# Government of Greenland Mineral Licence and Safety Authority P.O. Box 930, Imaneq 1A 201, DK-3900 Nuuk, Greenland Tel. +299 34 68 00 E-mail: mlsa@nanoq.gl Website: www.govmin.gl

# **Cover for Geological Report**

According to MLSA's rules a licensee must forward a geological report following work in Greenland. This cover, abstract and the report shall be forwarded to MLSA in three copies no later than April 1. the following calendar year. Unprocessed data may be submitted to MLSA as paper copies, or, as per agreement with MLSA, transferred directly to GEUS's data processing system.

A geological report is the final report covering objectives, activities, results, conclusions and recommendations for a licenced area. As stated in "Rules for field work and reporting regarding mineral resources (excluding hydrocarbons) in Greenland" sec. 7.03 a geological report must contain the following:

- a. The length of the field season and numbers of participants
- b. Working methods (sampling methods, analytical techniques with detection limits and name of laboratory, geophysical methods, statistical procedures, drilling methods, etc.)
- c. Positioning and marking in the terrain of fix points for local reference systems
- d. Topographic maps of the investigated areas
- e. Geological maps
- f. Sample maps
- g. Geophysical maps
- h. Sample list
- i. Drill log
- j. All raw data (chemical values, geophysical values, etc.)

# Licence data:

Licence no.:	2010/40
Area:	Sarfartoq
Year:	2013
Field period:	May 26 through November 7, 2013
Operator:	Hudson Resources Inc.

# Abstract

Abstract of the report including all important conclusions and recommendations.

2013 was primarily focused on completing the permitting applications and bench scale studies. Hudson has already established a significant resource via drilling at the ST1 location between 2009 and 2012.

As planned, in 2013, Hudson:

1. Conducted final baseline studies required for the Environmental Impact Assessment study that is being conducted by Innuplan (ERM).

2. Conducted limited prospecting and reconnaissance activities on the licence

Most of the camp at Sarfartoq was moved to the Naajat camp location. The core logging tent, office, recreation and dry remain.

As summary of the project based on the Company's most recent 43-101 disclosure is included.

# TECHNICAL REPORT ON THE SARFARTOQ PROJECT WEST GREENLAND

**Prepared** for

Hudson Resources Inc. Suite 1460 - 1066 West Hastings Street Vancouver, British Columbia, V6E 3X1 Canada

Dr. Michael Druecker, Ph. D., CPG 14010 Kimberley Ln. Houston, TX, USA 77079 Tel: 281-497-2904 Email: <u>mdmd1@peoplepc.com</u>

Ronald G. Simpson, P.Geo GeoSim Services Inc. 1975 Stephens St. Vancouver, BC, Canada V6K 4M7 Tel: (604) 803-7470 Email: rgs@uniserve.com

Effective Date: April 26, 2012





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# **1 EXECUTIVE SUMMARY**

#### 1.1 Introduction

Hudson Resources Inc (Hudson) is a Canadian mineral exploration company focused on exploring and developing the Sarfartoq Project on the central west coast of Greenland. The Company has a 100% interest in the 687 sq. km. Sarfartoq Exploration Licence (Sarfartoq EL) which is centered on the 130 sq. km. Sarfartoq Carbonatite Complex (SCC) located at approximately latitude 66°30'N (the Arctic Circle) and longitude 51°15'W. The reference grid used throughout the exploration program is WGS84 UTM 22N. The license grants Hudson the exclusive right to explore for and develop mineral deposits including rare earth minerals.

During the last few years, the Company has been primarily focused on the Sarfartoq Rare Earth Elements (REE) Project. Between 2003 and 2008, the Company was primarily focused on the Garnet Lake Diamond Project.

In 2009, Hudson recognized the growing market for rare earth elements due to their increasing importance in green technologies and the high tech industries and thus changed it's exploration focus to the Sarfartoq Carbonatite Complex. Results from the past three field seasons have been very encouraging with a number of excellent targets being discovered around the carbonatite. The ST1 location has been the focus of much of these exploration efforts. The Company was able to generate an inferred resource on it in early 2011 and published an initial preliminary economic assessment in December 2011. This report updates the resource calculation and moves a significant number of tonnes into the indicated resource category.



#### Figure 1-1 Hudson Resources Property Location



# **1.2** Geology and Mineralization

Hudson's properties, located in Western Greenland, consist of exposed glacially scoured crystalline basement rocks, which are predominantly granulite-facies orthogneisses intruded by diorite dykes. Cutting approximately NE/SW across the Hudson properties, lies the boundary between the approximately 3 Ga Meso-Archaean N. Atlantic Craton to the south (Garde et al., 2000) and Archaean rocks affected by the 1.9 - 1.8 Ga Palaeoproterozoic Nagssugtoqidian Orogen (Willigers et al., 2002, Connelly et al., 2006 and refs. therein).

The Sarfartoq Carbonatite Complex (SCC), measuring approximately 13km in diameter, is situated on this boundary presumably having exploited an area of structural weakness. Similarly, kimberlite bodies and associated ultramafic lamprophyres metasomatised lithospheric mantle-derived rocks occur throughout the area. These are typically Cambrian in age and range from approximately 515 to 600 Ma in age with the SCC dated at approximately 580 Ma (Larsen and Rex, 1992, Secher, 2008).

The target commodities for the Sarfartoq Project are rare earths (primarily cerium, lanthanum, neodymium, praseodymium, and europium), specialty metals (niobium and tantalum) and diamonds. REE's and specialty metals are associated with the SCC and diamonds are found within kimberlite host rock and associated diamondiferous, mafic, igneous rocks.

# **1.3 Exploration History**

# 1.3.1 Rare Earths

Previous rare earth exploration efforts in the 1980's and 1990's by Hecla Mining (Hecla) and New Millennium Resources NL (New Millennium) concentrated on a small but high grade Niobium resource hosted in pyrochlore which is located near the core of the SCC. Hudson acquired all of the geological and geophysical exploration data from Hecla and New Millennium in 2009. Both companies described the potential for REE mineralization along the interpreted outer ring structure of the carbonatite complex but conducted only minimal work in those areas.

Hudson began exploration activities on the carbonatite complex in 2009 with encouraging results from surface sampling and drilling. In the three field seasons, 2009, 2010 and 2011, Hudson has completed a total of 25,400m of drilling and conducted 273 kilometers of geophysical surveys. Most of the work targeted areas exhibiting higher radiometric signatures, in particular areas ST1, ST19, ST24, ST31 and ST40.

In 2009, a large zone of ferrocarbonatite was discovered at the ST1 site. Subsequent delineation drilling in 2010 allowed for a 43-101 compliant resources estimate to be completed. The results were a 14.1 million tonne inferred resources averaging 1.5% Total Rare Earth Oxides (TREO) at a cut off grade of 0.8% TREO based on an open pit mining scenario. This report updates the resource based on an underground mining whereby the resource estimate includes indicated resources of 5.9M tonnes averaging 1.8% TREO and inferred resources of 2.5M tonnes averaging 1.6% TREO, based on a 1.0% cut-off grade.



# 1.3.2 Diamonds

Previous diamond exploration in the area was conducted by a number of companies including Monopros, Dia Met and Aber Resources.

Since 2003, Hudson has been exploring for kimberlite occurrences and this led to the discovery of the diamondiferous Garnet Lake kimberlite dike.

Work on the kimberlite advanced to a bulk sampling stage and in 2008 a bulk sampling program processed 499 dry tonnes of kimberlite through the Company's on-site DMS plant, which yielded 78.26 carats. There were 23 diamonds in the 0.25 to 1.0 carat range, including an exceptional 0.95 carat amber coloured diamond. A high proportion of the diamonds recovered were high quality, inclusion free stones. No future diamond exploration is planned.

# **1.4 Drill Hole and Assay Database**

Between September 2009 and September 2011, 116 core holes (25,343 m) have been drilled into the Sarfartoq Carbonatite Complex. Nine holes were completed in September 2009, 36 in 2010 and 71 in 2011. Fifty holes totaling 12,700 meters of drilling has been included in the ST1 resource calculation. Table 10-1 lists significant drill intercepts.

# **1.5 Metallurgical Testing**

Metallurgical testing is ongoing. Positive progress continues to be made on the flowsheet for the ST1 Zone which hosts the rare earths in bastnasite and monazite mineralization. The company has consolidated the major testwork components at SRC in Saskatoon under the direction of John Goode, P.Eng. Earlier testwork at SRC demonstrated that recoveries of over 90% were achievable utilizing acid baking and leaching. Preliminary flotation and gravity testwork to date has demonstrated the ability to upgrade the ore and more work is ongoing. Additional beneficiation and hydrometallurgical testwork is continuing at SRC.

# **1.6 Resource Estimate**

In 2009, a large zone of ferrocarbonatite was discovered at the ST1 site. Subsequent delineation drilling in 2010 allowed for a 43-101 compliant resources estimate to be completed with an effective date of January 4, 2011. At that time, the ST1 Zone was estimated to contain an inferred open pit mineral resource totaling 14.1 million tonne averaging 1.51% TREO at a cut-off grade of 0.8% TREO. See Section 17

The resource estimate that is the subject of this report has been updated and is estimated to contain indicated resources of 5.9M tonnes averaging 1.8% total rare earth oxides (TREO) and inferred resources of 2.5M tonnes averaging 1.6% TREO for the ST1 zone, based on a 1.0% cut-off grade and an underground mining scenario.

The mineral resource was estimated using the inverse distance squared method in two passes with incremental maximum search distances of 30 and 80 m. Samples from at least two drill holes were required to estimate block grades. Individual rare earth oxides were estimated and



combined to determine the final TREO estimate. Block dimensions were 5 metres by 5 metres horizontal and 5 metres vertical. Grade estimation was based on analyses of core samples from 50 diamond drill holes (12,705metres) completed between September 2009 and September 2011. Assays were composited in two metre down-hole intervals. It was concluded from statistical analysis of the raw sample data that grade capping or special treatment of outliers was not warranted.

Wireframe models of the major lithologies were developed to constrain the grade estimate and for assigning density values. The density values were assigned to the carbonatite and gneiss lithologies based on 1785 specific gravity measurements of drill core. Grade estimation was constrained by a solid model of the carbonatite intrusive and constrained beyond this domain by a 0.5% TREO grade shell. Hard boundaries were used between the carbonatite domain and surrounding gneiss complex.

Estimated blocks were classified as "Indicated' if they were within the carbonatite domain gradeshell and estimated in the first pass with a maximum search distance of 30 metres and minimum of 2 drill holes. All other estimated blocks were classified as 'Inferred'.

Assumptions used to establish the base case underground cut-off grade were:

- A weighted average bulk concentrate price of \$32/kg corresponding to a 54% discount on the three-year trailing average REO prices as of April, 2012.
- The three year trailing average for REE prices (per kilogram) as of April 2012: La2O3 \$46.40; Ce2O3 \$44.60; Pr2O3 \$99.00; Nd2O3 \$112.80; Sm2O3 \$47.70; Gd2O3 \$67.70; Tb2O3 \$1287.60; Eu2O3 \$1586.10; Dy2O3 \$713.10; Y2O3 \$67.80.
- TREO cut-off grades of 0.6%, 0.8%, 1.0% and 1.2% were considered potentially viable at break-even mining costs (General & Administration, Processing and Ore Mining costs) of \$125/tonne, \$166/tonne, \$208/tonne and \$250/tonne, respectively.
- A recovery of 65% has been assumed and will be revised when metallurgical test results are available.

# 1.7 Conclusions & Recommendations

In conclusion, after three field seasons of increasingly detailed work, Hudson has identified a significant REE mineralized indicated resource at ST1. The SCC is mineralized across the entire extent of the complex and remains largely unexplored. It is expected that there will be multiple bodies similar to the ST1 Zone found as exploration activities continue. Hudson has completed a preliminary economic assessment on the ST1 zone based on the initial inferred resource that has concluded the significant economic potential of the project. The new resource estimation is based on an underground mining scenario where the grade potential is higher than in the open pit mining scenario.

Based on the exploration work conducted in 2009/2010/201, the main recommendations are as follows:



- 1) Focus exploration efforts on the REE potential of the Sarfartoq Carbonatite Complex, specifically in the ST1 area.
- 2) Continue to advance the bench scale metallurgical studies on the ST1 Zone material.
- 3) Conduct the exploration drill program at and around the ST1 Zone in order to focus on the higher grade indicated resource in order to increase the tonnage potential.
- 4) Conduct geotechnical drilling at ST1 in order to advance the project to pre-feasibility.
- 5) Complete additional exploration drilling on other REE targets around the 32 kilometer outer ring structure of the SCC.
- 6) Undertake the necessary environmental and socio-economic assessments required to advance the project to pre-feasibility.

A recommended budget for work in 2012 is as follows:

1) Field Program

1)	Drilling	10,000 m
2)	Helicopter	300 hours
3)	Camp Supplies	Food, fuel, materials
4)	Personnel	Geologists, cooks, helpers
5)	Travel	Airfares, hotels, meals
	Total	(based on \$350/m as per 2011)
6)	EIA/SIA	Baseline EIA (consultant)
7)	Metallurgy – Phase 2	
8)	Prefeasibility Study	(2012 portion of )
9)	G&A	
	Т	OTAL

The remainder of available funds will be used for general working capital and potential acquisitions, as and when identified.



# 2 INTRODUCTION AND TERMS OF REFERENCE

Dr. Michael Druecker (Druecker) was retained by Hudson Resources Inc. (Hudson), to prepare an independent Technical Report on the Sarfartoq Project, in West Greenland. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. Druecker visited the project on multiple occasions in 2010 and 2011. In 2010 from May 30 to June 5 and from August 15 to September. In 2011 from May 4 to May 17, from June 21 to June 23 and from August 7 to August 24.

Geosim Services Inc. (Geosim) was retained by Hudson to prepare a 43-101 compliant Independent Resource Estimate of the ST1 Zone on the Sarfartoq Carbonatite to be incorporated into the 43-101 report. Simpson visited the project from September 7-9, 2010.

Hudson is a Canadian mineral exploration company that is a reporting issuer in British Columbia and Alberta. The common shares of Hudson trade on the TSX Venture Exchange (symbol:HUD) and on the OTCQX exchange in the US (symbol:HUDRF). The Company is under the jurisdiction of the British Columbia Securities Commission.

This report was prepared using published information, unpublished company reports, and data generated by Company consultants. Where possible, references are included in the context of the report and a list of such references is included in Section 23.

#### 2.1 Terms of Reference

Units of measurement used in this report conform to the SI (metric) system. Any currency in this report is Canadian dollars (C\$) unless otherwise noted.

Centimetre.	cm	Kilometre	m
Degree	0	Metre	m
Degrees Celsius	°C	Millimetre	mm
Dollar (American)	US\$	Million	М
Dollar (Canadian)	Cdn\$	Million tonnes	Mt
Gram	g	Parts per million	ppm
Grams per tonne	g/t	Parts per billion	ppb
Hectare (10,000 m <sup>2</sup> )	ha	Square kilometre	km <sup>2</sup>
Kilo (thousand)	k		
Kilogram	kg		

#### **Table 2-1: Terms of Abbreviations**

#### Table 2-2: Terms for elements, mineralization and alteration

Alteration Very weak	А	Lutetium	Lu
Alteration weak	A+	Manganese	Mn
Alteration Medium	A++	Neodynium	Nd
Alteration Strong to Pervasive	A+++	Niobium	Nb
Ankerite	ank	Phosphorous	Р



Antimony	Sb	Praseodynium	Pr
Arsenic	As	Promethium	Pm
Barium	Ba	Pyrite	ру
Beryllium	Be	Rare Earth	RE
Calcium Oxide.	CaO	Rare Earth Element.	RE
Carbonate	Carb	Rare Earth Element Oxides	RE
Cerium	Ce	Rubedium	Rb
Chlorite	chl	Samarium	Sm
Cobalt	Со	Silver	Ag
Copper	Cu	Strontium	Sr
Core Axis	CA	Tantalum	Та
Dolomite	dol	Tamarium	Tm
Dysprosium	Dy	Terbium	Tb
Erbium	Er	Thorium.	Th
Europium	Eu	Thulium	Tm
Gadelinium	Gd	Tin	Sn
Gallium	Ga	Tobernium	Tb
Gadolinium	Gd	Tungsten	W
Hafnium	Hf	Uranium.	U
Holmium	Но	Yttrium	Y
Iron	Fe	Ytterbium	Yb
Iron Oxides	FeOx	Zinc	Zn
Feldspar K	KFps	Zirconium	Zr
	-		

# 2.1.1 RARE EARTH ELEMENTS

- **TREO** Total Rare Earth elements calculated as Oxides. The elements include atomic numbers 57 (lanthanum) to 71 (lutetium), plus 39 (Yttrium). The conversion from element to oxide for the individual elements in included below.
- **REM** Hematite and calcite masses interpreted to hold Rare Earth Minerals
- LREE Light Rare earth elements (La to Sm)
- **HREE** Heavy Rare Earth elements (Eu to Lu plus Y)

Element	Multiplier	Oxide Equivalent	Element	Multiplier	Oxide Equivalent
La	1.173	La2O3	Но	1.146	Ho2O3
Ce	1.171	Ce2O3	Er	1.143	Er2O3
Pr	1.17	Pr2O3	Tm	1.142	Tm2O3
Nd	1.166	Nd2O3	Yb	1.139	Yb2O3
Sm	1.16	Sm2O3	Lu	1.137	Lu2O3
Eu	1.158	Eu2O3	Y	1.27	Y2O3
Gd	1.153	Gd2O3	Nb	1.431	Nb2O5
Tb	1.151	Tb2O3	Та	1.221	Ta2O5
Dy	1.147	Dy2O3			

#### Table 2-3 Rare Earth Oxide Conversion Factors



### **3 RELIANCE ON OTHER EXPERTS**

The authors have prepared this report and the information, conclusions and opinions contained herein are based on:

- Information available to the authors at the time of preparation of this report
- Assumptions, conditions and qualifications as set forth in this report
- Data, reports and other information supplied by Hudson
- Information collected during site visits

Literature sources were consulted and where used, are cited accordingly as references. Previous work from New Millennium was used and cited where appropriate.

The authors have not verified the legal details of the property, title, sale and ownership agreements; instead they have relied on information provided by Hudson.



### **4 PROPERTY DESCRIPTION AND LOCATION**

#### 4.1 Location

The Sarfartoq REE Project is located approximately 60 kilometres to the southwest of the international airport at Kangerlussuaq (Figure 4-1). Access to the project is possible by boat to the Angujartorfik Inlet on Sondre Stromfjord, or by a 20-minute helicopter flight from Kangerlussuaq.

Sondre Stromfjord is a large deep-water fjord and is navigable by boat from the coast up to its terminus at Kangerlussuaq. The coast is usually ice-free for most of the year.

The center of the property is located 140 km northeast of the village of Maniitsoq, where most of Hudson's food supplies are purchased. The property is located 110 km southeast from the town of Sisimiut.

#### 4.2 Mining Industry and Legislation

In Greenland, a license covers exploration for all mineral resources except hydrocarbons and radioactive elements, unless otherwise indicated in the license. A first license period is between 1 and 5 years. At expiration the licensee is entitled to be granted a new 5 year license for the same area and mineral resources, provided the Greenland Bureau



Figure 4-1: General Location Map

of Mining and Petroleum ("BMP" has received an application for this no later than December 31 in year 5. The new license period will count as years 6-10. At expiration of the second license period, the licensee may be granted new 2-year licenses for the same area and mineral resources.

There is a fixed fee to be paid at the granting of the license at each period (DKK 25,000). During years 6-10 there is an annual fee per license (DKK 25,000) which is indexed to the Danish CPI.

The licensee is obligated to spend exploration expenses per calendar year (adjusted for inflation) as follows:



Years 1-2: DKK 100,000 Years 3-5: DKK 200,000 Years 6-10: DKK 400,000

An amount per km2 per calendar year as follows:

Years 1-2: DKK 1,000 per km2 Years 3-5: DKK 5,000 per km2 Years 6-10: DKK 10,000 per km2

Expenditures for periods beyond year 10 are negotiated with the BMP. For the Sarfartoq EL, Hudson will be obliged to meet expenditures of 6,000,000 DKK in 2012 and 2013.

The license Period, fees and obligations are well explained and available on the BMP website: (<u>http://www.bmp.gl/minerals/exploration\_license.pdf</u>)

# 4.2.1 Royalties and Taxes

Greenland has an effective income tax rate of 31.8%. While there are no other significant indirect taxes all dividend distributions are subject to 37% withholding tax, depending on the company place of residence in Greenland. As the dividends declared are deductible against taxable income, the effective rate of tax will not exceed the withholding tax rate at 37%. Exploration and feasibility expenditure is immediately deductible. Development expenditure and plant and equipment are deductible through depreciation at a rate of 30% on a declining balance basis. The Greenland fiscal regime also allows additional depreciation limited to 50% of the taxable income in a given year; if applied, this additional depreciation will accelerate in the course of the period over which the expenditure can be deducted. Accordingly, unlike some of the other tax regimes, expenditure in Greenland in relation to plant and equipment can thus be fully deducted by year 10.

Tax Summary

- Income tax rate: 30% +(6% of 30%) = 31.8%. With reference to paragraph 27, section 6, in the Greenlandic Act No.11 on Income Tax, November 2, 2006, it is custom *not* to levy the additional tax of 6% on companies holding an exploration license or an exploitation license in accordance with The Mineral Resources Act, 1998.
- Deductions for computing taxable income are as follows:
  - Feasibility study cost: The Greenland Government may allow costs of formation, experiments and research, rationalization, land improvement, and similar expenses incurred in earning income to be deducted from the taxable income. The Greenland Government will typically approve such a deduction for mining companies.
  - Pre-production exploration costs: May be carried forward for future deduction.
  - Development costs: Deductible through depreciation.
  - Depreciation of equipment: The depreciation rate on fixed assets is 30% based on declining balance.



- The depreciation rate on ships is 10% based on the straight-line method. The depreciation rate on buildings is 5% based on the straight-line method. Further, there is the possibility of depreciation of up to 50% of the taxable income after prior years' losses have been carried forward and after the deduction of any declared dividends. This depreciation can be allocated to all depreciable assets according to investor's own choice. Costs qualifying for depreciation or amortization cannot be adjusted for inflation.
- The following types of costs may be deducted for calculating net taxable income:
  - Pre-production costs, exploration costs, operating costs, depreciation of development costs and equipment, amortization of certain intangible assets, abandonment costs, loan interest, royalty tax (if any currently not applicable to mining investments), withholding tax on dividends, import duties on equipment, labour market tax, occupation fees based on land area, stamp taxes (in determining a capital gain limitations apply), depletion (license fees see below), and payroll taxes.
  - Depletion allowance: License fees may be deducted in the year incurred.
  - Any amount set aside to financially ensure that a closure plan approved under the license may be deducted is subject to later tax liability on an unspent amount, if any.
  - Excess profits type tax: No royalties are currently levied on mineral licenses.
- Section 8. It shall be laid down in a license under section 7 to which extent the licensee shall pay fees to the authorities. It may, for example, be determined that an annual fee shall be paid based on the size of the license area (area fee). Also, provisions may be laid down regarding payment of a fee calculated on the basis of the produced resources, etc. (royalty) or regarding payments to the authorities of a share of the profits from the activities under the license.
- Subsection 2. It may be stipulated in a license under section 7 that a company controlled by the Danish Government and the Greenland Home Rule Government shall be entitled, on terms to be defined, to participate in the activities under the license. Subsection 3. In connection with the determination of a licensee's payments to the authorities under subsections 1 and 2, the licensee may be granted an exemption from taxation of the activities under the license.

