



**Amended 43-101 Technical Report on the Rare Earth Element Occurrences in the
Lofdal Carbonatite Complex, Kunene Region, Khorixas District, Namibia**

Prepared For

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Glossary of Terms

Aegerine A sodium-rich clinopyroxene, the sodium end member of the aegerine-augite series.

Aeschinite A rare earth-bearing Ti and Nb-rich oxy-hydroxide mineral.

Airborne magnetic surveys Surveys flown by helicopter or fixed wing aircraft to measure the magnetic susceptibility of rocks at or near the earth's surface.

Albitite Rock that is composed almost entirely of albite (Na-plagioclase).

Alkaline rocks Rocks containing an excess of sodium and/or potassium.

Alvikite Fine textured calcitic carbonatite.

Amphibolite A metamorphic rock comprised mainly of amphibole.

Apatite A mineral $\text{Ca}_5(\text{F,Cl})(\text{PO}_4)_3$ found in igneous rocks which is a source of phosphate and locally contains significant amounts of rare earth elements.

Archean The third oldest of four geological eons in the history of the earth. It extends from 2,500 million years back to approximately 3,800 million years.

Barite A mineral consisting of barium sulphate BaSO_4

Basement The igneous and metamorphic crust of the earth, underlying sedimentary deposits.

Bastnaesite A family of rare-earth carbonate-fluoride minerals.

Brecciated A body of rock that has been intensely fractured.

Calcite A mineral consisting of calcium carbonate CaCO_3 .

Carbonate A **rock**, usually of sedimentary origin, composed primarily of calcium, magnesium or iron and CO_3 or a **mineral** characterized by the presence of the carbonate ion (CO_3^{2-}).

Carbonatite An igneous intrusive or extrusive rock that consists of more than 50% carbonate minerals. Calcitic carbonatite is dominantly calcium carbonate, dolomitic carbonatite is dominantly magnesium carbonate, ankeritic carbonatite is dominantly iron carbonate.

Ce Cerium, a LREE.

Channel sample A sample taken by cutting a shallow "channel" across an outcrop surface permitting a continuous sampling of the outcrop and providing assay results that are representative of a specified width across the outcrop.

Chondrite Stony meteorites that have not been modified due to melting or differentiation of the parent body, and are considered to have very primitive compositions

Craton Large, ancient, stable mass of the earth's crust comprised of various crustal blocks amalgamated by tectonic processes.

Diamond Drilling Method of obtaining a cylindrical core of rock by drilling with a diamond impregnated bit.

Dolomite A carbonate mineral composed of calcium and magnesium carbonate, $\text{CaMg}(\text{CO}_3)_2$; a rock predominantly comprised of this mineral is also referred to as dolomite or dolostone.

Diatreme Breccia A breccia-filled volcanic pipe that was formed by a gaseous explosion or, more generally, any concave body of broken rock or tuff-breccia formed by explosive or hydrostatic forces.

Dy Dysprosium, a HREE.

dyke A tabular body of intrusive igneous rock, crosscutting the host strata at an oblique angle.

EPL (Exclusive Prospecting License) A mineral right granted by the Government of Namibia that allows the holder to carry on prospecting operations related to the mineral or group of minerals specified in the licence and to remove any mineral or group of minerals for any purpose other than sale or disposal, from any place where it was found or incidentally won in the course of prospecting.

Er Erbium, a HREE.

Fabric The orientation in space of the elements of which a rock is composed.

Fault A fracture or fracture zone in the earth's crust, along which displacement of opposing sides has occurred.

Fenitisation A distinctive alkali metasomatic alteration of host rocks surrounding a carbonatite intrusion.

Fluorite A mineral composed of calcium fluoride (CaF_2); a.k.a. fluorspar.

Fold A planar sequence of rocks or a feature bent about an axis.

Gd Gadolinium, a HREE.

GPS (global positioning system) A satellite-based navigation system that provides reliable location information anywhere on Earth when there is an unobstructed line of sight to four or more GPS satellites.

Gneiss A foliated metamorphic rock that has a banded appearance.

Grab samples Rock samples taken from outcrop in non-systematic manner.

Ho Holmium, a HREE.

HREE Heavy Rare Earth Elements – Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

Hydrothermal Processes that involve heated water.

Hyperspectral Data from multiple wavelengths across the electromagnetic spectrum.

ICP-OES Inductively Coupled Plasma Optical Emission Spectroscopy, an analytical method used for elemental analyses.

ICP-MS Inductively Coupled Plasma Mass Spectrometry, an analytical method used for elemental analyses, particularly trace elements including the rare earth elements.

La Lanthanum, a LREE.

Landsat imagery Photographs of the earth's surface, collected by satellite, and taken at different wave-lengths of light, processed to enhance particular features.

Leucocratic Light-coloured igneous or metamorphic rocks that are relatively poor in dark-coloured minerals.

lithogeochemical Study involving the chemical composition of rocks.

LOI Loss on ignition The amount of volatile substances that are driven out of a sample by heating, reported as part of an elemental or oxide analyses of a rock or mineral.

LREE Light Rare Earths – La, Ce, Pr, Nd and Sm.

Lu Lutetium, a HREE.

Ma Million years.

Magnetometer An instrument for measuring the intensity of the earth's magnetic field.

Magnetic susceptibility The degree of magnetisation of a material in response to an applied magnetic field.

Magnetite An important iron oxide mineral Fe_3O_4

Mafic Pertaining to or composed dominantly of magnesium and iron rock-forming silicates. Typically synonymous with "dark minerals".

Metamorphism Changes to rocks and minerals generally as a result of changes in pressure and/or temperature.

Metasomatic A metamorphic change in the rock which involves the introduction of material from another source.

Monazite A rare earth and thorium phosphate mineral found as an accessory mineral in felsic igneous rocks, pegmatite dykes and heavy mineral sands.

Muscovite A potassium-bearing white mica.

Nd Neodymium, a LREE.

Nepheline A rock-forming feldspathoid mineral with composition $\text{Na}_3\text{KAl}_4\text{Si}_4\text{O}_{16}$, that occurs in low-silica intrusive and volcanic rocks.

Orogen A belt of rocks characterized by folding, faulting, metamorphism and intrusion recording active ancient tectonic regimes that culminated in mountain-building.

Orogeny A deformation and/or magmatic event in the earth's crust, usually caused by collision between tectonic plates.

Paragneiss Banded metamorphic rocks derived from sedimentary rocks.

Parisite A rare earth-bearing fluor-carbonate mineral.

Paleoproterozoic The early Proterozoic era of geological time, between 2,500 and 1,600 million years ago.

Phlogopite A potassium-bearing Mg end member of the mica family of phyllosilicates with the composition $\text{KMg}_3\text{AlSi}_3\text{O}_{10}(\text{OH},\text{F})_2$.

Phonolite Fine-grained to porphyritic igneous rocks that are rich in nepheline and potash feldspar.

Plug A near vertical, more or less cylindrical, intrusion that appears more or less circular in plan.

Porphyritic Igneous rock containing larger crystals of one or more minerals in a dominantly fine grained groundmass.

Pm Promethium, a LREE.

Pr Praseodymium, a LREE.

Precambrian Informal name for the geological time periods that predate the Paleozoic (older than ca. 545 million years).

Proterozoic The era of geological time spanning the period from 2,500 to 545 million years before present.

Pyrochlore A mineral with chemical formula $(\text{Na},\text{Ca})_2\text{Nb}_2\text{O}_6(\text{OH},\text{F})$ characteristically associated with carbonatites and a principal ore mineral for Nb.

Radiometrics A measure of the natural radiation in the earth's surface (sometimes referred to as Gamma-Ray Spectrometry).

Rare Earth Elements 15 elements of the Lanthanide Series ranging from atomic number 57 (Lanthanum) to atomic number 71 (Lutetium).

Rauhaugite Dolomite-rich carbonatite.

REO Rare Earth Oxides.

RC drilling (Reverse Circulation) A percussion drilling method in which the fragmented sample is brought to the surface inside the drill rods.

Riebeckite The sodium-rich end member of the amphibole group.

Shear zone A tabular to sheetlike, planar or curvilinear zone composed of rocks that are more highly strained than rocks adjacent to the zone, typically zones of much more intense foliation, deformation, and folding.

THREE Total Heavy Rare Earth Elements (includes yttrium)

TREE Total Rare Earth Elements

TREO Total Rare Earth Oxides.

Schist A crystalline metamorphic rock having a foliated or parallel fabric resulting from the alignment of platy (micaceous) minerals.

Scintillometer An instrument that measures the intensity of ionizing radiation.

SEM (*scanning electron microscope*) A type of electron microscope that images a sample by scanning it with a high-energy beam of electrons.

Sill A tabular intrusion that is parallel to the layering in the host rocks.

Sm Samarium, a LREE.

Spectrometer (gamma ray) An instrument capable of detecting and analysing the spectrum of the intensity of gamma radiation. Specifically, it can measure the relative intensity of radiation resulting from uranium, thorium and potassium.

Sövite The coarse-grained variety or facies of a carbonatite intrusive. Sövite is often a medium to coarse grained calcite carbonatite with variable accessory amphibole, biotite, pyrite, pyrochlore and fluorite.

Shonkinite A mafic undersaturated intrusive rock consisting of potassic feldspar, nepheline, augite, biotite and olivine.

Strontianite A mineral consisting of strontium carbonatite SrCO_3 .

Subsolidus Refers to chemical reactions in rocks that take place under pressures and temperatures at which the magmatic liquids have completely solidified.

Supergene Process involving circulation of surface waters throughout an orebody, which can result in remobilisation and enrichment of metals and minerals.

Strike Horizontal direction or trend of a geological structure, defined as the intersection of a horizontal plane with the plane of the structure.

Syenite An intrusive igneous rock composed dominantly of alkali feldspar, with little or no quartz and ferromagnesian minerals.

Synchesite A rare earth-bearing fluor-carbonate mineral.

Tb Terbium, a HREE.

Tectonic Pertaining to the forces involved in, or the resulting structures of, movement in the earth's crust.

Thorite An accessory mineral of composition (Th,U)SiO₄, the most common mineral of thorium.

Tm Thulium, a HREE.

Trenching The process of digging shallow linear pits in the shallow overburden to provide access to a more or less continuous section of bedrock.

Xenotime A rare earth-bearing phosphate mineral of composition YPO₄ in which the heavy rare earths are expressive secondary components.

XRF (X-Ray Fluorescence) A routine non-destructive analytical method to determine major and trace element concentrations in geological materials

Y Yttrium Element with atomic number 39, which behaves chemically in a similar fashion to the HREE and is typically included with the HREE for purposes of economic valuation.

Yb Ytterbium A HREE.

Zircon A mineral consisting of zirconium silicate (ZrSiO₄).

Item 3: Summary

3.1 Introduction

Namibia Rare Earths Inc. (“NRE”) is undertaking an exploration program for rare earth elements (aka “rare earths” or REE) on its Lofdal property in north-western Namibia. The property has widespread occurrences of REE hosted by the Lofdal carbonatite complex, a ca 750Ma silicate/carbonatite intrusive suite. The Lofdal rare earth element property is held under Exclusive Prospecting Licence (EPL) 3400 by Namibia Rare Earths (Pty) Ltd (formerly Etruscan Resources Namibia (Pty) Ltd), which is 100% owned by NRE through its subsidiary Cayman Namibia Rare Earths Ltd. The company name was officially changed from Etruscan Resources Namibia (Pty) Ltd to Namibia Rare Earths (Pty) Ltd (“NRE (Pty)”) and entered into the Namibian Register of Companies on February 15, 2011. NRE (Pty) is the operating entity in Namibia.

Swinden Geoscience Consultants Ltd. was commissioned by Namibia Rare Earths Inc. to prepare an independent technical report (ITR) on the rare earth mineralization and exploration potential on the Lofdal property in north-western Namibia, in compliance with disclosure and reporting requirements set forth in National Instrument 43-101, Standards of Disclosure for Mineral Projects and the companion policy 43-101CP, and in accordance with Ontario Securities Commission Form 43-101F1. The Lofdal property is a new district scale greenfields exploration project for rare earth elements associated with alkali syenite and carbonatite intrusions which has a relatively limited exploration history dating back to only 2008.

3.2 Property, Location and Ownership

The Lofdal property comprises Exclusive Prospecting License (EPL) 3400, located approximately 25 km NW of the town of Khorixas in the Kunene Region of north-western Namibia. The EPL is held by Namibia Rare Earths (Pty) Ltd. (“NRE (Pty)”), a wholly owned subsidiary of Namibia Rare Earths Inc. It was renewed by the Government of Namibia in 2010 and is in good standing until November, 2012. The property is subject to a 2% NSR to Alberto Lobo-Guerrero Sanz, who brought the project to NRE (Pty).

Northern Namibia is a semi-arid environment. The property is characterized by gently rolling topography and is lightly forested. There is good road access to the property, and the town of Khorixas is connected to the national telecommunications and electricity infrastructure.

3.3 Geology and Mineralization

The Lofdal property is underlain by Paleoproterozoic metamorphic rocks of the Huab Metamorphic Complex, which outcrop as an inlier of the Congo Craton surrounded by stratified

rocks of the Damaran Orogen. The metamorphic basement was intruded at ca 750 Ma by alkaline silicate rocks and carbonatites of the Lofdal carbonatite complex. The complex comprises an early silicate intrusive assemblage of dominantly nepheline syenite, and a later carbonatite intrusive assemblage ranging from sovite through dolomitic and ankeritic carbonatite. The entire complex, as it is presently understood, comprises a central intrusive core characterized by a number of plugs of nepheline syenite and carbonatite with associated diatreme breccias, surrounded by a wide area of dyking and associated hydrothermal alteration, in which phonolite and carbonatite dykes related to the intrusive plugs have exploited pre-existing structures in the basement that were re-activated during Neoproterozoic tectonism. The carbonatite dykes are widely mineralized with rare earth elements. The total area affected by carbonatitic dykes and associated alteration and mineralization is more than 200 km².

Rare earth element mineralization in the Lofdal carbonatite complex is closely associated with the carbonatite dykes and related hydrothermal alteration. A high quality lithogeochemical database demonstrates that significant numbers of the dykes are geochemically anomalous in the rare earth elements and yttrium with a significant population being of economic interest. Almost 40% of the 3764 grab samples taken to date contain more than 0.25% total rare earths+yttrium (TREE+Y) and almost 15% carry greater than 1% TREE+Y. Of particular significance and exploration interest is the frequent enrichment of heavy rare earths in the dykes. The rare earth mineralization in the Lofdal carbonatite complex is extremely variable. It includes both light rare earth- and heavy rare earth-enriched varieties that appear to have been introduced in separate mineralizing events. Evidence suggests that the heavy rare earth-rich mineralization is dominantly a hydrothermal event, that occurred relatively late in the history of the complex. Mineralogically, the heavy rare earth-enriched mineralization is dominated by xenotime, which is commonly associated with apatite and/or thorite. The mineralization is, in many areas, associated with wide zones over 10's of meters of carbonatite intrusion and related hydrothermal alteration. The alteration systems are robust, continuous both along strike and at depth and produce clear geological, geochemical and radiometric signatures that are easily recognized, particularly in drill core that can be utilized for exploration.

3.4 Exploration

There exists a very high quality and extensive exploration database over Lofdal comprising geological, geochemical, geophysical and remote sensing data all of which confirm the exploration potential of the property for the discovery of a rare earth deposit.

Rare earth exploration at Lofdal has proceeded in three phases:

- i) **Regional Lithogeochemical Sampling:** Regional lithogeochemical sampling campaigns were carried out during 2008, 2009 and 2010. About 80 km² were systematically traversed and grab samples taken from outcrops at 3764 localities were assayed for rare earths and other elements. The regional sampling campaign identified a large number of anomalies and mineralized localities for follow up exploration on a district scale over the entire area surveyed. The regional sampling shows that the intrusive core of the complex, including the two intrusive plugs identified to date, is dominantly LREE-enriched. More significantly however, the sampling identified a “corridor” of heavy rare earth enrichment that is 7 km long and more than 1 km wide along the northwest side of the complex and near the contact margins of the Main intrusion (Table 3.1). Understanding of the regional framework has been significantly enhanced with the incorporation of geophysical and remote sensing surveys.

Table 3.1 Summary analyses of selected elements of 25 best LREE-rich and 25 best HREE-rich samples from regional lithogeochemical sampling.

	La (ppm)	Ce (ppm)	Dy (ppm)	Y (ppm)	HREE+Y (%)	TREE+Y (%)	% of Total as HREE+Y
Avg 25 HREE-rich	2,111	3,382	2,529	15,034	2.34	3.12	74.9
Best HREE Sample	1,390	2,300	5,000	50,000	6.78	7.34	92.4
Avg 25 LREE-rich	18,506	28,344	285	1,199	0.27	6.00	4.6
Best LREE Sample	22,400	44,200	567	2,300	0.54	8.85	6.1

- ii) **Detailed Geological Mapping and Trenching:** Four areas were chosen for initial follow-up exploration based on the regional lithogeochemical results. Two of these, Areas 2 and 4, have been geologically mapped and additional grab samples taken. In both areas, additional wide and laterally extensive carbonatite dykes and related alteration zones were mapped and sampled with new mineralized samples being located confirming the potential as indicated from the regional sampling (Table 3.2).

Table 3.2 Summary analyses of selected elements of the highest LREE-rich and HREE-rich samples from Area 4.

	La (ppm)	Ce (ppm)	Dy (ppm)	Y (ppm)	HREE+Y (%)	TREE+Y (%)	% of Total as HREE+Y
Avg 14 HREE-rich	113	212	1,758	11,839	1.79	1.86	96.0
Best HREE Sample	378	509	4,400	29,700	4.52	4.69	96.4
Avg 13 LREE-rich	12,299	17,079	105	563	0.11	3.6	3.0
Best LREE Sample	19,100	28,100	168	817	0.16	5.82	2.8

In addition, one wide carbonatite zone, the 2B zone, was chosen for trenching and drilling, to test the continuity of the zone and its contained mineralization along strike and at depth. The zone was originally sampled by 50 grab samples, of which 13 returned HREE>0.1% HREE (Table 3.3).

Table 3.3 Average analyses of selected elements of 13 lithogeochemical samples from the 2B zone containing HREE>0.1%.

	La (ppm)	Ce (ppm)	Dy (ppm)	Y (ppm)	HREE+Y (%)	TREE+Y (%)	% of Total as HREE+Y
Avg 13 HREE-rich	1911	2838	540	2495	0.46	1.12	43.1
Best HREE Sample	1630	2560	994	4840	0.86	1.49	58.0

Twenty-five trenches were dug across the 2B zone, mapped, channel sampled and geophysically surveyed. The results clearly show that the carbonatite dyking and related alteration can be traced in detail for more than 600 m along strike, as evidenced by geological, geochemical and radiometric signatures. Sampling returned anomalous HREE generally consistent with values in the grab samples. (Table 3.4).

Table 3.4 Summary analyses of selected elements of of best intercepts from trench samples.

Width (m)	La (ppm)	Ce (ppm)	Dy (ppm)	Y (ppm)	HREE + Y %	TREE + Y %	% of Total as HREE + Y
1.0	569	933	659	3741	0.60	0.86	70.3
11.0	817	1230	545	2676	0.45	0.74	60.8
<i>includes 1.0</i>	<i>1510</i>	<i>2240</i>	<i>1630</i>	<i>7568</i>	<i>1.31</i>	<i>1.88</i>	<i>69.7</i>
16.0	648	961	329	1595	0.28	0.51	54.3
<i>includes 1.0</i>	<i>645</i>	<i>947</i>	<i>925</i>	<i>4627</i>	<i>0.75</i>	<i>0.99</i>	<i>75.0</i>
2.0	2338	3455	1134	4479	0.88	1.80	48.8
2.0	2409	3357	272	1199	0.23	0.96	23.6
2.0	3955	5310	209	1030	0.19	1.32	14.2
1.3	5695	7985	320	1787	0.30	1.94	15.2

- iii) **Diamond Drilling:** Following trenching, six sections were chosen on the 2B zone for testing by diamond drilling. Thirteen holes were drilled in a series of two-hole fences with holes at -50 and -65 degrees. All holes intersected the alteration zones and rare earth mineralization, which was readily traced from hole to hole and correlated with exposures in the trenches on the basis of geological, geochemical and radiometric observations. Most holes contained carbonatite, but typically less than was mapped at surface. Significant concentrations of rare earth elements were restricted in both trenches and drill holes to widths of 1-3 meters. Previously unrecognized

hydrothermal alteration with anomalous concentrations of rare earths was well documented in the drill cores over widths of 10-25 meters. A number of holes intersected interesting HREE mineralization as a late hydrothermal phase associated with veining, alteration and anomalous radioactivity (Table 3.5).

Table 3.5 Summary analyses of selected elements of best intercepts from diamond drilling.

Width (m)	La (ppm)	Ce (ppm)	Dy (ppm)	Y (ppm)	HREE + Y %	TREE + Y %	% of Total as HREE + Y
1.0	829	1390	2000	9660	1.57	1.93	81.6
8.0	301	436	241	1403	0.23	0.33	69.2
<i>includes 1.0</i>	<i>926</i>	<i>1360</i>	<i>493</i>	<i>2441</i>	<i>0.42</i>	<i>0.75</i>	<i>55.8</i>
<i>includes 1.0</i>	<i>15</i>	<i>31</i>	<i>510</i>	<i>3249</i>	<i>0.51</i>	<i>0.52</i>	<i>97.8</i>
1.7	721	976	357	2058	0.33	0.56	59.0
7.8	354	588	149	936	0.15	0.28	54.0
9.6	617	854	186	1093	0.18	0.38	48.2
<i>includes 2.0</i>	<i>668</i>	<i>1008</i>	<i>301</i>	<i>1629</i>	<i>0.28</i>	<i>0.53</i>	<i>52.9</i>
<i>includes 1.6</i>	<i>2568</i>	<i>3370</i>	<i>304</i>	<i>1623</i>	<i>0.28</i>	<i>1.02</i>	<i>27.7</i>
1.0	1080	1590	344	1702	0.27	0.61	44.5
1.0	1260	1990	272	900	0.25	0.79	31.2

3.5 Conclusions and Recommendations

Exploration to date has identified a widespread and robust carbonatite complex at Lofdal. The early intrusive and related hydrothermal activity appears to have been mainly enriched in the light rare earths. However, there is a significant later hydrothermal event that has introduced heavy rare earth-enriched mineralization in the dykes and alteration zones associated with the complex. Regional sampling indicates that this heavy rare earth enrichment was focused along the northwestern side of the complex and near the contact zones with the Main intrusion. The significant enrichment in heavy rare earths associated with the carbonatites, and the dominance of xenotime as one of the principal rare earth-bearing minerals, indicates a significant potential for the discovery of a heavy rare earth-enriched deposit associated with this intrusive complex.

The regional lithogeochemical sampling has to date covered about 40% of the total prospective area (defined by a regional airborne radiometric anomaly) and identified a number of areas of anomalous rare earth mineralization for follow up. There is significant potential for the discovery of additional heavy rare earth targets in the remaining 60% of the complex.

The detailed mapping, trenching and drilling in Area 2B has resulted in a much better understanding of the intrusive complex and its associated hydrothermal alteration and

mineralization. This work has demonstrated that the carbonatite intrusion and alteration is associated with basement structures that have focused the intrusions and related hydrothermal fluids. The mineralized structure in Area 2B is wide, robust, and can be traced laterally and in the subsurface where it has consistent geological, geochemical and geophysical signatures. The zones overall are geochemically anomalous in the REE, Y, Th and some associated elements and locally contain significant, although to date narrow, zones of high grade HREE mineralization. It is likely that similar intrusion/alteration zones already identified elsewhere on the property are associated with rare earth mineralizing systems. Such zones of intense hydrothermal alteration with accompanying heavy rare earth mineralization remain the highest priority targets for exploration and there are a large number such zones on the property that present high quality targets for focused exploration.

The Lofdal property represents a high quality, exploration stage, rare earth project with particular potential for the discovery of a heavy rare earth-enriched deposit. Although an economic body has not yet been identified, rare earth occurrences are prolific in the carbonatites at Lofdal and this speaks to the potential for one or more discoveries. The primary exploration tools on a go forward basis should be detailed geological mapping in priority areas identified from the existing database, followed by diamond drilling. Deeper drilling to 100 vertical meters should be undertaken in the established mineralized system in the 2B Zone. More regional exploration is warranted over the southern portions of the complex.

It is recommended that the Company take a staged approach to development with provisions at milestone events. The immediate focus should be to rapidly work towards the identification and delineation of mineral resources within the priority target areas already identified. Based on the successful outcome of the first phase, a feasibility study would be undertaken to advance the project to production. Phase I is budgeted at CDN\$6.4M with an initial 7,500 m drill program directed at priority targets in Areas 1, 2, 4, 5 and 6 and at Emanya, with continued exploration in Area 8 and the southern half of the carbonatite complex. A provision of 15,000 m of drilling is allocated for the delineation of a 43-101 compliant inferred mineral resource and accompanying preliminary economic assessment. Based on the successful outcome from the first phase, Phase II is budgeted at CDN\$7.0M for the delineation of a 43-101 compliant mineral reserve with 15,000 m of drilling and to complete a feasibility study (CDN\$7.0M).

Item 4: Introduction

Namibia Rare Earths Inc. (“NRE”) is undertaking an exploration program for rare earth elements (aka “rare earths” or REE) on its Lofdal property in north-western Namibia. The property has widespread occurrences of REE hosted by the Lofdal carbonatite complex, a ca 750Ma silicate/carbonatite intrusive suite. The Lofdal rare earth element property is held under Exclusive Prospecting Licence (EPL) 3400 by Namibia Rare Earths (Pty) Ltd. (“NRE (Pty)”), which is 100% owned by NRE through its subsidiary Cayman Namibia Rare Earths Ltd. NRE (Pty) is the operating entity in Namibia.

Swinden Geoscience Consultants Ltd. was commissioned by NRE to prepare an independent technical report (ITR) on the rare earth mineralization on the Lofdal property in compliance with disclosure and reporting requirements set forth in National Instrument 43-101, Standards of Disclosure for Mineral Projects and the companion policy 43-101CP, and in accordance with Ontario Securities Commission Form 43-101F1.

The Lofdal property is a greenfield exploration project for REE associated with carbonatite intrusions. Carbonatite dykes have been known in the area for some time and were briefly explored for rare earths, yttrium and thorium in the early 1980’s. However, it is only in recent years that the extent of the intrusive complex has been mapped and the widespread nature of the rare earth mineralization appreciated. Lithogeochemical sampling over approximately 40% of the complex between 2008 and early 2010 by NRE (Pty) returned anomalous values of REE from outcrops over an area of more than 80 km². Significantly, and in contrast to typical carbonatitic REE environments, the Lofdal mineralization shows widespread enrichment in the heavy rare earth elements (HREE). Results of the regional sampling identified a number of significant zones of carbonatite intrusion and hydrothermal alteration that locally carry anomalous REE concentrations and one of these areas, termed “Area 2” in this report, was selected for detailed follow-up and evaluation. One zone, termed the “2B Zone”, has been explored through excavation of 24 trenches with detailed geological mapping and channel sampling to delimit the aerial extend of the mineralized zone. A diamond drill program of 13 holes has confirmed the vertical continuity of the zone.

This ITR describes the property and the mineralization that has been discovered to date and reviews and discusses the history of geological and exploration work carried out on and in the vicinity of the property. It describes exploration procedures and results including prospecting, geological mapping and lithogeochemical surveys, geophysical and other remote sensing surveys, trenching and diamond drilling carried out by NRE (Pty) on the property between 2006 and 2010. The geological setting of the property and its mineralization is described, the known mineralization is interpreted in the context of deposit models for rare earth elements in

carbonatites, and interpretations and conclusions related to the results of this work with respect to potential mineral deposits on the property are discussed. Recommendations for continued exploration and a supporting budget are presented.

The focus of this report is exploration that was completed before the end of November, 2010 (i.e. to the end of the 2010 drilling campaign). The authors are aware that exploration including new geological mapping, geophysics and sampling, has continued on the property since that time but the results of this work have not been completely assessed at the time of writing.

The information in this ITR was compiled from a variety of published documents, unpublished reports by previous companies, and unpublished maps, reports and data generated by NRE (Pty) and their consultants, as well as from personal observations by the authors. Documents relating to its exploration programs were provided by NRE (Pty) and these were supplemented by research in the files of the Geological Survey of Namibia and available published sources. Beneficial discussions have been held with employees and contractors of NRE (Pty) who have been part of the previous work on the property. The lead author has particularly benefitted from discussions with Dr. Rainer Ellmies and Vicky do Cabo of the Geological Survey of Namibia. No material works that may influence the recommendations have been knowingly excluded from consideration. All documents used in preparation of this report are cited in Item 23, References.

The involvement of the lead author (Swinden) with the Lofdal project dates from July, 2010. Between mid July and mid December, he has spent a total of approximately 50 days on the property, and personally observed the exploration procedures, and carried out geological investigations.

Swinden Geoscience Consultants Limited is a geoscientific consulting practice that has provided services to the mineral exploration sector since 2009. The principal consultant and lead author of the ITR, Dr. Scott Swinden, is a registered professional geoscientist in the Province of Nova Scotia, with more than 35 years' experience in mineral exploration in Canada and the United States, public sector geoscience organizations in support of the minerals sector, and academia. He has a record of geoscientific research in a broad range of mineral deposits types and is a specialist in the geochemistry of rare earth elements in geological systems. He has the appropriate experience, qualifications, competence and independence to be considered a "Qualified Person" under the definitions provided in NI 43-101.

Mr. Siegfried is the principal consultant with GeoAfrica Prospecting Services which managed and executed the 2010 drilling program from October to December, 2010. Mr. Siegfried is a professional consulting geologist with 25 years' experience in the exploration and evaluation of mineral properties including a large number of REE-bearing carbonatite occurrences. Mr.

Siegfried is a member in good standing with the Australian Institute for Metallurgy and Mining (AusIMM) and has the appropriate relevant qualifications, experience, competence and independence to be considered a “Qualified Person” under the definitions provided in the Reporting Code. He is particularly experienced with rare earth deposits and mineralizing systems, having worked as a principal consulting geologist on a number of projects in southern Africa.

