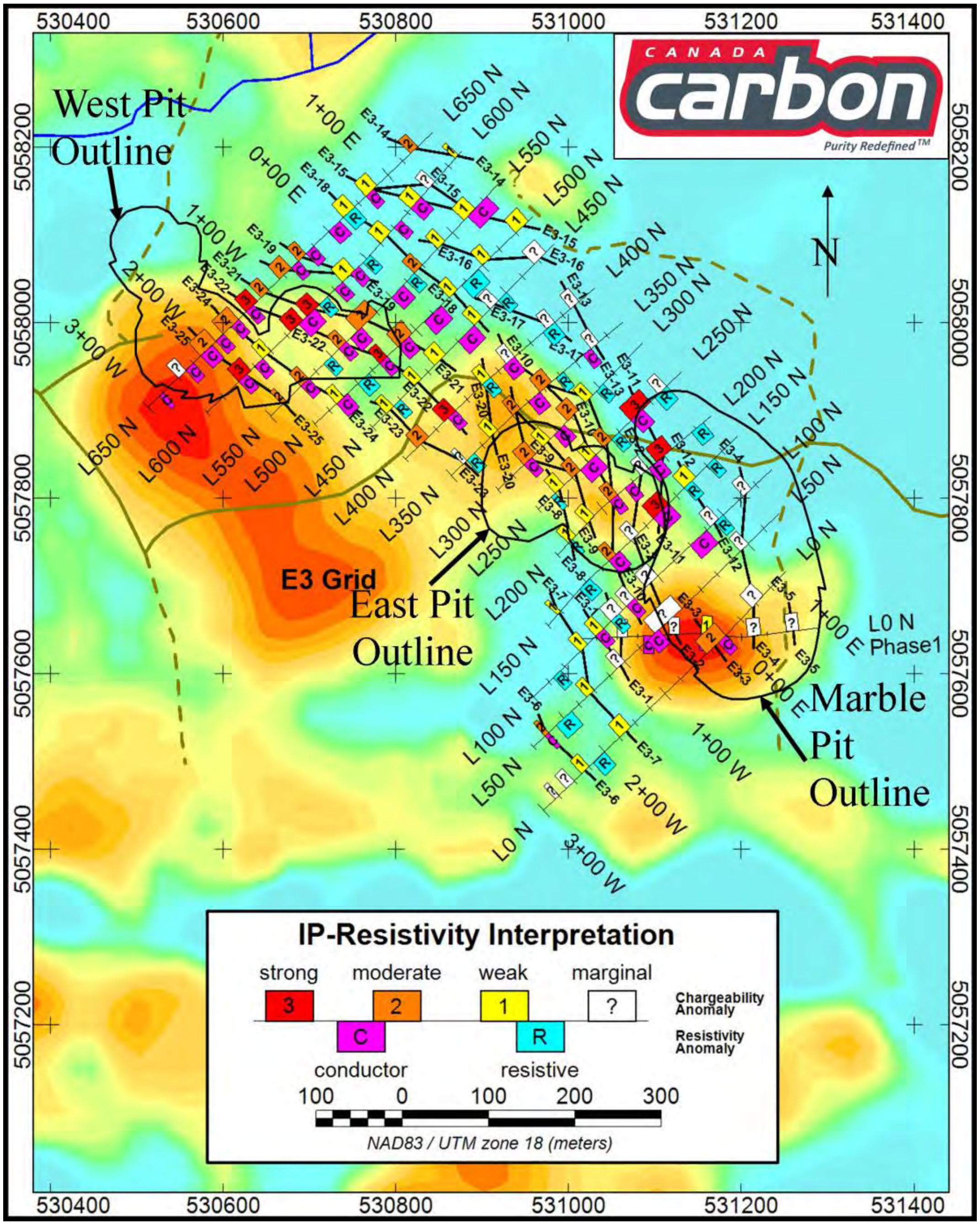
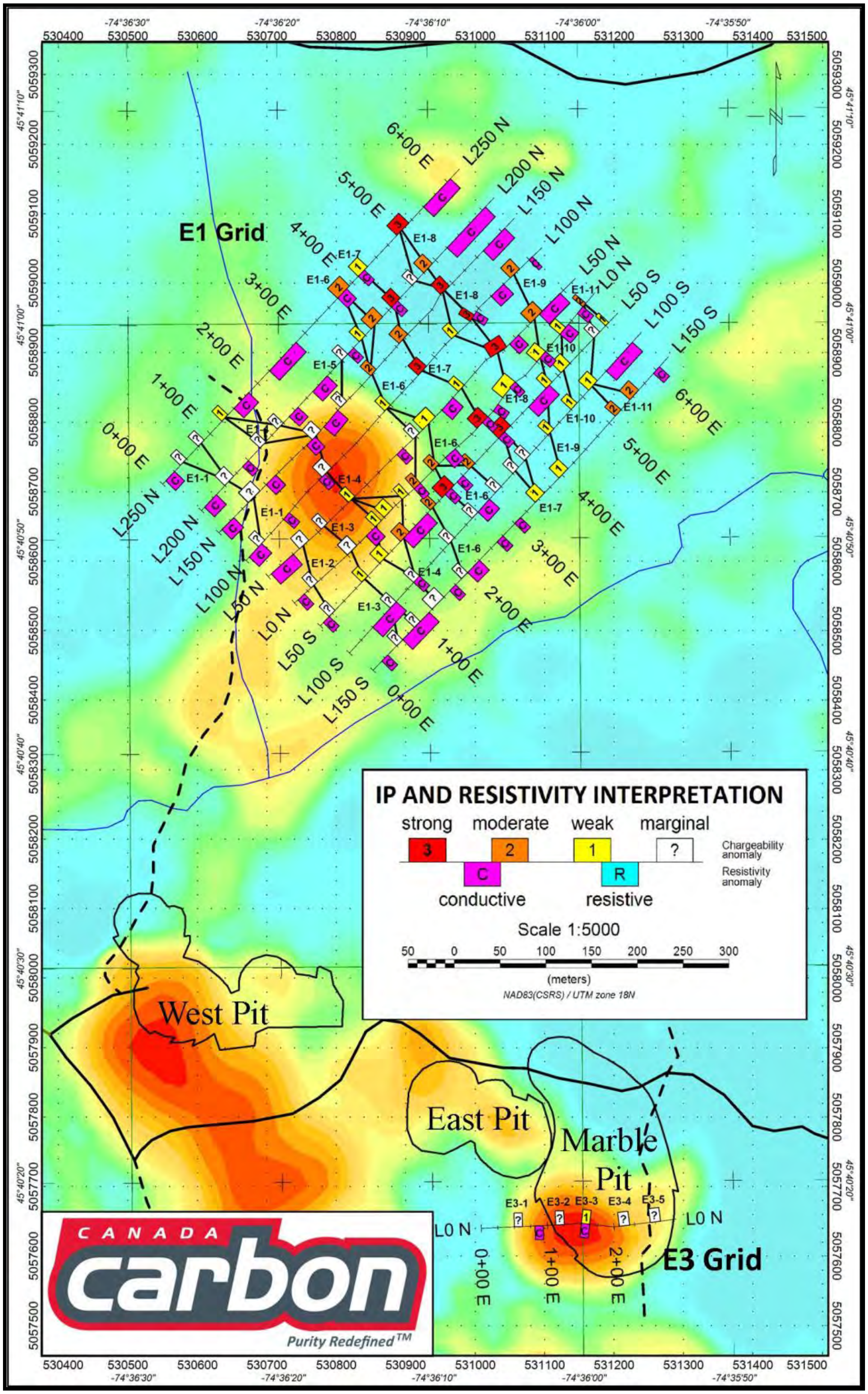


Figure 9.5 Resistivity and IP Interpretation over Airborne TDEM on the Northern IP Grid



9.3 PROSPECTING AND TRENCHING

Based on the IP, IMAGEM, Max-Min and other results provided by the geophysics surveys, Canada Carbon trenched every exploration anomaly to expose the bedrock. Additional ground EM surveying and trenching led to the identification of eight high-interest showings (VN1 to VN9, skipping VN5); Figure 9.6, Figure 9.7, and Figure 9.8.

Although few outcrops are found on the Miller Property, numerous graphite mineralization examples were uncovered during prospecting phases. Numerous closely-spaced graphite veins ranging in width from several centimetres to tens of centimetres were discovered under the overburden. Some veins occur at the marble-paragneiss contact, in an identical geological context to that of the Miller Mine site and trench area. Several exploration pits were also located, with graphite-bearing blocks adjacent to them, apparently sourced from the pits. Figure 9.7 shows the location of trenches completed since 2014. Occasionally, the trench did not reach bedrock and therefore no observations could be made. Some anomalies also remain unexplained and require additional investigation.

Figure 9.6 Location of Showings

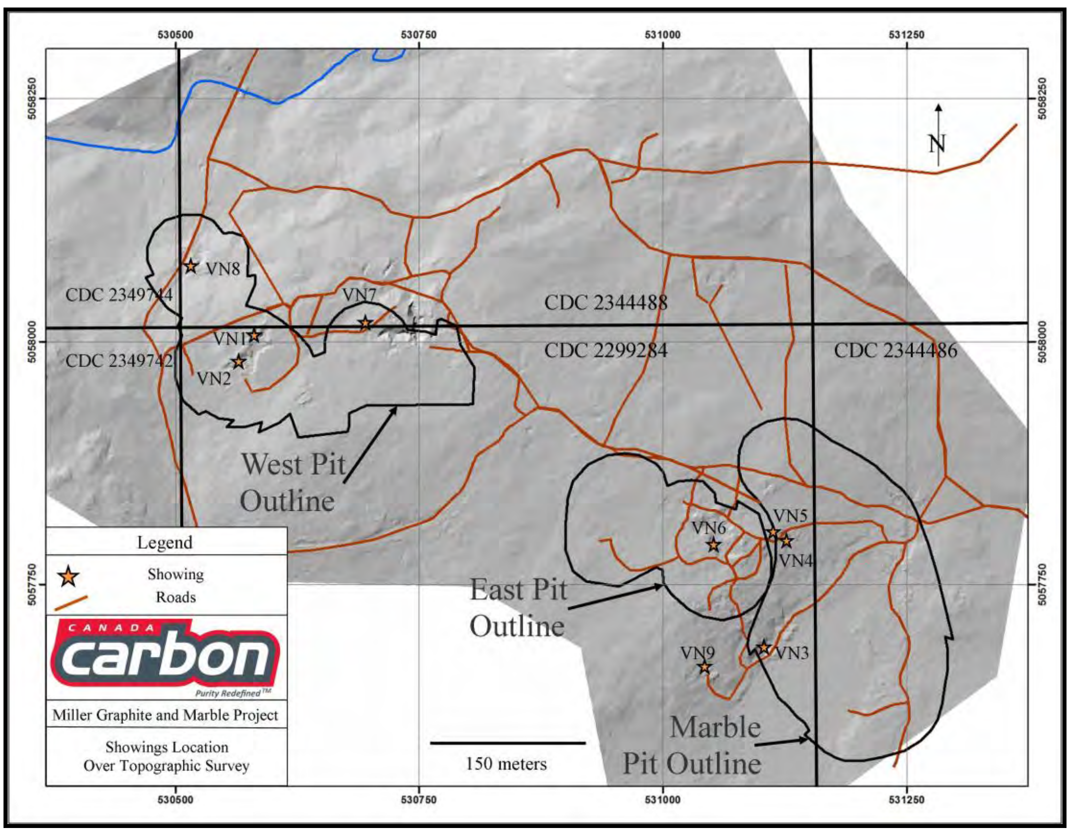


Figure 9.7 Location of the Trenches

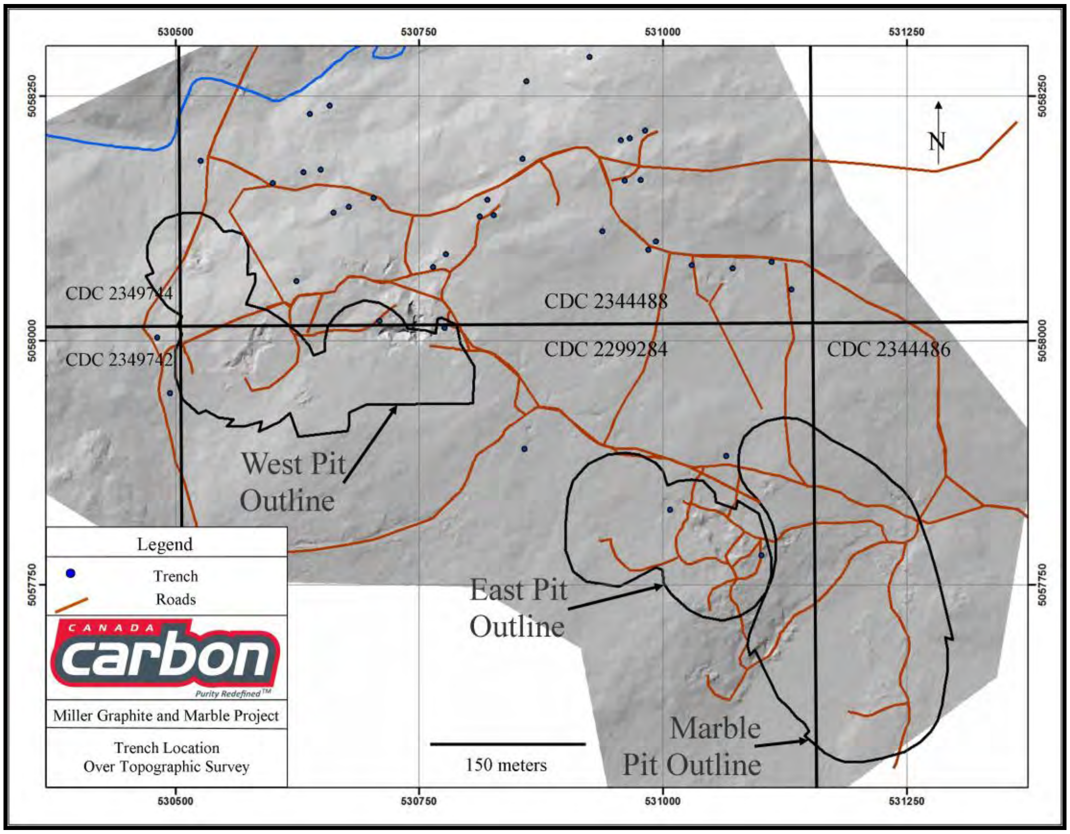


Figure 9.8 Example of a Striped Area with Banded Mineralization at VN6

9.3.1 VN1-2

Trenching on the combined IMAGEM, Beep-Mat and IP-1 anomalies in 2013 yielded some of the most interesting mineralization on the Miller Property. Graphite vein mineralization was exposed by mechanical stripping; revealing two high-grade showings (VN1 and VN2) located 200 m west of the Miller Mine pit. One of the two smaller initial trenches was extended to reveal the bedrock between the VN2 and the VN1 showings.

Subsequent trenching exposed the contact between marble and a paragneiss unit in the northeast part of the trench and between marble and a banded marble-paragneiss unit in the central and southeast parts. Coarse-grained skarns mark the contact and are spatially associated with mineralization: wide graphite veins and metre-scale graphite-wollastonite pods. The distinction between marble and skarn was based on diopside content. The marble displays variable degrees of silicification, increasing in intensity closer to the coarse skarn, to the point where marble at the contact forms a zone of "quartzite". In the banded marble-paragneiss unit, the marble is visibly altered whereas the paragneiss does not show signs of alteration at the macroscopic scale. The paragneiss unit at the northeast end of the trench also does not show visible signs of alteration.

A diabase dyke cuts across the other rock units. The diabase dyke is locally cut by graphite-filled faults. Coarse skarn completely fills the contact zone in the northeast part.

The contact zone in the southeast part displays intense alteration and could not be described in detail because it corresponds to a depression filled with soil and calcite grains resulting from surface weathering.

Other metre-scale pods of graphite were also found scattered in the marble unit away from any contact.

The VN1 showing is characterized by an irregular vein of semi-massive coarse graphite. The graphite vein is exposed along a strike length of 12.8 m, oriented northeast-southeast (148°) with a sub-vertical dip. From southeast to northwest, the vein ranges in width from 1 m to 1.7 m over a distance of 7.9 m, and of that length, the vein maintains a width of 1.6 m over 2.5 m. Toward the northwest, the vein is truncated where it encounters a 1.2 m zone of more competent host rocks. The width of the vein on the other side of the competent zone ranges from 10 cm to 1 m over a strike length of 3.7 m. Smaller graphite veins can be observed on both sides of the main vein, on available exposures. Finer grained graphite is locally present in the surrounding carbonate host rocks. The VN1 showing was covered by 1 to 3 m of glacial till.

Semi-massive coarse-grained graphite occurs within a coarse skarn-mineral envelope, which includes large crystals of white feldspar, diopside and wollastonite. Local geology consists of a complex intermixing of banded paragneiss and medium-grained carbonate rock (historically referred to as a marble unit), where contorted fragments of gneiss appear to float within an equigranular carbonate matrix.

The VN2 showing is characterized by a massive graphite vein up to 1.5 m thick that can be followed for more than 3 m at surface, several graphite pods, and multiple secondary graphite veins. The high-grade graphite veins and pods are aligned northweast-southwest and follow the contact between marble and paragneiss.

From the southern border of the trench, the contact can be followed at surface for more than 50 m and becomes folded toward the east. At depth, the mineralized contact was encountered 39.3 m below the VN2 showing.

9.3.2 VN3

A make-shift trench was excavated at the VN3 showing in the southern area of the Miller Property, close to a targeted VTEM anomaly. The showing was discovered when a vein was exposed while moving the rig to the E3 drill site during the second drilling campaign. The bedrock was subsequently stripped to reveal a vein over 2 m wide that could be followed along strike for 5 m before pinching out.

9.3.3 VN4

The VN4 showing was exposed 120 m north of VN3 at PhiSpy anomalies EM-13 and EM-14. Excavation led to the discovery of two mineralized zones a few metres away from a contact between the marble and skarn. A sub-vertical diabase dyke is visible at the southern part of the outcrop, striking west at 80°.

The mineralization consists of two pods of coarse grained graphite. The first pod is about 1.5 m in size and is oriented northwest-southeast. It is a mix of amphibole, wollastonite, graphite and re-crystallized calcite, encased in the highly altered marble. Channel samples 61501 to 61504 are surface grabs that include material from both mineralization and host rock.

The second pod is located 3 m south and 2 m lower (topographically) and is 0.50 m in size. It is composed of coarse graphite in fine grained grey skarn.

9.3.4 VN6

The VN6 showing was exposed 120 m north-northwest of VN3 and 60m west of VN4, at PhiSpy anomalies EM-12. Trenching on VN6 has uncovered marble and graphite-rich skarn bands with widths over 7 m, which can be followed in the newly exposed bedrock surfaces for over 40 m (Figure 9.9). Similar mineralization is found in the VN6 Extension trench located 45 m along strike, suggesting that the skarn unit is continuous for at least 90 m (Figure 9.9).

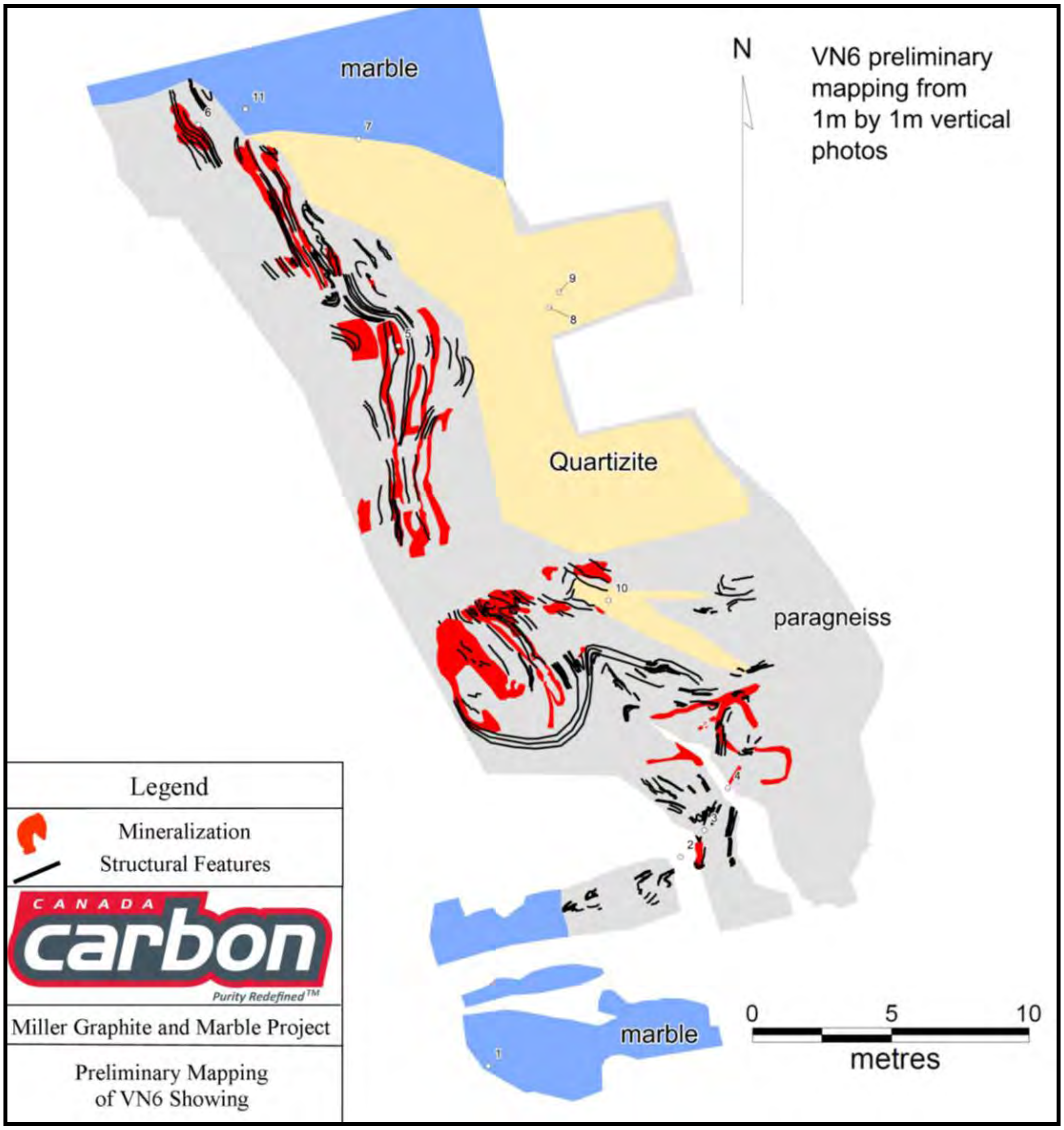
The VN6 showing is characterized by a 2-m-large, 30-m-long sheet mineralized horizon. Similarl to a banded-iron formation, the sheet is layered graphite in a pyroxene-wollastonite-feldspar matrix (skarn). The surface expression of the mineralized layer is kinked and folds toward the northeast. Interpretations of drill core logs indicate a westward dip at a low angle. The mineralization is at a contact between the marble and skarn (Figure 9.9). Mineralization consists of coarse grained graphite, from 1 mm to 10 mm in size.

At the northeast end of the outcrop is a diabase dyke, 50 cm wide, oriented 80° west (Figure 9.9). The projection of the dyke strike and dip is concordant with the dyke near VN4. Small kinks at the wall seem to indicate post-intrusion constraints.

At the southeast end is an important fault that cross-cuts the mineralization (Figure 9.9). The orientation is N090° similar to many other structures on the Miller Property. The displacement is not well known, the VN4 showing or an old pit tens of metres away could both be candidates of the extension.

Channel samples are surface grabs that include material from both mineralization and host rock. Graphite content varies from 0.3 to 19.8%. Results are summarized in Table 9.2.

Figure 9.9 Preliminary Mapping of VN6 from Vertical Photos



9.3.5 VN7

The VN7 showing was exposed at the southeast tip of the right arm of the Miller Mine. The showing is located at conductive and chargeable anomalies E3-21 and E3-22. Excavation led to the discovery of a 2 by 5-m-large mineralized horizon. The showing is a superposition of graphite and skarn layers, each of varying thicknesses (from 0.5 cm to tens of centimetres). The mineralization is at a contact between vertical layers of marble and skarns. The horizons are layered graphite in an amphibole-diopside-feldspar matrix (skarn). Mineralization consists of coarse grained graphite, from 1 to 10 mm in size. Several centimetre thick graphite veins are observed. The surface expression of the mineralized layer is oriented 45° and dips sharply.

9.3.6 VN8

The VN8 showing is located northwest of VN1, near the access road to the river. Excavation led to the discovery of a 2 by 20 m long mineralized horizon under about 1 m of soil. Both extensions are lost under the overburden, so the exact length is not well known. The host rock is the recrystallized marble unit, with disseminated millimetric grains of graphite. The mineralization is a stacking of graphite and skarn layers, each a few centimetres thick. It is heavily folded and arcing greatly. A very large (2 m) diabase dyke is visible, cutting across the mineralization. At least two shearing episodes are visible, recouping both the graphite/skarn and the dyke.

9.3.7 VN9

West of VN3 is a small anomaly (EM-1). Drillhole DDH15-76 intersected only minor mineralization, so a larger trench was dug around the casing. Coarse feldspars with large crystals of graphite have been found at the northern tip of the trench while at the east is a 1 m pod of graphite.

9.3.8 Anomalies EM-16 and EM-17

At location L350N 000E to L350N 065E on the geophysical grid are two small EM anomalies (EM-16 and EM-17). Two trenches were done to make observations. The western part (from 000E to 025E) is a marble horizon with underlying fine grained skarn. In the eastern part (from 050E to 065E), the bedrock is a fine grained green and white skarn. Centimetric veins of graphite are also visible in the skarn horizon.

Using the orientation and position of the diabase dyke at VN4/VN6, as well as the one at L600N 015E and in using a geophysical pseudo section, the dyke extension was inferred to be around L350 25E. The portion between the two outcrops was trenched but it filled with water in a matter of minutes, preventing direct cartography. Visual observation of blocs removed showed the presence of the diabase dyke.

9.3.9 Anomaly EM-22

An old pit, roughly 2 m in diameter is located at coordinate L400N 50W on the geophysics grid. Graphitic mineralization is observed in a skarn exposed by trenching on a small conductive anomaly (E3-22) located less than 10 m away. Folding has been observed on the outcrop.

9.3.10 Anomalies EM-22 and EM-23

Two small EM anomalies (EM-22 and EM-23) are located at L550N 035W on the geophysical grid. Trenching was done to record observations prior to drilling. The overburden is composed of mineralized blocks from ancient stockpile and soil approximately one metre thick. The bedrock is a 2-m marble cap, with disseminated graphite and millimetric graphite veins. An underlying skarn horizon was exposed. A coarse grained wollastonite and amphibole pod is visible in the fine grained silicate skarn. Disseminated graphite is also visible in the skarn horizon.

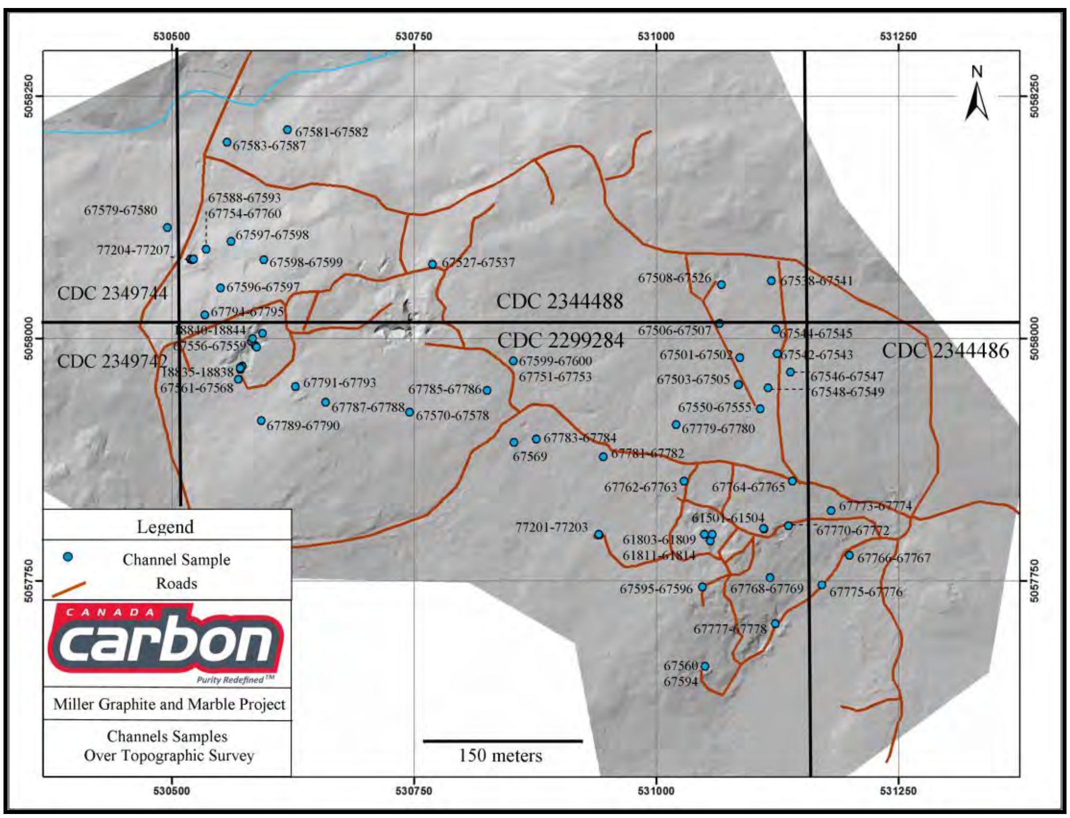
9.3.11 ANOMALY E3-19

Location L600 015E was trenched to place a drillhole to reach a subsurface conductive anomaly (E3-19). A large amount of mineralized (disseminated graphite) marble was found. A diabase dyke 1.20m thick oriented N130 and sub-vertical was observed. The orientation of S0 is interpreted to be N290°. Thin millimetric veinlets of graphite in the marble are oriented N315°. White skarn with large feldspars are located at the eastern end of the outcrop (at L600N 025E). No mineralization is visible in the skarn.

9.4 CHANNEL SAMPLING

All channel samples were taken perpendicular to the orientation of the stratigraphy, schistosity, mineralization and/or any other visible continuous structure. Channel samples were between 2 to 3 cm in width, approximately 10 cm in depth and one metre long. Sample weights were between 5 to 10 kg. Channels were placed to sample marble where no nearby drillholes existed. They spanned the longest length possible within the trenches, with the objective of sampling both the mineralization and host rock. Figure 9.10 displays the location of the channel samples.

Figure 9.10 Location of Channel Samples



9.4.1 VN1–VN2

Four channels were taken at the VN1-VN2 showings (Table 9.1). They were aimed directly at the pods in an attempt to intersect the thickest part of the mineralization, perpendicular to the length.

9.4.2 VN4

Two channels were completed directly on the VN4 showing (Table 9.1), measuring about 1.5 m and 0.5 m in length. RN4-1 intersected coarse amphibole-wollastonite-graphite mineralization and RN4-1b, situated half a meter to the south, was placed on a richer part of the pod.

9.4.3 VN6

Two long channel samples (Table 9.1) were taken perpendicular to the mineralized layers. The locations were chosen as the thickest parts of the apparent section. Lengths in the rock were identified and pre-cut, 7 m long for the first one and 3.5 m long for the second. By the time the channels were completely cut, the water table had moved up and over the first metres, hampering their recovery. They both cross-cut the lithologies near a contact between the marble and skarn. The horizon consisted of layered graphite in a fine-grained pyroxene-wollastonite-feldspar matrix (skarn). Mineralization consisted of coarse grained graphite, from 1 to 10 mm in size.

9.4.4 VN8

Small, metre-long channel samples were taken randomly along the mineralized sheet (Table 9.1). They were placed perpendicular to the lithologies at the contact between the marble and skarn. The mineralized horizon is layered graphite in a fine-grained pyroxene-wollastonite-feldspar matrix (skarn). Mineralization consisted of coarse grained graphite, from 1 to 10 mm in size.

Table 9.1 Channels and Grab Samples for the VN's

Hole ID	Azimuth (°)	From (m)	To (m)	Length (m)	Certificate No.	Assay Graphite (Gp%)	Sample No.
Pod #1	Grab	0.0	0.60	0.60	A13-11616	10.100	C18835
Pod VN1	N140	0.0	1.00	1.00	A13-11616	18.600	C18836
Pod VN1	N140	0.0	1.30	1.30	A13-11616	22.200	C18837
Pod VN1	N140	0.0	0.58	0.58	A13-11616	6.570	C18838
Pod #2	Grab	0.0	0.44	0.44	A13-11616	42.000	C18839
VN2	N220	0.0	1.30	1.30	A13-11616	28.200	C18841
VN2	N220	0.0	0.25	0.25	A13-11616	49.700	C18840
Pod #3 (VN2)	N270	0.0	0.65	0.65	A13-11616	12.500	C18842
Pod #3 (VN2)	N270	0.0	0.50	0.50	A13-11616	24.400	C18843

table continues...

Hole ID	Azimuth (°)	From (m)	To (m)	Length (m)	Certificate No.	Assay Graphite (Gp%)	Sample No.
Pod #3 (VN2)	N270	0.0	0.50	0.50	A13-11616	17.700	C18844
Pod #4	Grab	0.0	0.50	0.50	A13-11616	33.000	C18845
Pod #4	Grab	-	-	-	A13-11616	5.590	18846
Pod #4	Grab	-	-	-	A13-11616	2.840	18847
RN4-1	N300	0	0.50	0.50	A14-10103	11.900	61501
RN4-1	N300	0.5	1.00	0.50	A14-10103	3.910	61502
RN4-1	N300	1.0	1.50	0.50	A14-10103	2.650	61503
RN4-1b	N300	0.0	0.50	0.50	A14-10103	9.720	61504
Channel 1 VN6	N070	0.0	0.50	0.50	N/A	N/A	N/A
Channel 1 VN6	N070	0.5	1.00	0.50	N/A	N/A	N/A
Channel 1 VN6	N070	1.0	2.00	1.00	A14-10103	0.330	61803
Channel 1 VN6	N070	2.0	3.00	1.00	A14-10103	19.800	61804
Channel 1 VN6	N070	3.0	4.00	1.00	A14-10103	8.080	61805
Channel 1 VN6	N070	4.0	5.00	1.00	A14-10103	7.610	61806
Channel 1 VN6	N070	5.0	6.00	1.00	A14-10103	10.000	61807
Channel 1 VN6	N070	6.0	7.00	1.00	A14-10103	8.430	61808
Channel 1 VN6	N070	7.0	8.00	1.00	A14-10103	0.470	61809
Channel RN6-1b	N070	0.0	1.00	1.00	N/A	N/A	N/A
Channel RN6-2	N070	0.0	0.50	0.50	A14-10103	7.560	61811
Channel RN6-2	N070	0.5	1.50	1.00	A14-10103	6.100	61812
Channel RN6-2	N070	1.5	2.50	1.00	A14-10103	7.320	61813
Channel RN6-2	N070	2.5	3.50	1.00	A14-10103	6.080	61814
Channel VN8-R1	Grab	0.0	1.00	1.00	A15-04793	6.480	77204
Channel VN8-R2	Grab	0.0	1.00	1.00	A15-04793	13.400	77205
Channel VN8-R3	Grab	0.0	1.00	1.00	A15-04793	4.300	77206
Channel VN8-R4	Grab	0.0	1.00	1.00	A15-04793	15.200	77207

9.4.5 MARBLE

An important part of the 2015 summer campaign focused on the determination of graphite content of the marble unit. Trenches were dug and channel samples were taken systematically in trenches (Table 9.2). They were placed either directly above the horizontal projection of the end of a near diamond drill hole, between drillholes that intersected important lengths of marble and where the density of information was lower, or simply in any visible marble horizon at the surface, inside previously opened trenches.

Logging of diamond drill core and channel samples revealed a significant amount of white marble, with little alteration or color variation. This marble poses significant architectural stone potential. The area northeast of VN3 has been identified as the best sector for potential quarrying. Two large test samples (greater than 100 kg each) were collected with a Tramac in the VN3 area. They were sent to a monument builder in the Stanstead area to be cut and polished. They were deemed of sufficient quality to be of commercial value. Two larger blocks were collected, about two cubic meters each, and were sent for further testing and assaying.

Table 9.2 Marble Channels

ID	Easting	Northing	Target	Direction	Length (m)	Lithology	MX
R001	531086	5057980	T016	N025	2.0	Marble	GP
R002	531068	5077990	T017	N015	3.0	Marble	GP
R003	531065	5058015	T019	N020	2.0	Marble	GP
R004	531067	5058055	T023	N000	19.0	Marble	GP
R005	530769	5058076	-	N030	11.0	Marble	GP
R006	531118	5058059	-	N025	4.0	Marble	GP
R007	531123	5058009	-	N030	2.0	Marble	GP
R008	531124	5057984	-	N030	2.0	Marble	GP
R009	531138	5057965	T007	N020	1.5	Marble	GP
R010	531115	5057949	T006	N030	2.0	Marble	GP
R011	531107	5057927	T017	N030	6.0	Marble	GP
R012	530582	5057997	VN1	N060	4.0	Marble	GP
R013	530568	5057958	VN2	N090	8.0	Marble	GP
R014	530853	5057893	-	N110	1.0	Marble	GP
R015	530745	5057924	-	N135	9.0	Hematized Breccia	-
R016	530495	5058114	-	N005	2.0	Hematized Breccia	-
R017	530619	5058215	L1200-55w	N080	2.0	Skarn	-
R018	530557	5058202	L1200-125W	N000	2.0	Hematized Breccia	-
R019a	530557	5058202	L1200-125W	N120	2.0	Skarn	-
R019b	530557	5058202	VN7	N120	0.5	Skarn	-
R020a	530535	5058092	VN7	N090	6.0	Marble	GP
R20b	530535	5058092	VN8	N080	8.0	Skarn	-
R021a	531050	5057662	VN8	~N000	0.5	Skarn	-
R021b	531050	5057662	VN9	~N000	0.6	Skarn	-
R022	531047	5057744	VN9	N090	2.0	Marble	GP
R024	530852	5057977	-	N070	5.0	Skarn	-
R025	531028	5057853	-	N180	2.0	Marble	GP
R026	531140	5057853	-	N020	2.0	Skarn	-
R027	531199	5057776	-	N150	2.0	Marble	GP
R028	531136	5057807	-	N050	3.0	Marble	GP
R029	531180	5057822	-	N090	2.0	Marble	GP
R030	531117	5057753	-	N110	2.0	Marble	GP
R031	531170	5057746	-	N110	2.0	Marble	GP
R032	531122	5057706	-	N315	2.0	Marble	GP
R033	531020	5057911	-	N170	2.0	Marble	GP
R035	530945	5057878	-	N050	2.0	Skarn	-
R036	530876	5057896	-	N120	2.0	Marble	GP
R037	530825	5057946	-	N080	2.0	Marble	GP

table continues...

ID	Easting	Northing	Target	Direction	Length (m)	Lithology	MX
R038	530658	5057934	-	N100	2.0	Skarn	-
R039	530592	5057915	-	N020	2.0	Skarn	-
R040	530627	5057950	-	N110	2.0	Marble	GP
R040b	530627	5057950	-	N110	1.0	Paragneiss	-
R041	530534	5058024	-	N070	2.0	Marble	GP
R042	530550	5058052	-	N170	2.0	Marble	GP
R043	530595	5058081	-	N020	2.0	Marble	GP
R044	530561	5058100	-	N080	2.0	Marble	GP

9.5 BULK SAMPLING

In March 2013, Canada Carbon received permission to collect and ship up to 480 t of graphite-bearing material from its Miller Property in Quebec. According to the authorization granted by the MRN, the material could be extracted for mineralogical testing as well as for distribution to potential purchasers. The sample was to be collected between March 15 and September 15, 2014, and the results of the treatment were to be reported to the MERN by September 15, 2015. The objective of the bulk sample was to test the historically mined trench area of the Miller Property, along with multiple veins of graphite mineralization found over the area during field exploration by Canada Carbon. Stockpiles of graphitic material from historical production were also found in various areas around the former mine and could be sent out for the purpose of bulk sampling. The removal of surface material in the trench would also assist Canada Carbon to understand the distribution of graphite pods and veins along the mineralized contact.

Canada Carbon, in association with SGS (Lakefield) began pilot-scale processing of graphite material from the Miller Property. The primary objectives of the pilot plant operation were to generate larger quantities of graphite flotation concentrate for downstream evaluation, and to provide process data to facilitate future engineering studies. An initial 25-t composite was shipped to SGS Lakefield in mid-August 2014 for commissioning purposes. An additional 102 t of material from the Miller graphite mineralization was received by SGS on September 9, 2014 for pilot plant-scale flotation optimization.

The initial 25-t sample was selected for purposes of commissioning the pilot plant equipment at SGS (Lakefield). This sample was composed of graphitic material from multiple sites, selected by visual examination. Approximately 5 t of the material (20% of the bulk sample) were comprised of metre-scale graphitic blocks excavated during the trenching over the VN1 and VN2 showings, which lie about 150 m west of the Miller pit. A further approximate 5 t (20%) of the material comprised of 0.3 to 1 m graphitic blocks excavated during the trenching over the VN3 showing, which lies about 500 m to the southeast of the Miller pit. The remaining approximate 15 t (60%) were obtained from the historic Miller stockpiles; hand-sorting and mechanical removal of gangue mineralization yielded blocks of 0.15 to 1 m dimensions.

The 102-t bulk sample comprised of graphitic blocks which were visually estimated to have graphite concentrations of 5% or more, intended to be representative of the lower grade material present on the Miller Property. Approximately 61 t of the material were obtained from the historic Miller stockpiles. A further 26 t (approximate) were provided by blocks excavated during trenching over the VN6 showing. The remaining 15 t (approximate) were provided by blocks excavated during trenching over the VN4 showing. Block sizes ranged from 10 cm to 2 m. The bulk sample processed includes material from all known significant surface exposures of graphite, and is therefore fully representative of the lower grade Miller hydrothermal graphite mineralization. Results were reported in Canada Carbon's press releases of September and October 2014.

In late 2014, a second bulk sample of about 20 t was taken. Emile Foucault Excavation Inc., a local business specializing in excavation and demolition, was contracted to use machines to excavate mineralization on the VN6 showing for bulk sampling. Under the supervision of a geologist, the Tramac demolished the layered graphite horizon, measuring approximately 1 m deep by 20 m long and 5 m wide. Large blocks (above 30 cm) were subsequently broken into smaller pieces until the largest blocks measured a maximum of 20 to 30 cm in diameter. Approximately 30 t of mobile material, mineralized or sterile, was created. Under the supervision of a geologist, the best material was hand-sorted and put into industrial bags (36 inch by 36 inch x 48 inch, 1,500 kg capacity). Each bag was about 1 t and 22 bags were filled. To measure the exact total amount of material, bags were loaded onto a truck and weighed. The total mass was 21,500 kg of chosen material to be sent for metallurgic testing to a private purchaser. The shipment was sent in early 2015 due to weather conditions. The issuer and the receiver signed a confidentiality agreement restricting the disclosure of the metallurgical results.

Jean-Philippe Paiement of SGS is of the opinion that hand sorting block of 20 to 30 cm could result in high grading the material compared to sampling an entire load closer to the smallest mining unit (SMU). However, metallurgical tests were also performed on lower-grade mineralization.

10.0 DRILLING

Canada Carbon performed a number of drilling campaigns between 2013 and 2015 (Figure 10.1) to test geophysical targets (conductors) and to extend surface graphite mineralization, targeting high-grade graphite mineralization to depth. A total of 95 holes were drilled on the Miller Property for a total 5,283.53 m. Four additional drill holes (VN1-01; VN1-02; VN2-01; VN2-02) were done in 2013, using a winky drill that targeted near surface mineralization. The results from the winky drill holes were not used in the Mineral Resource estimate.

The witness drill cores boxes are stored onsite (Figure 10.2), in wooden racks. This site is accessible from the main road via a gated trail. A database of drill box location is kept on site. Drill cores are transferred from the drill to a temporary core shack by the drillers. The boxes are opened by a technician, measured and photographed. Each hole is logged, registering the different lithologies, marble quality and assay intervals.

The drillholes are planned using geographic information system (GIS) software and the drillhole collars locations are placed on the field using a chaining method based on known location (differential global positioning system (DGPS) surveyed drillholes or base station). Front sights and back sights are placed using a magnetic compass. Drilling directions vary from one area to another (Figure 10.1) and no established grid has been used on the Miler Property. The drillholes were set on dips varying from -45 to -90°.

The drilling campaigns were planned by Steven Lauzier, P.Geo. and the execution of the drilling, logging and sampling was conducted by SL Exploration Inc., with Downing Drilling and Foradrill performing the drill work. Final drill logs were reviewed by Steven Lauzier, P.Geo and the drilling data was compiled in a Microsoft® Excel database by Steven Lauzier, P.Geo and Pierre-Alexandre Pelletier, P.Geo.

A total of 2,652 samples were initially taken from the different drillholes and sent for assaying. The assays represent 2,626.23 m; which corresponds to 50% of the total length of the drillholes. All samples were assayed for graphitic carbon and the assay results were registered in a Microsoft® Excel database; which was later transferred to an Access based logging software. The initial sampling programs focused on high grade visible graphite mineralization. Following a change of exploration scope to both high grade and low grade disseminated mineralization, Canada Carbon resampled the missing length of drill core according to SGS's recommendations.

The drilling companies have left some of the casings in the drillholes (Figure 10.3). Markers with drillhole identification, direction and dip are left in each hole when drilling is completed (Figure 10.3). The final drilling locations were surveyed using a DGPS and the surveying work was conducted by J L Corriveau & Assoc Inc.

Figure 10.1 Location of Drillholes

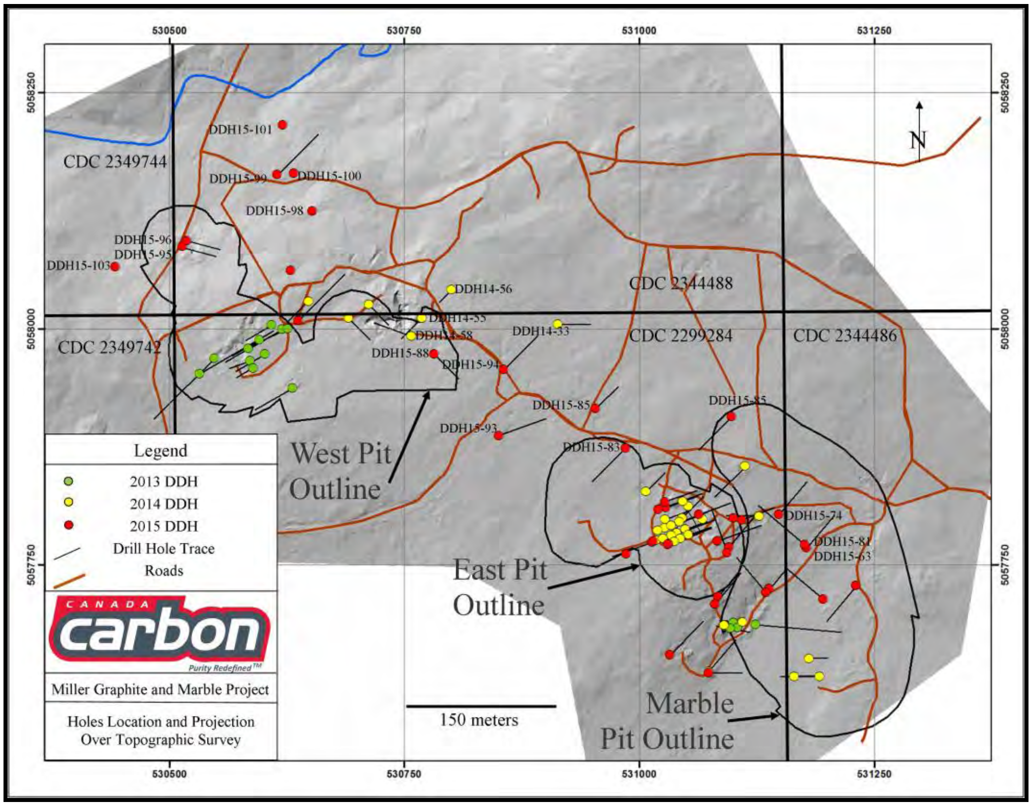


Figure 10.2 Core Storage Area on Site

Figure 10.3 Example of Drillhole Markers

10.1 DRILLING CAMPAIGN, JULY 2013

Canada Carbon's first drilling campaign of 12 holes totalling 594.9 m was carried out from late July to early August of 2013. The objective was to test the depth and lateral extent of the various veins. Downing Drilling was contracted to drill the VN1 and VN2 showings in August 2013. The firm used NQ size drilling rods for DDH13-01 to DDH13-08. One hole was attempted using a small portable drill (VN1-01) but was terminated in the first metre of drilling due to the hardness of the pegmatite. An on-track drill was then used to complete the other three planned short holes (VN1-02, VN2-01, and VN2-02).

The results of the drilling campaign demonstrate that the graphitic vein system extends to a depth of at least 39 m beneath the VN2 surface occurrences. Drilling intersected a graphite-wollastonite pod at 39.3 m (vertically) beneath the VN2 showing in hole DDH13-03, returning assays similar to the surface results, with 15.14% graphitic carbon over 0.9 m. Drill hole DDH13-04 laterally extended the graphite-wollastonite mineralization 14 m toward the east, and intersected 14.5% graphitic carbon over 0.5 m at 33.8 m (vertically) underground.

Some drillholes also tested the VN2 showing near surface. Drillhole VN02-01 encountered 32.45% graphitic carbon over 2 m from 1 to 3 m downhole, including two veins assaying 53.6% graphitic carbon over 0.3 m and 51.7% graphitic carbon over 0.9 m, respectively.

Many lower grade intersections were also encountered. Some of the lower grade mineralization includes graphitic marble or paragneiss grading between 0.46% and

5.27% graphitic carbon. Many rock units were crosscut by thin veins (2 to 5 cm). Highlights of the drilling results are presented in Table 10.1.

10.2 Drilling Campaign, November 2013

Canada Carbon contracted George Downing Estate Drilling Ltd. in mid-November 2013 (Grenville-sur-la-Rouge, Quebec) to complete a 10-hole (551 m) NQ-sized diamond drilling program. The firm used a BoartLongyear LF70 rig with Interlock system. The objective was to extend the VN2 graphite mineralization at depth and along strike, and to drill-test three VTEM anomalies identified by the VTEM anomaly modelling. This hole was intended to sample below the graphite veins and pods observed in the trench area since previous drilling had already tested the continuity of the graphite veins. The winter campaign encountered bad weather, which slowed down drilling production.

Diamond drillhole (DDH) 13-09 explained the E2 VTEM anomaly when it encountered a sulphide-rich intersection with minor disseminated graphite. DDH13-10 targeted the E3 anomaly and encountered a wide intersection of minor and disseminated graphite in marble.

While moving the rig to the E3 drill site, a graphite-rich vein (VN3) was exposed over a width of 2 m and a strike length of 5 m before pinching out. The VN3 discovery was drilled during the third campaign with six shallow drill holes that targeted the projected strike and depth extensions of the vein (see next section for details).

The most significant results were from the new vein discovery VN3 with 48.60% graphitic carbon over 1.8 m in DDH13-15, including 63.20% graphitic carbon over 0.5 m. This intersection of graphite mineralization occurs 4.6 m (vertically) below the VN3 showing. In turn, DDH13-14 intersected a graphite vein grading 50.50% over 0.30 m within a 3.50 m interval grading 6.80% graphitic carbon between the surface and the DDH13-15 graphite mineralization. The VN3 showing remained open at depth at the end of the drill campaign and was closed in subsequent drilling.

The other hole of interest is DDH13-11, which targeted the depth extension of a wollastonite-graphite pod located 22.5 m southeast of the VN2 showing in the trench area. The hole encountered another pod, thereby extending the mineralized contact hosting the pods to a vertical depth of 8.19 m below the surface showing. The hole yielded grades similar to other wollastonite-graphite pods, specifically 8.10% graphitic carbon over 2.3 m including 11.00% graphitic carbon over 0.90 m. The pod southeast of the VN2 showing is suspected to be within the same mineralized contact that extends to at least 39.3 m (vertically) beneath the VN2 showing. The mineralized contact also remains open at depth.

Many lower-grade intersections were also sampled during drilling. The best results were graphitic marble grading 2.00% over 10.50 m including 4.50 m at 3.50% graphitic carbon, and 1.00% over 13.00 m including 4.30 m at 1.6% graphitic carbon. Isolated values range between trace amounts of graphite and 4.00% graphitic carbon. No significant gold or base metal assays were obtained. Canada Carbon will use the lithogeochemistry data to establish alteration patterns and to better interpret the lithologies. Highlights of the drilling results are presented in Table 10.1.

10.3 DRILLING CAMPAIGN, 2014

Drilling of the new target revealed by the PhiSpy survey and the Geotech E3 target was done using a small portable drill (Gopher drill) from Downing Drilling due to the swampy nature of the drill pad. Two holes were drilled for a total of 64.5 m, targeting two anomalies provided by the PhiSpy survey. The anomalies are parallel, oriented north-south. The holes were drilled with a dip of 48° to the east. Significant results are presented in Table 10.1.

10.4 DRILLING CAMPAIGN, AUGUST 2014

Canada Carbon's August 2014 drilling campaign consisted of eight holes totaling 441.5 m. The objective was to test the depth and lateral extent of the various anomalies E1-4, E1-6, E1-7 and E1-9. Downing Drilling was contracted to drill the northern block about 800 m north of VN1. They completed drillholes DDH14-21 to DDH14-28 and produced BQ diameter core. Table 10.1 presents significant results.

10.5 DRILLING CAMPAIGN, SEPTEMBER 2014

Canada Carbon contracted Downing Drilling in September 2014 (Grenville-sur-la-Rouge, Quebec) to complete a nine-hole (408 m) BQ-sized diamond drilling program. The objective was to extend the VN3 graphite mineralization at depth and along strike, and to drill-test three TDEM anomalies identified by the PhiSpy survey. Highlights of the drilling results are presented in Table 10.1.

10.6 DRILLING CAMPAIGN, OCTOBER 2014

Canada Carbon contracted Foradrill in October 2014 (Grenville-sur-la-Rouge, Quebec) to complete a 13-hole (640 m) BTW-sized diamond drilling program. The objective was to extend the VN6 graphite mineralization at depth and along strike, and to drill-test three TDEM anomalies identified by the PhiSpy survey.

Contrary to all the previous holes drilled parallel to the geophysical grid, a preferred orientation of 70° toward the north was chosen. Extensive trenching done during the summer combined with information from previous holes (DDH14-35, DDH14-36 and DDH14-37) revealed more details about the direction and schistosity of the rocks. Highlights of the drilling results are presented in Table 10.1.

10.7 DRILLING CAMPAIGN, NOVEMBER 2014

Canada Carbon contracted Foradrill in November 2014 (Grenville-sur-la-Rouge, Quebec) to complete a 12-hole (518 m) BTW-sized diamond drilling program. The objective was to extend the VN6 graphite mineralization at depth and along strike, and to drill-test five TDEM and conductive anomalies identified by the previous survey. Highlights of the drilling results are presented in Table 10.1.

10.8 DRILLING CAMPAIGN, FEBRUARY 2015

Canada Carbon contracted Foradrill in February 2015 to complete a 42-hole (2,525 m) BTW-sized diamond drilling program. The objective was to extend the VN6 graphite mineralization at depth and along strike, and to drill-test TDEM and conductive anomalies identified by the previous survey. Highlights of the drilling results are presented in Table 10.1.

Table 10.1 Significant Results from the Different Drilling Programs

Hole	Lithology	From (m)	To (m)	Interval (m)	Cg (%)
VN1					
VN01-02	0.2-1.8 m: graphite pod 1.8-15 m: silicified marble	0.00	1.35	1.35	7.22
VN2					
VN02-01	0.8-2.70 m: graphite pod 2.70-3 m: wollastonite pod 3-5 m: silicified marble 5-5.6 m: pegmatite 5.6-15 m: silicified marble	1.00 Including 1.00 1.70 3.00 7.50 Including 8.50	3.00 1.30 2.60 7.50 9.60 8.90	2.00 0.30 0.90 4.50 2.10 0.40	32.45 53.60 51.70 2.51 9.65 11.50
VN02-02	0-1.7 m: paragneiss 1.7-5 m: silicified marble 5-10.5 m: quartzite	0.00	4.00	4.00	2.32
VN2					
DDH13-11	0.4-10 m: paragneiss 10-10.9 m: paragneiss with graphite 10.9-13.3 m: silicified marble with graphite 13.3-17.6 m: silicified marble with a pegmatite intrusion 17.6-36 m: white marble with pegmatite intrusion	0.90	36.00	35.10	0.80

table continues...

Hole	Lithology	From (m)	To (m)	Interval (m)	Cg (%)
VN3					
DDH13-14	2-4 m: white marble 4-4.3 m: massive graphite 4.3-8 m: silicified marble with beddings of graphite 8-17 m: marble	2.12 Including 4.0	17.00 7.5	14.88 3.5	4.28 14.37
DDH13-15	2-6 m: marble 6-7.8 m: graphite veins 7.8-20 m : marble	2.10 Including 6.0	20.00 9.6	17.90 3.6	11.17 32.16
VN1					
DDH14-20	2.5-12.9 m: silicified marble and small pegmatite intrusions 12.9-26.4 m: white marble 26.4-28 m: silicified marble 28-28.6 m: bedded graphite in silicified marble 28.6-36 m: silicified marble	2.50	35.64	33.14	0.51
2014					
DDH14-30	2.7-25.5 m : Marble	2.75	25.60	22.85	0.85
DDH14-34	1.4-41 m : Marble 41-49.5 m : Skarn	1.30	49.53	48.23	0.76
DDH14-35	2.7-20.5 m : Marble 20.5-24 m : Skarn 24-33 m : Marble 33-45 m : Skarn 45-49 m : Marble 49-49.5 m : Skarn	2.70 Including 7.6	49.50 10.6	46.80 3.0	1.14 8.60
DDH14-39	1.42-6m : Skarn 6-19.4m : Marble 19.4-27.7m : Skarn 27.7-40.5m : Marble	1.67 Including 31.5	40.5 38.5	38.83 7.0	1.88 5.86
DDH14-45	3-4m : Marble 4-17.85m : Skarn 17.85-19.9m : Marble 19.9-36m : Skarn 36-37m : Marble 37-43.5m : Skarn	3 Including 8.4	43.5 11.4	40.5 3.0	1.26 9.14
DDH14-52	1.25-4.5 m : Skarn 4.5-17.2 m : Marble 17.2-23.2 m : Skarn 23.2-31.3 m : Marble 31.3-45 m : Skarn	1.30	45.00	43.7	0.84
DDH14-55	1.2-23.4 m : Skarn 23.4-24.6 m : Marble 24.6-29.95 m : Skarn 29.95-36.5 m :Marble 36.5-42 m : Skarn	1.70	42.00	40.30	1.05

table continues...