# 4.2.2 Surface and Private Property Rights

Under Greenland law, there is no ownership of surface rights.

# 4.2.3 Environmental Regulations

An EIA report must be prepared when a company plans to exploit a mineral deposit. The EIA



report must cover the entire exploitation period from mine development prior to the mine start until closure of the mine and a subsequent monitoring period. Also a period during the exploration phase should be considered as a part of the EIA, because environmental baseline studies must be initiated prior to mine start. Baseline studies must be performed in the premining phase because the state of the environment must be determined prior to a possible impact from the mining activities. Baseline studies must cover a period of some years before construction starts, so that the environmental variations are incorporated in the baseline description. The number of years needed for baseline studies will depend on the project and the site. Often 2-3 years of baseline studies are needed.

A detailed plan for the EIA process, including plans for baseline studies, must be forwarded to and approved by the BMP prior to the start of the EIA process. The guidelines for conducting an EIA are available through the Bureau of Minerals and Petroleum at: <u>http://www.bmp.gl/minerals/eia\_guidelines.html</u>.

# 4.3 Mineral Property Title

In late 2011, Hudson made application to consolidate most of its exploration licences under one master Sarfartoq EL. As a result, the Hudson Resources holds a direct 100% interest two exploration licenses totalling 783 square kilometres in the Sarfartoq region, located near Kangerlussuaq, Greenland. The details are shown in Table 4-1.

Licenses	Name	Size (km2)	Expiration date
2002/06	Naajat	96	12/31/2013 (Under renewal)
2010/40	Sarfartoq	687	12/31/2013 (Under renewal)

Table 4-1 List of Licenses of the Sarfartoq Project

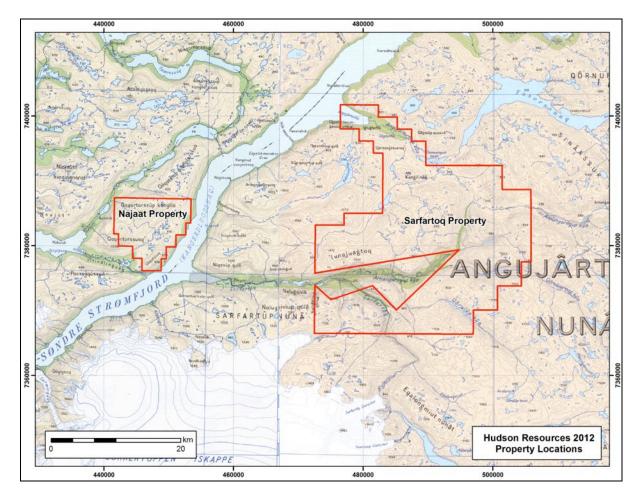
#### Tenure History

The Company began applying for exploration licenses in connection with its diamond exploration program in 2002. The initial application was for the Naajat property that principally covered the northwestern side of the SondreStrom fjord. The Sarfartoq carbonatite is principally situated in the Sarfartoq exploration license (2010/40). The company acquired the license from New Millenium Resources which had been conducting exploration activities related the niobium and tantalum occurrences on the southern slope of the Sarfartoq carbonatite. The following is a history of the exploration licenses tenure:

# Naajat EL (2002/06)

On July 15, 2002, the Company's application for the Naajat mineral claim (EL 2002/06) comprising 851 square kilometres in Western Greenland was approved by the Greenland





#### Figure 4-2 2012 Property Locations

mining authorities. In December, 2003, the Company reduced the area to 325 square kilometres based on the results of the 2003 exploration program. In December, 2004, the Company reduced the area to 243 square kilometres. In December, 2006, the company renewed the license for an additional five year period and the license area was reduced to 190 square kilometres. In December 2011, Hudson applied to extend the licence period into years 11 and 12 and reduced the area to 96 sq. km.

# Nalussivik EL (2003/04)

On May 1, 2003, the Company's application for the Nalussivik mineral claim (EL 2003/04) comprising 208 square kilometres in Western Greenland, was approved by the BMP. In 2004, the Company applied for and was granted an additional 193 square kilometres under the Nalussivik EL bringing the total to 401 square kilometres. In December 2009, the Company reduced the license area to 121 square kilometres. In December 2011, Hudson merged a portion of the licence into the master Sarfartoq EL.

# Sarfartuup Qulaa EL (2010/42)

On January 31, 2005, the Company's application for the Sarfartuup Qulaa mineral claim (EL 2005/03), comprising 89 square kilometres in Western Greenland, was approved by the BMP. In 2010, the Company extended the license for an additional five year period.



In December 2011, Hudson merged a portion of the licence into the master Sarfartoq EL.

### Sarfartoq EL (2010/40)

On June 20, 2003, the Company entered into an agreement with a Perth, Australia based company, New Millennium Resources NL ("New Millennium"), to acquire an 80% interest in the diamond mineral rights (including all other minerals except for tantalum and niobium) on the Sarfartoq exploration license on property located in West Greenland.

In April 2006, the Company acquired the remaining 20 percent interest (including 100% of previously excluded mineral rights) in the Safartoq exploration license in West Greenland from New Millennium for consideration of \$89,000 and 600,000 common shares of the company (issued at the value of \$450,000).

In 2010, the license was extended for a further 2 year period ending December 31, 2011. In December 2011, Hudson merged a portion of the licence, together with new ground and portions of four of the other EL's into the master Sarfartoq EL.

#### Sarfartoq Øst EL (2006/02)

In July 2006, the Company's application for the Sarfartoq Øst mineral claim (EL 2006/02) comprising 1,117 square kilometres in Western Greenland was approved by the BMP. In December 2007, the Company reduced the area to 374 square kilometres. In December 2010, the Company applied for a 5 year renewal of the license and reduced the area to approximately 250 square kilometres. In December 2011, Hudson dropped the EL.

#### Arnanganeq EL (2007/28)

In July 2007, the Company's application for the Arnanganeq mineral claim (EL 2007/28) comprising 236 square kilometres in Western Greenland was approved by the BMP. In December 2011, Hudson merged a portion of the licence into the master Sarfartoq EL.

#### Sarfartoq Valley EL (2009/04)

In July 2009, the Company's application for the Sarfartoq Valley mineral claim (EL 2009/20) comprising 5 square kilometres in Western Greenland was approved by the BMP. In December 2011, Hudson merged a portion of the licence into the master Sarfartoq EL.

#### 4.3.1 Surface Rights

In accordance with the Greenland law, there is no ownership of surface rights. Hudson has the right to explore with the option of a rollover into exploitation.

#### 4.3.2 Environment

There is a preserved area called Arnangarnup Qoorua in the Sarfartoq project area. This reserve occupies part of a broad glacial valley and its location is shown in **Error! Reference source not found.** It covers approximately 89 km<sup>2</sup>. The rules for field work and reporting regarding mineral resources (excluding hydrocarbons) in Greenland, Government of Greenland Bureau of Minerals and Petroleum, Ref. no.69.03.20+01 dated June, 1999 sets out the following requirements for access in the protected area at Sarfartoq:



- 3.04.02. Ruins, graves and other in situ antiquities shall not be damaged or changed in any way.
- *3.04.03. Collection of vegetation, antlers, skulls and relics is not allowed.*
- *3.04.04. For flying operations in the area the following applies:*

Helicopters and fixed-wing aircraft shall hold a minimum of 500 m above ground level, unless otherwise prompted by weather conditions or aviation regulations

Landing in the terrain with fixed-wing aircraft is subject to BMP's approval.

- *3.04.05.* Use of vegetation as solid fuel is not allowed.
- 3.04.06. Use of open fire is not allowed closer than 50 m to willow scrubs or other similar vegetation.
- 3.04.07. Traffic, loitering and other activities is not permitted within the area indicated in enclosure 3.04.

Complete rules can be downloaded at http://www.bmp.gl/minerals/rules\_for\_fieldwork.pdf.

4.3.3 Permits

Under the Standard Terms for Exploration Licenses for Minerals as set out by the BMP, the following activities may be carried out by the licensee without their specific approval:

- a. geological and geochemical investigations as well as sampling using handheld equipment, provided samples from each location do not exceed 3 tons and provided the total weight of the samples does not exceed 10 tons per year;
- b. drilling with handheld equipment;
- c. geophysical investigations carried out without the use of explosive materials.

Pre-approval from the BMP is required for the following activities:

- a. use of explosive materials;
- b. drilling excluding drilling with handheld equipment;
- c. sampling exceeding the limits set out above;
- d. use of equipment containing radioactive sources;
- e. use of vehicles, bulldozers, etc.;
- f. levelling of the terrain and construction of installations, buildings, etc; construction of shafts, drifts, ramps, etc.



# 4.3.4 Socioeconomics

An SIA Plan as well as an Environmental Impact Assessment must be submitted with the application for an exploitation license. The guidelines for Social Impact Assessments for mining projects in Greenland can be found at: http://www.bmp.gl/minerals/sia\_guidelines.html

The main objectives of a Social Impact Assessment (SIA) process for a mineral project in Greenland are:

- to engage all relevant stakeholders in consultations and public hearings;
- to provide a detailed description and analysis of the social pre-project baseline situation as a basis for development planning, mitigation and future monitoring;
- to provide an assessment based on collected baseline data to identify both positive and negative social impacts at both the local and national level;
- to optimize positive impacts and mitigate negative impacts from the mining activities throughout the project lifetime
- to develop a Benefit and Impact Plan for implementation of the Impact Benefit Agreement.



# 5 ACCESSIBILITY, CLIMATE, INFRASTRUCTURE AND PHYSIOGRAPHY

# 5.1 Accessibility

The property can be accessed year round by helicopter from the community of Kangerlussuaq, approximately 60 km northeast of the property and by boat from several communities when the fjord is typically ice free from March to November. Kangerlussuaq Airport is Greenland's most important transport hub. Up to seven flights arrive every week from Copenhagen in the summer (four a week year round) and connect to internal flights operated by Air Greenland to the capital Nuuk and Ilulissat amongst other locations. During the summer months flights are available to and from Keflavík, Iceland.

During the summer months (May to September), the property can be accessed by small boat or barge from Søndre Strømfjord. Small boats can be rented in Kangerlussuaq; however, a larger craft and crew must be chartered from a bigger community, such as the capital of Greenland, Nuuk if needed. The fjord is typically ice free from March through to November but varies from year to year.

There is no road to any communities outside the Kangerlussuaq area, but there have been discussions for several years about building a 170 km long road to Sisimiut.

#### 5.2 Climate

The climate is classified as polar continental and varies from -35 C to 20 C. Percipitation is sparse throughout the year. Although snow can fall in summer, the area is usually ice and snow free from May to late September.

#### 5.3 Local Resources Infrastructure

As the Property is located on the Arctic Circle there are certain limitations for various activities. Exploration techniques such as prospecting, heavy mineral sampling and geological studies are limited to the summer months (May to September) when the snow cover has melted. Activities such as ground or airborne geophysics and drilling can be conducted over a much greater period during the year (March to October), being limited only by the practicalities of working in the low temperatures and light levels of the mid-winter (December – February) months.

Power for operations in the field must be generated locally. Drilling, augering and water supply and drainage are supported by diesel and gasoline powered generators. Camp power is provided by diesel generators and transportation power is provided by Jet-A1 fuel in the case of helicopter support, and diesel in the case of excavators and a dump truck. With the exception of the majority of helicopter work, where fuel is available at the Kangerlussuaq airport, all other fuels are flown or barged into the field in 200 litre drums or 1,000 litre containers.



# 5.4 Physiography

The topography of the area is rugged with elevation ranging from 1,200 meters at the Garnet Lake site to sea level in the Sarfartoq Valley and Sondre Stromjford. The Sarfartoq Camp is located at about 600m elevation and has easy access from the north to the fjord. It is characterised by steeply incised streams and creeks and broad glacial valleys. Intermittent streams are numerous. The area underlain by the core of the carbonatite complex is less rugged and may be more vegetated due to the presence of phosphates present in the carbonatite.

The area is host to subarctic vegetation, with till-covered areas blanketed by grasses and ground shrubs (Labrador tea, dwarf willow and birch) and flowering plants.

Wildlife is plentiful, and includes caribou (reindeer), muskox, arctic hare, ptarmigan and other land and sea birds. The majority of the wildlife is concentrated in the Sarfartoq Valley outside of Hudson's exploration licenses.

# 5.5 Seismicity

There is no significant seismic activity recorded in this region.



# 6 **PROPERTY DESCRIPTION AND LOCATION**

The Sarfartoq region has been the focus of several sustained exploration programmes over the past 50 years. Early stage generative diamond exploration was conducted by subsidiaries of De Beers and Rio Tinto in the early 1970's. Later, in the 1980's work was conducted on the carbonatite looking for niobium and tantalum. The 1990's saw a sustained generative campaign on diamond exploration as a result of the discovery of the Canadian diamond mines in the Canadian arctic.

### 6.1 Rare Earth and Specialty Metals Exploration

The Sarfartoq carbonatite complex (SCC) was discovered by GGU (Danish Geological Survey) geologists after field investigation of a regional airborne radiometric survey conducted in 1976 (Secher, 1976). Between 1976 and 1981, mapping by Secher & Larsen (GGU) combined with airborne geomagnetic and ground magnetometer surveys provided a geological map of the complex and detailed information in reference to the petrology, mineralogy and petrogenesis of the complex (Secher, 1986; Secher and Larsen, 1981). In 2009, A. Bedini concluded that a lithological map of the different carbonatite types and alterations can be obtained using a Hymap imaging spectrometer data. He also confirmed the ferrocarbonate nature of the core and the hematite alteration in what he refers to as the marginal zone that surrounds the SCC.

Secher in 1976 inferred a potential resource for large phosphorous, niobium and REE deposits. He estimated that the phosphorous content was limited to the inner core of the complex, a magnetite-apatite bearing Ferrocarbonatite. Niobium mineralization recognized as pyrochlore accumulations is present within the marginal zone of the core of the SCC and associated with uranium bearing faults and fractures. Only one locality, the Sarfartoq No 1 is of potential economic interest.

In 1989, Hecla Mining Company undertook a diamond drilling program consisting of 13 holes totalling 567.51 meters in the Sarfartoq No.1 Niobium occurrence. Druecker (1989) calculated a non-43-101 resource estimate of 25,000 to 30,000 tonnes at a cut-off grade of 10% Nb2O5, and he interpreted that the pyrochlore zone pinched out laterally at both ends of the shear zone. Hecla surrendered the license at the end of 1989. Texas Energy Corporation NL (TEC) and Foundation Resources were granted a license (EL25/96) in 1996 and conducted geological and metallurgical investigations on the Sarfartoq No.1 Niobium occurrence in 1997.

In 1998, TEC and Foundation Resources signed an exclusive rights agreement with New Millennium Resources (NMR). NMR then drilled 15 NQ diamond drill holes totalling 707 meters at Sarfartoq No. 1 and took channel samples over the deposit. Maynard (1999) provides an independent non-compliant 43-101 resource estimate of 35,000 tonnes at 7.9% Nb (11.3% Nb2O5) using a cut-off grade of 5% Nb to a vertical depth of 45 meters in the measured category. The resource estimate has an indicated non-43-101 resource estimate of 186,000 tonnes at 3.2% Nb (4.6% Nb2O5). In 1999, NMR conducted a Landsat 7 interpretation of the complex.



In 2000, NMR contracted Tesla to fly a low-level high resolution heli-aeromagnetic and radiometric survey over the entire Sarfartoq license. Southern Geoscience interpreted the results. The radiometric anomalies were followed up in the 2000 and 2001 field seasons. The license was transferred to NMR in 2000.

In 2001, Snowden Mining Industry Consultants prepared an independent technical audit of the Sarfartoq No. 1 Resource. They concluded that there was not enough information to permit a Measured Resource status under the JORC code. Maynard in 2001 revised the resource estimate as follows: 35,000 tonnes at a grade of 7.8% Nb, an Indicated Resource of 100,000 tonnes at a grade of 3.2% Nb and up to 300,000 tonnes or more at a grade of 3.2% Nb within the existing strike length. This is a non-compliant NI 43-101 resource estimate.

NMR completed an in-house resource estimate in 2002 that conforms to JORC Standard as follows: Measured Resource of 23,478 tonnes with 5.95% Nb (8.51% Nb2O5) using a lower cut-off grade of 3.0% Nb to a vertical depth of 75 meters and an Inferred Resource of 64,301 tonnes at 3.89% Nb (5.56% Nb2O5) using a cut-off grade of 1.0% Nb to a vertical depth of 90 meters (taken from Woodbury, 2003).

The reader is cautioned that these are non-compliant NI 43-101 resource estimates. A qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves. Nor is the issuer treating the historical estimate as current mineral resources or mineral reserves as defined in sections 1.2 and 1.3 of National Instrument 43-1-1. Finally, the historical estimates should not be relied upon.

NMR also focused on identifying new high-grade pyrochlore occurrences in the license. The U-Th radiometric anomalies were ranked, named, prospected and sampled on a regional scale. Stream sediment sampling was conducted on the margins of the Sarfartoq license but no significant Nb or Ta anomalies were identified outside of the carbonatite complex.

In 2003, Hudson Minerals entered a joint-venture agreement with NMR to explore for diamonds on the Sarfartoq license and in 2006 Hudson acquired the right to 100% of all metals and diamonds on the license.

Work by Hudson on the Sarfartoq Carbonatite Complex (SCC) began in 2009 with encouraging results and that success continued through to 2011.

To date, Hudson has completed a total of 25,400m of drilling and conducted 273 kilometers of geophysical surveys. Most of the work targeted areas exhibiting higher radiometric signatures, in particular areas ST1, ST19, ST24, ST31 and ST40.

# 6.2 Diamond Exploration

The Sarfartoq region has been the subject of significant diamond exploration in the past. In certain areas, Hudson's exploration licences overlap areas previously held by Platinova A/S, Monopros Ltd. (DeBeers), Dia Met Minerals Ltd. (Subsequently BHP), Aber Resources, and Metalex Ventures Ltd.



Exploration Licenses 29-96 and 03-98 were part of a property package held in a joint venture between Platinova A/S and Aber Resources Ltd (Now Aber Diamond Corporation). Aber Diamond Corporation (Aber) was the operator of the joint venture and later relinquished the ground at the end of 2000. Much of the ground covered by these licences was subsequently acquired by New Millennium Resources N.L. (NMR) for niobium and tantalum exploration.

Exploration Licence 38-96 was part of a property package held in joint venture by Monopros Ltd. (Monopros), Dia Met Minerals Ltd. (DiaMet) and Citation Resources Inc. (Citation). Monopros was the operator of the joint venture, which included several other exploration licenses throughout west Greenland. At the end of 1999, Monopros relinquished its interest in EL 38-96 to DiaMet and Citation. Exploration Licence 38-96 was later dropped by DiaMet and Citation.

EL 17-97 and EL 18-97 were both included in a separate property package held in joint venture by DiaMet, Cantex Mine Development Ltd. (Cantex) and Citation. DiaMet was operator of the joint venture that also included several other exploration licences. In early 2001, control of DiaMet was acquired by a wholly own subsidiary of BHP-Billiton Diamonds Inc (BHP); hence, DiaMet's interests in both joint ventures were taken over by BHP. These EL's were later dropped by the joint venture. The main licence area was then picked up by Metalax Ventures and represented the same personnel involved with the DiaMet venture (Chuck Fipke, et al).

Exploration license number a0455 was formerly two licenses, namely 2004/03 & 2005/08 held by Cantex Mine Development Corp. These licenses were dropped at a date unknown to the author but known to be between 16th September 2006 and 16th January 2007.

Exploration conducted by DiaMet and other companies such as Monopros and Aber/Platinova was restricted to heavy mineral sampling and prospecting conducted over one or two field seasons. Results from a number of prior heavy mineral sampling programs have demonstrated that kimberlite indicator minerals with excellent diamond inclusion chemistry are present within Hudson's license areas. A large number of kimberlite indicator minerals, likely indicative of the presence of local kimberlites, were identified by DiaMet throughout the licence based upon the results of heavy mineral sampling program during 1997 and 1998 (Counts, 1999, 2002). All of the DiaMet Indicator mineral processing was completed at CF Mineral Research Ltd. (CF Minerals) of Kelowna, B.C.

A number of occurrences of kimberlite in outcrop and in float are found within the area that appears to yield large numbers of pyrope garnets and kimberlitic picroilmenites. Three important points can be gleaned from this distribution of indicator minerals. First, that the full suite of indicator minerals appear in samples that are locally associated with large numbers of kimberlite bodies and that the prospective samples and kimberlites are within a range of no more than 50 to 60 km north and east of the Sukkertoppen ice cap. Secondly, the mineral assemblage seen in the areas further east and north lack significant amounts of pyrope garnet and kimberlitic picroilmenite and, therefore, may be indicative of other related alkaline to ultramafic intrusions that are not kimberlitic, and finally, that the lack of a true kimberlite and associated mantle mineral assemblage in surface samples between the Property and the Main Greenland Icecap to the east is strong evidence that the indicator minerals that have been recovered from the Property to date are most likely derived from local kimberlites or potentially



from kimberlite that lies beneath the Sukkertoppen Ice cap and not from beneath the main continental ice cap well off to the east.

Microprobe analysis of a number of the pyrope garnets by CF Minerals demonstrated that a large number of the grains recovered by DiaMet on the Property were most likely formed under the same temperatures and pressures at which diamond is stable. This may indicate that kimberlites in the area that have yielded these indicator minerals may also contain diamonds. Microprobe results from the Property pyrope garnets recovered by DiaMet compare favourably with the chemistry of pyrope garnets found as inclusions in diamonds and to the pyrope garnets from the Lac de Gras kimberlite field in the Northwest Territories of Canada, where economic quantities of gem quality diamonds have been discovered and are now in production (Counts, 2002). A large number of the pyrope garnets identified in the heavy mineral samples from the Property by DiaMet are "G-10" Garnets and are derived from a depleted mantle source that is prospective for diamonds.

In each successive year since 2003, Hudson recovered ever larger diamonds from its' exploration programs. The largest stones to be recovered in Greenland have all emanated from the Hudson EL's. Hudson has completed a large amount of geophysical surveys (airborne mag and em, seismic and ground geophysics), a significant drill program, extensive reconnaissance and significant bulk sampling programs.