While not identified as an author of this report, Remote Exploration Services (RES) of South Africa has made major contributions towards the geological mapping on the property between September and December, 2010 and execution of the trenching program in Area 2.

The authors of this ITR do not have any material direct or indirect interest in NRE. The relationship with NRE is contractual between client and professional consultants and the fees paid for preparation of this ITR are not contingent upon the results expressed herein.

Item 5: Reliance on Other Experts

The historical work reported herein is based on files maintained by the Geological Survey of Namibia, published sources, and unpublished reports, maps and data provided by NRE. Land tenure information was provided by NRE and verified by personal inspection of relevant documents. The lead author has exercised all due care in reviewing the documents provided and attempted to verify the quality and accuracy of the data. The lead author has reviewed some of the data to assess its quality and accuracy, and believes that the supplied information and the basic assumptions are factual and correct and that the interpretations are reasonable. The lead author has no reason to believe that any material facts were withheld.

The authors have relied on employees and contractors of NRE (Pty) for historical information regarding the NRE (Pty) exploration programs at Lofdal between 2006 and 2010, and particularly information on sampling rationale and procedures and analytical work. The authors have relied on geologists working for Remote Exploration Services Ltd. (RES) for procedures and geological observations during the 2010 trenching and geological mapping program and on geologists working for GeoAfrica Prospecting Services Ltd. for procedures and geological observations during the 2010 diamond drilling program.

The legal status and rights of NRE (Pty) in relation to EPL3400 have been independently verified by LorentzAngula Inc, Notaries and Conveyancers, in Windhoek and this is the basis for reporting of the EPL status as provided by NRE.

The authors have taken every possible care to verify and accurately report all information provided by third parties but cannot guarantee the accuracy, validity or completeness of the obtained data. Not all authors of files upon which the authors have relied may be qualified persons according to NI 43-101. However, it is the considered opinion of the authors that the work appears to have been carried out with thoroughness and the data are internally consistent and are of a quality that is acceptable for the purposes of this ITR.

Item 6: Property Description and Location

6.1 Property Location

The Lofdal property comprises Exclusive Prospecting License (EPL) 3400, located approximately 25 km northwest of the town of Khorixas in the Kunene Region of north-western Namibia (Figure 6.1). Khorixas is approximately 325 km in a straight line and 450 km by paved road northwest of the capital Windhoek. The property is reached from Khorixas by an all-weather gravel road, D2625, which bisects the property.



Figure 6.1 Location of the Lofdal Property (red square) NW of Khorixas.

6.2 Property Description

6.2.1 Exclusive Prospecting Licences in Namibia

Namibia has a well-organized, structured and reasonable framework for mineral tenure. EPL's in Namibia are governed by the provisions of the *Minerals Act, 1992, Part X*. The Act is

interpreted in the context of the Minerals Policy of Namibia which recognizes the contribution of the minerals sector to the economy and expresses support for the sustainable development of the country's mineral resources. The Minerals Policy's rationale is stated as:

The Government of Namibia has developed a minerals policy to ensure the continued development of the mining industry. The formulation of such a policy will contribute to the creation of an environment that attracts both foreign and local investment in mining. It will also contribute to the development of opportunities for the Namibian people to benefit from their country's mineral resources in line with the Government's policy on socio-economic upliftment.

The Act provides for the granting, among other things, of an Exclusive Prospecting Licence, the holder of which is entitled to carry on prospecting operations related to the mineral or group of minerals specified in the licence and to remove any mineral or group of minerals for any purpose other than sale or disposal, from any place where it was found or incidentally won in the course of prospecting. EPLs are subject to renewal after the first three years, and subsequently every two years. At the first renewal, the EPL may have to be reduced by 25% and in subsequent renewals by 50%. Renewals after the first two are subject to Ministerial discretion, and experience in Namibia is that they are typically granted provided the holder has substantially fulfilled the terms of the existing license in good faith.

6.2.2 EPL 3400 (Lofdal)

EPL 3400 (Lofdal) originally comprised 99,900 ha and allowed the company the exclusive right to prospect for "base and rare metals" and "precious metals". The term "base and rare metals" specifically includes the rare earths under the Act. The boundaries of the EPL are established by reference to latitude and longitude coordinates in the projection WGS34, Zone 33S, to six decimal places. The area of the original EPL is shown in Figure 6.2, the history of tenure is given in Table 6.1, and the coordinates of the original boundaries in Table 6.2, and. The EPL covers all or part of 24 farms. The current exploration interest is principally on farms Lofdal 491 and Bergville 490.

The area within the EPL boundaries that is believed to have potential for rare earth mineralization and is the focus of the exploration at present on the Lofdal EPL is also shown in Figure 6.2.

Table 6.1 History of tenure of EPL 3400 (Lofdal)

Application	Applied	Granted	Validity	Comment
Original	June 27, 2005	Nov. 15, 2005	To Nov. 14, 2008	99.000 ha; work program of prospecting, geochemical, geophysical work and drilling totalling N\$3,350,000. Environmental clearance granted Feb. 22, 2006.
First renewal	Aug. 15, 2008 (amended Nov. 14/08)	Jun 19. 2006	To Nov 14, 2010	No size reduction because of newly recognized REE potential, included industrial minerals; included filing of a "Social Empowerment Plan and Commitment" as required by the Ministry of Mines and Energy
Second Renewal	Aug. 13, 2010	Dec. 15, 2010	To Nov. 14, 2012	25% reduction in size (74,000 ha). Proposed exploration program of geological and geochemical mapping and sampling, trenching and core drilling totalling N\$9,100,000

Table 6.2 Coordinates of the original EPL 3400 and its first renewal period [WGS84 Datum]

Point #	Latitude	Longitude
1	-20.14283738	14.49715360
2	-20.15397733	14.82807306
3	-20.40879899	14.82804120
4	-20.40499457	14.49866276
5	-20.19208481	14.49666561

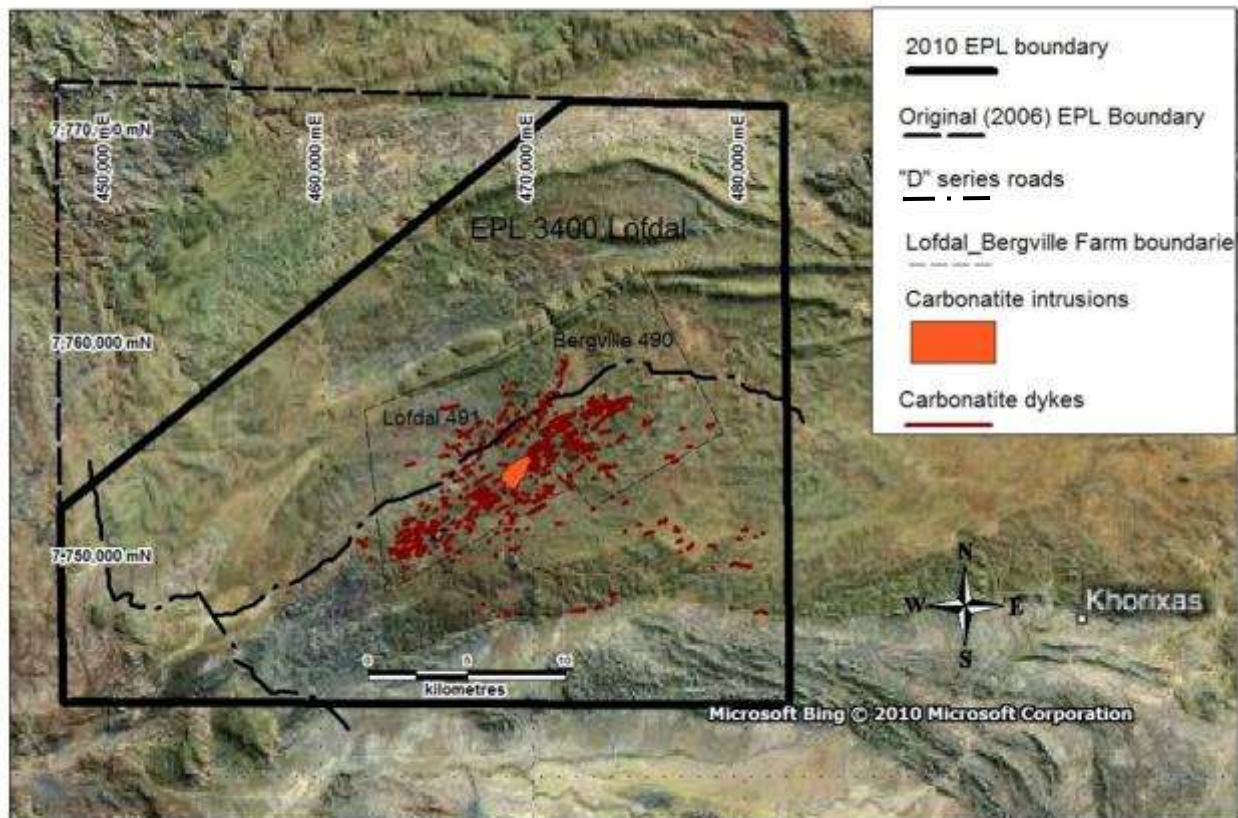


Figure 6.2 Location of EPL 3400 showing original and current boundaries, roads, carbonatitic intrusions and farm boundaries. The carbonatite intrusive plugs that are in the centre of the region of interest are shown in orange and the carbonatite dykes and fracture zones that have been mapped and sampled to date are shown in red. Datum WGS84; Zone 33S.

The EPL is for mineral rights only and does not confer any rights in land. The surface rights in the area of the Lofdal rare earths project are communally held. Communal land is vested in the State by the Constitution. The State is under a duty to administer communal lands in trust for the benefit of the traditional communities residing on these lands and for the purpose of promoting the economic and social development of the people of Namibia. Communal lands are administered through the office of the Regional Governor and the office of Rural Development.

An application to renew the EPL for a further two years for base and rare metals and precious metals was made by NRE (Pty) on August 13, 2010, more than 90 days before the expiry of the license, as required by the legislation. This application included a request to release 25% of the area of the EPL, with the reduced licence to comprise 74,000 Ha. The area, which was proposed to be released to effect the reduction (Figure 6.2), is in the northwestern part of the EPL, and is

outside the area of geological potential for rare earth mineralization. This reduction will not affect the planned exploration or compromise the area of interest for rare earths. The coordinates of the reduced EPL are given in Table 6.3 and the boundary of the reduced EPL is shown in Figure 6.2.

Table 6.3 Coordinates of EPL 3400 [WGS84 Datum] as renewed in 2010.

Point #	Latitude	Longitude
1	-20.15068191	14.72785723
2	-20.15397733	14.82807306
3	-20.40879899	14.82804120
4	-20.40499457	14.49866276
5	-20.32407475	14.49786318

The application for the recently granted renewal forecast expenditures of \$N4,900,000 in the first year and \$N4,200,000 in the second year of the terms and proposed an exploration program for the current renewal period of geological and geochemical mapping and sampling, trenching and core drilling. The renewed EPL is valid until November 14, 2012, at which time it will need to be renewed and, in the absence of further representations to the Ministry, would be expected to be reduced in size by a further 50%.

6.2.3 General Provisions

The company is in receipt of a legal opinion by LorentzAngula Inc., Attorneys, Notaries and Conveyancers, in Windhoek, dated May, 2010, that the company, Etruscan Resources Namibia (Pty) Ltd., is the legal holder of 100% of the interest in EPL 3400, which is valid and existing as of the date of the opinion. There have been no changes to legislation or policy in the intervening time that would give reason to question the continuing validity of this opinion.

Under the *Minerals Act*, 1992, and as declared in Government Gazette 45 of 2009, rare earths are subject to a royalty of 3% of market value. The property is also subject to a 2% NSR to Alberto Lobo-Guerrero Sanz, who brought the project to NRE (Pty).

Neither the applications by NRE (Pty) to acquire or renew the EPL, nor the environmental contract that was agreed to by the company and the Government of Namibia, identify any pre-existing environmental liabilities on the property and none are known to exist.

Under the provisions of the Environmental Contract, NRE (Pty) is required to submit quarterly environmental reports detailing work and potential impacts. NRE (Pty) has fully complied with this provision and copies of these reports are filed in company files. They are complete and up to date.

Notifications of trenching and drilling programs are required to be filed with the Mining Commissioner, Department of Mines and Energy. Notification of trenching was filed by letter dated August 13, 2010 and notification of drilling was filed by letter dated September 21, 2010. The authors are not aware of any other permits that are required to conduct the planned work.

6.3 Adjacent and Overlapping EPL's

EPL 3400 is one of four contiguous EPL's held or applied for by Namibia Rare Earths (Pty) Ltd. in this area (Figure 6.3). The contiguous EPL's cover the regional potential related to intrusion of carbonatites in this region but have received little exploration for these commodities to date and little is known of their potential.

Table 6.4 Summary of EPL's held or applied for by Namibia Rare Earths (Pty) Ltd. contiguous to EPL 3400.

ID	Minerals	Size	Granted	Renewed	Expires	Status
3304 (Mesopotamie)	Base and rare metals, dimension stone, precious metals, nuclear fuels	7,103 Ha	May 19, 2005	May 19, 2010	May 18, 2012	Renewed
3399 (Noute)	Base and rare metals, precious metals	99,900 Ha	May 31, 2006	June 1, 2009	May 31, 2011	Renewed
4208 (Florida)	Base and rare metals, industrial minerals, precious metals, nuclear fuels	57,050 Ha	Applied Nov. 4, 2008			pending

EPL3400 is overlapped by EPL's 3808 and 3809 which are pending to Stone Africa (Pty) Ltd. for dimension stone (Figure 6.3). It is also overlapped by Mining License 137, also to Stone Africa in favour of dimension stone. Stone Africa has 3 small quarries within the area of ML 137. There is no conflict of mineral rights associated with these EPL's and no current operational issues associated with the respective exercise of these overlapping mineral rights. It should be noted that the *Minerals Act* does not provide a dispute resolution mechanism in the event that holders of overlapping mineral rights experience conflict and the author does not express an opinion as to the potential outcome of any dispute with respect to the activities of NRE (Pty) or Stone Africa on lands that are subject to overlapping mineral rights.

The area of the former Lofdal copper mine is held under mining claims by a Mr. Hoppe. These claims predate the EPL and take precedence over it. Their exact location is not known but the approximate location can be estimated from the location of claim beacons in the field – this area is indicated by the white polygon in Figure 6.3.

There are no other factors or risks known to the author that might affect NRE (Pty)'s right or ability to perform work on the property.

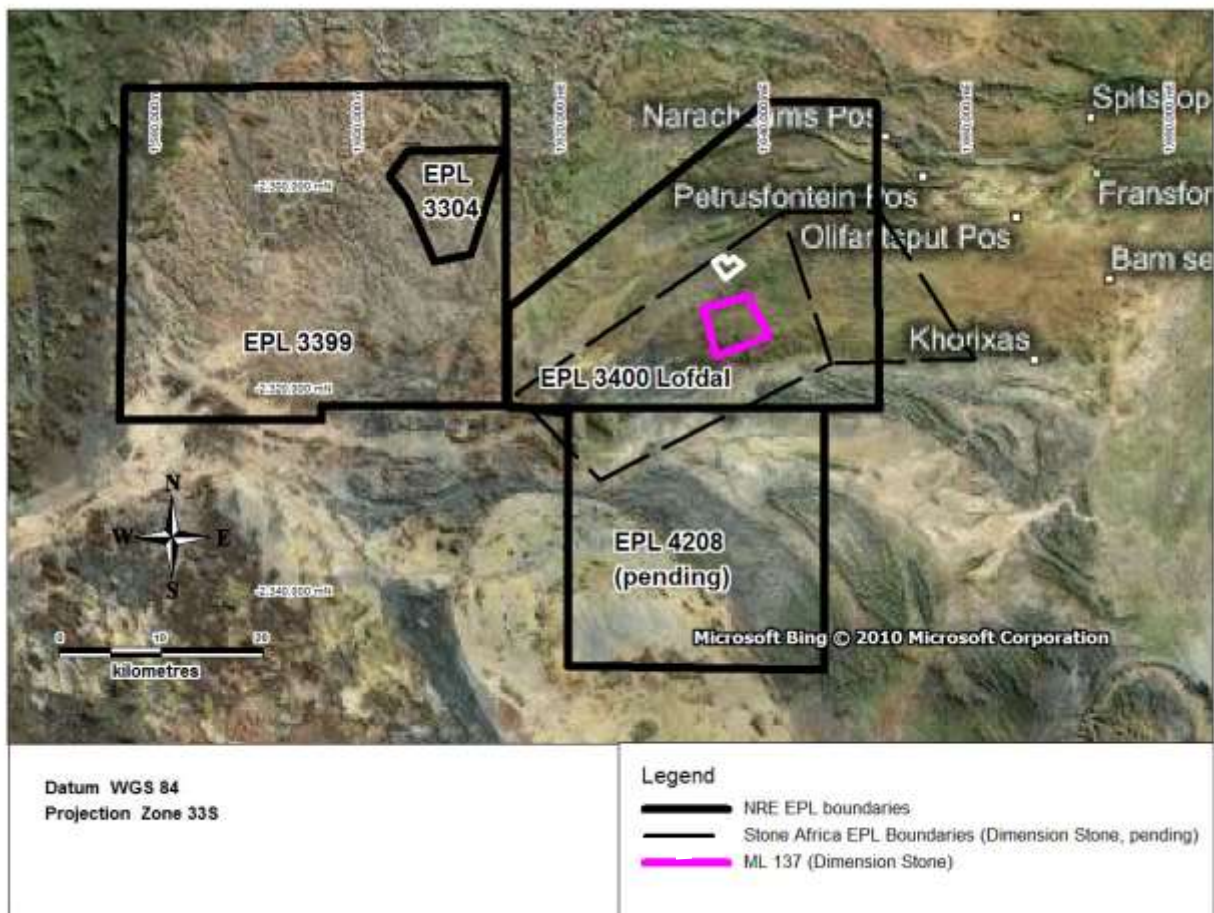


Figure 6.3 Adjacent EPL's and overlapping mineral rights on EPL 3400. White polygon north of ML 137 outlines approximate area of Hoppe mining claims.

Item 7: Accessibility, Climate, Local Resources, Infrastructure and Physiography

7.1 Accessibility

The town of Khorixas is connected to the capital city of Windhoek by approximately 450 km of paved road via Otjiwarongo and Outjo. Windhoek is the country's commercial and administrative centre and has international and regional airports with scheduled service to domestic centres, regional centres in southern Africa, and Frankfurt. Driving time from Windhoek to Khorixas is about 5 hours.

From Khorixas, the Lofdal project area can be reached via 28 km of secondary all weather gravel road (national road D2625; Figure 7.1). Bush tracks negotiable by 4WD vehicles provide good access to most parts of the project area.

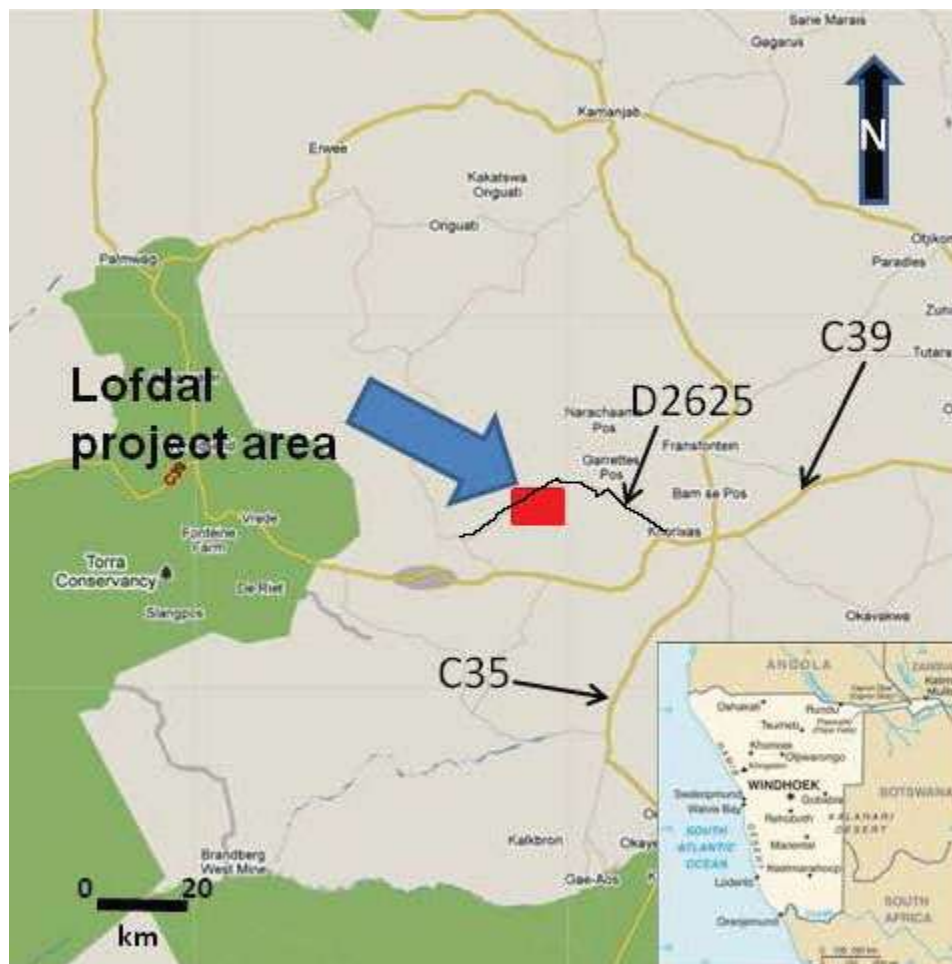


Figure 7.1 Location and road access to the Lofdal project area. National “C” and “D” series roads are labelled.

7.2 Climate

North-western Namibia is an arid to semi-arid region. Rainfall is largely confined to the summer months (November to March) and averages 350 to 700 mm per year. Average daytime high temperatures range from less than 25° in June/July to more than 35°C from November to January and locally exceed 40°C during hot spells. Night time lows reach 5°C in winter rising to about 20°C in summer. Sunshine averages more than 11 hours per day during winter, and 8 to 9 hours during the summer rainy season when there is frequent cloud cover. The climate is conducive to year round operations.

There is no year-round surface water. The property lies within the catchment area of the Huab River. The hydrological map of Namibia (van Wyck et al.) indicates that the project area is an area of moderate to low water availability in bedrock. Information from water boreholes in the area suggests the water table is about 60 m below surface. Experience to date indicates that wells can supply sufficient water for the needs of exploration without compromising the requirements of local communities. While the water supply is sufficient for exploration purposes, a more thorough investigation of the capacity of the local aquifers will need to be carried out to determine whether a sufficient supply exists for a mining operation.

7.3 Local Resources and Infrastructure

Khorixas is a regional administrative centre. Local services include two gas stations, a hardware store, a small supermarket, a number of smaller convenience stores, a bank and facilities for basic vehicle servicing, welding and other trades. There is a small dirt airstrip but no scheduled air service. There are two tourist lodges in Khorixas offering accommodation, camping, and restaurants. NRE (Pty) rents a 330 m² warehouse and a 7600 m² surrounding yard with municipal water and electricity that serves for equipment storage, local office, and drill core processing and storage (Plate 7.1).



Plate 7.1 NRE (Pty) warehouse facility in Khorixas that serves for equipment storage and core logging and storage.

The nearest large centres are Outjo, a town of more than 6000 that lies 120 km east of Khorixas, and Otjiwarongo, a town of approximately 20,000 that lies 200 km east of Khorixas. Otjiwarongo is a regional commercial and retail centre and is a service centre for, among other things, the Okoruso fluorspar mine 48 km to the north.

There are local farms in and around the project area that raise cattle, sheep, goats, donkeys and horses. These farms have wells that can supply adequate water for exploration needs and together with Khorixas, provide a stable pool of workers that can be tapped for exploration requirements.

Khorixas is connected to Namibia's land telecommunications grid and there is a Namtelecom office in the town. Cellular telephone services are provided by MTC and internet services are readily available through MTC as well.

Khorixas is connected to the national power grid via a 132 kV transmission line that runs east of town and north to Kamenjab.

7.4 Physiography

The project area is characterised by low, gently rolling, sparsely vegetated hills with peaks ranging up to an altitude of approximately 1030 m (Plate 7.2). There is an overall relief throughout the project area of slightly more than 100 m.



Plate 7.2 Physiography of the project area showing typical low rolling hills and sparse vegetation

There is little soil, but much of the ground is covered by residual gravel that typically closely reflects the composition of the bedrock beneath. This residuum is typically less than 1 m thick on the high ground, but locally thickens in the valleys. Outcrop is widespread throughout the area.

Vegetative cover includes a ubiquitous cover of native grass after the rainy season and numerous arid-adapted low shrubs. . Wildlife is relatively sparse but includes springbok, kudu, oryx and gemsbok as well as baboons, elephants and zebras and various small mammals and snakes.

Item 8: History

8.1 Regional Surveys - Geology

The definitive geological mapping of the area was carried out by Frets (1969), who set out the general stratigraphic and tectonic framework of the area. He identified and described the basement metamorphic rocks, the overlying sedimentary and volcanic rocks of the Damaran Orogen, and documented the alkaline intrusive plugs in the Lofdal area. Frets (1969) recognized and described the Oas quartz syenite and the understaturated syenitic rocks of the Lofdal complex. However, he did not identify the associated carbonatitic rocks.

The first published accounts of carbonatites in the Lofdal area are found in Diehl (1990, 1992), who noted “on the farms Lofdal 491 and Bergville 490, a swarm of carbonatite dykes and alkali rocks are known to contain thorium, yttrium and rare earth element mineralisation”. He noted that various silicate and carbonatite rocks intrude the metamorphic basement in this area, and that the carbonatites were locally radioactive containing xenotime, bastnaesite and thorite. The carbonatites were also described by Verwoerd (1993) and by Woolley (2001), in his survey of African carbonatites, in which he noted the presence of “numerous east-west trending felsic and carbonatite dykes” over an area of 13 x 8 km. He noted the presence of abundant fluorite in the carbonatites and Th, W, and Nb in the associated nepheline syenites. Descriptions of the geological setting of the carbonatite dykes in the Lofdal area are found in Niku-Paavola et al. (2001) and in Wall et al. (2008) as part of their study of xenotime in the dykes. A summary of the regional geology of the area is found in Miller (2008a,b) who described the geology of the basement rocks, and the alkaline and carbonatitic rocks of the Lofdal area, including the Oas Syenite, the Lofdal Nepheline Syenite, and the carbonatite dykes, which he referred to along with the related silicate dykes as the “Bergville dyke swarm”.

The current published geological map of the area is the 1:250,000 Fransfontein Sheet (Geological Survey of Namibia, 2006b) which substantially utilizes Frets (1969) mapping for the metamorphic basement and maps the syenitic and carbonatitic rocks of this area as part of the Oas Syenite. It is too large a scale to be a useful base map at the detailed map scales needed for mineral exploration.

8.2 Regional Surveys – Airborne Geophysics

The Geological Survey of Namibia has undertaken systematic airborne geophysical coverage of the country since 1995, which it makes available to the public sector. The Lofdal area was covered by combined airborne radiometric and magnetometer surveys in two principal periods; in the late 1990s at a line spacing of 400 m and in 2006 (Geological Survey of Namibia, 2006a)

at a line spacing of 200 m. A Versatile Time Domain Electromagnetic (VTEM) survey with accompanying magnetometer and spectrometer specifically targeted the Lofdal carbonatite complex in 2009 (Geotech Airborne Ltd., 2009). The 2006 survey was flown by GPX Surveys using a fixed wing aircraft on N/S lines, Cesium vapor magnetometers and 256/512 channel radiometric recording instruments. The 2009 survey was a helicopter borne survey with accompanying magnetometer and spectrometer flown by Geotech Airborne Ltd. at a flight line spacing of 200 m and direction of 327⁰.

The 2006 survey confirmed and clearly outlined in significant detail a radiometric (dominantly thorium) anomaly in the Lofdal area that is interpreted to be related, at least in part, to the alkaline silicate and carbonatite rocks that comprise the Lofdal carbonatite complex (Figure 8.1). The airborne anomaly underlies more than 200 km² and was important in guiding the district scale sampling phase of NRE (Pty)'s exploration (see Section 12.2). ERN). NRE (Pty) subsequently flew the entire complex with magnetic and radiometrics in 2010 at 75m spacing as described in Section 12.2.3.2. The VTEM survey reportedly did not detect any significant conductive bodies in bedrock although the Emania intrusion responded in early time channels.

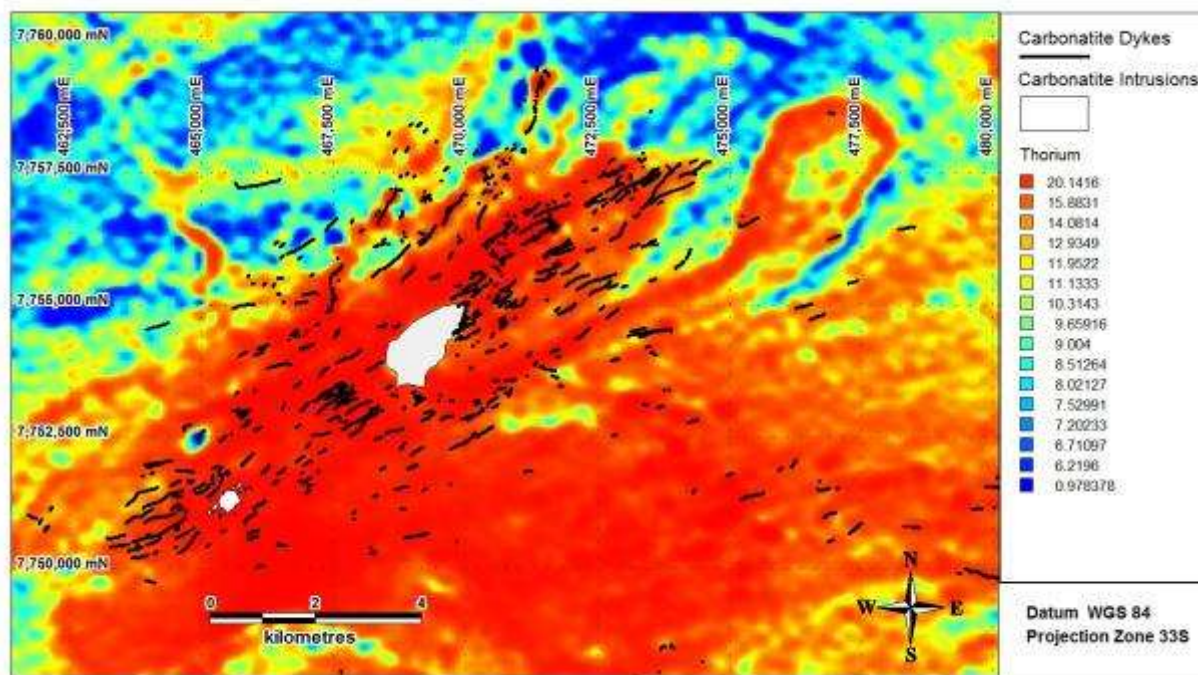


Figure 8.1 Thorium anomaly in the Lofdal area from the 2006 airborne survey. Mapped carbonatite intrusions (grey) and dykes (black) are shown for location reference.