Hole	Lithology	From (m)	To (m)	Interval (m)	Cg (%)
DDH14-57	1-2 m : Skarn 2-4 m : Marble 4-7 m : Skarn 7-7.5 m : Marble 7.5-14 m : Skarn 14-17.7 m : Marble 17.7-45 m : Skarn	1.00	45.00	44.00	1.24
DDH14-58	2-5 m : Marble 5-25.5 m : Skarn 25.5-26.9 m : Marble 26.9-60 m : Skarn	1.90	45.00	43.10	0.95
DDH15-87	0.9-41.8 m: Skarn 41.8-47.6 m: Marble 47.6-70.5 m: Skarn	1.8	71.0	69.2	0.92
DDH15-91a	1.1-27.1 m: Marble 27.1-30.8 m: Skarn 30.8-32.1 m: Marble 32.1-42.0 m: Skarn	1.1	42.0	40.9	2.06
DDH15-91b	0.6-47.4 m: Marble 47.4-51.0 m: Skarn	0.5 Including 28.0	51.0 36.0	50.5 8.0	0.79 7.00
DDH15-94	1.9-20.3 m: Marble 20.3-29.9 m: Skarn 29.9-36.3 m: Marble 36.3-39.0 m: Skarn 39.0-57.7 m: Marble 57.7-61.8 m: Skarn 61.8-63.0 m: Dyke 63.0-70.5 m: Skarn	1.9	70.5	68.7	0.74
DDH15-102	1.5-13.3 m: Skarn 13.3-23.8 m: Marble 23.8-39.4 m: Skarn 39.4-45.8 m: Marble 45.8-55.5 m: Skarn	1.2	56.0	54.8	1.16

10.9 CHANNEL SAMPLES

During the different exploration campaigns, Canada Carbon conducted different phases of trenching and stripping in which channel samples were taken. The channel samples range in size from 0.5 to 1 m and are oriented according to the azimuth of the sampling direction and dip to follow the terrain features.

Channels were treated as drillholes, with each samples plotted along the trace of the channel. Normally, the channel sampling is conducted over known mineralization with the beginning and end of the channel being in the host rock (Figure 10.4). However, some channel samples only cover the mineralization portion of the rock formation.

A total of 171 channel samples were taken on the Miller Property, for a total of 167.1 m. Samples were photographed, described and bagged to be sent for assaying. In some cases, witness half channel samples were left in place (Figure 10.4).

The channel sampling program was planned by SL Exploration Inc. and executed under supervision of Steven Lauzier, P.Geo. The channel locations were surveyed using a regular GPS or the geophysic grid location. No identification markers are left in place at channel sampling sites.

Figure 10.4 Example of Channel Sample Witness (left) and Channel (right)

11.0 SAMPLE PREPARATION, ANALYSIS AND SECURITY

11.1 SAMPLE PREPARATION

Prospecting work followed a protocol determined by Canada Carbon's technical team. To ensure samples and data were collected properly, a clear chain of custody of samples was established from the collection site to the laboratory.

Between 2013 and 2014, Canada Carbon sampled select intervals of drill core to assay; with the intent of highlighting high grade mineralization. One metre samples were taken over visibly graphite mineralised core. Shorter samples were also taken in the richest zone to determine zonation within graphite pods. Longer samples were also taken when recovery was poor.

In 2015, Canada Carbon conducted a systematic drill core sampling campaign of what was left to be sampled. The objective of the sampling was to generate a more complete graphite grade dataset for the Miller Deposit and ensure continuous sampling throughout the deposit. Sample preparation procedures for Canada Carbon are described in the following subsection. Quality assurance (QA)/quality control (QC) is described in Section 11.2.

Drill core was transported from the drill to the camp logging area with an all-terrain vehicle. Sample intervals were determined by the geologist during the geological logging process. Sample intervals were labelled with unique sequential sample identification numbers, on white plastified paper tags, which were: 1) put into the sample bags; 2) left in the sample booklet, and 3) stapled to the core box.

Sample intervals were determined by the geological relationships observed in the core and limited to a 3 m maximum length with no minimum length. An attempt was made to terminate sample intervals at lithological and mineralization boundaries. Sampling was generally continuous from the top to the bottom of the drill hole following the 2015 core sampling program.

Geological parameters were recorded based on defined sample intervals and/or drill run intervals (defined by the placement of a wooden block at the end of a core run). Drill logs were converted to a digital format and added to the database.

The drill core was photographed and then brought into the core shack where it was divided into sample intervals, split in half by a hydraulic splitter, and bagged by the core cutters. If core was not competent, it was split by using a spoon to transfer half of the core into the sample bag.

Once the core was split, half was sent to Actlabs facility in Ancaster, Ontario, for analysis and the other half was initially stored at the camp. Shipment of core samples from the Miller camp occurred after completion of the splitting campaign. Rice bags, containing 10 to 15 poly-bagged core samples each, were marked and labelled with the Canada Carbon name, bag number, and sample numbers enclosed. Rice bags were secured with a tie-wrap for transport by courier or by truck directly to the Actlabs facility.

In addition to the core, control samples were inserted into the shipments at the approximate rate of three standards (3%), one blank (1%) and four duplicates (4%) per 100 core samples:

- Standards: four different standards were used at the Miller Deposit. The core cutter inserted a sachet of the appropriate standard, as well as the sample tag, into the sample bag.
- Blanks: were composed of a standard void of mineralisation. The core cutter inserted a sachet of the blank material, as well as the sample tag, into the sample bag.
- Duplicates: the core cutter split the sample in half, split the half again, and placed two quarter-splits in two separate bags with unique tags and left the witness half in the core box.

11.1.1 Core Drilling Sampling

Core samples were split in half on site and sent to Actlabs. Richer intersections were subdivided into vein and non-vein material. Quarter-splits of the non-vein material were sent to SGS in Lakefield, Ontario, for additional assaying and quarter-splits of the rest (vein material) were sent to Actlabs, which reported their results according to protocol 5D-C.

At Actlabs, the samples underwent preparation RX1-Graphitic, which is drying, crushing with up to 90% passing through a #10 square-mesh screen, riffle splitting (250 gram) and pulverizing to 95% passing a 105 µm square-mesh screen. Graphitic carbon was determined by multistage furnace treatment and infrared absorption, with a 0.05% detection limit using analysis package 4F-C-Graphitic.

SGS prepared the samples by crushing to 75% passing 2 mm, splitting (250 g) and pulverizing to 85% passing 75 µm square-mesh screen. Graphitic carbon was determined by calculating the difference from the carbon assay (after ashing) by tube furnace/coulometer minus the carbonate carbon (after ashing) by coulometry. The remainder of the core was tagged and stored on site.

11.1.2 Channel Sampling

All channel samples were taken perpendicular to the orientation of the veins or pods. Channel samples were sent to Actlabs. Actlabs' results are reported using preparation RX1-Graphitic in which the samples underwent drying, crushing with up to 90% passing through a #10 square-mesh screen, riffle splitting (250 g) and pulverizing to 95% passing a 105 µm square-mesh screen. Graphitic carbon was determined by multi-stage furnace treatment and infrared absorption, with a 0.05% detection limit using analysis package 4F-C-Graphitic. .

11.2 QA/QC

Actlabs is an accredited laboratory meeting international standards International Organization for Standardization (ISO) 9001:2000 with certification:

- No. CERT-0032482
- the Canadian Association for Laboratory Accreditation Inc. Standard ISO/IFC170252005 accreditation No. A3200.

At the laboratory, samples are prepared using preparation RX1-Graphitic by drying, crushing (less than 7 kg) up to 90% passing 10 mesh, riffle splitting (250 g) and pulverizing (mild steel) to 95% passing 105 µm. Graphitic carbon assaying was completed by multistage furnace treatment and infrared absorption using analysis package 4F-C-Graphitic.. A suite of 49 elements were also analyzed in select samples by aqua regia digestion and Varian inductively coupled plasma (ICP) analysis. The multi-element package 1E3 (AR+ICP) comprised gold, cadmium, copper, manganese, molybdenum, nickel, lead, zinc, aluminum, arsenic, boron, barium, beryllium, bismuth, calcium, cobalt, chromium, iron, gallium, mercury, potassium, lanthanum, magnesium, sodium, phosphorus, sulphur, antimony, scandium, strontium, titanium, tellurium, thallium, uranium, vanadium, tungsten, yttrium, and zirconium. Duplicate analyses were performed at the laboratory for the purposes of quality assurance and quality control. No other QA or QC program was established.

11.3 Verification of the QA/QC Data

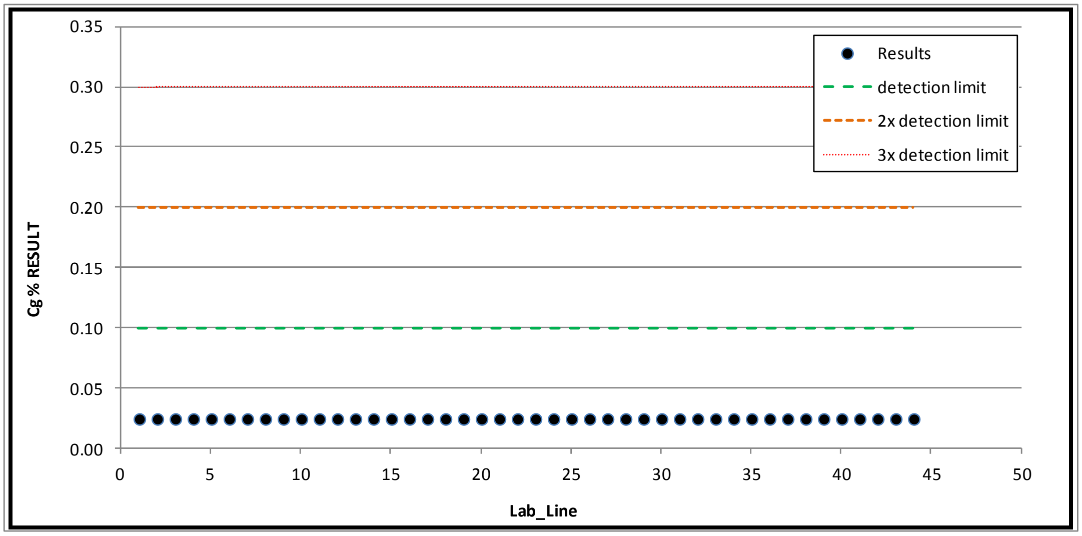
The database transmitted by Canada Carbon contained graphite assay results for 49 blanks samples, 190 field duplicates and 102 standards. The results were compiled and verified by the author to assess the laboratory performance and assay data reliability.

11.3.1 Blank Material Results

A total of 49 analytical blanks were analyzed during the 2013 to 2015 exploration programs. The blank chosen by Canada Carbon is composed of a standard material (GS912-5: pulverized granite) with 0.1% total carbon and void of graphitic carbon.

From the 49 blanks analyzed, 100% of them returned values less than 0.3% total carbon (0% graphitic carbon), which is three times the methods detection limit. Figure 11.1 shows a plot of the variation of the analytical blanks with time. No graphitic carbon was reported for all the blank samples despite the presence of other form of carbon found in the standard.

Figure 11.1 Laboratory Results for Blank Samples

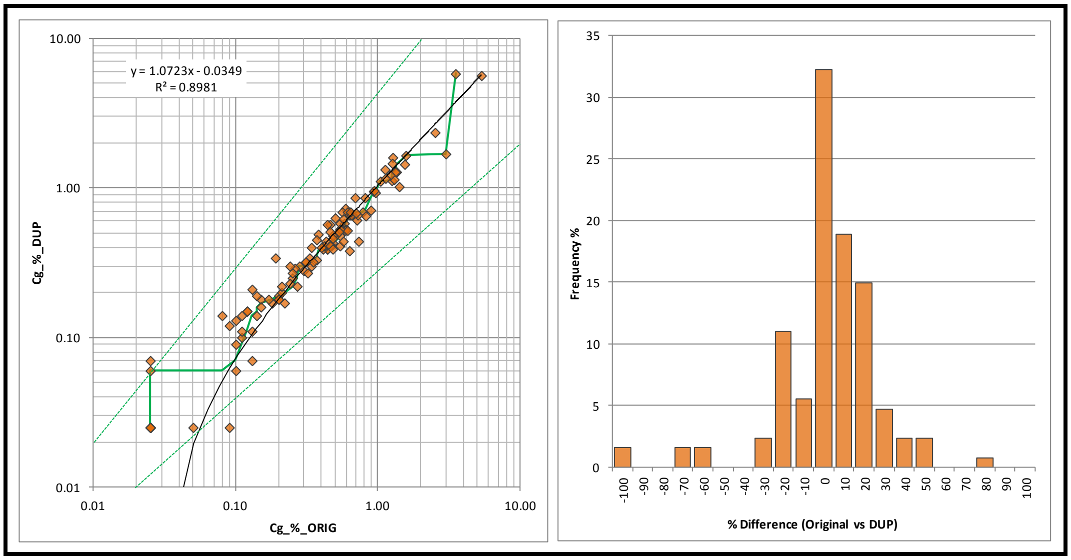


11.3.2 Duplicate Material Results

Sample duplicates were inserted in the sample stream as part of Canada Carbon's internal QA/QC protocol. The sample duplicates correspond to a quarter NQ or BTW core from the sample left behind for reference, or a representative channel sample from the secondary channel cut parallel to the main channel. Figure 11.2 shows correlation plots for the core duplicates.

From 2013, a total of 190 duplicates results analyzed by Actlabs are available. From the 190 core duplicates analyzed only three or 2.4% of the samples fall outside the ±20% range (Figure 11.2). The sign test for the duplicates does not show any bias (41% original < duplicate, 44% original > duplicate, and 15% original = duplicate). The mean of the percentages of difference is -3.24% (Figure 11.2).

Figure 11.2 Laboratory Results for the Duplicate Samples



11.3.3 Standard Material Results

Four different standards were used by Canada Carbon for the internal QA/QC program: two low-grade graphitic carbon (less than 0.4% graphitic carbon; GCC-08 and GCC-07) and two high-grade graphitic carbon (greater than 2.4% graphitic carbon; GGC-04 and GGC-09) standards. All four standards were taken from reference materials bought on the market (Geostats PTY Ltd.) and are certified for using a leach process (for graphitic carbon) and a carbon/sulphur analyzer.

A total of 51 high-grade standards and 51 low-grade standards were analyzed during the 2013, 2014, and 2015 exploration campaigns, representing 2.8% of the samples analyzed, which is under the industry's standard for QA/QC. In order to determine the QC warning (±2x standard deviation) and QC failure (±3x standard deviation) intervals for the standards, the standard deviation parameters are derived from the certificates of the reference material.

From the 25 GGC-04 standards analyzed, none of the results fall outside the QC warning and QC failure intervals, as set by the certificate (Figure 11.3). The mean value of the reported grade is 13.53% graphitic carbon, which is equal to the expected value of this standard.

The GGC-09 standard was inserted a total of 26 times in the sample stream. None of the results from this standard are outside the warning and fail QA/QC performance gates (Figure 11.3). However, a bias is observed in the results from GGC-09 standard. The mean value of the assay result is 2.74% graphitic carbon, with a standard deviation of 0.03, which is 12% higher than the expected value. This difference in results and expected value could be due to the different assaying method used in standard certification (leaching) and Canada Carbon's assays (multi-stage furnace).

Standard GCC-08 was assayed 10 times and again no QA/QC failures are observed (Figure 11.3). However, a bias is observed in the values; where the mean value of the assays is 0.44% graphitic carbon for an expected value Of 0.39% graphitic carbon. One hundred percent of the assays are overestimated by an average of 10% (Figure 11.3). For example in the GGC-09 standard, this bias could be due the different assay methods.

There are 41 results for standard GCC-07 and no QA/QC failures are observed (Figure 11.3). No bias is observed and the average value of the standards is 0.13% graphitic carbon, for an expected value of 0.13% graphitic carbon.

11.4 QA/QC Observation Conclusion

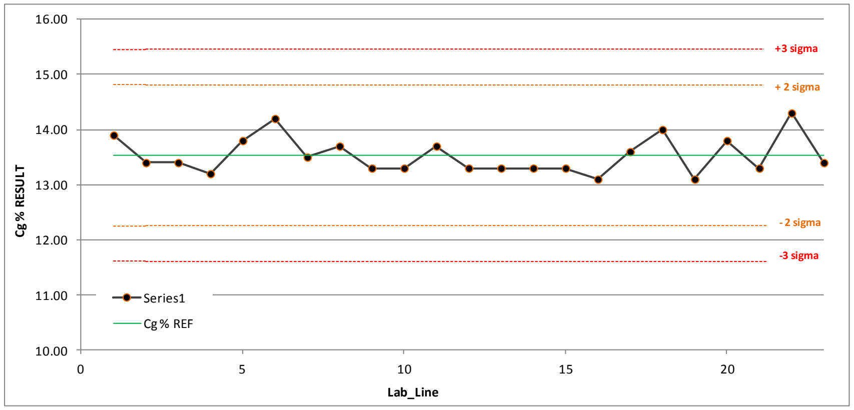
Internal QA/QC results from Canada Carbon indicate good correlation ($R^2 = 0.90$) for the same core duplicates for the principal mineral of economic interest (graphite) for the 2013, 2014 and 2015 drill programs. All values derived from the insertion of blanks into the sample stream by Canada Carbon were within acceptable ranges. No assay values exceeded the QA/QC performance gate. However biases are observed in two of the standards used in the QA/QC process. In both cases, the values seem to be overestimated by an average of 10%.

In SGS's opinion, the Project will benefit from more QA/QC samples included in the sample stream. The biases caused by possible assay method differences between standard certification and Canada Carbon assays should be investigated and fixed. 10% of overestimation could prove problematic especially in assays close to the economical assays grades.

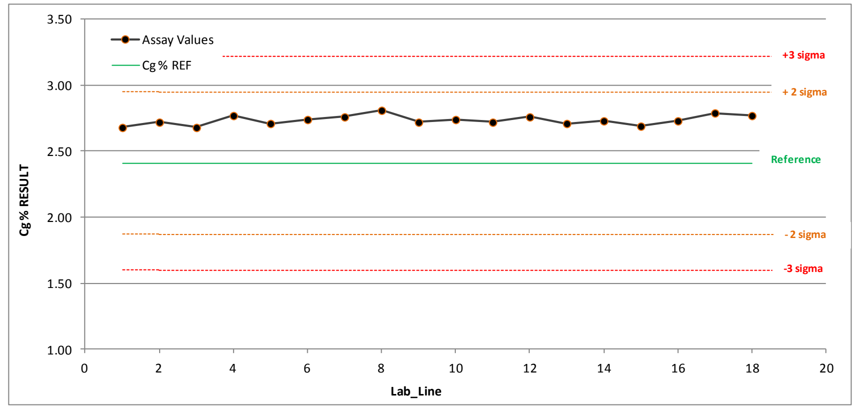
The data is considered acceptable for the estimation of Mineral Resources, but could affect the classification of the Mineral Resources as the QA/QC quantity is limited and the performance of the standards shows bias in two of the four standards.

Figure 11.3 Laboratory Results for the Standard Samples

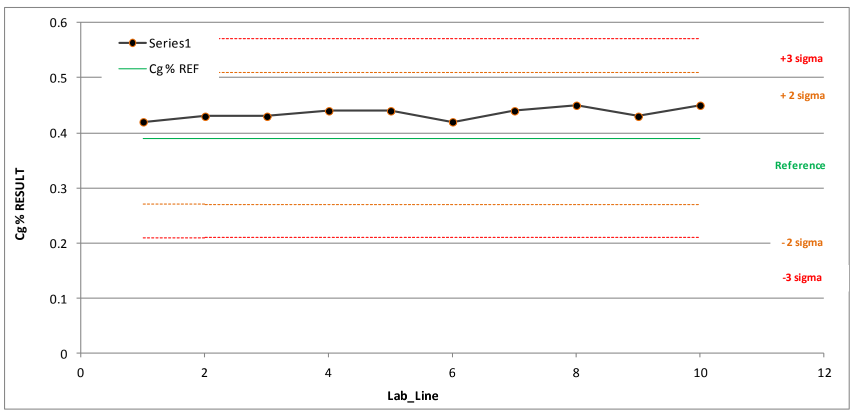
GGC-04



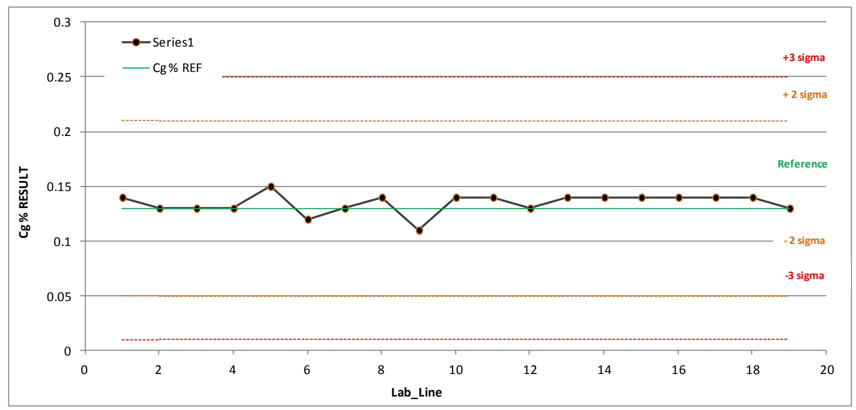
GGC-09



GCC-08



GCC-07



12.0 DATA VERIFICATION

A site visit was conducted by Jean-Philippe Paiement, P.Geo., M.Sc. at the Project site from August 5 to 6, 2015. The observations and comments from that site visit were included in an internal memorandum transmitted to Canada Carbon's representatives on August 10, 2015. The visit enabled the author to get familiar with the exploration methods used by Canada Carbon, the field conditions, the position of the drillhole collars, the core storage and logging facilities and the different exploration targets. During the site visit, Jean-Philippe Paiement of SGS collected a total of 41 control samples from existing drill cores.

The data validation was conducted from three fronts:

- validation of the drilling database
- validation of the QA.QC data (see Section 11.0)
- control sampling program.

12.1 Drilling Database Validation

The database for the Project was first transmitted to SGS by Canada Carbon on July 27, 2015. The database contained values for: 1) collar locations; 2) down hole surveys; 3) lithologies and 4) assays with a graphitic carbon percentage.

The database was transferred in Microsoft® Excel format and was transferred to a Microsoft® Access based logging software (Geobase©) by SGS. This enabled the author to run automatic checks scripts and highlight majors errors and discrepancies in the data. The errors were communicated to Canada Carbon and several iterations of the database were transmitted to SGS until December 10, 2015, at which point the database contained an extra entry table for the marble quality of the core and all of the mineralized marble assays intervals.

Upon importation of the data into the modelling and mineral resources estimation software (Genesis©), SGS conducted a second phase of data validation. At this point all the major discrepancies were removed from the database.

Lastly, SGS conducted random checks on approximately 5% of the assay certificates, to validate the assay values entered in the database.

12.2 CONTROL SAMPLING

During the site visit, the author conducted a check sampling program, re-sampling a total of 41 core samples to verify the presence of graphite mineralization on the Miller Property. The samples were taken from previously sampled intervals and the half cores were split to quarter cores. The graphite was analyzed at ALS Chemex laboratories in Val d'Or for percentages of graphitic carbon. The sampling was conducted by Canada Carbon's technician under the supervision of the author.

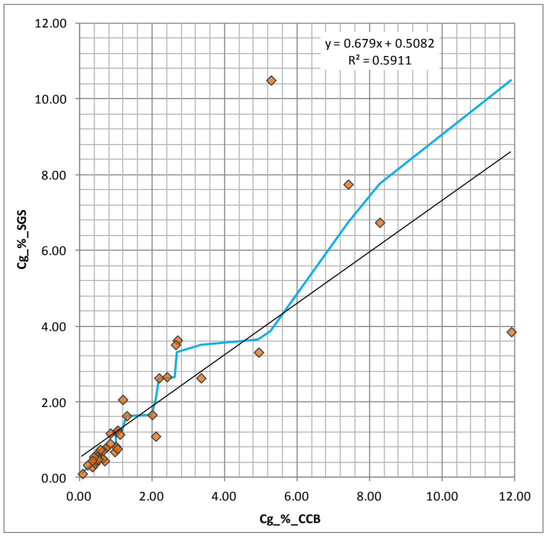
A total of six mineralized intervals (Table 12.1) were sampled to compare the average grade for the two different laboratories. The difference in average grade from the 0.15 m to 13.00 m intervals varies from 3 to 68%. The 68% difference can be explained by the short nature of the sampled interval by Canada Carbon (0.15 m), which was a grab sample of the vein material. Grab samples are biased by nature and the sample was not used in the resource estimate since a longer intersection was also sampled in parallel. The duplicate with a 30% difference can be easily explained by the coarse mineralization that generated a high nugget effect in the sample. The remaining percentage of differences between the average grades are acceptable, and all mineralized intervals were confirmed by SGS (Table 12.1).

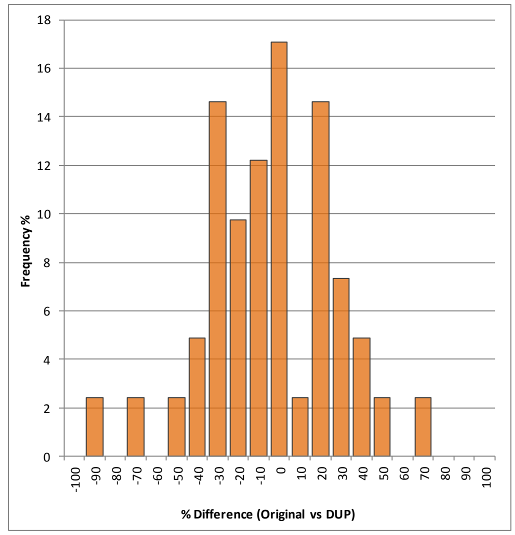
The sample to sample comparison yield a correlation of 0.6 (R^2; Figure 12.1), with the presence of two major outliers. By removing those two samples, the correlation increases to 0.91 (R^2) with an average grade of 1.46% graphitic carbon for both populations. No biases are observed in between the population, but it seems that the values are slightly lower in the initial samples (Canada Carbon; Figure 12.1). This could be explained by a sampling bias or the natural variance of the deposit. Further testing should be conducted in a further QA/QC program to establish the reason underlying this variance.

Table 12.1 Mineralized Interval Comparison between Canada Carbon and SGS

Drillhole	From (m)	To (m)	Canada Carbon (Cg%)	SGS (Cg%)	Difference Intervals (%)
DDH13-04	27.60	27.75	11.90	3.85	68
DDH13-18	12.50	19.00	0.83	0.87	-5
DDH14-46	13.30	19.00	1.87	1.69	10
DDH14-57	18.40	26.60	2.53	2.47	3
DDH15-67	52.00	56.00	0.95	0.66	30
DDH15-67	61.00	74.00	1.15	1.26	-10

Figure 12.1 Control Sampling Results





12.3 CONCLUSION

Following the data verification process and QA/QC review, the author is of the opinion that the data produced by Canada Carbon during the exploration program is of sufficient quality to produce a Mineral Resource estimate. The QA/QC quantity could be increased to the industry's standard of 10 to 15% of the sampling. Furthermore, future sampling should continue to be conducted on all of the cores and samples should continue to be split in order to have the same quantity of mineralization in both half of the core.

Recommendations will be made in Section 26.0 of the report in order to increase the sampling program performances and the integrity of the data collected by Canada Carbon.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 INTRODUCTION

This section summarizes the metallurgical test work conducted for the Project. Two potential mineral values have been identified, namely graphite and marble.

13.2 GRAPHITE

A total of five flotation testing programs, including a pilot plant campaign and several graphite concentrate upgrade tests were conducted using various samples originating from the Miller deposit. The flotation concentration test work was conducted by SGS in Lakefield, Ontario. Several graphite samples were subjected to flotation tests, as well as concentrate purification tests, glow-discharge mass-spectrometry (GDMS) analysis, and crystallinity determination by Raman spectroscopy.

13.2.1 HEAD SAMPLE CHEMICAL ANALYSIS

The head assays for the samples that were evaluated in the five metallurgical programs are depicted in Table 13.1. The head grades varied significantly between 0.53% graphitic carbon and 61.2% graphitic carbon. This is reflective of the different domains that are encountered in the Project, ranging from low-grade disseminated mineralization to high-grade graphite veins.

Table 13.1 Head Grade Analysis

Test Program ID	C(t) (%)	Cg (%)	C(o) (%)	S (%)	Hg (ppm)
14185-001/002	65.1	61.2	<0.05	0.04	-
14185-003	41.6	-	-	-	-
14185-004	6.87	5.91	0.15	0.09	<0.3
14185-005	7.31	0.53	<0.05	0.62	-

Notes: C(t): total carbon; Cg: graphitic carbon; C(o): total organic carbon
All carbon analyses were performed by SGS at the Lakefield facility and are reported as total carbon by LECO or graphitic carbon employing a roast to burn off any organic carbon, followed by a leach to remove any carbonates and LECO assay of the leach residue.

13.2.2 GRINDABILITY TEST

A Bond rod mill grindability test was carried out on the low-grade composite that yielded 0.53% graphitic carbon. The comminution test was carried out at the standard grind size of 14 mesh. The Bond rod mill work index was determined to be 6.1 kWh/t, which is softer than 98% of the more than 2,600 samples in the SGS Bond rod mill grindability database.

13.2.3 Flotation Concentration Test

Batch Flotation Test

The first set of two laboratory flotation tests under Project 14185-001/002 evaluated the metallurgical performance of a vein graphite sample grading 61.3% graphitic carbon. The primary objectives of the flotation tests were to observe the metallurgical response of the Miller graphite to conventional grinding and flotation technologies and to generate samples for purification tests. The circuit consisted of a brief primary grind followed by flash flotation on the mill discharge. The purpose of the flash flotation stage was to recover any liberated coarse graphite flakes prior to the employment of more aggressive secondary grinding conditions. The flash flotation tailings were subjected to a secondary grind using steel rods followed by scavenger flotation. The combined rougher and scavenger concentrate was then subjected to polish grinding using ceramic media and cleaner flotation. In Test F2, three stages of polish grinding and cleaner flotation were employed. A typical reagent regime for graphite projects was chosen in the tests and consisted of fuel oil #2 as the collector and methyl isobutyl carbinol (MIBC) as the frother.

The second test produced a concentrate grade of 93.2% total carbon at an open circuit with a carbon recovery of 97.2%. The results of the size fraction analysis of the 10th cleaner concentrate of Test F2 are presented in Table 13.2. All size fractions greater than 200 mesh yielded concentrate grades of 97.2% total carbon or higher. The majority of the impurities reported to the -200 mesh size fraction, which graded only 84.4% total carbon. The combined concentrate without the -200 mesh product graded 98.1% total carbon, containing 64.7% of the carbon units of the overall concentrate.

Table 13.2 Size Fraction Analysis of 10th Cleaner Concentrate (14185-001 F2)

Product - 10th Cleaner Concentrate	Weight (%)	Assays (C(t)%)	Distribution (C(t)%)
+48 Mesh	11.0	100.0*	11.9
+65 Mesh	10.1	99.1	10.8
+80 Mesh	6.3	97.6	6.6
+100 Mesh	7.5	96.8	7.8
+150 Mesh	13.7	97.4	14.4
+200 Mesh	12.7	97.2	13.3
-200 Mesh	38.7	84.4	35.3
Combined Concentrate	100.0	92.8	100.0
Combined +200 Mesh Fractions	61.3	98.1	64.7

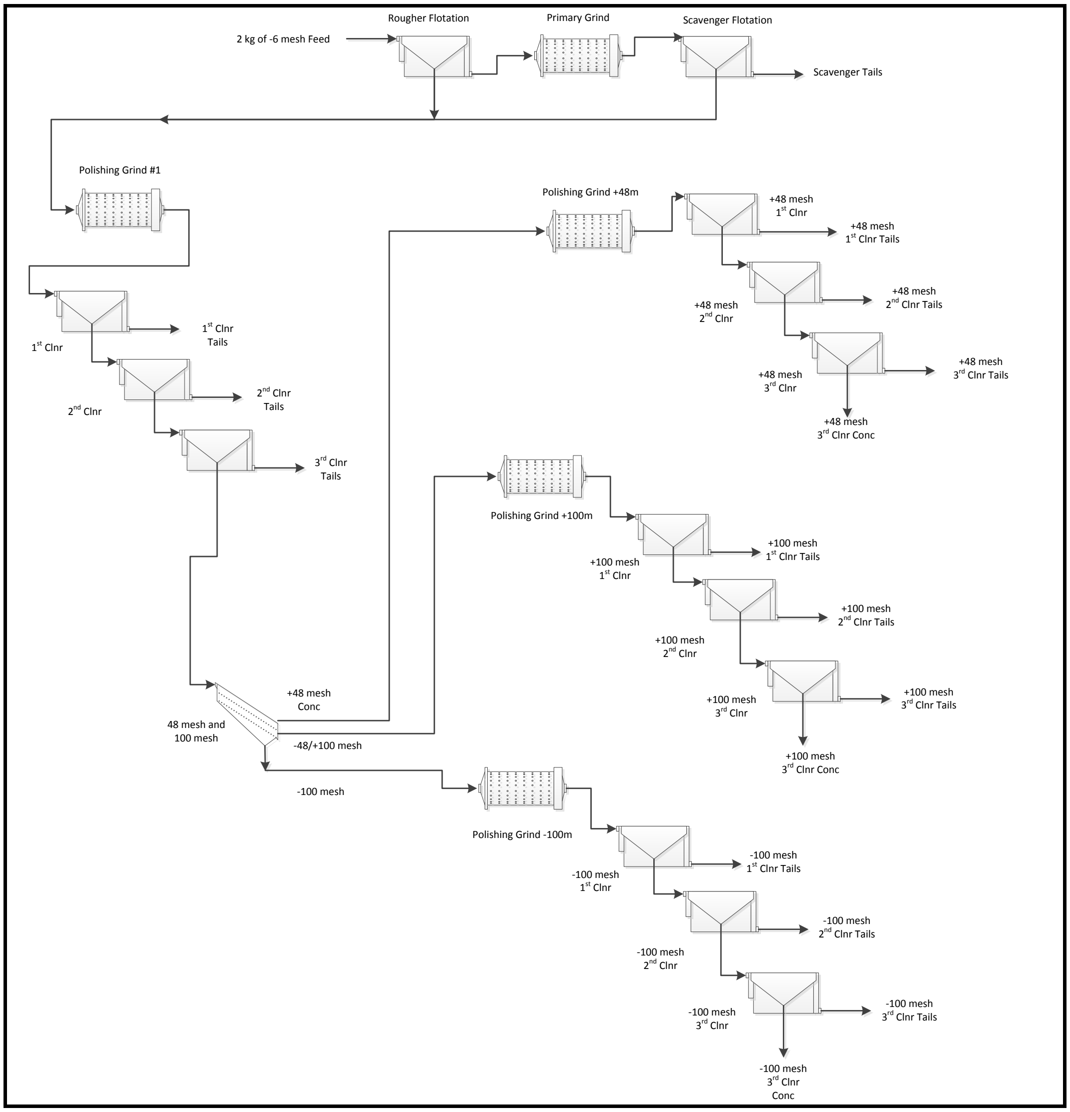
Note: *Any LECO readings greater than 100% C(t) are reported at 100% C(t).

While the results were preliminary in nature, they've provided two valuable insights. Firstly, the fact that the coarser flakes could be upgraded to over 97% total carbon using traditional mineral processing technologies may suggest that the impurities are attached to the outside of the flakes rather than being intercalated within the flake structure. Secondly, the mechanical manipulation that is required for the removal of the impurities is a function of the flake size. It is postulated that in order to achieve high concentrate grades in the smaller size fraction more mechanical manipulation and possibly a different grinding process may be required.

The second metallurgical program for the Miller project was carried out on a 51 kg sample, which was comprised of sub-samples from several different areas of the graphite target. The first sub-sample of 15 kg comprised stockpiled lump graphite remains from the original Miller Mine. The second sub-sample of 36 kg was obtained by cutting the vein with a rock saw from the VN3 mineralization exposed on the surface.

The primary objective of the test program was to develop a conceptual flowsheet for the Miller graphite mineralization that produces a saleable concentrate grading at least 95% total carbon while minimizing flake degradation. The program consisted of seven open circuit flotation tests, which culminated in the flowsheet that is depicted in Figure 13.1. The process flowsheet can be summarized as flash and rougher flotation followed by primary polishing and cleaning of the combined flash and rougher concentrate. The cleaner concentrate of the primary cleaning circuit is then subjected to classification into three size fractions of +48 mesh, -48/+100 mesh, and -100 mesh followed by polishing and cleaning circuits for each size fraction. The separate cleaning of three size fractions was chosen to address the different grinding energy requirements of the various graphite flake sizes.

Figure 13.1 Conceptual Flowsheet for Miller Graphite Mineralization (14185-003, Test F7)



Test F7 produced a combined graphite concentrate yielding 97.0% total carbon at a graphite recovery of 90.2%. The size fraction analysis for the combined concentrate is presented in Table 13.3. The data reveals that all size fractions greater than 400 mesh produced grades of 96.1% total carbon or higher, averaging 98.2% total carbon. The majority of the impurities reported to the finer than 400 mesh product grading 89.8% total carbon. It should be noted that 31.1% of the mass reported to the +65 mesh size fractions at an average grade of 99.6% total carbon.

Table 13.3 Size Fraction Analysis Results for Test F7 (14185-003)

Product - 3rd Cleaner Concentrate	Weight (%)	Assays (C(t)%)	Distribution (C(t)%)
+32 Mesh	3.6	100.0	3.7
+48 Mesh	13.5	99.6	13.9
+65 Mesh	14.0	99.5	14.3
+80 Mesh	7.9	97.9	8.0
+100 Mesh	11.0	98.4	11.2
+150 Mesh	8.3	97.4	8.3
+200 Mesh	10.4	98.1	10.5
+325 Mesh	13.0	96.4	12.9
+400 Mesh	4.6	96.1	4.6
-400 Mesh	13.7	89.8	12.7
Combined Concentrate	100.0	97.1	100.0
Combined +400 Mesh Fractions	86.3	98.2	87.3

Due to the need to generate significant quantities of graphite concentrate for downstream testing, a decision was made to proceed with pilot plant testing based on the results of the 14185-003 test program. The results of the pilot plant campaign are discussed in the following section.

The Miller graphite prospect is characterized by areas with disseminated low-grade graphite mineralization surrounding the vein structures. This disseminated graphite yields significantly lower graphite head grades. In order to assess the metallurgical response of the disseminated graphite, two open circuit cleaner flotation tests were carried out under SGS Project 14185-005 on a sample grading 0.53% graphitic carbon.

The same flowsheet that was developed under 14185-003 was employed in the two tests. The only difference was an adjustment of the classification sizes from 48 mesh and 100 mesh to 80 mesh and 200 mesh, which was the results of an optimization program carried out during the pilot plant campaign.

Despite the lower head grade of only 0.53% graphitic carbon, a combined concentrate grade of 96.4% total carbon at 90.1% open circuit carbon recovery was achieved. As in previous tests, the majority of the impurities reported to the finer size fractions. All products larger than 200 mesh yielded grades of at least 97.0% total carbon. The full size fraction analysis is depicted in Table 13.4. The +200 mesh size fractions graded 97.8% total carbon and represented 76.9% of the total concentrate mass.

Table 13.4 Size Fraction Analysis of Combined Concentrate for 0.53% Graphitic Carbon Feed Sample (14185-005, F2)

Product - 3rd Cleaner Concentrate	Weight (%)	Assays (C(t)%)	Distribution (C(t)%)
+48 Mesh	33.2	98.8	34.1
+65 Mesh	14.2	97.0	14.3
+80 Mesh	6.2	96.8	6.2
+100 Mesh	9.2	96.5	9.2
+150 Mesh	7.4	97.3	7.4
+200 Mesh	6.7	97.2	6.7
+325 Mesh	14.0	94.2	13.7
+400 Mesh	2.1	92.9	2.0
-400 Mesh	7.0	87.0	6.4
Combined Concentrate	100.0	96.4	100.0
Combined +200 Mesh Fractions	76.9	97.8	78.0

In conclusion, the three lab programs covered a wide range of head grades ranging from 0.53% graphitic carbon to 61.3% graphitic carbon. The metallurgical response was robust in that all size fractions greater than 200 mesh produced grades of at least 97% total carbon. The majority of the impurities reported to the -200 mesh product. A more detailed concentrate analysis that was conducted for the low-grade feed sample revealed that the concentrate grades decreased with each size fraction finer than 200 mesh and reached the minimum of 87.0% total carbon for the -400 mesh fines.

Pilot Flotation Test

During September and October 2014, a pilot plant campaign was conducted on approximately 127 t of a bulk sample from the Miller deposit. The information for bulk sample generation is detailed in Section 9.5. The flowsheet that was employed in the pilot plant was the conceptual flowsheet developed at the end of the 14185-003 program. The first run of the pilot plant campaign was based on the flowsheet and conditions of Test F7.

The primary objectives of the pilot plant campaign were (a) to produce graphite concentrates for down-stream evaluation, (b) to demonstrate the robustness of the proposed flowsheet, and (c) to generate process data that can be used to develop the process design criteria for preliminary economic assessment and feasibility study purposes. As shown in Table 13.5, the average head assay on the pilot plant composite indicates that the composite contained 6.78% total carbon, including 5.91% graphitic carbon, and 0.15% total organic carbon. Total sulphur content was 0.09% and the ICP scan did not reveal elevated concentrations of deleterious elements.

Table 13.5 Head Assay – Pilot Plant Test Composite

Element	Unit	Head Sample
LECO		
C(t)	%	6.78
C(g)	%	5.91
S	%	0.09
CO_2	%	2.83
C(o)-LECO	%	0.15
CVAA		
Hg	g/t	<0.3
ICP-OES		
B	g/t	48
Ag	g/t	<2
Al	g/t	44,800
As	g/t	<30
Ba	g/t	226
Be	g/t	1.28
Bi	g/t	<20
Ca	g/t	146,000
Cd	g/t	<2
Co	g/t	<10
Cr	g/t	98
Cu	g/t	11.5
Fe	g/t	23,400
K	g/t	13,900
Li	g/t	7
Mg	g/t	17,300
Mn	g/t	385
Mo	g/t	<5
Na	g/t	15,600
Ni	g/t	<20
P	g/t	407
Pb	g/t	<20
Sb	g/t	<10
Se	g/t	<30
Sn	g/t	<20
Sr	g/t	606
Ti	g/t	3,790
Tl	g/t	<30
U	g/t	<20
V	g/t	54

table continues…

Element	Unit	Head Sample
Y	g/t	27.7
Zn	g/t	35

Note: LECO – a carbon and sulfur assay instrument using the combustion infrared detection technique; CVAA – cold vapor atomic absorption; ICP-OES – inductively couple plasma-optical emission spectrometry

The initial commissioning run, PP-01, was carried out on September 8, 2014 and the final run, PP-22, was completed on October 31, 2014 with a total of 200 operating hours. A total of 22 pilot plant runs, PP-01 to PP-22, were completed. The flowsheet used for the pilot plant campaign consisted of the following circuits:

- primary grinding
- flash flotation
- secondary grinding
- rougher flotation
- primary polish grinding and cleaner flotation
- primary cleaner concentrate classification
- separate secondary polish grinding and flotation of classification products.

The products from different internal and external streams were collected every hour and submitted for total carbon assays. The assay data were used to evaluate the metallurgical performance of the pilot plant and to make adjustments to improve the metallurgical results.

According to the test results and the observations of runs PP01 to PP07, some minor modifications were made to enhance the metallurgical performance of the circuit. This included a change to the classification arrangement of the first cleaner concentrate, and the addition of dewatering the finest size fraction ahead of the secondary cleaning circuit. The dewatering process helped to increase the pulp density in the secondary polishing mill treating the -250 mesh material, thus increasing polishing efficiency. In addition to the flowsheet modifications other process variables such as reagent dosages, air flowrates, and froth removal rates were optimized throughout the entire pilot plant campaign. The modified flowsheet used in pilot plant runs PP-08 to PP-22 is shown in Figure 13.2. In addition to the actual flowsheet, the graph also depicts the metering points of process instrumentation equipment such as power meter, airflow meter, wash water controller, pH meter, redox probe, and auto samplers.

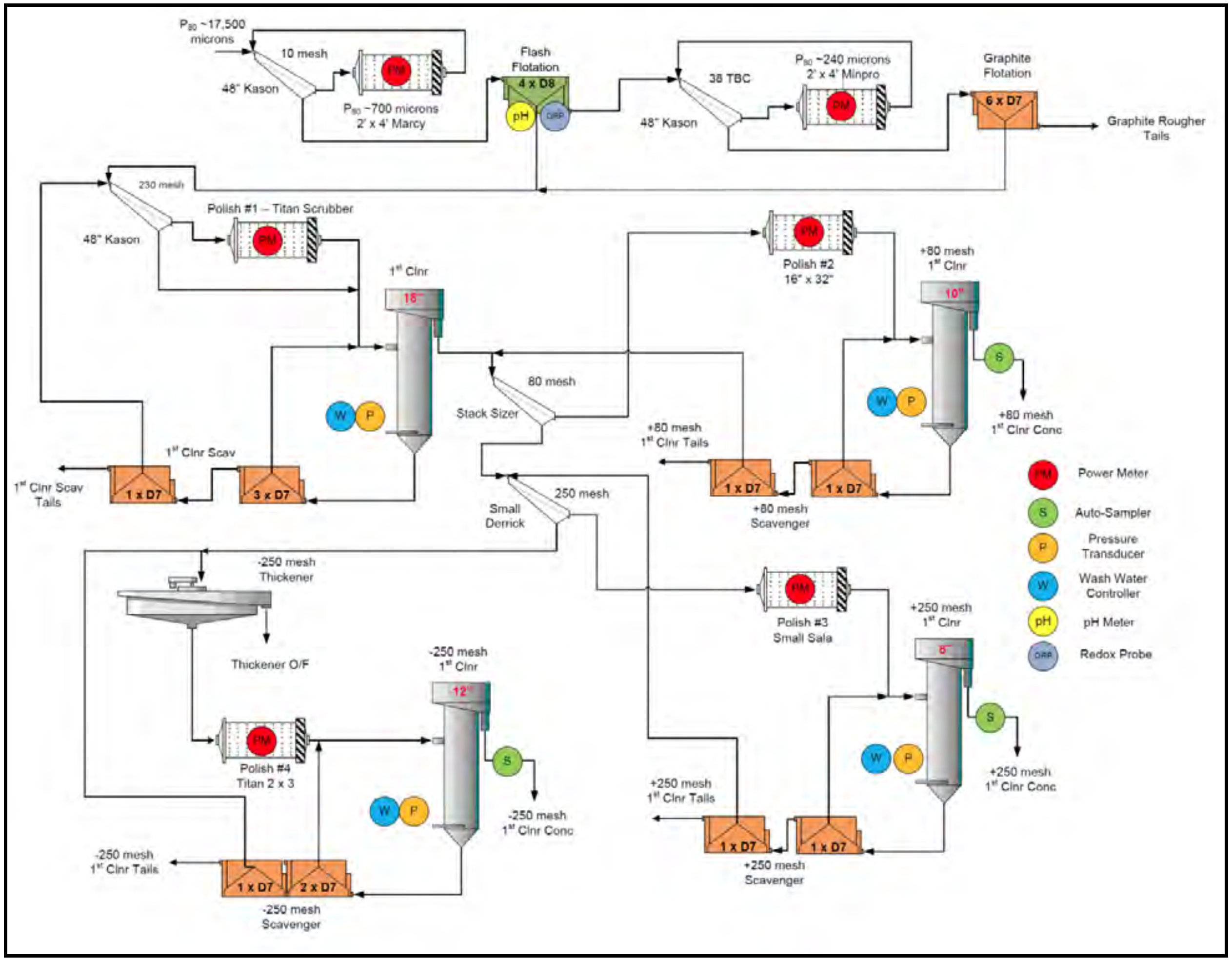
In order to obtain a full circuit mass balance, a total of 11 circuit surveys were carried out when the pilot plant circuit appeared in steady state. The data collected from the surveys, including particle distribution analysis on various streams, was used to quantitatively evaluate the metallurgical performance of the pilot plant circuit. With the data reconciliation software Bilmat™, the overall mass balances were generated using the total carbon grades from all the survey samples.

The average particle size for the pilot plant feed, flash flotation feed, and graphite rougher feed are shown in Table 13.6.

Table 13.6 Average Particle Size of Feed Streams

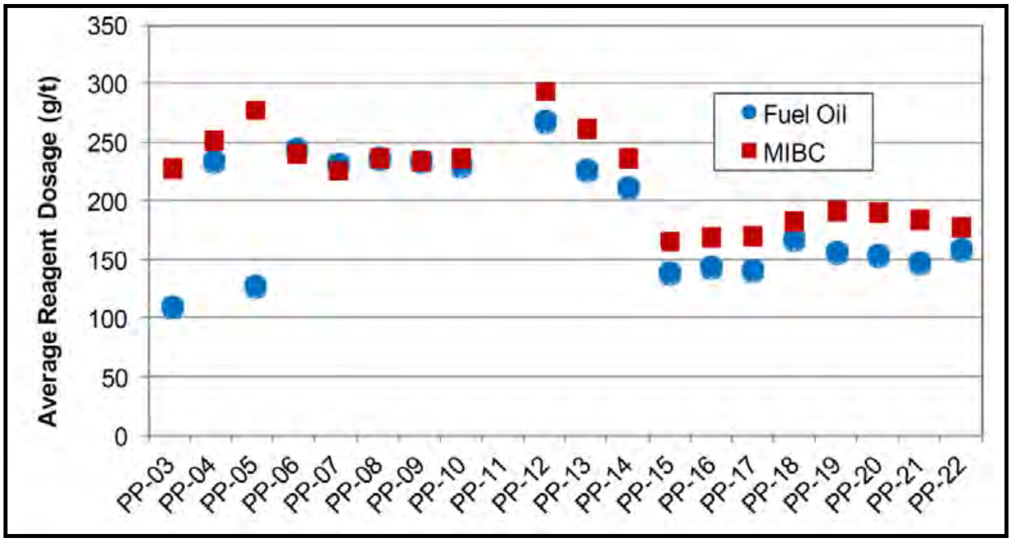
Feed Streams	80% Passing (µm)
Head	17,548
Flash Flotation Feed	689
Rougher Flotation Feed	236

Figure 13.2 Flowsheet for Plant Runs from PP-08 to PP-22



The same reagent regime that was employed in the laboratory scale program was also chosen for the pilot plant, consisting of fuel oil #2 and MIBC. Figure 13.3 depicts the reagent consumption for 19 of the 22 pilot plant runs. The first two runs PP-01 and PP-02 were excluded as they were deemed mechanical commissioning runs. Based on the results of the pilot plant runs PP-15 to PP-22, SGS estimated that the optimized reagent dosages for both fuel oil and MIBC would be between 140 and 170 g/t.

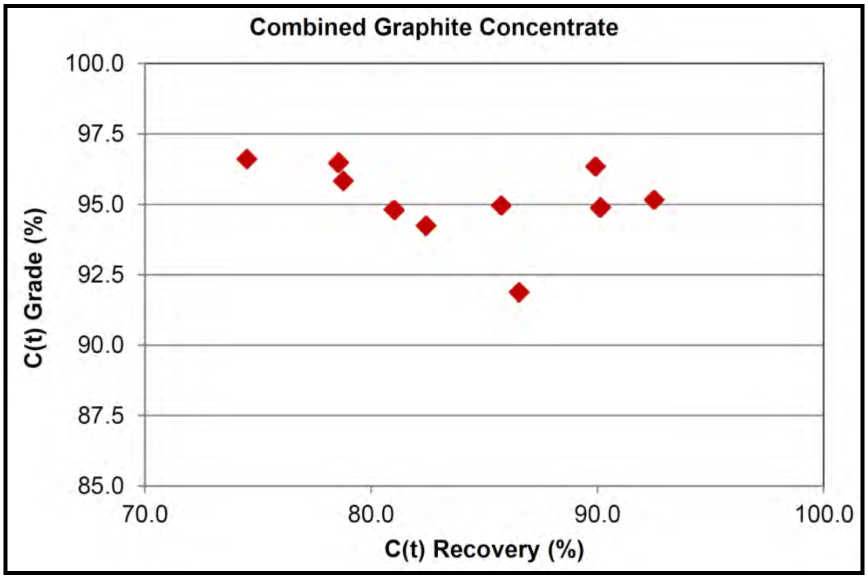
Figure 13.3 Reagent Consumption – Pilot Plant Runs



Mass balance results from the 11 circuit surveys indicate that the pilot plant produced an average final concentrate grade of 95.1% total carbon, ranging from 91.9 to 96.6% total carbon. The average carbon recovery was 84.0%, ranging from 74.5 to 92.5%. The average head grade for these pilot plant runs was 7.63% total carbon.

The total carbon grade of the combined concentrates versus the total carbon recovery into the combined concentrate of 10 circuit surveys is depicted in Figure 13.4. The survey results from the PP-20 run with a total carbon recovery of 58.3% were because the flash and rougher flotation conditions were too selective. For most projects and commodities, the recovery decreases as the concentrate grade increases. However, in the case of the Miller bulk sample that was processed in the pilot plant, high concentrate grades were maintained, even as the circuit carbon recoveries exceeded 90%. The plant surveys that were conducted at more selective flotation conditions were aimed to determine the maximum concentrate grade that can be achieved with the flotation circuit while accepting lower carbon recoveries. However, since more selective flotation conditions failed to further improve the concentrate grades, SGS recommended more aggressive operating conditions to maximize carbon recoveries while maintaining a high concentrate grade. It should be noted that the lowest concentrate grade of 91.9% was obtained from the PP-05 run at the beginning of the pilot plant campaign when operating conditions were still being optimized.

Figure 13.4 Carbon Recovery vs. Carbon Grade –Combined Graphite Concentrate



The combined graphite concentrates collected during each survey, starting from PP-08, were screened for particle size analysis, followed by a total carbon analysis on the various size fractions. The mass recovery into the various size fractions and the corresponding total carbon grades are depicted in Figure 13.5 and Figure 13.6, respectively. The particle size of the final concentrates from the surveys ranged between 80% passing 203 µm and 242 µm with an average particle size of 80% passing 217 µm.

The average grade of the coarser than 80 mesh size fraction was 98.2% total carbon at an average mass recovery of 31.3%, ranging between 26% and 42%. An average of 25.6% of the concentrate mass reported to the medium flake size fraction (smaller than 80 and larger than 150 mesh) with an average grade of 97.6% total carbon. The balance of 43.1% of the concentrate mass reported to the small flake fraction (finer than 150 mesh) with a grade of 92.6% total carbon.

Figure 13.5 Final Concentrate Mass Distribution by Size Fraction

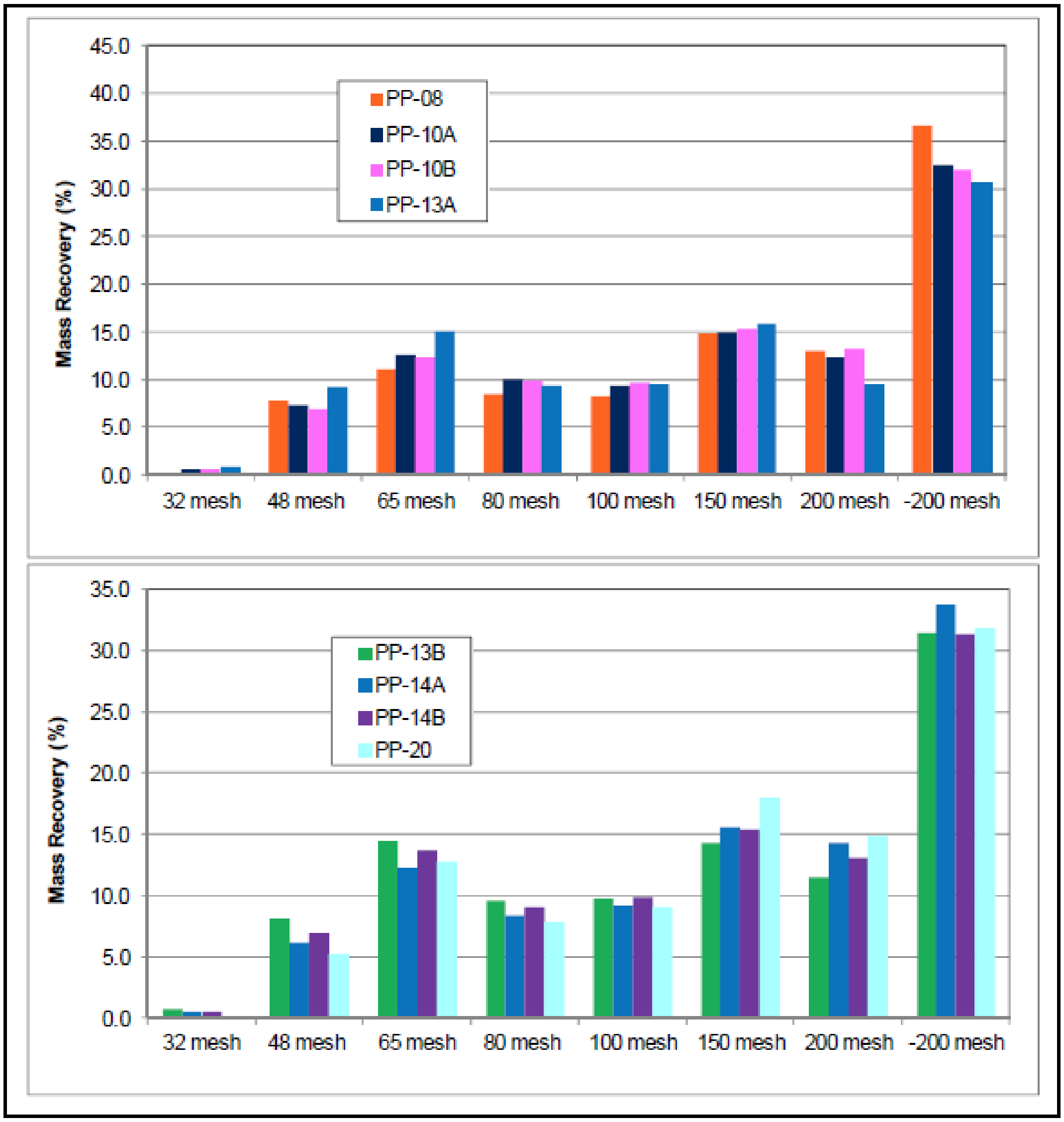
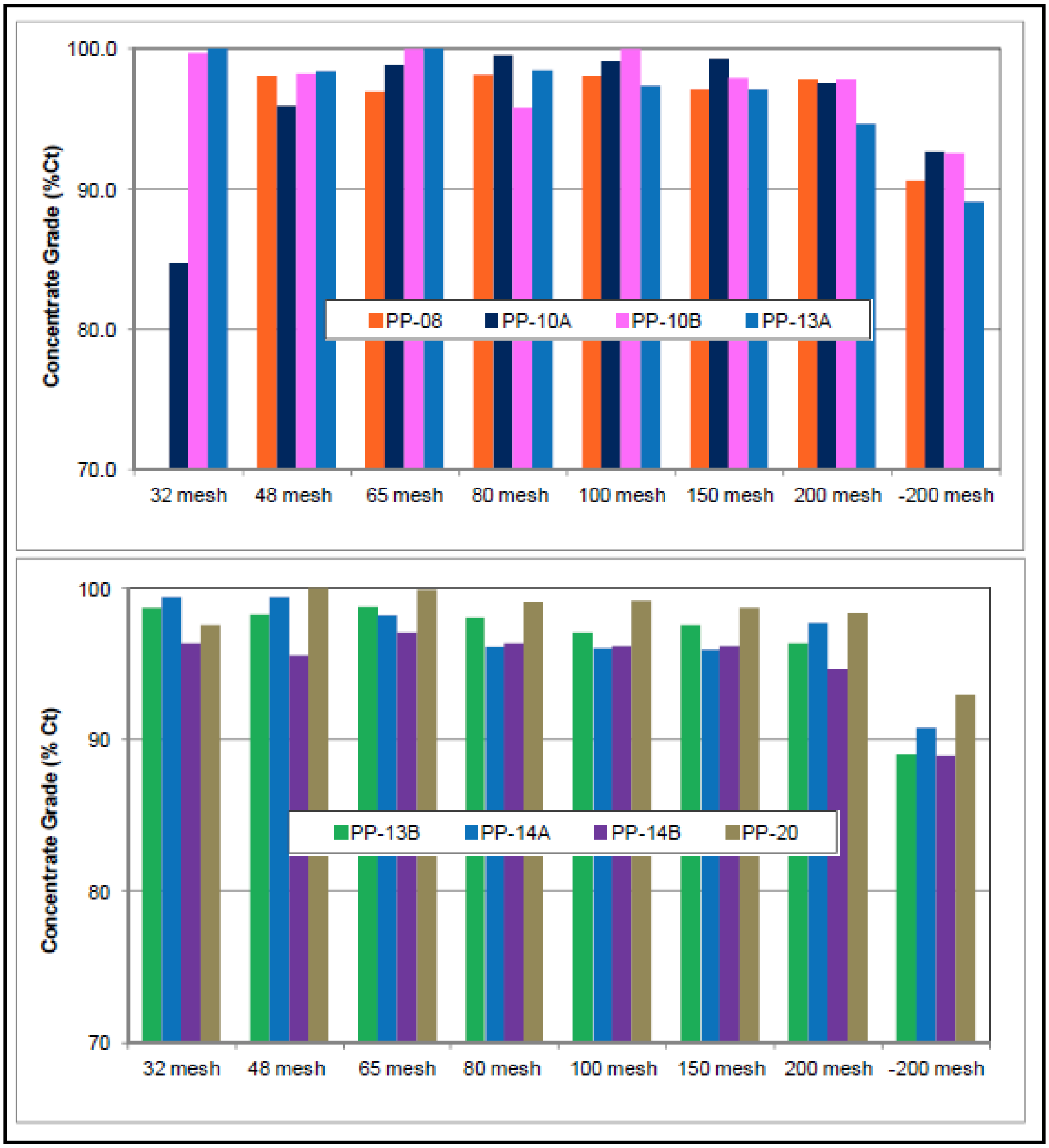


Figure 13.6 Final Concentrate Grades by Size Fraction



The average final concentrate size fraction analyses on eight survey samples are presented in Table 13.7. The average grade of the +80 mesh size fraction was 98.2% total carbon at an average mass recovery of 31.4% of the concentrate. An average of 25.6% of the concentrate mass reported to the medium flake size fraction (-80/+150 mesh) at an average grade of 97.6% total carbon. The concentrate mass reported to the small flakes fraction (-150 mesh) was 43.1% at an average grade of 92.6% total carbon.