Hudson has been successful in identifying numerous occurrences of diamondiferous kimberlite. The majority of individual surface locations can be classified as glacial float with a likelihood of a nearby in-situ source. Drilling has revealed in-situ kimberlite within almost all the holes. The body of principal focus is a kimberlite dike dipping at approximately 20° to the east with a strike of 160° to grid north at a locality called Garnet Lake within the Sarfartoq claim block. This body, which is called the Garnet Lake Dike, averages 2.5 four meters in thickness and has been tested by drilling approximately 1.4 km along strike and 900 m down slope (to a depth of 330 m) and by seismic reflection to approximately 2160 m down slope (to a depth of 646 m).

Hudson collected kimberlite samples from the Garnet Lake Dike of 47 (2006), 160 (2007) and 499 (2008) dry tonnes from two locations where the dike subcrops. The samples were extracted utilizing drilling, blasting and excavating down to a maximum depth of approximately five meters.

The 47 tonne sample was processed by dense media separation (DMS) followed by x-ray and grease table processing at SGS Facilities in Lakefield Ontario. The sample generated a total of 383 diamonds, weighing 12.07 carats, including a single 2.392 carat stone.

The 160 and 499 tonne samples were processed on-site in Greenland utilizing Hudson's DMS plant, with final liberation and diamond picking occurring at SRC Facilities in Saskatoon, Saskatchewan. The much coarser crushed 160 tonne sample generated 252 diamonds, weighing 15.47 carats. This included a 2.51 gem quality diamond valued at \$600/ct and a broken very high quality diamond that likely weighed 3.5 to 4 carats. That stone had a potential unbroken stone value of \$5,000/ct.



The 2008 bulk sample program processed 499 dry tonnes of kimberlite through the Company's on-site DMS plant and yielded 78.26 carats. There were 23 diamonds in the 0.25 to 1.0 carat range, including an exceptional 0.95 carat amber coloured diamond. A high proportion of the diamonds recovered were high quality, inclusion free stones.

# 7 GEOLOGICAL SETTING

# 7.1 Regional Geology

The Sarfartoq Carbonatite Complex (SCC) was first described by Secher (1976, 1986), Secher, and Larsen (1980). This intrusion is interpreted to straddle the boundary between the Archean craton and the Paleoproterozoic aged Nagssugtoqidian mobile belt (Figure 7-1). The host rocks are granite and granodiorite gneisses cut by a swarm of Paleoproterozoic diabase dykes called the Kangamiut dike swarm. Age dating indicates than age of 565Ma for emplacement of the SCC (Secher and Larsen 1980).

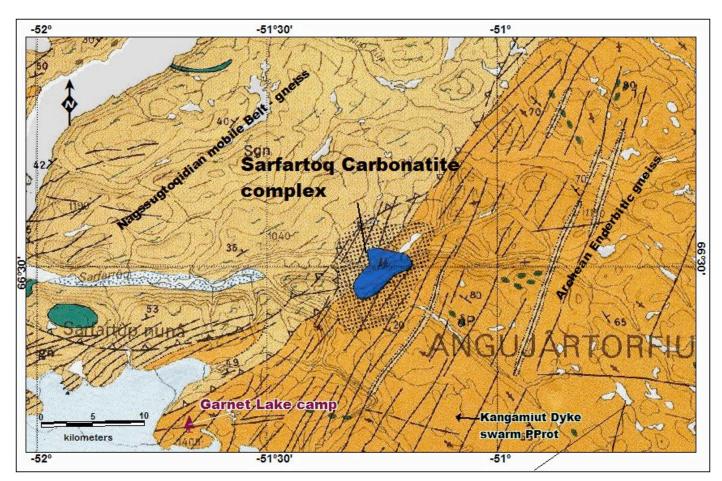


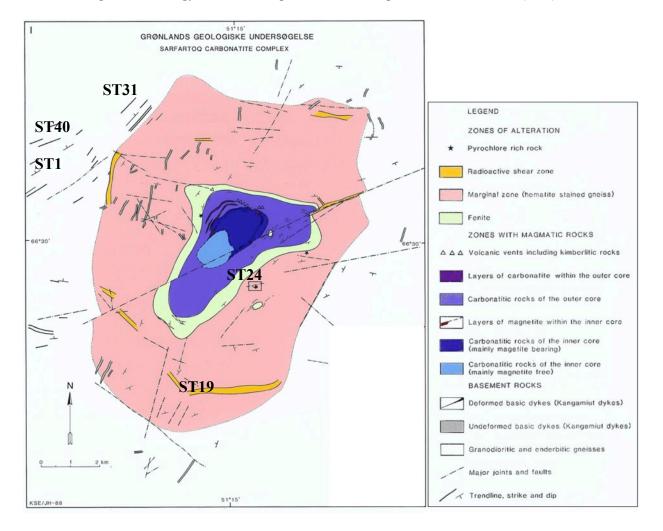
Figure 7-1 Regional Geology

The SCC is sub-circular to oval in shape and has an influence up to 12 km from the core (Figure 7-2). It has a conical structure with a magnetic core (Figure 7-3) consisting of apatite and magnetite rich ferrocarbonatites. The core is surrounded by narrow close-lying concentric



carbonatite sheets with interleaved screens of fenitized/altered country rock, and with a partial rim of sodic fenite. The dominant carbonatite type is ferrocarbonatite with rauhaugite (ankerite dominant) in the core and beforsite (ferrodolomite dominant) in the marginal dykes. Calciocarbonatite (sovite, calcite rich) only occurs as subordinate units in the core. The most common alteration encountered is light-grey and aegirine bearing fenite (Secher, 1986).

NMR during their field investigation also identified serpentinites, hornblendite, pyroxenites and kimberlite in the magnetic core of the complex (Barnes, 2000). It is likely that the composition and zonation of the SCC is more complex than that described by Secher and colleagues in 1976, 1986 and 1980.



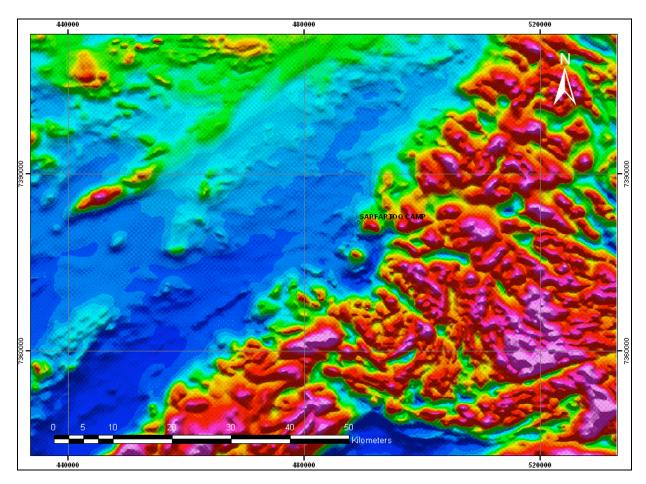


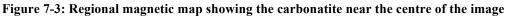
The carbonatites in the marginal zone also contain K-feldspar, chlorite, quartz, barite, pyrite, hematite and Nb-rutile; many are richer in silicates than the core rocks and may have been contaminated with country rock gneisses during emplacement or metasomatically altered. Mineral analyses of these phases are given in Secher and Larsen (1980).



Niobium, as pyrochlore is closely related to a series of ring dyke structures enclosing the central core of the complex. Pyrochlore is also found within shear zones where it is associated with high uranium content.

Bedini (2009) describes the outer ring structures as 50 to 200 meter wide radioactive shear zones that consist of strongly limonitized, hematized, jointed and crushed gneisses. They show as thorium and uranium anomalies on the radiometric maps. Most of them follow valleys and streams formed mostly because of the friable and soluble nature of these rocks.





# 7.2 Local and Property Geology

Very little work was previously conducted in the areas where Hudson sampled and drilled in 2009 and 2010. Summary descriptions for each target area are found in the New Millenium Resources reports (Barnes, 1999, 2000, 2001). The target areas with the detailed geological map from Secher et al (1981) are located in figure 7.2.



# ST40 Target Area

NMR (Barnes, 2000) called this area Anomaly ST40. It corresponds to coincident uranium and thorium radiometric anomalies. The strongest part of this anomaly is 1.1 km long by 0.23 km wide and extends in an east-west direction. The radiometric anomaly can be followed sporadically from east of ST40 to the ST1 area for a distance of 3 km. These areas may be connected. When approaching ST1 the anomaly changes direction. Altered gneisses with carbonate and barite veins sub-crop over this anomaly. NMR had previously identified pyrochlore, barite, rare earth carbonates and sulphides.

### ST1 Target Area

NMR (Barnes, 2000, 2001) called this area Anomaly J6. It corresponds to a strong thorium radiometric anomaly that is 2km long and up to 0.4 km wide with a northeast, southwest orientation. It corresponds in part to a deeply incised valley with intense alteration along the east wall and in the most northern part, along the west side of the valley as well. NMR identified pyrochlore, barite, strontianite, witherite and sulphides (pyrite, galena, sphalerite and chalcopyrite). Rare earth minerals were described but the mineralogy was not determined. It was one of the prime targets of NMR for further exploration.

#### ST19 Target Area

NMR (Barnes, 2000) called this area Anomaly ST19. It consists of a large thorium radiometric anomaly that follows a deep valley filled with a fast moving stream.

The strongest part of the anomaly measures 2.3 km in an east-west direction with a width of 400 meters. The rocks on the north valley wall consist of strongly altered granitic gneisses and mafic dykes cut by carbonatite dykes and carbonate veins with hematite, calcite and barite. Rare earth carbonates were observed by NMR (Barnes, 2000). In places, this valley has almost sub-vertical walls and is very difficult to access and explore. The bottom of the valley is covered in scree and big boulders.

#### ST24 Target Area

This area was referred to as Anomalies ST-24 and 25, and as Hb and Hj anomalies by NMR (Barnes 2000, 2001). Carbonatite dykes and intrusive breccias overly a large thorium radiometric anomaly 1.5 km by 0.6 km wide. NMR identified barite and sulphides associated with pervasively altered gneisses.

#### ST31 Target Area

NMR (Barnes 2000) called this area Anomaly ST31. It is located about 2 km north of the ST40 area. Outcrop is very sparse but carbonatite dykes and intrusive breccias were recognized in the field.



# 8 **DEPOSIT TYPE**

# 8.1 Carbonatite - Rare Earth

Carbonatites are igneous rocks that contain at least 50% modal carbonate minerals; calcite, dolomite, ankerite, or sodium and potassium- bearing carbonates. They occur as intrusive bodies of generally modest dimensions and less commonly as volcanic rocks. They are usually concentric with an aureole of metasomatically altered (fenitized) rocks.

A majority of carbonatites are located in stable cratons and intracontinental rifting and fault systems control their emplacement. They range in age from Archean to present.

Carbonatites are classified using the main carbonate content. Recommendations from the International Union of Geological Sciences Subcommission (Le Maitre, 2003) suggest the following classification:

- 1) Calcite carbonatite where the main carbonate is calcite. If the rock is coarse grained it may be called sovite, if medium to fine grained, alvikite
- 2) Dolomite carbonatite where the main carbonate is dolomite. They may be called beforsite or rauhaugite.
- 3) Ferrocarbonatite where the main carbonate is iron-rich.
- 4) Natrocarbonatite essentially composed of sodium, potassium and calcium carbonates.
- 5) If SiO2 > 20% the rock is a silicocarbonatite

Carbonatite associated deposits contain the majority of the known reserves of Niobium (Nb) of the world. They also account for a significant portion of world REE production and contain most known reserves. Simple circular or oval carbonatites plugs with or without alkaline intrusive rocks dominantly contain 45% of the niobium and REE deposits (Berger et al., 2009). Alkali-carbonatite intrusive complexes containing carbonatite as subordinate intrusions forming conic sheets, lenses and small plugs surrounding alkaline or ultramafic rocks, contain 30% of the Nb and REE deposits (Berger et al., 2009). Carbonatites may also occur as fissure-fill dykes, veins and stockwork partially of hydrothermal origin and they host 25% of the Nb and REE deposits worldwide.

Carbonatites were divided into three main mineralogical subtypes based on their association with economic deposits (Berger et al., 2009).

- 1) Calcite Carbonatite (Sovite and alvikite) was observed in 26 deposits (43%)
- 2) Ferrocarbonatite (beforsite and rauhaugite) was observed in nine deposits (16%)
- A combination of calcite and dolomite rich carbonatite was recognized in 23 deposits (38%)



The Bayan Obo orebody located in China is the world's largest REE deposit, with published reserves of 1.5 billion tonnes of 35% Fe ore, 48 million tonnes of 6% Rare Earth Oxides and 1 million tonnes of average grade of 0.13 wt. percent Nb (USGS website 1997). The Mountain Pass deposit in California was discovered in 1943 and was once the world leader in LREE production. It is a past producer and may resume production in the near future (Molycorp Minerals; http://www.molycorp.com/). The LREE (La to Sm) at Mountain Pass are associated with alkaline rocks and ferrocarbonatite dykes with barite veins. Alteration consists of fenitisation and minor supergene hematization (Haxel, 2005).

Carbonatites yield a variety of other mineral commodities, including phosphate, lime, anatase, fluorite, and copper. Agricultural phosphate for fertilizer is the most valuable single product and is developed by tropical weathering of carbonatites, dissolving the carbonates and thereby concentrating the less soluble apatite. Lime for agriculture and for cement manufacture is obtained from carbonatites in regions where limestones are lacking. Tropical weathering at several carbonatites in Brazil has produced economically important concentrations of anatase (TiO2) from the decomposition of perovskite (CaTiO3) (Richardson and Birkett, 1995).

# 8.2 Kimberlite - Diamonds

Kimberlite is best described as a hybrid igneous rock (e.g. Mitchell, 1995). Kimberlites are igneous in nature since they have crystallized from a molten liquid (kimberlitic magma) originating from the earth's upper mantle. Kimberlite magma contains volatile gases and is relatively buoyant with respect to the upper mantle. As a result, pockets of kimberlitic magma will begin to ascend upward through the upper mantle and along a path of least resistance to the Earth's surface. As the kimberlitic magma ascends, the volatile gases within the magma expand, fracturing the overlying rock, continually creating and expanding its own conduit to the Earth's surface. As a kimberlitic magma begins to ascend to the Earth's surface it rips up and incorporates fragments ("xenoliths") of the various rock types the magma passes through on its way to surface. As the magma breaks down and incorporates these xenoliths, the chemistry and mineralogy of the original magma becomes altered or hybridised. The amount and type of foreign rock types which a kimberlite may assimilate during its ascent will determine what types of minerals are present in the kimberlite when it erupts at surface.

When kimberlitic magma reaches or erupts at the earth's surface, the resulting volcanic event is typically violent, creating a broad shallow crater surrounded by a ring of kimberlitic volcanic ash and debris ("tuffaceous kimberlite"). The geological feature created by the eruption of a kimberlite is referred to as a diatreme or kimberlite pipe (e.g. Mitchell, 1995). In a simplified cross section a kimberlite diatreme appears as a near vertical, roughly "carrot shaped" body of solidified kimberlite magma capped by a broad shallow crater on surface that is both ringed and filled with tuffaceous kimberlite and country rock fragments.

Diamonds do not usually crystallise from a kimberlitic magma: they crystallise within a variety of diamond-bearing igneous rocks in the upper mantle called peridotites and eclogites. Peridotites and eclogites are each made up of a diagnostic assemblage of minerals that crystallise under specific pressure and temperature conditions similar to those conditions necessary to form and preserve diamonds ("diamond stability field"). Diamond bearing peridotite can be further broken down into three varieties that are, in order of greatest diamond



bearing significance, garnet harzburgite, chromite harzburgite, and to a lesser extent garnet lherzolite. For a kimberlite to be diamond bearing, the primary kimberlitic magma must disaggregate and incorporate some amount of diamond bearing peridotite or eclogite during its ascent to the earth's surface. The type and amount of diamond bearing peridotite or eclogite the kimberlitic magma incorporates during its ascent will determine the diamond content or grade of that specific kimberlite as well as the size and quality of diamonds. Diamond bearing peridotite and eclogite occur as discontinuous pods and layers in the upper mantle, typically underlying the thickest, most stable regions of Archean continental crust or cratons. As a result, almost all of the economic diamond bearing-kimberlites worldwide occur in the middle of stable Archean cratons.

Diamond indicator minerals (DIMs) include minerals that have crystallised directly from a kimberlitic magma (phenocrysts), or mantle derived minerals (xenocrysts) that have been incorporated into the kimberlitic magma as it ascends to the earth's surface. Examples of DIMs are picroilmenite, titanium and magnesium-rich chromite, chromium-bearing diopside, magnesium-rich olivine, pyrope garnet and eclogitic garnet. Varieties of garnet include G1, G2, G9, G10, G11, G12, G9 and G10 pyropes and G3, G4, G5, and G6 eclogitic garnets as discussed in Grütter et al. 2004). From this paragraph on, reference to G1, G2, G3, G4, G5, G6, G9, G10, G11 and G12 pyrope garnets refers to Grütter et al's (2004) classification.

The focus of exploration on the licenses lies on the identification of primary diamondiferous bodies of whatever nature. Worldwide, the majority of primary diamondiferous bodies are pipes, which notwithstanding the current surface expression, were in most cases explosive, extrusive bodies, i.e. volcanoes. However dykes and sheets which either exist as feeder channels to more concentrated bodies such as a pipe, or exist as the only expression of magmatic activity in a particular succession, can be significantly diamondiferous. Snap Lake, Canada and Benfontein, South Africa are examples of such bodies.

The model on which exploration is focussed therefore is one of ultramafic bodies occurring in both planar morphologies and as more irregular discrete bodies, containing DIMs and ultimately diamonds. Exploration methodology hence focuses on geophysical methods which can image such bodies remotely, drilling methods which can sample such bodies directly and geochemical methodologies which can both track the proximity to in-situ bodies of this nature and ultimately establish that the rocks sampled are indeed diamondiferous.

Worldwide, diamond occurs in two principal types of deposit. Primary deposits are ore bodies where diamonds are contained within crystallised versions of the same magmatic material, which have transported them from the Earth's mantle to levels whereby they can be mined. The principal example of a primary diamond body is the pipe, however commercial bodies of other shapes are known. Secondary deposits are ore bodies where diamonds are contained in sediments or altered sediments, which have formed due to processes of weathering and erosion of primary diamond deposits. The principal secondary diamond deposits are alluvial deposits although examples of lithified alluvial deposits and marine deposits are known.



# 9 MINERALIZATION

## 9.1 Rare Earths

The areas investigated by Hudson in 2009 through 2011 in relation to the exploration of rare earths are located along the interpreted outer ring structure of the SCC. The work concentrated mostly on four main areas (ST1, ST40, ST24 and ST19) which were chosen because of well-defined, elevated thorium radiometric anomalies.

Previous explorers recognized the REE potential but very little was done and detailed descriptions are lacking. The sampling and drilling described in this report represents the first mention of the REEs being associated with ferrocarbonatite bodies. They have associated fenite (strong to incipient), hematite and Fe-carbonate alteration. They are coincident with elevated thorium radiometric anomalies.

More work is required to understand their occurrence, shape and relationship with the outer ring structures and the central carbonatite core.

In 2009, Hudson commissioned a petrographic and SEM mineralogical study conducted on 13 samples (LeCouteur, 2009, Appendix 9); five samples from ST19, four samples from ST1 and four samples from ST40. The samples were selected because of elevated REE content (between 0.4% and 7.2% REE).

All of the samples were classified as ferrocarbonatites (or Ferroan Carbonatites) with varying amounts of ferrodolomite, ankerite, calcite and siderite. Sulphides include pyrite, sphalerite, galena and chalcopyrite. Barite, hematite, apatite and pyrochlore are also present. Minor minerals include pyrochlore, K feldspar, quartz, aegirine and phlogopite.

REE minerals identified included the following:

- Bastnasite (or bastnäsite)-(Ce) (Ce,La)[CO3]F
- Synchysite-(Ce) (Ce,La)Ca[CO3]2 F
- Synchysite-(Nd) (Nd,La)Ca[CO3]2 F
- Monazite-(Ce) (Ce,La,Nd,Th)PO4

## 9.1.1 Petrography

Three samples from core drilled in 2009 were selected for a mineralogical and petrography examination using thin sections and a scanning electron microscope (SEM). Specific gravity on these samples was also measured and reported in Table 9-1.

DDH	From / to (m)	Sample Number	%TREO	SG
SAR09-03	99.35 to 99.82	G0562608	2.315	3.42
SAR09-05	105.28 to 105.55	G0562822	1.682	3.00
SAR09-06	90.95 to 91.16	G0562895	1.367	3.07

**SAR09-03**: SEM determination established that sample G0562608 is a siderite - ankerite - barite ferrocarbonatite. This rock is mostly red- brown with scattered irregular and angular pale grey to off-white patches of siderite. The main constituents are barite (55%), ankerite / ferrodolomite (20%), siderite (10%), strontianite (5%), ancylite ?(3%), Ca-ancylite (Nd) (2%), hematite (2%), sphalerite (1%) and traces of galena.

**SAR09-05**: SEM determination of this core sample established that it is a ferrodolomite - ankerite Ferrocarbonatite. This rock is coarse grained, multicoloured with lesser amounts of dark red patched of fine grained ferrodolomite and calcite that contains most of the REE minerals encountered in this sample The main constituents are ankerite (70&) ferrodolomite, calcite (12%), apatite (6%), K-feldspar (4%) RE phosphate (Ce) (3%), pyrite (2%) siderite (2%) barite (2%) quartz (1%) with traces of pyrochlore and REE fluorocarbonates,

**SAR09-06**: SEM determination of this core sample established that this is a ferrodolomite – siderite - ankerite Ferrocarbonatite and is very similar to the core examined in SAR09-05. The main minerals are ankerite (50%), K-feldspar (15%), siderite (10-%), ferrodolomite (10%), apatite (10%), pyrite (3%), REE phosphate (2%) with traces of barite and chlorite.

# 9.1.2 Geochemical Composition of the Ferrocarbonatites

In order to properly plot and understand the mineralization for this very preliminary geochemical analysis, a sub-sample of core samples were selected from the drill hole analytical database.

Mineralized samples were selected with a TREO content above 0.5%, except for ST19 where samples with TREO% content above 0.4% as follows:

- 16 samples from the ST40 area
- 89 samples from the ST1 area
- 34 samples from the ST19 area

Two binary plots were done in order to compare relative ratios and composition for the mineralized bodies encountered by drilling in the three main areas.

The binary plot illustrated in Figure 9-1, shows the LREO% (La2O3 to Sm2O3) on the horizontal axis versus the HREO % (Eu2O3 to Yb2O3) on the vertical axis.