8.3 Mineralization and Exploration

Historically, mineral exploration activities in the area have focused on copper, gold and tantalite associated with quartz veins and/or pegmatites in gneiss, metasedimentary, and metavolcanic rocks of the Huab Complex. The mineralization was generally interpreted to be related to faults and shears (Geological Survey of Namibia, 1992).

Small scale mining by way of shallow adits is evident in at least two locations within the EPL immediately north of the project area (Plate 8.1). The adits were opened in the 1950's and one is reported to have yielded ore grading 10% Cu (Geological Survey of Namibia, 1992).

Exploration for copper and gold in this area was conducted by Messina (Tvl) Development Co. Ltd. from 1974 to 1976 (Davidson, 1977). Diamond drilling in 1974 intersected cupriferous silicified zones, the best of which assayed 1.02% and 1.51% Cu over 1.95 m and 1.2 m respectively (Geological Survey of Namibia, 1992). Davidson (1977) interpreted the deposit to possibly represent the root zone of a largely eroded deposit. Tsumeb Corporation Ltd explored for base and precious metals between 1981 and 1986.

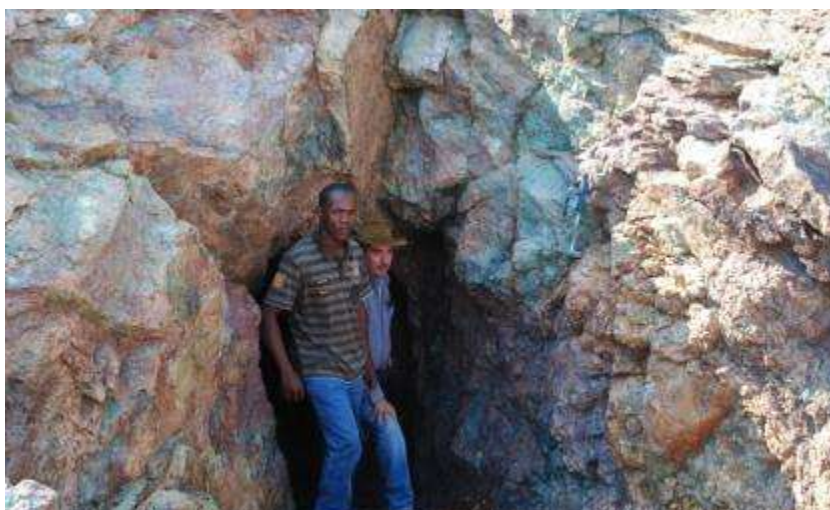


Plate 8.1 Adit at the former Lofdal copper mine with copper staining around the portal

The area was prospected for gold by Anglo American Prospecting Services Namibia (Pty) Ltd. between 1987 and 1989. Reconnaissance bulk stream sediment samples were processed and analyzed for gold content. Twenty-seven anomalous areas were selected for follow-up by detailed stream sediment sampling, soil sampling rock sampling and geological mapping. This work did not yield any significant concentrations of gold and the project was terminated in 1989 (Marsh et. al., 1989).

More recently the Namibia Small Miners Assistance Centre held EPL 2821 over portions of Lofdal and Bergville farms for precious stones, semi-precious stones, precious metals, base and rare metals from 2002 to 2004.

Although not extensively described in the literature, carbonatite dykes have been known to occur in the area of Lofdal and Bergville farms at least since the early 1980's and were the focus of an exploration program for yttrium and rare earths by Rouna (Pty) Ltd. between 1981 and 1983. Following a reconnaissance radiometric survey and some rock sampling in 1981 and 1982 (Plate 8.2), attention was focussed on anomalous responses in the area of farms Lofdal 491 and Bergville 491. The preliminary work indicated the presence of yttrium hosted in the mineral xenotime and demonstrated radiometrics as an effective prospecting tool because of an association of rare earths with thorium. Detailed sampling in 1983 yielded ThO_2 values ranging from 0.17% to 14.4% and yttrium from 207 ppm to 6300 ppm with one analysis of 1.01% Y. One carbonatite dyke sample yielded anomalous contents of rare earths (0.82% Ce, 1.5% La, 0.74% Nd) (Barbour, 1982). There are no analyses of HREE from this phase of exploration. In 2002, extensive sampling of the carbonatite dykes was carried out by Mr. P. Siegfried and Dr. T. Mariano for the Canadian REE company ME Technologies. REE mineralization with highly anomalous HREE was identified.



Plate 8.2 Rock pit for sampling of a carbonatite dyke from Rouna's exploration in the early 1980's

More recently, geological investigations in the area by the Geological Survey of Namibia have been ongoing since V. Niku-Paavola began a Ph.D. research project on the carbonatites in the

Lofdal area in 2004. This project is nearing completion at the Camborne School of Mines in Exeter, U.K. Dr. R. Ellmies of the GSN has maintained an active research interest in this area and facilitated research particularly by students at the University of Namibia. One B.Sc. thesis describing aspects of the carbonatites and rare earth mineralization has been completed (Ndalulilwa, 2009). Two M.Sc theses and two B.Sc. theses are in progress. GSN's work in this area has provided significant new information on the unusual HREE enrichment of certain carbonatite dykes at Lofdal and has yielded much detailed information about the mineralogy of the carbonatites and their contained rare earth mineralization (Niku-Paavola et al., 2001; Wall et al., 2008; do Cabo and Ellmies, 2010).

The presence of copper mineralization coupled with the presence of REE-bearing carbonatite dykes, abundant iron oxide mineralization, and magnetite-cemented diatreme breccias led Lobo-Guerrero (2005) to suggest a potential for Iron Oxide Copper Gold (IOCG) type deposits in the area, which was influential in attracting the interest of NRE (Pty) to the area. NRE (Pty) explored for copper and gold in the area from 2005 to 2007 but did not delineate any IOCG targets from its regional exploration. The company switched its focus to the potential for rare earth element mineralization associated with the carbonatites in 2008.

Item 9: Geological Setting

9.1 Regional Geology

The regional bedrock geology of north-western Namibia is characterised by Archean cratons to the north and south, the Congo and Kalahari cratons respectively, separated by a Neoproterozoic orogenic belt of Pan African affinity termed the Damara fold belt or Orogen (Figure 9.1).

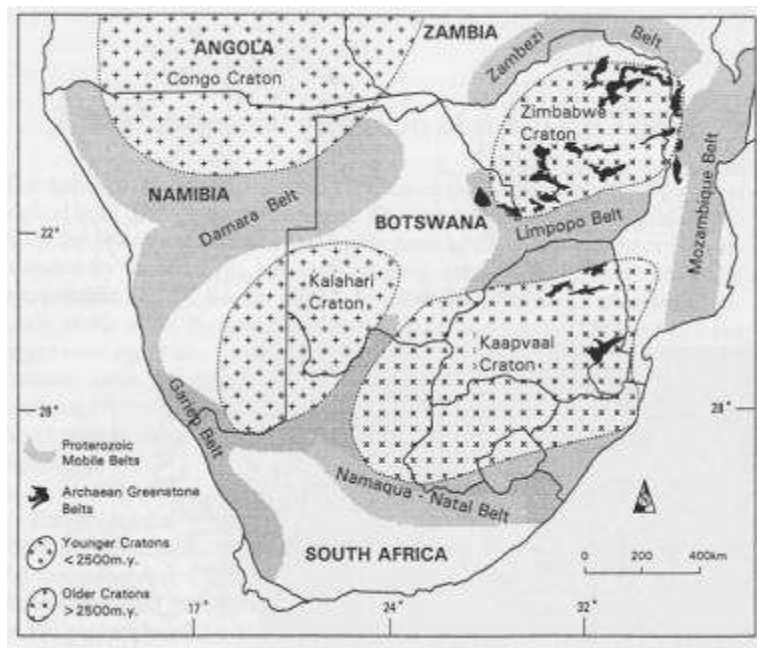


Figure 9.1 Cratons and orogenic belts in southern Africa (after Schneider, 2008)

The southern edge of the Congo Craton is exposed in three inliers in the Khorixas – Kamenjab area termed respectively the Kamenjab, Braklaagte and Welwitschia inliers (Figure 9.2), separated from each other by belts of younger volcanic and sedimentary rocks of the Damaran Orogen. The basement rocks in the Welwitschia Inlier were intruded post-tectonically by the Oas Syenite and the related Lofdal carbonatite complex, comprising syenite, nepheline syenite, phonolite and carbonatite.

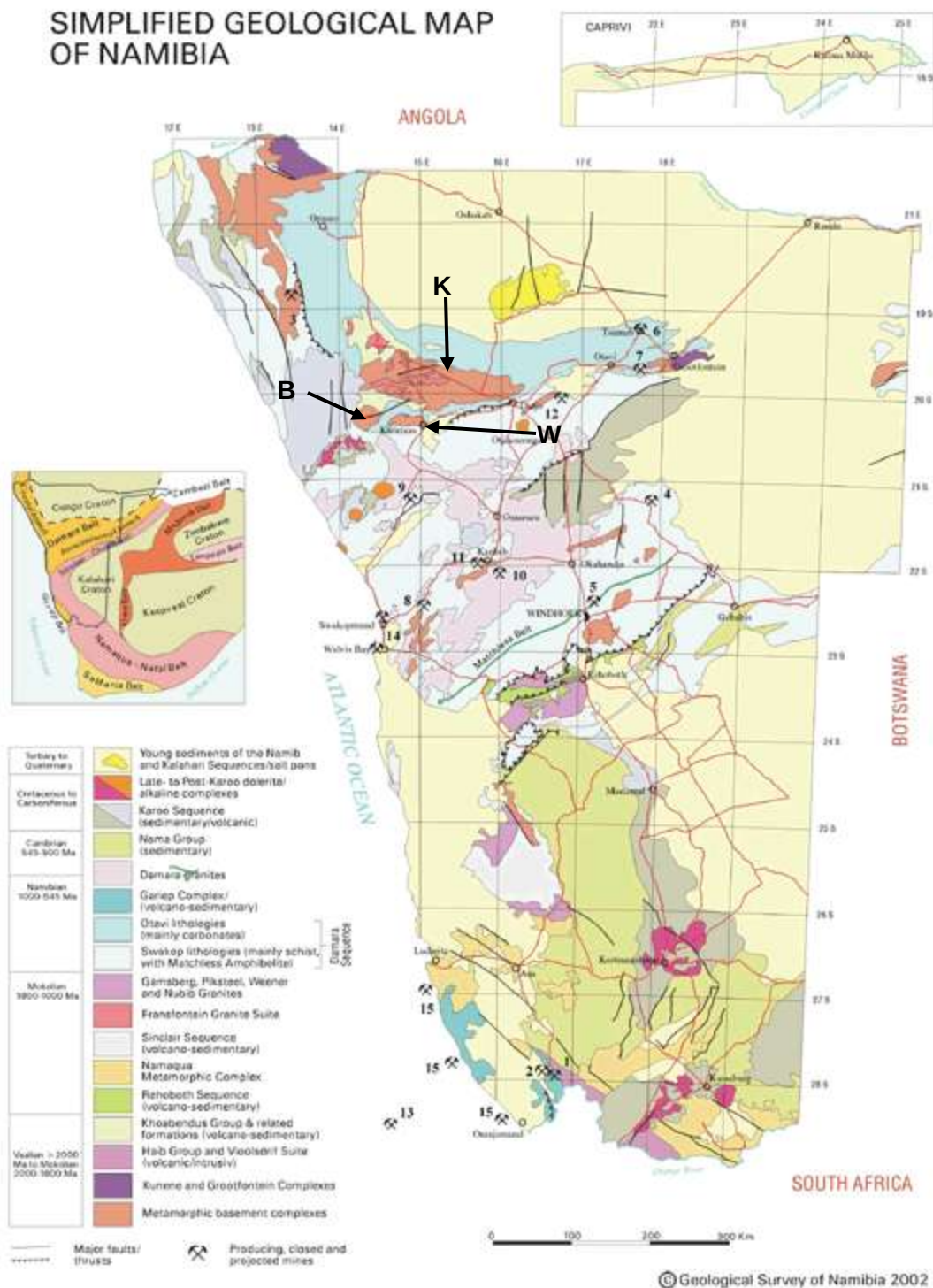


Figure 9.2 General geology of Namibia. Huab Metamorphic Complex Inliers are labelled: K - Kamenjab; B - Bratlaage; W – Welwitschia (Geological Survey of Namibia, 2002)

9.2 District Geology

A geological map of the Welwitschia Inlier, which hosts the Lofdal carbonatite complex, is shown in Figure 9.3. The principal geological units are briefly described below.

9.2.1 The Huab Metamorphic Complex

The oldest rocks in the inlier are leucocratic granitic gneiss, banded paragneiss and quartzite, amphibolite, and mica/chlorite schist assigned to the Huab Metamorphic Complex (Frets, 1969) (Plate 9.1). Locally, mafic sills, dykes and stocks cut the sequence. The Huab Metamorphic Complex is polydeformed, affected by at least one phase of high-temperature isoclinal folding and is locally migmatized. The Huab Metamorphic Complex has not been directly dated but is considered to be about 2.0 b.y. old as it is intruded post-tectonically by the Fransfontein Granite, which has been imprecisely dated by U/Pb with two discordia lines giving ages of 1871 $\pm$ 30 and 1730 $\pm$ 30 (Burger et al., 1976)

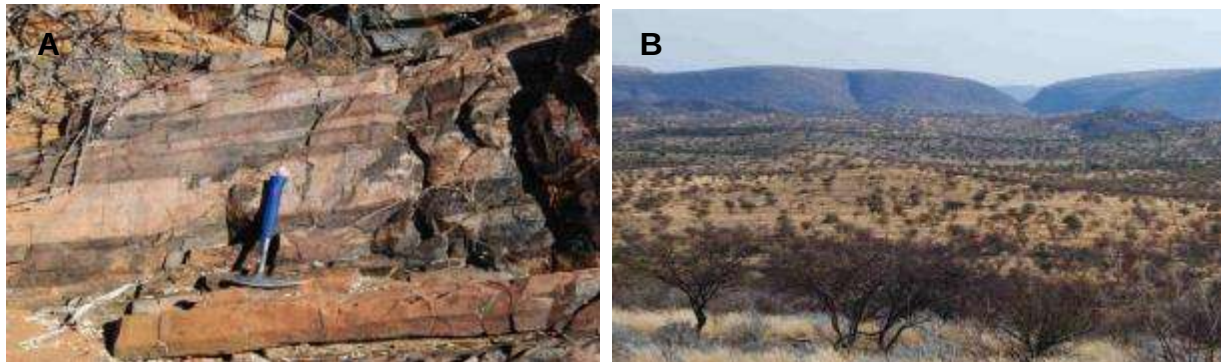


Plate 9.1. A - banded grey leucocratic granitic gneiss of the Huab Metamorphic complex. B - looking north across Huab Metamorphic Complex in the Welwitschia Inlier. High ground in distance is Damaran Orogen sedimentary rocks.

9.2.2 The Damaran Orogen

The Welwitschia Inlier is bounded to north and south by sedimentary rocks of the Damaran Orogen. To the north it is in fault contact with clastic sedimentary rocks of the Mulden Group. To the south it is unconformably overlain by volcanic and sedimentary rocks of the Nosib and Swakop groups.

The Damaran sequences represent a Pan African orogenic belt between the Congo and Kalahari Cratons. The basal successions (Nosib Group) comprise quartzite, arkose, conglomerate and

subordinate calc-silicate and limestone that were laid down in, or marginal to, the intra-continental rifts. Locally, alkaline ignimbrite and associated subvolcanic intrusions are present (the Nauupoort Formation), the basal part of which has been dated by U-Pb single zircon at 752 ± 7 (de Kock et al., 2000). Early rift sedimentation was followed by widespread carbonate shelf and slope deposition, which grades laterally into deep water clastic sediments with local accumulations of within-plate basic volcanic rocks (Swakop Group). Subsequent subduction and continental collision resulted in widespread deposition of molasse (Mulden Group).

9.2.3 Early Damaran Alkaline/Carbonatitic Intrusion

At about 760 Ma, more or less contemporaneously with the early Damaran alkalic Naauwpoort Formation volcanism, a suite of alkali silicate rocks and carbonatites were emplaced in the Huab Metamorphic Complex. The largest of these bodies is the Oas Syenite, first described by Frets (1969). It underlies approximately 20 km^2 immediately south of the Lofdal project area, and comprises a dominantly coarse grained, alkali feldspar, sodium plagioclase, hornblende and quartz syenite. Apatite and sphene are important accessory minerals (Frets, 1969). The Oas Syenite intrudes the basement gneisses and the basal sedimentary rocks of the Nauuupoort Formation (Frets, 1969) but is apparently overlain by Damaran limestones from higher in the sequence. The Oas Syenite has been dated at 757 ± 2 (Hoffman et al., 1996).

Frets (1969) mapped a body of nepheline syenite in the southern part of farm Lofdal 491, which he described as intrusive into the gneiss complex. He noted the presence of a number of smaller satellite plugs, consisting dominantly of medium to coarse-grained leucocratic nepheline syenite. He also noted the prevalence of calcite and siderite in cracks and marginal facies of the intrusive.

Recent work has shown that the intrusive complex at Lofdal is more complicated than envisaged by Frets (1969), and comprises an assemblage of nepheline syenite and carbonatite intrusive plugs and dykes with related phonolite dykes and breccias defining an intrusive complex that appears to underlie an area of more than 200 km^2 .

The distribution of lithologies is shown in Figure 9.3 and a more detailed view of the central part of the complex including the carbonatite intrusive plugs is shown in Figure 9.4. Individual lithologies are described below:

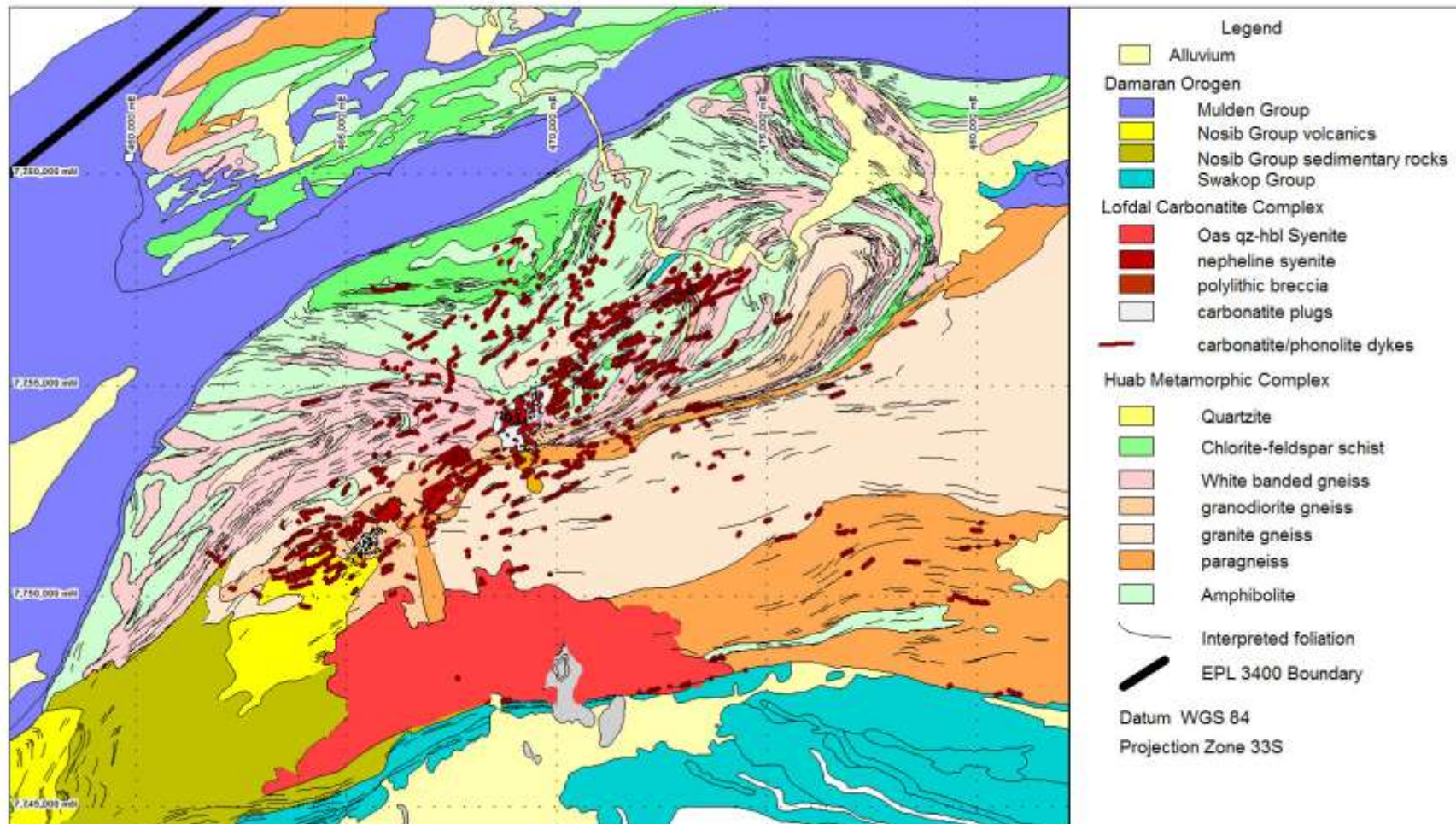


Figure 9.3 Geology of the Welwitschia Inlier, modified after Geological Survey of Namibia (2006b)

9.2.3.1 Nepheline Syenite

Nepheline syenites in the Lofdal area comprise medium to coarse grained feldspar- and nepheline-porphyritic syenites. The original syenite intrusion mapped by Frets (1969) is, in fact, composite, comprising a carapace of syenite, which is intruded from below by carbonatite (the Main intrusion, see below). This results in a map pattern dominated by syenite (Figure 9.4). Syenite occurs in a number of satellite intrusions where it displays a wide variety of textures including very coarse grained pegmatitic syenite phases. The syenite intrusions are locally cut by phonolite and carbonatite dykes, and fragments of the syenite are incorporated in the Lofdal breccias. The syenites are typically undeformed but locally exhibit mild shearing, characterized by development of a cleavage and alignment of feldspar phenocrysts. The Lofdal nepheline syenite has been imprecisely dated by Rb/Sr whole rock at 764 ± 60 (Hawkesworth et al., 1983)

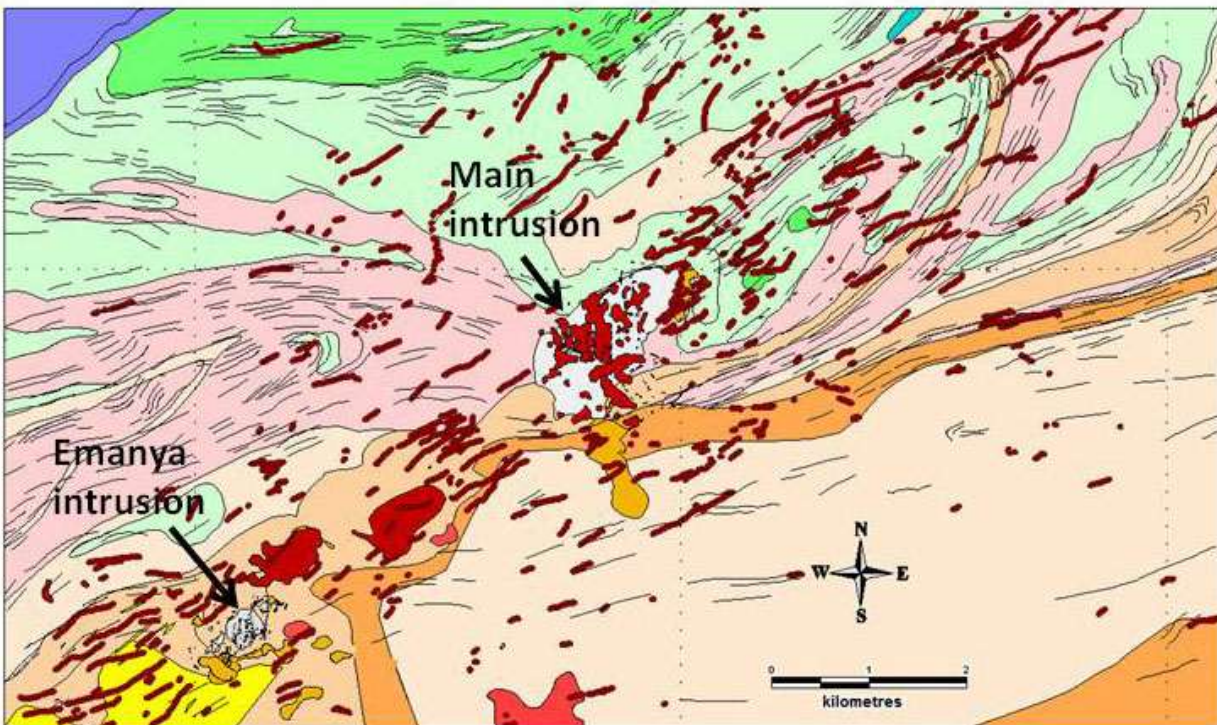


Figure 9.4 Detailed geology of the central part of the Lofdal Carbonatite Complex. Legend as for Figure 9.3

9.2.3.2 Phonolite

Phonolite (nepheline, alkali feldspar) dykes are widespread in the Lofdal area. They are dominantly north-east striking and typically fine-grained to moderately porphyritic with a locally trachytic texture (Plate 9.2). Where phenocrysts are present, they are dominantly alkali

feldspar lathes up to 2 mm long with lesser nepheline. Phonolite dykes have been observed to cut syenite and they are typically closely associated with carbonatite dykes throughout the area.

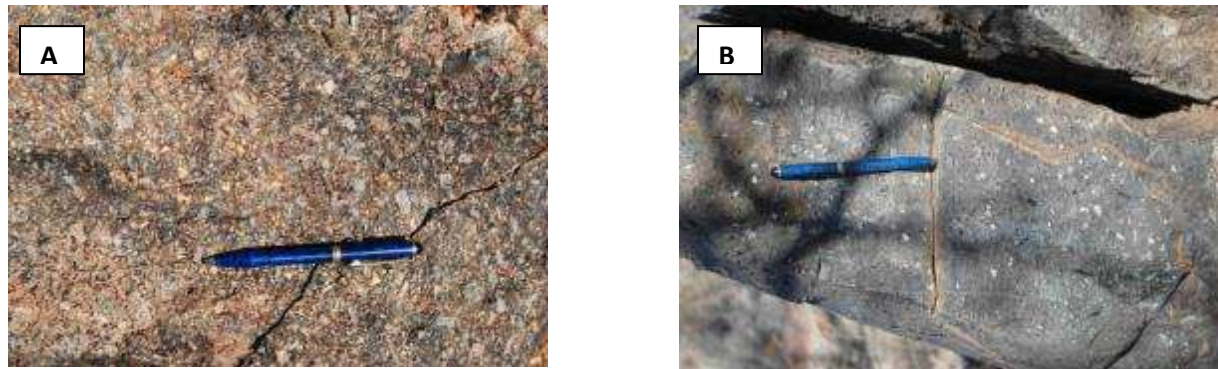


Plate 9.2 A - coarse grained, porphyritic nepheline syenite; B - slightly porphyritic phonolite dyke.

9.2.3.3 Lofdal Breccias

Frets (1969) first noted the presence of very coarse breccia associated with the nepheline syenites, which he described as *“closely packed angular fragments of gneiss which vary in size between 1 cm and 50 cm, embedded in a fine-grained, contaminated facies of the syenite.”* He suggested that it indicated a forceful intrusion of the syenite.

Geological mapping in the area has demonstrated that these breccias are more widespread than originally thought, and are associated with virtually all syenite intrusions. Although locally dominated by country rock fragments as described by Frets (1969), in other areas they are dominated by syenite fragments. The breccias range from poly lithic (basement) to monolithic (syenite) and are typically unsorted, angular, and chaotic (Plate 9.3). Locally the breccias are intruded by carbonatite indicating that their formation is related to syenite intrusion but predates the carbonatite. The spatial association of the breccias with the intrusive plugs in the complex provides evidence of the proximity to intrusive centres and may be an important exploration guide for hidden carbonatite plugs.



Plate 9.3 Lofdal breccias. A- a coarse grained, clast supported, unsorted syenite breccia near the Emanyia intrusion with a small carbonatite dyke under the hammer. B - polymictic breccia exposed in a quarry near the Main intrusion.

9.2.3.4 Carbonatites

Carbonatite dykes have been known in the Lofdal area for a considerable time (Barbour, 1982; Verwoerd, 1993). However, the recognition of larger, plug-like carbonatite intrusions in the area is relatively recent. The carbonatite plug that is now referred to as the “Main” intrusion appears on a map by Barbour (1982) but its full extent and significance was first recognized by Geological Survey of Namibia geologists (V. Do Cabo, pers comm.). A second, smaller intrusion approximately 4.5 km to the SW now referred to as the “Emanyia” intrusion or plug, was found in 2008 (Plate 9.4; Figure 9.4). Regional geological investigations between 2008 and 2010 have shown that there are literally hundreds of carbonatite dykes over an area of about 200 km² (Figure 9.3). Wall et al (2008) dated xenotime in the carbonatites by U-Pb and obtained an age of 765 +/-16, indicating that they are approximately coeval with the Oas Syenite.