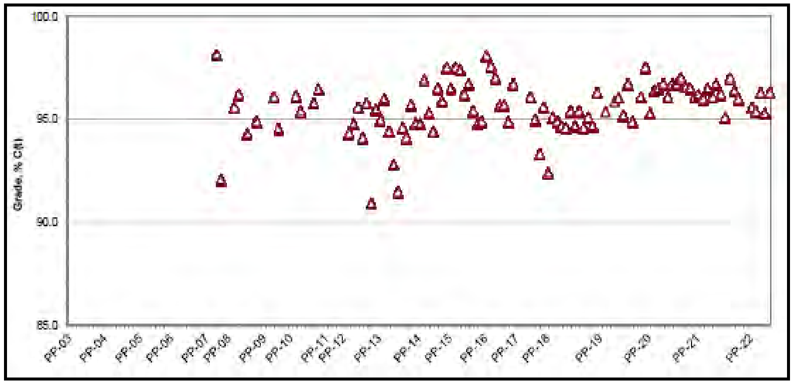
Compared to the bench test results, it appears that the pilot plant produced a final concentrate with the finer particle size distribution. SGS indicated that these results suggest that the polishing conditions in the pilot plant operation may have been too aggressive. A decision to choose more aggressive polish grinding conditions was made in collaboration with the client to ensure concentrate targets were met. A full optimization of the circuit including polish grinding conditions would have taken significantly more time than the allotted 200 hours of operation.

Table 13.7 Total Carbon Assay on Different Size Fractions of Combined Concentrate from Eight Surveys

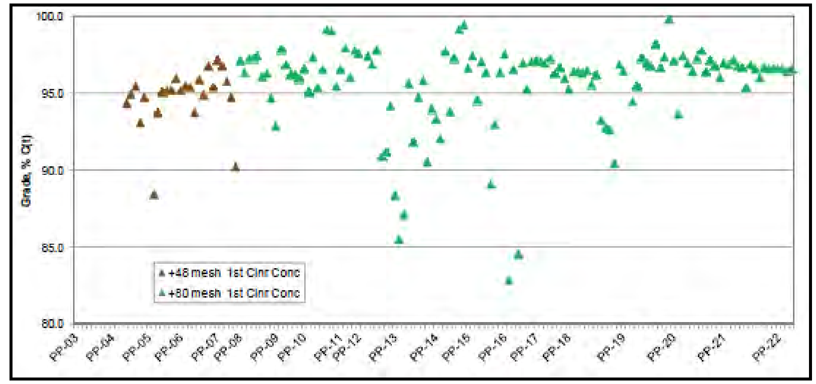
Size (mesh)	Average Mass Distribution (Wt%)	Average Grade (%C(t))
32	0.5	96.4
48	7.6	98.2
65	13.7	98.5
80	9.5	98.0
100	9.8	97.7
150	15.8	97.5
200	12.5	96.8
-200	30.6	90.9
Total (Calc)	100.0	95.6

The assay data of the grab samples collected from different pilot plant runs are summarized in Figure 13.7 illustrating the stability of the circuit in the second part of the campaign once flowsheet modifications were completed and process variables optimized.

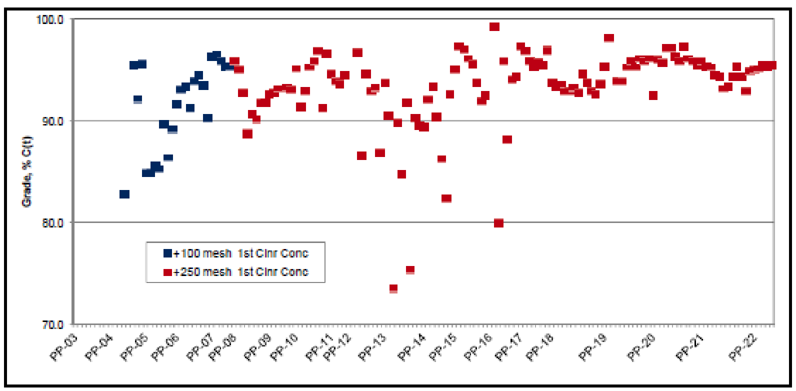
Figure 13.7 Final Cleaner Concentrate Grade Profiles from Grab Samples



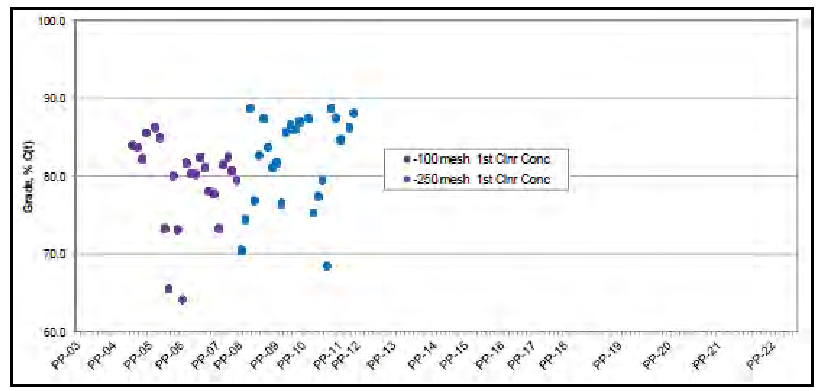
Combined Concentrate (All Fractions)



+48 mesh or +80 mesh



+100 mesh or +250 mesh



-100 mesh or -250 mesh

The profiles of all grab and survey samples of the combined concentrate are depicted in Figure 13.8 (+48, +65, and +80 mesh size fractions) and Figure 13.9 (+100, +150, +200, and -200 mesh size fractions), respectively. The results show that consistently high concentrate grades were achieved in PP-04 immediately after mechanical commissioning of the circuit. All size fractions of 200 mesh and coarser consistently produced concentrate grades of 96% total carbon or higher with the exception of a few samples.

The combined concentrate from the PP-10B circuit survey that is highlighted with a red rectangle was screened and assayed by LECO before the size fractions were shipped directly to Evans Analytical in Syracuse, New York.

The as-received concentrates were subjected to a glow discharge mass spectrometry (GDMS) analysis to quantify the impurities in the different size fractions. The GDMS analysis is more suited for graphite concentrates with high carbon contents compared to the LECO as the measurement error of the GDMS analytical method is significantly smaller. It is able to quantify impurities at trace concentrations in high-purity inorganic solids and to quantify concentrations of up to 73 chemical elements in a single analysis. However, the required time and costs of the GDMS analysis limits its application to a small number of samples.

The results of both the LECO and GDMS are presented in Table 13.8. All analyzed size fractions produced values of 99.38% total carbon or higher using GDMS analysis. As expected, the amount of impurities for the majority of graphite concentrates decreased as the size fractions increased. In contrast, the concentrate grades using LECO varied between 97.6% and 100% total carbon for the same size fractions. It should be noted that the GDMS results are conservative as any elements measured below their detection limit were assigned their detection limit as a value for impurity calculations.

Figure 13.8 Combined Concentrate Grade Profile (+48, +65, and +80 mesh)

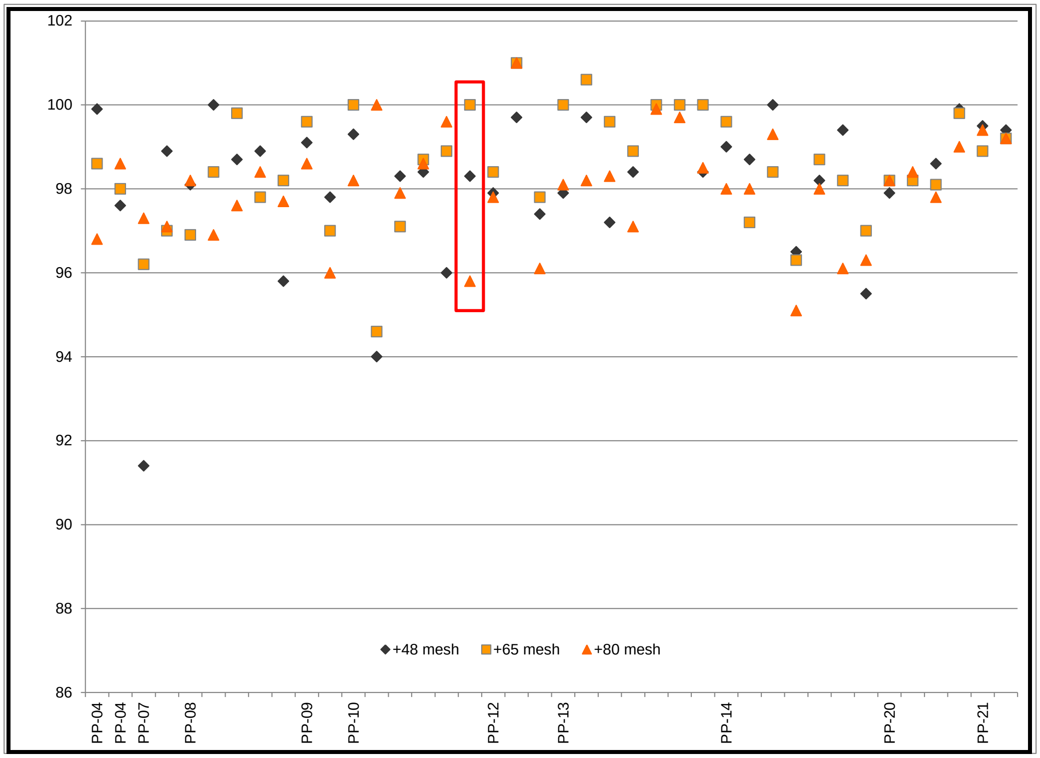


Figure 13.9 Combined Concentrate Grade Profile (+100, +150, -200 and +200 mesh)

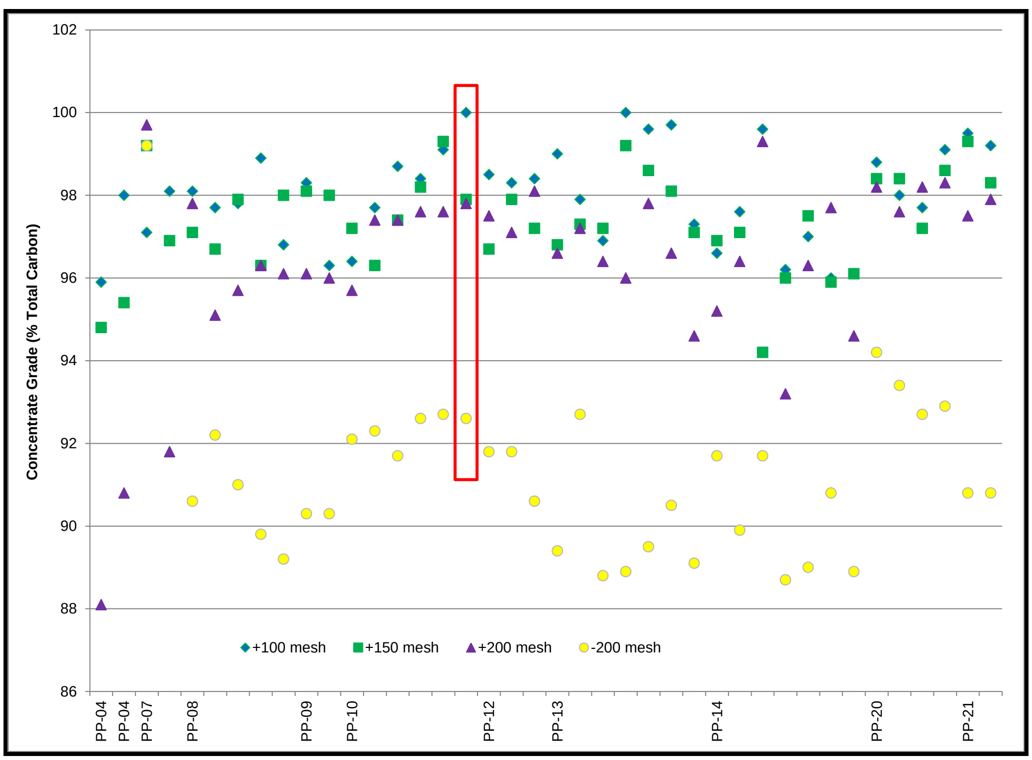


Table 13.8 Results of Analysis of Combined Concentrate by LECO and GDMS

Size Fraction	Percentage of C(t) by LECO (%)	Percentage of C(t) by GDMS (%)
+32 mesh	99.7	99.74
+48 mesh	98.3	99.73
+65 mesh	100	99.70
+80 mesh	97.6	99.63
+100 mesh	100	99.63
+150 mesh	97.9	99.52
+200 mesh	97.8	99.38
-200 mesh	92.6	Not Submitted

SGS derived following conclusions from the pilot plant campaign:

- The grab samples revealed that the circuit reached a good stability shortly after the commissioning runs.
- Circuit mass balances for runs PP-05 to PP-20 indicated that the plant produced a final concentrate with a grade ranging from 91.9 to 96.6% total carbon and a carbon recovery between 74.5 and 92.5%. The average head grade, final concentrate grade, recovery, and mass pull into concentrate were 7.63% total carbon, 95.1% total carbon, 84.0%, and 6.71%, respectively.
- Screen analyses were conducted on eight survey samples of the combined concentrate during the PP-08 to PP-20 runs. The results indicated that the 80% passing particle size of the final concentrates ranged between 203 and 242 µm with an average 80% passing particle size of 217 µm. The average mass recovery as a proportion of total concentrate to the +80 mesh, -80 mesh to +150 mesh, and -150 mesh size fractions was 31.3%, 25.6%, and 43.1%, respectively. The average final concentrate graded 95.6% total carbon.
- The average final concentrate grade derived from grab sample assays was 95.6% total carbon, which was consistent with the average grade from the survey samples at 95.1% total carbon. The average final concentrate grade of the pilot plant was also consistent with the concentrate grade obtained from bench test F1 at 94.4% total carbon. However, the recovery of the pilot plant was 6.5% higher than the bench test.

A review of the size fraction analyses of the pilot plant surveys reveals consistent results between the laboratory and the pilot plant testing and indicates that that the majority of the impurities reported to the finer than 200 mesh size fraction. The enrichment of impurities in the finer size fractions is characteristic for graphite deposits that impurities are entrained on the surface of the graphite flakes rather than intercalated within the graphite flake.

13.2.4 CONCENTRATE UPGRADING TESTS

SGS conducted preliminary chemical upgrading tests on different graphite flotation concentrates to remove silicates and other impurities from the graphite flotation concentrate. Two methods were evaluated in the upgrading test:

- Hydrofluoric acid leaching
- Alkaline roasting followed by hydrofluoric acid leaching.

Preliminary thermal upgrading tests have also been conducted, including a preliminary test by a commercial processor of synthetic nuclear graphite using a proprietary thermal upgrading process on a randomly selected flotation concentrate sample produced from the pilot plant flotation trials at SGS.

HYDROMETALLURGICAL UPGRADING

The +48 mesh graphite flotation concentrate that was generated in the first SGS flotation test F1 under SGS program 14185-001 on samples was treated by two different hydrometallurgical leaching methods. The objective was to determine the maximum concentrate grade that could be achieved with a flotation concentrate grading 94.4% total carbon and 93.5% graphitic carbon.

The hydrofluoric acid leaching test was conducted in two stages. The first stage involved mixing the feed sample with concentrated sulphuric acid (96% sulphuric acid) and water before concentrated hydrofluoric acid (48% hydrofluoric acid) was added to the mixture. The resulting slurry was heated to 90°C. After 300 minutes, water was added to the slurry. The slurry was stirred for an additional 60 minutes at 90°C. At the completion of the test, the slurry was filtered and the residue was thoroughly washed before the upgraded graphite was subjected to chemical analysis. The test conditions and test results are shown in Table 13.9 and Table 13.10, respectively. The purified concentrate was subjected to total carbon, graphitic carbon and double LOI analysis. Depending on the method, the results ranged between 99.2% graphitic carbon and 100% total carbon.

Table 13.9 Acid Leaching Test Conditions

Test ID	Feed Mass (g)	Particle Size (mesh)	HF (kg/t feed)	H_2SO_4, (kg/t feed)	Leach Retention Time (min)	Temperature (°C)
CC-T1	20	+48	334	864	360	90

Note: H_2SO_4 – sulphuric acid; HF – hydrofluoric acid

Table 13.10 Acid Leaching Test Results

C(t) (%)	C(g) (%)	LOI (%)	LOI @ 500°C (%)	S (%)
Initial Graphite Grade				
94.4	93.5	95	n/a	0.03
Final Graphite Grade				
100	99.2	100.8	0.55	0.02

Note: LOI – loss on ignition

Alkaline Roasting + Hydrofluoric Acid Leaching

Another sample of the flotation concentrate which was subjected to the hydrofluoric acid leach described above, was also submitted to a 2-stage hydrometallurgical process consisting of an alkaline roast and hydrofluoric leach.

The alkaline roasting process consisted of a caustic bake followed by a dilute acid leaching. The caustic bake was conducted at a temperature of 400°C in a muffle furnace after the graphite concentrate was mixed with sodium hydroxide in solution. The baked mixture was then subjected to a water leach with deionized water followed by an acid leach with 10% sulphuric acid.

In the second processing stage, the remaining residue was further leached with a hydrofluoric acid/sulphuric acid mixture to remove any remaining impurities. The test conditions and results are shown in Table 13.11 and Table 13.12 respectively.

Table 13.11 Alkaline Roasting + Hydrofluoric Acid Leaching Test Conditions

Test ID	Feed Mass (g)	Particle Size (mesh)	HF (kg/t feed)	H_2SO_4, (kg/t feed)	NaOH, (kg/t feed)	Retention Time (min)	Temperature (°C)
Alkaline Roast	30	+48	-	-	833	60	400
HF/H_2SO_4 Leach	18	+48	370.7	960	-	360	90

Note: NaOH – sodium hydroxide

Table 13.12 Alkaline Roasting + Hydrofluoric Acid Leaching Test Results

C(t) (%)	C(g) (%)	LOI (%)	LOI @ 500°C (%)
Initial Graphite Grade			
94.4	93.5	95	n/a
Product - Stage I: Alkaline Roast			
100	99.1	101	1.04
Product - Stage II: HF/H_2SO_4 Leach			
100	100	101	0.73

The two-stage caustic roasted/acid leached sample was submitted for full chemical analysis using GDMS analysis technology. Total measured elemental impurities were 246 ppm by weight, thus corresponding to a concentrate grade of approximately 99.97% total carbon.

In October 2014, SGS conducted another caustic bake test followed by dilute acid washing on a flotation concentrate sample collected from the pilot plant campaign PP-10. This is the same campaign that generated the flotation samples that were subjected to GDMS analysis. The purification work involved a three step process:

- caustic baking at 400°C
- washing of the baked product
- dilute sulphuric acid leach and wash to neutralize any residual caustic soda and to remove impurities which are insoluble in caustic solution.

The flotation concentrates prior to purification and the caustic bake upgraded concentrate were screened into five particle size fractions. The five size fractions of the flotation concentrate and the purified graphite were subjected to purity assessment by GDMS. The analysis results are shown in Table 13.13.

The carbon purities of the flotation concentrate ranged between 98.43% for the -325 mesh product and 99.85% for the -48/+80 mesh size fraction. The Equivalent Boron Content (EBC) ranged between 1.351 ppm and 6.881 ppm. The carbon purities increased to 99.979% for the -325 mesh size fraction and were as high as 99.9942% for the -80/+150 mesh size fraction. The mass-weighted average carbon purity for the entire sample was 99.9925%. Using the GDMS results, the EBC value was estimated in a range from 0.720 to 0.824 ppm for the individual size fractions.

Table 13.13 Alkaline Roasted Concentrate Fraction Assay Results by GDMS

Particle Size (mesh)	Flotation Concentrate		Caustic Baked Flotation Concentrate	
	Carbon Purity[1] (%)	EBC[2] (ppm)	Carbon Purity[1] (%)	EBC[2] (ppm)
+48	99.79	1.550	99.9929	0.737
-48+80	99.85	1.351	99.9939	0.720
-80+150	99.77	1.411	99.9942	0.737
-150+325	99.54	2.141	99.9929	0.777
-325	98.43	6.881	99.979	0.824

Notes: [1]Carbon purity was calculated by difference, 100% minus (sum of all impurity concentrations (%)). Reported carbon purity values were rounded to two significant digits. Reported GDMS elemental contaminant concentrations when added to the reported carbon purities, may not add to 100%, due to rounding error. Only the actual concentration of the various elements is considered and not their oxide form.
[2]Equivalent Boron Content (EBC) of the graphite is calculated from the impurity concentrations obtained by GDMS, as defined in ASTM Method C1233-09, "Standard Practice for Determining Equivalent Boron Contents of Nuclear Materials", in conjunction with ASTM Standard D7219-08, "Standard Specification for Isotropic and Near-isotropic Nuclear Graphites", which lists the 16 elements of concern with respect to the EBC criterion. EBC is a means of estimating the potential for the impurities contained in the graphite to absorb neutrons when exposed to the controlled neutron flux within a nuclear reactor. Any impurities absorbing neutrons would adversely affect the rate and the control of the nuclear chain reaction. EBC is calculated as the sum of the EBC of each impurity, such that EBC (impurity) = (EBC factor for impurity) multiplied by (concentration of impurity (ppm)). Each EBC factor was obtained from Table 1 of ASTM Method C1233-09. Desired maximum EBC levels are typically between 1 and 3 ppm, depending on the specifications of end-users.

Thermal Upgrading

In 2013 EAG conducted a rapid thermal upgrading (RTU) test on a coarser than 65 mesh (210 µm) flotation concentrate produced by a bench-scale scoping level flotation program under SGS Project 14185-001. RTU is a method for quickly eliminating heat-labile impurities from a graphite sample by exposing the sample to high heat in the presence of an inert atmosphere. The thermal upgrading results by the RTU procedure show that the total impurity concentration can be reduced from 609 to 236 ppm, after a three minute heat treatment at a temperature of 2,300°C in a helium atmosphere.

The sample that was subjected to two-stage caustic roast/acid leaching described in section 13.2.4 was further treated by the rapid thermal upgrading conducted by EAG using the following conditions:

- flowing helium atmosphere (100 mL/min)
- temperature of 2,000 to 2,200°C
- suration of 10 minutes.

Total measured impurities after heat treatment were less than 23 ppm, compared to greater than 246 ppm impurities by weight before heat treatment. More than 90% of the contaminants were removed from by rapid thermal upgrading, yielding carbon purity of 99.9978%.

Specific elements which were found in the pre-treated sample, but no longer detectable after thermal treatment included chromium, copper, iron, lead, magnesium, manganese, phosphorus, strontium, titanium, yttrium, zinc, and zirconium. In addition, aluminum, boron, calcium, chlorine, silicon, sodium, and sulphur were also reduced significantly (decreased by 50% or more).

In 2015, a randomly selected sample of the flotation concentrate (96.6% total carbon) produced from pilot plant flotation trial PP-10 conducted at SGS was treated by a proprietary thermal upgrading process employed by a commercial processor of synthetic nuclear graphite. After the concentrate sample was dried in an oven, the sample was thermally treated and upgraded to approximately 99.9998% total carbon purity without a hydrometallurgical process. The thermal upgrading test was conducted at a temperature of approximately 2,200 to 2,300°C in an inert atmosphere.

The GDMS assay showed that ultra-trace amounts of six elemental contaminants were detected:

- boron 100 ppb
- sodium 400 ppb
- copper 100 ppb
- zinc 80 ppb
- iron 90 ppb
- silicon 1,700 ppb.

In 2015 a further thermal upgrading test was conducted using the proprietary thermal upgrading procedure by the commercial nuclear graphite processor. The concentrate used for the testing was blended from the concentrates generated from two bench-scale flotation tests under SGS program 14185-005 on a sample with a calculated head grade of 0.53% graphitic carbon. The average grade of the blended concentrate was approximately 96% total carbon. The upgrading tests yielded graphite of approximately 99.9995% total carbon purity, with an EBC value of 0.917 ppm, as determined by GDMS. The GDMS analysis revealed the ultra-trace concentrations of nine elements:

- boron 300 ppb
- sodium 500 ppb
- aluminum 100 ppb
- silicon 3,000 ppb
- phosphorus 200 ppb
- potassium 200 ppb
- calcium 600 ppb
- iron 90 ppb

- tungsten 200 ppb.

Canada Carbon assumes that the contaminants identified following thermal treatment may associate with the hydrothermal matrix, rather than with the crystalline graphite itself, due to the high correlation between silicon content and all other measured elemental contaminants.

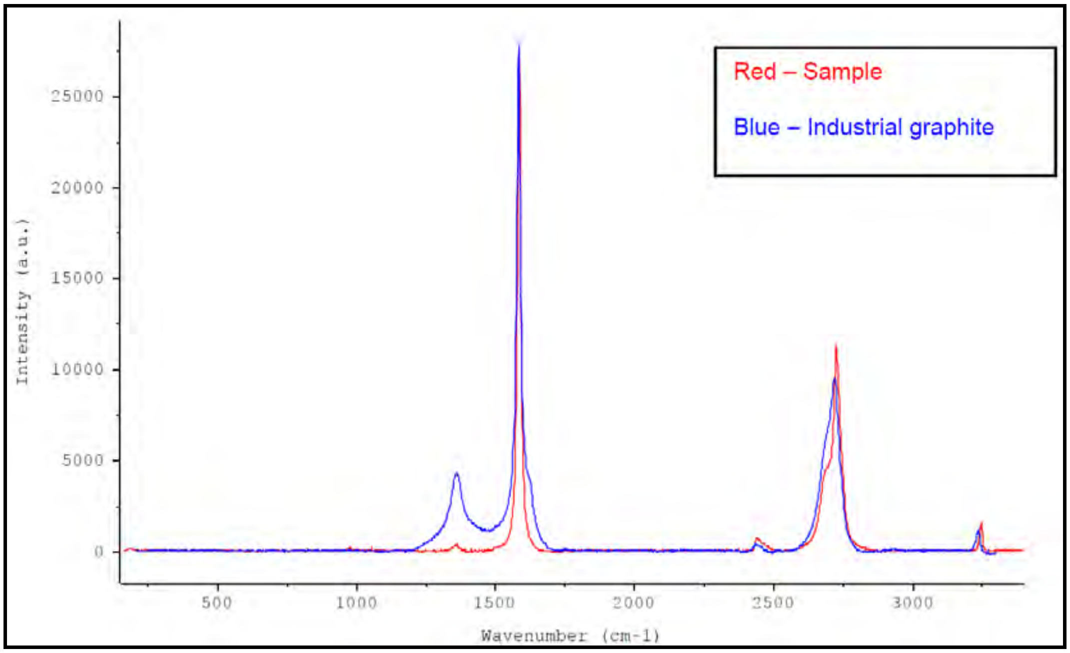
13.2.5 OTHER GRAPHITE CHARACTERIZATION TESTS

EAG also performed a laboratory characterization test on a Miller graphite sample provided by Canada Carbon to acquire a Raman spectrum. The crystallinity results were obtained using Raman spectroscopy, which is able to definitively determine the degree of crystallinity of certain materials, including graphite. Raman spectroscopy is the collection of light inelastically scattered by a material or compound. When a light of known wavelength strikes a material, the light is shifted according to the chemical functionalities of the material. The intensity of this shifted light depends on both molecular structure and macrostructure. As a result of these phenomena, the collection of the shifted light gives a Raman spectrum that can provide direct information regarding the molecular vibrations of the compound or material.

The crystallinity characterization was measured using a “LabRam” J-Y Spectrometer using an argon+ ion laser (514.5 nm wavelength) an 1,800 gr/mm grating. The Raman spectra were collected in the backscattering geometry (1,800) under an Olympus BX40 microscope.

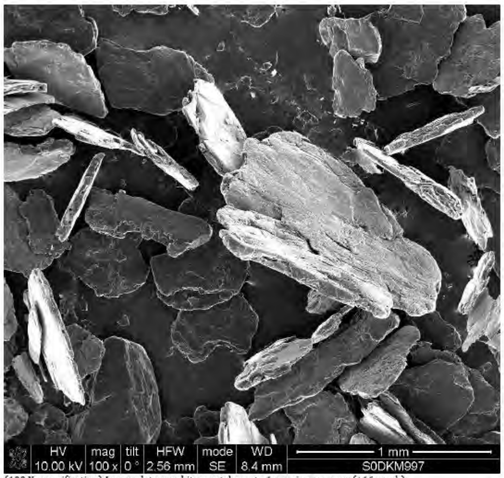
The key spectral features collected were the G-band (1,579 cm^{-1}) and D-band (1,350 cm^{-1}), where the G-band is theoretically the only permitted band arising from a single crystal of graphite, and the D-band is a measure of the disorder within the crystal. The sharp, high-intensity, narrow-shouldered G-band peak strongly suggests that the sample is a single crystal of graphite. The D band was barely detected at 1,350 cm^{-1} which indicates extremely low disorder in that crystal. The spectrum acquired from a flake of the sample is shown in Figure 13.10. EAG indicated that the Raman spectrum clearly demonstrates that the graphite in the sample is very high quality single crystal graphite.

Figure 13.10 Raman Spectrum from a Flake of Miller Graphite

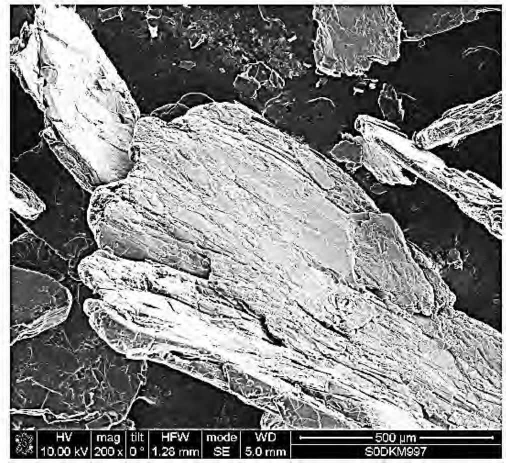


The graphite flakes were also studied by scanning electron microscope (SEM). The crystal images, including edge-on views of one graphite flake, are shown in Figure 13.11.

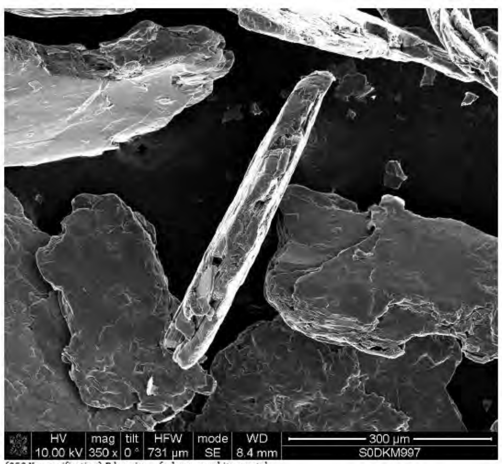
Figure 13.11 Scanning Electron Microscope Images



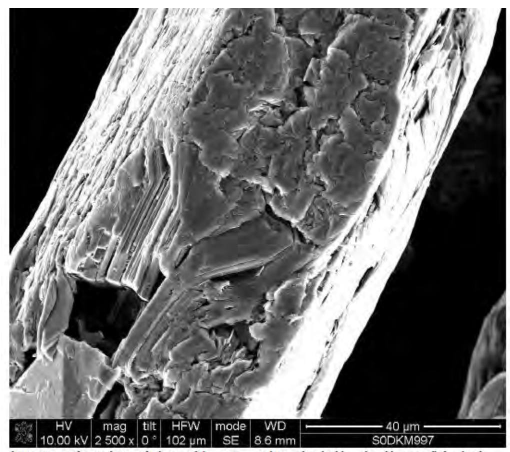
(100 X magnification) Large, platy graphite crystals, up to 1mm size, or more (+16 mesh).



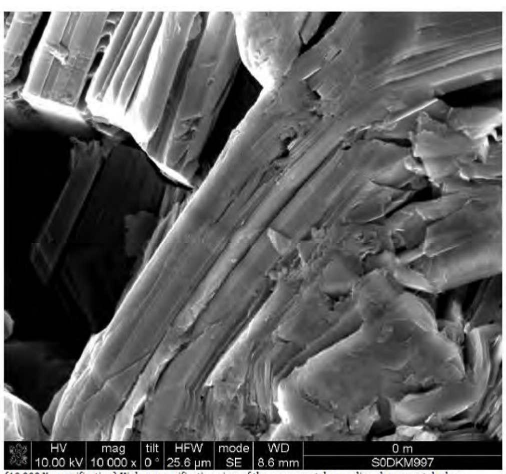
(200 X magnification) Same super-jumbo crystal seen at higher magnification.



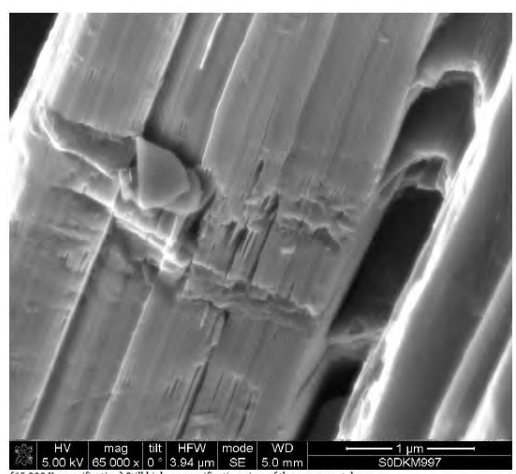
(350 X magnification) Edge view of a large graphite crystal.



(2500 X magnification) Magnified view of the same crystal, revealing highly ordered layering (left side of image), with minor mechanical damage (right side of image).



(10,000 X magnification) Higher magnification view of the same crystal, revealing sharp crystal edges.



(65,000 X magnification) Still higher magnification view of the same crystal

13.3 MARBLE

Marble blocks were extracted and sent for assessments as architectural marble products. No detailed physical and chemical assessment results, such as moisture absorption, surface hardness, texture, colour, are available for the review.

13.4 CONCLUSIONS

The Miller graphite samples tested to-date responded well to traditional mineral processing technologies consisting of grinding and froth flotation. A simple reagent regime consisting of fuel oil #2 as the collector and MIBC as the frother proved effective to achieve high concentrate grades with good overall carbon recoveries.

Samples from the Miller graphite prospect submitted to metallurgical testing covered a wide range from 0.53% graphitic carbon to 61.2% graphitic carbon. Liberation and upgrading of the medium and large graphite flakes has been demonstrated consistently for all samples that have been evaluated in a series of laboratory scale and pilot scale metallurgical programs. The fine fractions of less than 200 mesh contain the largest amount of impurities and range between approximately 85% and 95% total carbon. Processing of the fines fraction was carried out using a conventional polishing grind approach with ½" ceramic media in a mill without lifters. While this type of polishing mill proved very effective for the medium and coarse flake sizes and resulted in concentrate grades of greater than 97% total carbon, the grinding conditions were not as effective for the fine fractions. Alternative grinding technologies were developed at SGS in Lakefield in 2015 to improve the liberation properties for fine graphite flakes and intercalated graphite. These grinding technologies are expected to be more suitable for the treatment of the Miller small graphite flakes as well.

Since polishing grind times are directly proportional to the amount of material feeding into the mill, a mining block model should be generated to establish an upper, lower, and average head grade for the mill feed. Any process optimization should be carried out using a Master composite that represents the average head grade to the mill and consideration of the nameplate capacity of the proposed plant to ensure proper equipment sizing.

While the relative measurement uncertainties of standard analytical methods for total carbon and graphitic carbon generally do not constitute a concern, the high concentrate grades obtained for medium and coarse graphite flakes in the Miller flotation concentrate as well as the purified product render these methods inaccurate. An alternative analytical method in the form of GDMS analysis has proven effective in quantifying the type and level of impurities associated with the graphite concentrates.

Preliminary chemical and thermal upgrading trials proved effective in removing the majority of impurities remaining after the flotation process to produce graphite concentrates meeting nuclear graphite purity standards. While chemical upgrading was explored early in the project, thermal upgrading proved to be even more effective and led to a concentrate purity of 99.9998% in a 2015 upgrading trial. The six main remaining elemental impurities were detected at concentrations ranging between 80 and 1700 ppb, totalling 2,470 ppb. Similar results were obtained following thermal treatment of flotation concentrate obtained from bench scale processing of low grade disseminated graphite in marble.

The characterization of the potential marble source is preliminary in nature. Since marble is another industrial mineral that requires a close relationship between the producer and buyer, any further characterization work is expected to be carried out in close cooperation with the potential off-take partner(s).

14.0 MINERAL RESOURCE ESTIMATES

The Mineral Resource estimate was conducted using the CIM Definitions Standards for Mineral Resources in accordance with NI 43-101 Standards of Disclosure for Mineral Projects. Mineral Resources which are not mineral reserves do not have demonstrated economic viability. Inferred Mineral Resources are exclusive of the Measured and Indicated Resources. The Mineral Resource estimation work for the Project was conducted by Jean-Philippe Paiement, M.Sc., P.Geo. The 3D modelling, geostatistics, and grade interpolation of the block model was conducted using Genesis© software developed by SGS. The optimized pit shells and cut-off grade estimation were conducted by Tetra Tech. These pit shells are used to report Mineral Resources. The Mineral Resource estimation process was reviewed internally by Yann Camus, Eng, from SGS.

Two independent types of resources are estimated in this section and are exclusive of each other. Given the results from the metallurgical testing (see Section 13) of low-grade graphite samples and the price of the commodity (see Section 19.0), disseminated and vein (pod) hosted graphite can be considered as Mineral Resources. Following a letter of intent signed for the purchase of white marble, white marble can be considered for architectural marble block Mineral Resources.

14.1 DATABASE

The final database used for the Mineral Resource estimation was transmitted to SGS by Canada Carbon on December 10, 2015 in Microsoft® Excel format. The different validation and iteration steps are discussed in Section 12. The database comprised 95 drillholes, 40 surface samples, and 49 channels (Figure 14.1) with entries for:

- down hole survey (n = 560)
- assays (n = 7,985)
- lithologies (n = 966).

The database was validated upon importation in Genesis©, which enabled the correction of minor discrepancies between the table entries, surveys, and lithologies.

Vertical sections were generated, oriented N035° in order to respect and follow the drilling pattern and the general trend of the marble unit. In general, the sections have a 20 m spacing between them (Figure 14.2).

Two topographic surfaces were transferred to SGS by Canada Carbon; a local light detecting and ranging (LIDAR) and a regional digital evaluation model (DEM). Both surfaces were merged to create a single surface with priority given to the LIDAR surface. The surface was processed and normalized in order to correct the distortion in the edges

(Figure 14.3). A surface representing the contact between overburden and fresh rock was also generated using the lithological entries. Average overburden thickness is approximately 1.54 m with increasing thickness towards the southwest (Figure 14.4).

Figure 14.1 Drillhole Collar Positioning

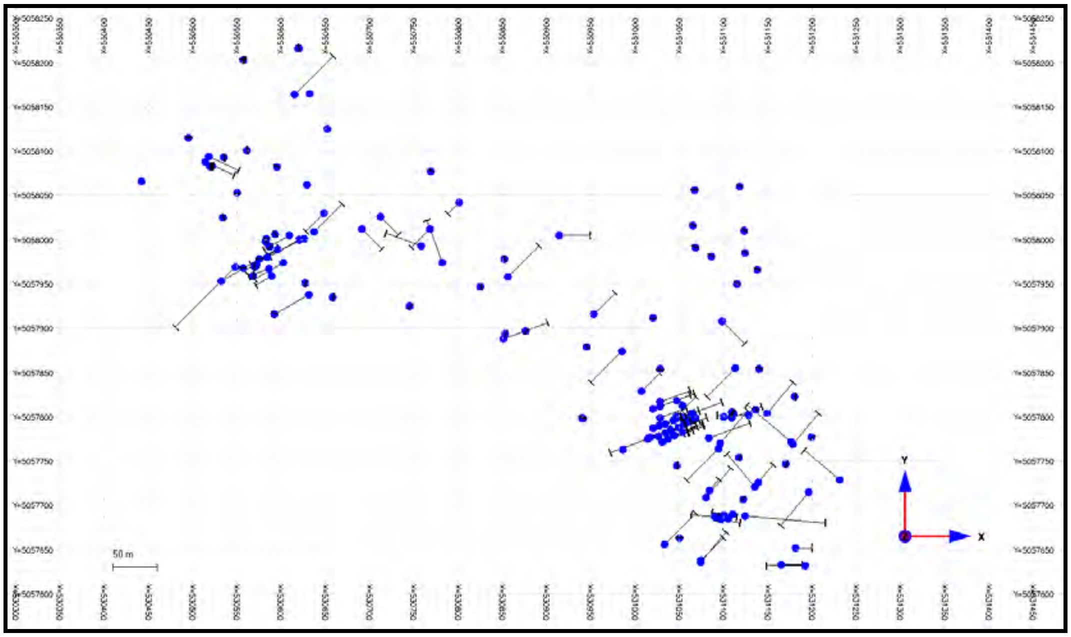


Figure 14.2 Plan View Showing Trace of Each Vertical Section with Drillhole Collars

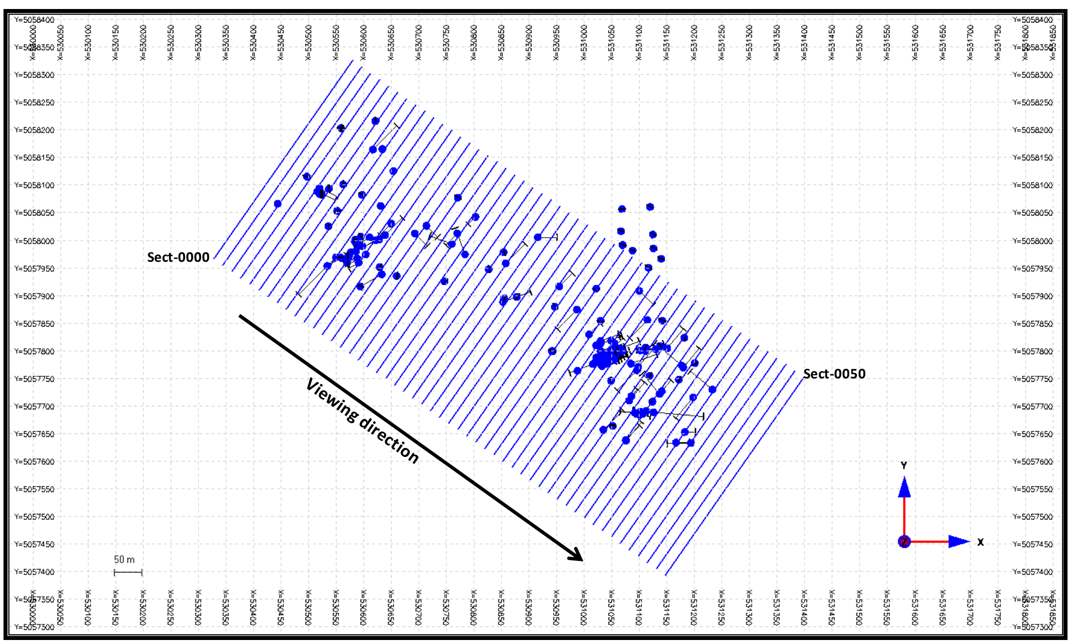


Figure 14.3 Topographic Rock Surface with Drillhole Collars

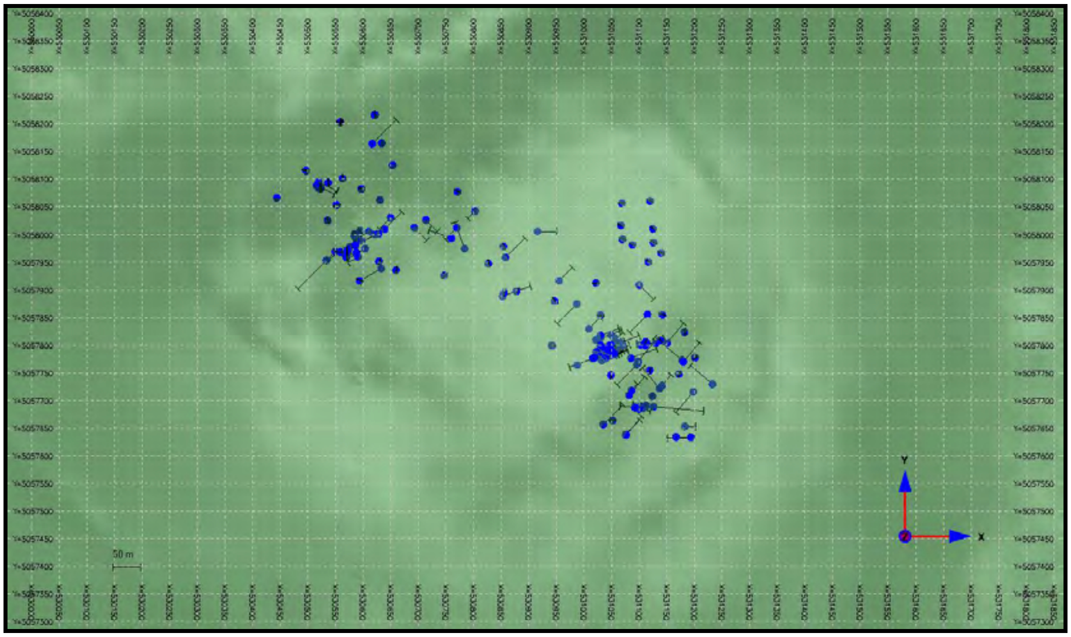
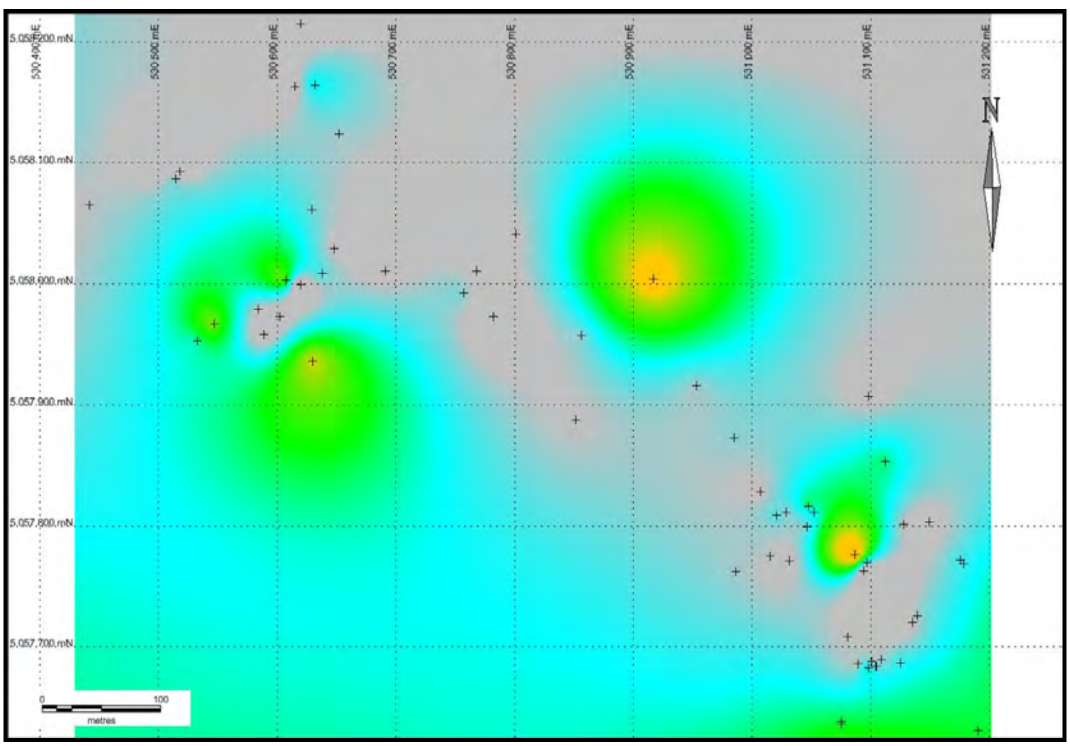


Figure 14.4 Overburden Thickness (m) Grid with Drillhole Collars (Black Crosses)



14.2 GEOLOGICAL MODEL

Since most of the mineralization is found in marbles or at the contact of marble and other rock units, and since white marble poses potential for architectural stones, the marble rock unit needed to be modelled. Due to the low density of the drilling grid and limited coverage of 3D geological information (Figure 14.1), an effort was made to incorporate the geophysical survey results in the modelling process. A 3D inversion model of the airborne magnetic response survey was transmitted to SGS by Canada Carbon. The magnetic data was combined with the lithological observations made at the surface and in the drillholes to verify the possibility of using a magnetic threshold to map the marble rock unit (Figure 14.5). This enabled the author to assign a modelled magnetic susceptibility value to each rock type in surface and drillhole data. The magnetic susceptibility values were then compared from one rock type to another and a limit of 0.006 on the International System of Units (SI) was established as the limit between non-magnetic rocks (marble and skarn; Figure 14.6) and magnetic rocks (arkose and paragneiss; Figure 14.6). This limit was modelled in the 3D inversion data, providing a probable contact surface between marbles (and skarns) and host rocks (Figure 14.7).

The marble unit had to be modeled for architectural rock resources. The magnetic contact surface was then combined with the drilling database to model the extent of the marble unit, as identified by the level of information in the data. Two dimensional interpretations were conducted on each vertical section using the lithologies and magnetic contact surface in which only the marble was highlighted and all other lithologies were considered as non-marble (waste: Figure 14.8).

A 3D solid was then generated, corresponding to the marble rock unit interpretation, based on geophysical (magnetic) evidences and drillhole data (Figure 14.9). Extrapolation of the marble unit was limited to 100 m beyond the last information point and interpolation of the solid (between two points of information) was limited at 150 m. The solid corresponding to the marble rock type (Figure 14.9) will be further used to estimate the marble architectural rock resources.

Figure 14.5 Magnetic Inversion Model with Surface Geology Points (top) and Drilling Information (bottom)

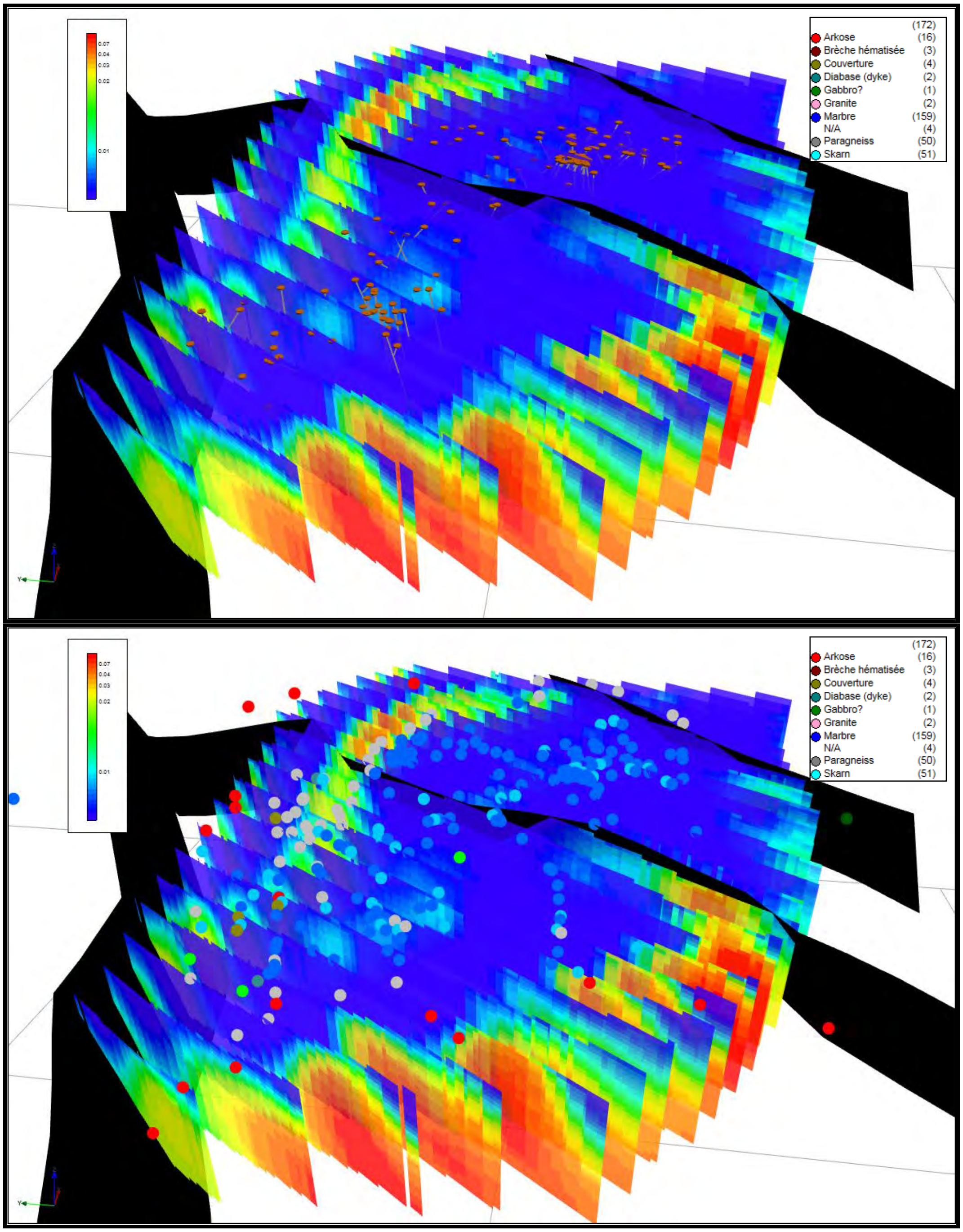


Figure 14.6 Magnetic Susceptibility of the Different Rock Types

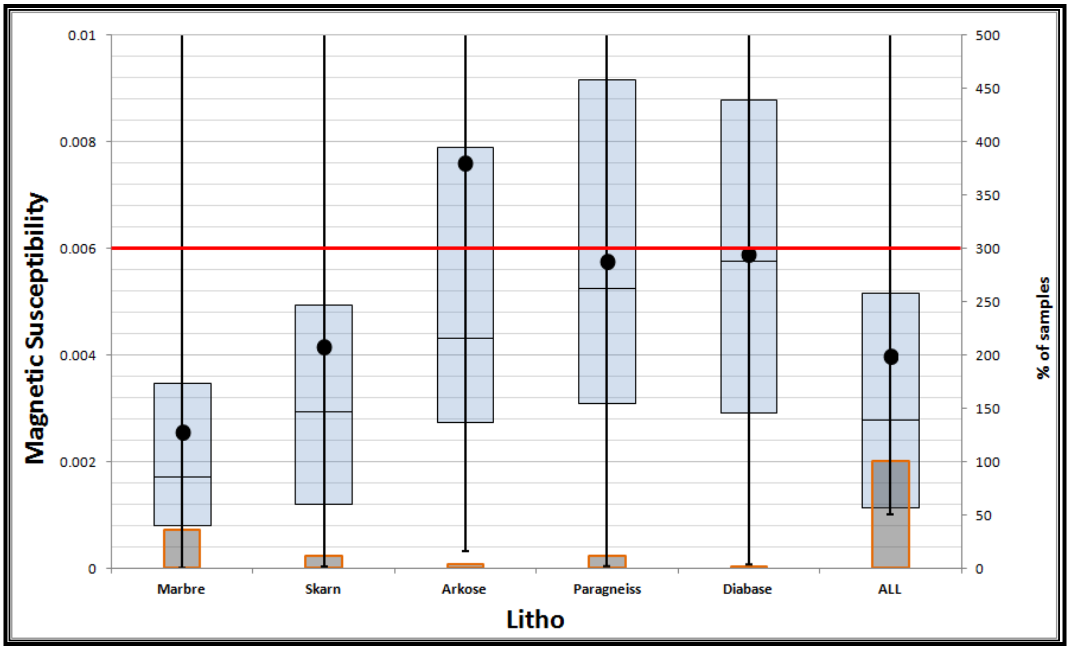


Figure 14.7 Modelled Contact between Marbles (+skarn) and Arkose-paragneiss

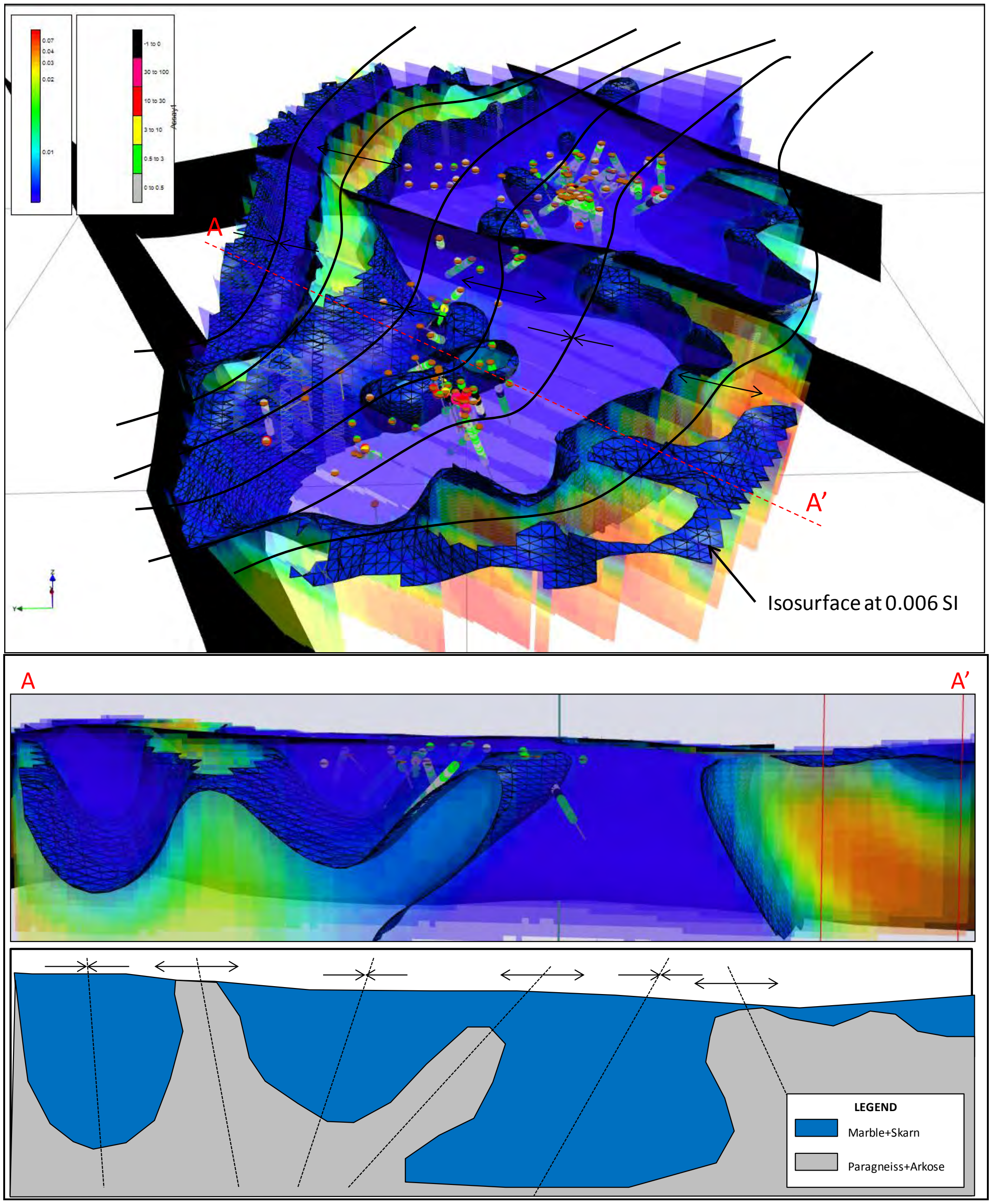


Figure 14.8 Sectional Interpretation of the Marble Unit

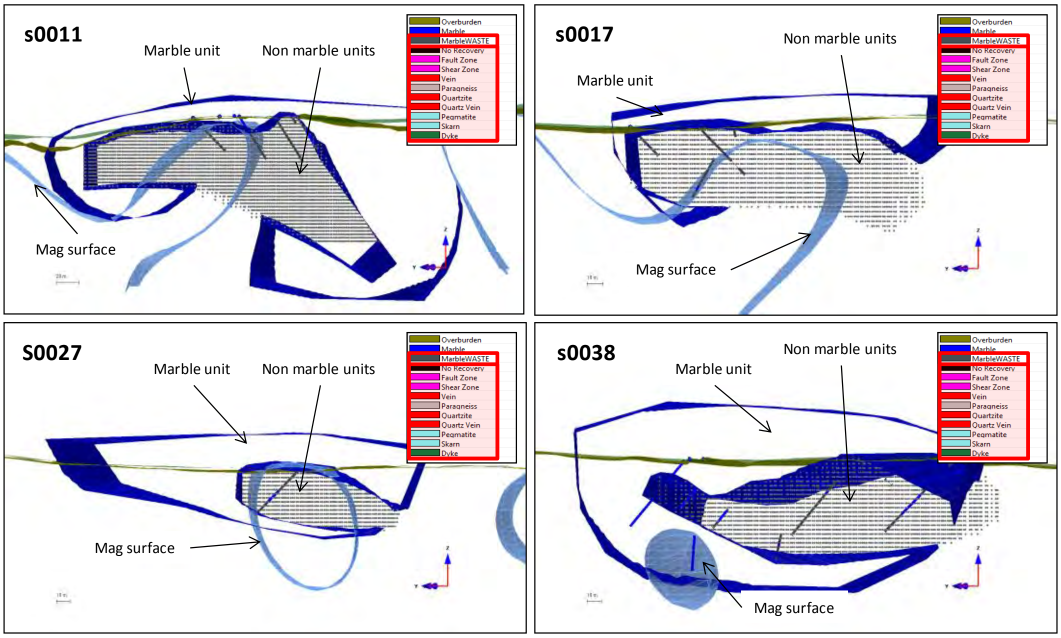
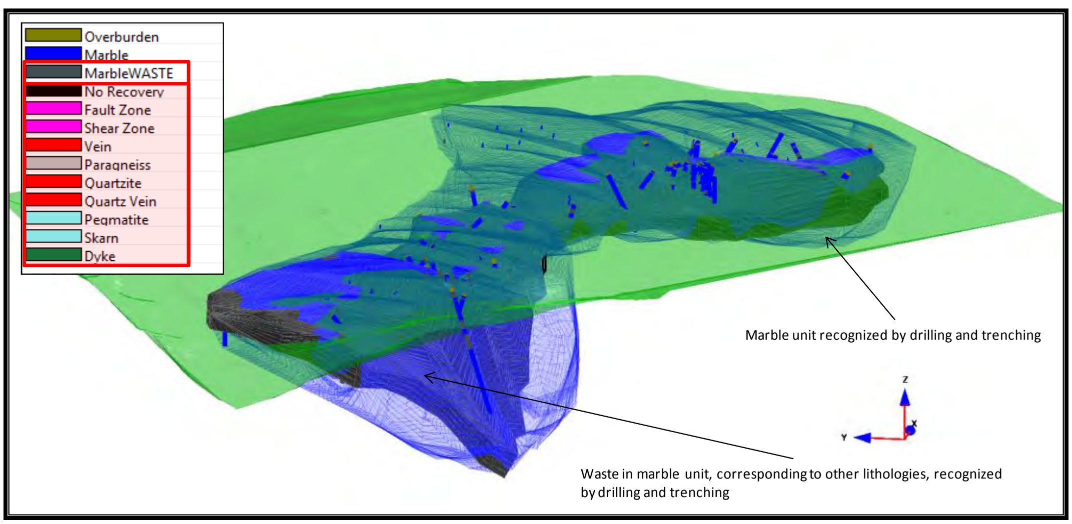


Figure 14.9 3D Solids Corresponding to the Marble and Non-marble Units



14.3 MINERALIZED INTERVALS AND MINERALIZED SOLIDS

14.3.1 GRAPHITE MINERALIZATION

Mineralized intervals corresponding to an average grade of combined assays were generated following the limits of the geological envelopes and a minimal grade of 0.5% graphitic carbon. The modelling of the minimal grade was established in order to limit the amount of waste material included in the mineralized solids and from the graphite values observed in the geological model (Figure 14.10). In the event that a single hole in the middle of a geological envelope was lower than the minimal modelling grade, the hole was still integrated in the solids and is considered as internal waste. The mineralized intervals have an average graphitic carbon value of 0.85% (minimum: 0% graphitic carbon and maximum: 49.7% graphitic carbon) with an average length of 17.63 m (minimum: 0.1 m and maximum: 71.72 m).