The mineralized samples from ST40 stand out as being richer in the HREO when compared to the ST1 and ST19. There are however three samples for SAR09-01 that plot in the same field



as the ST1 and ST40 samples. This might mean that there are at least two different types of mineralized bodies in the ST40 area,

Samples from ST1 and ST19 show comparable compositions, although ST1 samples have a slightly richer HREE content.

The LREO/ HREO average ratios for the areas are as follows: 24 for ST40, 40 for ST1 and 52 for ST19.

In Figure 9-2, three pie charts, one for each area, illustrate the relative abundance of each Rare Earth Oxide within the mineralized horizons.

According to the analytical data from the drill holes, the relative abundance of the REE's in mineralization is:

ST40; Nd2O3(42%) > Ce2O3(30%) > La2O3(8%) = Pr2O3(8%)  $\ge$  Sm2O3 = (8%) > Gd2O3 (3%) > Eu2O3 (1%) > others (<1%)

ST1; Ce2O3(51%) > La2O3(20%)  $\ge$  Nd2O3(19%) > Pr2O3(6%) > Sm2O3(2%) = Gd2O3(2%) > Eu2O3(<1%) > others (<1%)

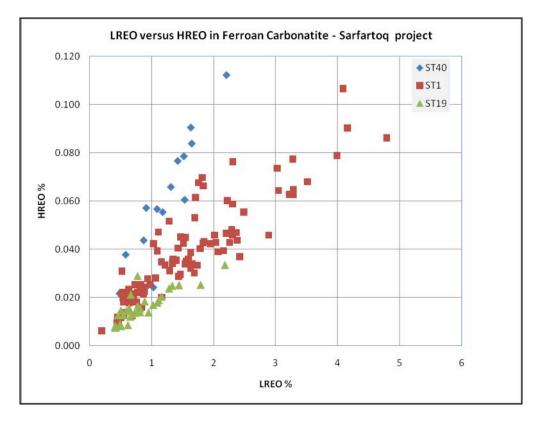
ST19; Ce2O3(49%) > La2O3(31%) > Nd2O3(13%) > Pr2O3(5%) > Gd2O3(1%) = Sm2O3(1%) > Eu2O3(<1%) > others (<1%)

In order to visualize the differences in the LREE in the three areas, a binary plot of La versus Nd is shown in Figure 9-3. The following diagrams and plots use only those samples. Elemental values were used instead of Oxides for the La versus Nd plot.

This plot shows a marked difference between the three areas. ST40 samples, except for three samples from SAR09-01 drill hole, show Nd enrichment when compared to the other areas. They also have lower La values. ST19 samples show lower Nd values when compared to La. The Ferrocarbonatite bodies at ST1 show a composition between ST40 and ST19 but also a wider scatter of data. This may be the result of a greater number of samples for that area.

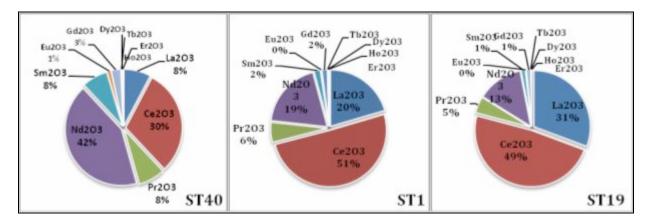
The La/Nd average ratios are as follows: 0.38 for ST40, 1.06 for ST1 and 2.31 for ST19.





#### Figure 9-1: Binary plot showing LREO vs HREO in samples from the ST40, ST1 and ST19 areas

Figure 9-2: Pie charts showing relative REE amounts for each target





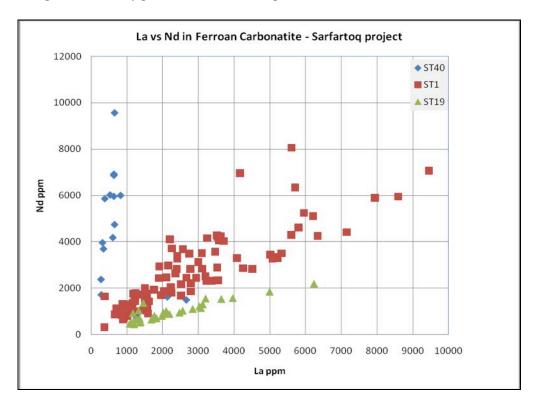


Figure 9-3: Binary plot of La vs Nd in samples from the ST40, ST1 and ST19 areas

Correlation matrixes were calculated for the REE mineralized ferrocarbonatite bodies in the three zones that were drilled in 2009. The results are presented in Table 9-2 to Table 9-4.

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Yb	Lu	Nb	Th	U	Y	Ва	Zn
La	1.0																			
Ce	0.3	1.0																		
Pr	-0.3	0.8	1.0																	
Nd	-0.4	0.7	1.0	1.0																
Sm	-0.4	0.6	1.0	1.0	1.0															
Eu	-0.4	0.6	0.9	1.0	1.0	1.0														
Gd	-0.4	0.7	1.0	1.0	1.0	1.0	1.0													
Tb	-0.4	0.6	1.0	1.0	1.0	1.0	1.0	1.0												
Dy	-0.4	0.5	0.9	0.9	0.9	0.9	0.9	1.0	1.0											
Но	-0.5	0.4	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0										
Er	-0.4	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0									
Tm	0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.1	0.1	-0.3	1.0								
Yb	-0.5	0.4	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.0	1.0		I					
Lu	-0.5	0.3	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	0.8	0.1	1.0	1.0						
Nb	0.9	0.0	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	0.4	-0.7	-0.7	1.0					
Th	-0.5	0.6	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.9	-0.3	0.9	0.8	-0.7	1.0				
U	0.6	0.1	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.3	0.3	-0.2	-0.1	0.6	-0.2	1.0			
Y	-0.4	0.1	0.4	0.5	0.6	0.6	0.6	0.6	0.8	0.9	0.6	0.3	0.9	0.9	-0.5	0.7	0.0	1.0		
Ва	-0.6	0.3	0.7	0.8	0.9	0.9	0.8	0.9	0.9	0.9	0.9	-0.2	0.9	0.9	-0.8	0.8	-0.3	0.8	1.0	
Zn	-0.4	0.1	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.0	0.8	0.8	-0.5	0.5	-0.3	0.6	0.8	1



	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Yb	Lu	Nb	Th	U	Y	Ba	Zn
La	1																			
Ce	1.0	1.0																		
Pr	0.9	1.0	1.0																	
Nd	0.9	1.0	1.0	1.0																
Sm	0.8	0.9	0.9	1.0	1.0	-														
Eu	0.7	0.8	0.9	0.9	1.0	1.0														
Gd	0.8	0.9	1.0	1.0	1.0	1.0	1.0													
Tb	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0												
Dy	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0											
Но	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8	1.0	1.0										
Er	0.8	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0									
Tm	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.7	1.0								
Yb	0.5	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.9	1.0	0.8	0.9	1.0							
Lu	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.0						
Nb	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.1	-0.1	1.0					
Th	0.4	0.5	0.6	0.6	0.7	0.9	0.8	0.9	0.9	0.8	0.7	0.4	0.7	0.6	-0.1	1.0				
U	0.0	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	0.1	0.0	0.1	1.0	0.0	1.0			
Y	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.9	1.0	0.8	0.9	1.0	0.9	-0.1	0.7	0.0	1.0		
Ва	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	-0.1	0.0	-0.1	0.1	1.0	
Zn	0.1	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.4	0.2	0.2	0.3	-0.1	0.2	-0.1	0.2	0.2	1

<b>Table 9-3: Correlation</b>	Matrix: ST1	mineralized	ferrocarbonatites
rable / b. Correlation	matrix. OI	minutanzea	ici i ocui bonatico

Table 9-4: Correlation Matrix: ST19 mineralized ferrocarbonatites

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Yb	Lu	Nb	Th	U	Y	Ва	Zn
La	1																			
Ce	1.0	1.0																		
Pr	1.0	1.0	1.0																	
Nd	0.9	1.0	1.0	1.0																
Sm	0.7	0.7	0.8	0.9	1.0															
	<u> </u>	~ <b>-</b>																		
Eu	0.6	0.7	0.8	0.8	1.0	1.0														
Gd	0.9	0.9	1.0	1.0	0.9	0.9	1.0													
Tb	0.7	0.7	0.8	0.9	1.0	1.0	0.9	1.0												
Dy	0.4	0.5	0.5	0.6	0.8	0.8	0.7	0.9	1.0											
Но	0.4	0.5	0.5	0.6	0.8	0.8	0.7	0.9	1.0	1.0										
Er	0.7	0.7	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	1.0									
Tm	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.7	0.9	0.9	0.8	1.0								
Yb	0.3	0.4	0.5	0.6	0.7	0.7	0.6	0.8	0.9	1.0	0.9	0.9	1.0							
Lu	0.3	0.4	0.4	0.5	0.7	0.7	0.6	0.8	0.9	0.9	0.9	0.8	1.0	1.0	_					
Nb	-0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.4	0.4	0.3	0.5	0.5	0.5	1.0					
Th	0.0	0.0	0.1	0.1	0.4	0.5	0.3	0.3	0.2	0.1	0.1	-0.1	0.1	0.2	0.1	1.0				
U	-0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.5	0.5	0.4	0.6	0.6	0.6	0.9	0.1	1.0			
Y	0.3	0.4	0.5	0.6	0.7	0.7	0.6	0.8	1.0	1.0	0.9	0.9	1.0	0.9	0.4	0.1	0.5	1.0		
Ва	-0.2	-0.1	0.0	0.1	0.4	0.4	0.2	0.5	0.7	0.7	0.4	0.5	0.6	0.6	0.2	0.1	0.3	0.7	1	
Zn	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.4	0.0	-0.1	0.1	0.2	0.1	1



Results for the 3 areas are summarized as follows:

## **ST40 Target area** (Table 9-2)

- Good to excellent correlation between Pr, Nd, Sm, Eu, Gd, Dy, Ho, Er, Yb, Lu. These elements have poor correlation with Ce and very poor correlation with La.
- U correlates with Nb and La
- Ba, Zn and Th correlates with all of the REE except for La.
- Ba and Zn correlates well with each other.
- La has excellent correlation with Nb

# **ST1 Target area** (Table 9-3)

- Table 9-3Good to excellent correlation between all of the REE's and Y.
- U correlates with Nb only
- Th correlates with all of the REE

**ST19 Target area** (Table 9-4)

- Excellent correlation between all of the LREE's
- Excellent correlation between the HREE's and Y;
- Good correlation between the HREE's and the LREE's
- U shows excellent correlation with Nb, and correlates with some of the HREE's

## 9.2 Diamonds

Hudson initiated diamond exploration in Greenland in July, 2003 based on reports of highly prospective kimberlite indicator mineral ("KIM") chemistry. Previous explorers in the region, Dia Met Minerals, Aber Resources and Monopros (DeBeers), collected thousands of KIM samples which had become a matter of public record.

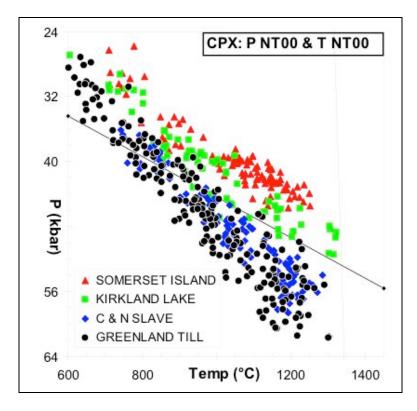
In the fall of 2003, Hudson engaged Mineral Services Canada Inc. to conduct an investigation of clinopyroxene compositions from the Kangerlussuaq fjord area, Greenland. The investigation was to specifically address the regional geothermal conditions indicated by application of thermobarometry techniques to clinopyroxene grains derived from till samples taken in the area during diamond exploration activities in the years 1995 to 1998. Clinopyroxene compositions taken from the indicator mineral database of Jensen et al. (2003) were used. This database contains 7,292 analyses for clinopyroxene grains.



The area of interest used occupies about 70 km E-W by 60 km N-S, lies mainly westward of the Sarfartoq carbonatite complex and extends at most 15 km to the northwest of the Kangerlussuaq fjord. At the time, the area was known to contain carbonate-rich kimberlite dykes and kimberlite felsenmeer which were thought to be the local source of the recovered indicator minerals (see Jensen et al., 2003).

Calculated P-T values for the selected clinopyroxenes from the Kangerlussuaq area in western Greenland are shown in Figure 9-4. The west Greenland dataset follows a geothermal array equivalent to, or perhaps colder than, the geotherm recorded by clinopyroxenes in garnet lherzolite xenoliths from the Diavik, Gahcho Kue (Kennady Lake) and Jericho kimberlites that are situated in the Slave craton, Canada. The west Greenland geotherm is clearly distinct from, and substantially colder than, the geotherms pertinent to the Kirkland Lake and Somerset Island kimberlites. Data for samples taken in sub-areas within the greater Kangerlussuaq area showed no discernable variation of geothermal conditions.

It follows that some of these magmas have sampled garnet lherzolite at pressure-temperature conditions deep within the lithosphere and well inside the diamond stability field. This does not necessarily equate to a high diamond potential for the west Greenland kimberlites, because the association of diamond with garnet lherzolite is rather weak (Gurney, 1984), and other factors like the diamond carrying capacity of the magma also need to be considered. However, as shown by the examples of the Diavik, Gahcho Kue and Jericho kimberlites, having a cold geotherm constitutes one of the fundamental pre-requisites for the presence of diamondiferous, economic or near-economic kimberlites.



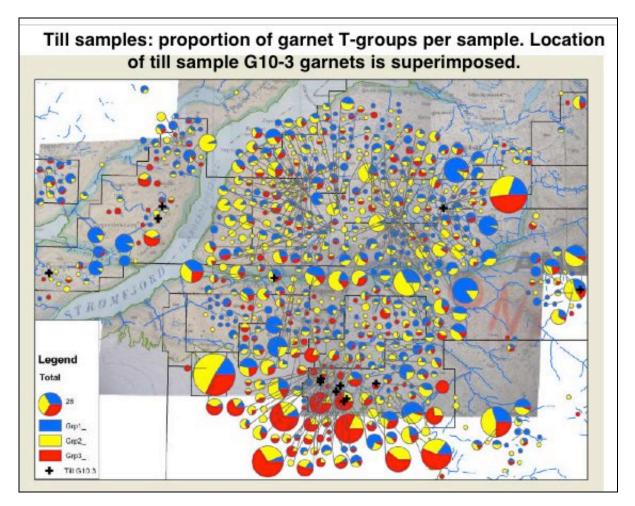
## Figure 9-4: Calculated P-T values for selected clinopyroxenes



The Company conducted exploration programs for diamonds in each year from 2003 to 2008 and confirmed that gem quality diamonds existed within its exploration licenses. In late 2005, Hudson again engaged Mineral Services Canada Inc. to conduct a study on the exploration results and to recommend the highest potential areas of interest (Figure 9-6).

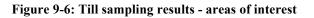
The general conclusion was that mineral composition trends suggested that in the main, the till sample results are consistent with those found in rock samples collected from the same general vicinity (Figure 9-5). The indicators found in till samples in elevated areas do not appear to have traveled significant distances from source. Glacio-fluvial outwash in current river valleys probably represents well-mixed and potentially well-traveled material.

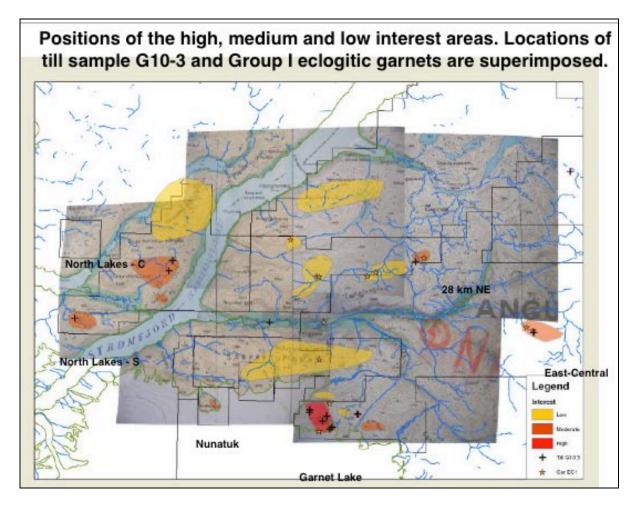
The results from this work and the recovery of diamonds from field samples concentrated the Company's exploration activities within the Garnet Lake area. In general, the presence of pyrope garnets within the matrix of the kimberlite magma was a reliable pathfinder to finding diamonds within the same material.



### Figure 9-5: Till sampling results – proportion of garnet T-groups per sample









# 10 EXPLORATION

# **10.1 Rare Earth Exploration**

In 2009, diamond exploration was halted in favor of rare earth exploration.

In 2009 the objective was to test previously reported REE mineralization associated with the outside ring structure of the SCC. To this affect a sampling and prospecting program was undertaken in late June and July. Based on the positive results of this program a reconnaissance drill program was executed between September 5 and 25, 2009. The objectives were to drill test the areas where anomalous grab samples were taken during the earlier summer work. These areas had never been previously drilled.

In 2010, exploration increased in scope with ground geophysics and trenching complimenting an expanded drilling/sampling program. In addition, a new camp was established closer to the property.

In 2011, a similar but larger program of drilling, prospecting and geophysics was conducted. A brief summary of work carried out from early May to late September in 2011 is as follows:

- 1) An additional 31 rock samples were collected and sent for assay.
- 2) A 7 tonne bulk sample was collected from the ST1 zone and sent for assay.
- **3)** A large diamond drilling program of 71 holes totalling 16,292 meters helped to delineate the ST1 zone and test new prospective areas.
- 4) Numerous ground geophysical grids were surveyed at the ST1, ST19 and ST24 zones.
- **5)** Both medium and high definition DEM was purchased, covering the entire Sarfartoq carbonatite as well as some surrounding areas including Robinson Bay.
- 6) An Environmental Impact Assessment was initiated with studies done on local flora and fauna.
- A Preliminary Economic Assessment study was initiated and engineers were on site in July.
- 8) Socio-economic talks began and were conducted in various towns and communities proximal to the project area.

# **10.2** Sampling and Prospecting

In 2011, Hudson's exploration team carried out fieldwork with the objective of defining potential REE drill targets. The program included some ground radiometric surveying, rock and stream sediment sampling, and reconnaissance mapping. The program focused on known



radiometric anomalies located in the areas referred to as ST1, ST40, ST19 and ST24 (Figure 10-1). Other areas such as ST31 saw light coverage.

All of these areas cover the interpreted outer ring structure of the SCC. The outer ring structure is approximately 35km in circumference and up until 2009, remained largely unexplored.

Approximately 31 rock samples were collected in 2011 and all but 1 were collected from the ST1 and ST19 zones. Sample descriptions and assay results can be found in Appendices 1 while a basic thematic map of results can be found in Figure 10-2.

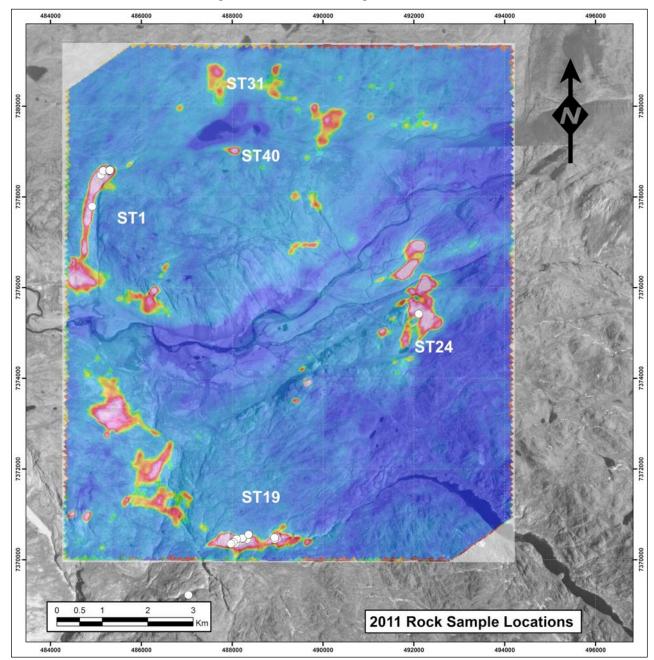
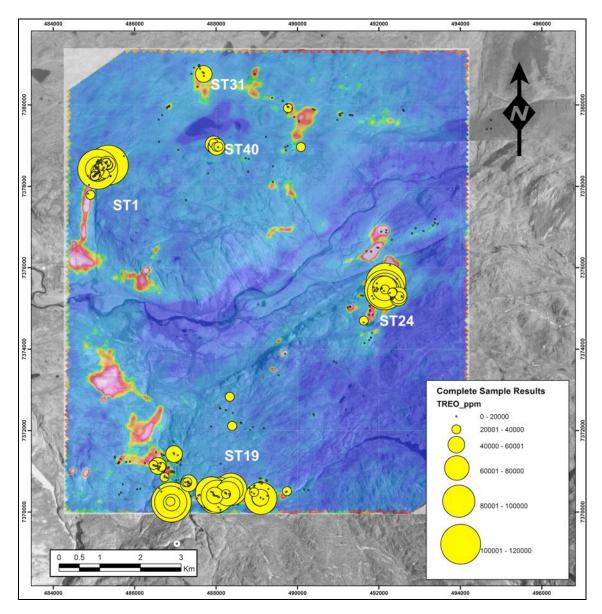


Figure 10-1 2012 Rock Sample Locations



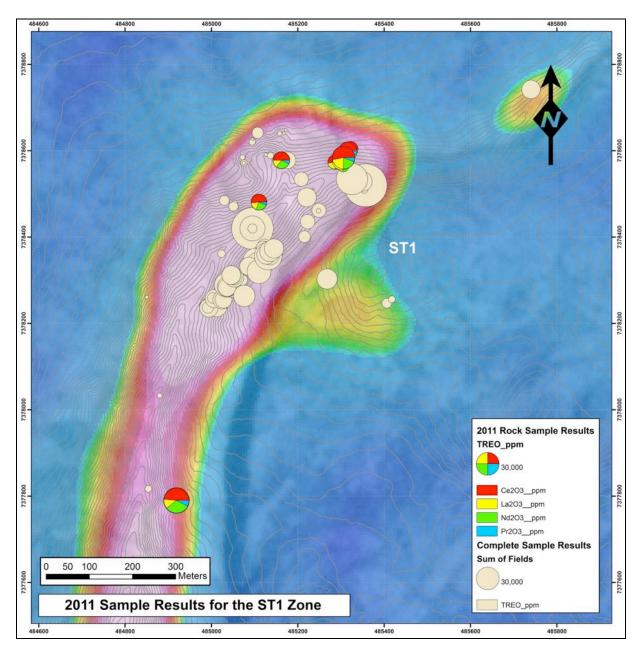




**ST1**: The ST1 area has produced the most significant results for Hudson in both the 2009 and 2010 exploration campaigns. Several of the holes drilled in 2009 and 2010 have intersected wide zones of REE-bearing ferrocarbonatite. The REE grades in these zones are considered to be potentially economical.