The Main intrusion is the largest carbonatite body found to date in the complex. Its outcrop area is an ovoid with long axis of about 2 km and an exposed area of about 1.5.km² (Figure 9.4). The Main intrusion carbonatites are dominantly coarse grained white sovite. The carbonatites intrude nepheline syenite, which forms an outcrop carapace on top of the carbonatite at the present level of exposure (Plate 9.4). Because of this, syenite dominates the outcrop pattern in the area of the intrusion and it is not surprising that previous workers mapped this body as dominantly syenite (Frets, 1969). The Main intrusion is relatively uniform geochemically, with

low iron contents and exhibits a LREE-enriched rare earth distribution that is typical of carbonatite magmas but too low in absolute concentration to be of economic interest.

The Emanyia intrusion is located about 3.8 km southwest of the Main intrusion (Figure 9.4). It comprises a main body, roughly circular in outcrop with a diameter of about 350 m as well as several smaller satellite bodies within a 450m radius. The carbonatites in this intrusion are calcitic but contrast with the Main intrusion in that they are finer grained and dominantly brown to reddish-brown with abundant iron oxide throughout (Plate 9.4). Fluorite is locally present in veinlets. On average, the Emanyia carbonatites contain approximately 8.6 times more LREE and 3.6 times more HREE than the Main intrusion. The REE in Emanyia are fractionated in favour of the LREE compared to the Main intrusion.

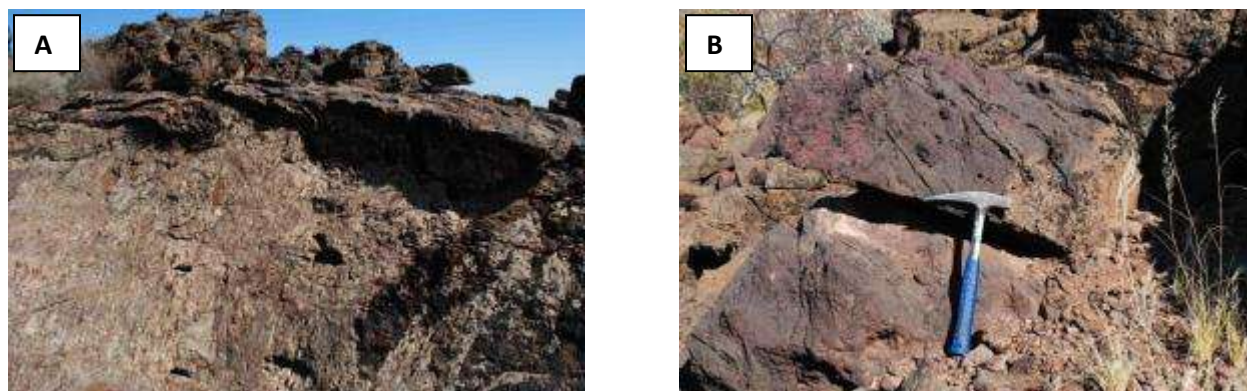


Plate 9.4 A, white soelite of the Main Intrusion intrudes a carapace of nepheline syenite (ledge at top of outcrop). B – dark reddish brown carbonatite is characteristic of the Emanyia intrusion.

Carbonatite dykes have been mapped over an area of more than 200 km² throughout the Lofdal carbonatite complex. They typically follow the structural grain of the country rocks, striking in a northeasterly direction (Figure 9.5) and dipping steeply to the south. They exhibit a wide range of lithological characteristics, ranging from <10 cm to several 10's of metres wide and exhibiting a wide range of colour variation, from white and grey, through shades of brown, red and yellow (Plate 9.5). The carbonatite dykes are the youngest intrusive event in the complex. They typically have sharp contacts with the country rocks, but small fracture fills and veinlets in the country rocks near the dykes are commonly observed. The carbonatite dykes are closely associated with phonolite dykes throughout the area, often occurring together in the same dyke (with the carbonatite always the later phase) or in close-spaced parallel dyke swarms.

There is also considerable variability in the internal structure of the dykes. Many dykes are uniform in character, exhibiting little internal banding or colour variation. Such dykes are typically grey to light brown in colour and are often coarse grained. Most dykes, however, exhibit some internal structure. The most common is colour and/or compositional banding on a scale ranging from millimetres to centimetres.

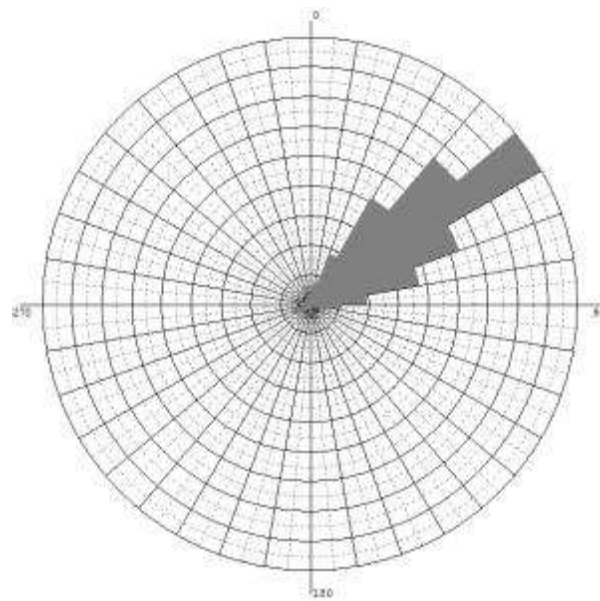


Figure 9.5 Rose diagram of measured strike of carbonatite dykes in the Lofdal Complex, showing a dominantly NE-SW trend

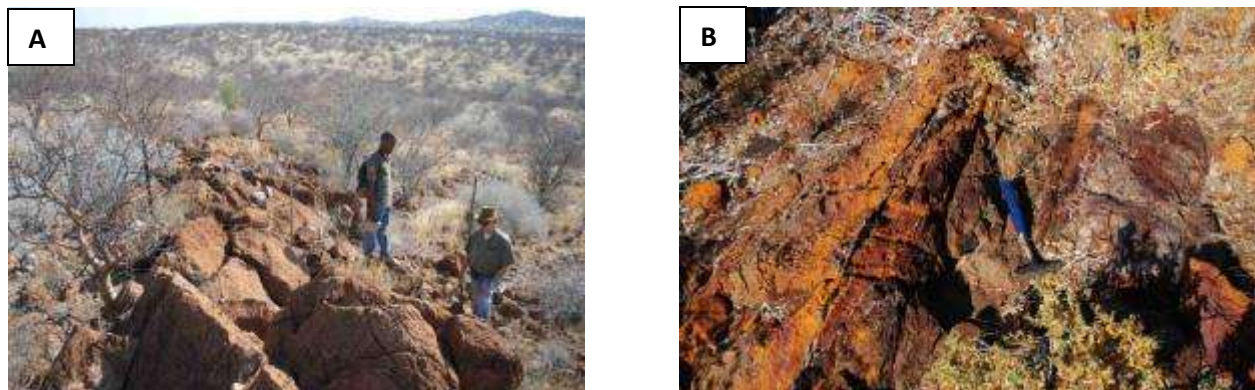


Plate 9.5 A - 10 m wide massive brown carbonatite dyke. B – laminated red and yellow carbonatite dyke with a band of albitite along the right side (under the hammer head).

The carbonatite dykes are often composite and many are internally zoned. The zoning is locally bilaterally symmetrical, suggesting a dynamic environment in which some dykes were repeatedly opened and injected with carbonatite (Plate 9.6A). The banding may reflect various

processes including flow banding during injection, repeated opening of a fracture and injection of new carbonatite, and sub-solidus hydrothermal alteration.

There is abundant evidence for hydrothermal alteration of the carbonatite dykes. The iron oxides are variably magnetic suggesting that much of the magnetite has been oxidised. Colour variations within the dykes appear to reflect dominantly the abundance and oxidation state of iron (oxides and carbonates) and contacts are often irregular and diffuse suggesting that these colour variations reflect an alteration front rather than different magmatic phases. The carbonatite dykes often occur in wide (>20m) zones of hydrothermal alteration in which the dominant rock types are massive to highly brecciated albitite (Plate 9.5B; 9.6B) and mafic schists infused with brown carbonate, phlogopite and albitite. Most rocks in these zones are at least moderately albitized. The albitites in particular commonly exhibit brittle brecciation and broken albitite fragments are infused and surrounded by brown carbonatite.

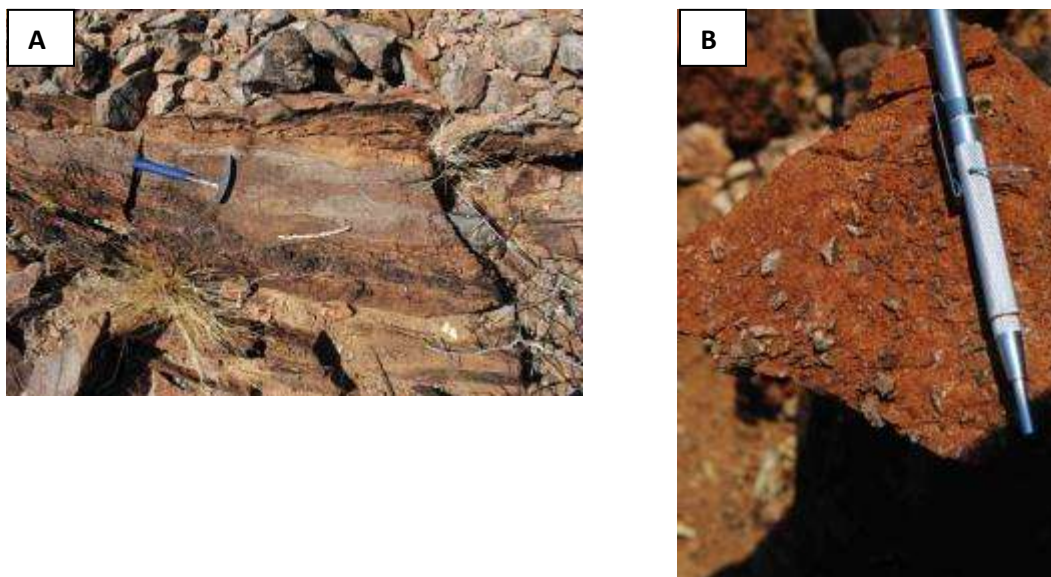


Plate 9.6 A - laminated carbonatite dyke with bilaterally symmetrical colour bands suggesting repeated opening and filling of the fracture with carbonatite. B – albitite fragments in a carbonatite breccia.

9.3 Structural Setting

Rocks of the Huab Metamorphic Complex were polydeformed and metamorphosed prior to intrusion of the Fransfontein Granite at ca 1.7 b.y. They were subsequently affected by extensional tectonics during the rifting event that initiated the Damaran Orogen at ca 850 – 750 m.y. and transpression during the orogenic events that accompanied the Damaran Orogeny.

The effects of both NeoProterozoic rifting and early Paleozoic transpression are recorded in the Lofdal carbonatites.

A comprehensive structural interpretation of the area was undertaken by NPA Fugro on behalf of NRE (Pty), integrating hyperspectral and Landsat data with all available airborne geophysical surveys and NRE (Pty) geological and geochemical databases to produce a high level interpretation of structural features in the Welwitschia Inlier (Figure 9.6). This interpretation identifies regional structures in the basement that probably reflect the pre-Damara history of these rocks. As well, it identifies a series of sinuous NE/SW striking major fault structures that systematically offset the basement structures in a sinistral sense. These structures are locally offset by a series of NNE-striking dextral structures and NW/SE striking structures.

The intrusive complex at Lofdal shows a close relationship to the structural grain of the basement. The Main and Emana intrusions are located between large sinistral structures and the phonolite and carbonatite dykes in the complex are typically structurally aligned with the ENE and NNE-trending structures (Figure 9.6). The intrusive complex seems, therefore, to have exploited regional structures during emplacement.

Structures within the carbonatites appear to record both extensional and transpressional events. The repeated injection of first phonolite and then several phases of carbonatite, and hydrothermal fluids into many of the dyke structures may be the result of repeated opening of pre-existing structures during the extensional regime that prevailed at about 750Ma. However, there is also evidence of transpressional deformation within the dykes, with minor structures (folds, shear bands) indicating transpression with the same sense of shear as is interpreted for the major structures. It may be that at least some of the deformation recorded in the dykes is Damara. It seems likely that the intrusions were facilitated by extension faults that determined the location and orientation of the intrusions. These faults and fractures may have been reactivated during the Damara Orogeny, producing the observed structures.

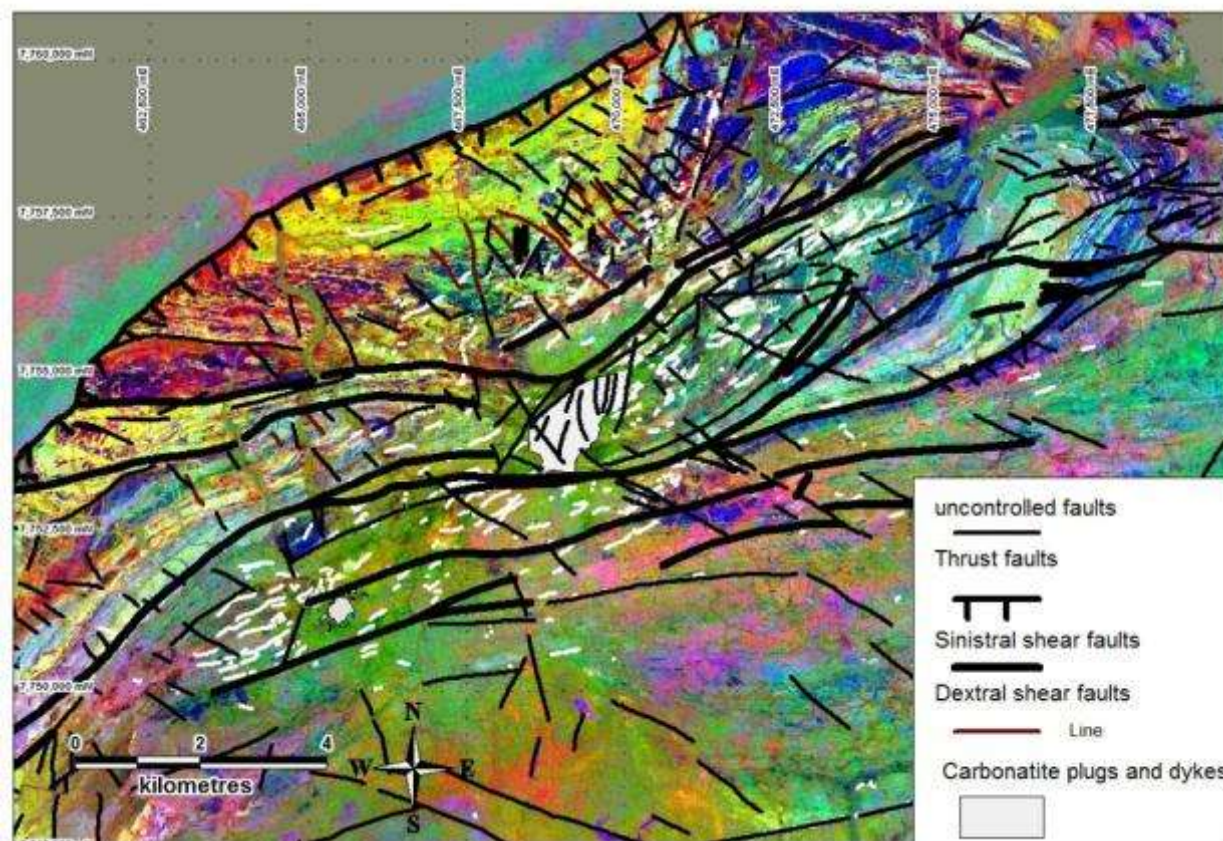


Figure 9.6 Structural elements of the Lofdal area, interpreted from landsat and hyperspectral data (NPA-Fugro, 2010). Base is hyperspectral image.

9.4 Detailed Geology of Areas 2 and 4

Prior to the 2010 drilling and trenching campaign, four priority target areas were identified by NRE (Pty) geologists for detailed assessment based on anomalous concentrations of HREE from regional lithogeochemical sampling, and the potential for significant widths of mineralization as indicated by geological mapping (Figure 9.7).

To date, detailed geological mapping has been carried out in two of these priority areas (Areas 2 and 4) in order to better understand the geological relationships between the basement and the mineralized dykes at property scale and to begin to assess the aerial and vertical extent of the mineralized zones.

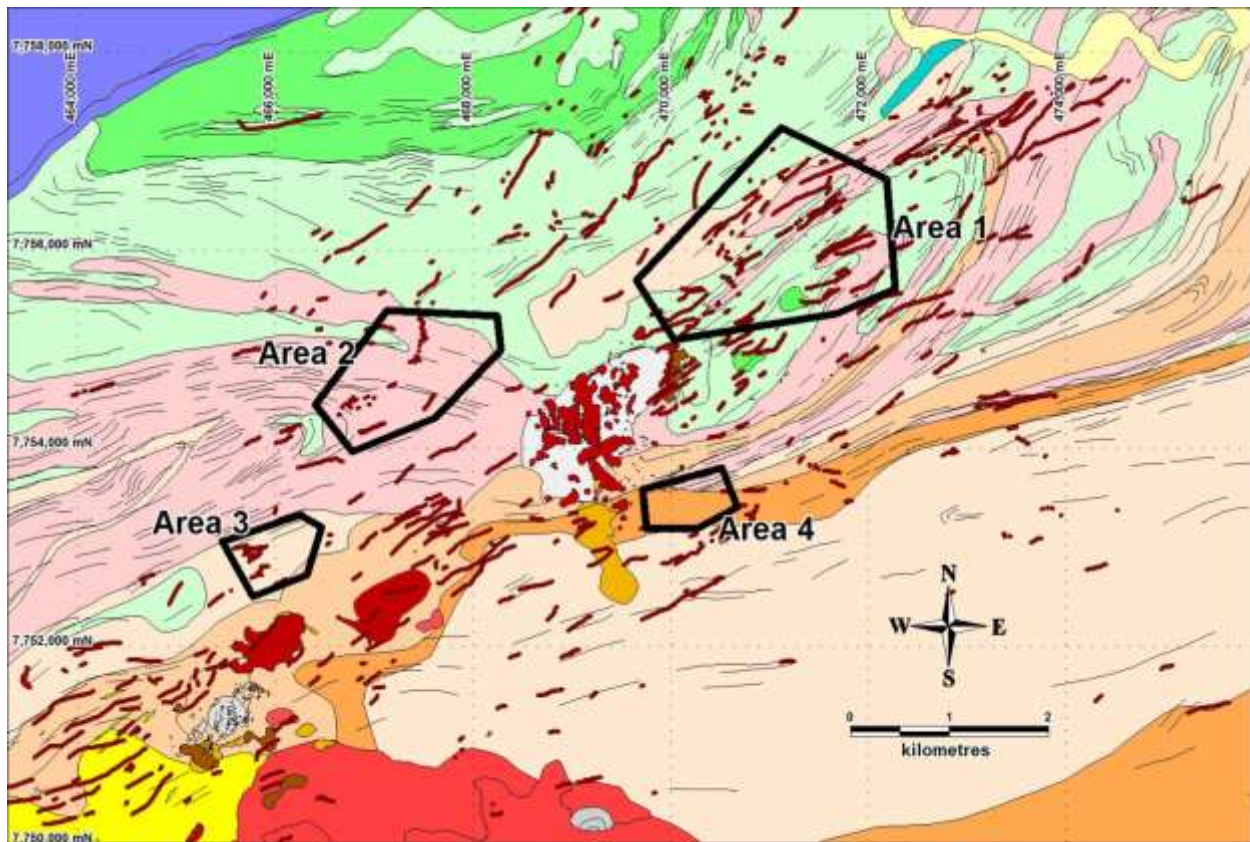


Figure 9.7 Location of Priority target areas 1,2,3 and 4. Legend as for Figure 9.3.

9.4.1 Area 2 Geological Mapping

Detailed geological mapping of Area 2 at 100 m traverse intervals, and detailed mapping of trenches on the showings, reveal a more detailed picture of the basement geology and the mineralized carbonatite bodies in this area (Fig 9.8).

The lithologies do not closely correspond to those shown on pre-existing maps and the fine structure of the metamorphic basement is considerably more complex than could be portrayed at regional map scale. The dominant country rock in Area 2 is an amphibolitic schist. It is interbanded at outcrop scale with leucocratic quartzo-feldspathic paragneiss and muscovite schist and locally intruded by coarse grained granitic pegmatites. The rocks are complexly folded on a fine scale.

There is a large number of phonolite and carbonatite dykes of variable orientation and thickness. The carbonatites are often intimately associated with phonolite dykes, which they

intrude and locally alter. Carbonatite dykes range from a few cm to more than 10 meters in width in outcrop and a number of dykes were traced along strike for more than 500 m.

Detailed mapping in the trenches shows that when carbonatites intrude schistose rocks, the host rocks are altered (carbonatized) and may be infused with carbonatite veinlets.

Dykes in this area dominantly trend from NE/SW to NNE/SSW and contrary to indications from regional scale mapping, in Area 2 the main carbonatitic and phonolitic intrusions do not follow the structural grain of the basement (which in this area trends E/W to ESE/WNW). Detailed mapping shows that it is common for dykes to change strike direction, particularly from NE to NNE, and it is common for the same dykes to have segments that respectively strike in these two directions.

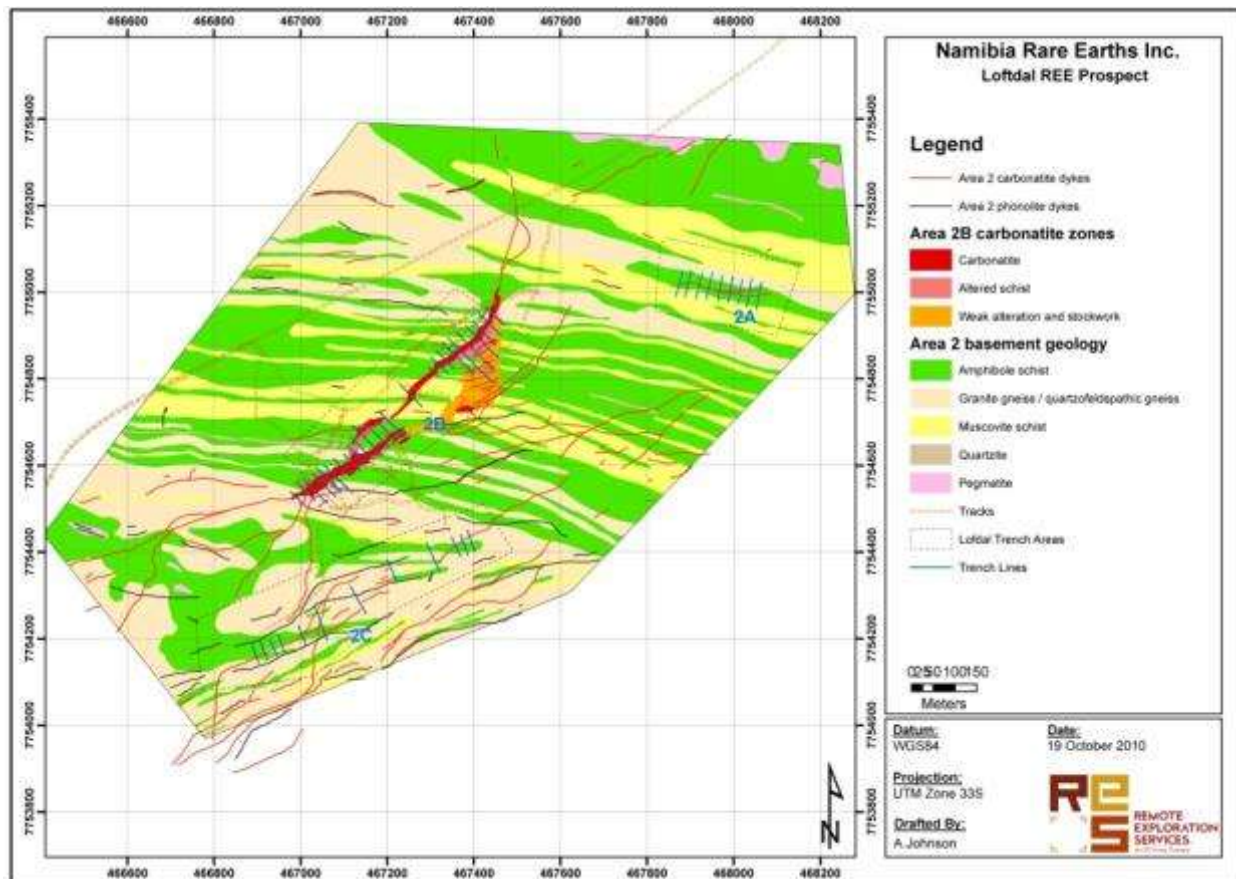


Figure 9.8 Detailed geological map of Area 2, showing location of the 2A, 2B and 2C mineralized zones.

The principal mineralized showing in Area 2 is the 2B zone (Figures 9.8, 9.9), comprising a wide zone of hydrothermal alteration and carbonatite intrusion. The zone has been traced by detailed trench mapping along a strike length of more than 600 m. Remote sensing information and regional sampling results suggest that it ultimately may have a strike length of more than 3 km. The southern part of the zone is dominantly brown carbonatite and related alteration. Alteration zone lithologies include massive albitite, localized zones of green phlogopitic fenite, brown stained albitite breccias infused with carbonatite, and altered mafic schist that has been carbonatized, variably albitized, and intruded by carbonate veinlets. Although massive and continuous across strike at its southern end, the zone bifurcates in its central section with a hanging wall zone of dominantly carbonatite and related alteration and a footwall zone that includes considerable altered, carbonatized schist and carbonatized stockwork (Figure 9.9). The zone comes together again at its northern end.

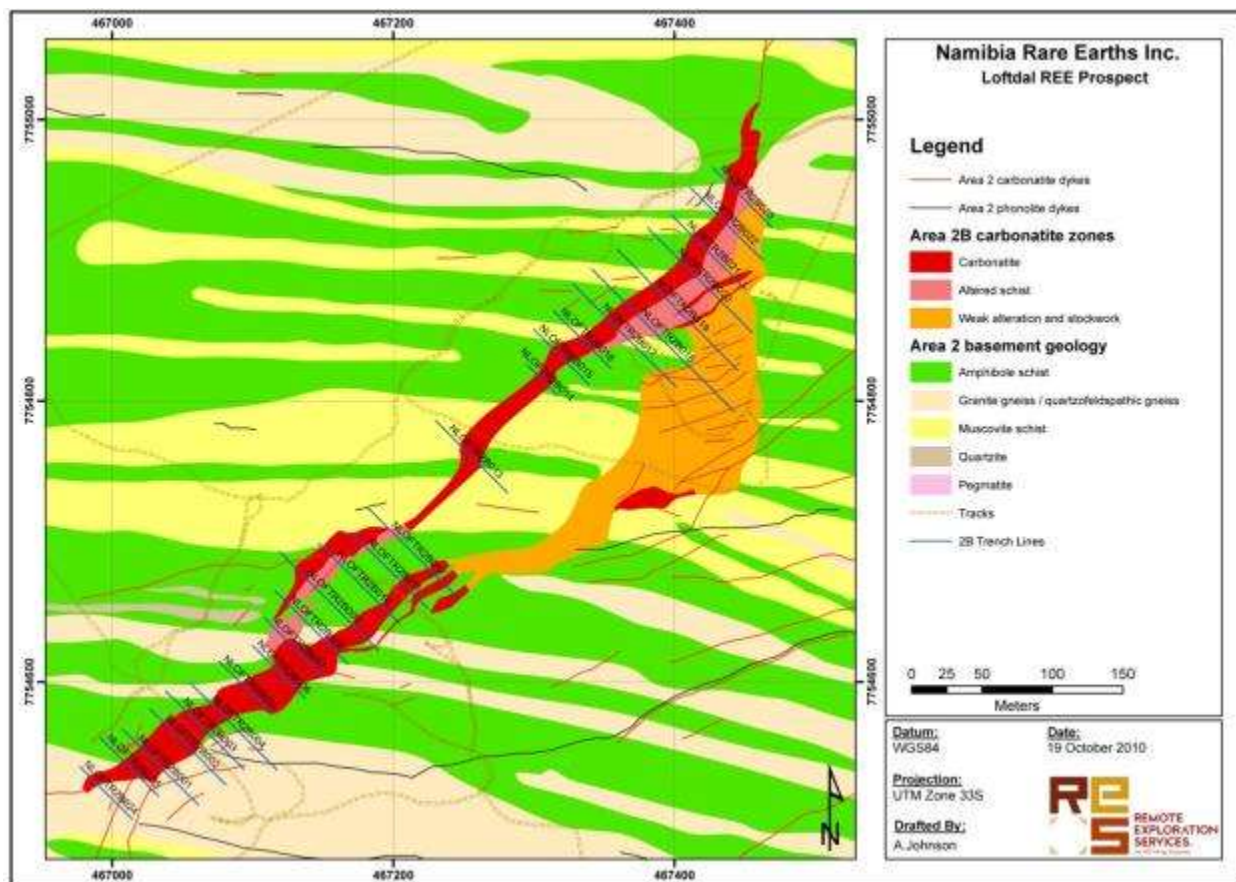


Figure 9.9 Detailed geology of the 2B zone showing location of the trenches.

9.4.2 Area 4 Geological Mapping

Detailed mapping of Area 4 has likewise helped clarify the relationship between dykes and the metamorphic host rocks (Figure 9.10). The basement rocks in this area are dominated by granitic gneiss with lesser amphibolite and amphibolitic schist, pegmatite and muscovite schist.