Based on the mineralized intervals (Figure 14.11) and geological solids modelled for the marble, solids were digitized on each section. The solids are extrapolated to a maximum of 50 m from the last point of intersection and interpolated on a maximal distance of 75 m between points of information. The solid apexes were snapped to the mineralized intervals. A single mineralized solid was generated (Figure 14.13) with an extent of 885 m along strike, a maximum extent of 240 m across, and an approximate vertical thickness of 70 m. The solid has a volume of 4.3 Mm³.

Figure 14.10 Assays Value Distribution for all Rock Types (top) and Assays above 0.5% Graphitic Carbon (bottom)

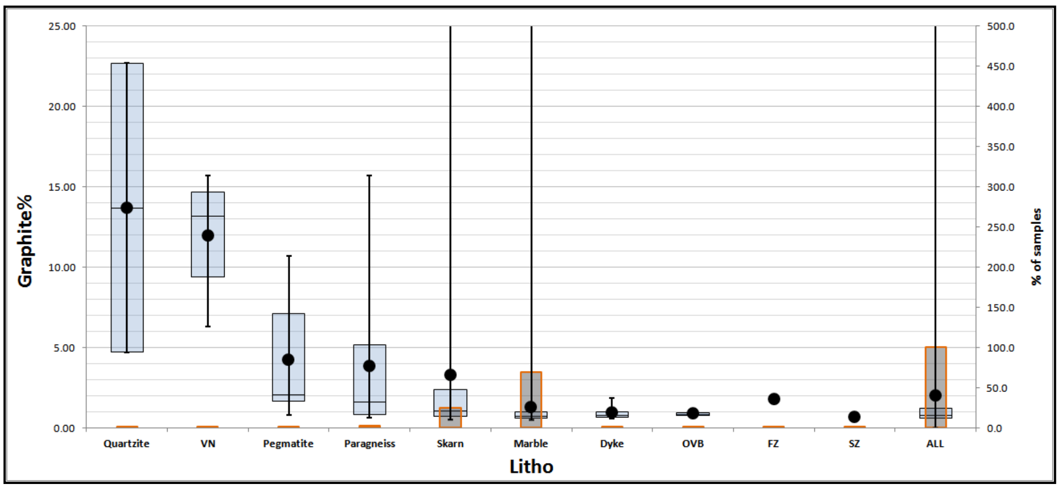


Figure 14.11 Mineralized Intervals for Graphitic Carbon

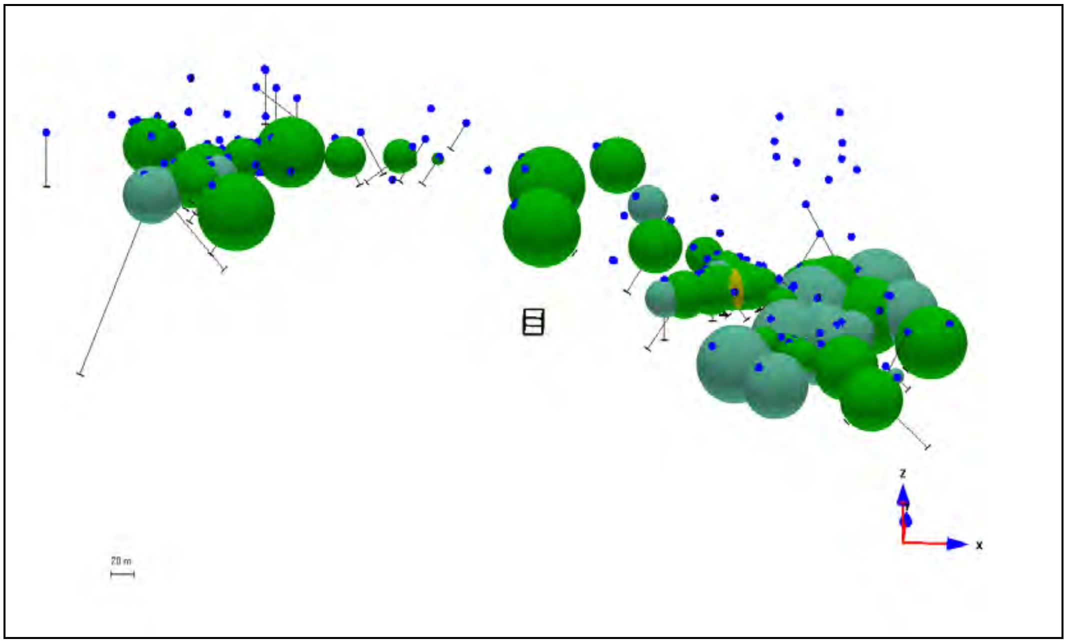


Figure 14.12 Sectional Interpretation of the Graphite Mineralized Solids

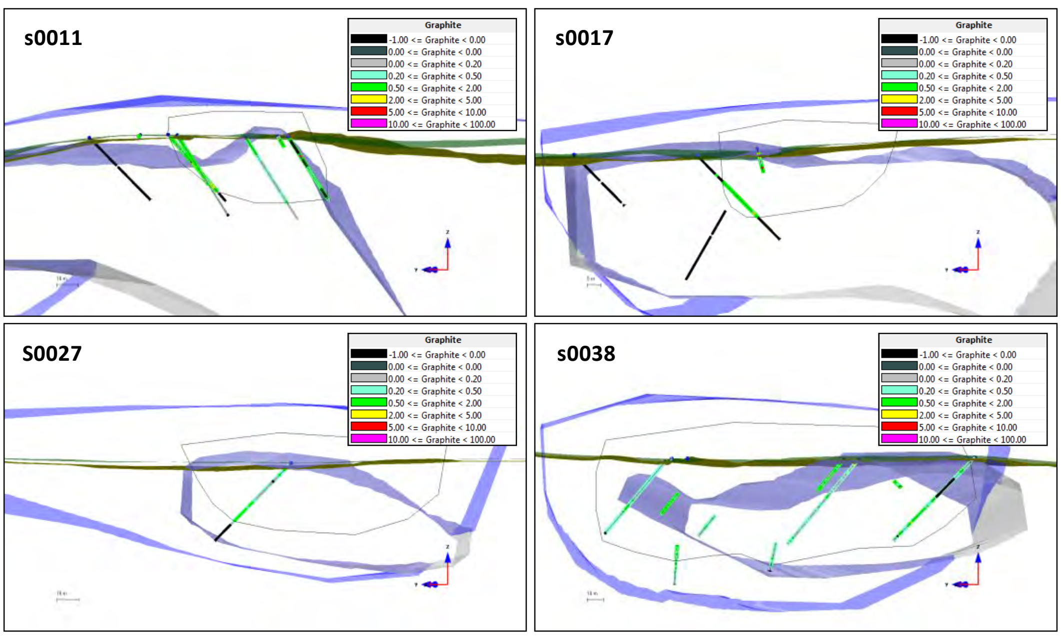
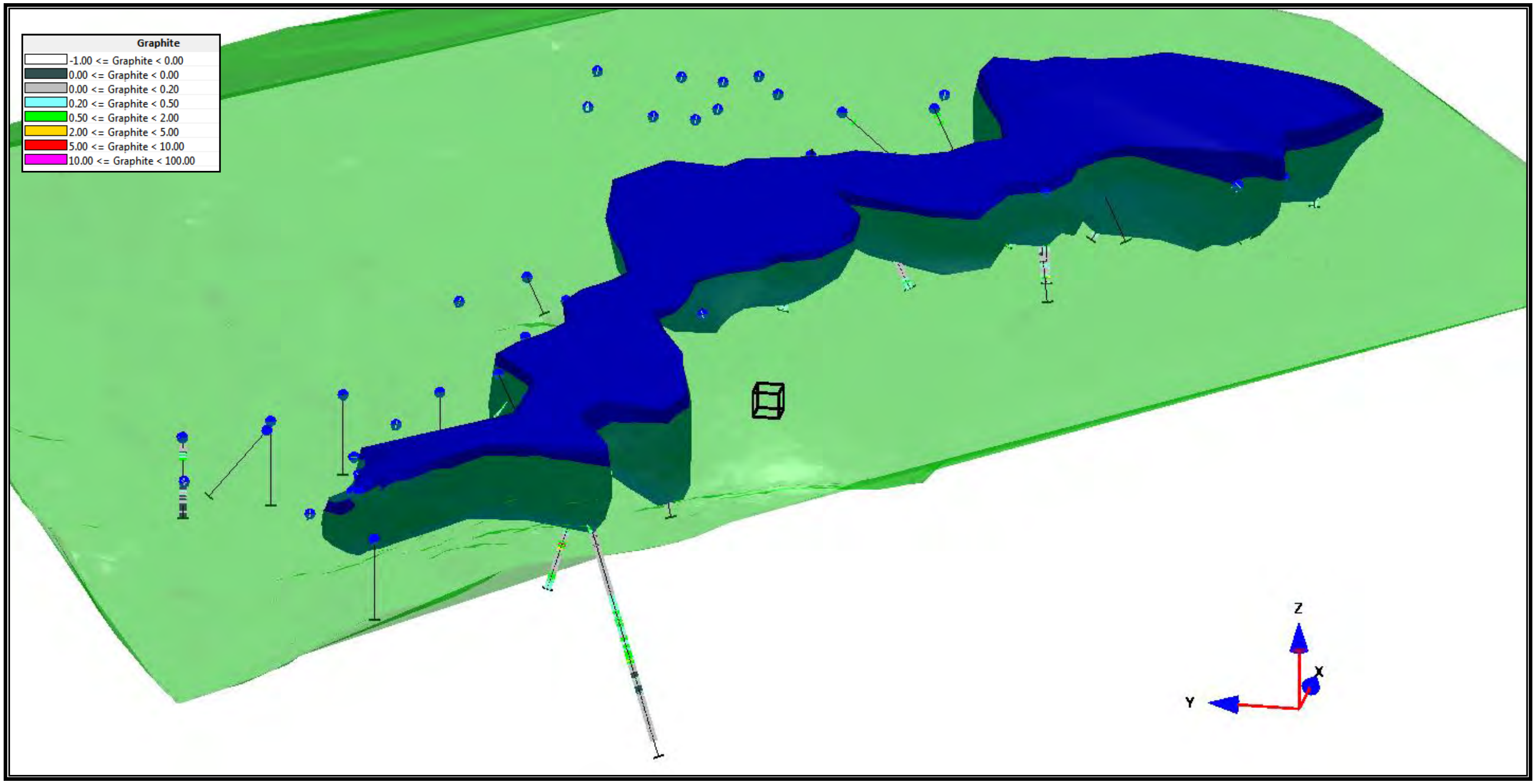


Figure 14.13 Mineralized Solid for Graphite



14.4 COMPOSITING OF ASSAYS

14.4.1 GRAPHITE MINERALIZATION

The assays present inside the limits of the mineralized intervals were re-divided in equal length composites of 1.5 m, which represent the largest and second most common assay length in the database (Figure 14.14). They also represent a proper size compared to the selected block size (see below). These composites will be used to interpolate the block values. Assay gaps inside the solids were replaced with composites with values of 0% graphitic carbon. A total of 2,090 composites were generated for a total length of 3,135 m (Figure 14.15).

Figure 14.14 Assays Length Statistics

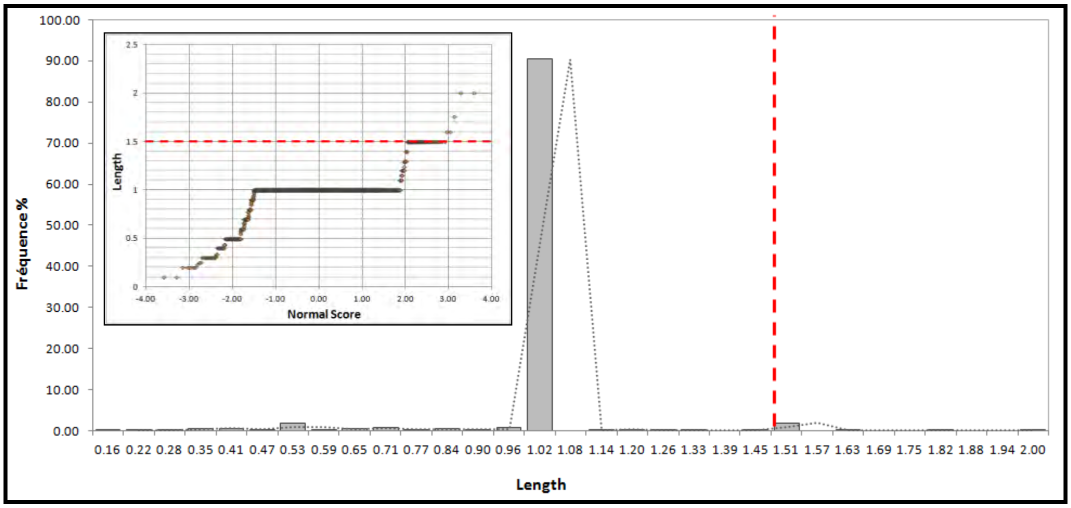
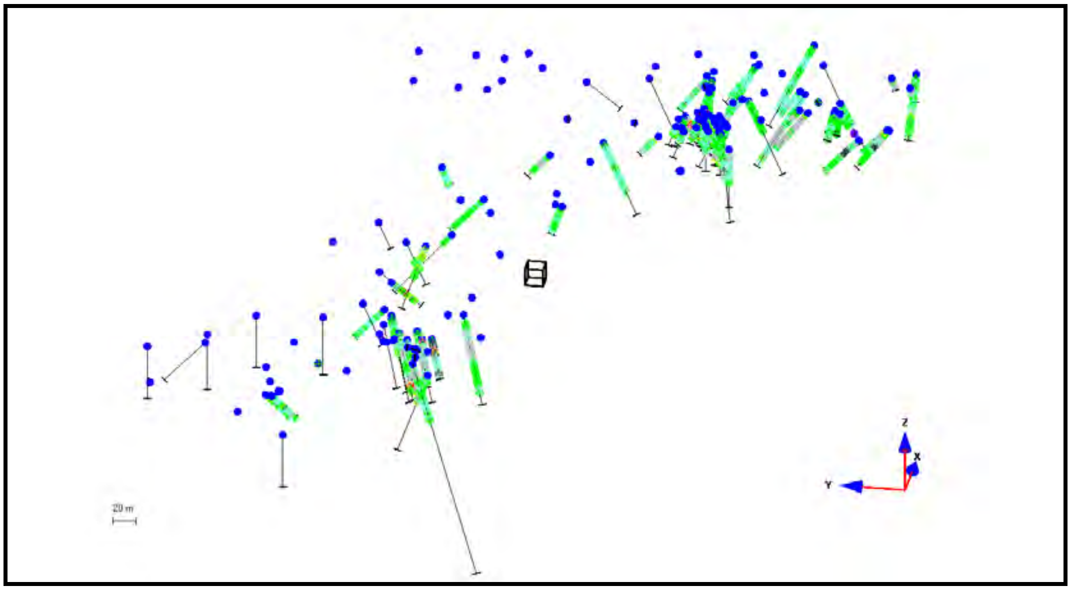


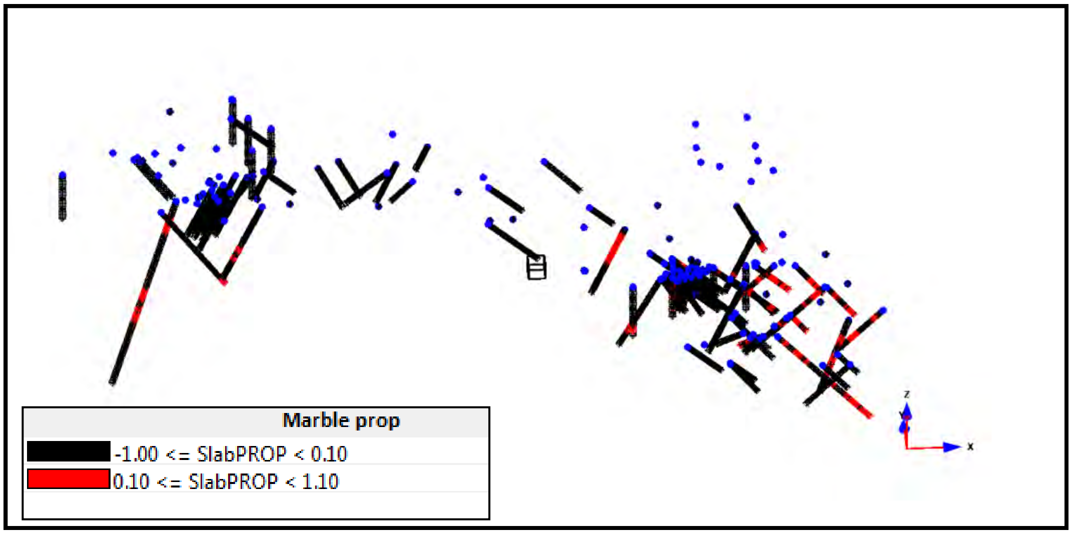
Figure 14.15 Graphite Composite Set



14.4.2 ARCHITECTURAL MARBLE

A second set of composites were generated for the architectural marble. The lithological entries from the database were sub-divided into 1.5-m intervals and only the interval inside the marble unit solid (Figure 14.9) were kept as composites. The values of the composite were derived from the color logging provided by Canada Carbon. Since only the white colored marble is acceptable for architectural stone production, the composites within white colored intervals were coded with “1” and the other composites were coded with “0”; creating an indicator variable named “SLABprob”. The indicator represents the probability of the rock being white marble (suitable for architectural blocks production); where “1” represents 100% probability of encountering white marble and “0” represents 0% probability of encountering white marble. A total of 3,685 composites were generated for a total length of 5,527.5 m (Figure 14.16).

Figure 14.16 Architectural Marble Composite Set



14.5 GEOSTATISTICS AND VARIOGRAPHY

In order to interpolate the different potential mineral resources, the composites were independently analyzed using standard statistic tools and variography. These steps allow for validation of the compositing process and mineralized solids generation. The mathematical models derived from the variograms will be used to interpolate the blocks using Ordinary Kriging and Indicator Kriging. The exercise was performed for: 1) graphitic carbon (Cg%) and 2) white marble indicators.

14.5.1 GRAPHITIC CARBON

The composites corresponding to the graphite mineralization have an average value of 0.81% graphitic carbon (Table 14.1). The distribution of the values outlines three different populations within the graphite mineralization (Figure 14.17): 1) a population corresponding to the local integration of waste material in the solids and missing assay intervals within the solids; 2) a population representing the majority of the assay value, which can be considered as a disseminated low grade graphite mineralization and 3) a high-grade population representing the discontinuous veins and pods of graphite observed throughout the Miller Property.

The presence of the high-grade pods would be lost if conventional interpolation is used, since they only represent 7% of the population. A two-stage interpolation using indicators and high-grade probability model was used for resources estimation in order to present a more realistic model without exaggerated dilution and smoothing.

In order to proceed with this type of interpolation, the composite population needed to be divided between low grade and high grade, with a proper limit between both. The high-grade population was separated from the low-grade population using a process comparable to grade capping, in which the “break” in the frequency distribution is considered the limit between the low grade and high grade (Figure 14.18). This process was validated using a histogram modelling technique which establishes the limit between the two populations at 2% graphitic carbon (Figure 14.18).

Three new variables were then added to the composite set. The “GraphiteLG” variable corresponds the all the composites capped at a value of 2% graphitic carbon. The “GraphiteHG” only contains the composites with values greater than 2% graphitic carbon and finally the “Indicator” variable contains “0” if the original graphite value is below 2% graphitic carbon and “1” if the original graphite value is equal or greater than 2% graphitic carbon.

Table 14.1 General Statistics of the Graphite Composites

Element	Count	Average	Minimum	Maximum	Standard Deviation	Variance	Coefficient of Variation
Graphite (%)	2,090	0.81	0.00	38.70	1.96	3.86	242%
GraphiteLG (%)	2,090	0.60	0	2	0.49	0.24	82%
GraphiteHG (%)	113	5.92	2	38.7	6.45	41.73	109%
Indicator	2,090	0.05	0	1	0.23	0.05	418%

Figure 14.17 Statistical Distribution of Graphite Values

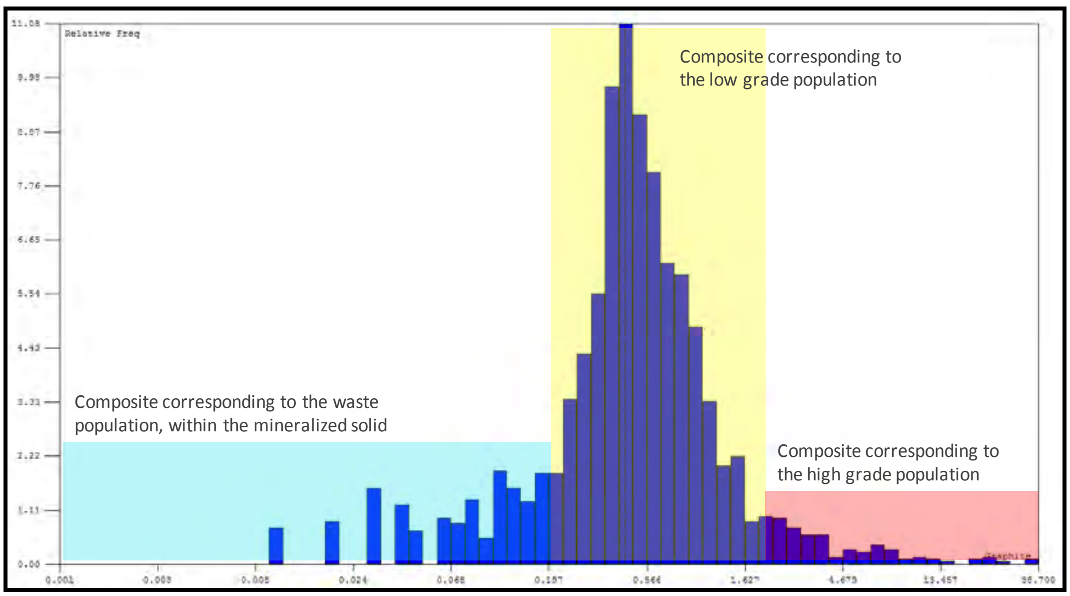
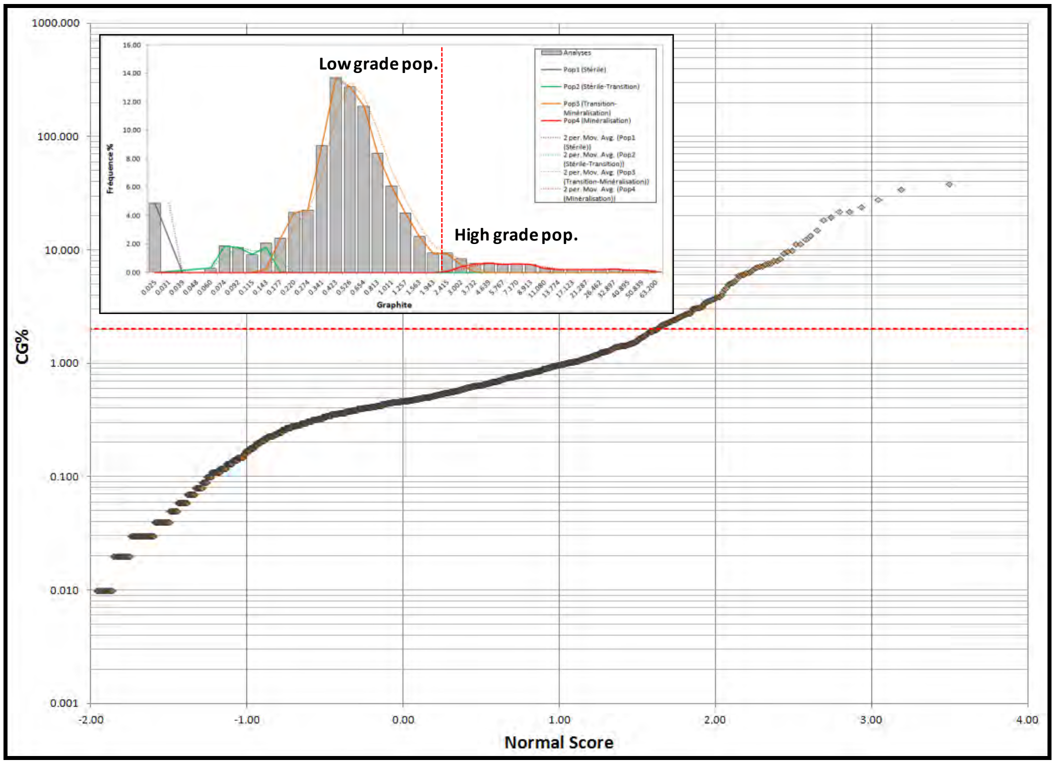


Figure 14.18 Low-grade and High-grade Population Limit Determination



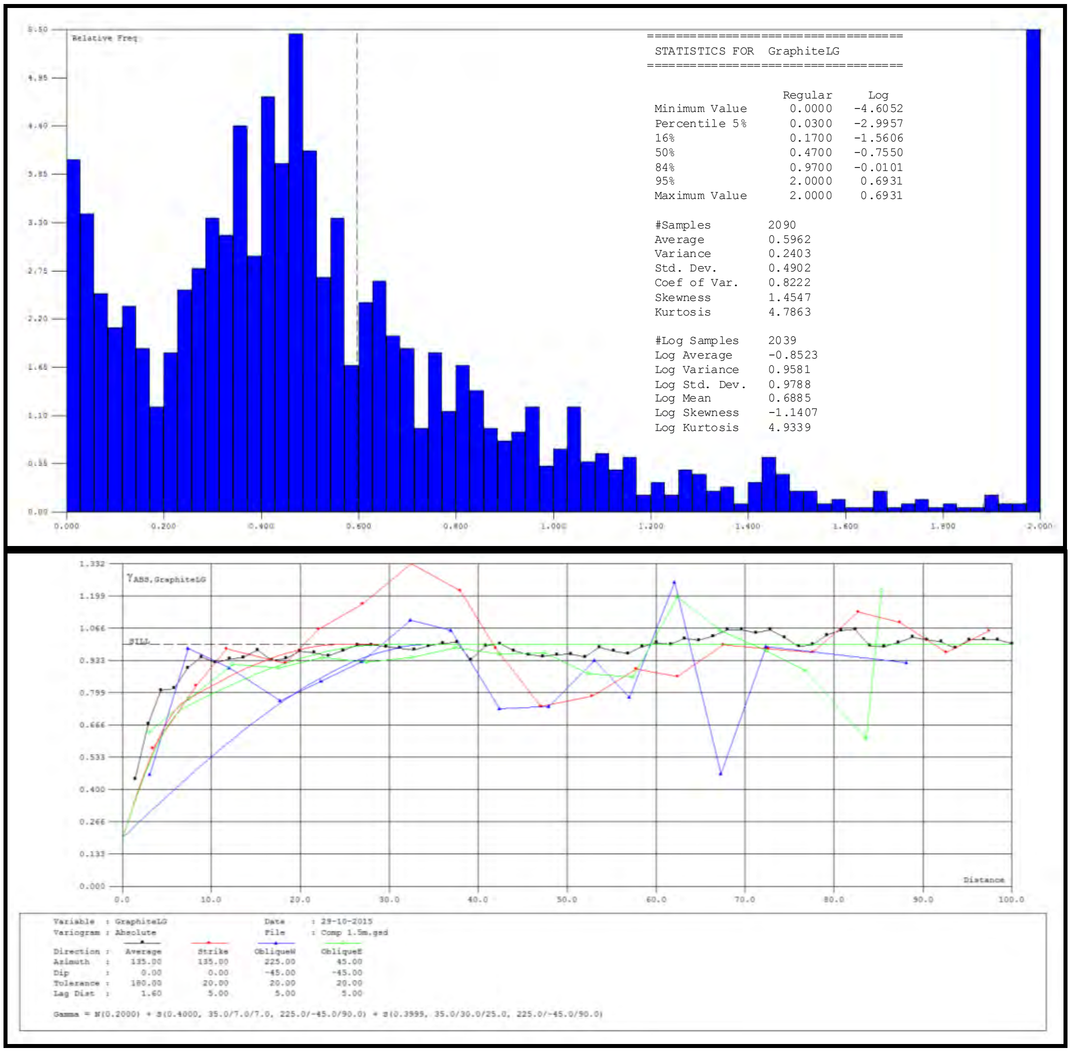
GRAPHITELG VARIABLE

The GraphiteLG variable shows a skewed distribution towards the low values (Figure 14.19) with a mean value of 0.6% graphitic carbon (Table 14.1). The composites were used to generate a variogram with directions aligned along the strike of the deposit and 45° across the deposit in both northeast and southwest directions (Figure 14.19). The average variogram was also generated using mostly pairs along the same drillhole (Figure 14.19). The nugget effect is limited to 20%, due to the relatively low variance generated by capping of the high-grade population at 2% graphitic carbon. The major direction of continuity dips at -45° towards the southwest along the strike, which has a sill at 0.4 for a range of 35 m and a maximum range of 35 m (Figure 14.19). The other directions show relatively low continuity with 60% of the sill with a range of 7 m (Figure 14.19). The model of the variogram is given by the following equation:

Gamma = N (0.2) + S (0.4, 35/7/7, 225/-45/90) + S (0.4, 35/30/25, 225/-45/90)

The variogram maximal ranger is smaller than the largest extrapolation and interpolation distance of the mineralized solid.

Figure 14.19 GraphiteLG Statistics and Variographic Model



GRAPHITEHG VARIABLE

The GraphiteHG variable shows a skewed distribution towards the low values (Figure 14.20) with a mean value of 5.92% graphitic carbon (Table 14.1). The composites were used to generate a variogram with directions aligned along the strike of the deposit and 45° across the deposit in both northeast and southwest directions (Figure 14.20). The average variogram was also generated using mostly pairs along the same drillhole (Figure 14.20). The nugget effect is of 55%, which can be explained by the relatively low geological continuities of the high-grade veins and pods. The variographic model is isotropic with 85% of the sill at a range of 4 m and a maximum range of 8 m (Figure 14.20). The model of the variogram is given by the following equation:

$$Gamma = N\,(0.55) + S\,(0.3,\ 4/4/4,\ 0/0/0) + S\,(0.15,\ 8/8/8,\ 0/0/0)$$

The relatively low range of the variographic model might be due to low number of composites used (113), but also dictates low interpolation distances for the GraphiteHG variable, which is consistent with the geological observation of discontinuous pods and veins.

INDICATOR VARIABLE

The Indicator variable shows a skewed distribution towards the 0 values (Figure 14.21) with a mean value of 0.05 (Table 14.1); which is consistent with the majority of the graphite mineralization comprising low grade values. The composites were used to generate a variogram with directions aligned along the strike of the deposit and 45° across the deposit in both northeast and southwest directions (Figure 14.21). The average variogram was also generated using mostly pairs along the same drill hole (Figure 14.21). The nugget effect is limited to 25%, due to the relatively low variance generated by the high number of 0's in the values. The major direction of continuity is at -45° towards the southwest, which has a sill at 0.5 for a range of 10 m and a maximum range of 30 m (Figure 14.21). The other directions show relatively low continuity with 75% of the sill with a range of 4 m and 2 m (Figure 14.21). The model of the variogram is given by the following equation:

Gamma = N (0.25) + S (0.5, 10/4/2, 225/-45/0) + S (0.25, 30/20/8, 225/-45/0)

The variogram maximal range is smaller than the largest extrapolation and interpolation distance of the mineralized solid.

Figure 14.20 GraphiteHG Statistics and Variographic Model

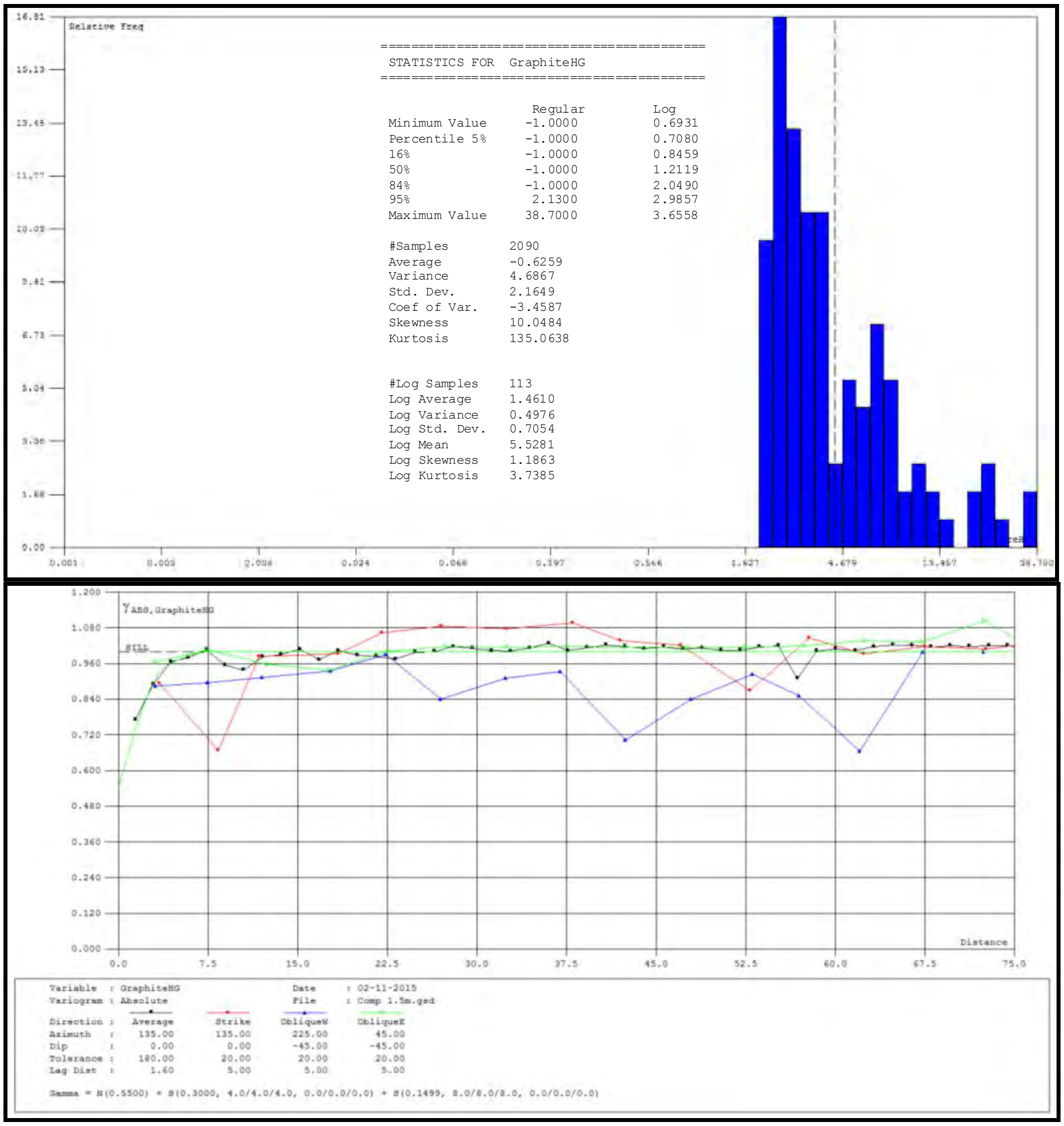
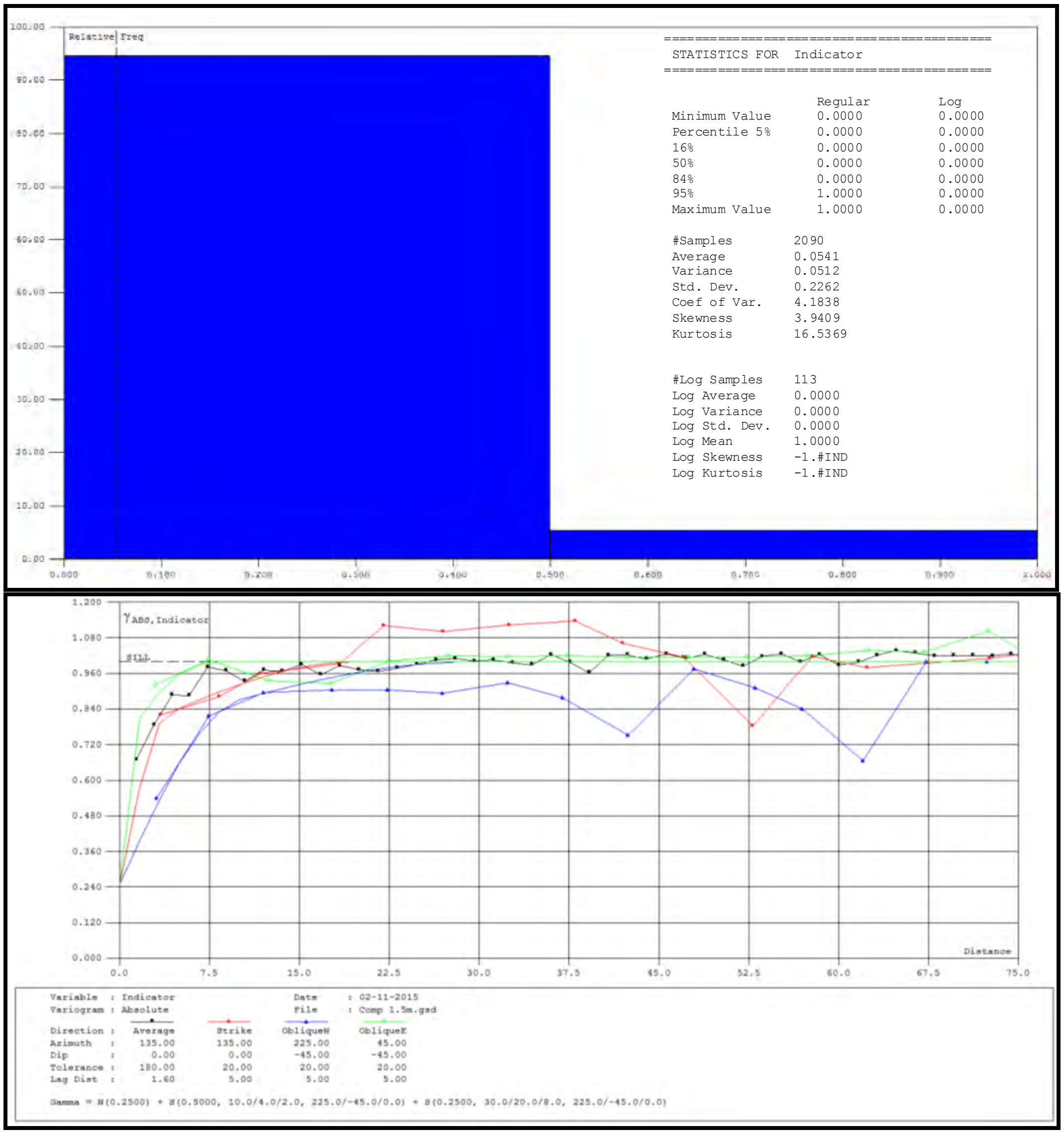


Figure 14.21 Indicator Statistics and Variographic Model



14.5.2 ARCHITECTURAL MARBLE (SLABPROB)

The composites corresponding to the architectural marble have an average value of 0.09 (Table 14.2). Based on the entire drilling data, more than 90% of the drilled lithologies are not suitable marble for architectural slab production (Figure 14.22). The composites were used to generate an average variogram using mostly pairs along the same drill hole (Figure 14.22). The nugget effect is limited to 5% due to the relatively low variance generated by the high number of 0's in the values. The variogram shows relatively low continuity with 65% of the sill with a range of 8 m (Figure 14.22) and a maximum continuity of 40 m. The model of the variogram is given by the following equation:

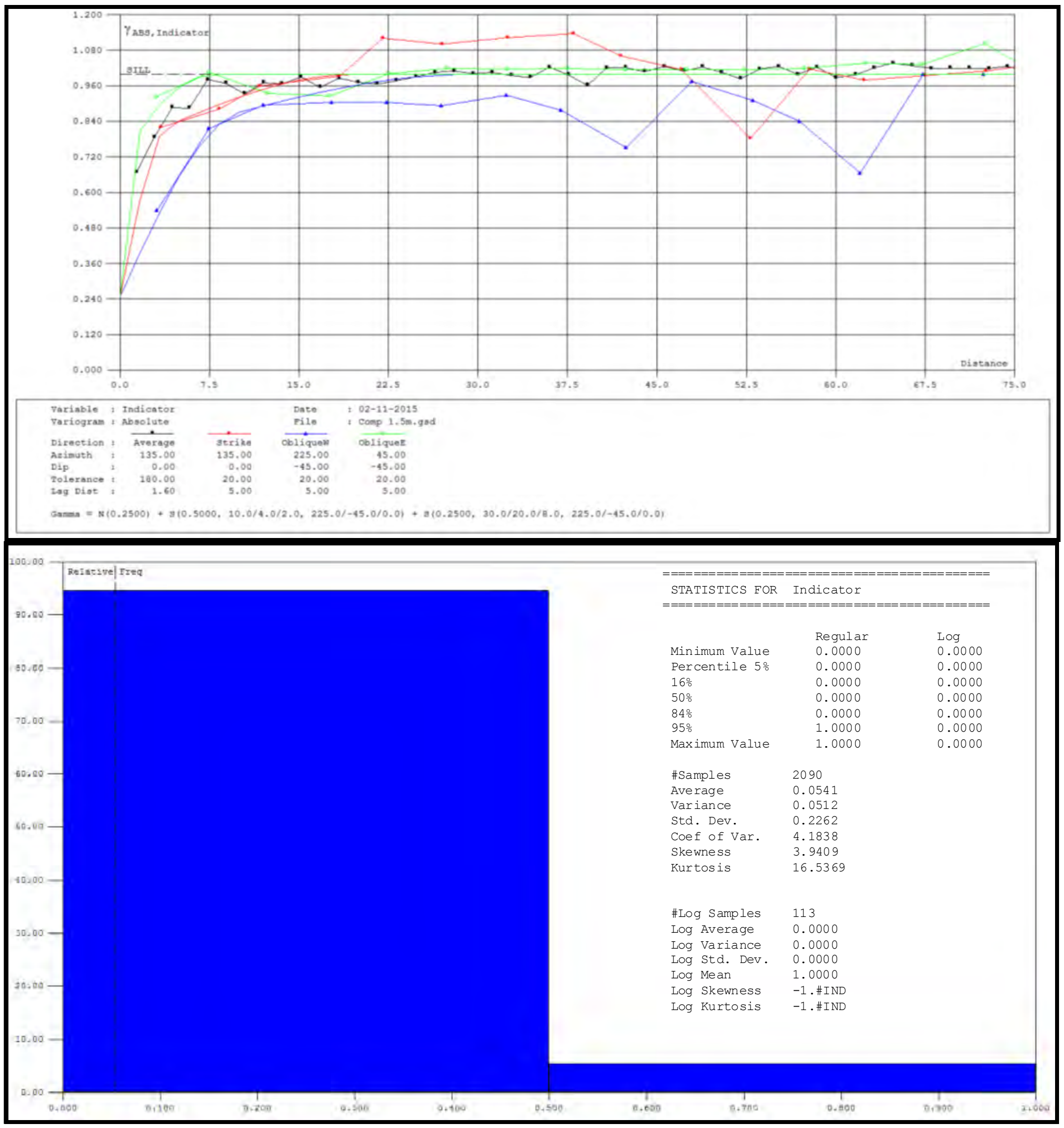
Gamma = N (0.05) + S (0.6, 8/8/8, 0/0/0) + S (0.35, 40/40/40, 0/0/0)

The variogram maximal ranger is smaller than the largest extrapolation and interpolation distance of the mineralized solid.

Table 14.2 General Statistics of the Architectural Marble Composites

Element	Count	Average	Minimum	Maximum	Standard Deviation	Variance	Coefficient of Variation
SLABprob	3685	0.09	0.00	1.00	0.28	0.08	320%

Figure 14.22 SLABprob Statistics and Variographic Model



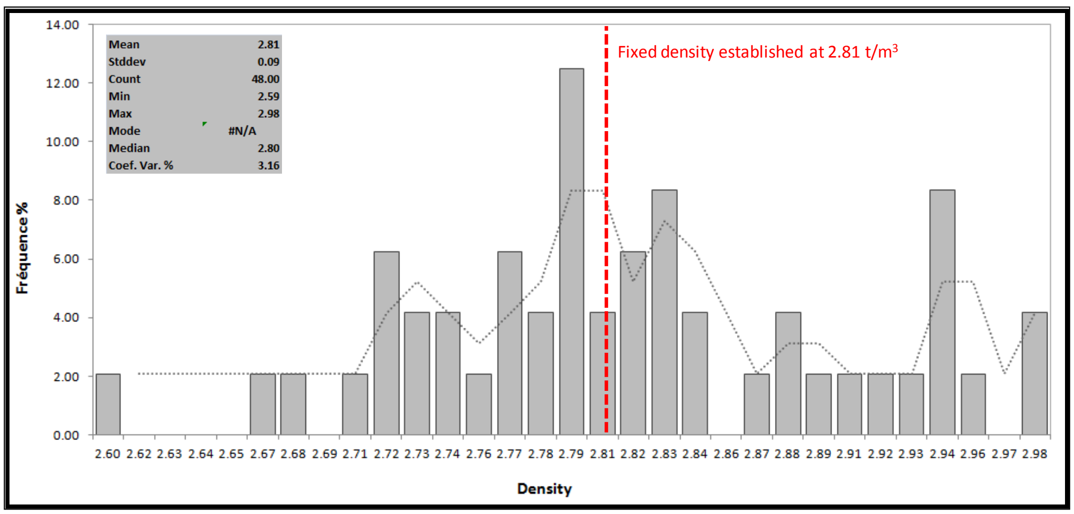
14.6 DENSITY

In order to convert the volumes of the block models to tonnages in the Mineral Resource reporting, density measurements were conducted by Canada Carbon on witness core samples in the marble rock unit. A total of 48 measurements were made using the dry and immersed weights.

The density values vary from 2.59 to 2.98 t/m³ with an average value of 2.81 t/m³ (Figure 14.23). Given the low number of measurements and their distribution in space, it is not possible to interpolated the densities or correlate them to the graphite grades. Hence, a fixed density of 2.81 t/m³ was applied to all material in the block model.

In the future, more density measurements should be conducted and should be appropriately spaced along the drilling grid and distributed between the different rock types. The density poses a significant risk factor in the tonnage estimates of the mineral resources and should be better constrained with the project's advancements. Additional density measurements will be conducted on the different lithologies and grade material in further exploration campaigns.

Figure 14.23 Statistical Distribution of the Density Measurements



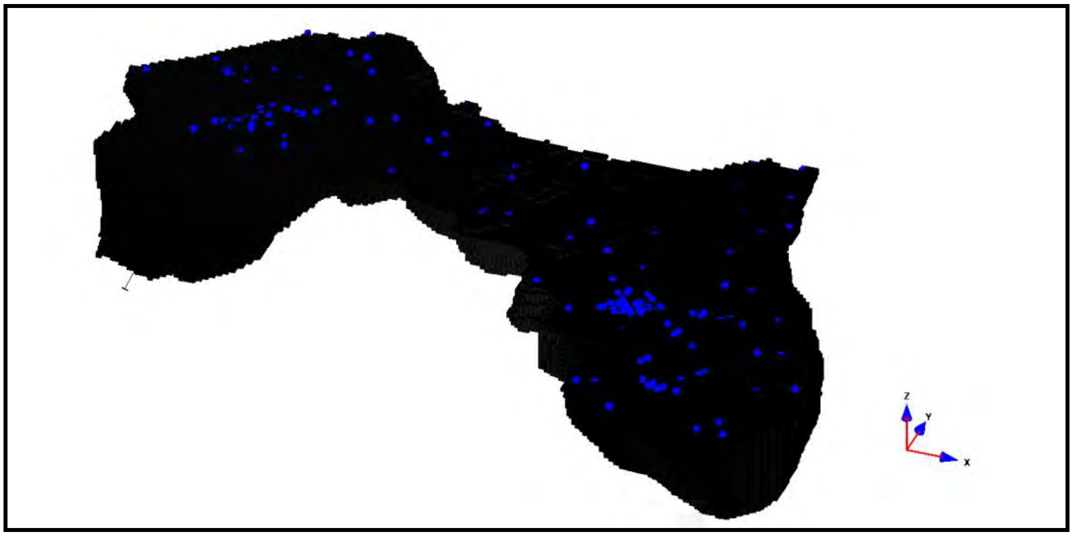
14.7 BLOCK MODEL

A block model was generated within the limits stated in Table 14.3. A total of 179,356 blocks were generated within the limits of the marble unit and graphite model combined (Figure 14.24). The blocks were limited at surface to the rock overburden interface. The volume of the block model is 136,452,000 m³.

Table 14.3 Block Model Grid Parameters

Grid	X	Y	Z
Origin	530,330	5,057,501	100
Size	5	5	3
Discretization	3	3	2
Starting Coordinates	530,330	5,057,501	100
Starting Indices	1	1	1
Ending Coordinates	531,330	5,058,301	298
Ending Indices	201	161	67

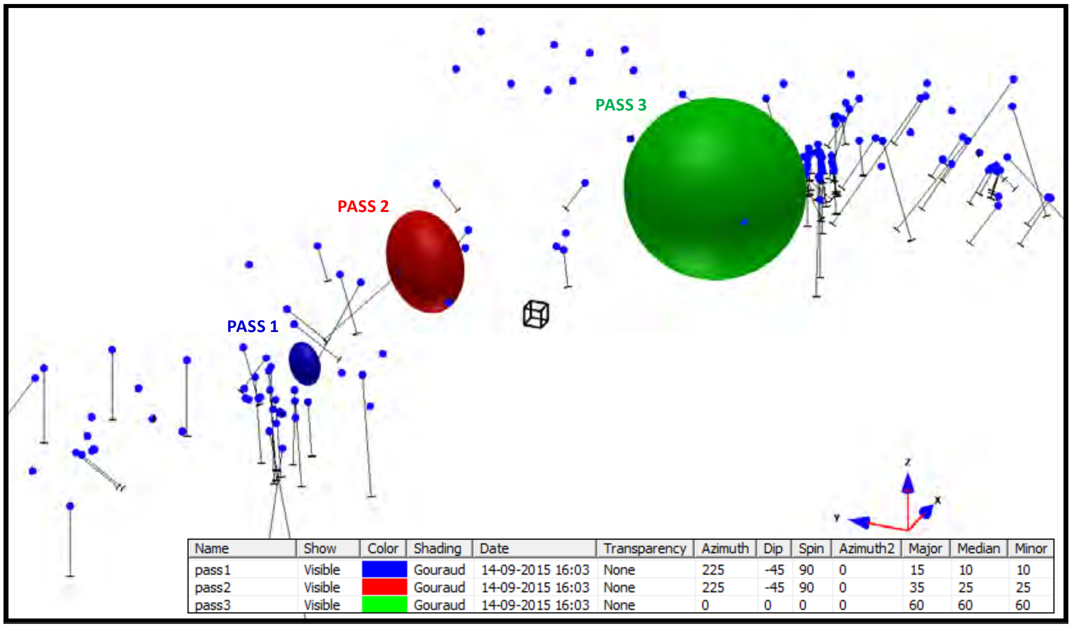
Figure 14.24 Block Model Used for Interpolation



14.7.1 Search Ellipsoids

Given the continuity observed in the variographic studies, the sparse drilling grid, and the geological observations, three different search ellipsoids were used in the interpolation process (Figure 14.25). The Pass 1 search ellipsoid was designed to represent the low continuity in the data and interpolated blocks using a limited distance and composites inside that particular block, thus limiting the smoothing effect. The Pass 2 and Pass 3 ellipses were designed to enable interpolation on a broader distance with Pass 3 limited to the maximum extrapolation and interpolation in the mineralized solids.

Figure 14.25 Search Ellipsoids



14.8 BLOCK MODEL INTERPOLATION

In order to interpolate the different block models, different sets of composites, solids, ellipses and parameters were generated (Table 14.4). This process enabled the use of the specific statistical properties of each zone during the interpolation process. All the different variables were interpolated using Ordinary Kriging (OK) methodology.