The strongly gossanous area is highlighted by a strong radiometric anomaly that centers in a steeply cut, north/south running gully. Veins and veinlets of ferrocarbonatite outcrop along the eastern slope of the gully over a distance of approximately 400 meters and where thick overburden covers the slope, REE-bearing ferrocarbonatite float is plentiful. Surface rock samples that assay in a range from one to ten percent TREO are common

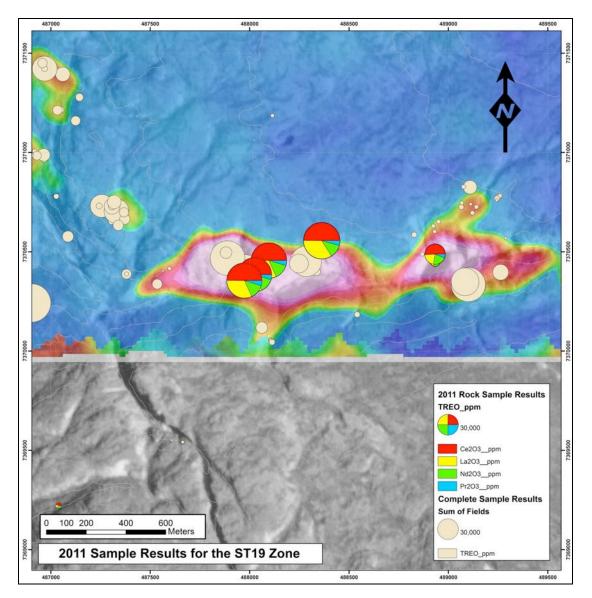




### Figure 10-3 Thematic sample results for the ST1 zone

In 2011, prospecting and rock geochemical sampling continued on the western slope of the ST1 gully with an aim to uncover new REE-bearing ferrocarbonatite outcrops and to extend those discovered previously. There were some surprisingly higher counts on this side of the gully, once thought to be barren. Highlights of some of the more significant assay results from the 2011 sampling are samples 985767 (2.24% TREO) and, 985760 (2.96%). A map of the area including 2011 thematic assay results can be found in Figure 10-3.

**ST19:** ST19 is a highly prospective area following the southern extents of the SCC outer ring structure and the associated radiometric anomaly. The radiometric anomaly and associated gossan are coincident with the river that cuts through the area from east to west. The area of

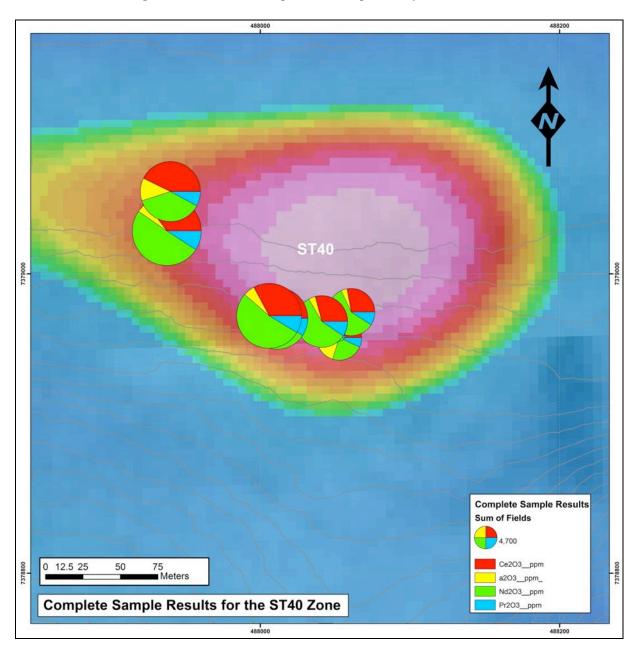


### Figure 10-4 Thematic sample results for the ST19 zone

interest is approximately 4 kms long by 1.5 kms wide. Prospecting in 2009 and 2010 led Hudson to designate four main prospective areas. They are 1) ST19 "East", 2) ST19 "Gorge", 3) ST19 "Gully" and 4) ST19 "Nose".

The "Gorge" area is coincident with a strong radiometric signature centered over a large talus slope on the north side of the river. In 2009, two samples located 110 meters apart returned 8.2% and 8.6% TREO. While no samples were collected from the area in 2010, numerous large carbonatite veins were discovered to have high TREO counts using a handheld portable XRF analyzer, some upwards of 15% TREO.





### Figure 10-5 Results of samples collected previously at the ST40 zone

Sample collection was restricted to the "Gorge" area in 2011 and again counts were elevated. Samples 986398 and 986399 returned 8.09 and 8.66 percentage TREO respectively and just east of the "Gorge" area, two samples located near the top of the steep hillside also returned high counts. They were samples 973882 (8.79%) and 973884 (9.28%) shown in Figure 10-4.



Many areas around within the ST19 zone remain highly prospective and will be targeted by drilling in 2012.

**ST24**: The ST24 area lies along the eastern rim of the SCC associated ring structure. It is coincident with a high radiometric signature and is a large gossanous area. Terrain-wise it differs from ST1 and ST19. The anomaly lies on top of the bluffs overlooking the Sarfartoq Valley to the north. There is no deeply cut river valley through the heart of the anomaly like those found at both ST1 and ST19.

The ST24 area returned numerous high assay values from rock samples in 2010 and was an obvious target for drilling. Some of the higher TREO counts were from samples 984110 (12.65%), 984105 (12.1%), 984114 (10.97%), 984117 (12.48%), and 984118 (11.37%). Most of the samples were from small, high-grade, sub-cropping veins. Two holes were drilled over the more prospective zone but neither intersected large zones of carbonatite.

One ample was collected in 2011 and it also assayed high. Sample 975951 returned a count of 12.59% TREO.

Because of the high assay values and a lack of exploration, the ST24 this area remains a high priority target for 2011.

**ST40**: In 2011, no samples were collected in close proximity to the ST40 Zone. However, assay results from samples collected previously in the area show considerably higher percentages of neodymium relative to TREO. It is these figures that make the area continually prospective Figure 10-5.

**ST31**: No samples were collected in close proximity to the ST31 Zone

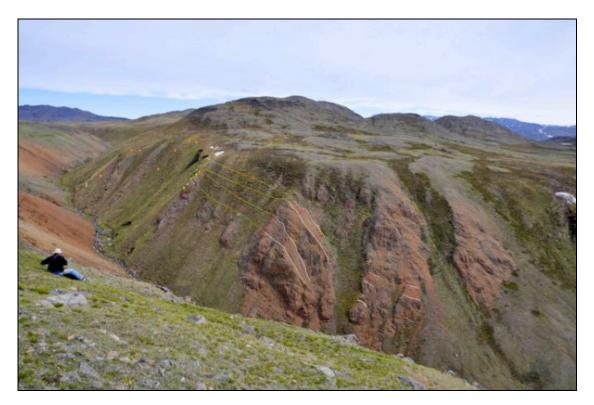
## **10.3 Ground Geophysics**

In 2011, ground geophysical surveys were conducted over four large areas of interest. This included areas of ST24, ST19 and ST1. Magnetic surveys were carried out over two of the blocks while three were subject to radiometrics, carried out by synching a handheld scintillometer with a Trimble Geoexplorer handheld GPS receiver.

Results of the surveys can be seen in Figure 10-7 to Figure 10-14.

Radiometrics were undertaken on a block just north of the ST1 zone to help identify a possible continuation of the strong radiometric signature seen at ST1. The anomaly is thought to be coincident with the main ore body here and positive results would help to identify future drill targets in the area.





### Figure 10-6 Photo showing carbonatite exposure at the ST1 zone

A weak continuation can certainly be seen in the thorium survey. If it is indeed a continuation of the main ore body, the weak count may mean the body has decreased in size, or, with luck has simply increased in depth. The anomaly will be drill tested along its length in 2012.

At the ST19 "Nose" area, a large grid was flagged and both magnetic and radiometric surveys conducted. Because there are no sizeable outcrops of carbonatite in the particular area, it was hoped drill targets could be generated using the survey results.

There is a definite if not a bit vague northeast/southwest trend for both the thorium and magnetic surveys. This is coincident with the large gossanous trend seen on surface. The magnetic signature is low here which you would expect to see with the carbonatite. The area will be targeted with drilling in 2012 to help identify the cause of the anomalous signature.

The ST24 area saw similar coverage and while there are no obvious anomalies, this large gossanous area will be drill targeted again in 2012.

Lastly, a large area just south of the ST1 zone was targeted with magnetics as an extension to similar work carried out previously in 2010.



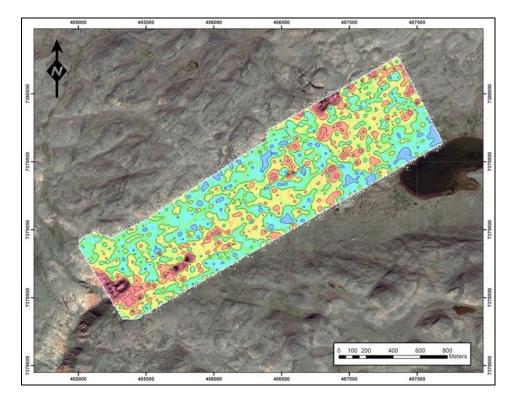
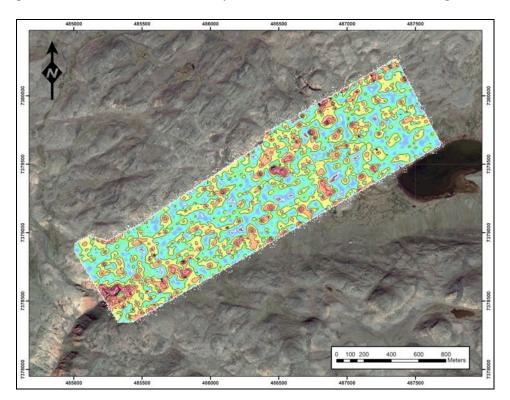


Figure 10-7 Ground radiometric survey results north of the ST1 zone, showing thorium.

Figure 10-8 Ground radiometric survey results north of the ST1 zone, showing uranium.





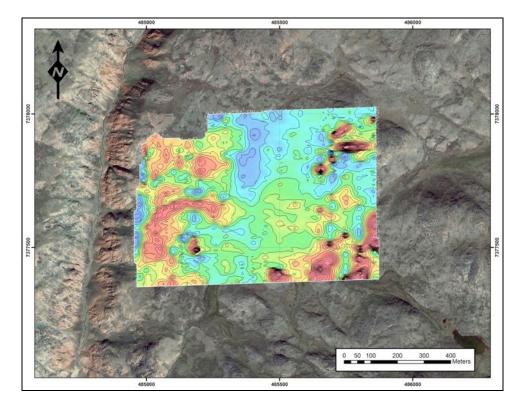
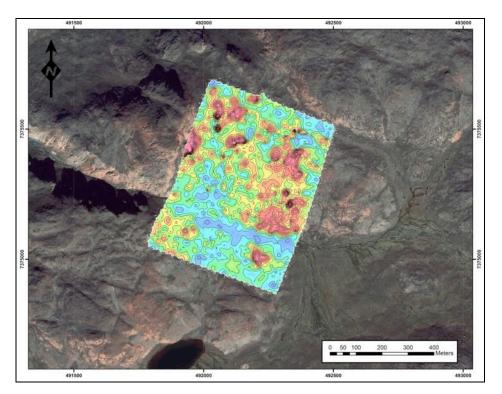


Figure 10-9 Ground magnetics survey south of the ST1 zone

Figure 10-10 Ground geophysical survey at the ST24 zone, showing thorium





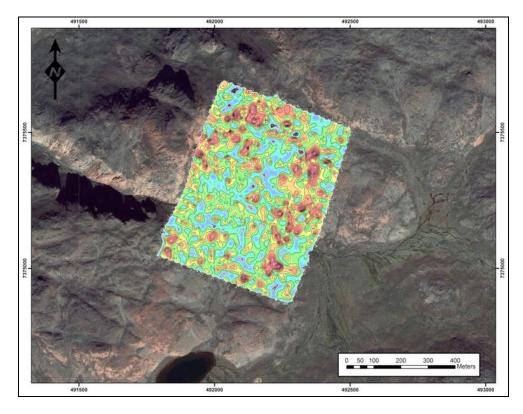
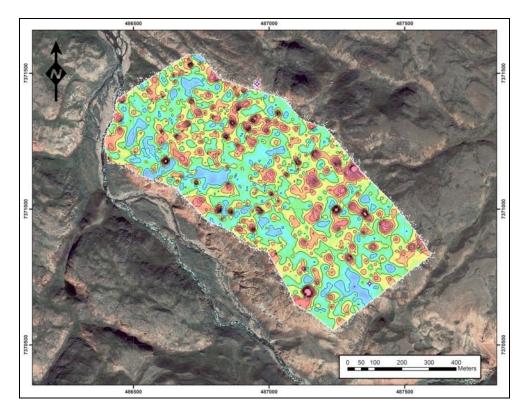


Figure 10-11 Ground geophysical survey at the ST24 zone, showing uranium

Figure 10-12 Ground geophysical survey at the ST19 zone showing magnetic





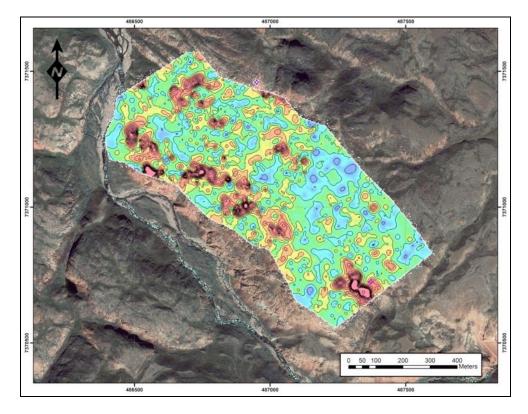
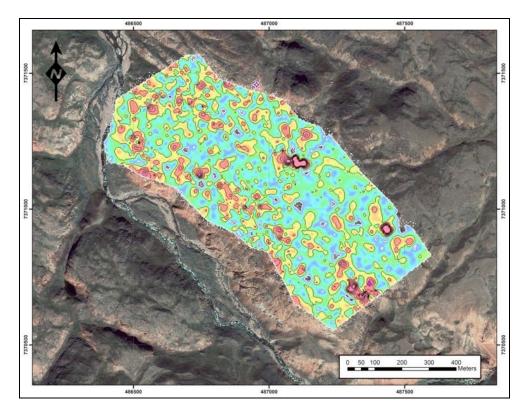


Figure 10-13 Ground geophysical survey at the ST19 showing thorium

Figure 10-14 Ground geophysical survey at the ST19 zone showing uranium





# 10.4 Drilling

Drilling results indicate that the REE mineralization is associated with coarse-grained bodies classified as ferrocarbonatite, also called Ferroan Carbonatites, formed mostly of ankerite, ferrodolomite, siderite and barite. The REE's are associated with hematite and ankeritic-calcitic masses containing fine-grained Bastnasite (or bastnäsite), Synchysite-(Ce), synchysite-(Nd) and monazite. All were identified with a SEM (Scanning Electron Microscope).

The enclosing granitic to granodiorite gneisses are weakly to pervasively fenite altered with K-feldspar, hematite, aegirine and ferrocarbonates. Within the alteration zones, stringers and veins of carbonates with barite with hematite masses are common, are usually multiphase, multidirectional, and often cross cutting. Outside of the main alteration zone, fractures in the granitic gneisses are usually weakly fenitized and hematized. Fine grained light grey carbonatite dykes, microdykes and intrusive breccias are commonly associated with the fenite alteration zones and are present in all of the drill holes. Sulphides are ubiquitous and include mostly pyrite but sphalerite, galena and chalcopyrite are observed locally.

All areas are strongly enriched in the Light Rare Earth\* Elements (LREE). The relative abundance of REE in the mineralization, reported below as Oxides, varies from area to area. The high ratio of neodymium at ST40 and ST1, in comparison with other world-wide deposits, is an important economic driver for the Company's exploration and development program:

In 2011, 71 core holes have been drilled into the Sarfartoq Carbonatite Complex totalling 16,300 meters. Forty were drilled into the ST1 zone, eight into the ST40 zone, seven at ST19, three at ST31 and the remainder on ground between the ST1 and ST40 zones.

Significant drill intercepts can be seen in Table 10-1.

Table 10-1 SI	ginneant u	i în întercep	15			
Drill Hole		From (m)	To (m)	Width (m)	TREO %	Nd2O3% of TREO
			ST1			
SAR11-17		86	132	46	2.28	18.3
	incl	90	108	18	2.25	23.2
SAR11-20		106	146	40	1.78	18.2
	incl	114	124	10	2.3	16.5
	incl	134	146	12	2.79	17.6
SAR11-24		278	344	66	1.29	18.2
	incl	280	288	8	2.67	15.2
	incl	330	344	14	2.65	16.6
SAR11-25		230	266	36	1.37	23.5
	incl	248	266	18	1.74	24.9
	incl	248	252	4	2.60	24.3
SAR11-26		140	268	128	1.73	19.3
	Incl	160	194	34	2.59	18.2
	Incl	172	182	10	3.33	16.7
	Incl	248	268	20	2.94	19.5
SAR11-29		356	380	24	2.41	17.9
SAR11-30		84	226	142	1.39	17.7

 Table 10-1 Significant drill intercepts



Drill Hole		From (m)	To (m)	Width (m)	TREO %	Nd2O3% of TREO
	Incl	84	104	20	2.63	17.0
	Incl	94	104	10	3.80	16.4
	Incl	114	130	16	2.23	17.6
	incl	114	124	10	3.02	17.8
	Incl	202	226	24	2.76	16.2
	Incl	210	220	10	4.28	15.7
SAR11-31		36	42	6	3.71	14.8
		68	102	34	1.07	17.1
SAR11-34		142	250	108	1.11	16.3
	incl	152	176	24	2.56	16.4
	incl	166	176	10	4.28	15.4
SAR11-35		162	178	16	1.77	15.0
	incl	162	170	8	2.54	14.8
		244	250	6	2.18	18.1
SAR10-37		260	326	66	1.96	19.5
	incl	272	286	14	2.54	16.4
	incl	302	318	16	2.88	19.5
	Incl	304	316	12	3.11	19.8
SAR10-42		5.7	28	22	1.09	17.0
	and	150	164	14	2.61	16.9
	incl	150	158	8	3.36	16.5
SAR10-44		28	92	64	1.44	16.7
	incl	52	62	10	2.68	16.0
	incl	72	82	10	2.70	16.5
SAR10-45		16	90	74	2.15	17.5
	incl	28	44	16	2.91	17.3
	incl	36	44	8	4.04	15.4
	incl	66	86	20	4.15	15.4
	incl	70	84	14	4.76	14.9
SAR10-46		148	154	6	2.32	15.5
	and	190	194	4	3.33	14.9
SAR10-50		206	220	14	3.26	13.0
	Incl	206	210	4	7.15	12.3
	Incl	216	218	2	5.90	12.0
SAR10-56		148	166	18	2.08	15.4
	Incl	158	166	8	3.85	14.4
SAR10-58		30	132	102	0.87	16.6
	Incl	104	110	6	1.85	16.5
	Incl	126	132	6	1.66	15.5
	and	232	292	60	2.65	16.3
	incl	252	288	36	3.56	16.0
	incl	254	276	22	3.96	15.8
SAR10-62		60	144	84	1.69	17.3
	Incl	102	112	10	2.21	19.0
	Incl	130	144	14	4.04	15.0
	Incl	134	142	8	4.91	14.2
SAR10-64		172	214	42	1.58	17.2
	Incl	192	198	6	3.72	16.3
SAR10-66		144	170	26	2.34	15.8
	Incl	154	166	12	3.68	15.0



Drill Hole		From (m)	To (m)	Width (m)	TREO %	Nd2O3% of TREO
SAR10-69		136	182	46	1.37	24.4
	Incl	152	164	12	2.07	26.8
	and	258	268	10	1.65	20.3
	and	350	360	10	2.04	19.5
SAR10-71		128	144	16	3.96	14.3
	incl	134	142	8	6.49	13.7
			ST19			
SAR11-57		60.0	120.0	60.0	2.58	12.33
	incl	60.0	66.0	6.0	3.46	11.27
SAR11-59		80.0	102.0	22.0	3.38	11.33
	and	90.0	102.0	12.0	3.97	10.65
	incl	106.0	116.0	10.0	3.38	11.33
	and	32.0	92.0	60.0	2.20	12.15

# 10.4.1 Collar and Down Hole Surveys

Table 10-2 contains the header information for each drill hole. Elevations at ST1 were recorded using a "Trimble" hand-held GPS, allowing a very small margin of error. The elevations in the table use the height above sea level (HASL) and have been collected using either a handheld Garmin GPS or the more accurate Trimble GPS. All elevations at ST1 have been measured using the Trimble differential GPS and for the purposes of the resource estimate the Height Above Elipsoid has been used. The projection used is WGS 84, UTM Zone 22N.

A Reflex EZ-trac tool was utilized to conduct down-hole orientation surveys of each drill hole. Table 10-2 shows the locations of holes drilled in 2011.