As in Area 2, the fine structure of the dykes is better defined than on previous regional maps. Although dyke directions are dominated by NE/SW and NNE/SSW trends, dykes trending in other directions are locally seen. In this area, the dominant direction of dyking does follow the structural grain of the basement. Several dykes were mapped along strike for more than 350 m and the central zone of dyking and carbonatization has been mapped for more than 800 m along strike. This wide zone of carbonatite intrusion and alteration corresponds with a significant hyperspectral signature and an interpreted regional sinistral shear structure. The zone extends to the east beyond the mapped area. The lithologies and style of alteration in this zone seem very similar to those in the 2B zone.

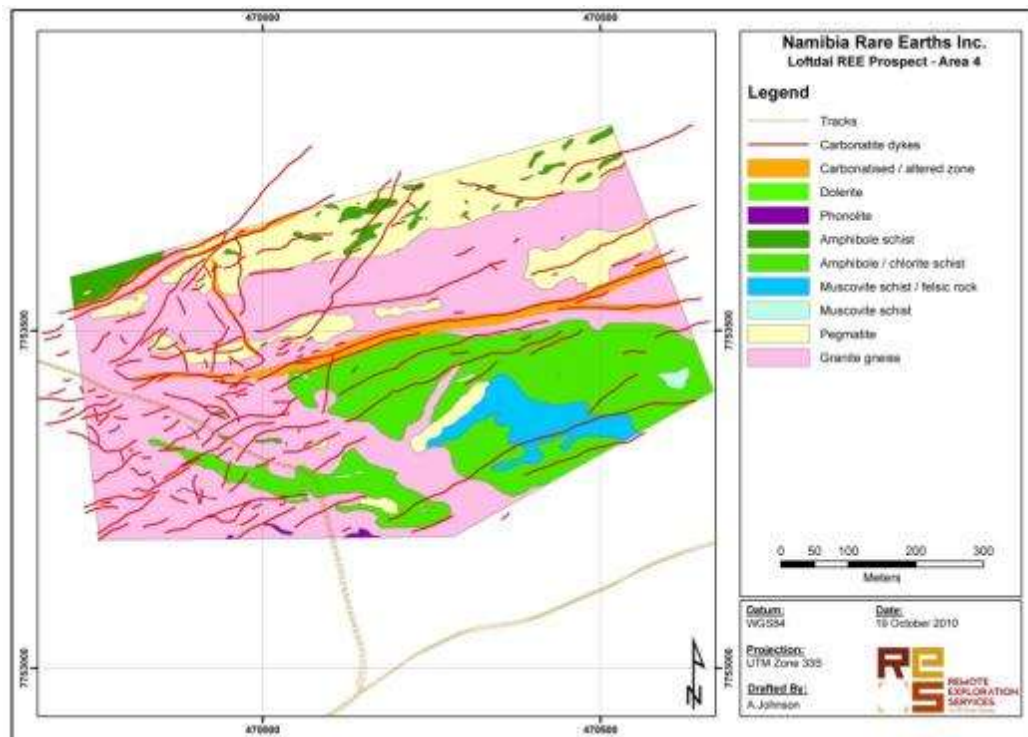


Figure 9.10 Detailed geological map of Area 4 showing fine structure of basement geology, carbonatized alteration zones and carbonatite dykes.

Item 10: Deposit Types

Carbonatites and related silicate rocks originate in the mantle through very low degrees of partial melting. They typically display geochemical enrichments in Ba, Nb, REE's, Sr, Ta, Th, U and Zr. Carbonatites are important for a variety of economic mineral deposit types including REE's (e.g. Bayan Obo, Mountain Pass), Nb (e.g. Araxa, Oka), titanium, phosphate from apatite (e.g. Araxa, Palabora), vermiculite, fluorite (e.g. Okoruso) and Cu (Palabora). Carbonatite-associated deposits, including the giant Bayan Obo deposit in China, are a principal source of rare earth elements. Carbonatites are the focus of much current exploration for rare earths throughout the world.

A widely-cited general model for intrusion of a carbonatite complex is shown in Figure 10.1. Although most complexes differ from each other in detail, this model provides a useful framework for description of observed mineralization at Lofdal. At Lofdal, the early silicate intrusions are dominantly syenite and nepheline syenite, rather than ijolite and urtite. Like the model, they are succeeded by a sovite intrusion (the Main intrusion) and by one and potentially

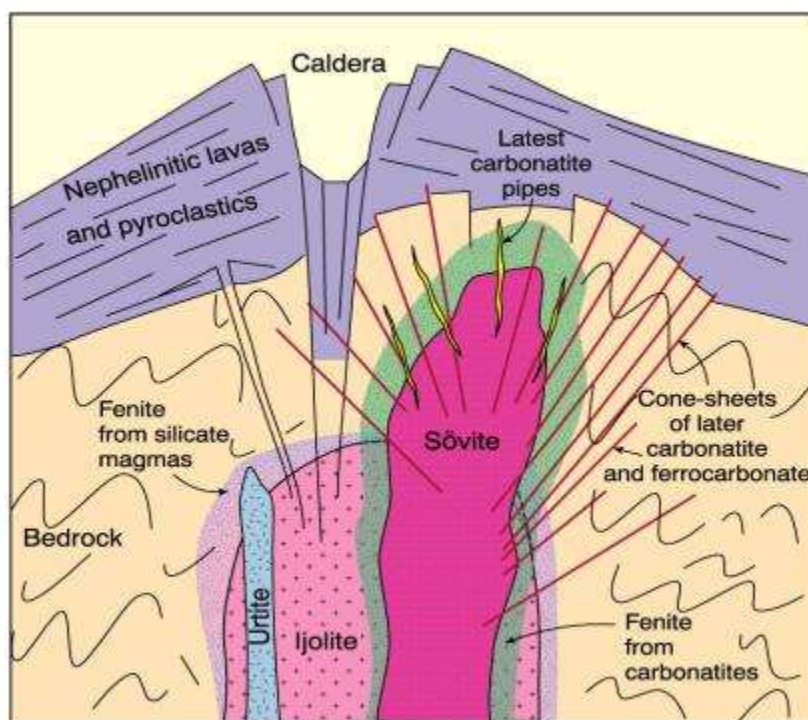


Figure 10.1 General cross-sectional model for an alkali silicate-carbonate intrusive complex, after Le Bas, 1987. Early silicate intrusions are intruded by carbonatite intrusions, which are cut by later carbonatitic dyke complexes.

more subsidiary intrusive plugs, presently represented by the Emanyia intrusion. Like the model, Lofdal has abundant later stage dykes of both silicate (phonolite) and carbonatite (ranging from calcitic through dolomitic and ankeritic). There is abundant evidence of hydrothermal alteration associated with many if not most of the carbonatites and fenetization is recognized locally, particularly in drill core.

The target deposit at Lofdal is a carbonatite-associated rare earth element deposit with particular enrichment in the heavy rare earths accompanied by yttrium. The Lofdal project is at an early exploration stage with the objective of making a new rare earth deposit discovery. REE mineralization on a district scale was only documented by NRE (Pty) geologists in 2008-2009 from wide spaced outcrop grab sampling. Systematic channel sampling and drilling has only been carried out in Area 2 in the fall of 2010. At the time of writing, an economic mineral deposit has not yet been identified.

Rare earths, and particularly the LREE, are typically significantly enriched in carbonatites over normal crustal abundances, a result of their mantle partial melting history, subsequent concentration through fractional crystallization in the crust and subsolidus hydrothermal activity accompanying the intrusion. Locally, the enrichment in rare earths produces deposits of economic proportions. Mariano (1989) identified three types of mineralization that might be expected in a carbonatite complex:

- i) magmatic primary crystallization of REE minerals;
- ii) hydrothermal concentration; and
- iii) supergene concentration.

The rocks at Lofdal are not deeply weathered and there is very low likelihood of extensive supergene enrichment. However, there is significant potential for both magmatic and hydrothermal deposits.

10.1 Magmatic REE mineralization

It is rare to find a REE deposit that has formed through primary crystallization from a carbonatite magma. Perhaps the best known example is the Mountain Pass deposit in California, where a 1.4 b.y. intrusive complex consisting of a total of eight plugs ranging in composition from shonkinite to carbonatite intrude Precambrian basement metamorphic rocks (Figure 10.2). Shonkinite was the first alkali phase to be intruded, succeeded by syenite granite and fine grained shonkinite dykes. The last intrusive phase is carbonatite, which occurs in one plug (the Sulfide Queen) and in peripheral dykes within the metamorphic host rocks. The Mountain Pass carbonatite is a complex intrusion of calcitic and dolomitic carbonatite (Figure

10.3). The orebody has current reserves of more than 20 million tonnes of ore with an average grade of 8.9% rare-earth oxides (Castor, 2008). The ore, which typically contains 10–15% bastnäsite-(Ce) subsidiary monazite and apatite, is mostly composed of calcite, dolomite and barite, along with generally minor amounts of other minerals. Texture and mineral paragenesis shows that bastnaesite and parasite are primary magmatic minerals.

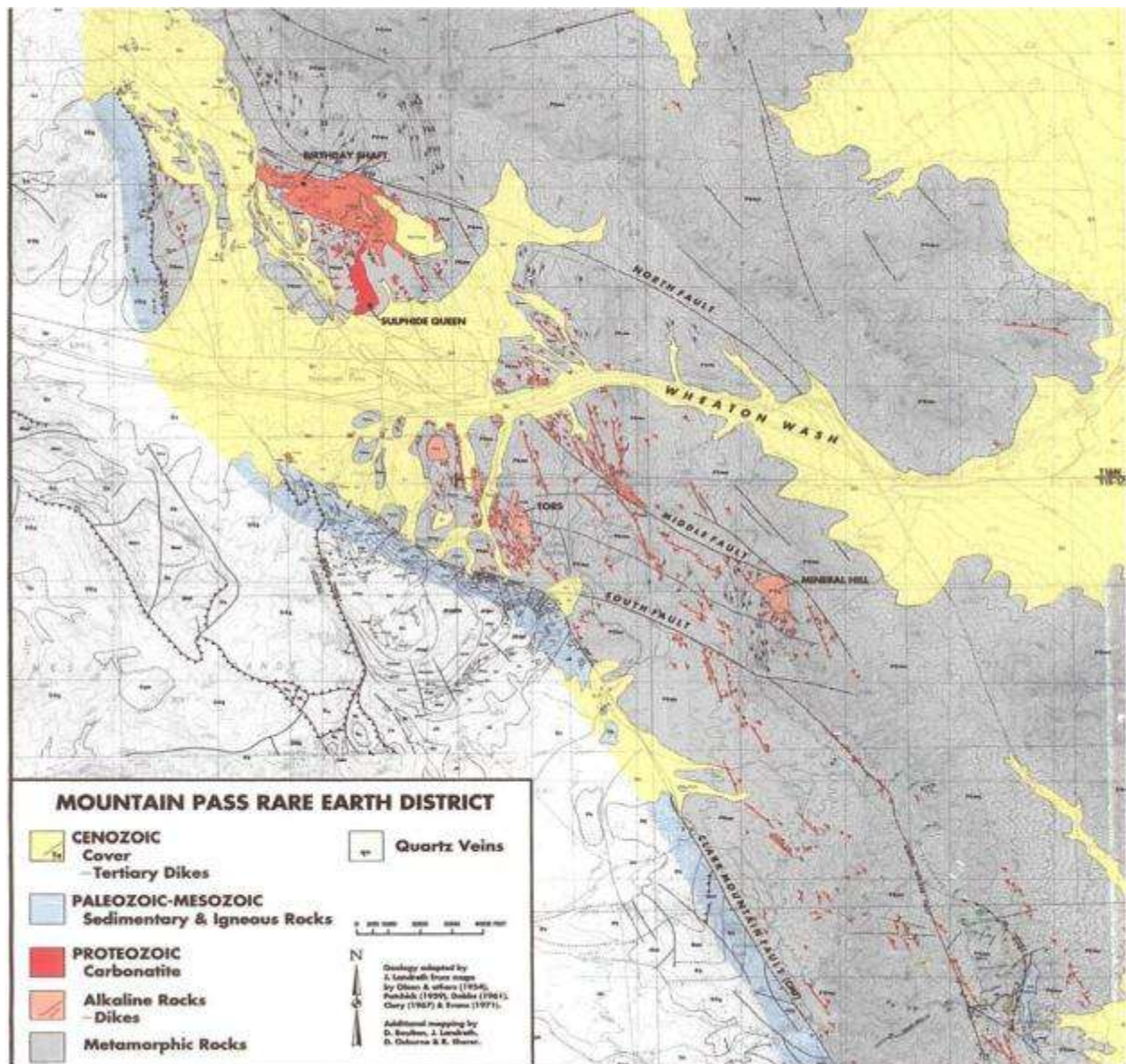


Figure 10.2 Geology of the Mountain Pass deposit. Sulfide Queen orebody shown in red (from Molycorp Minerals, 2009).

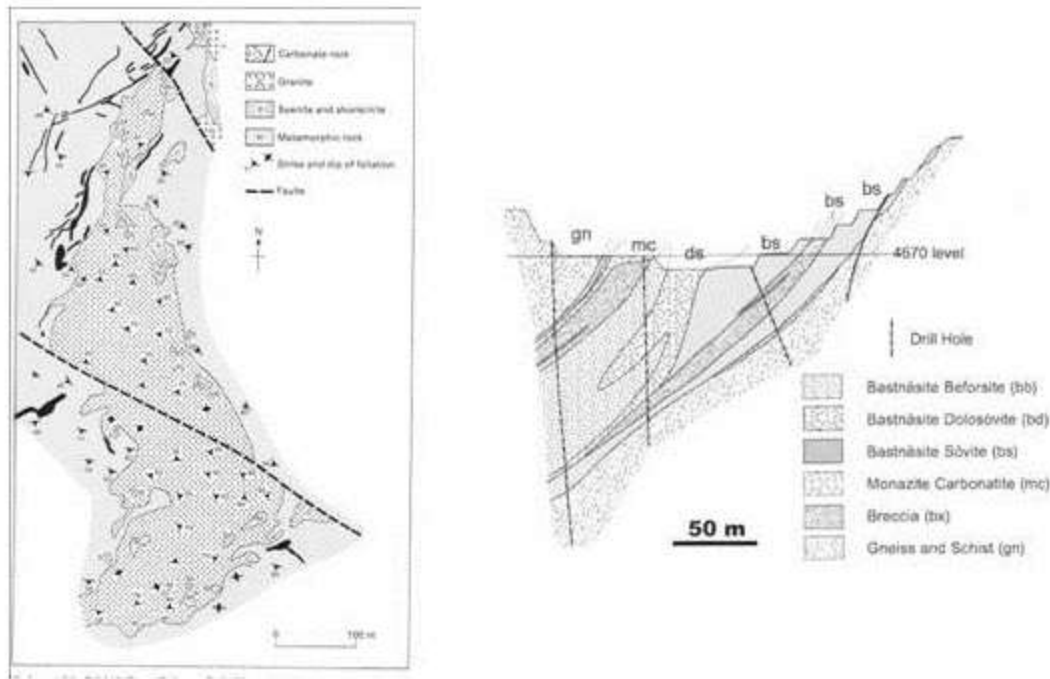


Figure 10.3 Detailed geology of the Mountain Pass deposit. Left – geology of the Sulfide Queen carbonatite from Evans (1993); right - simplified cross section through the approximate centre of the Mountain Pass deposit, from Castor (2008)

The Mountain Pass carbonatite plug provides an analog for potential targets at Lofdal. There is evidence that at least some of the xenotime at Lofdal formed in a final magmatic phase of apatite-bearing calcite carbonatite emplacement transitional to hydrothermal carbonatites (Wall et al., 2008). The carbonatite intrusion at Mountain Pass is comparable in size to the Emania intrusion and there is considerable potential for the discovery of additional plugs of similar size at Lofdal. The scale of dyking associated with the carbonatite at Mountain Pass is on the order of the scale of the HREE “corridor” at Lofdal (see Section 11.1).

10.2 Hydrothermal REE Mineralization

There is abundant evidence, both observational and theoretical, that REE minerals are precipitated from hydrothermal solutions and according to Mariano (1989), this is the origin of REE minerals in most carbonatites. Such a process can result in formation of various fluor-carbonate and phosphate minerals that typically occur as fracture or void fillings accompanied by quartz, fluorite, barite, hematite or sulphides, or as disseminated, fine-grained polycrystalline aggregates overprinting earlier minerals (Wall and Mariano, 1996). Much of the

REE mineralization in carbonatites may result from the breakdown of REE-bearing primary minerals such as calcite, dolomite, apatite or sulphides. The solutions become increasingly enriched in Ba, F, SO, Sr, REE and Th, and precipitate REE phosphates if phosphate is available, or carbonates if phosphate is not sufficiently abundant. The REE mineralization in these environments tends to mirror that of the original carbonatite, i.e. fractionated in favour of the LREE.

At Lofdal, there is abundant evidence for hydrothermal alteration, particularly of the dykes. The Emany intrusion has abundant iron oxide veining and locally fluorite, indicating that some hydrothermal alteration has occurred and its REE concentrations are significantly enriched over those in the Main intrusion, although still LREE-dominated. Like the Emany intrusion, many of the carbonatite dykes are significantly enriched in TREE and fractionated in favour of the LREE. However, Lofdal is unusual, and perhaps unique, in that many of the carbonatite dykes are enriched in HREE. This is very significant because it is the HREE that are the most valuable of the rare earths.

At Lofdal, there is potential to find either dykes or dyke swarms that contain economic concentrations of HREE-enriched REE over economic widths. Observations of drill core from the 2B zone (see section 13.2) show that hydrothermal alteration and brecciation is very prevalent in association with the carbonatites, and that dyke intrusions can be associated with wide alteration and breccia haloes characterized by albitite, fenite, iron oxides, carbonate and fluorite. Fenetisation with the formation of a phlogopite-bearing assemblage is locally observed within these altered zones. Drilling shows that these zones of carbonatite and hydrothermal alteration are commonly associated with significant shear structures that may have acted as fluid pathways during mineralization. Significantly, this hydrothermal activity has mineralized alteration lithologies including albitite and fenite over greater widths than the dykes themselves and this adds to the potential for finding a deposit of economic dimensions related to mineralized carbonatite dykes.

10.3 Summary

To date, the highly anomalous HREE enrichment at Lofdal has only been observed in the carbonatite dykes and related alteration lithologies and the origin of the HREE enrichment is still uncertain. If it represents a late stage fluid resulting from extended fractionation of a carbonatite magma, then the possibility exists that a plug containing a similar enrichment may be present in the subsurface. Alternatively, this HREE event may record expulsion of late hydrothermal fluids from a HREE-enriched fractionating magma, in which case the primary

targets will be in the dykes. Both are viable targets for discovery of a significant REE deposit that could be enriched in the HREE.

Item 11: Mineralization

To date, exploration at Lofdal has demonstrated that there is widespread REE mineralization related to the Lofdal carbonatite intrusions. Regional lithogeochemical sampling carried out in 2008, 2009 and early 2010 has demonstrated that there are many individual dykes that carry significant enrichments in the REE, and many of these are significantly enriched in HREE. Detailed studies of samples from some of these localities provide insight into the mineralogy, and paragenesis of this mineralization. In addition, trenching and core drilling on the 2B zone has provided in depth information about the 3 dimensional extent and geological relationships of this zone. Exploration outside of Area 2 provides abundant evidence of HREE-enriched mineralization associated with the carbonatite intrusions. A mineral deposit has not yet been delineated on the property. However, the the abundance of carbonatite dykes and widespread REE minneralization are a strong indication of the positive exploration potential.

11.1 Regional Extent and Distribution

Systematic traversing and grab sampling of carbonatite dykes in outcrop has been completed over about 80 km².of the complex (Figure 11.1). In the initial phases of regional sampling, a total of 3764 grab samples from outcrops were analysed, including 171 samples from the Main intrusion and 217 samples from the Emanyia intrusion. Figure 11.1 illustrates the distribution of anomalous concentrations of TREE+Y in these samples. Of the total of 3764 samples analysed from the regional sampling, 549 or almost 15% carry greater than 1% TREE+Y and there are approximately 1450 samples (~40%) with geochemically-anomalous TREE+Y concentrations of greater than 0.25%. The REE mineralization at Lofdal occurs over an area of at least 200 km² which could be considered to be on a district scale.

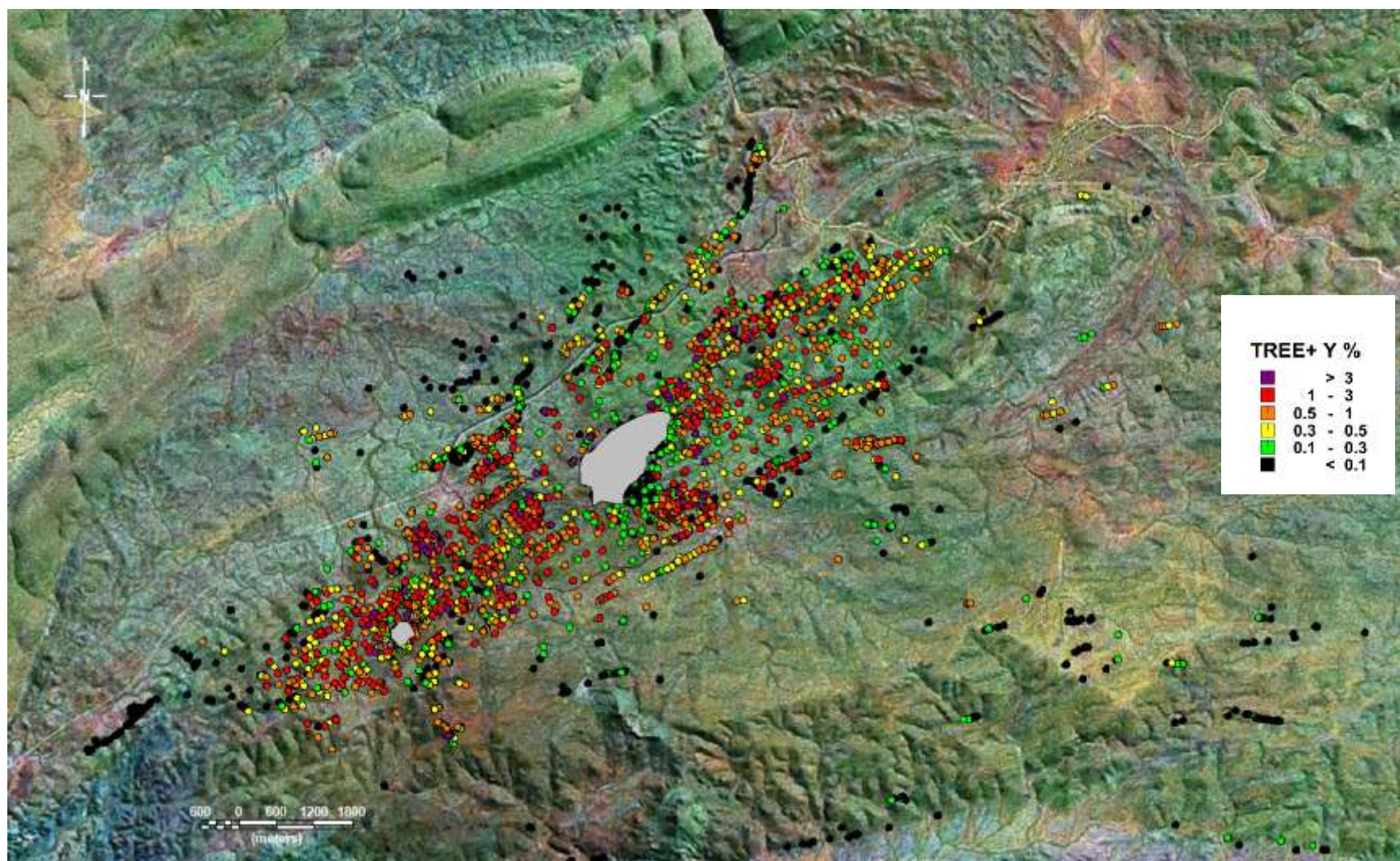


Figure 11.1 Distribution of lithogeochemical grab samples in the Lofdal area, colour coded for total REE + Y. Base is Landsat Geocover Mosaic. Main intrusion is shown in grey.

There is considerable variation in both the absolute concentrations of REE, and in the relative proportions of LREE versus HREE in the mineralized samples. Figure 11.2 shows concentrations of HREE versus TREE+Y in the three main intrusive phases, the Main intrusion, Emanyia intrusion and the dykes. The Main intrusion has very low concentrations of all REE whereas the Emanyia intrusion shows a trend to higher TREE+Y, which is mainly a result of LREE-enrichment, with little enrichment in HREE. The dykes show a wide variation with much stronger enrichment trends in both LREE and HREE. At high concentrations, the trends are separate suggesting that LREE- and HREE-enrichment result from separate processes, which may have important implications for exploration targeting.

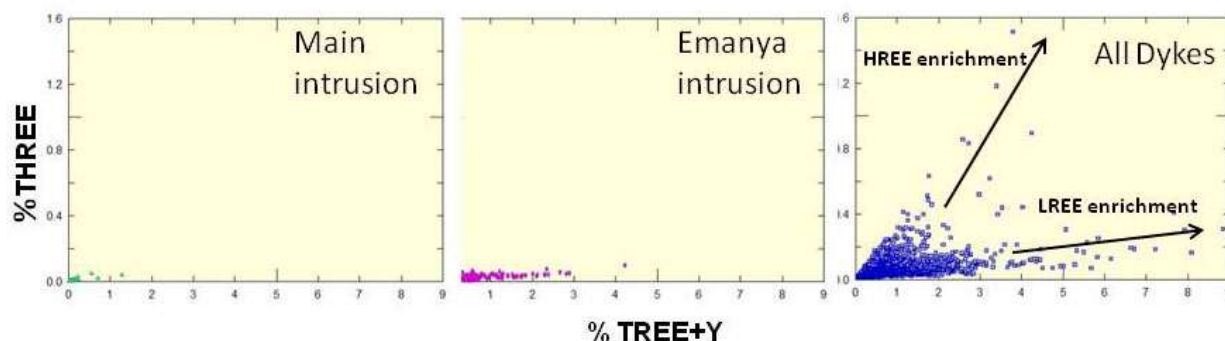


Figure 11.2 Comparison of TREE+Y and HREE+Y values in lithogeochemical grab samples from the Main and Emanyia intrusions and the carbonatite dykes. Main intrusion is not enriched in rare earths, Emanyia shows a trend of increasing LREE, dykes show variable enrichment in both LREE and HREE.

Table 11.1 shows TREE+Y analyses for the 25 most LREE-enriched samples and the 25 most HREE-enriched samples from the regional lithogeochemical program. In the majority of the 25 most LREE-enriched samples, the LREE constitute >95% of the TREE+Y. The most HREE-enriched samples contain up to 1.78% HREE, which constitutes between 68 and 90% of the TREE in the rock. The 25 most HREE-enriched samples are also enriched in Y. There is no overlap in the most LREE and HREE-enriched samples –LREE-rich and HREE-rich analyses come from different rock samples, although these samples were sometimes taken in close proximity.

Table 11.1 REE + Y analyses of the 25 highest LREE and the 25 highest HREE samples from the regional lithogeochemical program. Individual REE in ppm, totals in wt. %. HREE ratio is HREE+Y as a percentage of TREE+Y.