Table 14.4 Block Model Interpolation Parameters

Variables	Passes	Method	Ellipses	Minimum Comp	Maximum Comp	Minimum DDH	No. Estimated Blocks	Average Sample Distance
GraphiteLG	1	OK	Pass1	5	9	3	1,214 (2.6%)	9.95m
GraphiteLG	2	OK	Pass2	5	9	3	12,201 (26.5%)	23.21m
GraphiteLG	3	OK	Pass3	3	9	3	31,704 (68.7%)	35.90m
GraphiteHG	1	OK	Pass1	3	7	2	715 (1.5%)	10.85m
GraphiteHG	2	OK	Pass2	3	7	2	4,552 (9.9%)	25.74m
Indicator	1	OK	Pass1	3	7	2	3,480 (7.5%)	10.50m
Indicator	2	OK	Pass2	3	7	2	17,895 (38.8%)	24.38m
SLABprob	1	OK	Pass2	3	8	2	-	-
SLABprob	2	OK	Pass3	3	8	2	-	-

14.8.1 GRAPHITE MINERALIZATION INTERPOLATION

The different variables created in the compositing process were interpolated within the limits of the graphite mineralization solid (Figure 14.13). All the blocks inside the solid were interpolated using the parameters in Table 14.4 for the GraphiteLG variable. The GraphiteHG and Indicator (high-grade probability) were restricted to smaller search ellipsoids (Table 14.4) due to the discontinuous nature of the high-grade mineralization.

The three different variables were then used to re-calculate the graphite percentage (graphitic carbon) of each block. The GraphiteLG representing the bulk disseminated mineralization in the marble was then combined with the high-grade model (GraphiteHG) using the probability that the given block is actually high-grade material (Indicator). The final graphitic carbon grade of the block was calculated as follows:

Blocks with	Standard Interpolation	Selective Indicators	Grade source
0% high grade probability	One grade	One grade	Low grade Interpolation
10% high grade probability	One grade	One grade	Low grade Interpolation
20% high grade probability	One grade	One grade	Low grade Interpolation
30% high grade probability	One grade	One grade	Low grade Interpolation
40% high grade probability	One grade	Two grade	High + Low grade Interpolation
50% high grade probability	One grade	Two grade	High + Low grade Interpolation
60% high grade probability	One grade	Two grade	High + Low grade Interpolation
70% high grade probability	One grade	One grade	High grade Interpolation
80% high grade probability	One grade	One grade	High grade Interpolation
90% high grade probability	One grade	One grade	High grade Interpolation
100% high grade probability	One grade	One grade	High grade Interpolation

CgTOTAL = If Indicator <= 0.3, CgTOTAL = GraphiteLG

*CgTOTAL = If 0.7 <= Indicator > 0.3, CgTOTAL = GraphiteLG+(GraphiteHG * Indicator)*

CgTOTAL = If Indicator > 0.7, CgTOTAL = GraphiteHG

A total of 45,119 blocks were interpolated with the GraphiteLG variable (Figure 14.26), whereas the Indicator variable was only interpolated in 21,375 blocks (Figure 14.26), with only 5,267 blocks containing GraphiteHG results (Figure 14.26). All the GraphiteHG interpolated blocks have Indicator values ranging from 0.1 to 1.

All the 45,119 blocks were re-calculated for the CgTOTAL variable with grades ranging from 0.02 to 12.92% graphitic carbon, with an average grade of 0.72% graphitic carbon (Figure 14.28). Given the statistical distribution of the original assays and composite original grades, the block model does not seem to over (or under) estimate the graphite grades (Figure 14.28). Furthermore, a good correlation is observed between the block grades and the composites located inside those blocks (Figure 14.28). Lastly, the swath plot makes for an acceptable level of smoothing and grade value across the x, y and z axis of the deposit (Figure 14.29).

Caution needs to be taken with the block grade located around the three channel samples at VN6-3, where the interpolation creates a significant volume of high-grade blocks with no drilling information constraining the values (Figure 14.27). Classification of these blocks should not exceed the Inferred category in this particular moment until the next drilling campaign (completed in January 2016); which aims at better defining this area for the next Mineral Resource estimation.

Figure 14.26 Block Model Interpolation Results for GraphiteLG (top), Indicators (middle) and GraphiteHG (bottom)

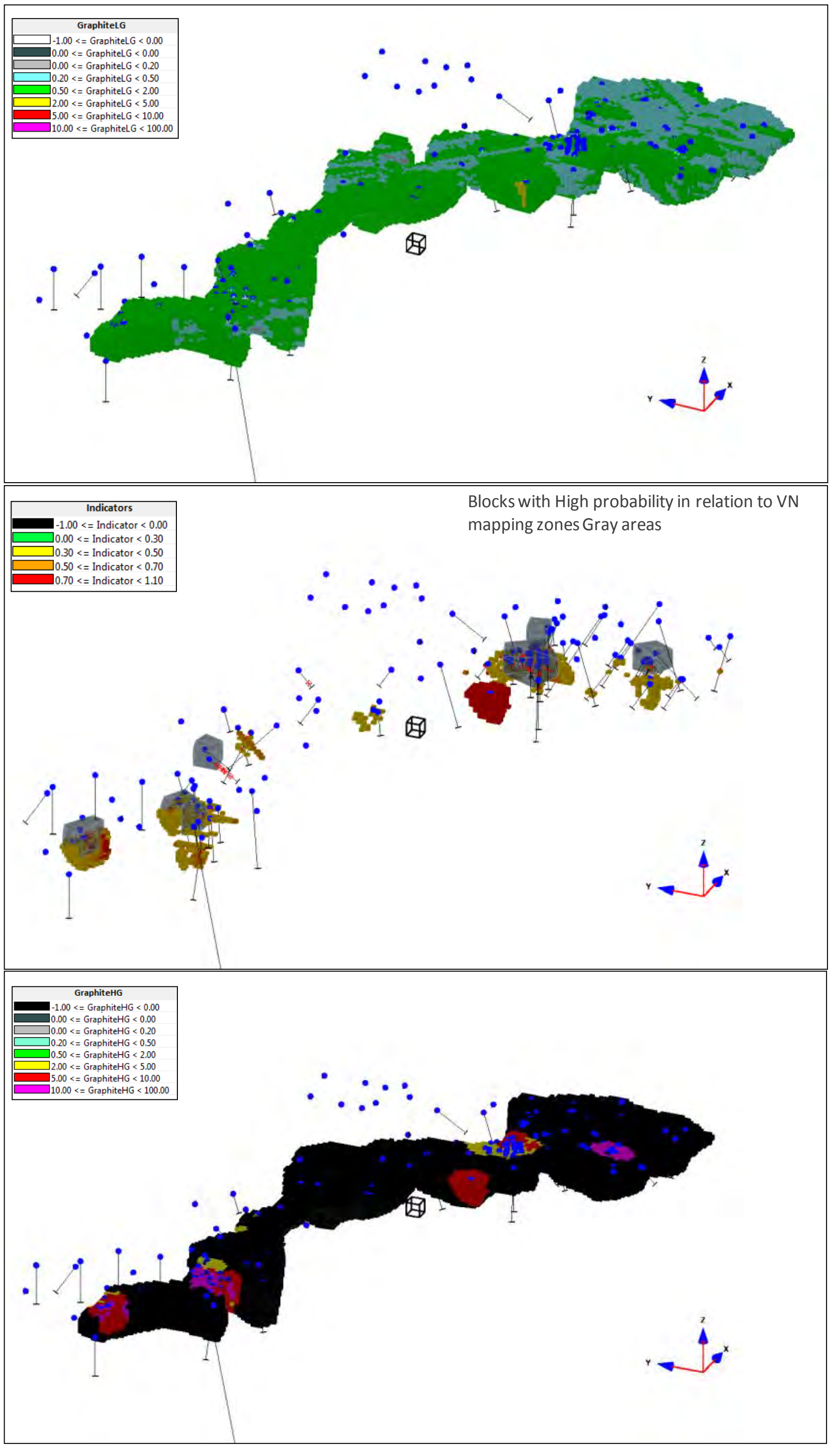


Figure 14.27 Resulting CgTOTAL Interpolation Result

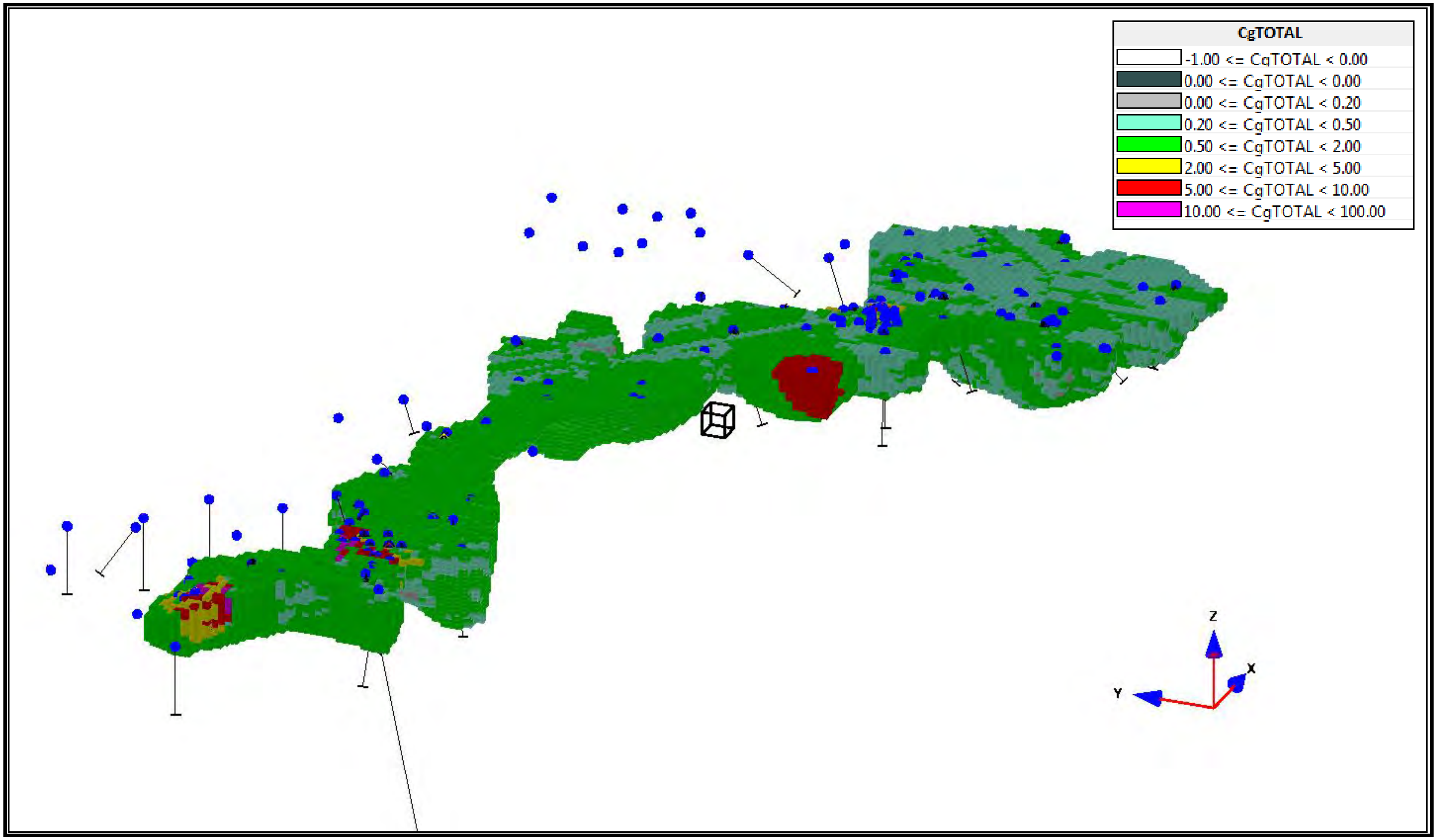
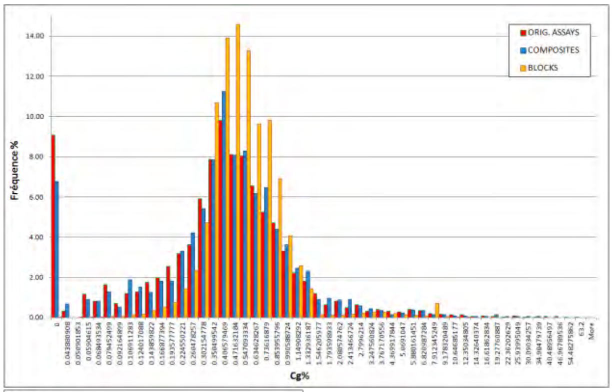
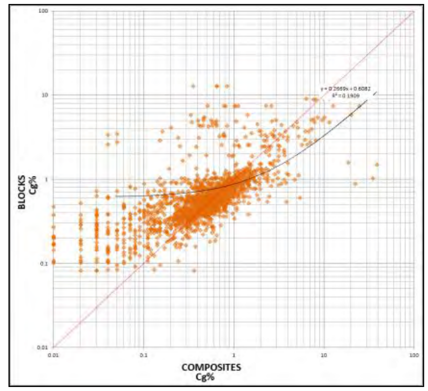
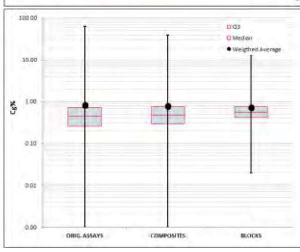


Figure 14.28 Results from the Block Model Validation Process

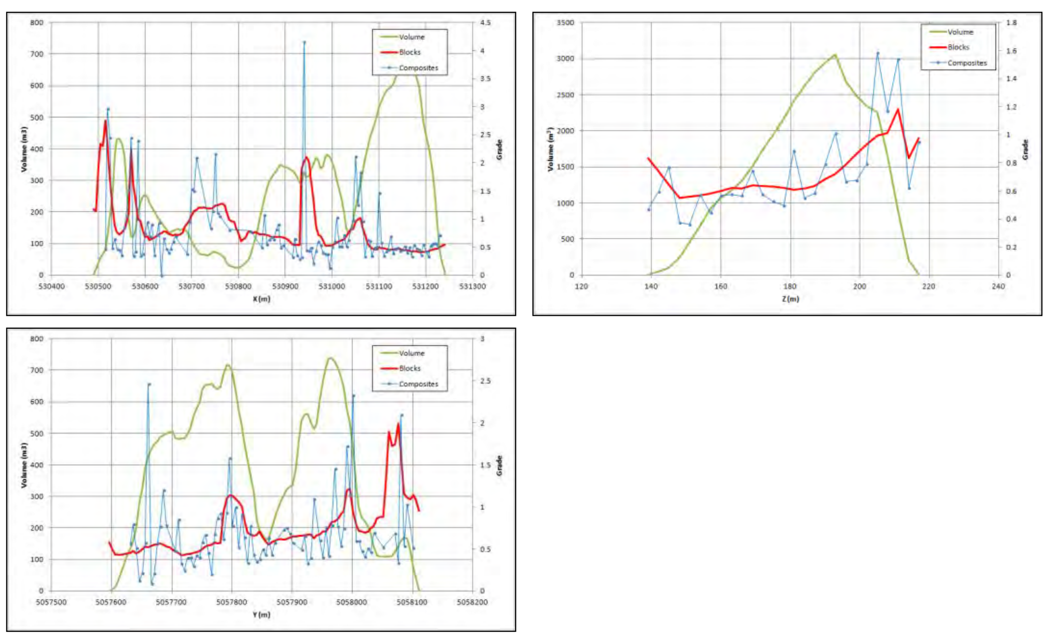






	ORIG. ASSAYS	COMPOSITES	BLOCKS
Average	0.89	0.81	0.72
Weighted Average	0.81	0.78	0.71
Standard Deviation	2.92	1.96	0.92
% Variation	328.9%	243.1%	126.9%
Median	0.45	0.47	0.55
Mode	0.03	0.00	9.12
Variance	8.55	3.86	0.84
Minimum	0.00	0.00	0.02
Maximum	63.20	38.70	12.92
Count	3108	2090	45119

Figure 14.29 Swath Plot Across the Three Axes of the Block Model



14.8.2 ARCHITECTURAL MARBLE BLOCK INTERPOLATION

The variables created to represent the probability of encountering white marble (SLABprob) were interpolated within the limits of the entire block model. A total of 167,958 blocks inside the model were interpolated using the parameters in Table 14.4. The blocks that were not interpolated were given a probability of "0".

All the 179,356 blocks in the model have a SLABprob variable with values ranging from 0 to 1, with an average grade of 0.1. The distribution of the blocks seems adequate given the statistical distribution of the composite indicator values (90% of "0"). Furthermore, a good visual correlation is observed between the block with SLABprob >0.9 and the composites with indicators at 1 (Figure 14.28).

The block values associated with composites not classified as white marble are 85% of the time interpolated with a value of 0 (Figure 14.31) and 99% of the time with values lower than 0.5 (Figure 14.31). This is considered acceptable since the smoothing created by interpolation does not seem to create too many "false" positives". The blocks with an estimated SLABprob value above 0.6 (1% or less of false positives in the interpolation) were then considered as white marble, suitable for architectural stone.

Figure 14.30 Visual Comparison of White Marble Composites (red dots) and Block with Values Greater Than 0.9 (blue dots)

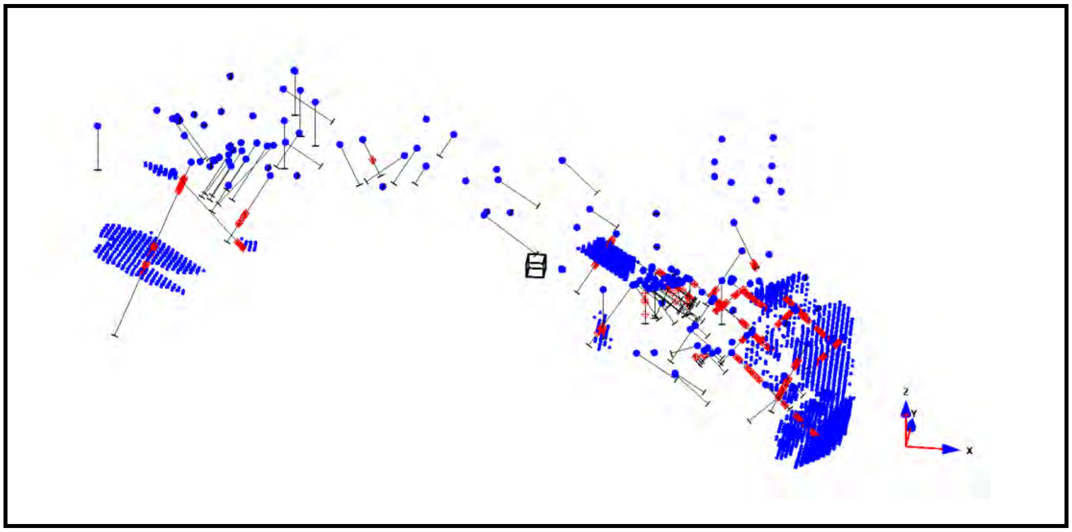


Figure 14.31 SLABprob Block Value Distribution According to Composite Classification

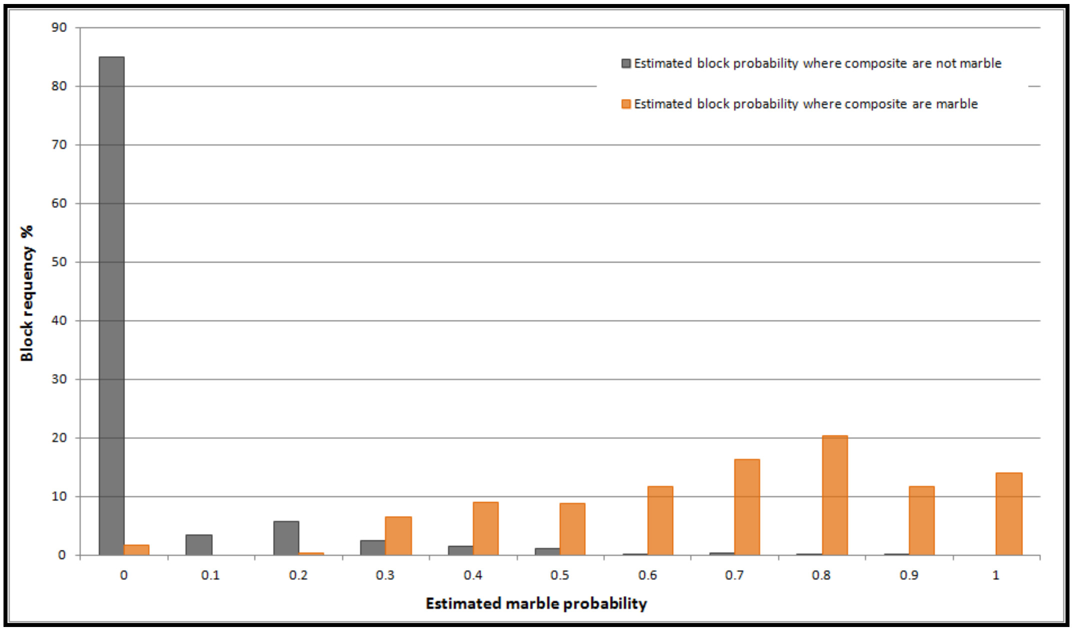
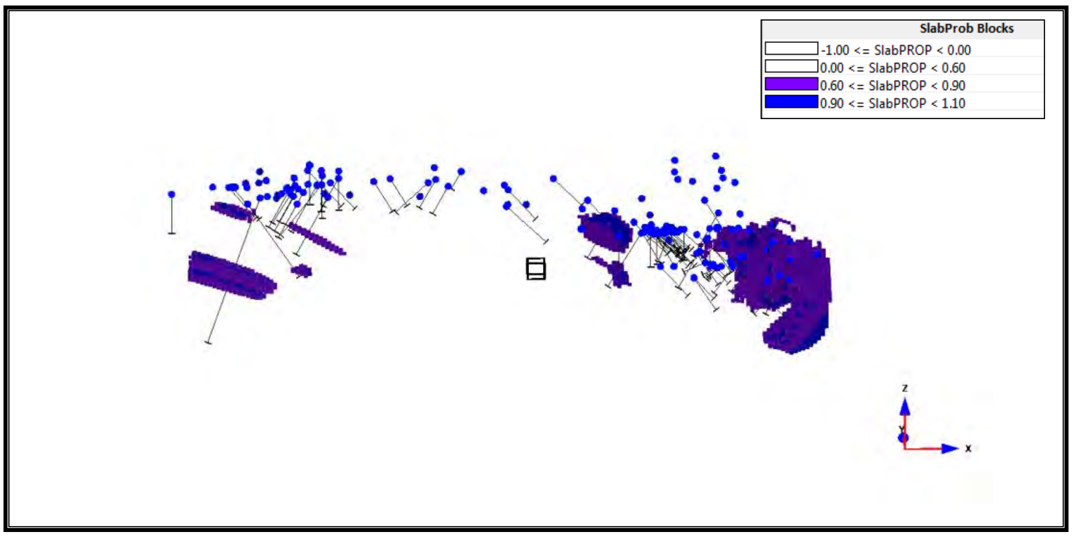


Figure 14.32 White Marble Architectural Block Distribution



14.9 Block Model Classification

Given the drilling grid in relation to the observed continuity on the geological and statistical scale, the Mineral Resources comprising the current block model will all be classified as Inferred.

This classification is also in line with the quality of the data stated in Sections 11.0 and 12.0 and with the presence of surface samples in the database. Furthermore, the author is cautious with the parameter to qualify the marble quality (white colored marble) due to the limitation of color logging with the human eye. The cut-off of 0.6 probability used to classify the blocks is adequate for the Inferred category.

Subsequent work phases could increase the confidence level of the Mineral Resources for both graphite and marble resources. The marble Mineral Resource classification could benefit from logging using a technology able to differentiate rock colors using an empirical variable (i.e. Corescan©), as proposed in the recommendation section of this report. An increase of drilling grid coverage and in QA/QC sample insertion, coupled with the removal of punctual surface samples from the database is required in order to increase the Mineral Resources classification to Indicated or Measured.

14.10 Optimization Procedures and Parameters

Two separate open pit optimizations were conducted on the Project to validate the Mineral Resources under the NI 43-101 requirements of *"reasonable prospect of eventual economic extraction"* (CIM 2012) for Mineral Resource reporting purposes. A first scenario was conducted using the graphite Mineral Resources, in which the CgTOTAL variable was used to generate optimized shells using the parameters in Table 14.5. This scenario produced two separate pits with a cut-off grade estimation at 0.8% graphitic carbon (Figure 14.33).

Once the graphite pits were generated, all the blocks inside those shells were classified with a SLABprob of 0 and a second phase of optimization was conducted to establish the optimized pit shell for the architectural marble blocks. Only the blocks with SLABprob value greater than or equal to 0.6 were considered to be potential ore. The blocks with value equal or greater than 0.6 were assigned a value of 184$/t and since the extracted blocks are directly sold, no processing costs are estimated (Table 14.6). The blocks above the 0.6 SLABprob and within the pit shell will be considered as architectural marble resources (Figure 14.34).

Table 14.5 Graphite Mineral Resource Optimization Parameters

Parameters	Value	Unit	References
Sales Revenues			
Exchange Rate	0.75	-	CAD1 = USDX (Tetra Tech)
Metal Price	0.0173	$/g	Canada Carbon (13,000.00 USD/t)
Operating Costs			
Mining Mineralized Material	- 1.00	$/t mined	Canada Carbon
Mining Overburden	2.22	$/t mined	Canada Carbon
Mining Waste	- 1.00	$/t mined	Canada Carbon
Mining Dilution	5.00	%	Tetra Tech
Mining Recovery	95.00	%	Tetra Tech
Crushing and Processing	25.00	$/t milled	Tetra Tech
Treatment and Refining	1,600.00	$/t conc.	Tetra Tech

table continues…

Parameters	Value	Unit	References
General and Administration	12.00	$/t mined	Assumption Tetra Tech
Freight Mine to Treatment	18.00	$/t mined	Canada Carbon
Metallurgy and Royalties			
Concentration Recovery	88.00	%	SGS Canada Inc.
Royalties	4.00	%	Canada Carbon
Geotechnical Parameters			
Pit Slopes	45.00	degrees	Tetra Tech
Density of Mineralized Material and Waste	2.81	t/m³	SGS Canada Inc.
Density of Overburden	1.80	t/m³	Assumption Tetra Tech

Note: The pit parameters in the table were estimated based on the data available at the time and that these variables may be different than the final figures used for the financial modelling process.

Table 14.6 Marble Mineral Resource Optimization Parameters

Parameters	Value	Unit	References
Sales Revenues			
Exchange Rate	0.75	-	CAD1 = USDX (Tetra Tech)
Metal Price	184.00	$/t	Canada Carbon
Operating Costs			
Mining Mineralized Material	8.83	$/t mined	Canada Carbon
Mining Overburden	2.22	$/t mined	Canada Carbon
Mining Waste	- 1.00	$/t mined	Canada Carbon
Mining Dilution	-	%	Tetra Tech
Mining Recovery	80.00	%	Tetra Tech
General and Administration	12.00	$/t mined	Assumption Tetra Tech
Freight Mine to Treatment	23.75	$/t mined	Canada Carbon
Metallurgy and Royalties			
Royalties	2.5	%	Canada Carbon
Geotechnical Parameters			
Pit Slopes	55.00	degrees	Tetra Tech
Density of Mineralized Material and Waste	2.81	t/m³	SGS Canada Inc.
Density of Overburden	1.80	t/m³	Assumption Tetra Tech

Note: The pit parameters in the table were estimated based on the data available at the time and that these variables may be different than the final figures used for the financial modelling process.

Figure 14.33 Optimized Pit Shell from the Graphite Scenario

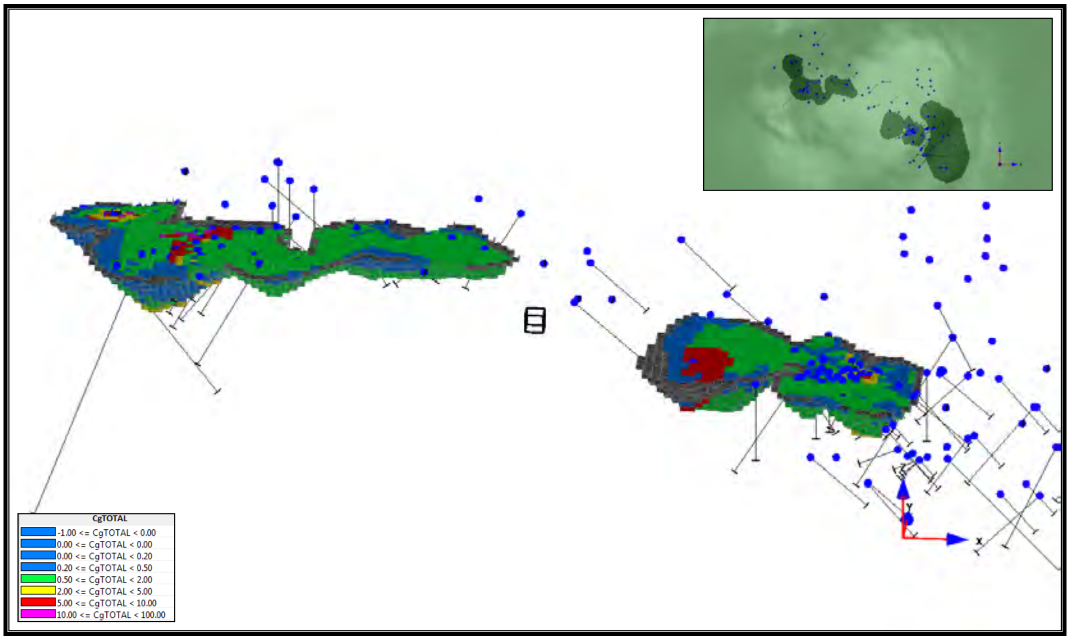
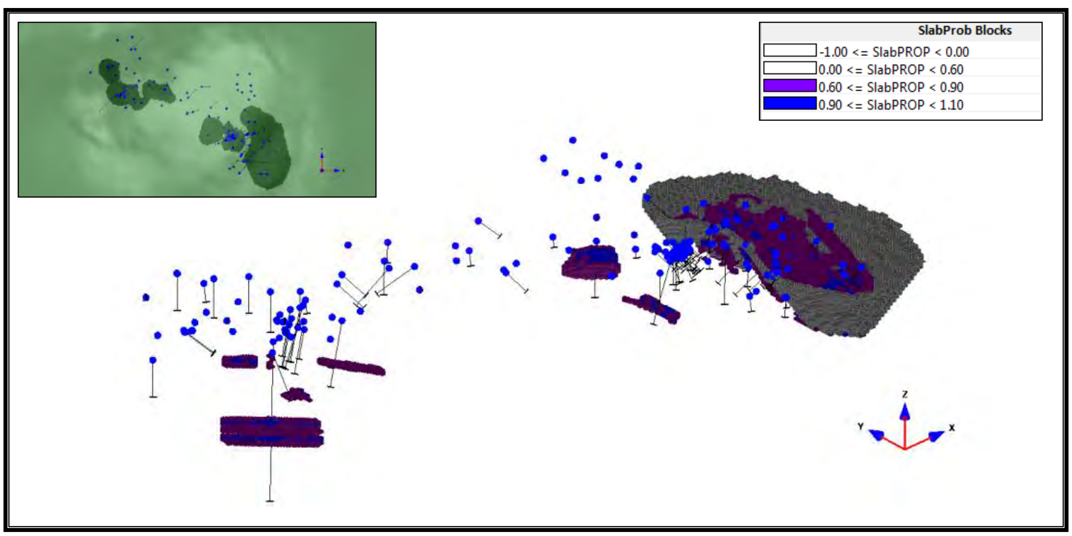


Figure 14.34 Optimized Pit Shell from the Architectural Marble Scenario



14.11 Mineral Resources

The pit shells from the optimization scenarios were used to limit the extent of the Mineral Resources at depth (Figure 14.33 and Figure 14.34). The mineral resources are stated at different cut off grades, depending on the pit in which they are contained. The main two graphite pits have a cut-off grade of 0.8% graphitic carbon, whereas the blocks not considered architectural marble in the marble pit have a graphite cut-off of 0.4%

graphitic carbon (Table 14.7), since they do not require expenditure to be mined (the mining cost is already included in the waste mining cost of the marble pit; Table 14.6.)

However, architectural blocks within the graphite pit shells cannot be considered in the mineral resources due to the waste mining technique not being adapted to extract quality blocks in the production.

The graphite pits contain 952,000 t of Inferred Resources at an average grade of 2.00% graphitic carbon (reported at a cut-off grade of 0.8% graphitic carbon) and the marble pit comprises 1.18 Mt of Inferred Resources at an average grade of 0.53% graphitic carbon (reported at a cut-off grade of 0.4% graphitic carbon; Table 14.7). The marble pit contains 1.52 Mt of architectural marble with an average probability of white marble at 0.82 (reported at a minimum probability of 0.6; Table 14.7).

Table 14.7 Graphite and Architectural Marble Mineral Resources

Mineral Resources with the Two Graphite Pit Shells				
Cut-off Grade (%Cg)	Category	Tonnage	Average Cg%	Graphite (t)
0.8	Inferred	952,000	2.00	19,000

Mineral Resources within the Marble Pit Shell							
Cut-off Grade		Category		Tonnage	Average		Marble or Graphite (t)
0.6	Prob	Marble	Inferred	1,519,000	0.82	Prob	1,519,000
0.4	%Cg	Graphite	Inferred	1,180,000	0.53	% Cg	6,200

Notes: The mineral resource estimate has been conducted using the CIM Definitions Standards for mineral resources in accordance with National Instrument 43-101, Standards of Disclosure for Mineral Projects.
Mineral resources, which are not mineral reserves, do not have demonstrated economic viability.
Inferred mineral resources are exclusive of the Measured and Indicated resources.
A fixed density of 2.81 t/m^3 was used to estimate the tonnage from block model volumes.
Resources are constrained by the pit shell and the topography of the overburden layer.
Effective date February 16, 2016

15.0 MINERAL RESERVE ESTIMATES

A Mineral Reserve has not been estimated for the Miller Project as part of this PEA.

16.0 MINING METHODS

16.1 INTRODUCTION

Tetra Tech prepared an open pit mining study for the Project, based on a target annual production of 1,500 t of refined graphite and 150,000 t of marble blocks. Canada Carbon provided Tetra Tech with a signed letter of intent with a potential mining contractor, for mining out graphite material, crushing to finer than 20 mm, hauling to the mill, and handling waste rock. Canada Carbon also provided Tetra Tech with rental rates for the leased supporting and ancillary mining equipment, to be utilized for both the graphite and marble pits. This section outlines the input data, procedures and results of the mining study.

16.2 MINING METHOD

The graphite pit will be mined using a conventional truck/loader open pit mining method. The production cycle includes drilling, blasting, loading, and hauling, all of which will be performed by a mining contractor.

Marble will be cut into blocks using a chain saw. First a horizontal bottom section with a length of 20 m and a depth of 2.25 m will be cut, then a back vertical section with a length of 20 m will be cut at a 2.25 m depth. Wood blocks will be used to prevent the marble blocks from falling. Vertical cross sections will be cut at approximately 2-m intervals to produce 2.25 m by 2.25 m by 2 m marble blocks. The marble blocks will be separated and pushed down over a prepared cushion layer of crushed rocks using hydraulic block pushers. A fork loader will be used to load the marble blocks onto a flatbed truck for off-site transportation.

Based on the letter of intent between Canada Carbon and a local quarry company, the mining contractor will mine, move, and consume all waste material from the graphite and marble pits and pay Canada Carbon $1.00/t of waste.

16.3 PIT OPTIMIZATION

Tetra Tech performed open pit optimizations using GEOVIA Whittle™ (Whittle™) software, which is based on the Lerchs-Grossmann (LG) optimization algorithm. Pit optimization parameters were prepared based on data provided by Canada Carbon, other consultants, technical studies, and experience from other projects.

16.3.1 BLOCK MODEL

Mineral Resource estimation was performed by SGS (see Section 14.0). SGS provided Tetra Tech with a topographical drawing and a 5 m by 5 m by 3 m block model, which formed the basis of the open pit optimizations.

16.3.2 PIT SLOPE ANGLE

Due to the lack of pit geotechnical studies for the Project, an overall pit slope angle of 45° was assumed for the graphite pit optimizations and 55° was assumed for the marble pit optimizations.

16.3.3 PIT OPTIMIZATION PARAMETERS

The economic, technical, and operational parameters, as well as the metallurgical recoveries used for pit and mine schedule optimizations are provided in Table 16.1.

Table 16.1 Pit Optimization Parameters

Items		Unit	Value
Exchange Rate	-	CAD = USD	1.00 = 0.75
Discount Rate	-	%	10.0
Production Rate	Maximum Daily Mining Capacity, Graphite	t/d	500
	Working Days	d/a	365
	Processing Cut-off for Graphite Pit	% Cg	0.80
	Refined Graphite Produced	t/a	1,500
	Marble Blocks	t/a	150,000
Product Price (Market)	Graphite	USD/t	13,000.00
	Marble	CAD/t	184.00
Graphite Processing	Method	-	flotation and heat treatment
	Recovery, Flotation	%	88.0
	Recovery, Refining	%	95.0
	Concentrate Grade	% Cg	95.0
	Product Grade, Final Product	% Cg	99.99980
Off-site Costs	*Graphite:*	-	-
	Transportation, Insurance – Graphite Concentrate from Miller to Asbury	CAD/t graphite concentrate	18.00
	Concentrate Shipping by Truck to New York State, 90% of Concentrate	CAD/t concentrate	400.00
	Concentrate Shipping by Boat to Germany, 10% of Concentrate	CAD/t concentrate	250.00
	Royalty, Third Party	%	4.0
	Marble:	-	-
	Transportation, Insurance – Marble	CAD/t marble	23.75
	Royalty, Third Party	%	2.5%

table continues...

Items		Unit	Value
Operating Costs	*Mining:*	-	-
	Mining Staff G&A	CAD/t mined	2.00
	Haulage Roads Construction and Maintenance	CAD/t mined	0.50
	Graphite Mining and Crushing to 20 mm (Contractor)	CAD/t mined	7.24
	Mining of Graphite not Selected for Further Crushing (Contractor)	CAD/t mined	-1.00
	Mining, Overburden (Contractor)	CAD/m³ removed	4.00
	Mining, All Waste including Graphite, Marble and any Other Waste (Contractor)	CAD/t mined	-1.00
	Mining, Marble (Owner Mining)	CAD/t mined	20.00
	Processing and G&A:	-	-
	Processing, Graphite	CAD/t processed	25.00
	Treatment and Refining, Graphite	CAD/t concentrate	1,600.00
	G&A	CAD/t processed	12.00
Block Model	Block Model	m	5 x 5 x 3
	Graphite Grade	%	varies
	Marble Quality	slab/waste	varies
Density	Graphite	t/m³	2.81
	Marble	t/m³	2.81
	Waste	t/m³	2.81
	Over Burden	t/m³	1.80
	Default	t/m³	2.81
Mining Technical Assumptions	Mining Recovery, Graphite	%	95
	Mining Dilution, Graphite	%	5
	Mining Recovery, Marble	%	80
Pit Slope Angles	Overall, Pit (Graphite)	degrees	45
	Overall, Pit (Marble)	degrees	55

Note: The pit parameters in the table were estimated based on the data available at the time and that these variables may be different than the final figures used for the financial modelling process.

16.3.4 Pit Optimization Results

Using the pit optimization parameters in Table 16.1, 33 graphite pit shells were generated using Whittle™ software corresponding to price factors ranging between 0.175 and 1. For the marble pit, 24 pit shells were generated corresponding to price factors ranging from 0.3 to 1. The discounted cash flow value of each pit was estimated using a discount rate of 10%. All operating costs in Table 16.1 were considered when estimating the discounted values; no capital costs were considered in generating these values. The optimization results for the graphite pit and the marble pit are summarized in Table 16.2 and Table 16.3, respectively. For graphite, pit 15 was selected as the final pit for further design and scheduling, and for marble, pit 17 was selected as the final pit. The criteria for selecting these pits was to achieve a high discounted value, while minimizing the pit footprints and waste production.

Table 16.2 Graphite Pit Optimization Results

Pit Number	Price Factor	Discounted Cash Flow ($ million)	Tonnage Mined (t)	Waste Mined (t)	Tonnage Processed (t)	Average Grade (%Cg)
1	0.175	50.1	108,547	33,408	75,139	6.98
2	0.200	63.0	183,856	68,728	115,128	6.04
3	0.225	70.5	253,736	97,986	155,750	5.18
4	0.250	78.4	385,436	162,125	223,311	4.23
5	0.275	81.9	504,953	242,073	262,880	3.86
6	0.300	83.8	597,941	312,119	285,822	3.69
7	0.325	85.0	719,215	419,502	299,713	3.61
8	0.350	86.5	830,883	508,650	322,233	3.47
9	0.375	88.2	908,599	554,374	354,225	3.28
10	0.400	90.5	986,167	577,429	408,738	3.00
11	0.425	96.7	1,219,742	653,361	566,381	2.48
12	0.450	100.4	1,439,377	764,392	674,985	2.25
13	0.475	102.4	1,613,156	865,137	748,019	2.13
14	0.500	105.2	1,815,014	947,867	867,147	1.97
15	0.525	107.8	2,102,380	1,103,478	998,902	1.83
16	0.550	110.7	2,572,779	1,385,293	1,187,486	1.68
17	0.575	112.8	3,034,047	1,717,121	1,316,926	1.59
18	0.600	113.6	3,271,238	1,895,800	1,375,438	1.56
19	0.625	113.9	3,432,462	2,032,189	1,400,273	1.55
20	0.650	114.2	3,612,812	2,187,913	1,424,899	1.54
21	0.675	114.6	4,053,375	2,586,382	1,466,993	1.52
22	0.700	114.8	4,193,366	2,715,639	1,477,727	1.51
23	0.725	114.8	4,308,729	2,822,583	1,486,146	1.51
24	0.750	114.8	4,341,705	2,853,454	1,488,251	1.51
25	0.775	114.9	4,385,917	2,894,930	1,490,987	1.51
26	0.800	114.9	4,567,449	3,067,833	1,499,616	1.50

table continues...

Pit Number	Price Factor	Discounted Cash Flow ($ million)	Tonnage Mined (t)	Waste Mined (t)	Tonnage Processed (t)	Average Grade (%Cg)
27	0.825	114.9	4,613,190	3,111,258	1,501,932	1.50
28	0.850	114.9	4,729,081	3,221,888	1,507,193	1.50
29	0.875	115.0	4,800,905	3,290,975	1,509,930	1.50
30	0.900	115.0	4,844,409	3,332,796	1,511,613	1.50
31	0.925	115.0	4,976,581	3,460,548	1,516,033	1.50
32	0.950	115.0	5,027,358	3,509,641	1,517,717	1.49
33	1.000	115.0	5,051,134	3,532,365	1,518,769	1.49

Table 16.3 Marble Pit Optimization Results

Pit Number	Price Factor	Discounted Cash Flows ($ million)	Marble (t)	Waste (t)
1	0.30	6.00	47,567	52,268
2	0.32	84.94	942,486	3,397,240
3	0.34	94.34	1,095,421	4,263,913
4	0.36	96.84	1,140,299	4,630,678
5	0.38	97.98	1,162,501	4,856,770
6	0.40	98.43	1,171,954	4,975,606
7	0.42	98.84	1,180,743	5,103,047
8	0.44	98.98	1,183,950	5,159,340
9	0.46	98.98	1,184,119	5,162,758
10	0.48	99.00	1,184,457	5,169,705
11	0.50	99.10	1,186,997	5,223,836
12	0.52	99.19	1,189,027	5,257,406
13	0.54	99.20	1,189,534	5,271,788
14	0.56	99.24	1,190,715	5,309,265
15	0.58	99.25	1,190,884	5,315,426
16	0.60	99.27	1,191,728	5,346,092
17	0.66	99.28	1,192,066	5,359,110
18	0.74	99.27	1,192,066	5,365,110
19	0.76	99.27	1,192,090	5,366,563
20	0.86	99.27	1,192,094	5,366,770
21	0.88	99.27	1,192,431	5,389,645
22	0.92	99.27	1,192,600	5,401,684
23	0.94	99.27	1,192,769	5,414,309
24	1.00	99.27	1,192,769	5,418,107

16.4 Mine Design

16.4.1 Bench Height and Pit Wall Slope

Limited geotechnical data is available for the Project. Both the graphite and marble pit designs are assumed to incorporate a bench height of 15 m, with a minimum berm width of 8 m. The inter-ramp angle is assumed to be 45° for the graphite pit and 55° for the marble pit.

16.4.2 Haul Road

Main haul roads for the Project were designed to accommodate 24-t articulated trucks with one-way traffic due to the shallow depth of both pits and small scale operations. Ramps are designed with a width of 8 m and a maximum grade of 10%.

16.4.3 Pit Hydrology/Dewatering

No pit hydrology study is included in this PEA; however, an allowance is included in the mining operating cost to account for pit dewatering.

16.4.4 Pit Design Results

The final graphite pit contains 890,805 t of graphite material grading 1.87% graphitic carbon and the final marble pit contains 1,182,037 t of marble. A material summary from the final pits is shown in Table 16.4 and Table 16.5. Figure 16.1 and Figure 16.2 show general views of the final graphite and marble pits.

Table 16.4 Graphite Pit Design Results

Material	Mass (t)	Cg (%)
Graphite Material	890,805	1.87
Waste	1,479,770	-
Overburden Removed	158,279	-

Table 16.5 Marble Pit Design Results

Material	Mass (t)	Cg (%)
Marble Material	1,182,037	-
Graphite Material	1,206,051	0.53
Waste	5,031,758	-
Overburden Removed	210,468	-

Figure 16.1 Graphite Pit Design

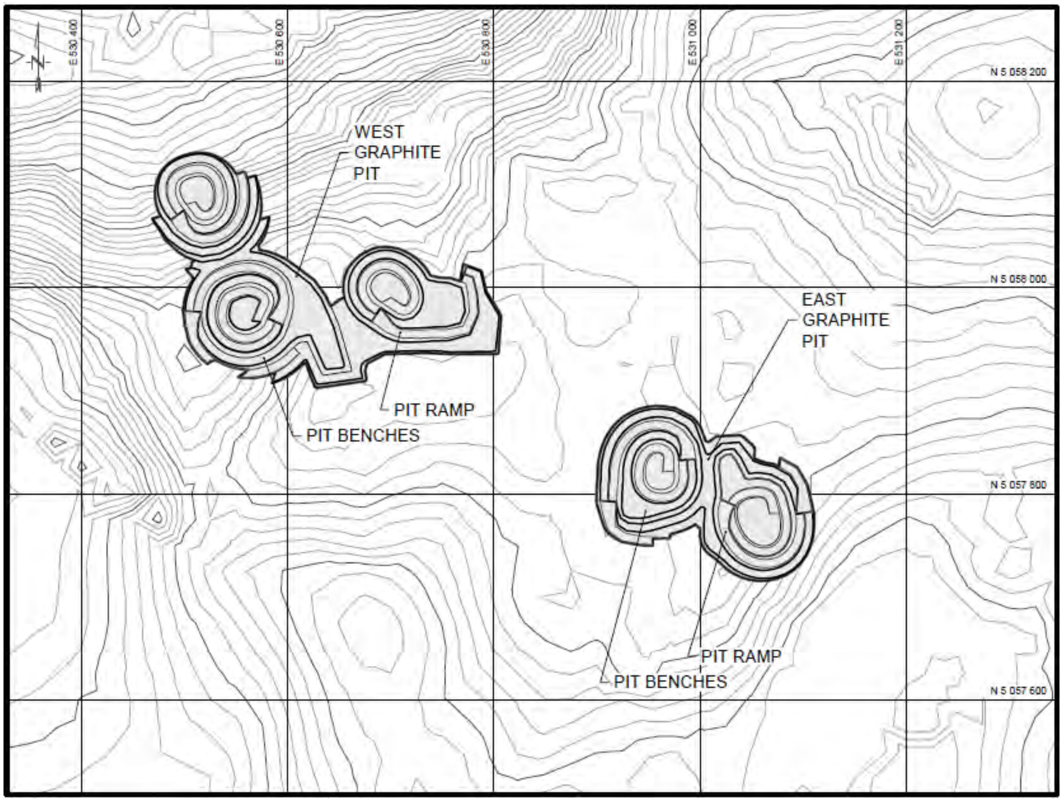
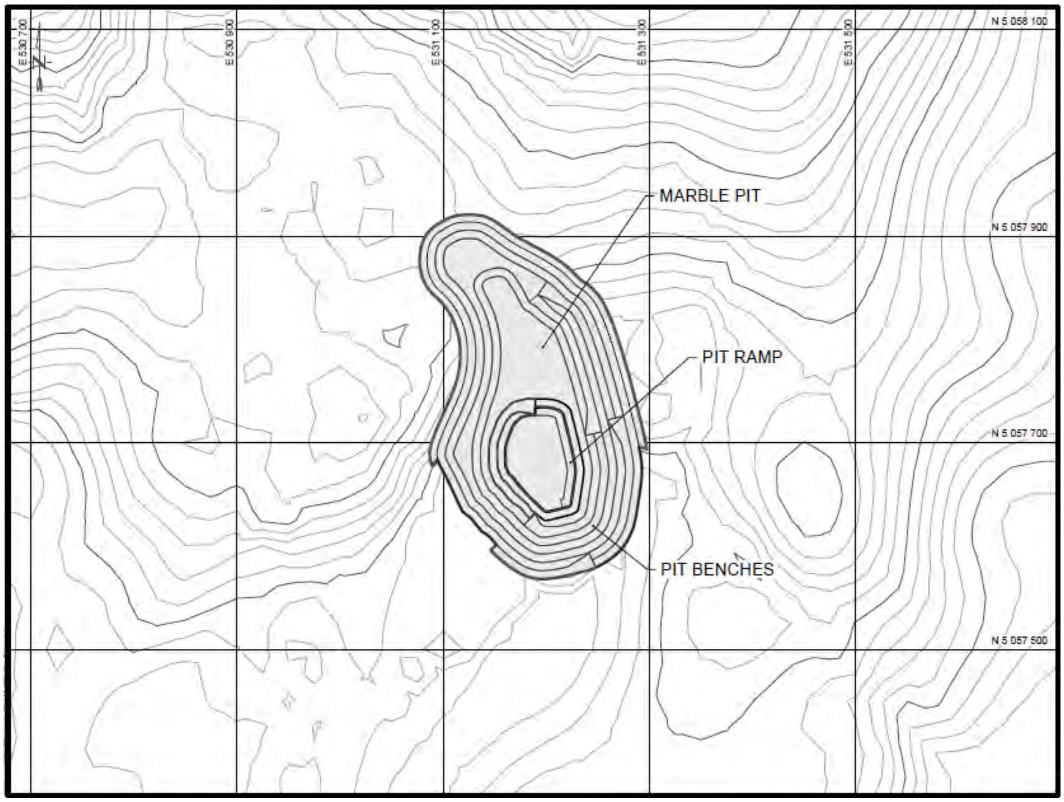


Figure 16.2 Marble Pit Design



16.5 PRODUCTION SCHEDULE

The graphite pit mining schedule was developed based on a maximum refined graphite capacity of 1,500 t/a. Production will start at the west pit and continue over four years, until the resource within the west pit is exhausted. Mining will then start at the east pit and continue until Year 10. Low-grade graphite material from the west pit will be stockpiled and used beginning in Year 5 to meet mill capacity and refined graphite production limits. As shown in Table 16.6, the graphite pit will produce 890,805 t of graphite material, 1,479,770 t of waste rock, and 158,279 t of overburden over the 10-year LOM. The LOM stripping ratio is 1.8 and LOM average mill head grade is 1.87% graphitic carbon. Figure 16.3 shows the production schedule indicating the total mined waste and total mined mineralized material to be fed to the process plant.

The marble pit is scheduled to produce a maximum annual marble tonnage of 150,000 t. The graphite material contained in the marble pit will be stockpiled and reclaimed starting in Year 9. As shown in Table 16.7, the marble pit will produce 1,182,037 t of marble, 1,206,051 t of graphite material grading 0.53% graphitic carbon, 5,031,758 t of waste, and 210,468 t of overburden over the 8-year LOM. The LOM stripping ratio is 2.2. The marble mining schedule is shown in Figure 16.4.

Table 16.6 Graphite Pit Production Schedule

Year	Material Mined				Graphite Material									
	Tonnage Mined (t)	Waste Mined (t)	Overburden Removed (t)	Strip Ratio	Pit to Flotation		Pit to Stockpile		Stockpile to Flotation		Total Processed		In SP	
					t	%Cg	t	%Cg	t	%Cg	t	%Cg	t	%Cg
1	350,000	105,101	44,680	0.7	73,000	2.44	127,219	0.94	-	-	73,000	2.44	127,219	0.94
2	430,000	266,422	30,912	2.2	73,000	2.45	59,666	0.88	-	-	73,000	2.45	186,885	0.92
3	350,000	219,984	25,230	2.3	73,000	2.44	31,786	0.85	-	-	73,000	2.44	218,671	0.91
4	470,261	308,278	38,560	2.8	69,949	2.56	53,475	0.91	-	-	69,949	2.56	272,146	0.91
5	145,000	91,975	5,657	2.1	47,368	2.59	-	-	62,132	0.91	109,500	1.64	210,014	0.91
6	135,000	83,768	107	1.6	51,125	2.45	-	-	58,375	0.91	109,500	1.63	151,639	0.91
7	116,000	66,036	1,485	1.4	48,479	2.52	-	-	61,021	0.91	109,500	1.62	90,618	0.91
8	134,000	79,418	8,382	1.9	46,200	2.59	-	-	63,300	0.91	109,500	1.62	27,318	0.91
9	200,000	138,403	3,266	2.4	58,331	2.18	-	-	27,318	0.91	85,649	1.78	-	-
10	198,593	120,385	-	1.5	78,207	1.08	-	-	-	-	78,207	1.08	-	-
LOM	2,528,854	1,479,770	158,279	1.8	618,659	2.29	272,146	0.91	272,146	0.91	890,805	1.87		

Figure 16.3 Graphite Pit Production Schedule

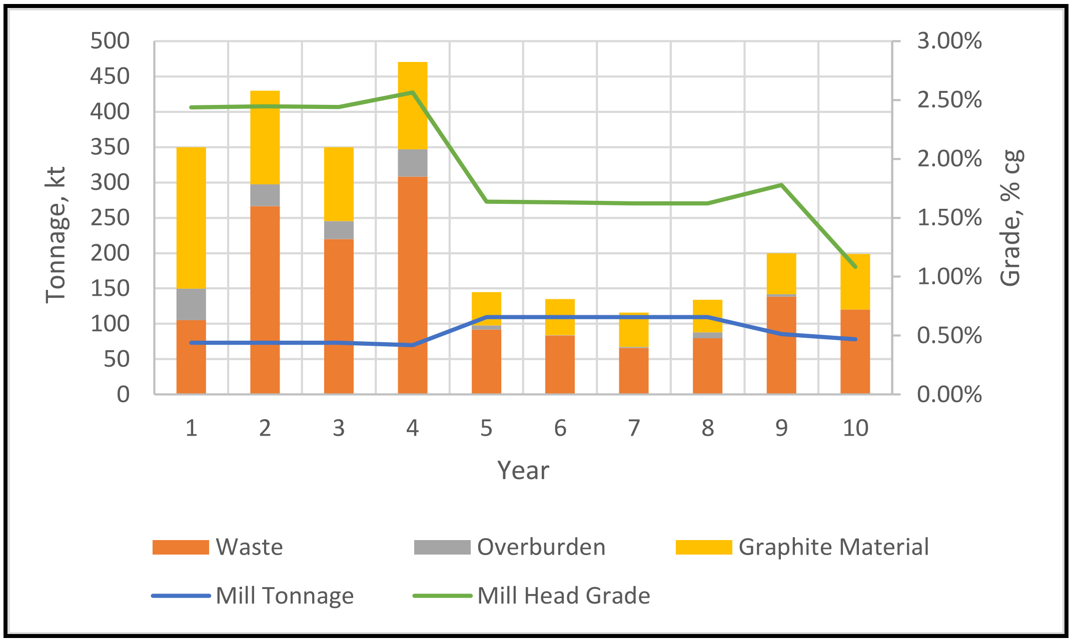
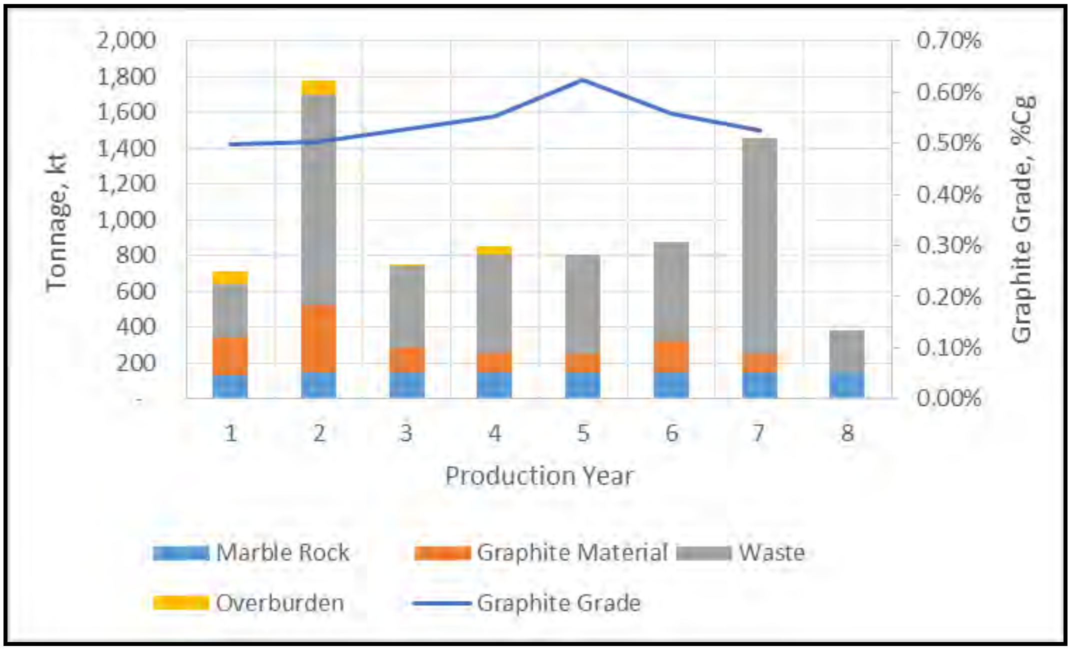


Table 16.7 Marble Pit Production Schedule

Year	Material Mined					Strip Ratio
	Marble (t)	Graphite		Waste (t)	Overburden (t)	
		t	%Cg			
1	135,000	207,633	0.50	298,374	70,981	1.1
2	150,000	371,139	0.50	1,176,413	83,703	2.4
3	150,000	140,745	0.53	450,611	9,927	1.6
4	150,000	104,531	0.55	550,689	45,857	2.3
5	150,000	101,435	0.62	558,431	-	2.2
6	150,000	170,833	0.56	556,381	-	1.7
7	150,000	109,735	0.53	1,201,473	-	4.6
8	147,037	-	0.00	239,386	-	1.6
LOM	1,182,037	1,206,051	0.53	5,031,758	210,468	2.2

Figure 16.4 Marble Pit Production Schedule



16.6 MINE WASTE ROCK MANAGEMENT

Over the LOM, the graphite pit and marble pit will produce 1,479,770 t and 5,031,758 t of waste rock, respectively. Canada Carbon provided Tetra Tech with a letter of intent with a potential mining contractor whereby the mining contractor will move and consume all waste material off-site, therefore, no waste rock will be stored on site.

16.7 MINING EQUIPMENT

A mining contractor will be used to mine the graphite pit on a unit rate basis. The marble blocks within the marble pit will be cut using chain saws to be purchased by Canada Carbon. Four chain saw units are required to achieve the target annual production of 150,000 t of marble rock. Waste rock, graphite material, and overburden will be mined by the mining contractor on a unit rate basis.

Support and ancillary equipment for both the graphite and marble will be leased. Table 16.8 lists the primary, support, and ancillary equipment. Contractor equipment required for mining the graphite pit, waste rock, and overburden are not included as capital costs as costing will be on a unit rate ($/t) basis.