					D	RILL COLLAR			
DDH	AREA	AZIM	DIP	LENGTH (m)	EASTING (m)	NORTHING (m)	ELEV (m)	START	FINISH
SAR11-01	ST40	91	-51	181.30	487990	7378962	695	6-May-11	8-May-11
SAR11-02	ST40	91	-57	181.00	487990	7378962	695	8-May-11	9-May-11
SAR11-03	ST40	91	-65	128.10	487990	7378962	695	9-May-11	10-May-11
SAR11-04	ST40	110	-55	256.20	487745	7379032	679	10-May-11	13-May-11
SAR11-05	ST40	282	-45	176.90	488170	7378941	695	13-May-11	14-May-11
SAR11-06	ST40	282	-50	161.60	488170	7378941	695	14-May-11	16-May-11
SAR11-07	ST40	90	-50	250.00	487932	7379070	676	16-May-11	18-May-11
SAR11-08	ST40	180	-45	198.25	488365	7378992	695	18-May-11	20-May-11
SAR11-09	ST31	335	-45	234.85	487704	7380711	751	20-May-11	22-May-11
SAR11-10	ST40 west	180	-45	94.55	487376	7379197	673	20-May-11	23-May-11
SAR11-11	ST31	335	-90	222.13	487704	7380711	751	23-May-11	24-May-11
SAR11-12	ST40 west	180	-60	332.45	487376	7379197	673	22-May-11	26-May-11
SAR11-13A	ST31	315	-45	35.69	488048	7380666	723	24-May-11	26-May-11
SAR11-13B	ST31	315	-45	149.45	488048	7380666	723	25-May-11	26-May-11
SAR11-14	ST40 west	180	-50	201.30	487287	7378992	680	28-May-11	30-May-11
SAR11-15	ST40 west	270	-50	268.00	487387	7379180	675	28-May-11	30-May-11

Table 10-2: Sarfartoq 2011 drillhole locations

Damien Consultants GeoSim Services

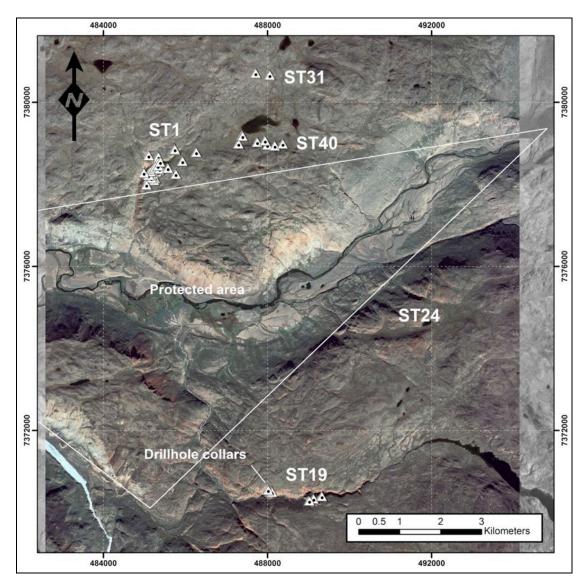


					D	RILL COLLAR			
SAR11-16	ST1	310	-65	248.99	485244	7378286	656	30-May-11	01-Jun-11
SAR11-17	ST1	310	-45	329.40	485244	7378286	656	1-Jun-11	01-Jun-11
SAR11-18	ST40 west	270	-81	263.15	487387	7379180	675	30-May-11	06-Jun-11
SAR11-19	ST1	310	-65	326.35	485085	7378106	628	3-Jun-11	06-Jun-11
SAR11-20	ST1	310	-45	252.15	485204	7378257	654	4-Jun-11	6-Jun-11
SAR11-21	ST1	310	-50	198.25	485085	7378106	628	7-Jun-11	8-Jun-11
SAR11-22	ST1	310	-45	307.05	485162	7378206	647	7-Jun-11	9-Jun-11
SAR11-23	ST1	310	-60	127.65	485098	7378143	630	8-Jun-11	11-Jun-11
SAR11-24	ST1	310	-60	399.95	485251	7378143	649	9-Jun-11	13-Jun-11
SAR11-25	ST1	310	-65	280.60	485098	7378143	630	11-Jun-11	13-Jun-11
SAR11-26	ST1	310	-90	307.00	485102	7378263	638	13-Jun-11	14-Jun-11
SAR11-27	ST1	310	-45	216.55	485098	7378143	630	13-Jun-11	15-Jun-11
SAR11-28	ST1	310	-45	198.25	485102	7378263	638	14-Jun-11	15-Jun-11
SAR11-29	ST1	310	-65	387.35	485230	7378101	641	15-Jun-11	
SAR11-30	ST1	317	-45	247.00	485284	7378310	671	16-Jun-11	17-Jun-11
SAR11-31	ST1	310	-90	247.05	485249	7378421	645	17-Jun-11	19-Jun-11
SAR11-32	ST1	301	-65	158.00	485249	7378421	645	19-Jun-11	19-Jun-11
SAR11-33	ST1	310	-45	132.08	485345	7378357	686	20-Jun-11	21-Jun-11
SAR11-34	ST1	310	-50	268.40	485345	7378357	686	21-Jun-11	23-Jun-11
SAR11-35	ST1	310	-50	259.25	485368	7378442	657	23-Jun-11	
SAR11-36	ST1	310	-70	213.74	485368	7378442	657	19-Jun-11	21-Jun-11
SAR11-37	ST1	310	-65	242.00	485160	7378155	643	19-Jun-11	
SAR11-38	ST1	310	-75	266.00	485368	7378442	657	21-Jun-11	
SAR11-39	ST1	310	-70	262.33	485091	7378223	635	23-Jun-11	25-Jun-11
SAR11-40	ST1	310	-50	192.15	485188	7378340	647	24-Jun-11	25-Jun-11
SAR11-41	ST1	310	-45	192.15	485091	7378223	635	25-Jun-11	27-Jun-11
SAR11-42	ST1	310	-45	189.10	485217	7378372	646	25-Jun-11	27-Jun-11
SAR11-43	ST1	310	-50	143.00	485139	7378314	642	27-Jun-11	28-Jun-11
SAR11-44	ST1	120	-60	115.90	485217	7378372	646	27-Jun-11	28-Jun-11
SAR11-45	ST1	120	-80	153.00	485217	7378372	646	28-Jul-11	29-Jul-11
SAR11-46	ST1 east	180	-55	207.40	485331	7378675	667	29-Jul-11	31-Jul-11
SAR11-47	ST1 east	180	-55	213.50	485745	7378835	671	29-Jul-11	31-Jul-11
SAR11-48	ST1 east	315	-55	246.00	485735	7378857	675	31-Jul-11	2-Aug-11
SAR11-49	ST1 east	0	-55	239.91	485331	7378675	667	31-Jul-11	2-Aug-11
SAR11-50	ST1 east	315	-55	244.00	486258	7378784	682	2-Aug-11	4-Aug-11
SAR11-51	ST1 east	90	-60	311.10	485098	7378702	688	2-Aug-11	5-Aug-11
SAR11-52	ST1 east	315	-55	258.85	485921	7378567	676	4-Aug-11	7-Aug-11
SAR11-53	ST1	130	-45	76.25	485324	7378541	603	5-Aug-11	6-Aug-11
SAR11-54	ST1	130	-55	256.20	485324	7378541	603	6-Aug-11	8-Aug-11
SAR11-55	ST1 south	220	-45	137.25	485760	7378252	676	7-Aug-11	8-Aug-11
SAR11-56	ST1	130	-70	206.78	485324	7378541	603	8-Aug-11	10-Aug-11
SAR11-57	ST19 east	150	-75	143.35	489119	7370340	590	8-Aug-11	10-Aug-11
SAR11-58	ST1	44	-49	311.10	485222	7378369	646	10-Aug-11	13-Aug-11
SAR11-59	ST19 east	0	-90	198.25	489119	7370340	590	10-Aug-11	11-Aug-11
SAR11-60	ST19 east	15	-82	216.55	489119	7370340	590	11-Aug-11	14-Aug-11
SAR11-61	ST19 east	224	-50	237.90	489320	7370398	589	14-Aug-11	15-Aug-11
SAR11-62	ST1	130	-75	165.55	485252	7378419	646	13-Aug-11	15-Aug-11
SAR11-63	ST19 east	10	-50	210.00	489012	7370290	524	15-Aug-11	17-Aug-11
SAR11-64	ST1	315	-63	228.75	485361	7378381	687	15-Aug-11	18-Aug-11
SAR11-65	ST19 gorge	215	-80	299.00	488101	7370498	553	18-Aug-11	20-Aug-11



					DRILL COLLAR				
SAR11-66	ST1	225	-85	174.34	485322	7378452	647	17-Aug-11	20-Aug-11
SAR11-67	ST19 gorge	250	-75	231.80	488008	7370552	556	20-Aug-11	22-Aug-11
SAR11-68	ST1	310	-45	17.61	485568	7378397	677	20-Aug-11	20-Aug-11
SAR11-68A	ST1	310	-50	366.00	485568	7378397	677	20-Aug-11	25-Aug-11
SAR11-69	ST1	179	-54	372.01	484980	7378285	550	22-Aug-11	25-Aug-11
SAR11-70	ST1	310	-73	314.15	485044	7377993	626	25-Aug-11	29-Aug-11
SAR11-71	ST1	57	-80	213.50	485377	7378547	611	26-Aug-11	28-Aug-11
				16,292					







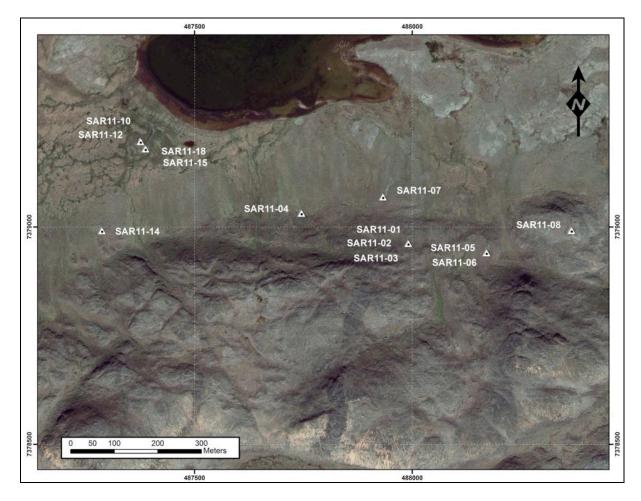


Figure 10-16 Drillhole locations at the ST40 zone

# 10.4.2 ST40 Zone Drill Results

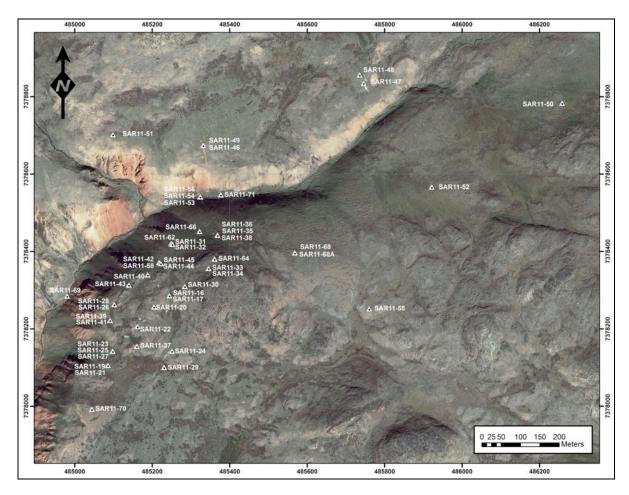
In 2011, the 10.33 meter wide zone identified in hole SAR09-03 was again targeted, this time by eight drill holes to test the zone's dip and strike (Figure 10-16)

The zone was determined to have an east/west strike and a steep dip.

The longest intersection encountered was 22 meters in hole <u>SAR11-02</u> and though none of the carbonatite encountered here in 2012 assayed up to expectations, the amount of neodymium relative to TREO remained high at 40 to 50 percent.

It is this abnormally high Nd/TREO ratio that commands attention and the zone will be drill targeted again in 2012.





### Figure 10-17 Drillhole locations at the ST1 zone

10.4.3 ST1 Zone Drill Results

In 2011, ST1 was drilled with forty holes totalling approximately 9000 meters – most aimed at delineating the body. A steeply incised valley with an intermittent stream characterizes this area. Most holes were collared from the top of the plateau overlooking the valley and most were drilled with matching dips and azimuths westwards towards the valley with the aim of cross-cutting the existing ore body at regular intervals. A few holes were collared at the bottom of the valley, designed to test the southern extension of the body (Figure 10-17).

Most holes intersected zones of ferrocarbonatite emplaced into altered granite and granodiorite gneisses with amphibolite horizons and dolerite dykes. The alteration is weak to pervasive and consists in hematitization and dolomitization of the gneisses. There are numerous centimetre wide fine-grained carbonatite dykes and intrusive breccias. Within the altered rocks, stringers of Fe-carbonates and multidirectional veins of Fe-carbonates with barite and masses of calcite and hematite are present.



The REE mineralization is associated with bodies of coarse-grained ferrocarbonatite that contain a wide variety of different minerals.

These bodies have sharp contact with the altered rocks and are locally intruded by light greybeige carbonatite dykes establishing a sequence of events, the ferrocarbonates being older than the finer grained carbonatite dykes. Mineralogy and petrography determination has identified this rock as a ferrodolomite-ankerite (+siderite) ferrocarbonatite (LeCouteur, 2009). It contains ferrodolomite, ankerite, siderite, and barite and masses of dark red hematite and calcite that contain some fine-grained REE minerals, notably bastnäsite (Le Couteur, 2009). They exhibit internal zonation and could be of hydrothermal origin. Pyrite is disseminated in the carbonatite material. Sphalerite, galena and fluorite were locally observed.

The 2011 drilling program was successful in upgrading the resource from an inferred tonnage to an indicated tonnage while identifying what looks like one continual zone of higher grade material within the body itself.

Examples of these higher grade intersections are found in holes SAR11-30, 34, 45, 50 and 62 (Figure 10-17).

Additionally, drilling has extended the zone further to the north. Hole SAR11-58 revealed an extension of the main body by drilling through 60 meters of carbonatite at depth about 200 meters further north than previously discovered. On top of that the grade of the intersection here proved higher as well, assaying at 2.65% TREO for the full 60 meters.

Further north still the exploratory hole SAR11-71, when testing for a further extension of the main body, encountered a smaller but higher grade zone that assayed 6.49% TREO over 8 meters.

These results have proved very encouraging and have generated considerable targets for the upcoming 2012 field season.

# 10.4.4 ST19 Zone Target

The ST19 zone was subject to limited drilling in 2011. Seven holes were drilled in the area, Two at the "Gully" and five at ST19 "East" (Figure 10-15). In 2010, two very encouraging holes were drilled at ST10 "East".

Hole <u>SAR10-22</u> was collared on top of a high, narrow ridge cutting between a set of deep parallel gorges. Prospecting here in 2010 identified numerous carbonatite veins hosted by fenetized granitic gneiss. The veins ran in various directions and dips in a zone thought to be approximately 25 meters wide at surface. Aiming for this zone at depth the drill encountered ferrocarbonatite mineralization at the 60 meter mark and continued in the zone until the 120 meter mark. Numerous broken, fractured zones were encountered throughout the hole. The zone averaged 2.6% TREO over 60m and included a 12m zone averaging 4.0% TREO.

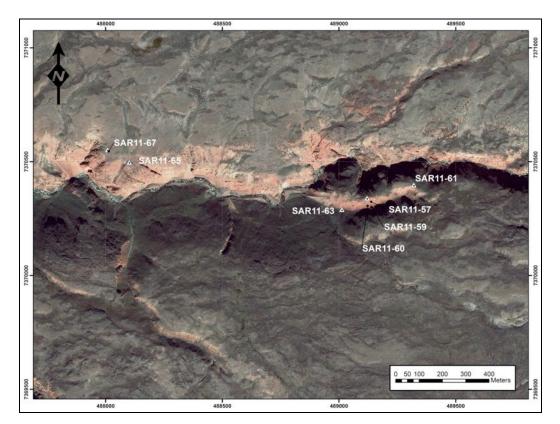


Hole <u>SAR10-23</u> was drilled from a set up approximately 75 meter east of SAR10-22. It was designed to intersect the zone discovered in hole SAR10-22 from the opposite direction. The hole intersected ferrocarbonatite mineralization from 43 meters to 93 meters but the



### Figure 10-18 A section of core from Hole SAR10-08

Figure 10-19 Drillhole locations at the ST19 zone





zone here was diluted by several small sections of fenetized granitic gneiss and crackle breccias. Again the drill had problems with zones of broken, fractured rock. The hole, however, returned higher than expected REE averages. The hole averaged 2.2%TREO over 60m including a 14m section that averaged 4.9%TREO

These holes were followed up in 2011 to test the potential size of the body and though hole SAR11-57 returned 60 meters grading 2.58% TREO, it is thought the drill ran down dip. It is now thought the body is smaller than originally anticipated and no drilling is planned here in 2012.

The two holed drilled at the "Gorge" area targeted the high grade carbonatite veins found in some abundance at the bottom of the gorge itself. Unfortunately no significant intercepts were seen.

# 10.4.5 Other Targets

The ST31 target was drilled for the first time in 2011 (Figure 10-15). Three holes targeted weak radiometric signatures in an area where rock samples collected in 2009 and 2010 returned moderate to weak assay counts. It was also thought this area may hold below it a possible extension of the ST1 zone. Unfortunately no carbonatite was encountered.

The remaining 13 holes were located over ground situated between the ST1 and ST40 zones. Most targeted low mag and low gravity targets identified earlier during the 2010 ground geophysical surveys.

The most surprising result came out of hole SAR11-50, located a few hundred meters northeast of the ST1 zone. Targeting a linear low mag feature, the hole intersected carbonatite just past the 200 meter mark that assayed 3.26% TREO over 14 meters including a surprising 7.15% over 4 meters.

Hole SAR11-48, spotted a few hundred meters north of ST1, hit 10 meters of carbonatite at the 110 meter mark.

These results, and the fact that most of the holes here consistently hit stringers of carbonatite within large stretches of fenetized gneiss provide considerable encouragement that other large carbonatite bodies may be found in the area.

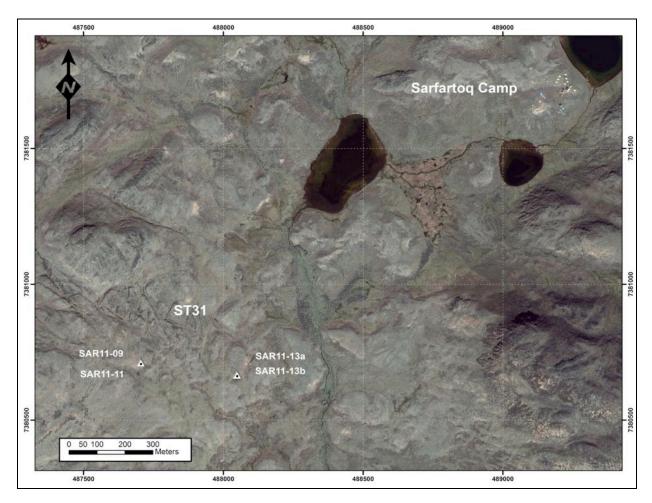
# 10.5 Bulk Sampling

In 2011, a 7 tonne bulk sample of carbonatite was collected from surface at the ST1 zone and sent to SRC Laboratories in Saskatoon, Canada for assay.

It was collected by hand using picks and shovels and was comprised of in-situ outcrop. It was placed in bulk bags which were closed and fitted with security seal to prevent tampering.

The results proved to be extremely good. The entire sample averaged 2.36% TREO and 20.9% neodymium (of TREO).





#### Figure 10-20 1 Drill hole locations on the ST31 zone



# 11 SAMPLING METHOD AND APPROACH

For core logging, Microsoft Excel spreadsheets were used in order to record sample intervals, geology and other parameters. It is recommended to change to a drill program that uses Microsoft access in order to simplify quality control of data entry and subsequent transition into modeling software.

The geologist marked the core for splitting both at the ends of the sample interval and along the length of the core, indicating the splitting location, using a pencil. A hand splitter was utilized and the core was split in two pieces, with one-half put back in the core box and the other half sent for analysis. In general, the core had extremely good recoveries. A sample tag was left in the box.

In 2011 approximately 280 blanks, 280 standards and 280 duplicates were inserted at regular intervals when preparing the split drill core samples (approx. one standard per 25 samples). The blanks consisted of local un-mineralized and unaltered granitic gneisses from the Garnet Lake area. The REE content was extremely low. The analytical results were reviewed and assessed using the blanks, the standards and the duplicates.

Core is now stored on site at Hudson's Sarfartoq camp.

For the first phase sampling program, grab samples were collected in the field based on their degree of alteration and their radiometric signature.

The bulk sample was collected from the ST1 zone at a large known surface showing. The material was in-situ and was freed using picks and shovels

## **11.1 Sample Interval**

For core, the normal sample interval for the Sarfartoq drill core was two meters and whenever possible it was tied to geological boundaries.

Any trenches are dug down to bedrock across the width of the ferrocarbonatite and sampled at each 2-meter interval.

## **11.2** Chain of Custody

The core boxes were covered (wooden top) and bound with strong fiber tape, then transported by helicopter to the core shack at the Company's secure project campsite. At the core shack the core boxes were laid out, numbered and labeled, and two-meter sample intervals were marked over selected (carbonatite) sections of the drill core.



Sample numbers, intervals, and scintillometer/spectrometer and Niton readings were recorded and entered onto paper and digital forms. All core boxes and select core sample intervals were digitally photographed and archived. The drill core was then split in half with a manual mechanical splitter and the half split, two-meter interval was placed in sample bags, labeled, marked with a unique in-sequence sample ID number, and sealed. The drill core was logged by Hudson geologists and consultants using paper and digital log forms that noted lithology, alteration, structure and mineralization.

Sample bags were then placed in large plastic containers or rice bags that were brought by helicopter to the Kangerlussuaq airport where they were flown to Copenhagen and then to the ALS Chemex lab in Vancouver. All sampling information is kept in ticket books, and paper and digital log forms for easy cross-referencing at the Company campsite office in Greenland and the corporate office in Vancouver.

Drill core was moved directly from the drill to the on-site logging facility at camp once a day, weather permitting. The exploration drill core was logged at the camp. There, the samples were marked, tagged, split and placed in a plastic bag with duplicate tag and sealed. The sample numbers and intervals are recorded on a logging sheet, and entered digitally into an excel spreadsheet. Plastic bags of samples were in turn placed in plastic pails. These pails were periodically shipped to Kangerlussuaq by helicopter. Hudson personnel and consultants accomplished all of this work.

Hudson used both ALS Chemex and Actlabs as the primary analytical laboratories. Both are corporately accredited to ISO 9001A:2000.



# **12** SAMPLE PREPARATION, ANALYSES AND SECURITY

The primary laboratories used for analytical work in 2011 were ALS Chemex in Vancouver and Actlabs in London, Ontario.

## **12.1** Sample Preparation

Preparation of samples for analytical work was not performed by Hudson. Once diamond drill core samples were put into sample bags no other sample preparation steps were conducted by employees, consultants, officers, directors, or associates of the Company. Sample security was more than adequate at the project site.

At the laboratory the drill core samples were crushed to 70% 2mm or better which is a standard preparation procedure for samples where a representative split was pulverized. The sample was then split using a riffle splitter and pulverized to 85% passing 75 micron or better.

## **12.2** Laboratory method

All of the core samples were analysed using the ME -MS81h analytical package. A lithium borate fusion of the sample is conducted prior to acid dissolution and ICP-MS analysis. This technique solubilises most mineral species, including those that are highly refractory. Some of the samples were analysed using the ME-MS61 package.

In 2009, selected pulp splits from ALS Chemex were sent to ACME Analytical in Vancouver, BC where they were analysed using Group 4B. Group 4B is a Total Trace Elements analysis package by ICP-MS. Rare Earth and refractory elements were determined by ICP mass spectrometry following a lithium metaborate / tetraborate fusion and nitric acid digestion. In addition, a separate 0.5 g split is digested in Aqua Regia and analysed by ICP mass spectrometry to report the precious and base metals.



# **13 DATA VERIFICATION**

The Senior Author of the recently filed 43-101 report, Mike Druecker, has visited the project on many occasions. Each time he examines geological, geochemical and geophysical data, the surface geology, recent drill core, and the procedures used by Hudson personnel in preparing the drill core samples to be sent to the analytical laboratory for analysis. Original geochemical analytical certificates were examined at the campsite in Greenland and the corporate office in Vancouver. Everything was found to be in order.