Sample #	La	Ce	Pr	Nd	Sm	LREE%	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	HREE%	Y	HREE+Y%	TREE+Y%	% of Total as HREE + Y
LREE-enriched samples																				
ERN15424	22400	44200	4120	11100	1290	8.31	328	1500	148.5	567	96.4	272	26.4	136	15.35	0.31	2300	0.54	8.85	6.1
ERN18110	24300	38600	3690	10700	1150	7.84	205	1030	70.5	172	29.2	111	8.2	43.2	4.97	0.17	782	0.25	8.09	3.1
ERN15444	21000	37200	3510	10600	1690	7.4	364	1485	156	587	92.6	240	21.2	105.5	11.9	0.31	2140	0.52	7.92	6.6
ERN18111	21700	33600	3210	9530	1085	6.91	210	1010	80.8	261	46.6	152	13.95	74.5	8.92	0.19	1190	0.31	7.22	4.3
ERN18198	22000	33700	3110	8780	1220	6.88	403	1630	232	1045	167.5	396	38.1	178	20.2	0.41	3810	0.79	7.67	10.3
ERN15448	16450	32600	3430	10500	1165	6.41	219	1050	84	252	42.4	139	12	70.3	8.91	0.19	1040	0.29	6.71	4.3
ERN15451	19950	31300	2840	7760	823	6.27	201	952	90.1	353	63.7	184	17.2	86.6	10.6	0.2	1660	0.36	6.63	5.4
ERN15188	15650	30700	3100	9130	1140	5.97	204	800	53	121	16.8	54.7	4.35	25.9	3.61	0.13	475	0.18	6.15	2.9
NLOFR1292	19100	28100	2230	6560	543	5.65	116	344	38.8	168	25.9	59.5	7.69	46.3	7.01	0.08	817	0.16	5.82	2.7
NLOFR1387	20600	26900	2130	5860	413	5.59	72.8	281	17	72.6	13.7	37.3	5.39	33.7	5.14	0.05	444	0.1	5.69	1.8
ERN18171	22200	26300	2060	4960	382	5.59	113	644	76.5	339	49.5	106	8.15	39.4	4.87	0.14	930	0.23	5.82	4.0
ERN18631	20300	26900	2250	5930	418	5.58	87.6	506	26.9	49.5	7.18	32.3	1.85	11.8	1.46	0.07	194	0.09	5.67	1.6
NLOFR1255	18500	26500	2110	6290	548	5.39	116	383	40.5	205	33.6	76.8	8.99	47.7	6.15	0.09	925	0.18	5.58	3.2
NLOFR1332	18000	26300	2120	5950	505	5.29	102	282	32.2	141	19.3	42.8	5.5	34.2	5.42	0.07	562	0.12	5.41	2.2
ERN18867	17800	26300	2160	5800	565	5.26	159.5	819	119	714	133	334	35.2	177	19.4	0.25	3300	0.58	5.84	9.9
ERN18113	16750	25800	2310	6240	594	5.17	151	750	77.8	342	63.2	179.5	18.75	96.2	11.65	0.17	1500	0.32	5.49	5.8
ERN15161	15600	26100	2350	6810	584	5.14	118.5	569	36.4	95.6	15.5	52.7	5.58	29.7	4.17	0.09	444	0.14	5.28	2.7
NLOFR0460	15550	25000	2460	7390	849	5.12	186	961	113	493	96.4	250	24.6	119.5	13.4	0.23	2220	0.45	5.57	8.1
ERN15443	15750	25400	2160	6040	959	5.03	225	915	82.1	291	49.1	140	13.1	67.7	7.18	0.18	1210	0.3	5.33	5.6
NLOFR1356	16900	24200	1980	6110	1050	5.02	273	707	56.9	197	25.2	58.7	8.34	56.3	8.65	0.14	785	0.22	5.24	4.2
ER12992	19600	22800	1700	4040	319	4.85	81.7	457	35.6	129	21.4	65.8	5.87	33.7	4.7	0.08	662	0.15	5	3.0
ER12925	17700	23200	1875	4850	344	4.8	75.1	471	33.9	108	19	70.7	6.88	38.8	4.7	0.08	576	0.14	4.94	2.8
NLOFR0426	16150	22600	1965	5180	356	4.63	77.4	418	27.6	78.2	13.7	50.6	4.91	27.8	3.41	0.07	423	0.11	4.74	2.3
NLOFR1259	15500	22200	1780	5280	453	4.52	102	344	45.9	249	42.5	107	14.7	96.8	14.6	0.1	1183	0.22	4.74	4.6
NLOFR1295	13200	22100	1950	6420	632	4.43	126	342	27.4	100	12.5	23.7	2.89	17.5	2.68	0.07	393	0.1	4.53	2.2
Average	18506	28344	2504	7112	763	5.7	173	746	72	285	48	129	13	68	8	0.2	1198.6	0.3	6.0	4.4

Sample #	La	Ce	Pr	Nd	Sm	LREE%	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	HREE%	Y	HREE+Y%	TREE+Y%	% of Total as HREE + Y
HREE-enriched samples																				
NLOFR1092	1390	2300	248	810	911	0.57	808	3030	839	5000	1290	3660	464	2380	305	1.78	50000	6.78	7.34	92.4
NLOFR1159	378	509	61.5	301	476	0.17	443	1915	634	4400	1040	3260	523	2840	450	1.55	29700	4.52	4.69	96.4
ERN15223	536	1700	356	2350	2340	0.73	1275	4580	933	4800	803	1660	191.5	812	97	1.52	15350	3.06	3.78	80.8
NLOFR1093	1650	2580	268	834	767	0.61	543	2430	648	4490	917	2560	330	1695	216	1.38	32500	4.63	5.24	88.4
NLOFR1206	170	393	56.9	299	734	0.17	598	2300	584	4100	841	2390	326	1890	250	1.33	28600	4.19	4.35	96.3
ERN15746	250	450	53	220	583	0.16	524	1910	547	3730	790	2150	303	1655	219	1.18	20600	3.24	3.4	95.3
NLOFR1158	154	268	37.9	187.5	282	0.09	295	1340	436	3110	756	2430	386	2110	316	1.12	24100	3.53	3.62	97.5
NLOFR1094	2050	3180	321	986	681	0.72	458	1915	476	3120	643	1745	221	1140	144.5	0.99	21000	3.09	3.81	81.1
NLOFR0780	5590	8590	898	2670	1215	1.9	790	2580	475	2620	483	1110	135.5	676	85.8	0.9	14450	2.35	4.24	55.3
ERN15768	632	1200	149	631	938	0.36	551	1805	421	2610	511	1390	178.5	978	123	0.86	13650	2.23	2.58	86.2
NLOFR1152	114	202	25.7	111	198	0.07	233	1000	319	2280	541	1725	283	1725	269	0.84	13400	2.18	2.24	97.3
ERN15425	525	1030	124	523	392	0.26	280	1140	370	2770	603	1680	221	1135	136.5	0.83	16300	2.46	2.72	90.4
ERN15701	225	450	56	246	607	0.16	414	1355	331	1985	378	951	126	689	86.4	0.63	9700	1.60	1.76	90.9
NLOFR0175	4950	8600	861	2740	789	1.79	390	1715	412	2140	383	717	78	310	37.6	0.62	8100	1.43	3.22	44.4
NLOFR1226	26	44	5.2	31.1	208	0.03	225	957	253	1780	350	981	139	811	101.5	0.56	9320	1.49	1.52	98.2
ERN15229	5740	8330	897	2860	944	1.88	426	1445	275	1460	269	670	98.4	506	70.8	0.52	5670	1.09	2.97	36.6
NLOFR1068	4500	7110	699	2040	726	1.51	426	1460	286	1570	269	634	74.5	389	50.9	0.52	6460	1.17	2.67	43.7
NLOFR0119	3	10	1.7	12.4	44.1	0.01	78.8	430	172.5	1535	365	1185	180	1065	140	0.52	12000	1.72	1.72	100.0
NLOFR1091	797	1275	137	464	496	0.32	302	1170	259	1580	303	803	101.5	539	69.3	0.51	9720	1.48	1.8	82.3
NLOFR0253	1765	2840	329	1250	1125	0.73	565	1660	292	1350	223	470	51.8	242	28.3	0.49	5320	1.02	1.75	58.4
NLOFR1218	68	157	22.1	117	310	0.07	258	1010	235	1485	288	763	104	604	78.1	0.48	8620	1.34	1.41	95.2
NLOFR2113	1630	2560	306	1420	769	0.67	327	1195	241	1470	257	652	74.2	376	41.6	0.46	6580	1.12	1.79	62.5
NLOFR0546	1850	3620	460	1645	693	0.83	448	1380	252	1325	236	523	61.9	321	42.7	0.46	5480	1.01	1.83	55.1
ERN18640	10300	14750	1340	3850	975	3.12	466	1605	252	1235	190.5	411	41.1	211	25	0.44	4520	0.89	4.02	22.2
NLOFR0166	7490	12400	1230	3960	971	2.61	431	1515	281	1280	220	416	45.8	190	24.2	0.44	4710	0.91	3.52	25.9
Average	2111	3382	358	1222	727	0.8	462	1714	409	2529	518	1397	190	1012	136	0.8	15034	2.3	3.1	74.9

There is, however, regularity to the distribution of LREE-rich and HREE-rich samples on a regional scale in the Lofdal area. Figure 11.3 shows the regional lithogeochemical data gridded and contoured for dysprosium (as a proxy for the HREE) and lanthanum (as a proxy for the LREE). Samples with HREE-enrichment are preferentially concentrated in a 7 km long NE-trending corridor along the NW margin of the complex and in two NNE-trending corridors that bracket the Main intrusion. The LREE-rich samples tend to occur in a more or less parallel, adjacent and wider corridor to the south of the HREE-rich corridor, bracketing the Main intrusion and including the Emana intrusion and extending over a strike length of more than 12 km.

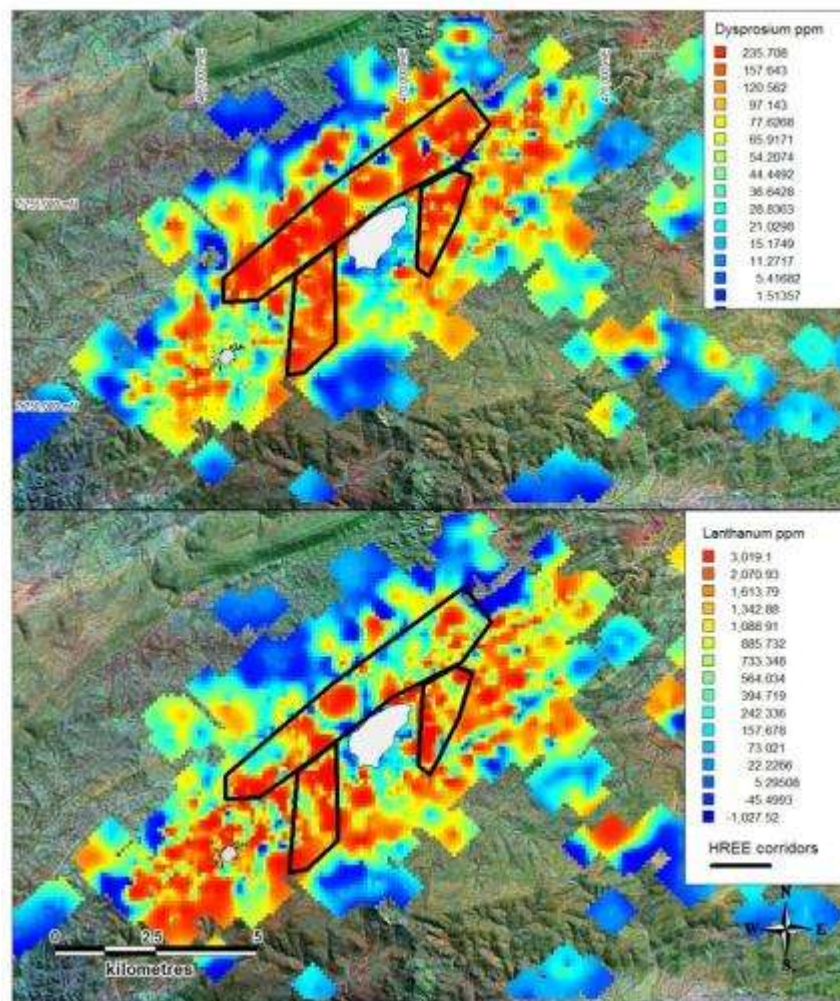


Figure 11.3 Dysprosium (upper map) and Lanthanum (lower map) concentrations from regional lithogeochemical grab samples, gridded and contoured. Dysprosium shows an enrichment in a 7 km long NE-trending corridor along the NW side of the complex and in two NNE-trending corridors on either side of the Main intrusion. La tends to be enriched in a 12 km long corridor passing through the Main and Emana intrusions.

The overall rare earth distribution in the various rocks is complex. REE contents in the Main intrusion are the most consistent (Figure 11.4). Chondrite-normalized patterns have a positive slope, with average concentrations ranging from about 700 x chondrite in the LREE to about 20 x chondrite in the HREE and a La_N/Yb_N (the ratio of chondrite-normalized values reflecting the degree of LREE enrichment) of approximately 23. This is a typical pattern for magmatic carbonatite (Wooley and Kempe, 1989).

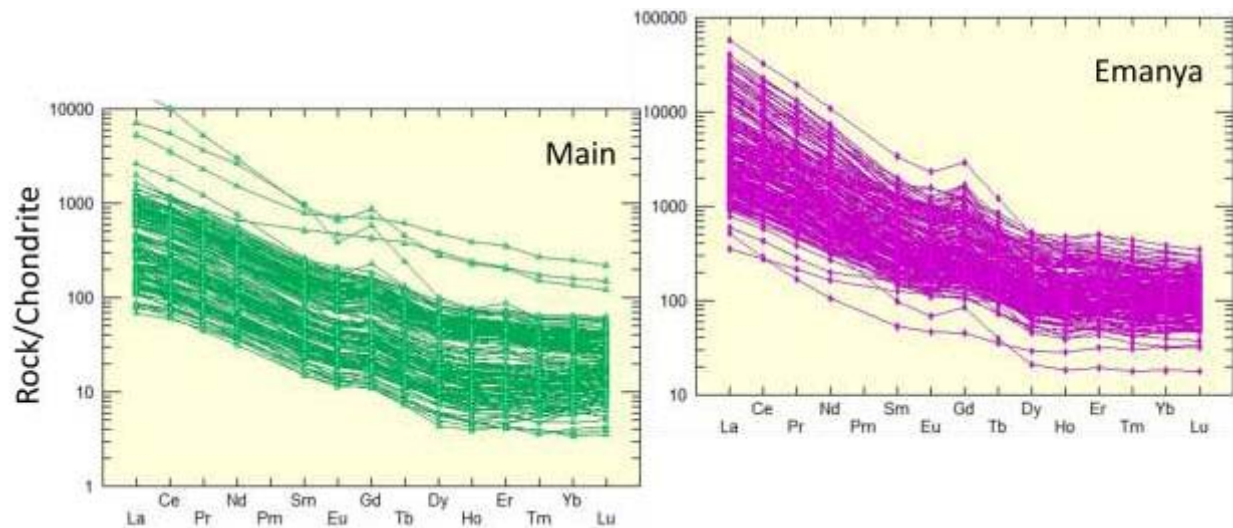


Figure 11.4 Chondrite normalized REE diagrams for the Main and Emanyra intrusions (offset vertically so scales are equivalent), after Sun and McDonough (1989). Both are LREE-enriched, but the Emanyra intrusion shows both higher absolute concentrations of the LREE and greater fractionation.

The Emanyra intrusion (Figure 11.4), also exhibits relatively consistent LREE-enriched patterns but absolute concentrations are generally higher than in the Main intrusion, particularly in the LREE, and there is considerably more variability in the shapes of the condrite-normalized patterns, reflecting a widely variable enrichment in the LREE. The Emanyra intrusion is more LREE-enriched than the Main intrusion with average La_N/Yb_N of approximately 60

The carbonatite dykes, in contrast, show substantial variation in their relative REE contents. They range from rounded HREE-enriched patterns with a maximum in the area of dysprosium that are suggestive of the presence of xenotime (Figure 11.5A) to very LREE-enriched, steep patterns (Figure 11.5F) that suggest that the REE's may be present in fluor-carbonates. There is a wide range of REE patterns in the dykes ranging between these extremes and at least some of this variability may be a consequence of hydrothermal alteration with complex overprinting of REE mineralization of different compositions at different times.

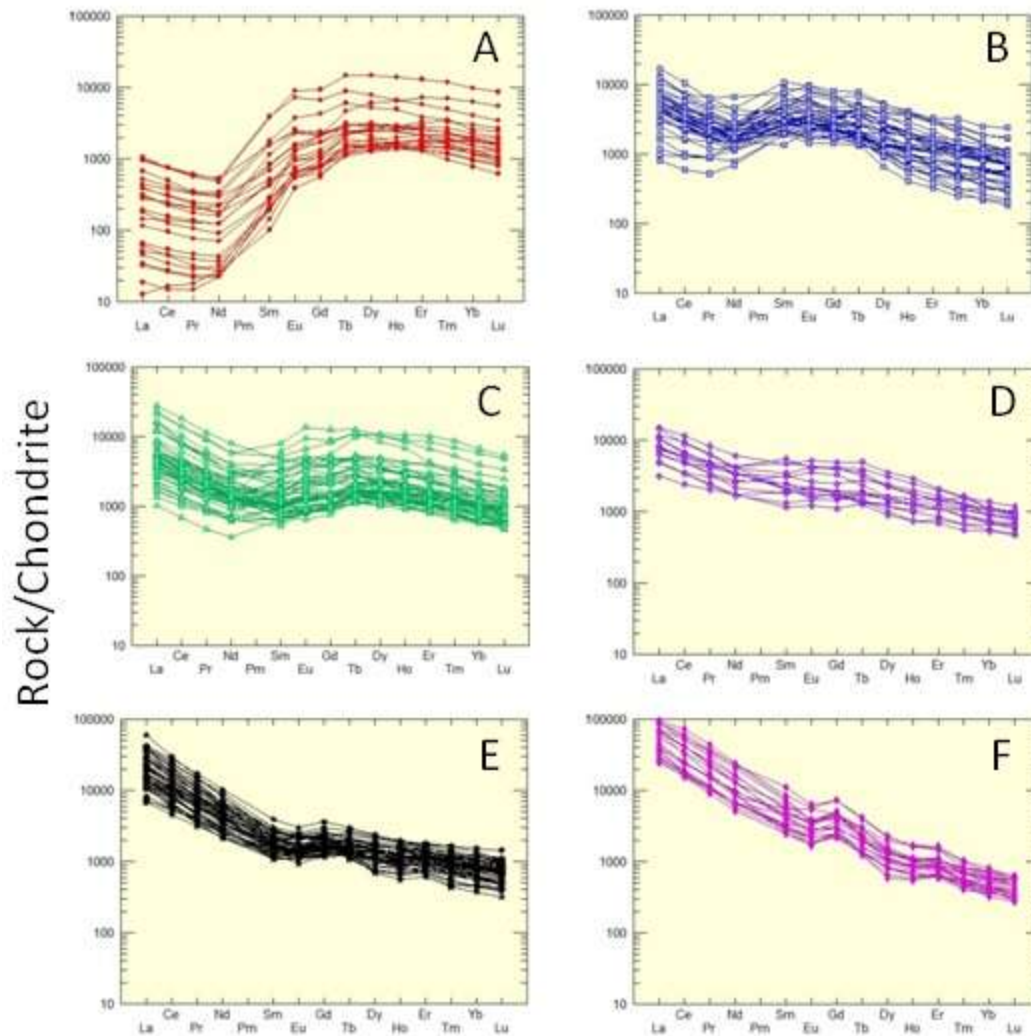


Figure 11.5 Contrasting REE patterns for HREE-enriched carbonatite dykes. All dykes shown have HREE>0.1%. Chondrite normalization after Sun and McDonough (1989).

The presence of thorium is an issue in many carbonatite-hosted REE deposits. In common with other areas, carbonatites in the Lofdal complex are locally enriched in thorium, and this in part contributes to the regional thorium airborne radiometric anomaly that defines the area of interest. It also provides a convenient and important prospecting and evaluation tool on the ground, as most carbonatites, and their associated alteration, have elevated radiometric signatures.

Thorium concentrations are generally very low in the intrusive plugs but higher and more variable in the dykes, reflecting the association of xenotime and thorium silicate identified by the detailed mineralogical work. The analytical package used for the regional rock samples

provided a maximum detection of 5000 ppm Th. Approximately 0.3% of dyke samples exceeded this limit. Figure 11.6 shows that there is a very poorly defined positive correlation between Th and the HREE in the dykes.

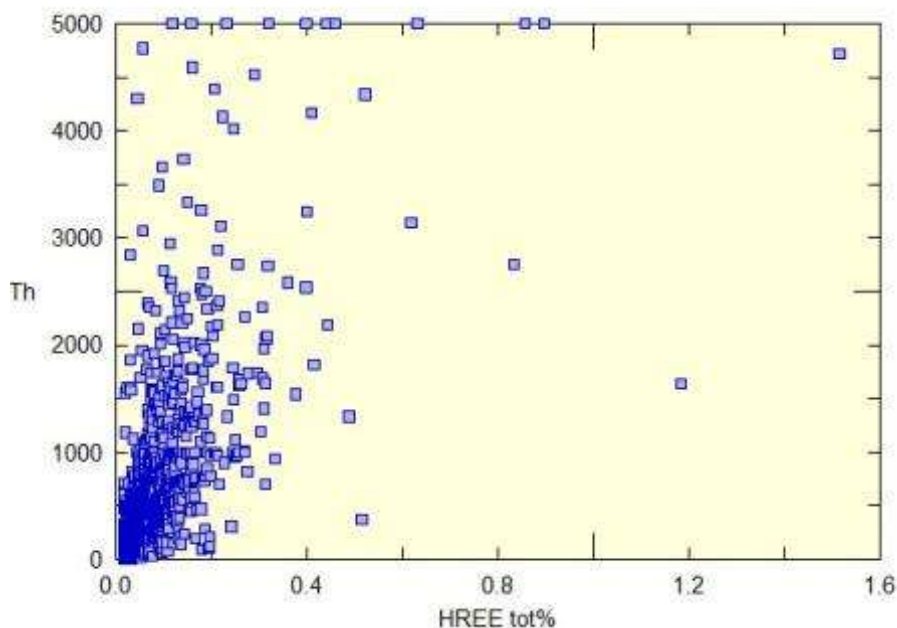


Figure 11.6 Thorium and the HREE show a very broad but ill-defined positive correlation. Maximum detection limits were 5000 ppm for Th.

11.2 Mineralogy and Paragenesis

Petrographic and scanning electron microscope studies on samples from the Lofdal area (Schandl, 2010; Wall et al., 2008) have identified a number of REE minerals including the LREE minerals bastnaesite (La), parisite (Ce), synchesite (Ce), and monazite (Ce), and HREE minerals xenotime(Y) and minor aeschynite (Y). Magnetite, apatite, fluorite, strontianite and barite are common accessories. Zircon and pyrochlore are locally present.

Xenotime is the principle mineral of interest at Lofdal and the carbonatites are unusual in their widespread enrichment in xenotime. Wall et al. (2008) and Do Cabo and Ellmies (2010) showed from detailed SEM analysis of selected samples that the xenotime occurs in at least three settings: 1) discrete crystals intimately associated with apatite; 2) very fine intergrowths with thorium silicate; and 3) coarse crystals in late carbonate veinlets. Types 1 and 2 locally occur in the same specimen. Wall et al. (2008) and Do Cabo and Ellmies (2010) suggested that the deposition of xenotime at Lofdal spans the magmatic-hydrothermal transition, with some early xenotime having been deposited along with magmatic apatite and magnetite in the late

magmatic stages, but with the bulk of the mineralization having been related to subsolidus hydrothermal activity. Do Cabo and Ellmies (2010) concluded that the HREE-mineralization at Lofdal is complex, but apparently strongly controlled by interaction of a HREE-rich fluid with carbonatite during intensive shearing.

11.3 Mineralization in the 2B Zone

The 2B Zone, as described in this report, is actually a segment of a much longer carbonatite dyke system that can be traced on the ground for more than 3 km. The segment that is herein termed the 2B Zone stands out in that of approximately 53 samples taken along it during the regional sampling phase, 24 had TREE+Y concentrations greater than 0.5% and 14 contained HREE>0.1%. This coupled with significant widths in outcrop made it an attractive first target for more detailed exploration and was the basis for the decision to select this zone for trenching and diamond drilling to confirm geological continuity in three dimensions.

REE mineralization in the 2B Zone has been traced in trenches for approximately 600 m along strike. The width of the zone in outcrop is variable and in some places, it contains intervals of unaltered, unmineralized country rock. At its southern end, the zone of alteration and carbonatization ranges from about 20 to 35 m wide but thins to less than 10 m in the central section where it bifurcates into two separate zones. At the northern end, where the zone of alteration and carbonatization is again amalgamated, it is more than 60 m wide. In outcrop, it comprises a zone of massive carbonatite dykes, within a complex envelope of hydrothermal alteration and brecciation. The zone has a strong and characteristic radiometric signature. In drill core, the zone is seen to consist of a zone of intense brecciation and hydrothermal alteration. There is less carbonatite in the drill holes than in the trench sections, but the zone of alteration and carbonatization is readily recognized geologically, geochemically and radiometrically. Where it is widest at both southern and northern ends of the zone, the alteration zone ranges from 20 to 25 m wide (approximately true width). The zone is encountered in most holes as expected from surface mapping and although there is variability in the details of lithologies, alteration intensity and mineralization, the characteristic radiometric signature can be traced both along strike in the trenches and in the third dimension in the drill holes. The REE mineralization in the 2B Zone is restricted to the zone of alteration and carbonatization. The zone is not consistently mineralized, but where good assay values are obtained, they appear to be related to late veining and alteration that cuts most of the previous alteration lithologies. Mineralization is typically better developed in the footwall section of the alteration zone.

Item 12: Exploration

Namibia Rare Earths (Pty) Ltd. began exploration in the Kunene Region (and on EPL3400) in 2006. There have been three main phases of exploration:

1. Regional and detailed exploration between 2006 and 2008 for copper and gold, targeting an IOCG model;
2. Regional assessment of the rare earth potential of the Lofdal complex between 2008 and early 2010;
3. Detailed geological mapping of key areas and 3-dimensional assessment of the 2B zone, one of the key REE showings, in the fall of 2010.

12.1 Copper-Gold Exploration - 2006-2008

NRE (Pty) was originally attracted to the Lofdal area as an iron oxide copper gold (IOCG) target (Lobo-Guerrero, 2005). The model was predicated on the presence of copper sulphides associated with magnetite in the matrix of hydrothermal breccias and sulfidation accompanying magnetite and hematite in quartz veins related to carbonatite dykes.

The IOCG exploration program consisted of:

- A comprehensive structural and satellite mapping exercise over an area of more than 10,000 km² encompassing EPL 3400 as well as the adjacent area covered by EPL 3399 and EPL 3304 (see Figure 6.3). The work was carried out under contract by the NPA Group of consultants, London, UK. Additional Landsat images were obtained and the Landsat Thematic Mapper (TM) images with two spectral bands (band 5 and 7) in the Short Wave Infrared (SWIR) were used to identify targets/outcrops of hydrothermal alteration and to delineate major structural features;
- Targets generated by the NPA study as well as other areas of interest were systematically sampled by NRE (Pty) personnel who collected a total of 2371 rock grab samples. During the latter part of this phase of exploration in 2008, the first 255 samples were collected from the Lofdal carbonatite complex;
- Areas returning anomalous Au values were sampled further, and a program of detailed geological mapping and trenching was undertaken to test the most prospective targets. Three of these targets were tested with a reverse circulation drill in 2008 but no significant Cu-Au mineralization was found;

- An orientation stream sediment geochemical program was undertaken by NRE (Pty) personnel in the area of the former Lofdal copper mine but did not generate any significant targets;

Virtually all of this exploration was outside of the current area of interest for REE mineralization and few of the data are directly applicable or relevant to the current program. Where 2006-08 data have played a part in the current exploration program, they are noted below.

12.2 Regional Assessment of Rare Earth Potential

12.2.1 Geological and Lithogeochemical Survey

Lobo-Guerrero (2005) recognized and recommended to NRE (Pty) the potential for rare earth mineralization associated with carbonatite dykes in the area. This potential was reinforced by the results of investigations by the Geological Survey of Namibia on the carbonatite. The company initiated an exploration campaign to test this potential in the middle of 2008.

The regional field survey of the Lofdal carbonatite complex was carried out by NRE (Pty) personnel in two field campaigns, one between September and December, 2008, and the second between December, 2009 and February, 2010. The aim was to systematically map and sample the outcrop extent of the Lofdal carbonatite complex as well as to begin a more regional sampling of the area. The regional target area was defined by an airborne thorium anomaly that was interpreted by NRE (Pty) personnel to potentially define the extent of the intrusive complex. Sampling in these two campaigns covered roughly the northwestern half of the anomaly, including the areas of known carbonatite-related mineralization (Fig. 12.1)

In addition to the regional traversing, detailed sampling on more or less 50 m intervals was carried out over the Emania and portions of the Main intrusions with 217 samples collected from the Emania intrusion 171 from the Main intrusion.

The regional surveys demonstrate that rare earth mineralization is associated with the Lofdal carbonatites over an area of approximately 80 km² (see also Section 11.1) and that there is a wide variation in the relative proportions of the various rare earths. Of particular significance for continuing exploration is the apparent existence of a NE-trending corridor across the northern part of the area that is particularly enriched in the HREE (Figure 11.3). This area measures approximately 7 km x 2 km and provides a number of high priority targets for detailed exploration where dykes or dyke swarms have returned a significantly higher than average proportion of samples with anomalous HREE concentrations. Finally, the regional sampling demonstrates that REE tenor in the rocks varies on a fine scale. Samples taken only metres apart on the same dyke system can have widely varying REE concentrations. Detailed

exploration on specific dyke systems will therefore be required to determine the extent and overall concentrations that can be achieved.

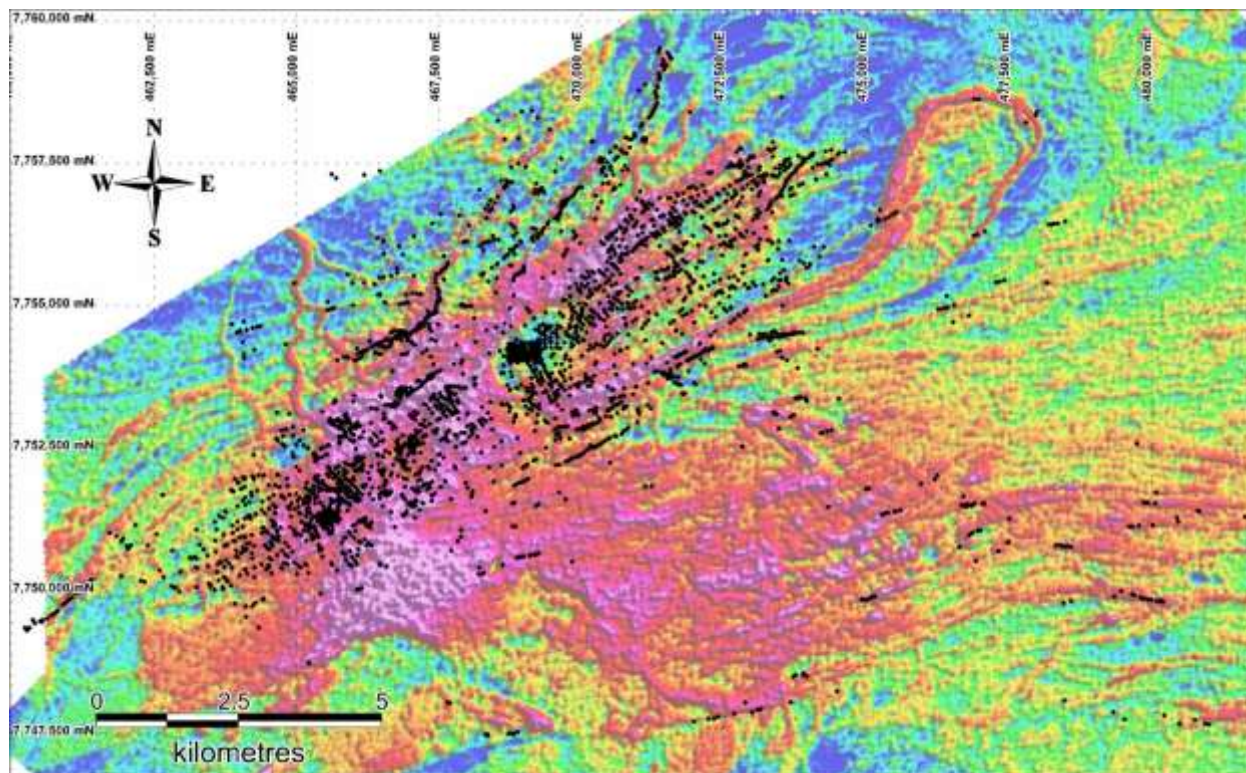


Figure 12.1 Distribution of regional lithogeochemical samples (grey dots) in the Lofdal area. Background is Th radiometric counts from the 2010 airborne survey, red and purple colours define the extent of the Th anomaly associated with the Lofdal carbonatite complex. Sampling to date has concentrated in the northwestern part of the complex.