Table 16.8 Primary, Support and Ancillary Equipment Requirements

Equipment	Units Required	Note
Chain Saw	4	Purchased
Fork Loader	1	Leased
Articulated Truck	1	Leased
Diesel Drill	2	Leased
Wheel Dozer	1	Leased
Grader	1	Leased
Water Truck	1	Leased
Snow Plow/Sanding Truck	1	Leased
Vibratory Compactor	1	Leased
Excavator	1	Leased
Block Pusher	2	Leased
Pick-up Truck	4	Leased
Light Plant/Towers	8	Purchased
Mobile Radios	30	Purchased
Safety Equipment	30	Purchased
Engineering/Geology Equipment (computers, software, licenses)	2	Purchased
Surveying	1	Purchased

16.8 MINING LABOUR

Chain saw labor requirements were estimated based on a 12-hour shift, 2 shifts per day, and a 2-week-on/2-week-off rotation schedule.

Staff and hourly operating rates are based on the base rates and burdens. A benefit package of 40% was applied to both salaried staff and the hourly labour base rates. The labour burden consists of vacation, statutory holidays, medical and health insurance, employment insurance, long-term disability insurance, overtime, shift differential, and other factors.

The mining staff and labour on payroll are shown in Table 16.9. The number in the table represents the requirements for chain saws and the general site. Mining of the graphite pit, waste rock, and overburden of both the graphite and marble pits will be performed by a mining contractor on a unit rate basis. Leased support and ancillary equipment are costed on a dollar per hour basis including labor and fuel. Labor requirements of the mining contractor, as well as the leased equipment, are not included in Table 16.9.

Table 16.9 Mine Staff and Labor on Payroll

Staff	Number Required
Mining Engineer	1
Geological Engineer	1
General Laborer	4
Chain Saw Operators	12
Total	**18**

17.0 RECOVERY METHODS

Graphite has been found as disseminations in marble, in sulphide-bearing paragneiss, in pods, and in veins in the Miller deposit. In known occurrences, the graphite can be alone or in association with other minerals, including pyroxene, scapolite, titanite, zircon, and wollastonite. The graphite mostly occurs in well-crystallized euhedral flakes. Graphite and marble are the major economical values contained in the mineralization.

17.1 GRAPHITE RECOVERY – FLOTATION CONCENTRATION

17.1.1 INTRODUCTION

The proposed graphite concentrator at the mine site will be conventional and will process graphite mineralization at a nominal rate of 200 t/d with an equipment availability of 88% (365 d/a). The concentrator is planned to expand to a nominal throughput of approximately 499 t/d in the late stages of the mine life. The concentrator will use conventional flotation technology to produce three graphite concentrates, each with a different particle size. The concentrates will be hauled to a thermal upgrading plant located at the Asbury site for further upgrading to the final graphite product containing higher than 99.99% graphitic carbon. The designed annual production rate of the high-purity graphite product is 1,500 t/a.

The concentrator feed will be supplied from the Miller open pits, described in Section 16.0.

17.1.2 SUMMARY

The process flowsheet developed for the Miller graphite mineralization consists of conventional multi-stages of grinding and flotation processes. The processing plant will produce three different particle size graphite flotation concentrates containing approximately 95% graphitic carbon. The processing plant is estimated to produce approximately 1,650 t/a of flotation concentrate from the mill feeds, grading from 0.5 to 2.6% graphitic carbon. The estimated graphite recoveries reporting to the flotation concentrates range from 85 to 88%. The processing plant will consist of:

- crushing plant by a mining contractor
- crushed materials storage and re-handling system
- a surge bin with a live capacity of 200 t on surface
- a primary grinding circuit integrated with flash flotation
- bulk rougher flotation and scavenger flotation concentrate regrinding

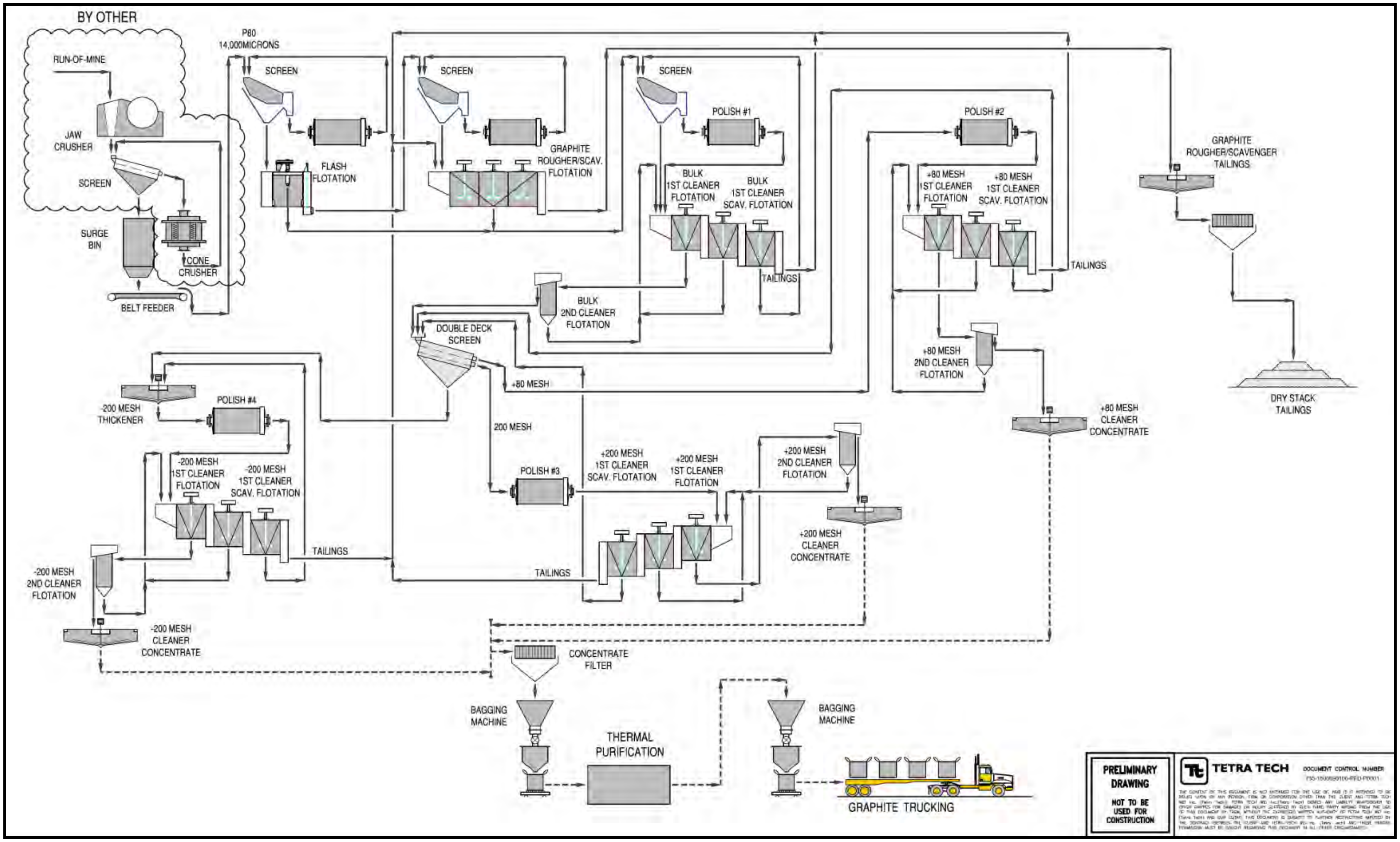
- bulk cleaner flotation followed by cleaner concentrate classification
- cleaner concentrate polishing regrinding
- refloating of the reground concentrates
- concentrate dewatering
- flotation tailings dewatering and dry stacking.

The final flotation concentrate will be dewatered, bagged, and trucked to the thermal upgrading plant for further upgrading at the Asbury site, located at approximately 150 km northwest of the Miller site.

The flotation tailings will be thickened, filtered, and stacked at the tailings management facility located at the proposed mine site. The tailings are planned to be backfilled to the excavated pits when any of the pits cease operation. The overflows from the concentrate and tailings thickeners will be recycled as process make-up water.

The simplified flotation plant flowsheet at the Miller site is shown in Figure 17.1.

Figure 17.1 Simplified Flotation Process Flowsheet



17.1.3 PLANT DESIGN CRITERIA

The plant is designed to process 200 t/d in the initial years and then increase to approximately 499 t/d when the low-grade materials are fed to the plant late in the LOM. The mill feed will be concentrated by flotation and the flotation concentrates will be further upgraded by thermal treatment. The major criteria used in the primary grinding and flotation circuits is outlined in Table 17.1.

Table 17.1 Major Design Criteria

Criteria	Unit	Value
Mill Operating Schedule and Production Plan		
Daily Processing Rate – Initial Years	t/d	200
Daily Processing Rate - Maximum	t/d	499
Operating Days per Year	d/a	365
Operating Schedule	-	two shifts/d; 12 h/shift
Average Mill Feed Grade - Initial Years	% Cg	2.46
Average Mill Feed Grade - LOM	% Cg	1.10
Average Graphite Recovery – Initial Years	% Cg	88.0
Average Graphite Recovery – LOM	% Cg	86.7
Average Graphite Concentrate Grade – LOM	% Cg	95.0
Crushing Circuit		
Crushing Circuit Arrangement	-	by Contractor
Crushed Product Particle Size, 80% passing	mm	12
Grinding/Flotation		
Availability	%	88
Primary/Secondary Grinding Circuit Arrangement	-	two stages of rod mill grinding, closed circuit
Primary Mill Grinding Particle Size, 80% passing	µm	850
Secondary Mill Grinding Particle Size, 80% passing	µm	250
Regrinding Particle Size, 80% passing	µm	varying, polishing regrinding
Flotation Cell Type	-	tank cells/columns
Tailings Management	-	dry stacking

17.1.4 PROCESSING PLANT DESCRIPTION

PRIMARY CRUSHING (BY CONTRACTOR)

A mining contractor will carry out the primary crushing. The mining contractor will crush the material from the graphite pits to 80% passing approximately 12 mm. The crushed material will be hauled to the mill feed stockpile at the graphite flotation plant site.

MILL FEED RECLAIM AND SURGE BIN

The rod mill feed surge bin is designed to have a live capacity of 200 t. The crushed product from the mill feed stockpile will be reclaimed by a front-end loader to a dump pocket, and then conveyed to the 200-t mill feed surge bin.

The crushed material from the mill feed surge bin will then be reclaimed by a belt feeder into the rod mill feed chute at a nominal rate of 9.5 t/h (at a mill feed rate of 200 t/d). A belt weight scale will be installed to control the mill feed rate.

A dust suppression system will be installed at the dump pocket to control fugitive dust that may be generated while transporting the crushed material.

Primary and Secondary Grinding, Classification and Flashing Flotation

A rod mill grinding circuit is proposed for primary grinding. The circuit will include two rod mills in series and two flash flotation cells to recover coarse graphite flakes that are liberated or partially liberated from their host minerals.

The crushed material from the surge bin will be reclaimed by a belt feeder into a tire-driven rod mill with an installed power of 75 kW. The rod mill will be in closed circuit with a vibrating screen with a slot opening of 1.65 mm. The rod mill discharge will be pumped to the screen feed box and the oversize from the screen will return back to the rod feed chute by gravity. The screen undersize will be sent to the flash flotation circuit where liberated or partially liberated graphite flakes will be floated. Fuel oil will be added as collector and MIBC as frother. The flash flotation concentrate will be sent to the downstream bulk flotation circuit while the flash flotation tailings will be further ground in the secondary grinding circuit.

The secondary grinding circuit will also be operated in closed circuit with a vibrating screen with a slot opening of 0.35 mm. A tire-driven rod mill with an installed power of 150 kW is proposed for the circuit. The product from the rod mill will be pumped into the feed box of the vibrating screen. The screen undersize or the product of the secondary grinding circuit will be 80% passing 250 µm. The screen undersize will report to the graphite bulk rougher flotation circuit. The screen oversize will return back to the secondary grinding rod mill feed chute.

Steel rods will be manually added into the mills on a batch basis as grinding media.

Dilution water will be added to the primary and secondary grinding circuits as required. A particle size analyzer will be installed to monitor and optimize the operating efficiency.

Rougher/Scavenger Flotation

The pulp from the secondary grinding circuit and the rejects from various cleaner flotation circuits will be subjected to conventional flotation to recover the graphite from the material being processed. The fresh feed rate for the flotation circuit will be approximately 9.1 t/h. Fuel oil will be used as collector and MIBC as frother. The process includes a rougher flotation and a scavenger flotation in five, 1.5-m^3 conventional tank cells. The concentrates produced from the circuit will be upgraded in a bulk cleaner flotation circuit.

The tailings from the flotation circuit will be discharged to the tailings thickener and then further dewatered by a pressure filter, prior to being trucked to the tailings stack storage pad at the mine site.

Polishing Regrinding and Bulk Cleaner Flotation

The concentrates produced from the rougher and scavenger flotation together with the concentrate from the flash flotation will be classified by a vibrating screen into two fractions. The screen oversize with a particle size coarser than 0.1 mm will be reground in a tire-driven rod mill for polishing regrinding. The polishing regrinding circuit will be in opened circuit. The regrinding rod mill discharge together with the screen undersize will be sent to the bulk cleaner flotation circuit.

The bulk cleaner circuit includes two stages of cleaner flotation. The first bulk cleaner flotation will be carried out in three, 0.5-m^3 conventional flotation cells. The bulk cleaner tailings will be further floated by two stages of scavenger flotation. The first bulk scavenger concentrate will be sent back to the head of the preceding bulk cleaner flotation cells, while the second bulk scavenger cleaner flotation concentrate will be pumped to the vibrating screen in the polishing regrinding circuit. The tailings from the second scavenger cleaner flotation will be sent to the rougher flotation circuit.

The first bulk cleaner concentrate will be further upgraded in a flotation column. The concentrate produced from the column will be classified into three different size fractions and refloated separately in downstream upgrading circuits. The tailings from the column flotation will be returned to the head of the first bulk cleaner flotation cells.

As required, the reagents used in the rougher flotation will be used in the bulk cleaner circuits.

Bulk Cleaner Concentrate Classification

The second cleaner concentrate pulp from the bulk cleaner circuit will be screened by a double deck vibrating screen (bulk concentrate screen) into three different size fractions: +0.18 mm, -0.18+0.074 mm and –0.074 mm. The fractions will be further polishing reground and refloated in separate refloat circuits.

Polishing Regrinding and Refloating (+0.18 mm Fraction)

The coarsest fraction (+0.18 mm) from the bulk cleaner concentrate screen will be sent to a tire-driven rod mill for polishing regrinding in opened circuit. The mill discharge will be refloated by two stages of upgrading flotation.

The first refloat flotation will be carried out in one conventional flotation cell. Similar to the bulk cleaner flotation, the first refloat tailings will be further treated by two stages of scavenger flotation. The first scavenger concentrate will be sent back to the head of the preceding first refloat flotation cell, while the second scavenger flotation concentrate will be pumped to the bulk concentrate screen feed box. The tailings discharged from the second scavenger flotation will be sent to the rougher flotation circuit.

The first refloat cleaner concentrate will be further upgraded by the second refloat treatment in a flotation column. The concentrate produced from the column will be the final product, which will be pumped to the +0.18 mm concentrate thickener. The tailings from the column flotation will be returned to the head of the first refloat flotation cell.

Polishing Regrinding and Refloating (-0.18+0.074 mm Fraction)

The middle fraction (-0.18+0.074 mm) from the bulk cleaner concentrate screen will be polishing reground in a tire-driven rod mill in opened circuit. Similar to the coarsest bulk cleaner concentrate fraction, the mill discharge will be refloated by two stages of upgrading flotation.

The first refloat flotation will be carried out in one conventional flotation cell. The first refloat tailings will be further treated by two stages of scavenger flotation. The first scavenger concentrate will be sent back to the head of the preceding first refloat flotation cell, while the second scavenger flotation concentrate will be pumped to the bulk concentrate screen feed box. The tailings discharged from the second scavenger flotation will be sent to the rougher flotation circuit.

The first refloat cleaner concentrate will be further upgraded by the second refloat treatment in a flotation column. The concentrate produced from the column will be the final product, which will be pumped to the -0.18+0.074 mm concentrate thickener. The tailings from the column flotation will be returned to the head of the first refloat flotation cell.

Polishing Regrinding and Refloating (-0.074 mm Mesh Fraction)

The fine fraction (-0.074 mm) from the bulk cleaner concentrate screen will be sent to a high-rate thickener. The thickener underflow will be pumped to a tire-driven ball mill for polishing regrinding in opened circuit. The thickener overflow will be pumped to the process water tank for reuse in the mill.

Similar to the two coarser bulk cleaner concentrate fractions, the mill discharge will be refloated by two stages of upgrading flotation.

The first refloat flotation will be carried out in one conventional flotation cell. The first refloat tailings will be further treated by two stages of scavenger flotation. The first scavenger concentrate will be sent back to the head of the preceding first refloat flotation cell, while the second scavenger flotation concentrate will be pumped to the bulk concentrate screen feed box. The tailings discharged from the second scavenger flotation will be sent to the rougher flotation circuit.

The first refloat cleaner concentrate will be further upgraded by the second refloat treatment in a flotation column. The concentrate produced from the column will be the final product, which will be pumped to the -0.074 mm concentrate thickener. The tailings from the column flotation will be returned to the head of the first refloat flotation cell.

As required, the reagents used in the preceding flotation circuits will be used in the refloat cleaner circuits.

Concentrate Handling

The different particle size concentrates from the refloat flotation circuits will be separately thickened, filtered, and bagged prior to being transported to the Asbury site for further upgrading by thermal treatment. The concentrate handling facility will have the following equipment:

- three, 1 m diameter high-rate thickeners
- three concentrate filter feed stock tanks
- one, 5-m^2 plate-frame pressure filter
- one bagging system
- related pumping and compressed air supply systems.

The final graphite concentrates will be separately pumped to their own concentrate thickeners. Flocculant will be added to the thickener feed wells to aid the settling process. The thickened concentrates will be sent to their own concentrate stock tanks. The underflow density of the thickener will be approximately 50 to 60% solids. Each of the concentrate stock tanks will be equipped with an agitator to keep the solids suspended. A plate-frame press filter will be used for further concentrate dewatering. The filtration will be operated in day shift only. The filtration operation will be scheduled to ensure all the three concentrates are filtered separately. The filter press will reduce the moisture content of the thickener underflows to approximately 12% w/w. The filter press solids will be discharged onto a conveyor that transports the filter cake to the bagging system. The different particle size concentrates will separately be bagged prior to being trucked to the thermal treatment plant. The plant will provide sufficient on-site storage capacity for up to 10 days of production, in the event of unexpected transportation disruption.

The filtrate from the pressure filter will be circulated back to a concentrate thickener feed well as dilution water. The overflow from the thickener will be pumped to the process water tank for re-use as process water.

Tailings Disposal

The final tailings from the rougher/scavenger flotation will be thickened and then filtered prior to being stacked in the tailings management facility located at the mine site.

The tailings handling equipment will include:

- one, 5 m diameter high-rate thickener
- one, 3.0 m diameter by 3.5 m high stock tank with an agitator
- one, 60-m^2 plate-frame pressure filter and

- related pumping and compressed air supply systems.

The final flotation tailings from the rougher/scavenger flotation cells will be pumped to a high-rate thickener with approximately 5 m in diameter. Flocculant will be added to the thickener feed well to aid the settling process. The thickener underflow will be sent to the tailings stock tank. The underflow density of the thickener is anticipated to be approximately 60% solids. The thickened slurry will be further dewatered by a plate-frame press filter to a moisture content of approximately 15%. The filter press solids will be discharged onto a tailings stockpile and then be loaded by a front-end loader onto a truck, which will haul the dewatered tailings to the tailings management facility for storage.

The filtrate from the pressure filter will be circulated back to the tailings thickener feed well as dilution water. The overflow from the thickener will be pumped to the process water tank for re-use as process water.

Reagent Handling and Storage

Fuel oil and MIBC will be added to the flotation process slurry streams to modify the chemical and physical characteristics of mineral particle surfaces, and to enhance the floatability of the graphite particles into the concentrate products. Flocculant will be used as a settling aid for the flotation concentrate and tailings thickening.

Fuel oil and MIBC will be shipped to the plant as liquid in bulk drums. The reagents will be directly pumped in undiluted form to the points of addition using metering pumps.

Solid flocculant will be used for the Project. The flocculant will be prepared in the standard manner in a wetting and mixing system to a dilute solution of less than 0.2% solution strength. The solution will be stored in a holding tank prior to being pumped by metering pumps to the thickener feed wells.

Assay and Metallurgical Laboratory

The assay laboratory will be equipped with the necessary analytical instruments to provide all routine assays for the mine and processing plant. One LECO furnace will be installed for graphite assay. The other assays, including water sample analysis, will be conducted by commercial laboratories.

The metallurgical laboratory will undertake all the necessary test work to monitor metallurgical performance and, more importantly, to improve process flowsheet unit operations and efficiencies. The laboratory will be equipped with necessary laboratory equipment.

Water Supply

Two separate water supply systems will be provided to support the operations for the processing plant: one fresh water supply system and one process water supply system.

Fresh water will be supplied to a fresh water storage tank from the water treatment plant or from a borehole.

The overflow solutions from the concentrate thickeners and tailings thickener will be re-used in the process circuit. The balance of the process water will be supplied from the water treatment plant, or from the fresh water tank, as required. All process water will be distributed to the processing plant via a process water loop connecting with the process water tank.

AIR SUPPLY

Air service systems will supply air to the following service areas:

- flotation circuit – low-pressure air for flotation cells will be provided by an air blower; high-pressure air will be provided for flotation columns
- filtration circuits – high-pressure air will be provided by air compressors for filtration and drying.
- plant air service – high-pressure air will be provided by air compressors for the various services.
- instrumentation – the service air will come from the plant air compressors and will be dried and stored in a dedicated air receiver.

17.2 GRAPHITE RECOVERY – THERMAL PURIFICATION

17.2.1 INTRODUCTION

The proposed graphite purification plant for this study is located 8.1 km northeast of Notre-Dame-Du-Laus in the Laurentides Region of Quebec, or approximately 150 km northwest of the Miller site. The graphite concentrates with different particle sizes will be hauled to the purification plant for further upgrading to the final graphite products containing higher than 99.99% graphitic carbon. The designed annual production rate of the high-purity graphite products is 1,500 t/a. The proposed upgrade method is thermal treatment to remove the impurities that are contained in the concentrates.

17.2.2 SUMMARY

The thermal treatment processing plant will upgrade the flotation concentrates containing approximately 95% graphitic carbon to the final graphite products containing higher than 99.99% graphitic carbon. The processing plant will consist of:

- concentrate storage
- concentrate thermal furnaces integrated with drying function
- gas handling systems for protective inert gases
- cooling systems

- an off-gas handling system, including a wet scrubbing system
- final graphite packing/bagging/storage/dispatch systems.

The major design criteria are shown in Table 17.2.

Table 17.2 Major Design Criteria – Graphite Purification

Criteria	Unit	Value
Plant Operating Schedule and Production Plan		
Annual Processing Graphite Rate	t/a	1,500
Operating Days per Year	d/a	365
Operating Schedule	-	two shifts/d; 12 h/shift
Average Plant Feed Grade	% Cg	95
Average Graphite Recovery	% Cg	96
Average Final Graphite Grade	% Cg	>99.99
Upgrading Method		
Upgrading Method	-	thermal treatment
Heating Temperature	°C	1,900 – 2,000
Protection Atmosphere	-	inert gas – high purity nitrogen gas
Off-gas Handling	-	wet scrubbing/dust collection

17.2.3 Processing Plant Description

The flotation concentrates produced at the Miller site will be trucked to the Asbury site. The different particle size concentrates will be separately loaded into the furnace feed bins. The concentrates will be dried using the recovered heat from the furnaces. A total of 11 furnaces will be installed and used for the graphite purification. The furnaces will work in a continuous mode. The dried concentrates will be fed into the furnaces at a control feed rate. The maximum feed rate is estimated to be approximately 50 lb/h/furnace. High-purity nitrogen gas will be purged into the furnaces to form a protective atmosphere.

The furnaces will be electrically heated. The temperature in the hottest zone of the furnaces is designed to be approximately 1,900 to 2,000°C. After passing through the hottest zone, the heated graphite will be cooled down through the cooling zone where it will be controlled by a water cooling system consisting of chillers.

The thermally treated graphite, or the final graphite products will be transferred and stored in separate hoppers in the product handling area according to their particle sizes. The final products will be packed or bagged prior to being shipped to the end users. Weigh scales would be provided for accounting purposes. Samples will be taken at the furnace exit points and the final product storage hoppers (before the graphite is bagged) for quality control assay.

The off-gas generated from the thermal purification process will be collected, cooled and passed through an off-gas scrubbing system prior to being discharged into the environment. A heat exchanger system will be installed to recover the heat energy from the off-gas.

Reagent Handling and Storage

High-purity nitrogen gas used for the upgrading treatment will be bottled and trucked to the site. The nitrogen gas bottles will be stored in a dedicated area.

Assay and Metallurgical Laboratory

The assay laboratory will be equipped with the necessary analytical instruments to provide all routine assays for the processing plant. One LECO furnace will be installed for graphite assay. The final product samples will be sent to commercial laboratories for high purity assays or product quality control assays.

The metallurgical laboratory is proposed to undertake essential test work to monitor metallurgical performance and, more importantly, to improve process flowsheet unit operations and efficiencies. The laboratory will be equipped with necessary laboratory equipment.

Water Supply

Fresh water will be supplied from boreholes at the plant site. The treated water from the water treatment plant will be reused for scrubbing the off-gases produced from the thermal process.

Air Supply

An air service system will supply high pressure air to the various service areas. Instrument service air will come from the plant air receiver and will be dried and stored in a dedicated air receiver.

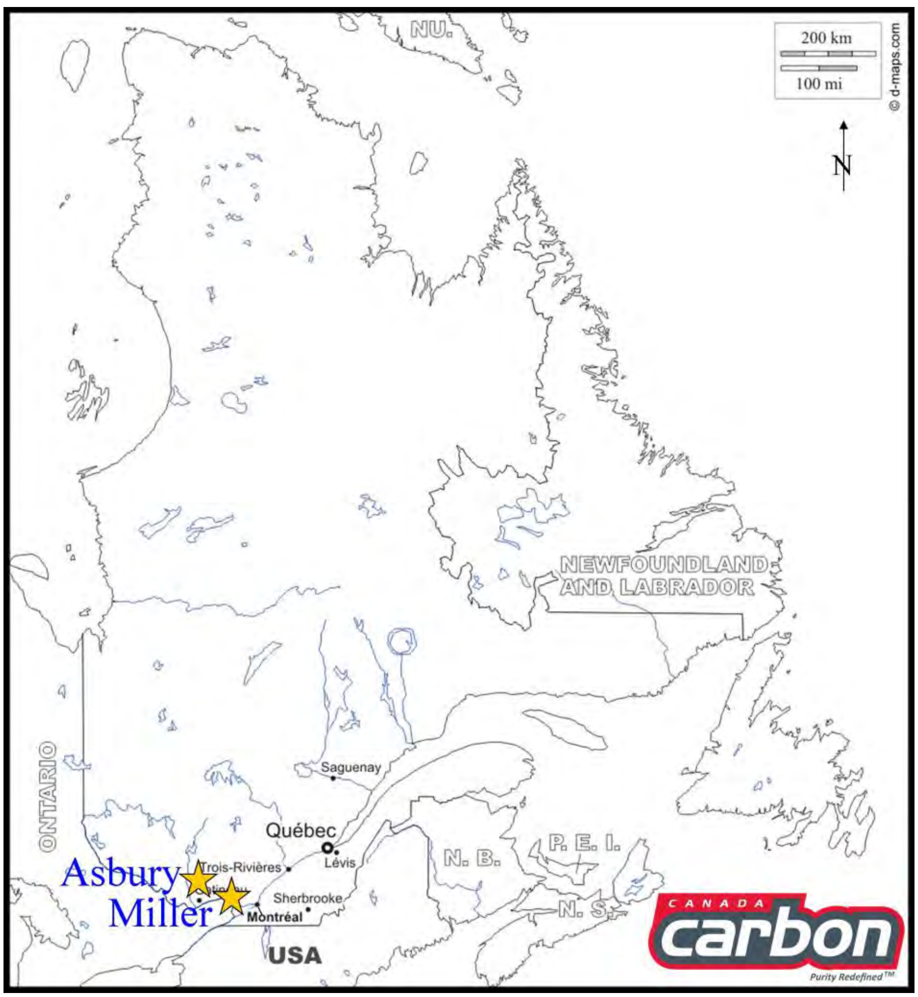
18.0 PROJECT INFRASTRUCTURE

18.1 INTRODUCTION

The proposed project infrastructure will be located at two separate locations: at the Miller site and at the Asbury site. All the mining activities, including processing graphite concentrate and the extraction of marble blocks, will be carried out at the Miller site. The flotation concentrate will be trucked to the Asbury site for further processing at the thermal upgrade plant. The Asbury site is located at approximately 150 km northwest of the Miller site.

The locations for both the sites are illustrated in Figure 18.1.

Figure 18.1 Locations of the Miller and Asbury Property

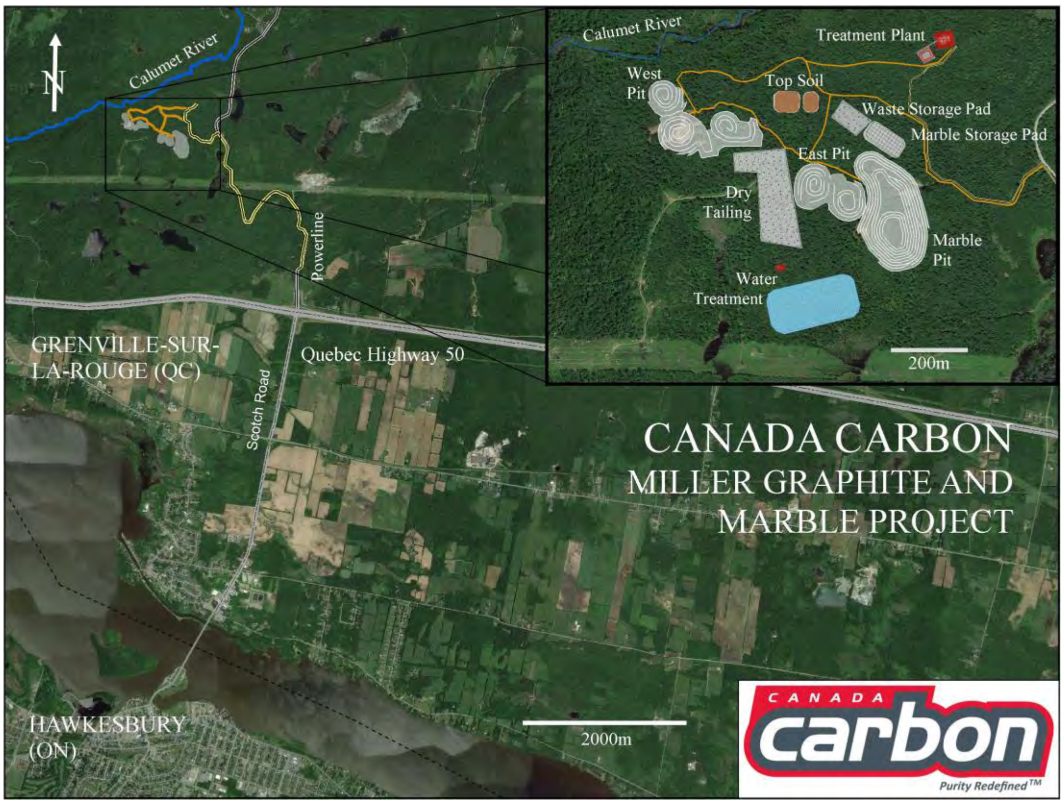


18.2 MILLER SITE INFRASTRUCTURE

The Miller Property is located in the Outaouais Region of southern Quebec, approximately 75 km west of Montreal, Quebec and 90 km east of Ottawa, Ontario (Figure 18.2). The approximate geographic centre of the Miller Property is located at 530,385 m east and 5,056,900 m north. The closest cities are Grenville, Quebec (5 km south of the Miller Property) and Hawkesbury, Ontario (8 km south of the Miller Property). The Project is located within the boundaries of the Argenteuil Regional County Municipality and is on the territory of Grenville-sur-la-Rouge municipality.

The elevation of the Project area varies from approximately 200 to 230 masl.

Figure 18.2 Location of the Miller Project Site



Local skilled labor force should be able to support the proposed mining operation. A few quarries are adjacent to the Property. Some of the quarry operators own excavation equipment. Canada Carbon has developed business partnerships with these quarry operators for potential equipment supply and operating expertise. The bulk sample generation for the 2014 pilot plant campaigns was carried out by one of the quarry operators.

18.2.1 Accessibility

All-year roads are available to access the Project site. The site is easily accessible from Highway 50, which runs approximately 2 km to the south of the deposit limit. Highway 50 is a provincial road linking the greater Montreal area to the greater Ottawa area. A railroad passes through the Ottawa Valley near the town of Grenville.

A local paved road, Scotch Road, traverses the Miller Property from south to north. Many existing forestry roads are present in and around, and allow access to, the Miller Property. The deposit is also accessible from Scotch Road via a network of bush trails, which runs more or less east to west.

The closest cities are Grenville (5 km to the south of the Project) and Hawkesbury, Ontario (8 km to the south of the Project). The immediate vicinity of the Project is scarcely populated and the settlements are mainly concentrated along Scotch Road with relatively limited local traffic.

18.2.2 Mine and Plant Access Roads

The local existing forestry roads within the proposed mine site will be upgraded for the mining and processing activities. New access roads will be constructed according to the proposed mine site layout, including a haulage road connecting the mine site and the plant site located northeast of the pits. The internal roads and pad areas will likely be gravel surfaced. Road surface structures will be designed giving consideration to the frequent use of the mine mobile equipment proposed for the project. A control gate will be constructed at the main access road which will connect the proposed mine and Scotch Road.

The traffic within the proposed mine site and at the main access road will be controlled by a radio communication system. Traffic deflection barriers or berms should be installed on roads or access adjacent to steep drop-offs.

18.2.3 Mine Site Facilities

Open pit mining is proposed for the project and the graphite and marble will be mined by contractors. The graphite bearing materials mined from the pits will be concentrated using conventional flotation. The marble blocks will be extracted from the marble pit and temporarily stored on the marble block pad prior to being trucked to architectural manufacturers. The mobile equipment, including haulage trucks, will be maintained or repaired by local commercial maintenance shops.

The proposed mine is designed to produce approximately 1,650 t of graphite concentrate per year, which will be further upgraded to high-purity graphite (1,500 t/a), and 150,000 t/a of architectural marble blocks.

The mining contractor will crush the graphite mineralized material to a particle size of approximately 80% passing 12 mm. The mill feed rate of the graphite flotation plant is designed according to the mill feed grades. For the initial years, the proposed mill feed rate will be approximately 200 t/d when high-grade materials are planned to feed into the mill. The mill process rates will be increased to approximately 300 t/d and 499 t/d with a decrease in mill feed grade.

The waste rocks produced are anticipated to be hauled offsite by the mining contractor and used as gravel for construction materials or cement raw materials.

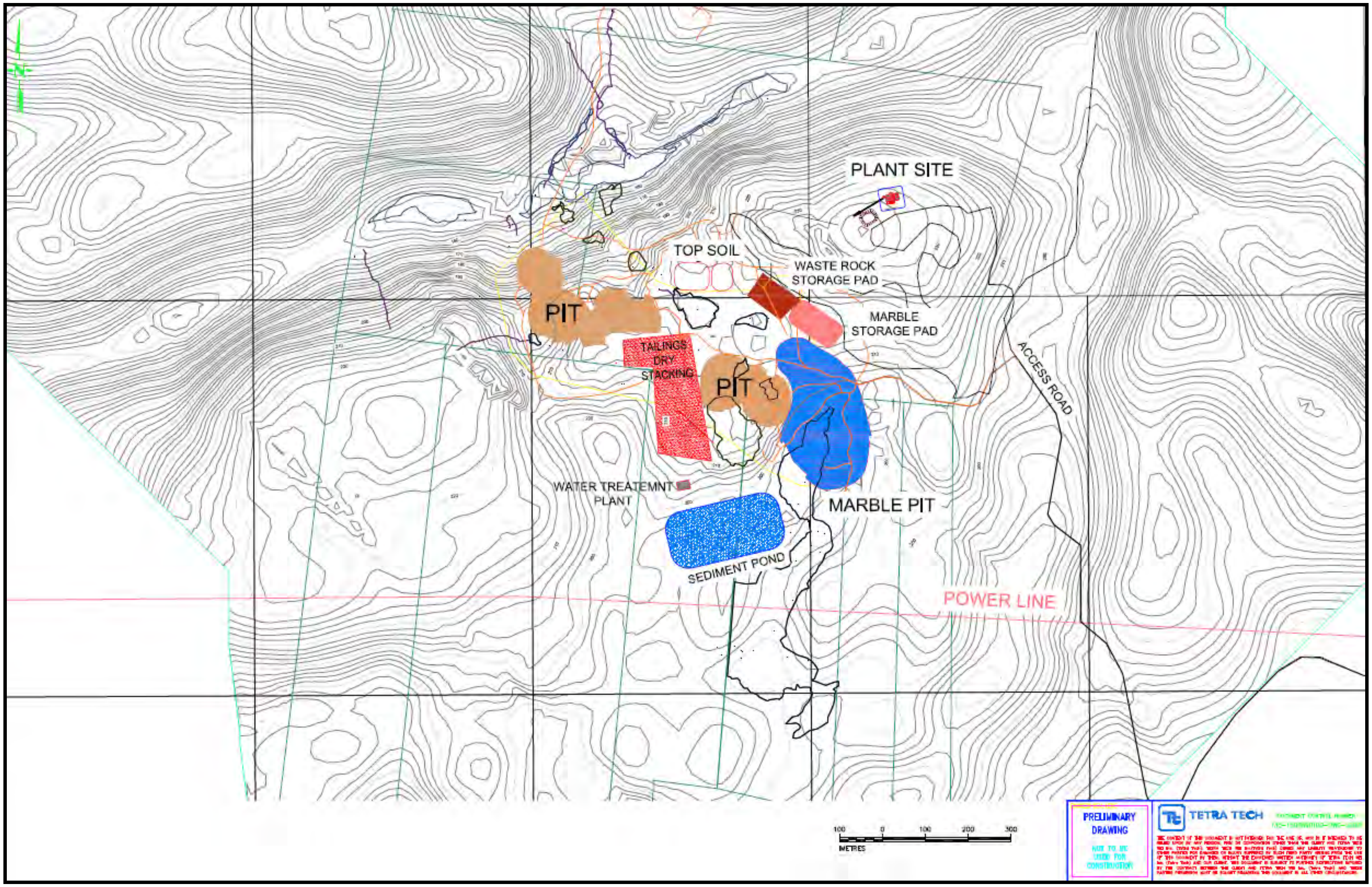
According to the preliminary project schedule developed for the PEA, the marble block extraction is planned to start operation one year earlier than the graphite production.

The proposed mining and flotation operation will consist of following main facilities:

- various storage pads for:
  - top soil
  - waste rocks
  - extracted marble blocks
  - dewatered tailings
  - crushed mill feeds
- a mill feed handling system, including a dumping pocket and a conveyor to transport the crushed material from the dumping pocket to a 200-t mill feed surge bin
- a main processing complex, including processing plant, assay/metallurgical laboratories and offices
- power supply and distribution systems
- a water treatment plant, including a contact water sediment pond
- overall mine site water management systems.

The preliminary Miller site layout is shown in Figure 18.3.

Figure 18.3 Miller Mine Site Layout



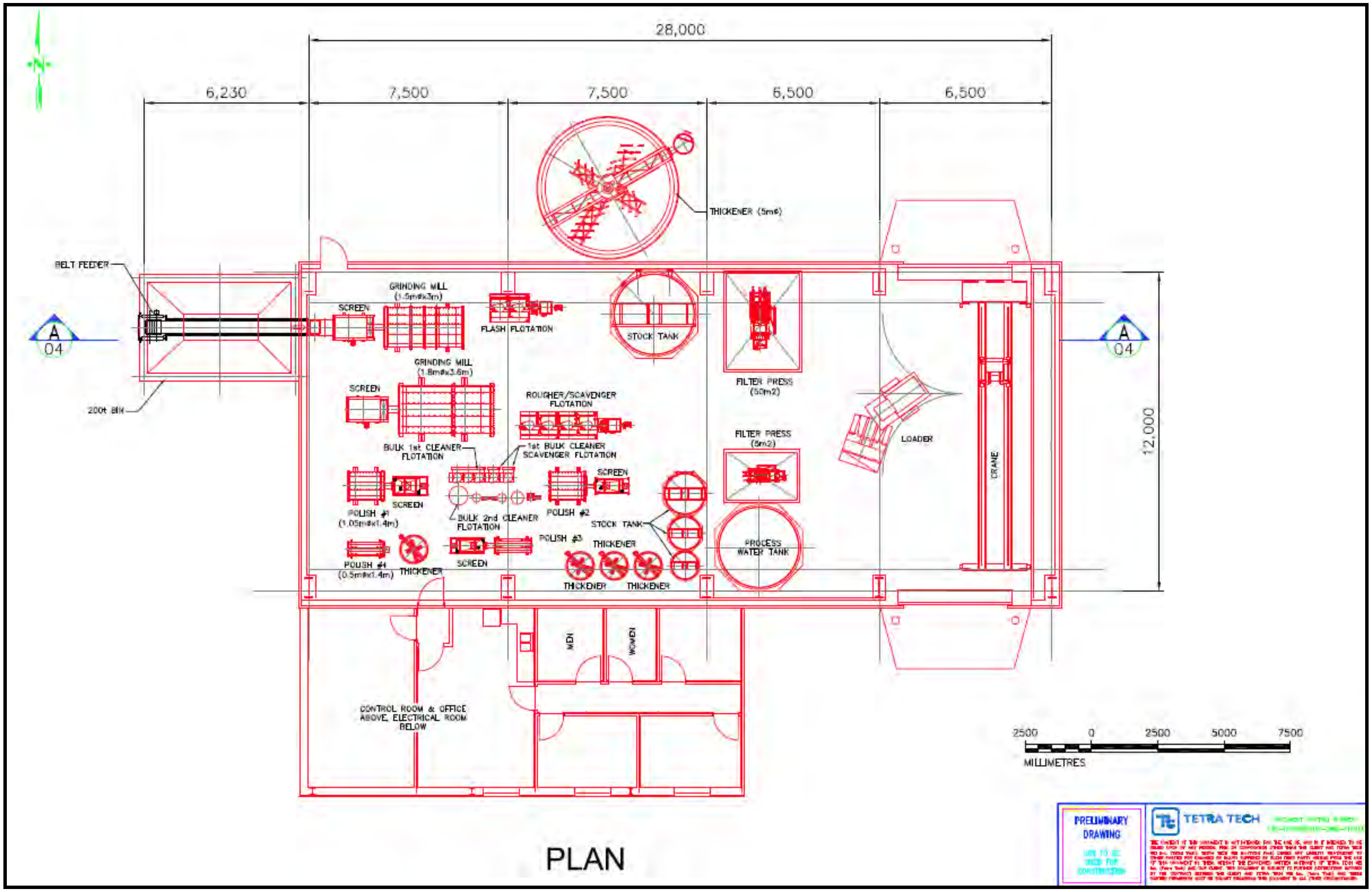
18.2.4 Processing Plant

The proposed graphite concentration plant will be located northeast of the pits. The crushed mill feed will be temporally stored at the excavated pits at the mine site and hauled to the mill feed receiving pad located at the plant site. The crushed mill feed will be reclaimed by a front-end loader onto a mill feed handling system and then to a mill feed surge bin prior to being ground and concentrated by flotation. The facilities at the plant site will include:

- a mill feed handling system, including a dumping pocket and a mill feed surge bin conveyor
- a 200-t mill feed surge bin and a reclaim belt feeder
- a primary and secondary grinding circuit, including a primary grinding rod mill, a secondary grinding rod mill, a flash flotation system, a particle size analyzer and related slurry pumps
- a graphite bulk rougher/scavenger flotation, a bulk cleaner concentrate regrinding and a bulk cleaner flotation circuits
- bulk cleaner concentrate classification and three refloating circuits to further upgrade the bulk concentrate
- concentrate dewatering and bagging systems
- tailings dewatering
- electrical rooms
- flocculant preparation
- reagent distribution
- plant air supply systems, including high pressure air for column flotation and plant air services and low pressure air for flotation cells
- an assay/metallurgical laboratory
- a maintenance workshop/warehouse
- offices.

The preliminary plant layout is shown in Figure 18.4.

Figure 18.4 Processing Plant Site Layout



18.2.5 Power Supply and Distribution

Electrical power will be supplied from the grid power line which runs along Scotch Road at the southeast part of the mine site. The grid power line will be able to supply sufficient electricity required by the mining and processing operations.

The electricity from the grid line will be transferred from 25 kV to 600 V by a pad mount transformer, and then further down to 120/208 V by a transformer. There will be a 600 V load centre panel and a 120/208 V load centre panel provided for mining and processing usages. A small 20 kVA generator will act as an emergency backup. Lightning protection will be installed to protect the power supply system and buildings.

18.2.6 Communications

As the Project site is located within an urbanized area, the main communications will rely on public communication systems provided by local suppliers. The mining and processing operations will use landline telephones, Internet, and cell phone coverage for communications. An additional system for handheld and vehicle radios will be installed to provide full local radio coverage for the overall Miller site.

18.2.7 Water Supply/Overall Site Water Management

Water Supply

Process water will come from recirculation of the solutions recovered from the concentrate and tailings thickeners in the processing plant and the water from the water treatment plant or from the boreholes at the plant area. The thickening processes will recover a large part of the water from the thickener overflow. The balance of the process water will come from the water treatment plant. If water from the water treatment plant is insufficient for the process operation, fresh water from the boreholes at the plant site will be used for the processing plant. All water will be pumped to a process water tank located inside of the plant. The process water will be delivered to various water addition points via a process water distribution loop.

Fresh water used for supporting overall site operations will come from the local boreholes. Potable water for drinking will come from bottled water supplied from local potable water suppliers.

Overall mine site firefighting will rely on local firefighting services provided by adjacent local cities/towns.

Overall Site Water Management

Primary sources of operation/construction-influenced water include:

- run-off from the temporary waste rock storage pad, the marble block storage pad and the tailings stacking pad

- pit dewatering water
- runoff from areas that are heavily impacted by mining/processing activities (plant, parking areas, equipment lay-down yards, etc.).

To divert non-contact water away from the operating areas, overall site drainage systems will be constructed, including various diversion channels. The diverted surface water will be discharged directly into the environment. The contact water, including the water collected from the pits will gravity flow to the sediment pond located south of the pits. The suspended solids will be settled out in a pond. An oil-water separator will be provided to separate the entrained oils from the mining and processing activities prior to the water being further treated by the water treatment plant. The water treatment plant will include a clarifier and related flocculant preparation and addition systems. The treated water will be used as process make-up water or discharged into the environment.

No hydrology or hydraulic (drainage) design has been completed for this study.

18.2.8 Waste Disposal

The wastes produced from the mining and processing operations are anticipated to include:

- waste rocks
- flotation tailings
- lubricants, batteries, various steel scraps, electronics, cardboards and others
- sewage.

Waste Rocks

The waste rocks extracted from the graphite and marble pits are expected to be trucked off site by the mining contractor and used as construction materials.

Flotation Tailings

The flotation tailings produced from the graphite concentration is approximately 97 to 99% of the mill feed. The tailings will be dewatered at the processing plant by thickening and filtration processes to a moisture content of approximately 15% w/w. The dewatered cakes from the pressure filter will be temporarily stockpiled inside of the processing plant. Then the cakes will be trucked and placed onto the tailings dry stacking storage pad adjacent to the graphite pits. As required, the tailings will be spread and compacted with mobile equipment (dozers) to provide sufficient compaction for trafficability of the equipment that needs to work on the pad.

When the west graphite pit is mined out, the dewatered tailings will be directly placed into the excavated pit. At the end of the operations, the stacked tailings will be backfilled into the excavated graphite and marble pits. Further tailings management plan should be conducted and reviewed in the next phase study, including tailing characterizations.

Canada Carbon is planning to work with a local cement manufacturer to evaluate whether the tailings material is suitable to be used as a raw material for cement production.

Other Industrial Waste Management

The general industrial wastes, such as lubricants, batteries, various steel scraps, electronics, cardboards, and others will be collected separately and temporarily stored at a dedicated location at the Project site. The collected waste materials will be separately sent to the local waste recycling facilities.

Sewage Management

The sewage produced at the mine site will be trucked off site and treated by the local sewage treatment plants operated by the local cities/towns.

18.3 Infrastructure - Asbury Site

The flotation concentrate is planned to be shipped to the Asbury site for further upgrading. The site, selected by Canada Carbon, is located at approximately 8.1 km northeast of Notre-Dame-Du-Laus, which is a municipality in the Laurentides region of Quebec, Canada. The Notre-Dame-Du-Laus village is approximately 240 km northwest of Montreal, or approximately 150 km northwest of the Miller site (Figure 18.5).

18.3.1 Accessibility

All-year roads are available to access the plant site. The site is easily accessible from Highway 309, which runs approximately 6 km to the west of the Asbury site. Highway 309 is a provincial road connecting with Highway 50.

Access to the proposed graphite upgrade plant from the Notre-Dame-Du-Laus village is via the Chemin du Ruisseau Serpent Road, which passes south of the Asbury site, and then Chemin de la Mine Road. The distance between the Asbury site and the Notre-Dame-Du-Laus village is approximately 8.1 km.

18.3.2 Thermal Upgrading Plant

The proposed graphite thermal treatment plant will upgrade the graphite concentrates produced at the Miller flotation plant to an average grade of higher than 99.99% graphitic carbon. There is an existing building at the Asbury site, which will be upgraded into a warehouse for storing the concentrates and the final graphite products, a workshop, a laboratory, and offices. A new building will be constructed to house the eleven thermal furnaces which will be used to upgrade the flotation concentrates.

Figure 18.5 Thermal Plant Location

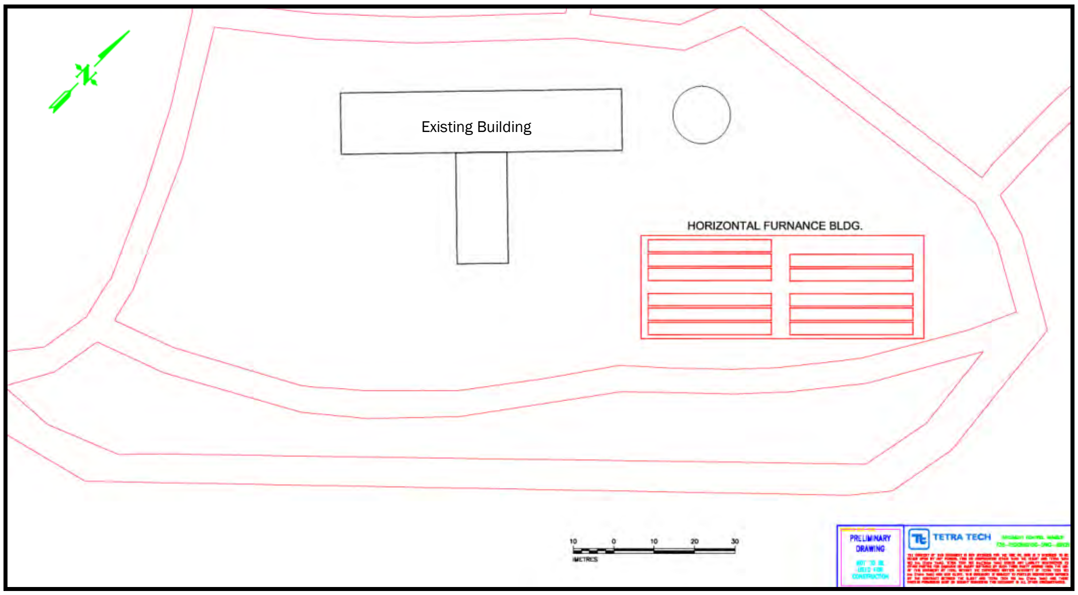
The thermal treatment plant at the site will include:

- a concentrate receiving and storage facility
- a thermal upgrading facility (thermal furnaces)
- an off-gas handling facility, including a wet scrubbing system and dust collection system
- an inert gas storage and handling system
- a water cooling system, consisting of compressive chillers
- a waste water treatment plant
- a final graphite product storage and distribution facility

- an assay/metallurgical laboratory
- a maintenance workshop
- power supply and distribution systems
- offices.

The preliminary thermal plant site layout is shown in Figure 18.6.

Figure 18.6 Processing Plant Site Layout



18.3.3 POWER SUPPLY AND DISTRIBUTION

The thermal upgrading plant will use eleven electric-powered furnaces to upgrade the graphite concentrates. The total power demand is estimated to be approximately 5 MW. Electrical power will be supplied from the grid power line along Chemin du Ruisseau Serpent Road. The grid power line will be able to supply electricity power required by the thermal upgrade operation.

The electricity from the grid line will be transferred from 25 kV to 600 V by a transformer, and then further down to 120/208 V by a transformer, as required. A small 20 kVA generator will act as an emergency backup. Lightning protection will be installed to protect the power supply system and buildings.

18.3.4 COMMUNICATIONS

As the Asbury site is located within an urbanized area, main communications will rely on public communication systems provided by local suppliers. Landline telephones, Internet and cell phone coverage will be used for operations at the Asbury site.

18.3.5 Water Supply/Overall Site Water Management

Water Supply

The water used for thermal processing will come from the water treatment plant or from the boreholes at the plant area. The cooling water used for furnace cooling will come from a chiller cooling system and will be re-used. The water used for the off-gas scrubbing will be treated through the water treatment system, which will also treat the runoff collected from the thermal plant pad.

Potable water for drinking will come from bottled water supplied from local potable water suppliers.

Overall mine site firefighting will rely on local firefighting services provided by adjacent local cities/towns.

No hydrology or hydraulic (drainage) design has been completed for this study.

18.3.6 Waste Disposal

The waste produced from the thermal upgrade operation are anticipated to include:

- solids collected from the off-gas scrubbing system and dust collection system
- lubricants, batteries, various steel scraps, cardboards and others
- sewage.

Waste Solids

The waste solids collected from the off-gas scrubbing system and dust collection system will be sent to the authorized landfill sites which are licensed to receive waste solids from industrial or commercial sources, or handled by a licensed waste handling contractor.

Other Industrial Waste Management

General industrial wastes, such as lubricants, batteries, various steel scraps, electronics, cardboards, and others, will be collected separately and temporarily stored at a dedicated location at the Asbury site. The collected waste materials will be separately sent to the local waste recycling facilities for treatment.

Sewage Management

The sewage produced at the thermal upgrading site is planned to be trucked off site and treated by the local sewage treatment plants operated by the local cities/towns.

19.0 MARKET STUDIES AND CONTRACTS

Graphite pricing and marketing information contained in this section was sourced from Canada Carbon's discussions with U.S. and international nuclear graphite researchers and regulatory agencies, academic institutions, and high-technology graphite consumers and distributors worldwide, under the guidance of Dr. Pieter J. Barnard, Ph.D., MBA, B.Sc. (Hons). Marble pricing and marketing data contained herein was obtained from marble processors and distributors, aggregate distributors, and cement manufacturers in North America. Canada Carbon is planning to produce high-purity graphite concentrate, ultra-high-purity refined graphite (to be thermally treated at Canada Carbon's Asbury facility), marble slabs and blocks, crushed stone (as aggregate), and marble powder from graphite flotation tailings potentially suitable for producing Portland cement and other products. All third-party market information and pricing provided herein has been independently verified by Dr. John Huang, the QP for this section.

19.1 GRAPHITE

Graphite is an industrial mineral with unique characteristics, including high thermal and chemical stability, high electrical and thermal conductance, as well as high strength and the ability to act as a lubricant. Natural graphite deposits are commonplace around the world. However, the Miller graphite is of the rare hydrothermal/vein type. Vein graphite typically has higher purity than other natural graphite, as well as having a highly developed crystal structure, which enhances the electrical and thermal conductance of the graphite. The high purity and high crystallinity each generate higher value in the marketplace. Synthetic graphite can be produced with very high purity, but it typically possesses disordered or tiny crystal domains, making it unsuitable in some applications.

Canada Carbon plans to produce a high grade graphite concentrate that can be further refined to ultra-high purity by thermal treatment, to meet the specifications of individual end-users in a number of high-technology applications, inter-alia nuclear graphite.

19.1.1 HIGH PURITY GRAPHITE CONCENTRATE

Canada Carbon plans to market 100% of its anticipated production as an ultra-high-purity concentrate. Standard froth flotation concentration has yielded graphite of more than 99% purity at bench scale, with average pilot plant production of 95.6% graphitic carbon. After undergoing brief thermal treatment, performed by a commercial processor of synthetic nuclear graphite, a run of mill sample of the Miller pilot plant graphite concentrate was upgraded to 99.9998% graphitic carbon. Scanning electron microscopy and Raman spectroscopy have clearly demonstrated the highly crystalline nature of the Miller graphite. These and other characteristics make the Miller graphite suitable for demanding high-technology applications for which there is a very limited graphite supply, yielding high market valuations.

19.1.2 High Purity Graphite Applications

Ultra-high-purity natural vein graphite is currently produced in limited amounts in Sri Lanka. Other types of natural graphite (flake and amorphous) dominate international commercial graphite markets, with supply variability resulting in high price volatility. Substantial new supply of flake graphite is expected to come to market within three years. Canada Carbon will not compete with flake or amorphous graphite producers, but will instead focus on specialized niche markets where the highly desirable properties of the Miller graphite are expected to be both prized, and valued appropriately.

Nuclear Reactors and Nuclear Research Programs

Nuclear reactor design and development programs are underway around the world, under the auspices of the Generation IV International Forum Charter. Generation IV reactor designs are expected to provide safer, higher-yielding (more efficient) generation of nuclear power, primarily for the production of electricity. Two leading designs, pebble bed and prismatic, are both high-temperature, inert gas cooled reactors which use graphite as the moderator. Graphite slows neutrons produced in the reactor core, making them far more likely to sustain the nuclear chain reaction, thereby increasing reactor efficiency dramatically. Natural graphite would be preferred over synthetic, based on both performance criteria and price, but the contaminant levels in natural graphite have made it unsuitable for nuclear applications, historically.

Canada Carbon's 99.9998% graphitic carbon (thermally purified) Miller graphite has been shown to not only qualify for nuclear reactor fuel compacts, but it demonstrated contaminant levels of only 2.7% and 12.2% (respectively) of the best natural or synthetic graphite studied in a major U.S. government funded nuclear research program conducted by Oak Ridge and Idaho National Laboratories (see Table 19.1) The contaminants measured in the Miller graphite were not only at ultra-trace concentrations, but also essentially benign, yielding an Equivalent Boron Content of 0.749 ppm.

Subcommittee D02.F0 on Manufactured Carbon and Graphite Products of ASTM International, which has a primary focus on developing internationally recognized test methods for comprehensive characterization of graphite and manufactured carbon materials used in nuclear and other high-technology applications, is working towards the publication of a new testing standard for nuclear graphite purity using ultra-high-purity thermally purified Miller graphite as a reference material.