Split core samples, drill logs, assay intervals, and geotechnical data from the 2011 drilling programs were reviewed and examined on site by Druecker for consistency in lithology, alteration and mineralization. Higher-grade TREO core zones were inspected visually and with a hand-held Niton and corroborated with the corresponding assay intervals. The results of this field and data inspection, and of the assay verification program, indicate that the geological and geochemical data, and the analytical data of the 2011 drilling at the Sarfartoq project are acceptable.

## 13.1 Standards

For the initial exploration drilling conducted in 2009, seventeen NRCan OKA-2 standards were used. This standard had very high La, Ce and Nd and was not an ideal standard for the Sarfartoq REE mineralization.

In 2010, Hudson commissioned an REE standard to be created from Sarfartoq ST1 Zone material. The standard was prepared by CDN Resource Laboratories Ltd. (CDN) in Langley, BC. CDN prepared a homogeneous pulp from ST1 material and 60 samples of 30g each were split and sent out for round-robin analysis to six independent laboratories. Results were then certified by Smee & Associates Consulting Ltd.

<b>Certified Standa</b>	rd		Drill Standards	based on 125	Variance	Drill Standards	based on 154	Variance
Smee & Associat	tes Consulting Ltd.		Samples submi	tted to Actlabs	to Mean	Samples submi	to Mean	
	Certified Mean	2 Standard Deviations	Mean	2 Standard Deviations		Mean	2 Standard Deviations	
Fusion Ce	6768 ppm	572 ppm	6,439 ppm	468 ppm	-4.9%	6,726 ppm	724 ppm	-0.6%
Fusion La	2665 ppm	196 ppm	2,713 ppm	178 ppm	1.8%	2,770 ppm	297 ppm	3.9%
Fusion Nd	2615 ppm	272 ppm	2,489 ppm	141 ppm	-4.8%	2,614 ppm	261 ppm	0.0%
Fusion Pr	746 ppm	62 ppm	734.54 ppm	51 ppm	-1.5%	803.1 ppm	91 ppm	7.7%
Fusion Sm	235 ppm	16 ppm	243.94 ppm	14 ppm	3.8%	88.63 ppm	20 ppm	-62.3%
Fusion Eu	50.9 ppm	2.8 ppm	50.683 ppm	3 ppm	-0.4%	52.11 ppm	6 ppm	2.4%
Dusion Dy	25.5 ppm	2.2 ppm	21.922 ppm	3 ppm	-14.0%	24.88 ppm	3 ppm	-2.4%
Fusion Th	442 ppm	46 ppm	458.53 ppm	27 ppm	3.7%	508.1 ppm	94 ppm	15.0%

#### Table 13-1: Analysis of Certified Standards vs Standards submitted into drill program

In 2011, a total of 279 blanks, 279 standards and 279 duplicates were inserted at regular intervals when preparing the 7000+ split drill core samples (approx. one standard per 25 samples). The analytical results were reviewed and assessed using the blanks, the standards and the duplicates. A similar frequency was used in 2009 and 2010. In general, the mean results fall within two standard deviations of the certified standard and demonstrate the veracity of the drill results.

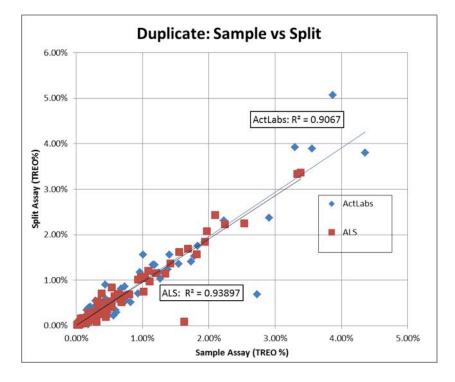


# 13.2 Blanks

The blanks consisted of local un-mineralized and unaltered granitic gneisses from the Garnet Lake area. The REE content was extremely low. Of the 277 blanks submitted in 2011, the mean REE content was 304 ppm (standard deviation of 284 ppm).

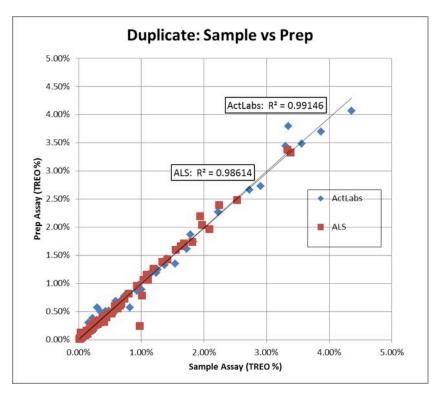
# **13.3 Field Duplicates**

Duplicates were collected at the same frequency as both standards and blanks. For each of the 277 designated duplicate samples collected in 2011, the split core was re-split into quarters and both quarters were sent to the lab. From the duplicate quarter, one field duplicate and two laboratory duplicates (split and pulp) were obtained. At both Actlabs and ALS the field duplicates demonstrated good correlation (R2 = 0.91 and 0.94) considering the heterogeneity of the sample material (Figure 13-1). Lab duplicates also demonstrated excellent correlation for prep duplicates and pulp duplicates (R2 = 0.992 and 0.998 for Actlabs and 0.986 and 0.961 for ALS) as can be seen in Figure 13-2and Figure 13-3.



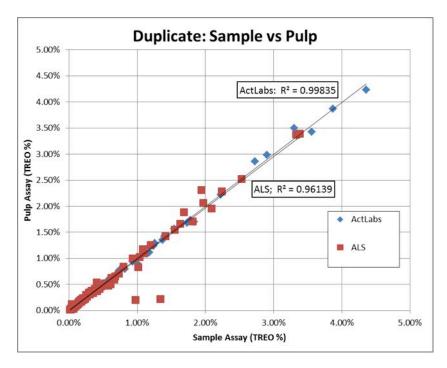
#### Figure 13-1 REE Field Sample Verification (Duplicates)





#### Figure 13-2 REE Lab Sample Verification (Prep Duplicates)

Figure 13-3 REE Lab Sample Verification (Pulp Duplicates)





## 13.4 Check Assays

In 2009, as part of the QA/QC program, Hudson Resources employed one check lab to which duplicate pulps were sent to confirm the primary lab accuracy. From this program, 18 pulps were sent to ACME Analytical in Vancouver.

There has been no check assays performed yet for the 2011 core samples but the use of new standards in 2011 will help evaluate what the best analysis is when these checks are done.

Table 13-2 results show that the ALS Chemex lab was in most cases lower than ACME Lab for almost all of the rare earth elements. Some of these samples were rerun at ALS Chemex and yielded very similar results to the first run. Because the results from the first and the second run at ALS Chemex were very similar, the higher values from ACME were discounted. It is not known why there was a difference between labs in some of the samples.

There has been no check assays performed yet for the 2011 core samples but the use of new standards in 2011 will help evaluate what the best analysis is when these checks are done.

	ALS vs. ACME	Number of samples
Ba	-27.00	13
Nb	-28.60	18
Rb	-2.19	18
Th	-4.80	18
U	-14.70	18
Y	-12.90	18
La	-2.90	18
Ce	-9.20	18
Pr	-0.80	18
Nd	-8.90	18
Sm	5.30	18
Eu	-0.80	18
Gd	41.20	18
Tb	41.60	18
Dy	-1.40	18
Но	3.30	18
Er	68.50	18
Tm	-33.70	15
Yb	-9.60	18
Lu	7.70	18

Table 13-2 : Relative differences of analyses between ALS Chemex and ACME labs



# 13.5 Core Recovery

Core recovery was close to 100% in all holes. A few drill holes encountered small zones of broken, fractured rock over one meter or less that dropped recovery slightly but these sections were mostly in the fenetized granites and not the main carbonatite bodies.

### 13.6 Site Visits

Dr. Michael Druecker (Druecker) was retained by Hudson Resources Inc. (Hudson), to prepare an independent Technical Report on the Sarfartoq Project, in West Greenland. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. Druecker visited the project on multiple occasions in 2010 and 2011. In 2010 from May 30 to June 5 and from August 15 to September. In 2011 from May 4 to May 17, from June 21 to June 23 and from August 7 to August 24.

Geosim Services Inc. (Geosim) was retained by Hudson to prepare a 43-101 compliant Independent Resource Estimate of the ST1 Zone on the Sarfartoq Carbonatite to be incorporated into the 43-101 report. Simpson visited the project from September 7-9, 2010. Three samples of core from two drill holes were collected and submitted to ACME Laboratories for analysis. Results for REE's were consistent with the reported values of the intervals from which they were collected (Table 13-3).

Sample	Dhole	Depth	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
SAR-1	SAR10-08	344.5	4443	15399	1859	7048	793.4	172.6	446.6	30.32	74.83
	Assay Interval	343-345	1775	6000	880	3120	355	78	287	20.6	35.4
SAR-2	SAR10-08	295.7	1566	6030	900.6	3611	397.3	75.84	160.8	9.69	25.6
	Assay Interval	295-297	4350	12350	1635	5680	622	150	488	35.1	67.5
SAR-3	SAR10-16	283.5	843.9	2048	257.7	900.2	113.6	29.7	75.14	5.58	13.26
	Assay Interval	282-284	1535	3890	462	1530	190	51.6	165	12.7	24.3

Table 13-3: September 2010 site visit check sample results

Sample	Dhole	Depth	Но	Er	Tm	Yb	Lu	Y	Nb	Та
SAR-1	SAR10-08	344.5	2.59	2.6	0.57	5.29	0.43	119.9	61.2	<0.1
	Assay Interval	343-345	3.25	15	0.33	2.7	0.26	55	28	<0.5
SAR-2	SAR10-08	295.7	0.25	0.63	0.2	2.21	0.15	36.5	77.9	0.2
	Assay Interval	295-297	5.65	26	0.67	4.1	0.41	108	60	<0.5
SAR-3	SAR10-16	283.5	0.76	0.89	0.21	1.87	0.21	24.6	204.1	4.6
	Assay Interval	282-284	2.3	7.5	0.14	2.1	0.24	39	55	1.3

## 13.7 Conclusions

Both ALS/Chemex land Actlabs laboratories have provided Hudson with consistent and quality assays for two years now and will continue to be used in the future. Results for the standards, blanks and duplicates are rarely incongruous and there have been no sample mix-ups or loss of samples.



# 14 ADJACENT PROPERTIES

Not Applicable



# 15 MINERAL PROCESSING AND METALLURGICAL TESTING

Metallurgical testing is ongoing. Positive progress continues to be made on the flowsheet for the ST1 Zone which hosts the rare earths in bastnasite and monazite mineralization. The company has consolidated the major testwork components at SRC in Saskatoon under the direction of John Goode, P.Eng. Earlier testwork at SRC demonstrated that recoveries of over 90% were achievable utilizing acid baking and leaching. Preliminary flotation and gravity testwork to date has demonstrated the ability to upgrade the ore and more work is ongoing. Additional beneficiation and hydrometallurgical testwork is continuing at SRC.



## 16 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

### 16.1 Introduction

The ST1 zone is at an intermediate stage of exploration. This section describes the first mineral resource estimate update prepared with the latest drilling results and geological interpretation. The primary economic items are rare earth oxides.

## **16.2 Exploratory Data Analysis**

The ST1 drill hole database consists of 50 BTW core holes drilled on the deposit between 2009 and 2011. Core recovery has been excellent averaging close to 100%. A summary of the drilling and sampling is presented in Table 16-1.

Year	Holes	Metres	Assay Intervals	Metres Sampled	Core Size
2009	4	573.40	216	392.55	BTW
2010	15	4163.40	2357	2954.10	BTW
2011	34	8560.62	4454	8928.45	BTW
Total	19	4736.80	2573	3346.65	BTW

Table 16-1	ST1	drilling	summary
	~		

The database includes interval tables for lithology, alteration, degree of oxidation, mineralogy/veining. Lithologic codes used for ST1 are listed in Table 16-2.

Code	Description
AMGN	Amphibolite Gneiss
BX	Breccia
CARB	Carbonatite
DIA	Diabase
FLT	Fault
FLT ZN	Fault Zone
GAB	Gabbro
GGN	Granitic Gneiss
KD	Kimberlitic dike
OVB	Overburden
PEG	Pegmatite
Q	Quartz
UNK	Unknown
VN	carbonatite vein

Table 16-2 ST1 lithologic codes

Statistical analysis was carried out both within the carbonatite domain and within the gneiss complex using gradeshell domains defined by indicator kriging with a threshold of 0.5% TREO. The main carbonatite domain hosts the bulk of the significant TREO levels and averages1.61% TREO. Elevated levels in the surrounding gneiss generally occur in close proximity to the carbonatite contact and average 0.84% TREO within the grade shell constraint.



Statistics for the individual rare earth oxides within the carbonatite and gneiss domains are shown in Table 16-3 and Table 16-4.

	Treo %	La₂O₃ ppm	Ce₂O₃ ppm	<b>Pr₂O₃</b> ppm	<b>Nd₂O₃</b> ppm	<b>Sm₂O</b> ₃ ppm	<b>Gd₂O₃</b> ppm	<b>Tb₂O₃</b> ppm	<b>Eu₂O</b> ₃ ppm	<b>Dy₂O₃</b> ppm	Y₂O₃ ppm
Count	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467
Min	0.03	48	114	14.5	54	9.3	5.4	0.69	3	2.2	6
Max	6.59	16771	34084	3429.1	11839	1310.4	848.3	81.84	320	137.1	491
Median	1.40	2697	6864	820.4	2718	271.4	141.2	11.68	62	30.1	60
Mean	1.61	3433	8034	931.5	3069	302.3	169.6	13.11	67	32.2	64
Variance	1.18	7749778	30818277	347415	3687836	32954	13144	64	1474	310	1307
Std Dev	1.09	2783.84	5551.42	589.42	1920.37	181.53	114.65	7.99	38.39	17.60	36.15
сv	0.67	0.81	0.69	0.63	0.63	0.60	0.68	0.61	0.57	0.55	0.56

#### Table 16-3 Statistics of REO within carbonatite domain

#### Table 16-4 Statistics of REO within gneiss domain

	Treo %	La <sub>2</sub> O <sub>3</sub> ppm	Ce <sub>2</sub> O <sub>3</sub> ppm	Pr <sub>2</sub> O <sub>3</sub> ppm	Nd <sub>2</sub> O <sub>3</sub> ppm	Sm <sub>2</sub> O <sub>3</sub> ppm	Gd <sub>2</sub> O <sub>3</sub> ppm	Tb <sub>2</sub> O <sub>3</sub> ppm	Eu <sub>2</sub> O <sub>3</sub> ppm	Dy <sub>2</sub> O <sub>3</sub> ppm	Y <sub>2</sub> O <sub>3</sub> ppm
Count	420	420	420	420	420	420	420	420	420	420	420
Min	0.01	25	55	6.1	20	3.7	2.5	0.39	1	1.7	5
Max	4.86	13018	24363	2364.1	7115	793.2	477.2	39.59	213	173.2	740
Median	0.69	1135	3274	462.9	1627	163.8	72.2	6.09	33	16.6	41
Mean	0.84	1585	4132	520.6	1771	179.4	92.5	7.62	39	20.8	48
Variance	0.42	2285355	10659816	141822	1523326	14666	6104	39	749	297	2129
Std Dev	0.65	1511.74	3264.94	376.59	1234.23	121.10	78.13	6.28	27.36	17.23	46.14
CV	0.77	0.95	0.79	0.72	0.70	0.67	0.84	0.82	0.70	0.83	0.96

### 16.3 Analysis of Outliers

Before compositing, the grade distribution in the raw sample data was examined to determine if grade capping or special treatment of high outliers was warranted. Log probability plots were examined for outlier populations and decile analyses were performed for La2O3, Ce2O3, Pr2O3 and Nd2O3 within the carbonatite domain. As a general rule, the cutting of high grades is warranted if:

- the last decile (upper 10% of samples) contains more than 40% of the metal; or
- the last decile contains more than 2.3 times the metal of the previous decile; or
- the last centile (upper 1%) contains more than 10% of the metal; or
- the last centile contains more than 1.75 times the next highest centile.

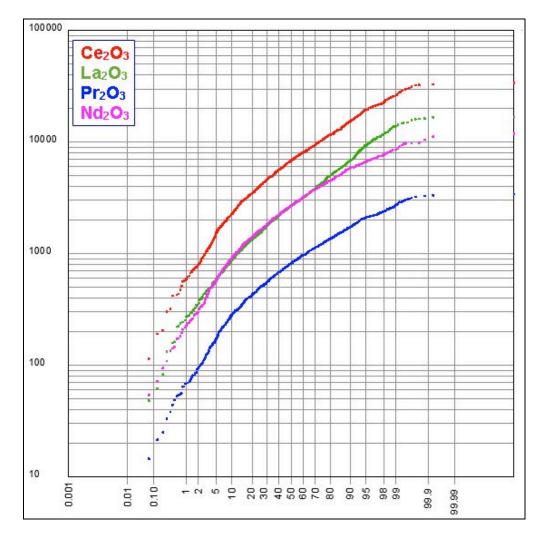
It was found that none of these criteria applied to any of the principal REO components. The last decile values ranged from 20.5 to 29.9% and the last centiles ranged from 2.2 to 5.3%.

Probability plots for the major oxides showed no significant outlier populations. (Figure 16-1)

It was concluded that no grade capping or special treatment of outliers was warranted.



#### Figure 16-1 Cumulative probability plots



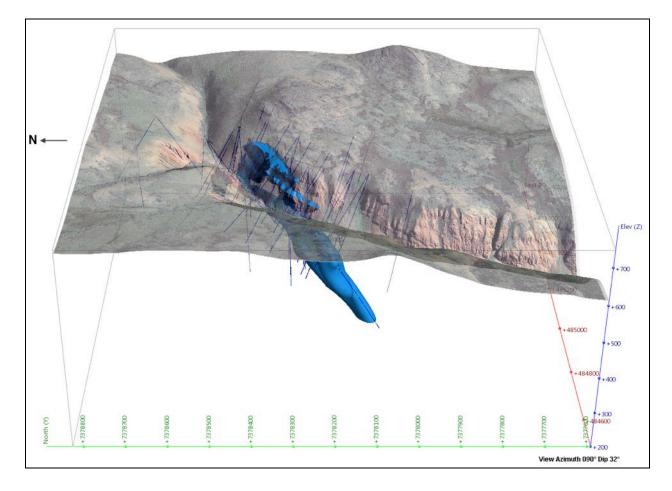
### 16.4 Deposit Modeling

Lithology was interpreted from drill hole intercepts and limited surface sampling data. Leapfrog3d© software was used to assist in the development of sol models with subsequent manual modifications in the form of control strings to further modify the wireframes. A solid model was created for the main intrusive carbonatite bodies and everything beyond these was coded as part of the gneiss complex.

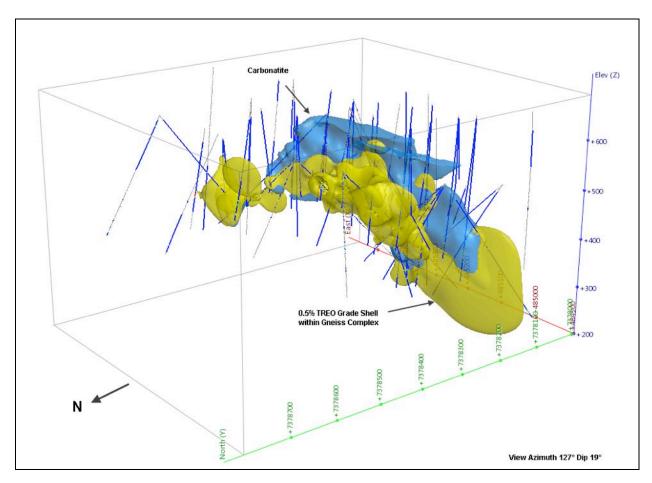
Within the gneiss complex, indicator kriging was used to define isosurfaces corresponding to a grade of 0.5% TREO in order to constrain the estimate to mineralized areas.



# Figure 16-2 Lithologic model of Carbonatite







#### Figure 16-3 Carbonatite model and 0.4% TREO grade shell in gneiss complex

### 16.5 Compositing

REO grades were composited using the 'best fit' method for the mineralized domains within the main carbonatite unit and the surrounding gneiss complex grade shell. This procedure produces samples of variable length, but of equal length within a contiguous drill hole zone, ensuring the composite length is as close as possible to the nominated composite length. In this case, the nominated length was set at 2m. Intervals within the domains that were not sampled were assumed to have zero grade and diluted accordingly. Statistics for composites are summarized in the following tables.



	Treo %	La <sub>2</sub> O <sub>3</sub> ppm	Ce <sub>2</sub> O <sub>3</sub> ppm	Pr <sub>2</sub> O <sub>3</sub> ppm	Nd <sub>2</sub> O <sub>3</sub> ppm	Sm <sub>2</sub> O <sub>3</sub> ppm	Gd <sub>2</sub> O <sub>3</sub> ppm	Tb <sub>2</sub> O <sub>3</sub> ppm	Eu <sub>2</sub> O <sub>3</sub> ppm	Dy <sub>2</sub> O <sub>3</sub> ppm	Y <sub>2</sub> O <sub>3</sub> ppm
n	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280
Min	0.07	140	326	39.4	131	17.7	11.7	1.15	5	3.3	8
Max	6.29	15480	32355	3279.6	10340	1046.4	682.1	48.34	208	112.6	389
Median	1.38	2705	6771	807.4	2645	263.9	146.5	11.81	60	29.7	60
Mean	1.60	3453	7993	920.1	3015	294.9	171.1	13.06	66	31.5	64
Variance	1.05	7068158	27460747	300805	3120866	26707	12029	56	1204	254	1041
Std Dev	1.03	2658.60	5240.30	548.46	1766.60	163.42	109.68	7.49	34.70	15.93	32.26
COV	0.64	0.77	0.66	0.60	0.59	0.55	0.64	0.57	0.53	0.51	0.51

#### Table 16-5 Composite Statistics – Carbonatite Domain

#### Table 16-6 Composite Statistics – Gneiss Domain

	Treo %	La <sub>2</sub> O <sub>3</sub> ppm	Ce <sub>2</sub> O <sub>3</sub> ppm	Pr <sub>2</sub> O <sub>3</sub> ppm	Nd <sub>2</sub> O <sub>3</sub> ppm	Sm <sub>2</sub> O <sub>3</sub> ppm	Gd <sub>2</sub> O <sub>3</sub> ppm	Tb <sub>2</sub> O <sub>3</sub> ppm	Eu <sub>2</sub> O <sub>3</sub> ppm	Dy <sub>2</sub> O <sub>3</sub> ppm	Y <sub>2</sub> O <sub>3</sub> ppm
n	340	340	340	340	340	340	340	340	340	340	340
Min	0.00	0	0	0.0	0	0.0	0.0	0.00	0	0.0	0
Max	4.05	10827	20290	2014.0	6201	665.0	396.5	32.92	177	128.9	548
Median	0.70	1197	3386	447.6	1581	155.0	71.9	5.84	32	16.6	39
Mean	0.80	1537	3938	491.3	1676	170.0	86.6	7.12	37	19.5	46
Variance	0.28	1626262	7108910	90874	995610	9864	3736	25.21	512	203	1456
Std Dev	0.53	1275.25	2666.25	301.45	997.80	99.32	61.12	5.02	22.63	14.24	38.16
COV	0.66	0.83	0.68	0.61	0.60	0.58	0.71	0.70	0.61	0.73	0.83

### 16.6 Density

In 2010 and 2011, 1785 core samples of the various lithologies, alteration and mineralization styles were measured for specific gravity ("SG") mainly at the Hudson campsite during drill core logging of rock properties, with several checks done by Aurora Geosciences Ltd., Yukon, Canada. Model blocks within the carbonatite solid were assigned a density value of 3.02 based on the median value of 385 density measurements. Model blocks within the gneiss domain were assigned a value of 2.72 which was the mean value of 1105 measurements representing the principle lithologies represented in the gneiss complex.