12.2.2 Remote Sensing

NRE (Pty) has made extensive use of remote sensing data in interpreting the geological relationships on the property and identifying priority exploration targets. In conducting this work, a number of airborne and satellite-based systems have been utilized:

- Landsat ETM+ with 15 m resolution;
- Airborne hyperspectral survey flown by HyVista Corporation for the Geological Survey of Namibia. HyVista's HyMap sensor provides 126 spectral bands between 0.4 μ and 2.5 μ at 4.6m resolution;

- Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) data from NASA satellite observations;
- Data from Quickbird, a high-resolution commercial earth observation satellite that collects panchromatic (black & white) imagery at 60-70 centimetre resolution and multispectral imagery at 2.4- and 2.8-meter resolutions.

12.2.2.1 Analysis of HyMap data by NamibGeoVista

An analysis of the HyMap data was carried out by NamibGeoVista GeoConsult and Imaging of Windhoek (Stengel, 2010) with the objective of identifying hyperspectral signatures that would help identify and map carbonatite dykes and plugs in the area. The analysis was successful in imaging the larger carbonatite and phonolite dykes (Figure 12.2) and, coupled with the results of regional lithogeochemical sampling, allowed NRE (Pty) staff to identify priority areas for more detailed exploration where carbonatite dykes of significant width were identified in areas where anomalous numbers of rock samples returned high REE values (Figure 12.3). The analysis was inconclusive regarding the identification of plugs.

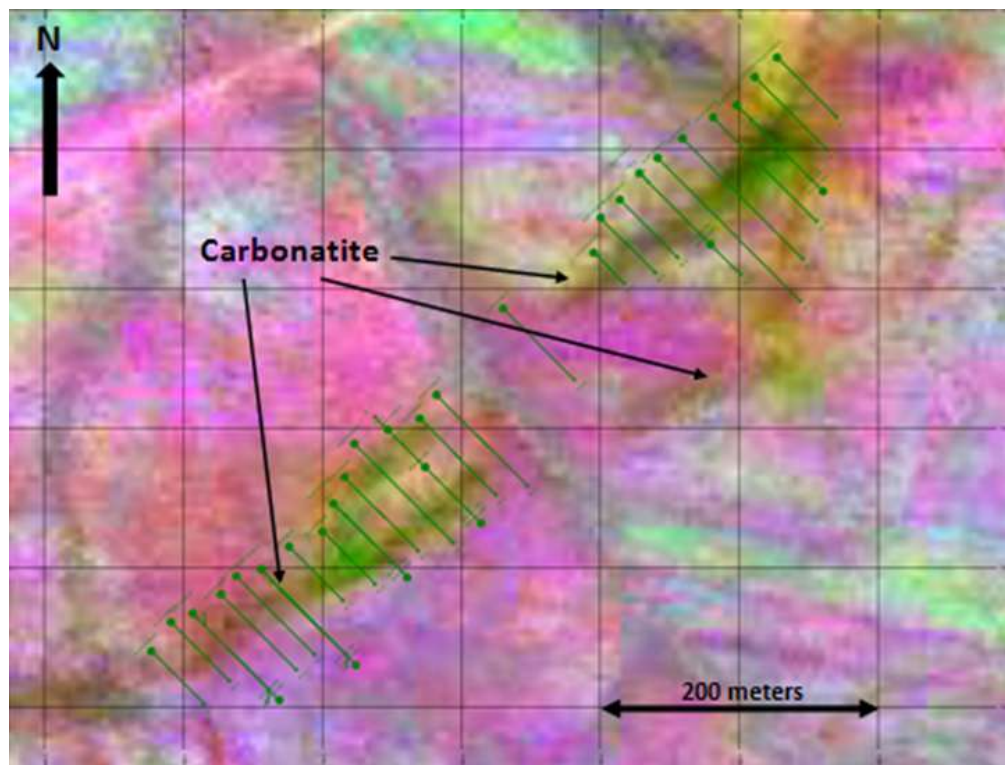


Figure 12.2 Hyperspectral image showing correlation of interpreted carbonatite dykes with trenches from Area 2.

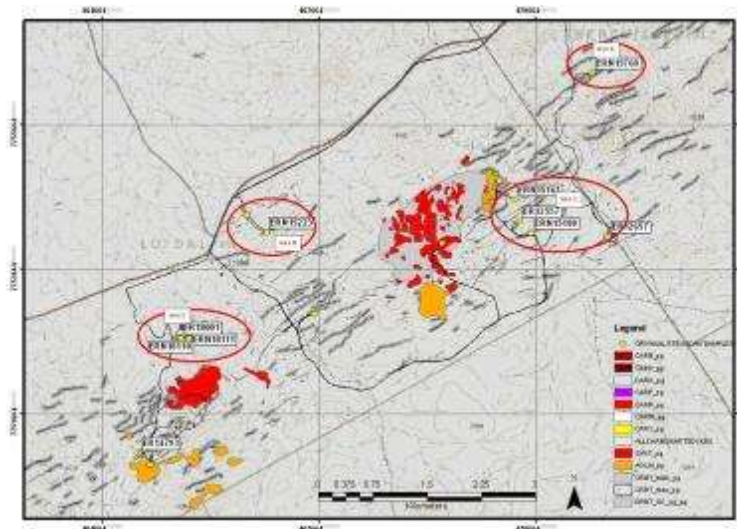


Figure 12.3 Priority areas for follow up based on geological and lithogeochemical data, some of which are coincident with hyperspectral target areas.

12.2.2.2 Integrated Interpretation of Remote Sensing Data by Fugro NPA

Following the initial observations from NamibGeoVista on the hyperspectral data, it was felt that a more comprehensive compilation of the data was warranted. NPA Consulting (now Fugro NPA) had previously carried out an interpretation of ASTER and Landsat data for NRE (Pty) at 1:100,000 scale during the 2006-08 copper-gold exploration program. They were commissioned again in 2010 to carry out a geological and spectral study in support of exploration of the carbonatites. The study utilized the Landsat ETM+, ASTER, HyMap hyperspectral and 2006 airborne magnetic and radiometric data as well as results of regional lithogeochemical sampling by NRE (Pty).

The study included a detailed structural interpretation of the Landsat ETM+ imaging at 1:50,000 scale. Another objective of the hyperspectral data processing was to provide a mineralogical interpretation of the data to highlight areas that might be associated with HREE. The ASTER data provided a lower resolution regional assessment of the mineralogy of the area with spurious results whilst the high resolution HyMap data was more useful in attempting to identify spectral signatures of carbonatite dykes.

On a regional scale, the ASTER data reflect the basement geology and provide some definition of some of the large carbonatite intrusions (Figure 12.4). They identify mineralogical features that are characteristic of particular lithologies, but were not effective in delineating carbonatites and related alkali silicate rocks, or as a tool for targeting individual dykes or attempting to correlate with anomalous lithogeochemistry.

The hyperspectral data, on the other hand, have contributed significantly to understanding the regional geology and identifying potential carbonatite dykes and related intrusions as well as zones of alteration (Figure 12.5). Structural interpretation using Landsat and hyperspectral data has identified a series of first order shear zones that trend from NE-SW to ENE-WSW. These major shear zones can be shown from hyperspectral imaging of the basement rocks to have a sinistral sense of offset and they appear to be significant structures, likely deep seated basement faults. There are a number of significant carbonatite dykes along these faults. The structural interpretation has also identified a series of NW-SE to NNW-SSE dextral shears, and a series of NNE-SS shears that may also be sinistral and that have several significant carbonatite dykes within them. They may be related to the primary shears, acting as linking faults.

Hyperspectral, magnetic and radiometric data were interpreted on the assumptions that target plugs and significant dykes might have an identifiable spectral signature, magnetic response related to the presence of magnetite in the dykes, and a radiometric response reflecting the association of the REE with thorium. Interpretations also took into account the presence of anomalous lithogeochemical samples and geological observations from the NRE (Pty) field programs to outline possible carbonatite intrusions and dykes through integrated interpretation of all of the data sets. This led to identification of two levels of priority target areas, primary and secondary targets (Figure 12.5) based upon confidence levels.

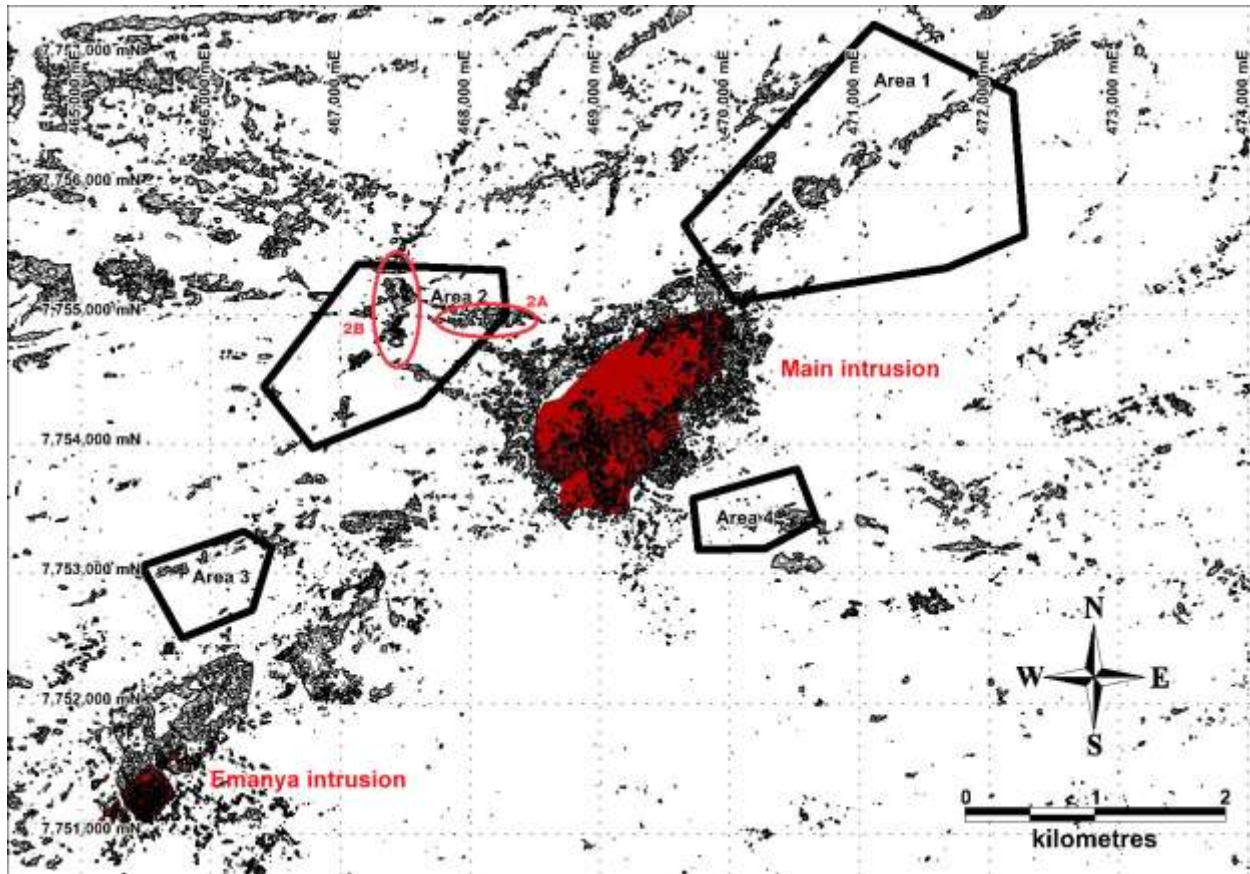


Figure 12.4 Contoured hyperspectral data for smectite, hematite and calcite. The data outline the Main intrusion, and the hematite data in particular highlight the Emanyu intrusion (both shown in red). Combined signals identify prominent zones of carbonatite intrusion, alteration and mineralization in Areas 1, 2, 3 and 4 including the 2B and nearby 2A zones (red circles)

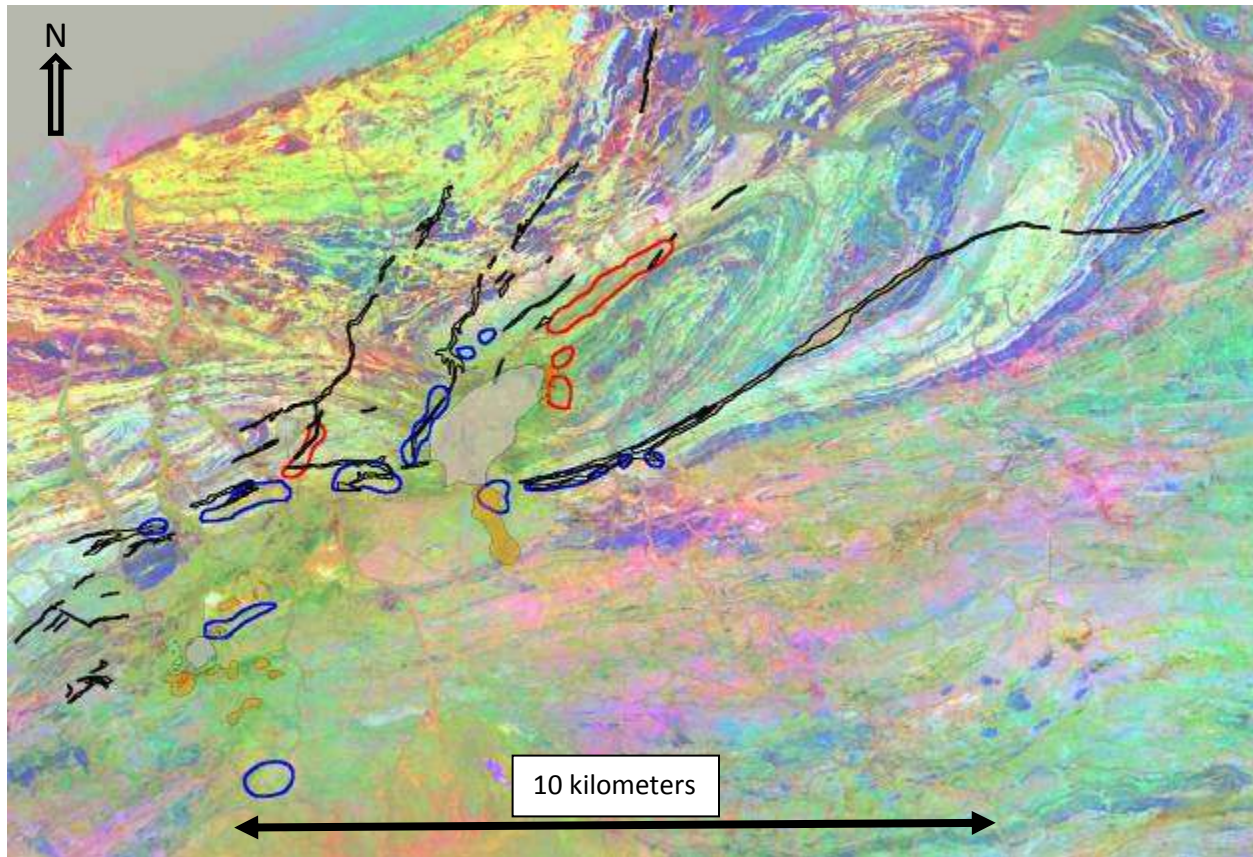


Figure 12.5 Priority targeting for follow up from NPA Fugro 2010, based on analysis of hyperspectral, landsat, airborne geophysical and lithogeochemical data. Significant structures with spectra indicating presence of carbonatites are shown in black. Primary target areas are in red, secondary target areas in blue. Main and Emanyia intrusions are grey, outcrops of Lofdal breccias in yellow.

The primary targets are interpreted as possible intrusions that have a magnetic signature, calcite/iron spectral signatures, structural control, radiometric signatures (Th) and heavy rare earths in proximity. The secondary targets are similar to the primary but generally lack a strong magnetic signature. The NPA Fugro study confirmed and more precisely targeted zones in Areas 1, 2, 3 and 4 and has provided several new targets that remain to be confirmed on the ground. This study and its associated database should be further scrutinized and refined as it has clearly demonstrated its effectiveness in exploration targeting.

12.2.3 Geophysics

In order to evaluate whether or not to acquire magnetic and radiometric data at higher resolution airborne than was provided by the 200m GSN survey, a ground radiometric and magnetic survey was carried out at 50 m spacing on a portion of Area 1 in the northeastern part

of the property by Gregory Symons Geophysics (GSG) during June/July 2010 (Figure 12.6). GSG also conducted a series of 5 test profiles of combined gravity, radiometrics and magnetics over selected target areas. The results of this survey were sufficiently encouraging that NRE (Pty) then had the entire project area covered by an airborne magnetic and radiometric survey at 75 m spacing by New Resolution Geophysics in June/July 2010.

12.2.3.1 Ground Geophysics

Ground radiometric, magnetometer, and gravity surveys over selected parts of the Lofdal property were carried out by GSG. The equipment used was:

- Pico Envirotech GRS-2 Portable Gamma Ray Spectrometer. The spectrometer has an in-built GPS antenna. The unit was calibrated on the NGS radiometric pads at Eros Airport, Windhoek;
- Scintrex CG-5 gravity meter and Trimble DPGS system working in real-time kinetic mode (RTK)GEM;
- GSM 19 Overhauser walking magnetometer with Geometrics G5 magnetometers used as the base station and Garmin handheld GPS for positioning;

The surveys were carried out between June 18 and July 11, 2010.

A detailed grid measuring 3.6 km x 2.0.km was established over some of the high-potential targets in Area 1 in the northeastern part of the property (Figure 12.6). Line spacing was 50 m with survey lines oriented NW-SE to provide optimal coupling with the dominant strike direction of the dykes and radiometric trends. The objective was to determine the radiometric and magnetic signature, strike extent and continuity of individual dykes containing REE and to test whether sufficient resolution could be obtained to assist in specific target identification.

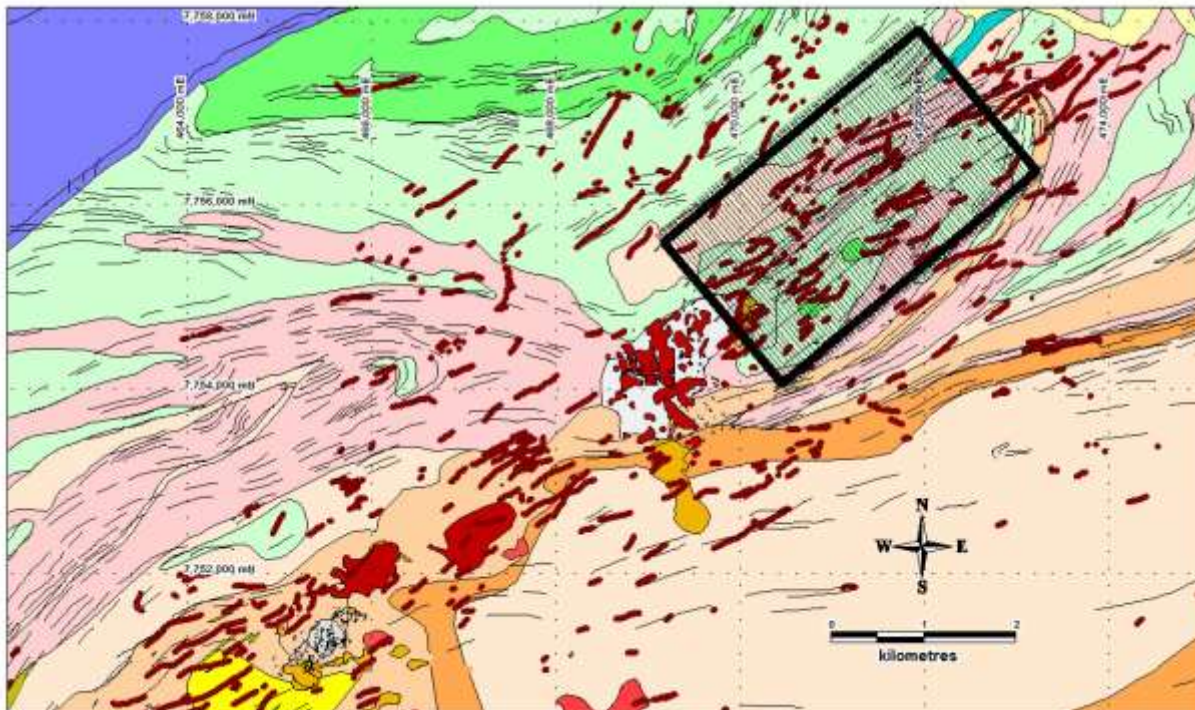


Figure 12.6 Location of ground geophysical grid in a portion or Area 1 on geological base map. Legend is same as Figure 9.3.

Ground magnetic and radiometric readings were collected using the magnetometer and spectrometer in a walking mode with the walking track recorded by a hand-held GPS. The magnetometer took readings every second, the GPS data was merged with the magnetic data, diurnally corrected and then gridded and imaged. The spectrometer has an inbuilt GPS so that the radiometric and positional data is automatically merged. A spectrum was measured each second, the spectra exported and sampled into total count, K, U and Th channels.

The survey was successful in mapping magnetic and radiometric signatures related to carbonatitic dykes (Symons, 2010). In particular, it strongly indicated that there were at least two types of dykes present in this area (Figure 12.7; Plate 12.1):

- Type 1 dykes are anomalous in K, U, and Th but do not appear to have a clear magnetic signature. They strike to the northeast but more northerly than the Type 2 dyke described below. Symons (2010) interpreted these dykes to be favourable REE targets and outlined 5 priority target areas to be investigated (Figure 12.8);
- Type 2 dykes have lower concentrations of K, U and Th, have a magnetic signature, and are thought to be poorer REE targets.

The 200 m spaced airborne survey did not discriminate the Type 1 dyke direction that was delineated by this survey, and this was a factor in deciding to conduct higher resolution airborne geophysics over the whole complex.

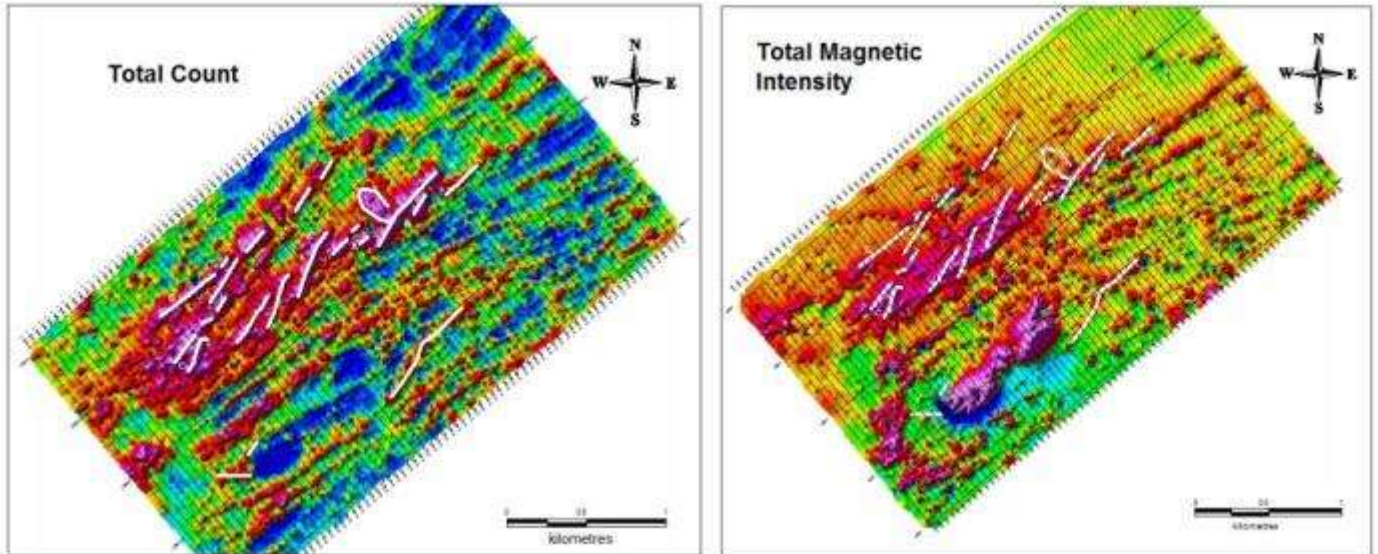


Figure 12.7 Total count and total magnetic intensity results for the ground geophysical grid. White lines highlight NNE-striking radiometric anomalies that are interpreted to reflect dykes with a Th signature with higher potential for HREE. Magnetic trends follow a more NE/SW trend with lower radiometric signature that is interpreted to be a lower priority target. The two dyke trends are reflected in outcrop, and NNE-trending dykes are locally seen intersecting NE-trending dykes. The former tend to have higher radiometric counts on the outcrop surface



Plate 12.1 Intersecting carbonatite dykes trending NNE and NE. NNE-trending dyke is more radioactive, and contains higher REE values than the NE-trending dyke, in accord with interpretations from ground geophysics.

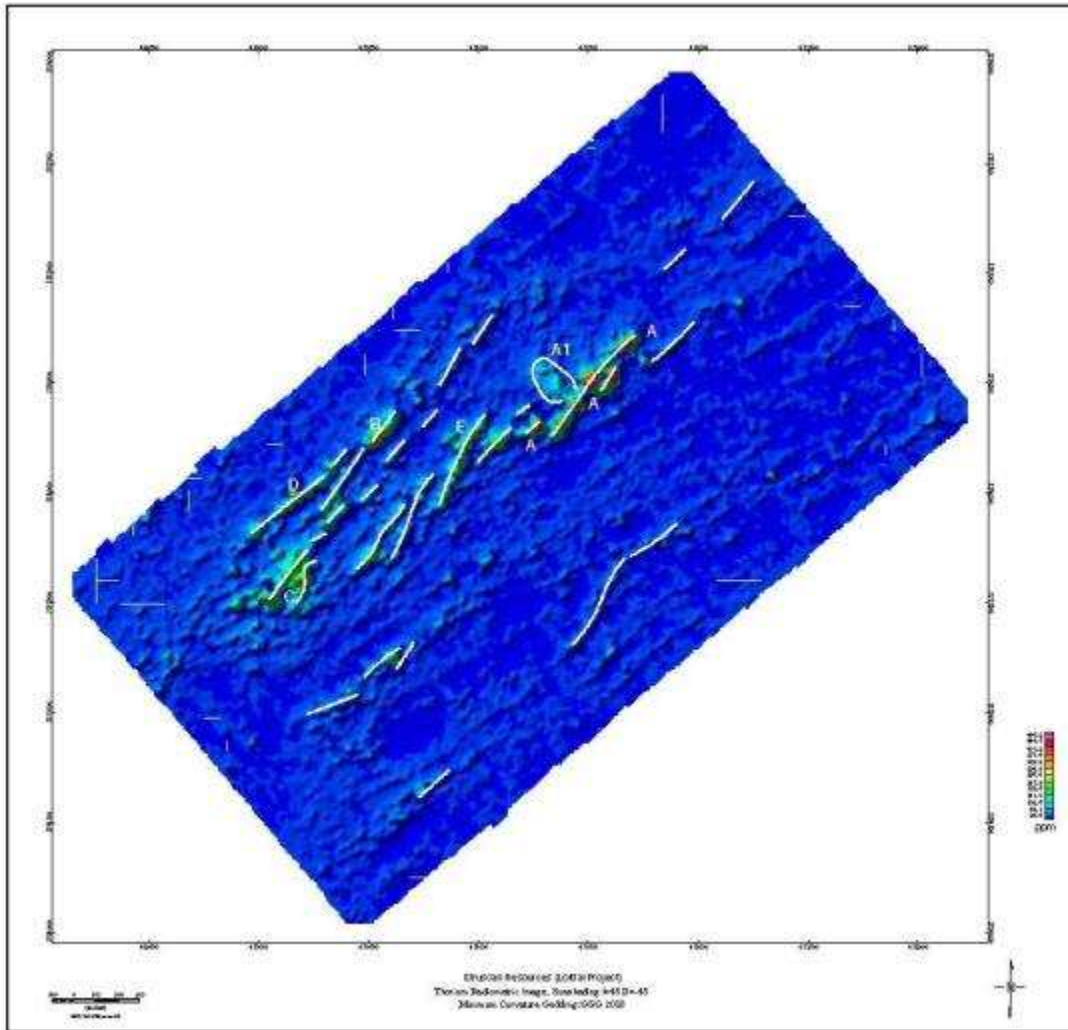


Figure 12.8 Th Image for the ground geophysical grid using a linear colour palette instead of a binomial one. This image attempts to show where the peak Th grades are situated. Five target areas are highlighted of which area A appears to be the most prominent.

In addition to the detailed grid survey, five profile lines were selected to primarily investigate the value of gravity surveys to detect intrusions and dykes. Gravity, radiometric, and magnetic data were collected along the five selected lines (Figure 12.9):

- Line 1 investigated the Emania intrusion and a prominent radiometric anomaly to the south;
- Line 3 investigated the Main carbonatite intrusion and a prominent radiometric anomaly that underlies Area 4;

- Lines 2, 4 and 5 covered dyke swarms in areas where HREE enrichment had previously been identified.