Table 19.1 Selected Nuclear Graphite Contaminants, AGR 2 Specification SPC-923

Element	Symbol	Miller Sample[1]	Asbury RD13371[1]	Graftech-D[2]	SGL KRB-2000[2]
Aluminum	Al	<0.01	8.3	<0.05	0.35
Calcium	Ca	<0.5	10	≤0.5	0.7
Titanium	Ti	<0.05	0.66	1.9	0.06
Vanadium	V	<0.05	0.35	4.7	0.02
Chromium	Cr	<0.05	<0.5	0.5	0.5
Manganese	Mn	<0.05	0.29	<0.05	<0.05
Iron	Fe	0.09	13	0.25	1.4
Cobalt	Co	<0.05	<0.05	<0.05	0.25
Nickel	Ni	<0.05	1.4	<0.1	1.2
Total Contaminants		**0.99**	**36.55**	**8.1**	**4.53**

Notes: [1]Natural graphite samples.
[2]Synthetic graphite samples.
All reported values are parts per million, by weight (ppm), as determined by GDMS analysis conducted by EAG, Liverpool NY.

Source: Adapted from "AGR-2 Fuel Compacts Information Summary: Prepared for the NRC MELCOR Project, Revision 1." John D. Hunn, November 2010. Available at: http://pbadupws.nrc.gov/docs/ML1033/ML103330379.pdf

Four international laboratories, one from the US and three from the EU with membership in Subcommittee D02.F0, have participated in the round-robin testing of the Miller graphite under the proposed testing standard testing protocol, contributing eight analytical datasets arising from three different Glow Discharge Mass Spectrometry ("GDMS") instrumental platforms. These experimental results are currently being interpreted in accordance with ASTM Standard E691-2011: "Standard Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method". In the final document, the GDMS analytical results will be compared with those arising from two different preparatory methods for Inductively Coupled Plasma Mass Spectrometry ("ICP-MS") analysis, as well as those arising from Particle Induced X-Ray Emission ("PIXE"), each of which is capable of producing analytical results of similar analytical sensitivity to GDMS.

Subcommittee D02.F0 is composed of international experts in specialty graphite and manufactured carbon materials research and development and includes leading scientists from the UK National Nuclear Laboratory, Idaho National Laboratory (US), Oak Ridge National Laboratory (US), Nuclear Regulatory Commission (US), representatives of other international governments and academic institutions, graphite end-users, and producers of specialty carbon products. Representatives of Canada Carbon have accepted invitations to join Subcommittee D02.F0, directly offered by the Chairman of the Subcommittee.

Canada Carbon has received inquiries and sample requests from government and university funded researchers around the world, and is in the process of negotiating supply agreements. Pricing for purified graphite for nuclear applications is not yet confirmed by contract, but it is expected to be sold for USD18,000 to USD35,000/t.

ELECTRONIC DEVICES

Graphite's thermal and electrical conductivity make it ideal for improving the efficiency and reliability of semiconductor based electronic devices. It can be used as a heat-sink, as a conductor, or a combination of the two. It can be used as a surface coating, or as an additive in composite materials. High crystallinity of the graphite raw material is required to ensure that these properties are maximized. Very high purity is also required, in order to minimize or eliminate thermal outgassing of impurities during the operation of the electronic devices.

The commercial processor responsible for the thermal upgrading of the Miller graphite to 99.9998% purity is an affiliate of a well-known international graphite corporation. Shortly after completing the upgrading trials for Canada Carbon, this international entity submitted a pricing letter stating that the ultra-high-purity Miller graphite was suitable for supplying to their clients in the specialty electronics industry. Assuming 10% market penetration into the stated market of 250 to 350 t/mo, Canada Carbon could sell 300 to 420 t/a, at a price of USD12,000 to USD14,000/t.

ENERGY STORAGE DEVICES

In the past two decades, technical advances in battery technology, particularly the Li-ion type, have driven a revolution in consumer devices due to enhanced portability and reliability. A growing consensus that the burning of fossil fuels is altering the world's climate is also driving the development of energy storage devices that would allow users reliant on renewable power sources such as solar collection or wind generation to have the power available during periods when power would otherwise not be available. For consumers connected to the electrical grid, cheaper power is often available at times of off-peak consumption. Less expensive stored power could be used at those times when grid power would be more costly. This behaviour would also provide a load-leveling effect for power utilities. Vanadium redox/flow batteries are also being developed which will have the capacity to store electricity for both domestic and industrial applications, and are already being installed as load-leveling devices by electrical utility operators. Both types of batteries require high purity graphite for essential components.

Economic factors have limited the adoption of Li-ion battery technology in transportation applications traditionally held by fossil fuels, but it is expected that graphite demand (for e.g. all-electric and hybrid automobiles) will skyrocket if the overall cost can be made comparable to traditionally powered vehicles. Because an all-electric Li-ion battery pack contains a substantial amount of graphite (estimated to be around 100 kg per vehicle), widespread adoption of this technology will cause a rapid increase in demand for graphite with the suitable characteristics of crystallinity, particle size and purity. The graphite particles must also be sphericalized, and coated, to enhance their performance characteristics.

Canada Carbon believes that its ultra-high-purity graphite is highly suited to Li-ion battery technology. There are already a number of flake graphite companies positioning themselves to meet the expected demand for automotive battery graphite, but high battery cost is the most critical variable impeding the widespread adoption of the technology. Anticipating that future graphite pricing for this market will be under significant negative pressure as a cost-reduction strategy, Canada Carbon sees no value in competing in this high-volume commercial Li-battery marketplace.

Canada Carbon has instead chosen to focus entirely on Li-ion battery applications in which performance and reliability are the primary criteria, such as are required by defense and aerospace applications. Samples of the ultra-high-purity Miller graphite are currently being assessed for high-performance Li-ion battery capability. Suitable graphite will command a premium, and once shaped and coated, values of USD15,000 to USD25,000/t are anticipated for this niche battery market.

GRAPHENE

Graphite crystals are composed of layers of graphene. Each layer of graphene is a sheet of carbon atoms bonded together in a hexagonal array, but which is itself only one atom thick. A sheet of graphene is so thin that approximately 3,000,000 sheets stacked in the natural crystalline structure would only be 1 mm thick. The physical properties of graphite (e.g. thermal and electrical conductivity) are really the properties of graphene, although any disruptions in the crystal structure or impurities in the graphite would diminish the observed property.

Unlike graphene sheets within a graphite crystal, which are protected from exposure to a chemically reactive environment by the other graphene sheets above and below them, a single layer of graphene is the only form of carbon in which each atom is available for chemical reaction from both sides. Atoms at the edges of the graphene sheet have enhanced reactivity. This reactivity makes graphene the target of an incredible variety of scientific research programs, as the properties of the graphene can be modified by reactions with other chemicals.

Graphene is the strongest material ever tested; it is over 200 times stronger than steel, on a weight basis. It is being investigated as a reinforcing agent in a number of composite materials.

Graphene which is produced via the exfoliation (separation of layers) of natural graphite may have a cost advantage over synthetic graphene because the available exfoliation technologies are amenable to bulk processing. However, the highest quality graphene requires the best precursor graphite, both in terms of crystal morphology and overall purity.

Canada Carbon's ultra-high-purity Miller graphite possesses both of those qualities. It has very large crystal structure, and can be purified to 99.9998% graphitic carbon. Samples of the purified Miller graphite are being examined by graphene researchers around the world.

19.2 MARBLE PRODUCTS

The Miller graphite is hosted by metasedimentary rocks which have undergone high-grade metamorphic activity (granulite facies). The graphite is associated with hydrothermally altered marble at its contact with paragneiss, and can be found as void-filling pods and veins, banded skarns, or broadly disseminated in the marble. During early exploration drilling, wide intervals of white marble were encountered. Consulting geologists determined that the marble had economic potential. Following extensive testing, an off-take agreement is in place for architectural marble slabs and blocks, with a base-case value of $184/t. Crushed marble produced during graphite mining or marble quarrying will be removed from site by the mining contractor, for a nominal credit of $1/t. Finely ground graphite tailings have potential value as Portland cement feedstock, and will be segregated in a dry-stack tailings facility on-site. An off-take agreement for this material is not yet finalized.

19.2.1 Marble Blocks and Slabs

As reported by the Company on February 19, 2015, wide intersections of white marble were discovered to lie adjacent to the main vein/skarn graphite mineralized zones, also hosted in white marble. Consultations with dimensional stone industry representatives revealed that the white marble intersections were continuous enough to warrant further evaluation of the quality and size of the marble units. A significant component of the 2015 drill campaign was dedicated to better defining the white marble zones.

A block of marble weighing approximately 1 t was shipped to an architectural stone processor located in Quebec, for cutting, polishing and assessment. The processor reported that the Miller marble was whiter, less brittle, easier to cut, and polish to a luster not seen in the imported white marble that they currently process. Following a site visit, the processor requested a further 50 t of marble for processing and distribution to potential customers. Canada Carbon subsequently signed a comprehensive agreement to sell 75,000 t of architectural-quality marble material from its flagship Miller Project. The agreed base valuation for marble blocks or slabs is $14/ft^3, which is approximately $184/t. There are provisions for price increases above this base case to be applied retroactively on specified tonnage thresholds, as well as royalties to be paid on the sale of all value-added marble products. The term of the contract is to run for one year from the date of the acquisition of the required environmental approvals and an extraction permit to quarry the material, and is renewable.

19.2.2 Marble Waste from Mining and Quarrying

Canada Carbon has signed a contract with a local quarry operator to perform all mining activities, including blasting, hauling, and preliminary crushing of graphite mineralized material. The contractor will remove and store off-site all non-mineralized stone material produced during graphite mining, as well as any material unsuitable for sale as blocks or slabs or for graphite processing produced during marble quarrying, for ultimate use as construction or decorative aggregates. Under Quebec legislation, that quarry operator can only store the aggregate materials off-site if there is a purchase agreement in place. The contractor is expected to pay a nominal amount of $1/t to move aggregate materials arising from both graphite mining and marble quarrying operations off-site.

19.2.3 Marble Contained in Graphite Mill Flotation Tailings

Detailed chemical analysis of the flotation tailings, composed entirely of crushed marble, has demonstrated that the tailings have calcium, iron, silica, and aluminum levels suitable as feedstock for cement manufacturers. The Miller marble contains low levels of magnesium, which makes it well-suited for certain specific value-added products distributed by the two international cement companies now in discussions with the Company.

In the absence of an off-take agreement, Canada Carbon cannot currently assign any value to the tailings material. However, storage costs will be reduced significantly if the tailings are moved off-site at any point in the life of mine cycle, even if no revenue is produced from their removal.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

Canada Carbon must complete the overall permitting and approval process in order to construct, operate, and close the Project. This permitting and approval process includes the acquisition of all necessary permits and approvals from various federal, provincial, and local government agencies. This section is based on information available as of the effective date of this report.

Canada Carbon has a number of environmental and social assessments underway, each required when Canada Carbon proceeds with an application to the MERN (the Ministry responsible for anything relating to mining—permits, titles, mining rights, etc.) for a mining and quarrying permit for the Project. The thermal plant at Asbury will require a certificate of authorisation. The area planned to be mined and developed at the Miller Property will cover approximately 1,000,000 m^2, including pit limits, stockpiles (tailings, waste rock, top soil, overburden, and mined materials), plant, access roads, parking lots, and offsets. The area to be used at the Asbury Property covers approximately 16,000 m^2, including, but not limited to, a new thermal upgrading plant, an existing plant building (to be upgraded as warehouse, office), and parking lots. The Asbury Property is zoned for heavy industrial usage. The author has not visited this site.

Key facilities and associated activities likely to interact with environmental, social, and economic components of the Project setting include the following:

- Miller Property:
  - graphite quarry pits
  - marble quarry pit
  - tailings dry stack
  - sediment pond
  - marble storage pad
  - waste rock pile
  - top soil and overburden stockpiles
  - stockpiles
  - milling plant
  - access road
  - transmission line
- Asbury Property:
  - processing plant
  - site roads

- each property:
  - construction contract and permanent staff
  - operations contract and permanent staff
  - site preparation activities
  - air emissions – dust, sulphur dioxide, volatile organic carbons, mono-nitrogen oxides and carbon monoxide emissions
  - noise and vibration
  - effluent discharge
  - waste water discharge
  - surface water and/or groundwater use.

20.1 PERMITTING

Canada Carbon is in the process of compiling required information for completing permit and authorization applications, prior to development of the Project. Environmental approval and permitting requirements described in this section is based on information provided by Canada Carbon at the time of writing this report. Separate permits and authorizations are required for the Miller graphite quarry pits, the Miller marble quarry pit and the Asbury thermal plant.

According to the Quebec *Mining Act* the Miller graphite quarry and the Miller marble quarry will each require a separate mining lease from the MERN prior to substance extraction. Under the *Mining Act,* graphite is considered a mineral substance requiring a mining lease and marble is considered a surface mineral substance requiring a lease to mine surface mineral substances prior to extraction. Prior to obtaining a mining lease, Canada Carbon must submit a rehabilitation and restoration plan to the MERN, and have it approved by the Ministry. The application for the lease must also be accompanied by a feasibility study, a land survey of the mining lease, a scoping and market study regarding the processing of mineralized material in Quebec (Quebec Government October 2015).

Canada Carbon is in the process of determining the permitting requirements for the Miller marble pit and expects to have the necessary information available for consideration during the feasibility stage. In Quebec, some substances on lands granted or alienated before January 1, 1966 were surrendered to the landowner. After January 1, 1966, the substances remain the property of the province on granted lands. Canada Carbon is currently investigating with the MERN the possibility that the Miller marble pit is the property of the land owner, which would remove the need to pay a royalty.

Under Section 22 of the *Environment Quality Act,* prior to extraction of the graphite or marble, Canada Carbon will need to obtain the necessary certificate of authorizations from the Quebec Ministry of Sustainable Development, Environment and the Fight against Climate Change [Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC)] (which is the Ministry responsible for anything relating to the environment and environmental impacts). It is expected that separate authorizations will be needed for the following components of the Project:

- marble quarry
- Miller graphite quarry
- Miller graphite production
- Miller treatment plant
- Asbury thermal plant

The *Environment Quality Act* requires an environmental impact assessment in the case of a mining project for the development and operation of “any other mine that has a production capacity of 500 metric tons or more per day” (other than a metal, asbestos, uranium or rare earth mine). Quarries within the meaning of the *Regulation respecting pits and quarries*, CQLR c. Q-2, r 7, are not subject to the Quebec impact assessment procedure. However, this exception does not apply to graphite mines which are specifically excluded from the definition of “quarry” under the *Regulation respecting pits and quarries*.

The Project would have a maximum graphite (a non-metal) mill feed rate of 499 t/d (from the Miller graphite quarry), maximum marble production rate of 150,000 t/a (or approximately 411 t/d—from the Miller marble quarry) and maximum refined graphite production of 1,500 t/a (from the Asbury thermal plant). Therefore, the Project is not subject to the Quebec environmental impact assessment procedure.

The federal *Regulations Designating Physical Activities*, SOR/2012-147 (the “Regulation”) identify the physical activities that constitute the "designated projects" that may require an environmental assessment by the Canadian Environmental Assessment Agency under the *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19 (CEA Act 2012). Sections of the Regulations which are applicable to the Project include: Section 1(d), which includes the construction, operation, decommissioning, and abandonment in a wildlife area or migratory bird sanctuary of a new mine or mill; and Section 16(a), which includes the construction, operation, decommissioning, and abandonment of the following projects:

- a metal mill with input capacity of 4,000 t/d or more
- a stone quarry or sand or gravel pit, with production capacity of 3.5 Mt/a or more.

The Project is not situated within a wildlife area (area of public lands set out in Schedule I of the Canadian, Wildlife Area Regulation) or a migratory bird sanctuary (per the Canadian, Migratory Bird Sanctuary Regulation) and does not fall under any of the project categories listed under Section 16(a) of the Regulations. As such, the Project does not require an environmental assessment by the Canadian Environmental Assessment Agency.

A preliminary summary of permitting and authorisations needed prior to construction and development of the Project is presented in Table 20.1.

The Commission for the Protection of Agricultural Territories of Quebec (Commision de la Protection du Territoire Agricole du Quebec (CPTAQ)) is a Quebec governmental agency with a mandate to protect and preserve agricultural lands. Authorization from CPTAQ is required for the use of land in an agricultural zone for purposes other than agriculture. An agricultural suitability assessment of the Miller Property area was completed for Canada Carbon in 2015. The assessment results indicate that the soils covering the assessed area are not suitable for agricultural use based on their emplacement (unfavorable topographic slope), high stone content (making it difficult for tilling), unfavorable moisture content, and low natural fertility. Historic mining activities also mark the Miller Property, which show characteristics of broadly distributed disturbances.

Work on the reports and applications required to obtain a Certificate of Authorization from MDDELCC to develop the Project are currently on the way. Key findings to date include the presence of wetlands and the presence of four plant species that have a special status in Quebec occurring within the area proposed to be disturbed by the Project mining facilities.

In summary, environmental laws and regulations that may apply to development of the Project include, but are not limited to, the following:

- *Mining Act/Regulation* respecting mineral substances other than petroleum, natural gas, and brine
- *Sustainable Forest Development Act/Regulation* respecting standards of forest management for forests in the domain of the State
- *Environment Quality Act/Regulation* respecting pits and quarries
- *An Act Respecting Occupational Health and Safety/Regulation* respecting occupational health and safety in mines
- *Natural Heritage Conservation Act*
- *Groundwater Catchment Regulation*
- *An Act Respecting the Conservation and Development of Wildlife*
- *An Act Respecting Threatened or Vulnerable Species.*

The Miller Property is located within the Municipality of Grenville-sur-la Rouge on private property within the Agroforestry (AF) land use zone, and the Asbury Property is located within the Municipality of Notre-Dame-du-Laus within the heavy industrial land use zone. According to respective land use plans, it is not expected that changes to land use zoning will be required.

Table 20.1 Permitting and Authorisations Summary Table

Issuing Authority	Authorizations	Fees	Processing Time	Comment
Marble Quarry				
MDDELCC	Certificate of authorization under s.22 of the *Environment Quality Act*	$1,708	75 days following the reception of the authorization request.	Expect questions and request for additional information
MDDELCC	Authorization under s.48 of the *Environment Quality Act* for the installation of air emissions control equipment (if required)	$1,138	75 days following the reception of the authorization request	Expect questions and request for additional information
MDDELCC	Authorization under s.31.75 of the *Environment Quality Act* for the withdrawal of water (pumping), if> 75 000 L / day	$1,477	75 days following the reception of the authorization request	Expect questions and request for additional information
Municipalité de Grenville-sur-la-Rouge (otherwise MDDELCC)	Grenville Sur La Rouge, Municipal license - domestic wastewater treatment system <3240 L / day (otherwise authorized under s.32 of the *Environment Quality Act*)	$50	60 days	For a limited capacity septic system - such as quarry scale (with some offices and kitchen)
Municipalité de Grenville-sur-la-Rouge	Municipal license - drinking water wells	$50	60 days	For a well serving the scale (see above)
Municipalité de Grenville-sur-la-Rouge	Municipal license - Tree Cutting	$50	60 days	Cuts for the site preparation
Miller Graphite Quarry				
MDDELCC	Certificate of authorization under s.22 of the *Environment Quality Act*	$1,708	75 days following the reception of the authorization request	Expect questions and request for additional information
MDDELCC	Authorization under s.48 of the *Environment Quality Act* for the installation of air emissions control equipment	$1,138	75 days following the reception of the authorization request	Expect questions and request for additional information

table continues...

Issuing Authority	Authorizations	Fees	Processing Time	Comment
MDDELCC	Authorization under s.31.75 of the *Environment Quality Act* for the withdrawal of water (pumping), if> 75 000 L / day	$1,477	75 days following the reception of the authorization request	Expect questions and request for additional information
	RBQ license for petroleum equipment. Basic amount	$150		
Municipalité de Grenville-sur-la-Rouge (otherwise MDDELCC)	Municipal license - domestic wastewater treatment system if <3240 L/day (otherwise authorized under A.32 of the EQA)	$50	60 days	For a limited capacity septic system - such as a garage (with some offices and kitchen)
Municipalité de Grenville-sur-la-Rouge	Municipal license - drinking water wells	$50	60 days	For example a well deserving a garage (see above)
Municipalité de Grenville-sur-la-Rouge	Authorization under s.32 of the *Environment Quality Act* for the installation or increase in the production capacity of drinking water treatment apparatus or equipment serving more than 20 persons	$1,138	75 days following the reception of the authorization request	Expect questions and request for additional information
Municipalité de Grenville-sur-la-Rouge	Municipal license - Tree Cutting	$50	60 days	Cuts for the site preparation
Miller Graphite Production				
MDDELCC	Certificate of authorization under s.22 of the *Environment Quality Act*	$1,708	75 days following the reception of the authorization request	Expect questions and request for additional information
Municipalité de Grenville-sur-la-Rouge	Municipal license – Tree felling	$50	60 days	-
Miller Treatment Plant				
MDDELCC	Certificate of authorization under s.22 of the *Environment Quality Act*	$1,708	75 days following the reception of the authorization request	Expect questions and request for additional information
MDDELCC	Authorization under s.48 of the *Environment Quality Act* for the installation of air emissions control equipment	-	-	-

table continues...

Issuing Authority	Authorizations	Fees	Processing Time	Comment
Municipalité de Grenville-sur-la-Rouge	Municipal license - domestic wastewater treatment system	-	-	-
Municipalité de Grenville-sur-la-Rouge	Unit rate per metric tonne of contaminants (water-air) rejected by year	$2 (with weighting factor)	-	-
Municipalité de Grenville-sur-la-Rouge	Municipal license - drinking water wells	$50	60 days	-
MDDELCC	Authorization under s. 32 of the *Environment Quality Act* for the installation or increase in the production capacity of drinking water treatment apparatus or equipment serving more than 20 persons	$1,138	75 days following the reception of the authorization request	Expect questions and request for additional information
Municipalité de Grenville-sur-la-Rouge	Municipal license - Tree cutting	50	60 days	-
Asbury – Thermal Plant				
MDDELCC	Certificate of authorization under the *Environment Quality Act* s.22	$1,708	75 days following the reception of the authorization request	Expect questions and request for additional information
MDDELCC	Authorization under s.48 of the *Environment Quality Act* for the installation of air emissions control equipment	-	-	-
Municipalité de Notre-Dame-Du-Laus	Municipal license - domestic wastewater treatment system	-	-	-
Municipalité de Notre-Dame-Du-Laus	Unit rate per metric tonne of contaminants (water-air) rejected by year	$2 (with weighting factor)	-	-
Municipalité de Notre-Dame-Du-Laus	Municipal license - drinking water wells	$50	60 days	-

table continues...

Issuing Authority	Authorizations	Fees	Processing Time	Comment
MDDELCC	Authorization under s.32 of the *Environment Quality Act* for the installation or increase in the production capacity of drinking water treatment apparatus or equipment serving more than 20 persons	$1,138	75 days following the reception of the authorization request	Expect questions and request for additional information
Municipalité de Notre-Dame-Du-Laus	Municipal license - Tree cutting	$50	60 days	-

20.2 ENVIRONMENTAL STUDIES

A summary of environmental baseline studies conducted in 2015, and other relevant documents reviewed as part of this PEA for the Project, is presented in Table 20.2. The environmental baseline studies, which focused on the biological environment, were based on results from literature search, and site specific surveys.

Table 20.2 List of Reviewed Documents

Description/Title	Author	Completion Date
Miller Property		
Canada Carbon Inc., Expert's Report on Sugar Bushes with Maple Production Potential, ("Canada Carbon Inc., Rapport D'Expertise du Potential Acéricole"), in French	Terra-Bois, Cooperative, Proprietaires de Boises	November 2015
Agronomic, Expertise, Soil characterization and interpretation of agricultural potential, Reference No. A2501, Canada Carbon – Miller Project, translated to English original in French	SolÉco Inc., Agriculture, Environnement	September 8, 2015
Preliminary Environmental Study, Part of lots 9A, 10A and 11A of rang 5 and part of lot 9B-P of rang 4 of the Cadastre of the Township of Grenville ("Étude Environnementale Préliminaire, Partie des lots 9A, 10A et 11A du rang 5, et partie du lot 9B-P dur rang 4 du cadastre du Canton de Grenville") in French Includes results from the following: wetlands mapping and characterization study, ecological function evaluation of wetlands, inventory of plants of special status or of concern and likelihood of occurrence analysis, animals of special status or of concern likelihood of occurrence analysis.	Office of applied ecology ("Bureau d'écologie appliquée")	January 2016
Surface Access Agreement entered into by 9007-2224 Quebec Inc. and 132956 Canada Inc. of 289 Principal, Grenville, Quebec, J0V1J0 ("Landholder") and Canada Carbon Inc. of 1166 Alberni Street, Suite 605, Vancouver, British Columbia, V6E 3Z3. Real Property owned by 9007-2224 Quebec Inc.: Range V: 9a-10a-10b-P11a ½ north – 11b – P11a ½ South; and owned by 132956 Canada Inc. Range VI: 5a- 10a- 11a- 12b -12c; RC 4P lot 9b	Signed by Michel Brunet of 132956 Canada Inc., Michel Brunet of 9007-2224 Quebec Inc., and R. Bruce Duncan of Canada Carbon Inc.	June 20, 2013
Asbury Property		
Preliminary Environmental Study, Part of lots lots 18, 19, 20 and 21 of rang 5, and part of lots 18, 19 and 20 of rang 6 the Cadastre of the Township of McGill ("Étude Environnementale Préliminaire, Partie des lots 18, 19, 20 et 21 du rang 5, et partie des lots 18, 19 et 20 du rang 6 du cadastre du Canton de McGill") in French	Office of applied ecology ("Bureau d'écologie appliquée")	January 22, 2016
Copy of Resolution, Excerpt of Verbal Proceedings	Notre Dame-du-Laus Municipality	May 5, 2015

It is understood that the environmental studies presented in Table 20.3 will be completed as part of development of project permit applications and future feasibility studies.

Table 20.3 Environmental Studies

Environmental Study	Expected Completion Date
Miller Marble	
Geochemistry	September 2016
Noise Impact Study	April 2016
Water Management	April 2016
Air Quality Study	April 2016
Soil Suitability Study	April 2016
Hydrogeological Survey	April 2016
Hydrology Survey	April 2016
Spring and Summer Wildlife and Vegetation Surveys	May and July 2016
Miller Property Rare Plants and Wetlands Surveys	July 2016
Calumet River Surface Water Quality Survey (doesn't include oil content)	May 2016
Miller Graphite	
Geochemistry	September 2016
Noise Impact Study	April 2016
Water Management	September 2016
Air Quality Study	April 2016
Soil Suitability Study	April 2016
Hydrogeological Survey	May 2016
Hydrology Survey	May 2016
Spring and Summer Wildlife and Vegetation Surveys	May and July 2016
Asbury - Thermal Plant	
Noise Impact Study	August 2016
Water Management	November 2016
Air Quality Study	August 2016
Soil Suitability Study	August 2016
Hydrogeological Survey	September 2016
Hydrology Survey	September 2016
Spring and Summer Wildlife and Vegetation Surveys	September 2016

The Miller Property is composed of 31 contiguous claims covering an area of 1,863.09 ha. It is primarily vegetated by leafy trees which mainly consist of maple, birch and aspen, with few firs that have been partly cleared or selectively logged and replanted. Small swamp and peat land are scattered all over the flat areas, whereas steeper hillsides and ridge tops display large rock outcrops. A power line crosses the southern part of the Miller Property.

20.2.1 Physiography

Physiography of the Miller and Asbury properties are described above Section 5.4.

20.2.2 Surface Drainage

The Miller Property appears to be located within the Calumet River watershed to the north, which flows into the Ottawa River and within the Ottawa River watershed to the south. At least nine watercourses meander through the Miller Property, three of which are permanent and six intermittent. The Calumet River is the most important in terms of size and flow rate. The Asbury Property appears to be within the Cotton/Snake Stream watershed that joins the Du Lièvre River, which eventually flows into the Ottawa River approximately 62 km upstream of the Calumet River outlet into the Ottawa River. Approximately 15 watercourses meander through the Asbury Property area, of which only one is permanent (CD8) and the remainder intermittent. Hydrology studies are planned to take place from February to May 2016 for the Miller Property and from July to September 2016 for the Asbury Property. Results from the project design, geochemistry, water quality, hydrology, and hydrogeology studies will be used to develop the site water balance (quality, quantity and flow) for each property.

20.2.3 Hydrogeology

Hydrogeology studies are planned to take place from February to May 2016 for the Miller Property and from July to September 2016 for the Asbury Property. Results from the project design, geochemistry, water quality, hydrology, and hydrogeology studies will be used to develop the site water balance (quality, quantity and flow) for each property.

20.2.4 Migratory Birds

Timing of migratory birds nesting periods should be considered prior to tree removal and site preparation for construction and mining. Provided best management practices and mitigation measures are used during tree removal, harm to migratory birds is not anticipated.

20.2.5 Miller Wetlands, Vegetation and Wildlife

The Miller Property is located within the "white-tailed deer yard" as defined in Quebec "*Regulation respecting wildlife habitats*" of the "*An Act respecting the conservation and development of wildlife*". Environmental fieldwork was completed on 67 ha of the Miller Property, by the Bureau d'écologie appliquée on August 24, 25 and 28, 2015. The Miller Property is covered by wetlands and mixed forest. There are at least six wetland areas comprised of treed swamps, shrub swamps, treed peatbogs, marshes and ponds all of which cover approximately 12 ha, or 18% of the studied area. The ecological values of the wetlands vary from low (treed swamp (MH1)), to medium (shrub swamps (MH2) and treed peatbogs (MH3 and MH4)) to high (shrub and treed swamps, marshes and ponds (MH5) and forested bogs, marshes and pond (MH6)). The rest of the study area is composed of terrestrial environments including, previously harvested uneven-aged hardwood and mixed forest stands (partial cuts).

There were 259 different plant species identified during the exhaustive inventory including 14 with special status or species of interest. Of these, four are likely to be designated as threatened or vulnerable in Québec (*Carex baileyi, Cypripedium reginae, Juglans cinerea, Spiranthes casei*) and one is designated as vulnerable in Québec (*Allium tricoccum*). The butternut tree (*Juglans cinerea*) is also designated as an endangered plant species in Canada.

One animal species with special status was observed: the pickerel frog, *Lithobates palustris* (likely to be designated as threatened or vulnerable in Québec).

Measures for avoidance of species designated as vulnerable to harvesting will be evaluated and assessed as part of the work needed for completing Certificate of Authorisation requirements. Where avoidance is not possible, mitigation measures such as relocation will be evaluated. These measures are intended to provide information for developing a global compensation plan. There are no legal actions stipulated for these species under the *Act Respecting Threatened or Vulnerable Species* or its accompanying regulation.

20.2.6 Asbury Wetlands, Vegetation and Wildlife

Environmental fieldwork was completed on 50 ha of the Asbury Property, by the Bureau d'écologie appliquée, on August 26 and 27, 2015. The main environmental components of the study area were characterized. Approximately 15% of the study area is covered by 13 separate wetland areas (including treed swamps, shrub swamps, treed peat bogs, fen-type (open) peatlands, and marshes and ponds) of low to high ecological value (artificial lakes are also present). The remaining 85% of the study area is covered by uneven-aged hardwood and mixed forest stands that have been harvested (partial cuts) and the disturbed footprint of past mining activities. There were 200 different plant species identified during plant inventory including two plant species with special status or species of interest (both are designated as vulnerable to harvesting). The potential for the site to contain other plant species of special status is considered very low. No animal species with special status was observed during the inventory process, however no specific wildlife inventory was conducted. There is a moderate potential for the site to contain animal species of special status (particularly for the hoary bat, the silver-haired bat, the eastern red bat and the pickerel frog).

Measures for avoidance of species designated as vulnerable to harvesting will be evaluated and assessed as part of the work needed for completing Certificate of Authorisation requirements. Where avoidance is not possible, mitigation measures such as relocation will be evaluated. These measures are intended to provide information for developing a global compensation plan. There are no legal actions stipulated for these species under the *Act Respecting Threatened or Vulnerable Species* or its accompanying regulation.

20.2.7 Soils

Characteristics of soil cover underlying the Miller Property vary throughout the site. Soil texture ranges from sand to sandy loam, or clay soil in places, with thickness ranging from 15 to 35 cm. The top layer consists of organic litter that decomposes to humus within the top 10 cm. Bedrock outcrops can be observed at several locations. Based on the Canada Land Inventory map on Soil Capability for Agriculture and confirmed during their site visit on August 28, 2015, the soil cover at the Miller Property ranges from:

- Class 4MF – soils with deficient moisture and low natural fertility, that have severe limitations that restrict the choice of crops, or require special conservation practices and very careful management, or both
- To Class 6 MT – soils with deficient moisture and adverse relief because of steepness or pattern of slopes, that are unsuited for cultivation, but are capable of use for unimproved permanent pasture
- To Class 7 TP – stony soils with adverse relief because of steepness or pattern of slopes, that have no capability for arable culture or permanent pasture.

Previous disturbance at the Miller Property is evident by presence of several abandoned mine shafts and mine waste material related to a historical mine operations. The Miller site is not suitable for agricultural use.

20.2.8 Suitability for Sugar Bush with Maple Production Potential

The Miller Property is located within an area potentially suitable for sugar bushes with maple production potential according to the CPTAQ. Although assessed, most of the area does not represent good potential for sugar bushes with maple production potential. However, one of the ecological stands was found to represent good suitability for sugar bushes with maple production potential if protected from anthropological disturbances.

Measures for avoidance of areas suitable for sugar bushes with maple production potential will be evaluated and assessed as part of the work needed for completing Certificate of Authorization requirements. Where avoidance is not possible, compensation measures will be evaluated. These measures are intended to provide information for developing a global compensation plan.

20.2.9 Other

Other potential detrimental effects associated with activities during the life of the Project include: increased dust, sulphur dioxide, volatile organic carbons, mono-nitrogen oxides and carbon monoxide concentrations in the air, and increased noise and vibrations.

The following environmental management plans, specific for the Project, will be developed and implemented to minimize potential effects on the environment:

- noise and vibration
- air quality and dust
- wetland remediation and compensation plan
- forest and vegetation management plan
- metal leaching and acid rock drainage prevention and management plan
- site-water management and surface erosion control
- soil and overburden salvage and protection
- waste (quarry, hazardous, municipal, and liquid wastes)
- water (resource and potable).

20.3 POTENTIAL SOCIAL OR COMMUNITY IMPACTS

As mentioned in Section 4.1, the Miller Property is located in the Outaouais Region of southern Quebec, about 75 km west of Montreal, Quebec and 90 km east of Ottawa, Ontario. The closest cities are Grenville (5 km to the south) and Hawkesbury, Ontario (8 km to the south). The immediate vicinity of the Project is thinly populated and the existing settlements are mainly concentrated along Scotch Road with relatively limited local traffic. The Miller Property is composed of 31 contiguous claims covering an area of 1,863.09 ha. The town of Grenville has a population of approximately 1,699 residents.

As mentioned in Section 18.0, the graphite concentrate produced at the Miller Mine will be transported to Notre-Dame-du-Laus, where Canada Carbon intends to utilize the pre-existing mining infrastructure at the historical Asbury Mine, a past graphite producer, to heat treat the graphite concentrate and to distribute the produced graphite. The Asbury Property is located in southern Quebec approximately 8.1 km northeast of the Municipality of Notre-Dame-du-Laus, approximately 6 km southwest of the town of Lac Serpent in the upper Laurentians region, and approximately 6.5 km west of the Papineau-Labelle Wildlife Reserve. The Municipality of Notre-Dame-du-Laus has an approximate population of 1,603 residents.

Canada Carbon Inc. is committed to:

- maintaining dialogue with the communities and other stakeholders within the area of influence in order to understand their concerns, minimize negative impacts, and to enhance environmental quality
- training and educating employees to understand their environmental responsibility related to the Canada Carbon's operations and activities
- operating in accordance with industry standards while complying with all applicable environmental, health and safety laws and regulations
- establishing and maintaining a well-defined environmental, health, and safety management system to guide its operations

- ensuring that all employees, officers, and directors understand and adhere to its environmental, health, and safety management program
- providing operations with the necessary resources, expertise and training to effectively carry out its environmental, health, and safety management programs
- conducting periodic audits on its operations against stated commitments and measures regarding environmental, health, and safety management.
- communicating openly with employees, government, the public, and other stakeholders regarding this policy and on all matters pertaining to health, safety and the environment.
- Sourcing the workforce from southern Quebec, with a priority for local citizens.

Mine development and operations are expected to have a positive effect on local employment (Table 20.4) and economy. Supplies and labour will be sourced from southern Quebec with a priority to local citizens. Potential issues of social concern are associated with annoyance from noise and vibration generation, air emissions, increased traffic, landscape and visual impacts, and disturbance or destruction of heritage resources.

Table 20.4 Estimated Required Manpower

Project Component	Construction	Operations
Miller Graphite and Marble	40	87
Asbury Upgrading and Distribution	18	16

Canada Carbon has designed a project that will minimize negative social effects while creating new jobs for residents in nearby communities and economic benefits from purchase of supplies and services. Dust, noise and vibration community concerns during each phase of the project will be minimized by implementing proactive adaptive management, which includes confirming management effort results through monitoring and documentation. Concerns associated with increased traffic will be minimized by adherence to applicable traffic bylaws. The design includes measures to minimize landscape and visual impacts by leaving an appropriate vegetated buffer zone around the operations. Site workers will be instructed on appropriate procedures for work in the event that an archaeological site or artifact is encountered during site preparation work to ensure adherence to applicable provincial and/or federal laws and regulations.

Social engagement includes the following:

- surface access agreement
- meeting with the municipality
- public consultation
- meeting with Regional County Municipality (MRC)

- meeting with government agencies
- Municipal Council Resolution from Notre-Dame-Du-Laus
- Ministère du Développement Durable et de a Lutte Contre les Changement Climatiques (MDDLCCC).

20.4 Mine Closure (Rehabilitation) Requirements and Costs

A Mine rehabilitation and restoration plan will be developed and submitted to the MERN in accordance with Division III, section 232 of the *Mining Act* and guidance from the 1997, Government of Quebec "*Guidelines for Preparing A Mining Site Rehabilitation Plan and General Mining Site Rehabilitation Requirements*" ("*Guide et Modalités de Préparation du Plan et Exigences Générales en Matière de Restauration des Sites Miniers au Québec*").

According to recently updated Québec Mining Law, the total amount of the financial guarantee depends on the rehabilitation plan and corresponds to 100% of the estimated cost with security payment schedule of three payments (50%, 25% and 25% of total costs) with security of half of the cost needed before the start of the operation.

Canada Carbon will develop and submit the rehabilitation and restoration plan for approval to MERN prior to the start of project development. The rehabilitation and restoration plan will meet the following Quebec Mining Law requirement:

- description of the rehabilitation and restoration work relating to the Miller mine and Asbury thermal plant intended to restore the affected land to a satisfactory condition as agreed upon with regulators
- description of dry stack tailings rehabilitation and stabilization work needed to prevent environmental damage that might be caused by the presence of tailings
- description of possible progressive rehabilitation and restoration work, related conditions and phases of completion of the work
- the conditions and phases of completion of the work in the event of final cessation of mining activities
- a detailed estimate of the expected costs to be incurred for completing the work
- in the case of an open pit mine, a backfill feasibility study.

The guarantee covering the anticipated cost of completing the work required under the rehabilitation and restoration plan relevant to the Project must include:

- rehabilitation and restoration of accumulation areas
- geotechnical soil stabilization
- water treatment
- road-related work.

Preliminary closure plans for the Miller and Asbury properties include, but are not limited to, the following considerations:

- preservation of topsoil and overburden for reclamation where possible
- replacement of topsoil and overburden during reclamation as appropriate
- soil analysis and quality amendment for productivity, reclamation success
- contemporaneous reclamation
- dismantling of buildings and surface infrastructure as agreed upon with the MERN
- waste management according to applicable permits and regulations
- elimination of unacceptable health hazards and ensuring public safety
- confirmatory assessment, testing and remediation for potential site contamination
- pit backfilling and flooding
- development of a functional wetland habitat
- site regarding and revegetation
- site monitoring and management for habitat function to ensure self-sufficiency by sixth year after planting.

The estimated cost for Project rehabilitation and closure is \$1,000,000 and \$10,000 per year for four years following mine closure, for water monitoring. The estimated security payment schedule is as follows: 50% of rehabilitation guarantee amount to be paid 90 days after Ministry approval of the rehabilitation and closure plan, 25% of rehabilitation guarantee amount one year later; and the remaining 25% of rehabilitation guarantee amount two years later.

It is expected that the reclamation plans for the marble quarry permit and the graphite mine permit will be submitted separately. The graphite mine permit is expected to be submitted approximately five months after the marble quarry permit for the 50%; 25% and 25% on the two successive years.

For the PEA, a cost of \$1,000,000 has been included in the initial years for mine rehabilitation and closure. Demolition of the mill and other infrastructures is assumed to be covered by salvage values of the process equipment.

Closure plan costs have been estimated based on the rehabilitation of the tailings disposal area (pit backfilling work) and the sedimentation pond. The waste rock will be sold during the LOM. There will be no waste rock left to manage on site at closure.

21.0 CAPITAL AND OPERATING COST ESTIMATES

The capital and operating costs for the Project are summarized in Table 21.1.

Table 21.1 Summary of Capital and Operating Costs

Cost Type	Total ($ million)	Unit Cost ($/t milled)	Unit Cost ($/t)
Capital Cost			
Initial Capital Costs			
Marble Mining	3.,6	-	-
Graphite Mining/Flotation	18.1	-	-
Graphite Upgrading/Thermal Plant	22.7	-	-
Total Initial Capital Costs	**44.4**	**-**	**-**
Total Sustaining Capital for LOM	**3.6**	**-**	**-**
Operating Costs			
Total LOM Average Operating Costs – Graphite	-	76.11	8,327
Total LOM Average Operating Costs – Marble	-	-	22.26

Note: The initial capital and sustaining capital costs do not include land acquisition costs ($1.05 M), mine reclamation/closure costs ($1.04M) and working capital costs.
Operating costs do not include transport costs to customers or royalties.

All costs are reflected in Q4 2015/Q1 2016 Canadian dollars unless otherwise specified. The expected accuracy range of the cost estimates is +40%/-25%. For the equipment quoted in US dollar, the prices were converted from US dollars to Canadian dollars based on the exchange rates when the quotations were received.

21.1 INITIAL CAPITAL COST ESTIMATES

The total estimated initial capital cost for the design, construction, installation, and commissioning of the Project is $44.3 million. A summary breakdown of the initial capital cost is provided in Table 21.2. This total includes all direct costs, indirects costs, Owner's costs, and contingency. The expected accuracy range of the capital cost estimate is +40%/-25%.

Table 21.2 Capital Cost Summary

Description	Initial Capital Cost ('000)			
	Thermal Plant	Graphite Mining/ Processing	Marble Mining	Total
Overall Site	80	410	808	1,298
Graphite Open Pit Mining	-	17	-	17
Marble Open Pit Mining	-	-	835	835
Miller Site Process	-	9,255	211	9,466
Asbury Site Process	14,920	-	-	14,920
On-Site Infrastructure and Services	238	298	567	1,104
Project Indirects	2,886	4,863	494	8,243
Owner's Costs	762	499	121	1,382
Contingencies	3,777	2,732	607	7,116
Total	**22,663**	**18,074**	**3,644**	**44,381**

21.1.1 Class of Estimate

This Class 4 cost estimate has been prepared in accordance with the standards of AACE International. There was no deviation from AACE International's recommended practices in the preparation of this estimate. The accuracy of the estimate is +40%/-25%.

21.1.2 Estimate Base Date and Validity Period

This estimate was prepared with a base date of Q4 2015/Q1 2016 and does not include any escalation beyond this date. The quotations used for this PEA estimate were obtained in Q4 2015/Q1 2016 and have a validity period of 90 calendar days or less.

21.2 Estimate Approach

21.2.1 Currency and Foreign Exchange

The capital cost estimate uses Canadian dollars as the base currency. When required, quotations received from vendors were converted to Canadian dollars based on the exchange rates when the quotations were received. There are no provisions for foreign exchange fluctuations.

21.2.2 Duties and Taxes

Duties and taxes are not included in the estimate.

21.2.3 Measurement System

The International System of Units (SI) is used in this estimate.

21.2.4 Work Breakdown Structure

The estimate is organized according to the following hierarchical work breakdown structure (WBS):

- Level 1 = Major Area
- Level 2 = Area
- Level 3 = Sub-area.

21.2.5 Elements of Cost

This capital cost estimate consists of four main parts: direct costs, indirect costs, Owner's costs, and contingency.

Direct Costs

AACE International defines direct costs as:

> *…costs of completing work that are directly attributable to its performance and are necessary for its completion. In construction, (it is considered to be) the cost of installed equipment, material, labor and supervision directly or immediately involved in the physical construction of the permanent facility.*

Examples of direct costs include mining equipment, process equipment, mobile equipment, and permanent buildings.

The total direct cost for the Project is estimated to be $27.6 million.

Indirect Costs

AACE International defines indirect costs as:

> *…costs not directly attributable to the completion of an activity, which are typically allocated or spread across all activities on a predetermined basis. In construction, (field) indirects are costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, start-up costs, contractor's fees, insurance, taxes, etc.*

The total indirect cost for the Project is estimated to be $8.2 million.

Owner's Costs

Owner's costs are costs assumed by the Owner to support and execute the Project.

The Project execution strategy, in particular for construction management, involves the Owner working with an EPCM organization and supervising the general contractor(s). The Owner's costs include home office staffing, home office travel, home office general expenses, field staffing, field travel, general field expenses, community relations, and Owner's contingency.

The total Owner's cost for the Project is estimated to be $1.4 million.

CONTINGENCY

When estimating costs for a project, there is always uncertainty as to the precise content of all items in the estimate, how work will be performed, what work conditions will be encountered during execution, etc. These uncertainties are risks to a project, and these risks are often referred to as "known-unknowns", which means that the estimator is aware of the risks and, based on experience, can estimate the probable costs. The estimated costs of the known-unknowns are referred to by cost estimators as "cost contingency". Tetra Tech estimated a contingency for each activity or discipline based on the level of engineering effort as well as experience on past projects.

The total contingency allowance for the Project is $7.1 million.

21.2.6 CAPITAL COST EXCLUSIONS

The following items have been excluded from this capital cost estimate:

- working or deferred capital (included in the financial model)
- financing costs
- refundable taxes and duties
- land acquisition
- currency fluctuations
- lost time due to severe weather conditions
- lost time due to force majeure
- additional costs for accelerated or decelerated deliveries of equipment, materials, or services resultant from a change in project schedule
- warehouse inventories, other than those supplied in initial fills, capital spares, or commissioning spares
- all project sunk costs (studies, exploration programs, etc.)
- mine reclamation costs (included in the financial model)
- mine closure costs (included in the financial model)
- escalation costs.

21.3 OPERATING COST ESTIMATES

21.3.1 MINING OPERATING COSTS

Canada Carbon provided Tetra Tech with a copy of a signed letter of intent with a potential mining contractor. The following are the key conditions of the agreement:

- Canada Carbon will pay a total of \$7.24/t of material that is both mined and crushed to 0 to 20 mm (which includes \$1.24/t for the blasting).
- The removal of overburden is to be done at a cost of \$4.00/m³ or at hourly equipment rates (which include labour), depending on which option is less expensive.
- The Operator (i.e., potential contractor) will remove, consume or dispose of the material that is not deemed by Canada Carbon to be graphite material or marble slabs, and will pay to Canada Carbon \$1.00/t for the waste material.

For the supporting and ancillary equipment, Canada Carbon will lease the following equipment and has provided the equipment rates. Table 21.3 shows the equipment rates including labour and fuel.

Table 21.3 Leased Equipment Rates

Equipment	Units Required	Rate Per Unit (\$/h)
Fork Loader	1	150.00
Articulated Truck	1	75.00
Diesel Drill	2	175.00
Wheel Dozer	1	110.00
Grader	1	150.00
Water Truck	1	100.00
Snow Plow/Sanding Truck	1	50.00
Vibratory Compactor	1	50.00
Excavator	1	140.00
Block Pusher	2	150.00
Pick-up Truck	4	7.00

LABOUR

Table 21.4 summarizes the salaried mining labour costs. The hourly rate for saw operators was assumed to be \$32.00/h with a 40% burden.

Table 21.4 Mining Labour Costs

Equipment	Number Required	Base ($/a)	Burden (%)	Total Cost ($/a)
Mining Engineer	1	90,000	40%	126,000
Geologist	1	80,000	40%	112,000
General Labourer	4	50,000	40%	280,000

Blasting Service

Blasting operations will be conducted by the potential mining contractor and all associated costs are included in the contractor rate provided above.

Mining Operating Cost Summary

The mining operating cost was calculated based on all information described above in this section. Table 21.5 and Table 21.6 summarize the mining operating costs for the graphite and marble, respectively.

Table 21.5 Graphite Mining Cost Summary

Production	LOM Cost ($ million)	Unit Cost ($/t processed)
Mining, Graphite Material	15.18	7.24
Mine G&A	5.43	2.59
Mining, Waste	(1.48)	(0.71)
Mining, Overburden	0.35	0.17
Total Costs	**19.48**	**9.29**

Table 21.6 Marble Mining Cost Summary

Production	LOM Cost ($ million)	Unit Cost ($/t marble)
Mining, Marble	22.72	19.22
Mine G&A	8.15	6.90
Mining, Waste	(5.03)	(4.26)
Mining, Overburden	0.47	0.40
Total Costs	**26.31**	**22.26**

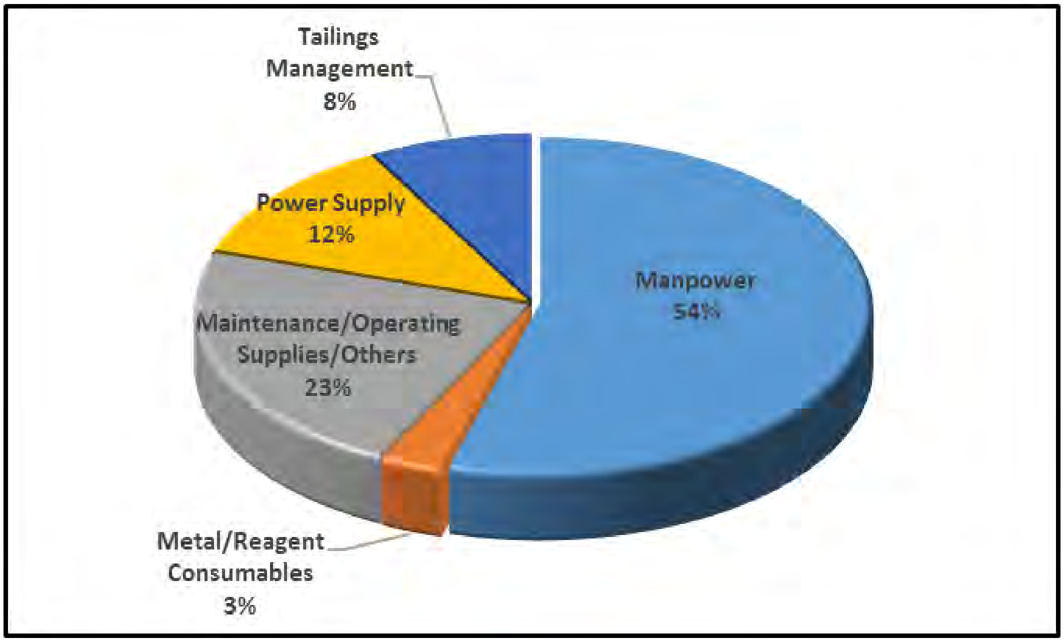
21.3.2 Process Operating Costs

For the high-purity graphite production, the LOM average unit process operating cost is estimated at $54.78/t milled or $5,994/t graphite at an average mill feed grade of 1.10% graphitic carbon, including the thermal upgrading cost of $17.52/t milled, or $1,917/t graphite.

The average unit process operating cost at a mill feed rate of 200 t/d is estimated to be \$88.77/t milled or \$4,251/t graphite at an average mill feed grade of 2.47% graphitic carbon. The estimate is based on 12 h/shift, 24 h/d, and 365 d/a.

The breakdown process operating costs for the initial four years are summarized in Table 21.7 and the process operating cost distributions are illustrated in Figure 21.1. All the costs are in Canadian fund, unless specified. The process operating costs do not include the costs associated with graphite shipments to customers or royalties.

Figure 21.1 Process Operating Cost Distribution



The process operating cost estimate includes:

- personnel requirements, including supervision, operation and maintenance; salary/wage levels, including burdens, based on the Q1 2016 labour rates at Quebec, Canada; the maintenance at the Asbury site is assumed to be contracted out.
- mill liner and grinding media consumption, estimated from the in-house data and experience
- maintenance supplies, based on approximately 7% of major equipment capital costs
- reagent consumptions based on test results and reagent prices estimated according to Tetra Tech's in-house database
- other operation consumables including laboratory and service vehicles consumables
- power consumption for the process plant.

All operating cost estimates exclude taxes unless otherwise specified. The sections below provide more detailed discussions based on a processing rate of 200 t/d.

PERSONNEL

The estimated average personnel cost, at a processing rate of 200 t/d is $48.05/t milled or $2,301/t graphite. The projected personnel requirement is 40 persons, including:

- 7 staff for management and professional services, including personnel at laboratories for quality control, process optimization and assaying.
- 28 operators servicing for overall operations from flotation to final high purity graphite.
- 5 personnel for equipment maintenance at the Miller site, excluding the labour requirement for Asbury maintenance which will be supported by contractors.
- the salaries and wages, including burdens, are based on the Q1 2016 labour rates at Quebec, Canada.

Table 21.7 Unit Process Operating Cost Summary – Initial Four Years

Description	Flotation			Thermal Purification			Total		
	Manpower	$/t milled	$/t graphite	Manpower	$/t milled	$/t graphite	Manpower	$/t milled	$/t graphite
Manpower									
Subtotal Manpower	27	32.97	1,579	13	15.08	722	40	48.05	2,301
Major Consumables/Supplies									
Metal/Reagent Consumables	-	1.84	88	-	0.80	38	-	2.64	126
Maintenance/Operating Supplies/Others	-	7.61	365	-	12.33	590	-	19.93	955
Power Supply	-	3.60	172	-	7.01	336	-	10.61	508
Tailings Management	-	7.07	339	-	n/a	-	-	7.08	339
Subtotal Supplies	-	20.12	964	-	20.14	964	-	40.26	1,928
Concentrate Transport									
Subtotal Concentrate Transport	-	0.46	22	-	-	-	-	0.46	22
Total	27	53.55	2,565	13	35.22	1,686	40	88.77	4,251

CONSUMABLES AND MAINTENANCE/OPERATION SUPPLIES

At a processing rate of 200 t/d, the operating costs for major consumables and maintenance/operation supplies were estimated at $22.57/t milled or $1,081/t graphite.

The costs for major consumables, which include metal and reagent consumables, were estimated at $2.64/t milled or $126/t graphite.

The cost for maintenance/operation supplies was estimated at $19.93/t milled or $955/t graphite. Maintenance supplies were estimated based on approximately 7% of major equipment capital costs.

POWER

The total process power cost was estimated at $10.61/t milled or $508/t graphite. The electricity will be supplied by grid lines. The power unit costs are estimated based on the preliminary plant equipment loads and a power unit cost of $0.075/kWh at the Miller site or $0.077/kWh at the Asbury site.

TAILINGS

Tailings management costs were estimated to be $7.08/t milled or $339/t graphite. The flotation tailings will be dewatered by thickening followed by filtration to a moisture content of approximately 15% w/w. The filter cakes will then be hauled by trucks to the tailings stacking pad for storage.

CONCENTRATE TRANSPORT COST

The estimated flotation concentrate transport cost is approximately $0.46/t milled (or $22/t graphite).

21.3.3 GENERAL AND ADMINISTRATIVE

G&A costs are costs that do not relate directly to the mining or processing operating costs. The total annual cost was estimated to be approximately $1.5 million. The average LOM unit G&A cost was estimated at $12.03/t milled or $1,316/t graphite at an average mill feed grade of 1.10% graphitic carbon. For the initial four-year operation at a mill feed rate of approximately 200 t/d, the average unit G&A cost was estimated to be $21.18/t milled or $1,014/t graphite at an average mill feed grade of 2.47%. The G&A costs include:

- personnel – general manager and staffing in accounting, purchasing, environmental, site maintenance and other G&A departments. The estimated total employee number is six. The salaries and wages are based on the Q1 2016 labour rates at Quebec, Canada, including base salary or wage and related burdens.

- **G&A expenses** – general administration, contractor services, insurance, security, legal services, human resources, travelling, communication services/supports, external assay/testing, overall site maintenance, surface water management, electricity and fuel supplies, engineering consulting, and sustainability including environment protection and community liaisons.

The G&A costs are summarized in Table 21.8. At a mill feed rate of 200 t/d and a head grade of 2.47% graphitic carbon, the average unit cost for management and service personnel was estimated at $8.06/t milled or $386/t graphite; the estimated average expenses for the general management and services is $12.90/t milled or $618/t graphite.

Table 21.8 G&A Cost Estimate

Description	LOM Average Unit Cost		Average Unit Cost at A Mill Feed Rate of 200 t/d*	
	$/t milled	$/t graphite	$/t milled	$/t graphite
Manpower	4.63	506	8.15	390
Expense	7.40	810	13.03	624
Total	**12.03**	**1,316**	**21.18**	**1,014**

Note: *Head grade: 2.47% Cg

22.0 ECONOMIC ANALYSIS

A PEA should not be considered to be a prefeasibility or feasibility study, as the economics and technical viability of the Project have not been demonstrated at this time. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Furthermore, there is no certainty that the conclusions or results as reported in the PEA will be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Tetra Tech prepared an economic evaluation of the Project based on a pre-tax financial model. The NPV was estimated at the beginning of the one-year construction period.

As indicated in Section 19.0 of this report, the graphite and marble prices used in the economic analysis are as follows:

- graphite: USD13,000/t
- marble: $184/t
- exchange rate (USD:CAD): 0.75:1.00

The following pre-tax financial results were calculated:

- 100.2% IRR
- 1.9-year payback on $44.4 million initial capital costs
- $149.7 million NPV at an 8% discount rate.

Canada Carbon and its external tax advisors prepared the tax calculations for use in the post-tax economic evaluation of the Project with the inclusion of Canadian Federal and Quebec income taxes, and the Quebec Mining Tax (see Section 22.5 for further details).

The following post-tax financial results were calculated:

- 85.0% IRR
- 2.0-year payback on $44.4 million initial capital costs
- $110.0 million NPV at an 8% discount rate.

Analyses were conducted to evaluate the sensitivity of the Project merit measures (NPV, IRR, and payback periods) to the main inputs.

22.1 PRE-TAX MODEL

22.2 MINE/PROCESS PRODUCTION IN FINANCIAL MODEL

The life-of-project average graphite material tonnages, grades, refined graphite, and marble production are shown in Table 22.1.

Table 22.1 Mine/Metal Production from the Miller Mine

Description	Value
Total Tonnes of Graphite Material to Mill from Graphite Pit (t)	890,805
Total Tonnes of Graphite Material to Mill from Marble Pit (t)	1,206,050
Total Waste Tonnes Mined From Graphite Pit (t)	1,479,770
Total Waste Tonnes Mined From Marble Pit (t)	5,031,758
Total Overburden Tonnes Removed from Graphite Pit (t)	158,279
Total Overburden Tonnes Removed from Marble Pit (t)	210,468
Total Marble Tonnes Mined from Marble Pit (t)	1,182,037
LOM, Graphite Pit (years)	10
LOM, Marble Pit (years)	8
Stockpile Re-handling (years)	7
Average Head Grade	
%Cg, Graphite Material from Graphite Pit (%)	1.87
%Cg, Graphite Material from Marble Pit (%)	0.53
Total Production	
Refined Graphite (t)	19,164
Marble (t)	1,182,037

22.2.1 BASIS OF FINANCIAL EVALUATION

The Project is anticipated to produce refined graphite and marble. Marble will be sold directly in blocks without any further processing. For graphite, the production schedule has been incorporated into the 100% equity pre-tax financial model to develop annual refined graphite production from the relationships of tonnage processed, head grades, and recoveries.