### 16.7 Variogram Analysis

Due to restrictions imposed by topography and equipment it was not possible to drill the zone in the preferred orientation across the structure. Many of the holes intersected the mineralized zone at shallow angles supplying little in the way of data to model directional variograms in other orientations. Pairwise relative semi-variogram models were interpreted using data within the carbonatite unit with maximum ranges of 40 m Table 16-7.



Table 10 7 Sel	n variogram	Tuble 10 / Semi variogram model parameters											
Axis	Azim	Dip	со	c1	a1	c2	a2						
Major	251.2	28.0	0.025	0.209	15	0.081	40						
Semi-Major	7.9	40.2	0.025	0.209	15	0.081	40						
Minor	317.5	-37.0	0.025	0.209	15	0.081	16.7						

#### Table 16-7 Semi variogram model parameters

## **16.8 Block Model and Grade Estimation Procedures**

A block model was created in Surpac Vision software using a block size of 5x5x5 metres. The parameters of the model are summarized in the following table.

 Table 16-8 Block model parameters

	Min	Max	Extent	Size	# blocks
Χ	484,550	485,700	1,150	5	230
Y	7,377,650	7,378,900	1,250	5	250
Z	200	800	600	5	120

Model blocks were assigned a lithologic code based on the majority of each block within the solid model of the carbonatite unit. All remaining unassigned blocks below surface were then categorized as gneiss. Block density values were assigned as described in Section 16.6.

Hard boundaries were imposed between the domain constraints. An anisotropic search ellipse was oriented paralleling the trend of the carbonatite plunging  $28^{\circ}$  towards an azimuth of  $251^{\circ}$  with a tilt of  $47^{\circ}$  (Axes of rotation using ZXY LRL of  $251^{\circ}$ ,  $28^{\circ}$ ,  $47^{\circ}$ ). Block grades were estimated for each REE using the inverse distance squared method (ID<sup>2</sup>) in two passes. The first pass used a maximum anisotropic search of 30 m corresponding to 75% of the maximum variogram range and the second pass used a maximum search distance of 80 m. Composites from at least two drill holes were required to estimate a block. This was accomplished by limiting the number of composites per hole to 4 and specifying the minimum number of composites as 5. Details of the block estimation parameters are summarized in Table 16-9

		Search Dis	tances				
Domain	Pass	Major Axis	Semi- major Axis	Minor Axis	Min # Composites	Max # Composites	Max per hole
CARB	1	30	30.0	12.5	5	15	4
CAKD	2	80	80.0	33.3	5	20	4
GNSS	1	30	30.0	12.5	5	15	4
	2	80	80.0	33.3	5	20	4

 Table 16-9 ID<sup>2</sup> Grade estimation parameters

The following set of figures illustrates the TREO block grade distribution in plan, section and perspective views.



#### Figure 16-4 TREO block grades - 570 level

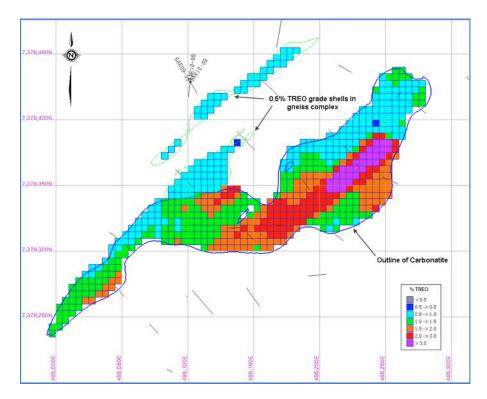
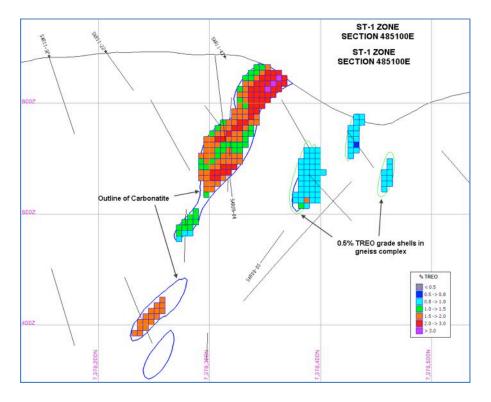


Figure 16-5 TREO block grades - Section 485100





#### Figure 16-6 TREO block grades - Section 7378280N

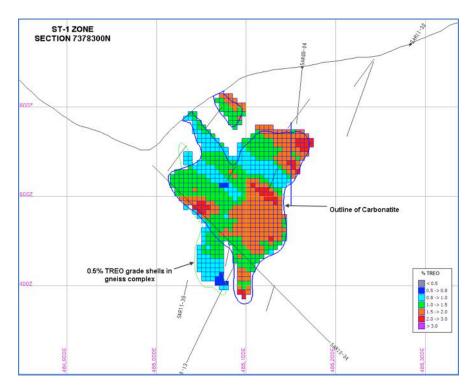
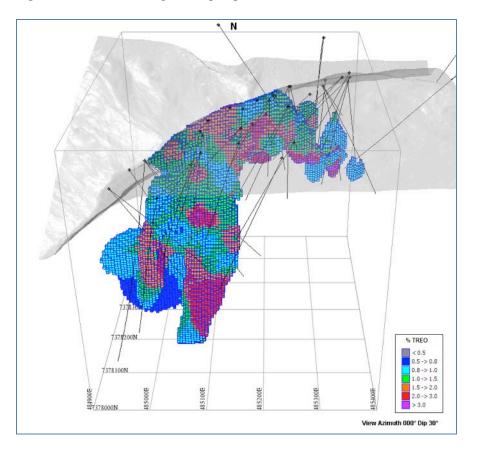


Figure 16-7 TREO block grades - perspective view





## 16.9 Mineral Resource Classification

Resource classifications used in this study conform to the following definition from National Instrument 43-101:

#### Mineral Resource

A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

#### Measured Mineral Resource

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

### Indicated Mineral Resource

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

### Inferred Mineral Resource

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Blocks were classified as 'Indicated' if they were within the main carbonatite domain and were estimated in the first pass using a maximum search distance of 30 m. All other estimated blocks were classified as 'Inferred'.



## 16.10 Model Validation

Model verification was initially carried out by visual comparison of blocks and sample grades in plan and section views. The estimated block grades showed reasonable correlation with adjacent composite grades.

A comparison of global mean values within the carbonatite domain shows a reasonably close relationship with samples, composites and block model values (Table 16-10 and Table 16-11).

Table 10-10 Global mean grade comparison – Carbonat								
REO	Samples	Composites	ID <sup>2</sup> Blocks					
La <sub>2</sub> O <sub>3</sub> ppm	3433	3453	3343					
Ce <sub>2</sub> O <sub>3</sub> ppm	8035	7993	7802					
Pr <sub>2</sub> O <sub>3</sub> ppm	932	920	907					
Nd <sub>2</sub> O <sub>3</sub> ppm	3069	3015	2973					
$Sm_2O_3$ ppm	302	295.0	293.0					
$Gd_2O_3$ ppm	170	171	163					
Tb <sub>2</sub> O <sub>3</sub> ppm	13	13	13					
Eu <sub>2</sub> O <sub>3</sub> ppm	67	66	66					
$Dy_2O_3$ ppm	32	32	31					
$Y_2O_3$ ppm	64	64	63					
TREO %	1.61	1.60	1.56					

Table 16-10 Global mean grade comparison – Carbonatite Domain

#### <u> Table 16-11 Global mean grade comparison – Gneiss Domain</u>

REO	Samples	Composites	<b>ID<sup>2</sup> Blocks</b>
La <sub>2</sub> O <sub>3</sub> ppm	1547	1537	1422
Ce <sub>2</sub> O <sub>3</sub> ppm	3988	3938	3556
Pr <sub>2</sub> O <sub>3</sub> ppm	499.0	491.0	441.0
Nd <sub>2</sub> O <sub>3</sub> ppm	1705	1676	1514
$Sm_2O_3$ ppm	173.0	170.0	154.0
$Gd_2O_3$ ppm	87.0	87.0	81.0
Tb <sub>2</sub> O <sub>3</sub> ppm	7.00	7.00	7.00
Eu <sub>2</sub> O <sub>3</sub> ppm	37	37	36
Dy <sub>2</sub> O <sub>3</sub> ppm	20.0	20.0	19.0
Y <sub>2</sub> O <sub>3</sub> ppm	47	46	42
TREO %	0.81	0.80	0.65

## **16.11 Mineral Resource Summary**

The following tables present the mineral resource estimate for the ST1 zone assuming an underground mining scenario at a range of cut-off grades with the base case in bold face. The selected base case cut-off grade of 1.0% TREOs considered consistent with other mineral deposits of similar characteristics, scale and location. The effective date of the estimate is April 26, 2012.



COG % TREO	Tonnes (000's)	TREO %	La <sub>2</sub> O <sub>3</sub> ppm	Ce <sub>2</sub> O <sub>3</sub> ppm	Pr <sub>2</sub> O <sub>3</sub> ppm	Nd <sub>2</sub> O <sub>3</sub> ppm	<b>Sm<sub>2</sub>O</b> <sub>3</sub> ppm	Gd2O 3 ppm	Tb <sub>2</sub> O <sub>3</sub> ppm	Eu <sub>2</sub> O <sub>3</sub> ppm	Dy <sub>2</sub> O <sub>3</sub> ppm	Y <sub>2</sub> O <sub>3</sub> ppm
0.6	7,221	1.60	3,452	7,969	919	2,998	294	166	13	66	31	63
0.8	6,755	1.66	3,589	8,275	952	3,107	304	172	13	68	32	65
1.0	5,884	1.77	3,855	8,844	1,012	3,296	321	181	14	71	34	68
1.2	5,083	1.87	4,110	9,383	1,067	3,473	337	188	14	74	35	71
1.4	4,117	2.01	4,452	10,070	1,135	3,681	353	197	15	78	37	73
1.6	3,111	2.17	4,921	10,927	1,214	3,896	367	207	16	81	38	76
1.8	2,246	2.36	5,426	11,878	1,304	4,154	385	214	16	84	40	78
2.0	1,612	2.54	5,945	12,822	1,392	4,404	401	212	16	87	41	80

#### Table 16-12 ST1 Zone Indicated Mineral Resource

 Table 16-13 ST1 Zone Inferred Mineral Resource

COG % TREO	Tonnes (000's)	TRE O %	La <sub>2</sub> O <sub>3</sub> ppm	Ce <sub>2</sub> O <sub>3</sub> ppm	Pr <sub>2</sub> O <sub>3</sub> ppm	Nd <sub>2</sub> O <sub>3</sub> ppm	<b>Sm<sub>2</sub>O</b> <sub>3</sub> ppm	<b>Gd</b> <sub>2</sub> <b>O</b> <sub>3</sub> ppm	Tb <sub>2</sub> O <sub>3</sub> ppm	Eu <sub>2</sub> O <sub>3</sub> ppm	Dy <sub>2</sub> O <sub>3</sub> ppm	Y <sub>2</sub> O <sub>3</sub> ppm
0.6	5,200	1.16	2,358	5,751	694	2,323	234	118	10	51	25	55
0.8	3,538	1.38	2,847	6,843	815	2,703	272	140	11	60	29	60
1.0	2,459	1.59	3,343	7,930	932	3,073	310	162	13	69	33	67
1.2	1,872	1.75	3,721	8,719	1,012	3,322	333	174	14	75	36	72
1.4	1,433	1.88	4,060	9,423	1,082	3,535	352	183	15	78	38	76
1.6	1,028	2.04	4,449	10,216	1,160	3,767	371	194	16	82	40	80
1.8	757	2.16	4,764	10,853	1,222	3,948	385	204	16	85	42	85
2.0	521	2.28	5,143	11,480	1,273	4,062	390	208	17	87	44	89

Assumptions used to establish the base case underground cut-off grade were:

- A weighted average bulk concentrate price of \$32/kg corresponding to a 54% discount on the three-year trailing average REO prices as of April, 2012.
- The three year trailing average for REE prices (per kilogram) as of April 2012: La<sub>2</sub>O<sub>3</sub> \$46.40; Ce<sub>2</sub>O<sub>3</sub> \$44.60; Pr<sub>2</sub>O<sub>3</sub> \$99.00; Nd<sub>2</sub>O<sub>3</sub> \$112.80; Sm<sub>2</sub>O<sub>3</sub> \$47.70; Gd<sub>2</sub>O<sub>3</sub> \$67.70; Tb<sub>2</sub>O<sub>3</sub> \$1287.60; Eu<sub>2</sub>O<sub>3</sub> \$1586.10; Dy<sub>2</sub>O<sub>3</sub> \$713.10; Y<sub>2</sub>O<sub>3</sub> \$67.80.
- TREO cut-off grades of 0.6%, 0.8%, 1.0% and 1.2% were considered potentially viable at break-even mining costs (General & Administration, Processing and Ore Mining costs) of \$125/tonne, \$166/tonne, \$208/tonne and \$250/tonne, respectively.

A recovery of 65% has been assumed and will be revised when metallurgical test results are available.



# **17 OTHER RELEVANT DATA AND INFORMATION**

There are no other data known to Druecker or Geosim that are relevant to this Technical Report: therefore there are no relevant data or information presented in this section.

Furthermore, there are no known factors or issues that materially affect the estimate of mineral resources.



# **18 INTERPRETATION AND CONCLUSIONS**

The report presents the exploration work conducted by Hudson Resources on the Sarfartoq REE project in West Greenland.

The exploration programs have been performed using industry standard practices.

On the Sarfartoq REE project field observations combined with mineralogical and petrographic analysis confirms that the REE mineralization at the ST1 Zone is associated with coarse grained ferrocarbonatite bodies composed mostly of ankerite, ferrodolomite, siderite, K feldspar, barite and pyrite. The rare earth elements (REE) are associated with hematite and ankeritic-calcitic masses containing fine-grained bastnäsite, synchysite-(Ce), synchysite-(Nd) and monazite identified with an SEM (Scanning Electron Microscope).

At ST40, a ferrocarbonatite body was intersected when drilling holes SAR09-02 and SAR09-03. Core angles in both holes indicate that this body is dipping at about 40° to the North. The body was intersected numerous times in 2011 and appears to be a steeply dipping narrow dyke. The grades were lower than expected however and the area has been given a lower priority for now.

Based on core angles, the main body at ST1 appears to be a large dyke-like feature striking to the northeast and dipping to the northwest. It is surrounded by a halo of associated stringers and stock work (described as veins in the logs) of various orientations. The incised valley would presumably be located where these friable ferrocarbonatite bodies are located. Some of the higher-grade surface samples were taken from rocks in the streambed.

Drilling in 2011 has identified what appears to be a lineal zone of higher grade material within the body itself. Additionally, drilling has extended the zone to the north, revealing more, high grade zones at the same time.

Another large ferrocarbonatite body was intersected at ST19 "East" in two drill holes in 2010. Its orientation cannot be determined due to a lack of holes but it appears to be a steeply dipping body about 30 to 40 meters wide. Drilling in 2011 determined that there is no obvious extension to this body and that it is probably a small blow in a dyke or a remnant of a larger weather out body.

Numerous high-grade grab samples were collected throughout the ST19 area in 2010 and 2011 and a large number of outcropping ferrocarbonatite veins observed. When associated with high radiometric signatures, these areas become priority drill targets, many of which remain to be drilled

A number of high-grade samples were collected from the ST24 area. Though no large intersections of ferrocarbonatite were discovered during drilling in 2010, interest in the area remains high and will be drill tested in 2012.

Some unexpected intersections of carbonatite in holes drilled between the ST1 and ST40 zones have increased interest in the area and time permitting it will be drill tested again in 2012.



Overall, it appears that the best drill targets arise from a combination of 1) a strong radiometric signature 2) magnetic low geophysical anomalies 3) obvious outcrops of ferrocarbonatite 4) high assay numbers in associates grab samples and 5) moderate to strong fenitization of host rocks. These anomalies are pervasive around the outer ring structure of the Sarfartoq Carbonatite Complex.

The resource estimate that is the subject of this report has been updated and is estimated to contain indicated resources of 5.9M tonnes averaging 1.8% total rare earth oxides (TREO) and inferred resources of 2.5M tonnes averaging 1.6% TREO for the ST1 zone, based on a 1.0% cut-off grade and an underground mining scenario.

The SCC is mineralized across the entire extent of the complex and large areas remain to be drill tested. It is hoped that there will be additional bodies similar to the ST1 Zone found as exploration activities continue.



### **19 RECOMMENDATIONS**

Based on the exploration work conducted in 2011 and on the conclusions presented above, the main recommendations are as follows:

- 1) Focus exploration efforts on the REE potential of the Sarfartoq Carbonatite Complex. Current REE fundamentals suggest that a gross per tonne value of the REE material is an order of magnitude more valuable than the diamondiferous kimberlite, and as such, all resources should be directed toward defining an economic REE project.
- 2) Continue bench scale metallurgical studies on the ST1 Zone material.
- 3) Continued expansion of the exploration drill program at and around the ST1 Zone in order to expand and upgrade the resource
- 4) Complete additional exploration drilling on other REE targets around the 32 kilometer outer ring structure of the SCC.
- 5) Begin Prefeasibility Studies in mid to late 2012.
- 6) Continue Environmental Impact Assessment studies.
- 7) Continue Socio-economic talks with the local population.
- 8) Begin Archeological Studies in conjunction with local experts.

A recommended budget for work in 2012 is as follows:

#### 2) Field Program

10) Drilling	10,000 m
11) Helicopter	300 hours
12) Camp Supplies	Food, fuel, materials
13) Personnel	Geologists, cooks, helpers
14) Travel	Airfares, hotels, meals
Total	(based on \$350/m as per 2011)
15) EIA/SIA	Baseline EIA (consultant)
16) Metallurgy – Phase 2	
17) Prefeasibility Study	(2012 portion of )
18) G&A	
Т	OTAL

The remainder of available funds will be used for general working capital and potential acquisitions, as and when identified.



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# 21 DATE AND SIGNATURE PAGE

The effective date of this Technical report, entitled "Technical Report on the Sarfartoq Project, West Greenland is April 26, 2012.

Michael D. Junech

Michael D. Druecker, Ph.D., CPG

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Ronald G. Simpson, P.Geo.

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## Certificate of Author – Ronald G. Simpson, P.Geo.

I, Ronald G. Simpson, P.Geo, residing at 1975 Stephens St., Vancouver, British Columbia, V6K 4M7, do hereby certify that:

- 1. I am president of GeoSim Services Inc.
- 2. This certificate applies to the Technical Report entitled "Technical Report on the Sarfartoq Project, West Greenland", dated April 26, 2012.
- 3. I graduated with an Honours Degree of Bachelor of Science in Geology from the University of British Columbia in 1975. I have practiced my profession continuously since 1975. My relevant experience includes 37 years' experience in mining and mineral exploration and 25 years' experience in mineral resource estimation.
- 4. I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (Registered Professional Geoscientist, No. 19513) and a Fellow of the Geological Association of Canada. I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101") due to my experience and current affiliation with a professional organization as defined in NI 43-101.
- 5. I have visited the property between the dates of September 7 and 9, 2010.
- 6. I am independent of the issuer applying all of the tests in section 1.4 of NI 43 101.
- 7. I have had prior involvement with the property that is the subject of the Technical Report, the nature of which involves the preparation of a previous Technical Report prepared for Hudson Resources Inc. dated January 4, 2011 and titled "Technical Report on the Sarfartoq Project, West Greenland".
- 8. I am responsible for the preparation of Section 16 of the Technical Report. I am also responsible for Sections 1 through 15 and 17 through 22 as a co-author.
- 9. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 10. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading
- 11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

DATED this 30<sup>th</sup> of May, 2012

Ronald G. Simpson, P.Geo.



#### Certificate of Author - Michael D. Druecker, Ph. D., CPG

I, Michael D. Druecker, Ph. D., CPG do hereby certify that:

- 1. I am an independent consulting geologist and a citizen of the United States of America residing at 14010 Kimberley Ln, Houston, TX, USA 77079.
- 2. I am a graduate of the Geology and Geophysics (B.Sc., 1975) program of the University of Hawaii and also hold a M.Sc. (Geology-Petrology, 1980) from the Colorado School of Mines and a Ph.D. (Geology-Geochemistry, 1986) from the University of Iowa.
- 3. I am a Certified Professional Geologist (CPG), in good standing, with the American Institute of Professional Geologists, a member of the Society of Mining, Metallurgy, and Exploration, and a core member of the Prospectors and Developers Association of Canada.
- 4. I have been practicing my profession related to mining and mineral exploration for over 30 years in a wide variety of locations in North, South, and Central America. Specific to the content of this report is my position as Project Manager of the Sarfartoq Project in Greenland in 1989 during my tenure as Senior Geologist for Hecla Mining Company in Coeur d'Alene, ID.
- 5. I have read the definition of "Qualified Persons" set out in NI 43-101 and as a result of my experience, education and registration; I am a Qualified Person as defined in NI 43-101. I visited the Sarfartoq Project five times during the last 24 months, from May 30, 2010 to June 5, 2010 from August 15, 2010 to September 9, 2010 from May 4, 2011 to May 17, 2011 from June 21, 2011 to June 23, 2011 and from August 7, 2011 to August 24, 2011.
- I am responsible for Sections 1 through 15 and 17 through 20 as a co-author for the technical report entitled "Technical Report on the Sarfartoq Project, West Greenland" for HUDSON RESOURCES INC. dated on April 26, 2012.
- 7. I have intimate knowledge of the property, and the results reported herein, which were gained while present at the property on five visits for several weeks between May 2010 and August, 2011.
- 8. As at the date hereof, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the report not misleading.
- 9. I am independent of the issuer applying all of the tests in section 1.4 of NI 43-101.
- 10. I have read National Instrument 43-101 and Form 42-101F1, and this Technical Report has been prepared in compliance with that instrument and form.
- 11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated the 30th day of May, 2012

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Michael D. Druecker, Ph. D., CPG