Gross revenues were calculated using a base case graphite price, marble price, and exchange rate. Net revenues were then estimated by subtracting applicable off-site transportation costs (applicable to marble only) and royalties. Annual operating costs for mining, processing, G&A and others were deducted from the net revenues to derive the annual operating cash flows.

Initial and sustaining capital costs, land acquisition costs, mine reclamation costs, as well as working capital, were incorporated on a year-by-year basis over the LOM. These capital expenditures were then deducted from the operating cash flow to determine the net cash flow before taxes.

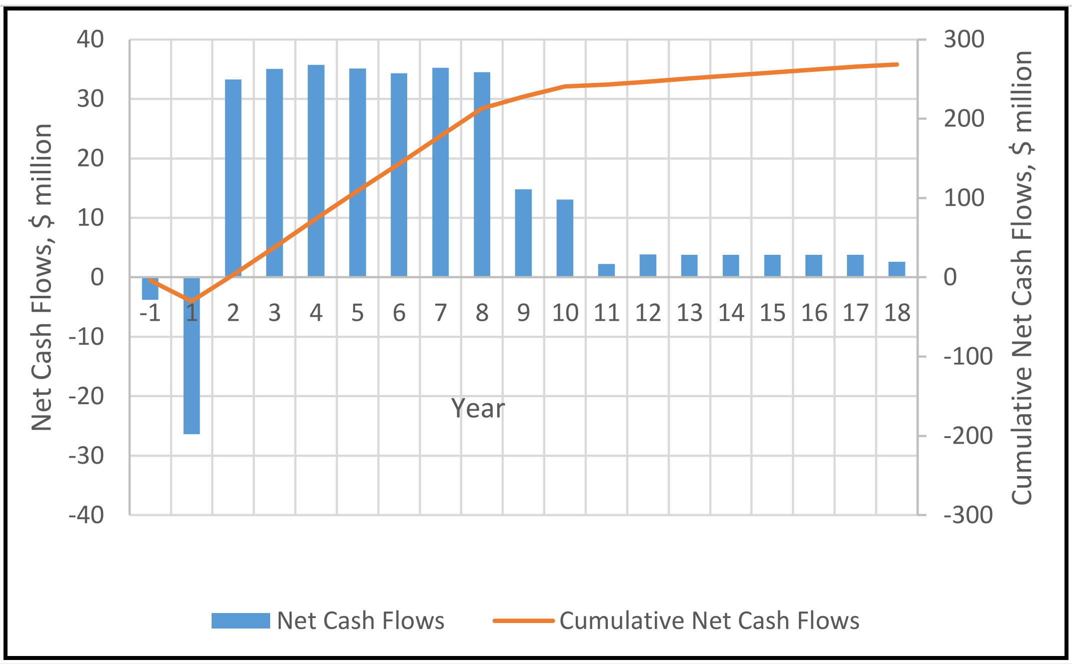
Initial capital expenditures include costs accumulated prior to first production of marble and refined graphite. Sustaining capital includes expenditures for mining and processing additions and replacement of equipment. Initial and sustaining capital costs were estimated at $44.38 million and $3.61 million, respectively. Land acquisition capital costs were estimated at $1.05 million. Mine closure and reclamation costs were estimated at $1.04 million. Total capital costs are $50.08 million.

The pre-production construction period is assumed to be one year for marble and two years for graphite (i.e., graphite production starts one year after marble production starts). The NPV of the Project was calculated at the beginning of the one-year construction period.

Working capital is assumed to be one month of the annual on-site operating cost and fluctuates from year to year based on the annual operating cost. The working capital is recovered at the end of the LOM.

The undiscounted annual net cash flow and cumulative net cash flow are illustrated in Figure 22.1.

Figure 22.1 Pre-tax Undiscounted Annual and Cumulative Net Cash Flow



22.3 SUMMARY OF FINANCIAL RESULTS

The pre-tax financial model was established on a 100% equity basis, excluding debt financing, and loan interest charges. The pre-tax financial results for the base case are presented in Table 22.2.

Table 22.2 Summary of Pre-tax Financial Results

Description	Value
Refined Graphite Price (USD/t)	13,000
Exchange Rate (USD:CAD)	0.75:1.00
Marble Price ($/t)	184
Total Refined Graphite Produced (t)	19,164
Total Marble Produced (t)	1,182,037
Total Waste Produced (t)	6,511,528
Gross Revenue ($million)	549.68
Off Site Costs ($ million)	41.46
On Site Operating Costs ($ million)	189.67
Operating Cash Flow ($ million)	318.55
Initial Capital Expenditure ($ million)	44.38
Sustaining Capital ($ million)	3.61
Mine Closure and Reclamation ($ million)	1.04
Land Acquisition ($ million)	1.05
Total Capital Expenditure ($ million)	50.08
Net Cash Flows ($million)	268.47
Discounted Cash Flow NPV ($ million) at 8%	149.72
Discounted Cash Flow NPV ($ million) at 10%	131.06
Discounted Cash Flow NPV ($ million) at 12%	115.21
Payback (years)	1.9
IRR (%)	100.2
Cash Operating Cost ($/t of Refined Graphite)	8,666
Cash Operating Cost ($/t Marble)	54

A PEA should not be considered to be a prefeasibility or feasibility study, as the economics and technical viability of the Project have not been demonstrated at this time. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Furthermore, there is no certainty that the conclusions or results as reported in the PEA will be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

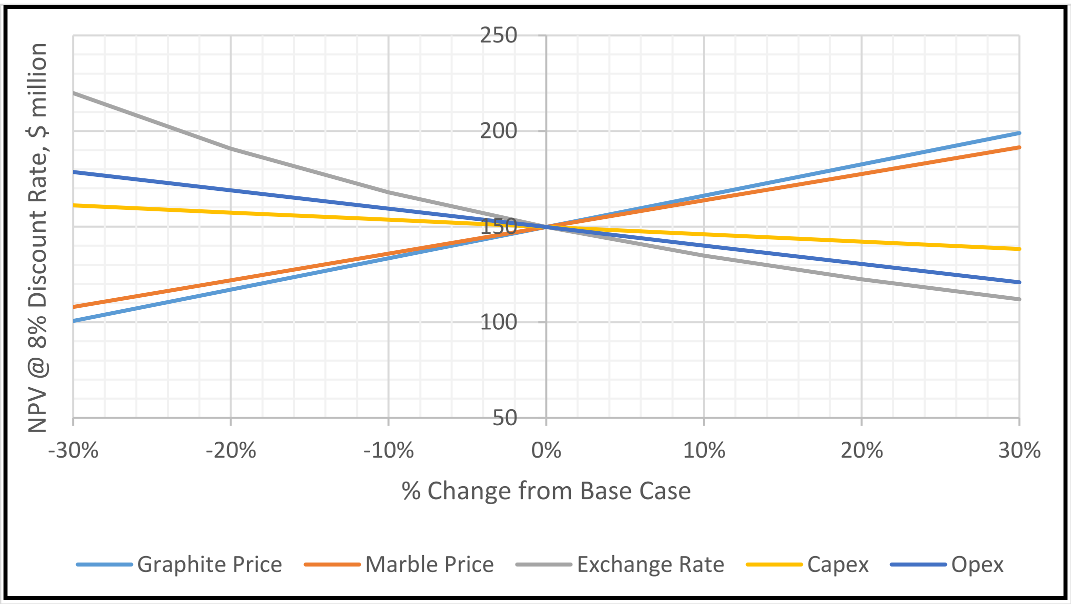
22.4 SENSITIVITY ANALYSIS

Tetra Tech investigated the sensitivity of NPV, IRR and payback period to the key Project variables. Using the base case as a reference, each of key variables was changed between -30% and +30% at a 10% interval while holding the other variables constant. The following key variables were investigated:

- graphite price
- marble price
- exchange rate
- capital costs
- operating costs

The pre-tax NPV, calculated at an 8% discount rate, is most sensitive to exchange rate and, in decreasing order, graphite price, marble price, operating costs and capital costs (Figure 22.2).

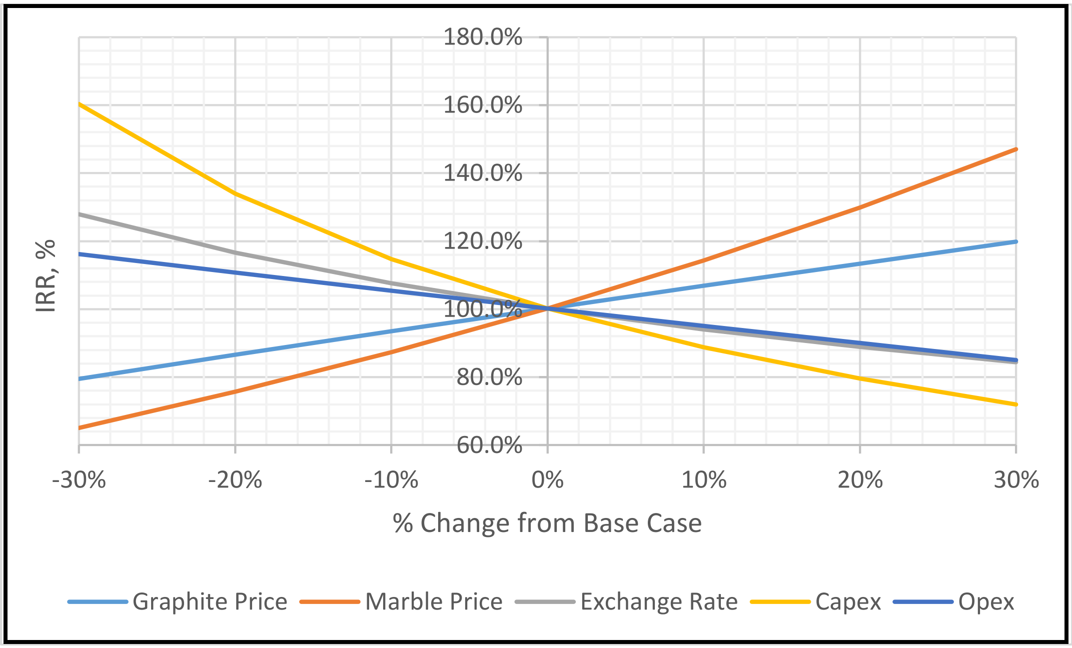
Figure 22.2 Pre-tax NPV Sensitivity Analysis



Note: Opex – operating cost; Capex – capital cost

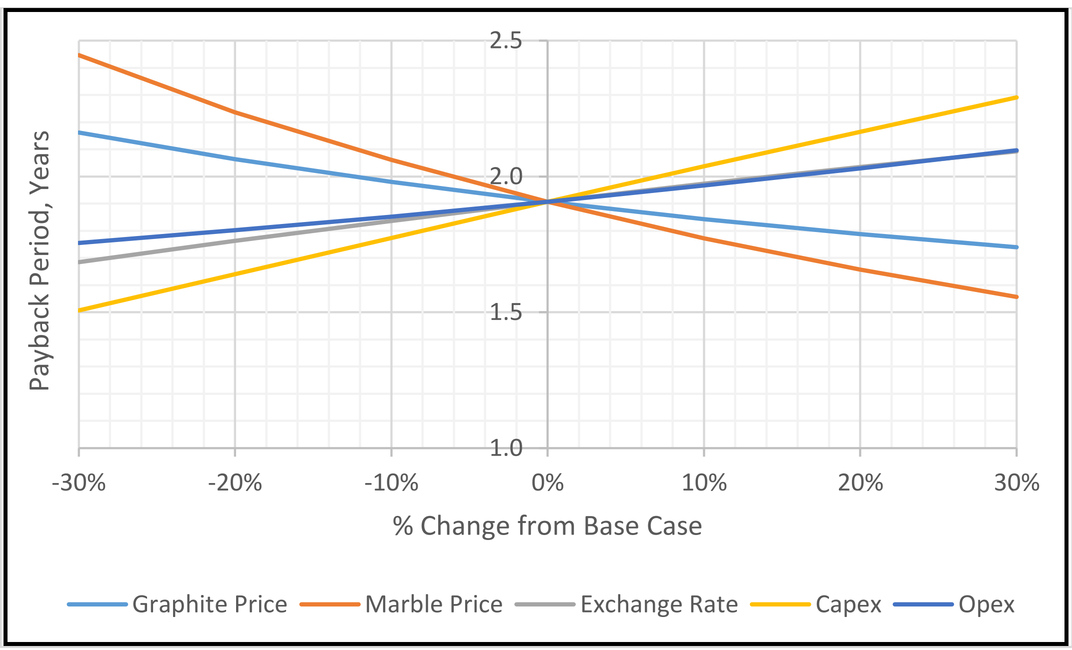
As shown in Figure 22.3, the Project's pre-tax IRR is most sensitive to the capital costs followed by marble price, graphite price, exchange rate, and operating costs.

Figure 22.3 Pre-tax IRR Sensitivity Analysis



The payback period (Figure 22.4) is sensitive to marble price followed by capital costs, graphite price, operating costs and exchange rate.

Figure 22.4 Pre-tax Payback Period Sensitivity Analysis



22.5 POST-TAX FINANCIAL ANALYSIS

Tetra Tech relied on Canada Carbon and its external tax advisors to prepare tax calculations for use in the post-tax economic evaluation of the Project with the inclusion of Federal and Quebec income taxes, and the Quebec Mining Tax (QMD) as applicable to the Project at the time of report writing as of March 4, 2016.

22.5.1 FEDERAL AND INCOME TAXES

The combined federal and Quebec corporate tax rate is 26.9% in 2016 and will be reduced to 26.5% progressively by 2020.

22.5.2 QUEBEC MINING DUTIES

The QMD regime is based on the calculation of annual profits. The progressive tax regime has three tax brackets of 16%, 22% and 28%. The tax bracket applied to annual profit is based on the level of profit margin.

Annual profit includes gross value and deducts the current expenses of the mining operation, depreciation allowances and a processing allowance based on the cost of the property used to process the mineralized material.

The depreciation allowance, based on limits imposed by tax law, is on a 30% declining rate basis.

The annual processing allowance is based on an amount of up to 20% of the cost of the processing assets.

22.5.3 TAXES AND POST-TAX RESULTS

At the base case graphite and marble prices, and exchange rate used for this study, the total estimated taxes payable on the Project profits are $70.50 million over the 18-year production life. The components of the various taxes that will be payable for the base case are shown in Table 22.3.

Table 22.3 Components of the Various Taxes

Item	Value
Graphite Price (USD/t)	13,000
Marble Price ($/t)	184
Exchange Rate (USD:CAD)	0.75:1.00
Mining Tax Payable ($ million)	6.00
Income Tax Payable ($ million)	64.50
Total Taxes ($ million)	**70.50**

The base case post-tax financial results are summarized in Table 22.4.

Table 22.4 Summary of Post-tax Financial Results

Description	Base Case
Graphite Price (USD/t)	13,000
Marble Price ($/t)	184
Exchange Rate (USD:CAD)	0.75:1.00
NCF ($ million)	197.97
Discounted Cash Flow NPV ($ million) at 8%	109.92
Discounted Cash Flow NPV ($ million) at 10%	96.06
Discounted Cash Flow NPV ($ million) at 12%	84.28
Payback (years)	2.0
IRR (%)	85.0

Table 22.5 shows the summary of cash flows.

Figure 22.5 Summary of Cash flows

			Production Year																		
			-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			Project Year																		
	Units		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mine Production																					
Graphite Pit Graphite Material to Mill	t	890,805	-	-	73,000	73,000	73,000	69,949	109,500	109,500	109,500	109,500	85,649	78,207	-	-	-	-	-	-	-
cg, Graphite Pit	%	1.87	-	-	2.44	2.45	2.44	2.56	1.64	1.63	1.62	1.62	1.78	1.08	-	-	-	-	-	-	-
Marble Pit Graphite Material to Mill	t	1,206,050	-	-	-	-	-	-	-	-	-	-	23,851	31,293	177,500	177,500	177,500	177,500	177,500	177,500	85,906
Cg, Marble Pit	%	0.53	-	-	-	-	-	-	-	-	-	-	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
Waste, Graphite Pit	t	1,479,770	-	-	105,101	266,422	219,984	308,278	91,975	83,768	66,036	79,418	138,403	120,385	-	-	-	-	-	-	-
OB, Graphite Pit	t	158,279	-	-	44,680	30,912	25,230	38,560	5,657	107	1,485	8,382	3,266	-	-	-	-	-	-	-	-
Marble	t	1,182,037	-	135,000	150,000	150,000	150,000	150,000	150,000	150,000	147,037	-	-	-	-	-	-	-	-	-	-
Graphite Material, Marble Pit	t	1,206,051	-	207,633	371,139	140,745	104,531	101,435	170,833	109,735	-	-	-	-	-	-	-	-	-	-	-
Cg	%	0.53	-	0.50	0.50	0.53	0.55	0.62	0.56	0.53	0.00	-	-	-	-	-	-	-	-	-	-
Waste, Marble Pit	t	5,031,758	-	298,374	1,176,413	450,611	550,689	558,431	556,381	1,201,473	239,386	-	-	-	-	-	-	-	-	-	-
OB, Marble Pit	t	210,468	-	70,981	83,703	9,927	45,857	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mill Production																					
Tonnes Mill Feed	t	2,096,855	-	-	73,000	73,000	73,000	69,949	109,500	109,500	109,500	109,500	109,500	109,500	177,500	177,500	177,500	177,500	177,500	177,500	85,906
Cg	%	1.10	-	-	2.44	2.45	2.44	2.56	1.64	1.63	1.62	1.62	1.51	0.93	0.53	0.53	0.53	0.53	0.53	0.53	0.53
Graphite Concentrate	t	21,014	-	-	1,649	1,655	1,651	1,661	1,642	1,636	1,628	1,628	1,510	907	840	840	840	840	840	840	407
Refined Graphite	t	19,164	-	-	1,504	1,509	1,506	1,515	1,498	1,492	1,485	1,484	1,377	827	766	766	766	766	766	766	371
Revenue																					
Graphite	$000	332,183	-		26,070	26,156	26,101	26,264	25,959	25,858	25,733	25,728	23,869	14,339	13,280	13,280	13,280	13,280	13,280	13,280	6,427
Marble	$000	217,495	-	24,840	27,600	27,600	27,600	27,600	27,600	27,600	27,055	-	-	-	-	-	-	-	-	-	-
Gross Revenue	$000	549,678	-	24,840	53,670	53,756	53,701	53,864	53,559	53,458	52,788	25,728	23,869	14,339	13,280	13,280	13,280	13,280	13,280	13,280	6,427
Off-site Costs																					
Transportation, Marble	$000	28,073	-	3,206	3,563	3,563	3,563	3,563	3,563	3,563	3,492	-	-	-	-	-	-	-	-	-	-
Royalty, Graphite	$000	7,580	-	-	638	687	689	696	655	658	665	649	587	259	214	214	214	214	214	214	109
Royalty, Marble	$000	5,805	-	655	735	738	737	739	739	739	724	-	-	-	-	-	-	-	-	-	-
Total off-site	$000	41,459	-	3,862	4,936	4,988	4,989	4,998	4,956	4,959	4,881	649	587	259	214	214	214	214	214	214	109
Operating Costs																					
Processing, Graphite	$000	77,722	-	-	3,832	3,832	3,832	3,792	4,435	4,435	4,435	4,435	4,435	4,435	5,525	5,525	5,525	5,525	5,525	5,525	2,674
G&A, Graphite	$000	25,222	-	-	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	741
Transportation, Miller to Asbury, Graphite	$000	420	-	-	33	33	33	33	33	33	33	33	30	18	17	17	17	17	17	17	8
Graphite Refining, Graphite	$000	36,731	-	-	2,559	2,564	2,561	2,570	2,553	2,548	2,541	2,540	2,436	1,903	1,844	1,844	1,844	1,844	1,844	1,844	892
Mining, Graphite	$000	15,181	-	1,088	2,473	1,266	1,076	1,038	1,688	1,368	793	793	668	629	355	355	355	355	355	355	172
Mining OH, Graphite	$000	5,433	-	-	247	248	247	247	247	248	247	1,235	1,235	1,235	-	-	-	-	-	-	-
Mining, Waste, Graphite	$000	(1,480)	-	-	(105)	(266)	(220)	(308)	(92)	(84)	(66)	(79)	(138)	(120)	-	-	-	-	-	-	-
Mining, OB, Graphite	$000	351	-	-	99	69	56	86	13	0	3	19	7	-	-	-	-	-	-	-	-
Mining, Marble	$000	22,719	-	2,601	2,882	2,882	2,882	2,882	2,882	2,882	2,826										
Mining OH, Marble	$000	8,154	-	1,235	988	990	988	988	988	990	988	-	-	-	-	-	-	-	-	-	-
Mining, Waste, Marble	$000	(5,032)	-	(298)	(1,176)	(451)	(551)	(558)	(556)	(1,201)	(239)	-	-	-	-	-	-	-	-	-	-
Mining, OB, Marble	$000	467	-	158	186	22	102	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mining & Exclusive Lease	$000	3,776	-	308	588	442	456	481	424	589	330	28	43	38	7	7	7	7	7	7	7
Total Operating Costs	$000	189,665	-	5,091	14,136	13,161	12,992	12,780	14,143	13,337	13,419	10,532	10,246	9,667	9,278	9,278	9,278	9,278	9,278	9,278	4,494

table continues...

			Production Year																			
			-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			Project Year																			
	Units		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Operating CF																						
Operating CF	$000	318,554	-	15,888	34,598	35,607	35,720	36,086	34,460	35,162	34,487	14,547	13,036	4,412	3,788	3,788	3,788	3,788	3,788	3,788	1,824
Capex																						
Initial	$000	44,381	3,644	40,737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining	$000	3,606	-	400	-	-	-	992	-	-	-	-	-	2,214	-	-	-	-	-	-	-
Reclamation/Closure	$000	1,040	150	425	250	175	-	-	-	-	-	-	-	-	-	-	-	10	10	10	10
Other (Land Acquisition)	$000	1,054	-	296	298	460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working	$000	-	-	424	754	(81)	(14)	(18)	114	(67)	7	(241)	(24)	(48)	(32)	-	-	-	-	-	(773)
Total Capex	$000	50,081	3,794	42,282	1,302	554	(14)	975	114	(67)	7	(241)	(24)	2,165	(32)	-	-	10	10	10	(763)
Pre-tax Financial Results																						
Pre-tax NCF	$000	268,474	(3,794)	(26,394)	33,296	35,053	35,734	35,111	34,346	35,229	34,480	14,788	13,060	2,247	3,820	3,788	3,788	3,778	3,778	3,778	2,588
Pre-tax CNCF	$000		(3,794)	(30,188)	3,108	38,161	73,896	109,007	143,353	178,582	213,063	227,851	240,910	243,157	246,977	250,765	254,553	258,330	262,108	265,886	268,474
Pre-tax IRR	%	100.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payback	years	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Pre-tax NPV @8% Discount Rate	$000	149,724	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax NPV @10% Discount Rate	$000	131,063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax NPV @12% Discount Rate	$000	115,205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-tax Financial Results																						
Mining Tax Payable	$000	6,003	-	-	435	435	435	435	449	535	816	804	658	124	110	125	135	142	147	150	70
Income Tax Payable	$000	64,498	-	-	3,204	4,932	8,317	9,067	8,707	8,927	8,719	3,473	3,139	871	724	762	793	816	835	850	363
Total Tax Payable	$000	70,501	-	-	3,638	5,366	8,752	9,502	9,156	9,462	9,534	4,277	3,797	994	834	887	927	958	982	1,000	433
Post-tax NCF	$000	197,973	(3,794)	(26,394)	29,658	29,687	26,982	25,610	25,191	25,767	24,946	10,511	9,263	1,253	2,986	2,900	2,860	2,820	2,796	2,778	2,154
Post-tax CNCF	$000	-	(3,794)	(30,188)	(530)	29,157	56,139	81,749	106,939	132,706	157,652	168,163	177,426	178,679	181,664	184,565	187,425	190,245	193,041	195,818	197,973
Post-tax IRR	%	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payback	years	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-tax NPV @8% Discount Rate	$000	109,922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-tax NPV @10% Discount Rate	$000	96,063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-tax NPV @12% Discount Rate	$000	84,278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

22.6 ROYALTIES

Tetra Tech has relied on Canada Carbon on the royalties applicable to the Project that were used in the economic analysis and outlined as follows:

- graphite:
  - 1.6% of gross proceeds less crushing costs, transportation costs to mill, milling costs, transport to Asbury, thermal processing costs and selling costs plus 2.0% of gross proceeds less mining costs, crushing, transportation costs to mill, milling costs, transport to Asbury, thermal processing costs, selling costs but excluding G&A and repairs and maintenance costs.
- marble:
  - 1.5% of gross proceeds less transportation to customer less selling costs plus 1.875% of gross proceeds less extraction costs, processing costs, less transport to customer and selling costs.

22.7 SMELTER TERMS

No smelter terms are applicable to the products of the Project.

22.8 TRANSPORTATION LOGISTICS

Tetra Tech has relied on Canada Carbon for the following transportation costs:

- graphite concentrate transportation from Miller to Asbury: $18.00/t
- refined graphite transportation from Asbury to market: not applicable as consumers will be responsible for transportation costs from Asbury
- marble transportation from Miller to market: $23.75/t.

22.9 INSURANCE

As advised by Canada Carbon, insurance for off-site marble transportation is included in the transportation costs.

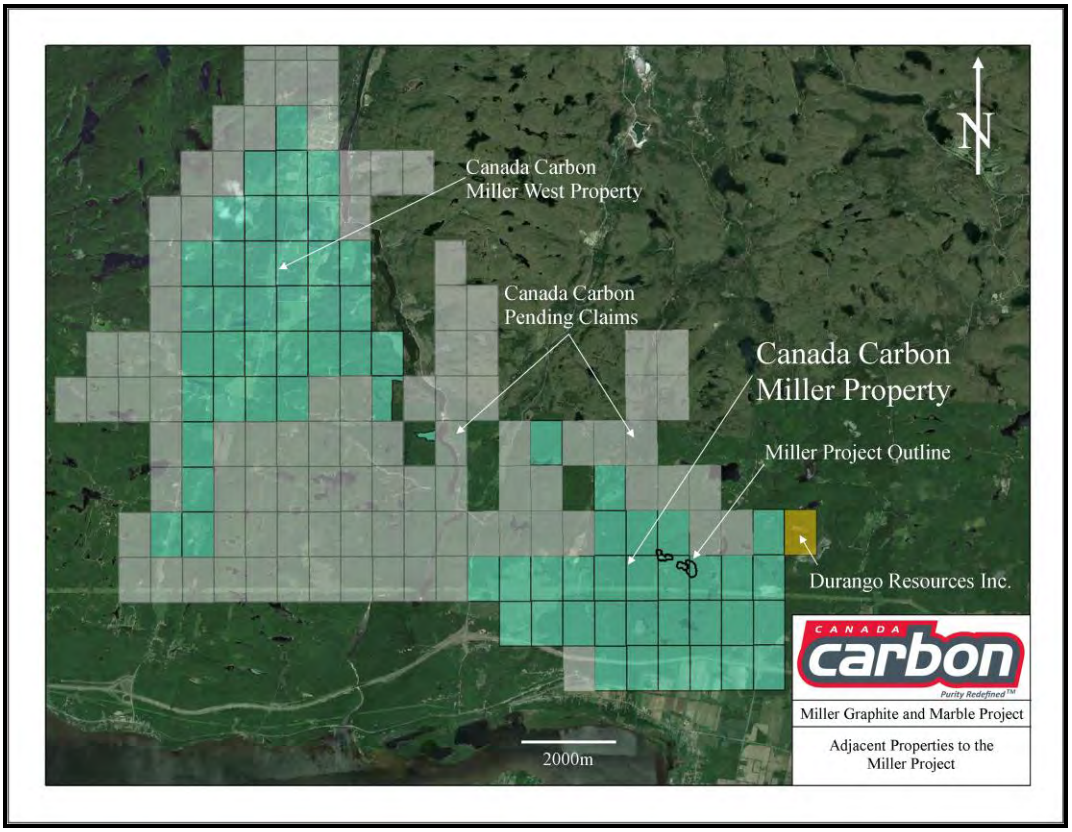
22.10 REPRESENTATION AND MARKETING

Not applicable to the products of the Project.

23.0 ADJACENT PROPERTIES

No known adjacent property has been explored for graphite resources, or any other commodities, in the direct vicinity of the Property. There is only one other active claim located northwest of the Property, which is owned by Durango Resources Inc. (Figure 23.1). No exploration or production of marble slabs is reported from local quarries. Uniroc and Emile Foucault Excavation Inc. own local quarries currently producing ballast, abrasives, high-performance rock, and crushed and manufactured sand from grey sediments and red syenites.

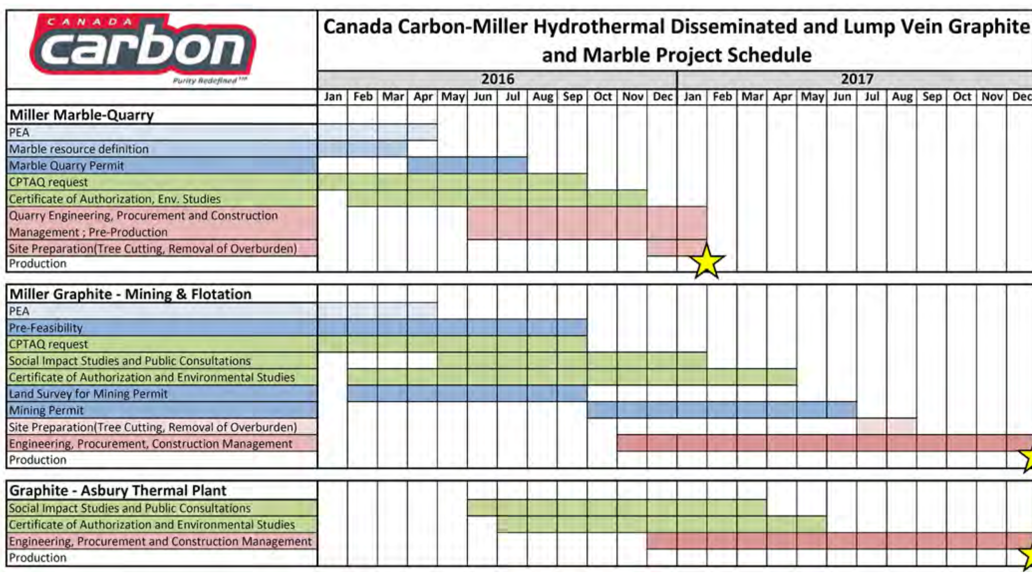
Figure 23.1 Adjacent Properties to the Miller Project



24.0 OTHER RELEVANT DATA AND INFORMATION

The preliminary project execution schedule was developed to provide a high-level overview of all activities required to complete the Project. The project execution plan is summarized in Figure 24.1.

Figure 24.1 Preliminary Project Execution Plan



Based on the preliminary schedule, Canada Carbon plans to start the marble quarrying in February 2017 and start the graphite process plant construction in July 2017. The graphite concentrate and the high-purity graphite are anticipated to be produced in January 2018. Canada Carbon has begun base data collection work.

25.0 INTERPRETATIONS AND CONCLUSIONS

25.1 DEPOSIT

Understanding of the deposit geology is still preliminary; an increase in drilling may significantly change the geometry and interpretation of the mineral deposit. Increasing the quantity of drillholes will greatly benefit understanding of the marble geometry and the distribution of the high-grade mineralization. The presence of fault and displacing structures may also increase the reliability of the geological model.

25.2 DRILLING AND RESOURCES ESTIMATION

SGS verified the work conducted by SL Exploration Inc. and is comfortable with what has been completed as of the effective date of this report. Changes may be needed in drilling management and data acquisition in order to increase classification of the Mineral Resources. These changes are discussed further in Section 25.3.

Geological and mineralized solids were modeled on vertical sections with the projection of 280 drillholes and surface samples using the assay values for graphitic carbon, at a modelling minimal value of 0.5%. Numerous intercalated assays below this lower model value were still incorporated in the mineralized solids in order to respect the general geometry of the mineralization, but were always surrounded (top and bottom) by an assay higher than the modeling value. Upon modeling the mineral zone, a block model was generated for the whole deposit (block size of 5 m by 5 m by 3 m). The block model was also limited at surface by the overburden surface, which was modeled using lithological information from drillholes.

Density measurements were conducted on drill core samples over the year and the values were used to generate a fixed density for each block. This fixed density value is not ideal, but was the only possible outcome using the 48 density measurement made in the marble rock unit.

Variographic studies were conducted for each of the four variables for GraphiteLG, GraphiteHG, Indicator and SLABprob. The correlograms were used in the kriging process of the block interpolation but also to establish search ellipsoid parameters and classification criteria of the Mineral Resources. The classification also accounted for the quality of the data, the geological comprehension and drilling grid. Each variable was domained differently and interpolated using its own set of 1.5-m composite and parameters. Upon interpolation of the variables, the GraphiteLG, the GraphiteHG and the Indicator variable were used to calculate the total graphitic carbon content of each block. The SLABprob was used to assign a positive or negative value on the existence of white marble within the block.

25.3 MINERAL RESOURCES

The Mineral Resources for the Project are limited at depth by two scenarios of optimized pit shells, in order to account for the "reasonable prospect of eventual economic extraction" of reported Mineral Resources under the NI 43-101 regulation. The pit shells outline three open pits that generate the maximum economic value. However, this value does not take into account mine planning and time value of money (discounting rate). It is for this reason that there are is guarantee that this shell shall be selected as the base case scenario to develop the mining scenario; and thus, to calculate the eventual in-pit reserves.

The optimized pit shell scenarios were used to limit the extent of the Mineral Resources at depth. The Mineral Resources are stated at different cut-off grades, depending on the pit they are part of. The cut-off grades are:

- graphite scenario pits: 0.8% graphitic carbon
- graphite in Marble pit scenario: 0.4% graphitic carbon
- marble pit scenario: 0.6 SLABprob.

The Mineral Resources comprise 952,000 t of Inferred graphite resources at an average grade of 2.00% graphitic carbon with an additional 1.180 Mt of graphite resources at an average grade of 0.53% graphitic carbon, and 1.519 Mt of architectural marble resources.

25.4 MINING METHODS

The PEA proposes a 19-year LOM, including 1 year of pre-production, 11 years of active mining operations, and 7 years of stockpile re-handling. Graphite material will be mined from two open pits and marble will be quarried from a separate pit. Marble pit production will start one year ahead of the graphite pits.

The graphite pits will be mined using conventional truck/loader open pit mining. The production cycle will include drilling, blasting, loading and hauling and will be performed by a mining contractor. Over the 10-year life of the graphite mine, the total production is estimated to be 890,805 t of graphite material, 1,479,770 t of waste rock, and 158,279 t of overburden. The LOM stripping ratio is 1.8, and the LOM average mill feed grade is 1.87% graphitic carbon, with an initial graphite mill feed grade of 2.45% graphitic carbon.

The marble pit is scheduled to produce a maximum annual marble tonnage of 150,000 t. Marble will be cut into blocks using special marble cutting machinery. Low-grade graphite mineralization mined from the marble pit will be stockpiled and reclaimed starting in Year 9. Over the 8-year marble LOM, the pit is expected to produce 1,182,037 t of marble, 1,206,051 t of graphite material grading 0.53% graphitic carbon, 5,031,758 t of waste, and 210,468 t of overburden. The overall LOM stripping ratio is 2.2.

The mine production projection outlined is highly dependent on the base case graphite and marble price assumptions, cost assumptions, metallurgical recoveries, marble quality attribute provided in the block model, and assumptions related to pit geotechnical parameters, among others. Any change in these assumptions may result in significant change in the mine production projection, and consequently the economics of the Project. It should be noted that all factors pose potential risks and opportunities to the current mine plan.

25.5 MINERAL PROCESSING AND METALLURGICAL TESTING

The bench scale tests and pilot plant campaign on various samples from the Miller graphite deposit show the mineralization responds well to conventional flotation concentration, which is widely used in the graphite recovery industry. On average, the flotation concentration can upgrade the head samples containing various graphitic carbon contents to approximately 95% or higher. Coarse size fractions of the concentrates produced a higher-graphitic grade. It appears that on average, the head grade did not have a significant impact on the final concentrate grades.

The preliminary concentrate purification tests, including using hydrometallurgical and thermal treatment procedures, showed that the concentrate samples were amendable to the purification treatments. It appears that the thermal treatments produced better upgrading results. A thermal treatment test using a proprietary thermal treatment method showed that a graphite concentrate produced from the pilot plant runs can be directly upgraded to a high-purity graphite containing 99.9998% graphitic carbon.

According to the test results, a combined treatment of flotation concentration and thermal purification is proposed for recovering the graphite from the mineralization.

25.6 ECONOMIC ANALYSIS

A PEA should not be considered to be a prefeasibility or feasibility study, as the economics and technical viability of the Project have not been demonstrated at this time. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Furthermore, there is no certainty that the conclusions or results as reported in the PEA will be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Tetra Tech prepared an economic evaluation of the Project based on a pre-tax financial model. The NPV was estimated at the beginning of the one-year construction period.

As indicated in Section 19.0, the graphite and marble prices used in the economic analysis are as follows:

- graphite: USD13,000/t
- marble: $184/t
- exchange rate (USD:CAD): 0.75:1.00

The following pre-tax financial results were calculated:

- 100.2% IRR
- 1.9-year payback on $44.4 million initial capital costs
- $149.7 million NPV at an 8% discount rate.

Canada Carbon and its external tax advisors prepared the tax calculations for use in the post-tax economic evaluation of the Project with the inclusion of Canadian Federal and Quebec income taxes, and the Quebec Mining Tax (see Section 22.5 for further details).

The following post-tax financial results were calculated:

- 85.0% IRR
- 2.0-year payback on the $44.4 million initial capital costs
- $110.0 million NPV at an 8% discount rate.

Analyses were conducted to analyze the sensitivity of the Project merit measures (NPV, IRR and payback periods) to the following key variables:

- graphite price
- marble price
- exchange rate
- capital costs
- operating costs.

Using the base case as a reference, each of key variables was changed between -30% and +30% at a 10% interval while holding the other variables constant. The pre-tax NPV, calculated at an 8% discount rate, was found to be most sensitive to exchange rate and, in decreasing order, graphite price, marble price, operating costs, and capital costs. The Project's pre-tax IRR was found to be most sensitive to the capital costs followed by marble price, graphite price, exchange rate, and operating costs. The payback period was found to be most sensitive to marble price followed by capital costs, graphite price, operating costs, and exchange rate.

26.0 RECOMMENDATIONS

26.1 INTRODUCTION

This section outlines the areas to investigate for improvements, and potential opportunities and risks, for the Project. A high-level budgetary estimate for the completion of each recommended item is provided.

Based on the results of the PEA, Tetra Tech recommends that Canada Carbon continue on to the next phase of work, a prefeasibility study, in order to further assess the technical and economic viability of the Project, and identify potential opportunities and risks.

Canada Carbon has moved forward with some of the recommendations provided by Tetra Tech in order to facilitate and expedite the data collection and assessments required for a prefeasibility study, which is expected to be completed in September 2016.

In 2015, Canada Carbon initiated environmental and hydrogeological assessments, which will be required for the permitting of the proposed open pits, the marble quarry, and graphite extraction. By conducting environmental and site assessments concurrent with the PEA program, it is expected that marble quarry production could begin in early 2017, with graphite mining beginning approximately one year later.

26.2 GEOLOGY

In order to increase the level of confidence in the Mineral Resources and better quantify the natural variability of the different grades impacting the concentrate quantity, quality, and tonnage, SGS recommends the following:

- geological/mineralization:
  - increase surface geological knowledge by conducting property scale mapping and structural study
  - refine geophysical interpretation to increase exploration success of disseminated and high grade mineralization
- drilling:
  - establish a quantitative model for the marble quality parameter associated with the architectural marble resources, possibly using Corescan technology
  - conduct further drilling on a constant grid to increase geological knowledge and sample distribution in the deposit (Figure 26.1)

- included systematic downhole surveys and geotechnical measurements in the data acquisition of the drilling campaigns
- conduct continuous channels to sample grade variability across surface exposures
- remove all surface grab samples from resource estimation database in order to increase resources classification
- use of a secure logging software for data acquisition
- follow drilling progress using drawn sections and plan

- sampling:
  - conduct continuous sampling at 1.5 m intervals in the mineralized marbles and other mineralized rock units
  - insert 5 to 10% QA/QC samples in the sampling stream.

The drilling, as proposed in Figure 26.1, was completed in February 2016, which included systematic downhole surveys. Secure logging software was used for data acquisition. The sampling was performed using 1.5-m intervals in all of the core lengths and approximately 8% of the QA/QC samples were inserted in the sampling stream.

Figure 26.1 Proposed Drillholes (Red Dots) for 2016 Field Campaign

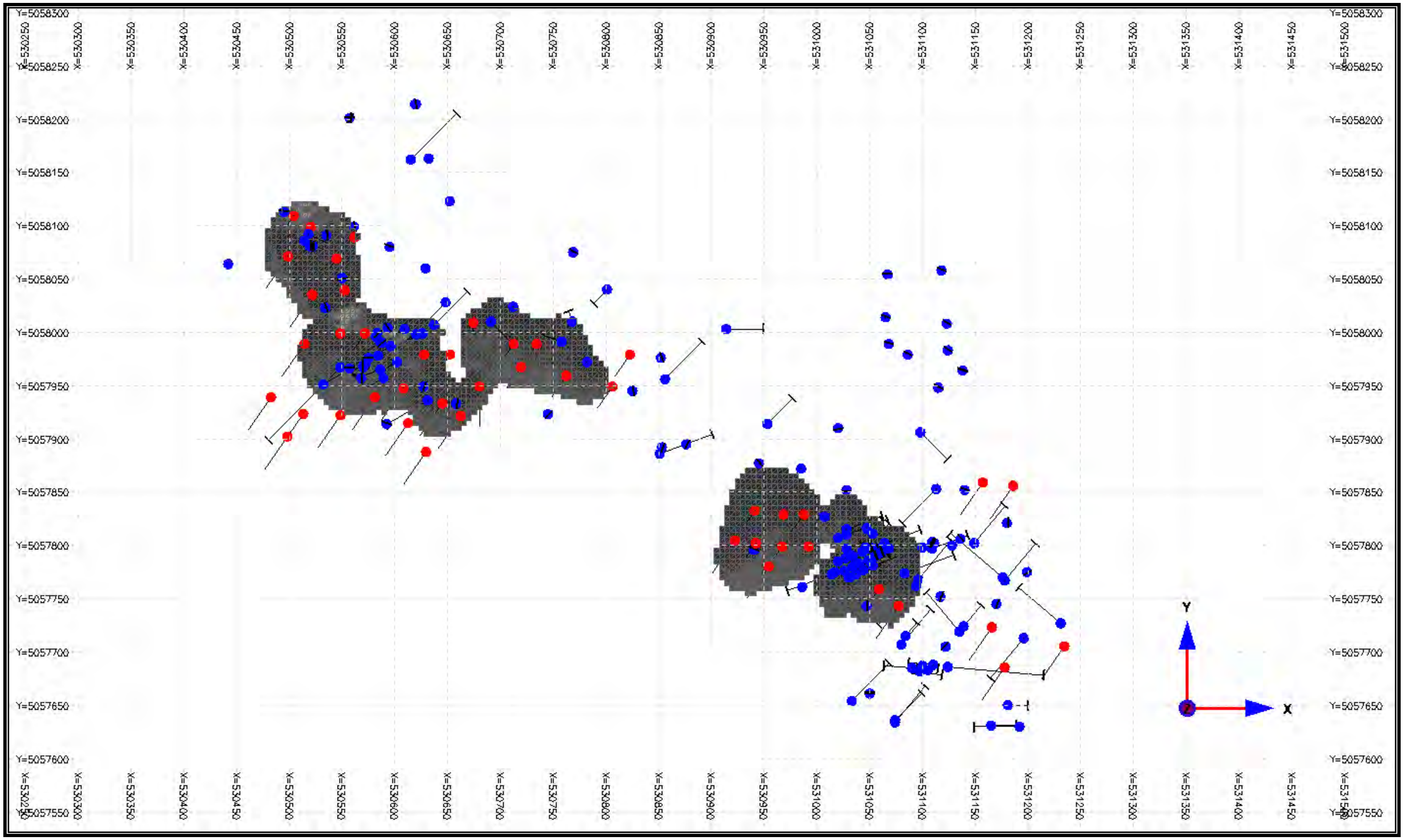


Table 26.1 Estimated Budget for Geological Recommendations

Items	Timeframe	Priority	Estimated Budget ($)
Surface Mapping and Structural Study	Summer 2016	2	25,000
Refine Geophysical Model	Spring-Summer 2016	2	15,000
Marble Quality Model and Data Acquisition	Spring-Summer 2016	1	200,000
Geotechnical Study	Winter-Spring 2016	1	30,000
Channel Sampling	Spring 2016	1	30,000
Total			**340,000**

Drilling, logging and assaying were completed in February 2016; however, SGS is not yet sure that this drilling will be sufficient to convert the Mineral Resources to Mineral Reserves. Additional drilling may be needed upon review of the 2016 drilling results.

26.3 MINERAL PROCESSING AND METALLURGICAL TESTING

Preliminary test work has been completed for the Project to evaluate the metallurgical performances of various head grade samples, including a large-scale pilot plant campaign. To better understand the metallurgical performances of the mineralization and to support next phase study and design work, additional test work should be conducted, especially thermal purification tests. The recommended test work for the graphite recovery and purification proposed includes:

- verification of metallurgical responses of the samples
- further optimization of process conditions and improvement of graphite recovery and product grade
- conducting variability flotation and thermal treatment tests to evaluate the metallurgical performances of the samples from different rock zones, lithological zones and spatial locations and the samples representative of the proposed mine plan
- confirming and establishing process design related parameters, including comminution related data and concentrate and tailings dewatering characteristics
- conducting environmental related tests to quantify the properties of the flotation tailings, waste rocks and the waste streams generated from thermal treatment, such as off-gases and solids collected from the gases
- determining efficient and cost effective methods for handling the off-gases that are anticipated to be generated from the proposed thermal treatment.

The estimated cost for this test work is approximately $250,000, including sample collection and shipment.

Marble physical and chemical characteristics should be determined. The test work should include:

- marble physical and chemical property tests, such as moisture absorption, surface hardness, texture and colour
- marble slab quality assessment.

The estimated cost for this test work is approximately $70,000, including sample collection and shipment.

Further optimizations on plant designs, including primary comminution circuits, flotation and regrinding circuits, and thermal upgrading circuits and related layouts, are recommended. The costs associated with the optimizations will be included in the costs for the next phase of study.

26.4 MINING METHODS

Tetra Tech makes the following recommendations for future mining work:

- geotechnical studies should be conducted to define the appropriate pit slope angles
- a hydrogeological study should be completed to define pit dewatering requirements
- a trade-off study between Owner and contract mining is recommended.

The estimated cost for the proposed mining work will be approximately $400,000.

26.5 INFRASTRUCTURE

The designs for the overall site infrastructure for this PEA study are very preliminary. Further investigations into geotechnical, power supply, hydrological and hydrogeological surveys should be conducted. Key investigations should include:

- tailings management plan
- detailed overall site water balance
- power supply, especially at the Asbury site
- geotechnical drilling at the pits, plant sites, water sediment pond and tailings storage area
- overall site water management and balance, including: divert tunnel construction, hydrological and hydrogeological surveys
- water treatment method and plant design.

The costs related to collect the infrastructure design parameters are estimated to be approximately $300,000.

The overall site infrastructure layouts should be optimized. The costs associated with the optimizations will be included in the costs for the next phase of study.

26.6 ENVIRONMENT

We understand that Canada Carbon began collecting environmental data for preparing permit applications in 2015. The environmental management plan will need to be finalized and implemented prior to Project development. The recommended environmental and permitting work includes:

- baseline and impact studies
  - geochemistry
  - noise impact study
  - water management
  - air quality study
  - soil suitability study
  - baseline hydrocarbon content in surface waters
  - hydrogeological survey
  - hydrology survey
  - spring and summer wildlife and vegetation surveys
  - Miller property rare plants and wetlands surveys
  - Calumet River surface water quality survey (doesn't include oil content)
  - Calumet River fish and fish habitat study
  - site water balance (quality, quantity and flow)
- management and mitigation plans
  - noise and vibration management plan
  - air quality and dust management plan
  - wetland remediation and compensation plan
  - forest and vegetation management plan
  - metal leaching and acid rock drainage prevention and management plan
  - site-water management and surface erosion control plan
  - soil and overburden salvage and protection plan
  - waste (quarry, hazardous, municipal, and liquid wastes) management plan
  - water (resource and potable) management plan
  - closure plan
- monitoring
  - noise

  - groundwater
  - surface water
  - air quality and dust
  - soil quality and suitability for reclamation
  - vegetation, wetland and wildlife
- remediation/mitigation.

The total cost for permits, studies and authorizations is estimated to be approximately $1.7 million (this includes the cost for the closure and rehabilitation bond of $1 million, the cost of which has been included in the PEA financial model).

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27.3 MINERAL PROCESSING

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28.0 CERTIFICATES OF QUALIFIED PERSONS

28.1 JEAN-PHILIPPE PAIEMENT, M.SC., P.GEO.

I, Jean-Philippe Paiement, M.Sc., P.Geo., of Quebec, Quebec, do hereby certify:

- I am a Geology Project Manager with SGS Canada Inc. with a business address at 125 rue Fortin, Suite 100, Quebec, Quebec, G1M 3M2.
- This certificate applies to the technical report entitled “Technical Report and Preliminary Economic Assessment for the Miller Graphite and Marble Project, Grenville Township, Quebec, Canada” with an effective date of March 4, 2016 (the “Technical Report”).
- I am a graduate of Université du Québec à Montréal (B.Sc.,Resource Geology, 2006) and from Université Laval (M.Sc. Geology, 2009). I am a member in good standing of Ordre des Géologues du Québec (#1410). My relevant experience includes six years of mineral resources estimation project with several industrial minerals clients. I have participated in numerous technical reports on different industrial commodities, varying from mineral resources estimation to feasibility studies. I am a “Qualified Person” for the purposes of National Instrument 43-101 (the “Instrument”).
- My most recent personal inspection of the Property was from August 5 to 6, 2015.
- I am responsible for Sections 1.2, 1.3, 1.4, 1.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 14.0, 23.0, 25.1, 25.2, 25.3, 26.2, 27.1, and 28.1 of the Technical Report.
- I am independent of Canada Carbon Inc. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and sections of the Technical Report I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 14th day of April, 2016 at Quebec, Quebec.

"Document signed and sealed by
Jean-Philippe Paiement, M.Sc., P.Geo."

Jean-Philippe Paiement, M.Sc., P.Geo.
Geology Project Manager
SGS Canada Inc.

28.2 JIANHUI (JOHN) HUANG, PH.D., P.ENG.

I, Jianhui (John) Huang, Ph.D., P.Eng., of Coquitlam, British Columbia, do hereby certify:

- I am a Senior Metallurgist with Tetra Tech WEI Inc. with a business address at Suite 1000, 10th Fl., 885 Dunsmuir St., Vancouver, BC, V6B 1N5.
- This certificate applies to the technical report entitled "Technical Report and Preliminary Economic Assessment for the Miller Graphite and Marble Project, Grenville Township, Quebec, Canada" with an effective date of March 4, 2016 (the "Technical Report").
- I am a graduate of North-East University, China (B.Eng., 1982), Beijing General Research Institute for Non-ferrous Metals, China (M.Eng., 1988), and Birmingham University, United Kingdom (Ph.D., 2000). I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (#30898). My relevant experience includes over 30 years involvement in mineral processing for base metal ores, gold and silver ores, rare metal ores, and industrial minerals. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- My most recent personal inspection of the Property was on December 3, 2015.
- I am responsible for Sections 1.1, 1.6, 1.8, 1.9, 1.11, 1.13, 1.14, 2.0, 3.0, 13.0, 17.0, 18.0, 19.0, 21.1, 21.2, 21.3.2, 21.3.3, 24.0, 25.5, 26.1, 26.3, 26.5, 27.3, and 28.2 of the Technical Report.
- I am independent of Canada Carbon Inc. as defined by Section 1.5 of the Instrument.
- I have had no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the section of the Technical Report that I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 14th day of April, 2016 at Vancouver, British Columbia.

"Document signed and sealed by
Jianhui (John) Huang, Ph.D., P.Eng."

Jianhui (John) Huang, Ph.D., P.Eng.
Senior Metallurgist
Tetra Tech WEI Inc.

28.3 SABRY ABDEL HAFEZ, PH.D., P.ENG.

I, Sabry Abdel Hafez, Ph.D., P.Eng., of Vancouver, British Columbia, do hereby certify:

- I am a Senior Mining Engineer with Tetra Tech WEI Inc. with a business address at Suite 1000, 10th Fl., 885 Dunsmuir St., Vancouver, BC, V6B 1N5.
- This certificate applies to the technical report entitled "Technical Report and Preliminary Economic Assessment for the Miller Graphite and Marble Project, Grenville Township, Quebec, Canada" with an effective date of March 4, 2016 (the "Technical Report").
- I am a graduate of Assiut University (B.Sc. Mining Engineering, 1991; M.Sc. Mining Engineering, 1996; Ph.D. in Mineral Economics, 2000). I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia, (#34975). My relevant experience is mine evaluation, with more than 19 years of experience in the evaluation of mining projects, advanced financial analysis, and mine planning and optimization. My capabilities range from conventional mine planning and evaluation to the advanced simulation-based techniques that incorporate both market and geological uncertainties. I have been involved in technical studies of several base metals, gold, coal, and aggregate mining projects in Canada and abroad. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- My most recent personal inspection of the Property was on December 3, 2015.
- I am responsible for Sections 1.7, 1.12, 15.0, 16.0, 21.3.1, 22.0, 25.4, 25.6, 26.4, and 28.3 of the Technical Report.
- I am independent of Canada Carbon Inc. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and sections of the Technical Report I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 14th day of April, 2016 at Vancouver, British Columbia.

*"Document signed and sealed by
Sabry Abdel Hafez, Ph.D., P.Eng."*

Sabry Abdel Hafez, Ph.D., P.Eng.
Senior Mining Engineer
Tetra Tech WEI Inc.

28.4 HASSAN GHAFFARI, P.ENG.

I, Hassan Ghaffari, P.Eng., of Vancouver, British Columbia, do hereby certify:

- I am a Director of Metallurgy with Tetra Tech WEI Inc. with a business address at Suite 1000, 10th Fl., 885 Dunsmuir St., Vancouver, BC, V6B 1N5.
- This certificate applies to the technical report entitled "Technical Report and Preliminary Economic Assessment for the Miller Graphite and Marble Project, Grenville Township, Quebec, Canada" with an effective date of March 4, 2016 (the "Technical Report").
- I am a graduate of the University of Tehran (M.A.Sc., Mining Engineering, 1990) and the University of British Columbia (M.A.Sc., Mineral Process Engineering, 2004). I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (30408). My relevant experience includes 23 years of experience in mining and plant operation, project studies, management, and engineering. I am a "Qualified Person" for the purposes of National Instrument 43-101 (the "Instrument").
- I have not conducted a personal inspection of the Property that is the subject of this Technical Report.
- I am responsible for Sections 1.10, 20.0, 26.6, 27.2, and 28.4 of the Technical Report.
- I am independent of Canada Carbon Inc. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and sections of the Technical Report I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 14th day of April, 2016 at Vancouver, British Columbia.

*"Document signed and sealed by
Hassan Ghaffari, P.Eng."*

Hassan Ghaffari, P.Eng.
Director of Metallurgy
Tetra Tech WEI Inc.

APPENDIX A

CLAIMS LIST

Title Number	Ownership	Ownership %	Owner No	NTS map sheet	Area (Ha)	Status	Date Emitted	Date Expiry	Title credit amount	Restrictions
2344487	Canada Carbon Inc.	100	91295	31G10	60.1	Active	5/11/2012	5/10/2016	2,308.00 $	Affected by: Fauna habitat
2344488	Canada Carbon Inc.	100	91295	31G10	60.09	Active	5/11/2012	5/10/2016	52,454.00 $	Affected by: Fauna habitat
2344486	Canada Carbon Inc.	100	91295	31G10	60.1	Active	5/11/2012	5/10/2016	17,878.00 $	Affected by: Fauna habitat
2349740	Canada Carbon Inc.	100	91295	31G10	60.1	Active	6/7/2012	6/6/2016	2,308.00 $	Affected by: Fauna habitat
2349745	Canada Carbon Inc.	100	91295	31G10	60.08	Active	6/7/2012	6/6/2016	1,808.00 $	Affected by: Fauna habitat
2349742	Canada Carbon Inc.	100	91295	31G10	60.1	Active	6/7/2012	6/6/2016	18,321.00 $	Affected by: Fauna habitat
2349738	Canada Carbon Inc.	100	91295	31G10	60.1	Active	6/7/2012	6/6/2016	2,308.00 $	Affected by: Fauna habitat
2349739	Canada Carbon Inc.	100	91295	31G10	60.1	Active	6/7/2012	6/6/2016	2,308.00 $	Affected by: Fauna habitat
2349743	Canada Carbon Inc.	100	91295	31G10	60.09	Active	6/7/2012	6/6/2016	1,808.00 $	Affected by: Fauna habitat
2349741	Canada Carbon Inc.	100	91295	31G10	60.11	Active	6/7/2012	6/6/2016	2,308.00 $	Affected by: Fauna habitat
2349744	Canada Carbon Inc.	100	91295	31G10	60.09	Active	6/7/2012	6/6/2016	17,878.00 $	Affected by: Fauna habitat
2380945	Canada Carbon Inc.	100	91295	31G10	60.1	Active	3/4/2013	3/3/2017	- $	Affected by: Fauna habitat
2380948	Canada Carbon Inc.	100	91295	31G10	60.07	Active	3/4/2013	3/3/2017	- $	Affected by: Fauna habitat
2380944	Canada Carbon Inc.	100	91295	31G10	60.11	Active	3/4/2013	3/3/2017	- $	Affected by: Fauna habitat
2299284	Canada Carbon Inc.	100	91295	31G10	60.1	Active	7/13/2011	7/12/2017	208,052.20 $	Affected by: Fauna habitat
2303792	Canada Carbon Inc.	100	91295	31G10	60.1	Active	7/27/2011	7/26/2017	- $	Affected by: Fauna habitat
2388716	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	1,108.00 $	Affected by: Fauna habitat
2388719	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	- $	Affected by: Fauna habitat
2388722	Canada Carbon Inc.	100	91295	31G10	60.09	Active	8/7/2013	8/6/2017	1,108.00 $	Affected by: Fauna habitat
2388717	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	- $	Affected by: Fauna habitat
2388721	Canada Carbon Inc.	100	91295	31G10	60.1	Active	8/7/2013	8/6/2017	1,108.00 $	Affected by: Fauna habitat
2388718	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	- $	Affected by: Fauna habitat
2388720	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	- $	Affected by: Fauna habitat
2388715	Canada Carbon Inc.	100	91295	31G10	60.11	Active	8/7/2013	8/6/2017	1,108.00 $	Affected by: Fauna habitat
2327930	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	- $	Affected by: Fauna habitat
2327934	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	1,524.01 $	Affected by: Fauna habitat
2327933	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	1,524.04 $	Affected by: Fauna habitat
2327931	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	- $	Affected by: Fauna habitat
2327932	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	- $	Affected by: Fauna habitat
2327928	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	- $	Affected by: Fauna habitat
2327929	Canada Carbon Inc.	100	91295	31G10	60.1	Active	12/9/2011	12/8/2017	- $	Affected by: Fauna habitat