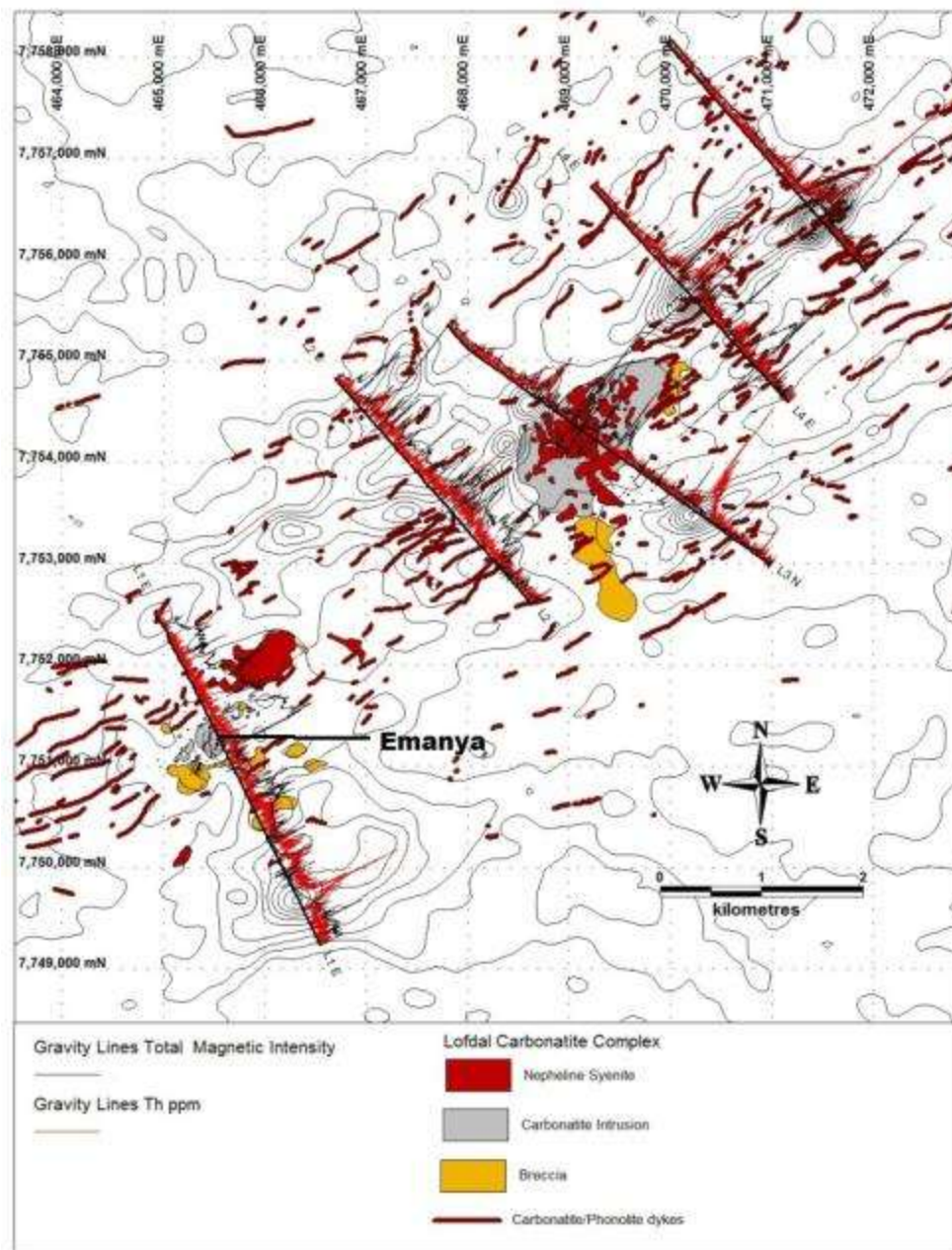


Figure 12.9 Profiles of total magnetic intensity and Th counts per second along the 5 gravity lines. Line 1 is in the southeast over the Emanya intrusion and Line 5 is in the northeast corner of the map area. Thorium contours are from the 2010 airborne radiometric survey. Th readings on the lines reflect regional anomalies and locally spike on individual dykes.

The primary objective of this survey was to measure the gravity response over the known carbonatite plugs (Main and Emania) to determine if they exhibit any characteristic geophysical signature, and to test other areas where significant radiometric anomalies might be related to blind intrusions. Radiometric and magnetometer readings along these lines provided good information on the location and characteristics of individual dykes and in the area of the grid, were consistent with results from the airborne and ground surveys.

The gravity data are less conclusive. To the west of Gravity Line 4, and on Line 3, a large gravity low of 4-6 mGal was identified which Symons (2010) interpreted as a large carbonatite or granite intrusion and correlated with the Main intrusion (Figure 12.10)

He concluded that the five gravity lines surveyed only partially define this anomaly and that, in contrast, the Emania intrusion seems to have an associated gravity high. At present, the gravity data do not clearly identify carbonatite intrusions at depth.

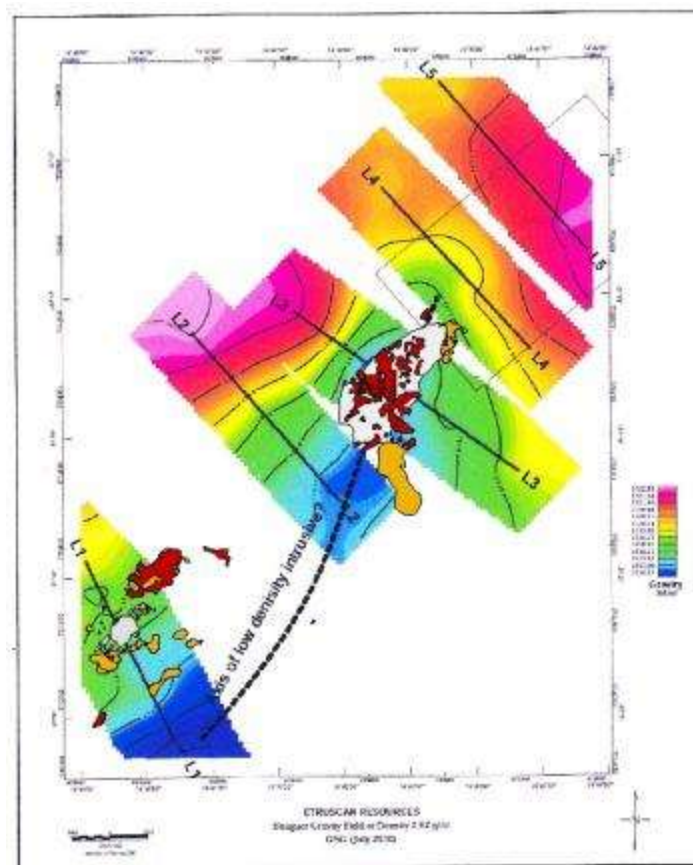


Figure 12.10 Preliminary interpretation of gravity profiles across the five gravity lines from Symons (2010). The Main intrusion is a gravity low, but there is a gravity high over the Emania intrusion. There is a suggestion of a low gravity axis from the Main intrusion to the area south of the Emania intrusion that may reflect a low density intrusion at depth. Geological legend same as Figure 12.9.

12.2.3.2 2010 Airborne Geophysics

Given the significant improvement in resolution and correlations with the mineralized structures achieved with the 50 m ground geophysical survey, it was decided to fly a high resolution airborne survey over the entire complex at 75 m spacing. New Resolution Geophysics (NRG) was contracted to carry out a helicopter-borne XPlorer magnetic and radiometric survey over the property between June 27 and July 1, 2010. The survey comprised 3,760 line km along 315° Az. lines spaced at 75 metres. It was determined that the 75 m spacing would provide 60% survey line overlap and emulate the 50 m ground resolution.

The resolution achieved by the 75 m spaced airborne lines appears to be comparable to that of the 50 m ground grid. The airborne survey provides excellent high resolution information that correlates well with existing geological, geophysical and lithogeochemical data for the area (Figure 12.11). In particular:

- It confirms the contrasting radiometric signatures of the Main and Emania intrusions, the former characterized by a strong thorium low, and potassium high (perhaps reflecting the abundant syenite associated with this intrusion), the latter characterized by high thorium and low potassium;
- The resolution is sufficiently high that in some cases, individual lithogeochemical samples can be correlated with individual geophysical responses to confirm and enhance the mapping of REE-bearing dykes. The example in Figure 12.11 shows that some individual large dykes that have been traced for considerable distances on the ground also have clear corresponding radiometric and/or magnetic responses from the airborne survey.
- It confirms interpreted structural trends and allows a more detailed mapping of major structures across the area, particularly where these structures appear to have served as conduits for carbonatite intrusion and mineralization.

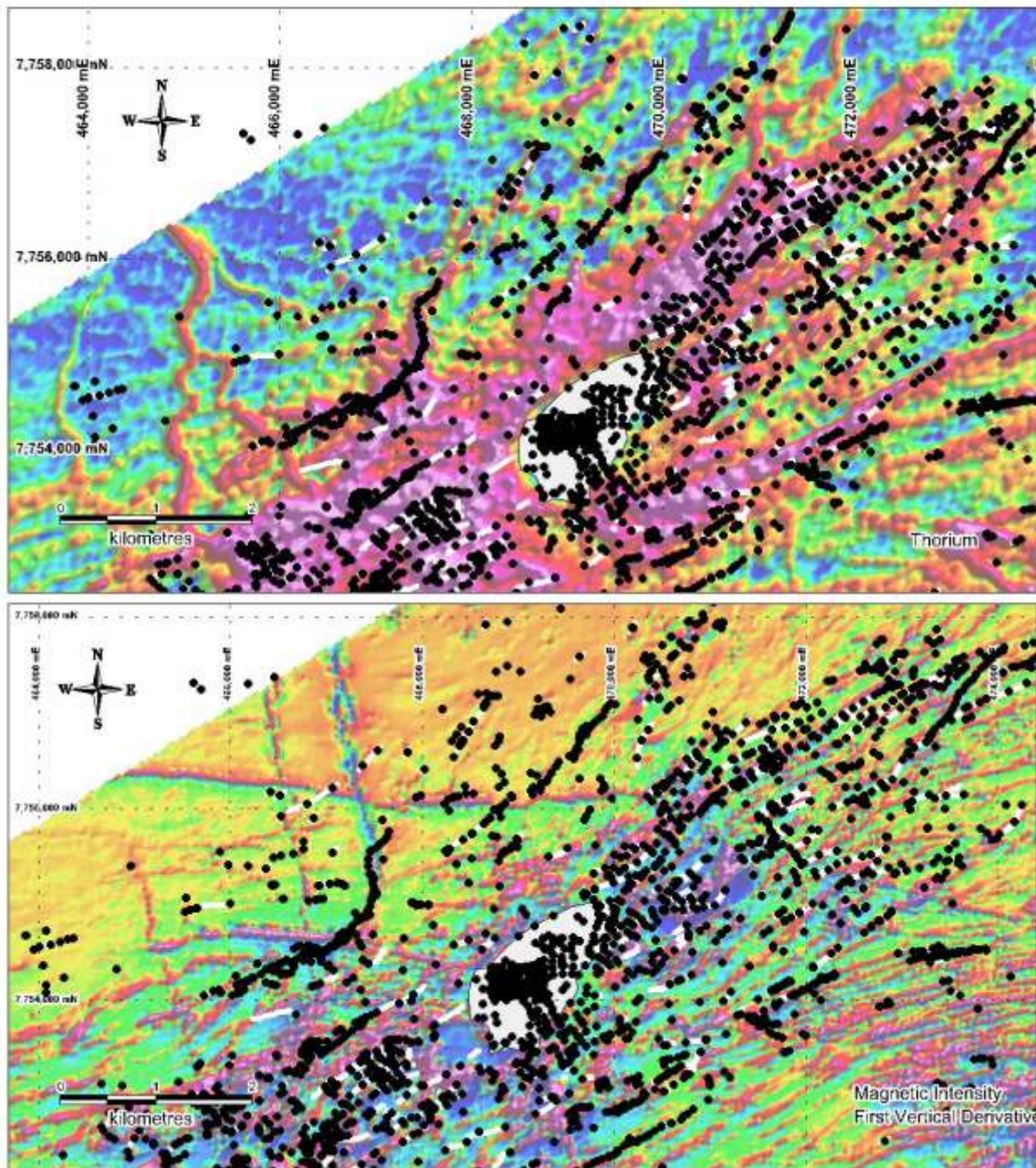


Figure 12.11 Sample locations from regional lithogeochemical sampling and interpreted carbonatite dykes (white) plotted on 2010 airborne thorium radiometric and first vertical derivative magnetic intensity. Resolution of geophysics is sufficient in some cases to pinpoint individual carbonatite dykes. Main intrusion is shown in white for reference.

12.2.4 Mineralogy and Petrography

In order to better understand the mineralogical distribution of the rare earths in the Lofdal carbonatites, a mineralogical and petrographic study of 18 variably mineralized samples was carried out by Eva Schandl of GeoConsult (Schandl, 2010). The samples were from carbonatite dykes and plugs as well as country rocks intruded by the dykes. The objectives of the study were to identify the REE-bearing minerals and describe their texture and paragenesis, identify the host rocks, classify the carbonatites if possible, and to identify features that might help distinguish LREE-rich from HREE-rich dykes in the field.

The samples were examined under the petrographic microscope in reflected and transmitted light, and selected samples were further analyzed by an ETEC electron microprobe to determine the composition and positive identification of minerals.

The study confirmed the presence of rare earth element minerals in 6 of the 18 samples. All six samples contained one or more LREE minerals including bastnaesite, parasite, synchysite (LREE fluor-carbonates), monazite (LREE phosphate) and, in one section, allanite (LREE Al-silicate). Two sections contained the HREE minerals xenotime (HREE phosphate) and aeschynite-(Y) (HREE-Nb-Ti-Th oxide-hydroxide). The study identified two distinct morphologies for the xenotime:

- granular, very fine-grained aggregates in the matrix, often intergrown with and apparently replacing REE-bearing fine grained apatite
- large euhedral crystals in late calcite veins

Schandl (2010) suggested on the basis of low thorium concentrations in these minerals that the REE minerals in the Lofdal carbonatites are hydrothermal in origin.

The carbonatite samples analysed by Scandl (2010) are mineralogically bimodal, comprising an ankeritic phase which she classified as ankeritic rauhaugite and a calcitic phase which she considered to be calcitic alvikite.

Schandl (2010) identified fine grained biotite, aegirine and riebeckite in the host rocks, which she interpreted as evidence of fenetization associated with the intrusions.

She suggested that exploration targets for HREE should focus on highly oxidized rocks consisting predominantly of ankeritic carbonate that shows evidence of hydrothermal alteration (brecciation, deformation and veining, presence of fluorite).

12.2.5 Summary of Regional Assessment of Rare Earth Potential

The regional exploration carried out to date has identified multiple high quality REE target areas and demonstrated a significant potential for discovery of deposits of rare earths associated

with the Lofdal carbonatite complex. Key results of the regional exploration carried out to date include:

- recognition of the district scale thorium anomaly (first identified in a government airborne survey, later refined through high resolution airborne and ground geophysics) which provides a first order regional target for REE exploration in the Lofdal area. To date, a substantial part of this anomaly remains to be traversed, mapped and sampled for REE mineralization;
- dramatic expansion of the number and extent of known carbonatite dykes and documentation of their geological characteristics and associated REE mineralization;
- recognition that not only the carbonatite dykes but also the associated rocks are extensively hydrothermally altered and variably mineralized with REE.
- A 7 km long corridor across the northwestern part of the complex appears to be preferentially enriched in HREE minerals;
- geological and geophysical characterization of two intrusive plugs in the centre of the complex;
- high resolution geophysical characterization of the area, interpretation of the regional structural setting of the complex, and recognition of hyperspectral and geophysical signatures that characterize carbonatite dykes and plugs;
- identification of REE minerals and the dominantly hydrothermal nature of the HREE rich mineralization.
- identification of a number of high-priority target areas for detailed exploration with new targets being generated as field work and compilations continue.

12.3 Detailed Geological Mapping (Areas 2 and 4) and Trenching in Area 2

The regional assessment of the REE potential of the Lofdal complex led to an initial selection of Areas 2 and 4 for more detailed exploration (Figure 9.7). The areas were chosen on the basis of the presence of carbonatite dykes with significant widths in outcrop, a high relative proportion of samples with anomalous REE values, and geophysical / hyperspectral signatures potentially indicating the presence of more extensive zones of carbonatite.

12.3.1 Area 2

Area 2 has received the most intense exploration to date. This area was targeted because:

- it contains a segment of a regionally significant, +/- 3 km long carbonatite dyke system in which almost 50% of samples collected to date contain more than 0.5% TREE and more than 25% of samples contain more than 0.1% HREE;
- surface mapping showed that this system was exposed over significant widths, up to 70 m at surface;
- there is abundant evidence of hydrothermal alteration associated with the carbonatites;
- nearby subsidiary dyke systems also carry anomalous amounts of HREE;

The 2010 program in Area 2 consisted of trenching across the most favourable parts of the dykes, as indicated by surface geochemistry; detailed mapping and sampling of the trenches to determine the distribution and setting of the REE's in two dimensions, geological mapping of the whole of Area 2 to provide geological context and linkages for the detailed trench maps, and drilling of the 2B zone, the widest and potentially largest zone, to investigate continuity and grade in the third dimension. Two other dyke systems within Area 2, zones 2A and 2C, were also selected for trenching. Geological/lithogeochemical characteristics of the three dyke systems are summarized in Table 12.1. Results from Areas 2A and 2B have not been analysed at the time of writing and do not form part of this report.

All aspects of the trenching program were managed and carried out by Remote Exploration Services Ltd. (RES) of Cape Town, South Africa. Trenching was carried out using a Bell 315J backhoe/loader (Plate 12.2). Trench endpoints and midpoints were located by GPS and a trench the width of the excavator bucket was dug. Bedrock is typically within 0.5 m of surface although in parts of some trenches, up to 1.5 m of soil or calcrete cover was encountered. The trenches were then cleaned by hand in preparation for mapping and sampling (Plate 12.2) and metre waypoints were measured and marked by aluminum tags.

Table 12.1 Geological characteristics of the 2A, 2B and 2C zones. Number of samples refers to surface grab samples from regional lithogeochemical program.

Zone	Dyke characteristics	Width	Strike Length of zone	# of spls	%>0.1% HREE	# of Trenches
2A	Thin carbonatite dykes with limited associated alteration	<5m	230m, potential for extension based on geophysics	9	89%	9
2B	Wide zone of carbonate intrusion and alteration; part of a regional dyke system	5-70 m	600m investigated; dyke continues along strike in both directions	50	26%	25
2C	Zone of narrow dykes and associated alteration; not continuous in outcrop	<5m	550 m	5	80%	15



Plate 12.2 A – digging trenches on Area 2B with a backhoe. B- cleaning trenches in preparation for sampling and mapping.

All trenches were geologically mapped prior to sampling and total average count radiometric readings were taken for each sample interval using a RadEye personal radiation detector (PRD). Total count K, U, and Th concentrations with a hand held spectrometer and magnetic susceptibility readings were taken at 1 m intervals.

In addition to the trench sampling, additional grab samples were taken during geological mapping of area 2 (Figure 12.12). Carbonatite dykes were sampled when encountered along the traverse lines and if they could be followed along strike, were sampled at 10 m intervals half the distance to the next traverse line.

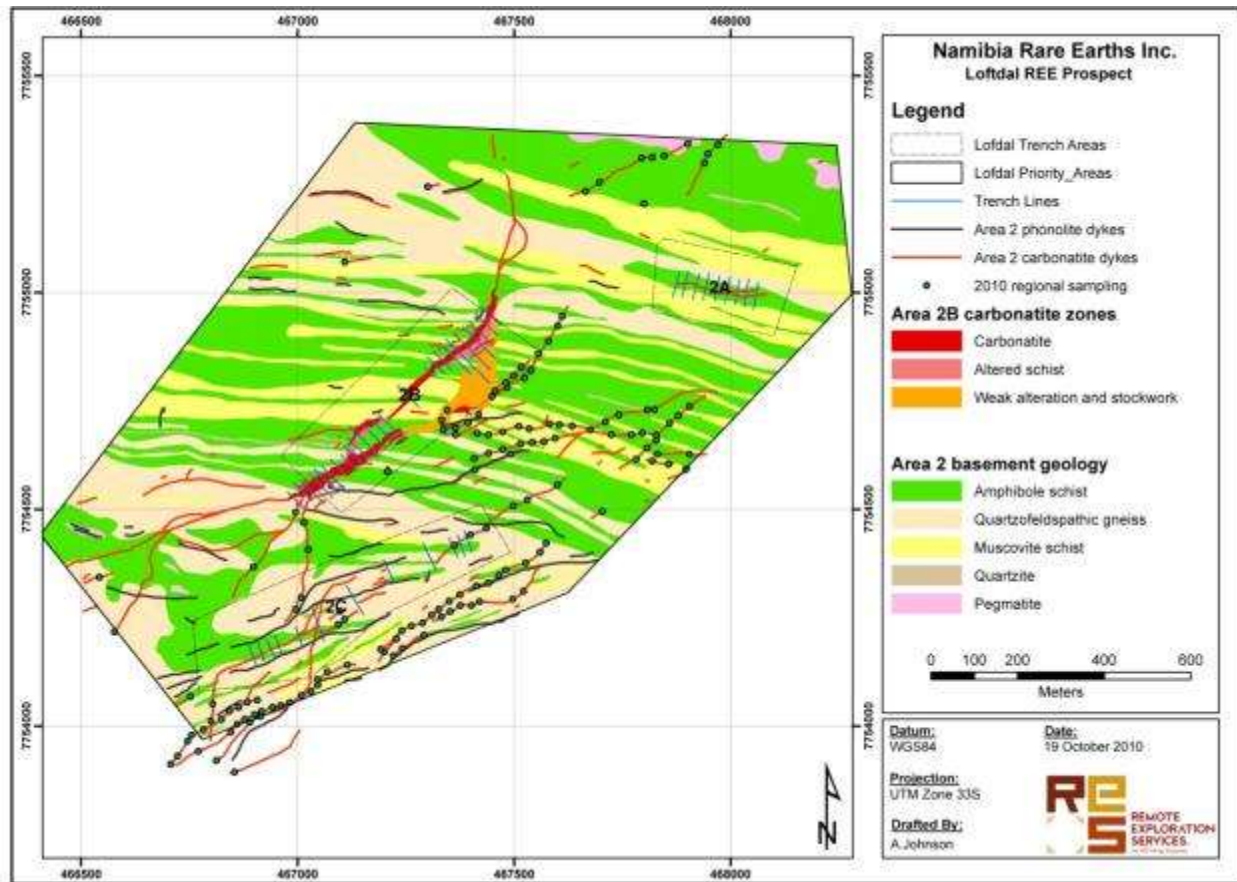


Figure 12.12 Geology and sample locations (blue dots) for lithogeochemical sampling of Area 2

A total of 25 trenches were put in on the 2B zone (Table 12.2). The results of trench mapping confirm the fine structure of the carbonatite/alteration system. Figure 12.13 shows the lithologic logs for the trench mapping. The mineralized zone is characterised by carbonatite dykes of variable width associated with variably altered schists and gneisses. The alteration is characteristic of the mineralized zones and consists of variable, locally intense, albitization, carbonatization, and local concentrations of phlogopite. Channel samples were taken throughout the entire length of the trenches to test whether mineralization is restricted to carbonatites or is related to hydrothermal alteration and occurs in other lithologies as well.

Table 12.2 Locational information for trenches on the 2B Zone Datum WGS84; UTM Zone 33S

ID	Easting	Northing	Elevation	Azimuth	Length
NLOFTR2B001	467013.91	7754568.9	957.5	135	77
NLOFTR2B002	467032.76	7754582.8	957.266	135	76
NLOFTR2B003	467046.45	7754596	956.606	135	79
NLOFTR2B004	467063.34	7754602.5	956.43	135	87
NLOFTR2B005	467077.65	7754619.1	955.315	135	53
NLOFTR2B006	467102.26	7754628.1	955.057	135	53
NLOFTR2B007	467111.07	7754648.6	953.717	135	60
NLOFTR2B008	467121.68	7754667.5	952.363	135	74
NLOFTR2B009	467126	7754694.3	949.928	135	100
NLOFTR2B010	467154.18	7754698.8	949.44	135	81
NLOFTR2B011	467174.37	7754710.6	947.891	135	77.5
NLOFTR2B012	467189.85	7754725	947.218	135	92
NLOFTR2B013	467235.24	7754788.1	945.109	135	72.5
NLOFTR2B014	467300.28	7754827.7	949.498	135	30.5
NLOFTR2B015	467306.97	7754852.8	950.418	135	55
NLOFTR2B016	467317.91	7754865.5	951.421	135	58
NLOFTR2B017	467332.29	7754885.3	951.599	135	104
NLOFTR2B018	467346.32	7754895.3	952.858	135	145
NLOFTR2B019	467364.2	7754910.1	953.284	135	122
NLOFTR2B020	467382.95	7754923.9	953.719	135	105
NLOFTR2B021	467403.65	7754932.7	953.139	135	75
NLOFTR2B022	467415.32	7754953.9	951.09	135	72
NLOFTR2B023	467431.85	7754966.7	949.439	135	60
NLOFTR2B024	466982.06	7754542	956.704	135	53
NLOFTR2B025	466996.18	7754561.2	957.016	135	60

The favourable zones of carbonatization, alteration, and mineralization are well outlined by both carbonatite intensity and by total count radiometric signature, as shown in Figures 12.13 and 12.14. The alteration zones are well characterized on the surface by elevated radiometric total count readings and this clearly provides a useful prospecting tool for carbonatite/hydrothermal alteration systems elsewhere on the property. The direct relationship between zones of carbonatite, alteration and radiometrics is also clearly displayed in Figure 12.15, strip logs of Trench NLOFTR2B001, 005 and 006 (see Figure 12.13 for location). The zones of carbonatization are shown on the lithology log and correspond closely to mapping of alteration intensity. The bar graph of total count radiometrics shows elevated counts over the part of the zone that displays the most intense alteration.

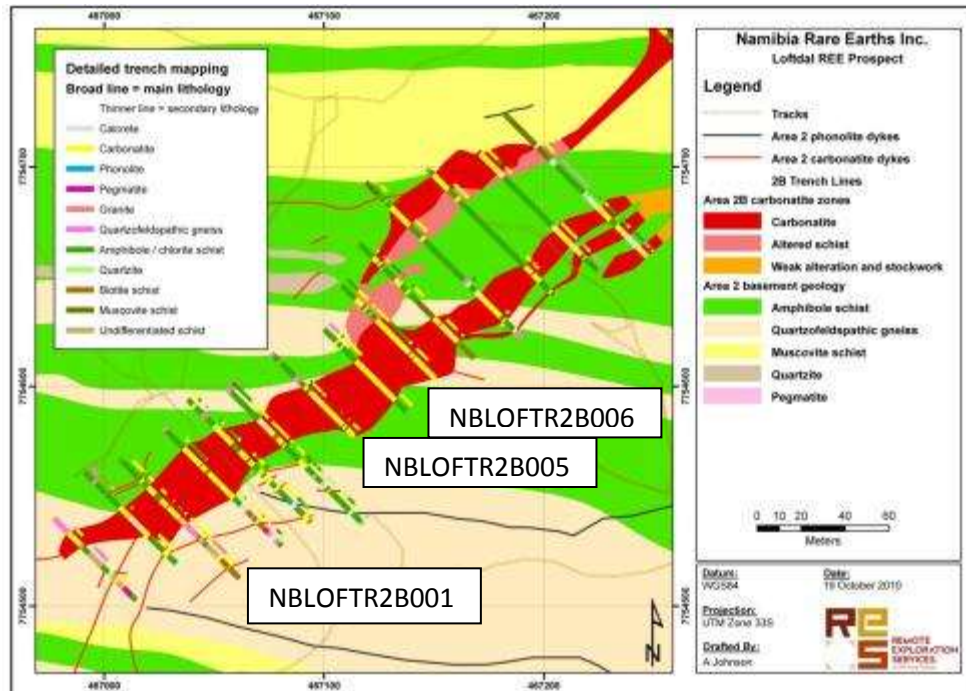


Figure 12.13 Lithological logs for trenches in the 2B zone. The zone is characterized by a wide zone of carbonatite intrusion and carbonatization of wall rocks.

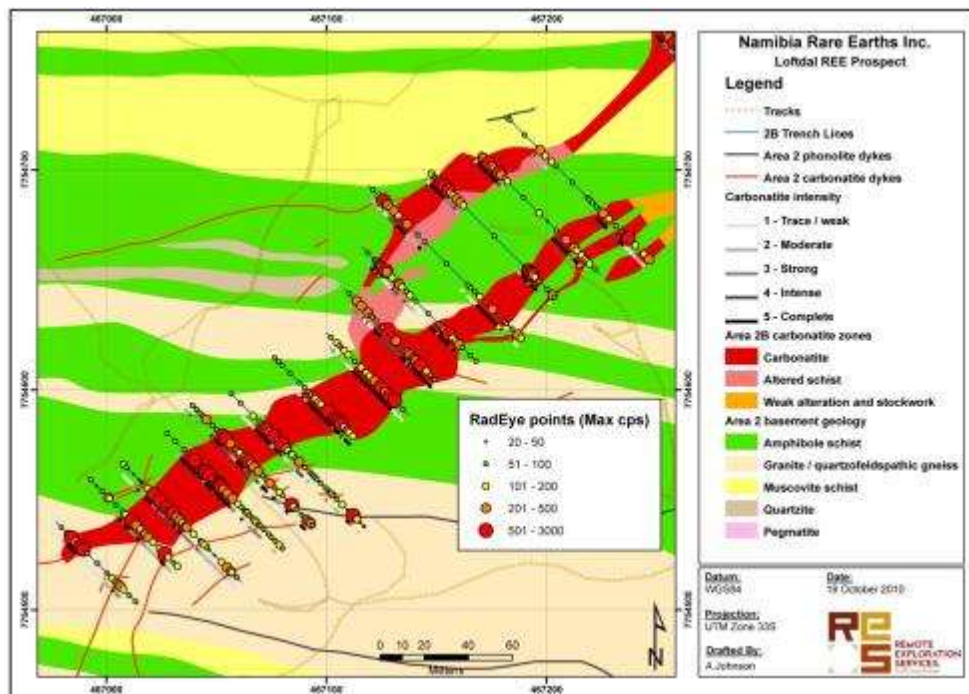


Figure 12.14 Maximum total count radiometrics taken with a RadEye PRD on trench outcrops. The zone of carbonatization and mineralization is generally characterized by anomalously high readings.

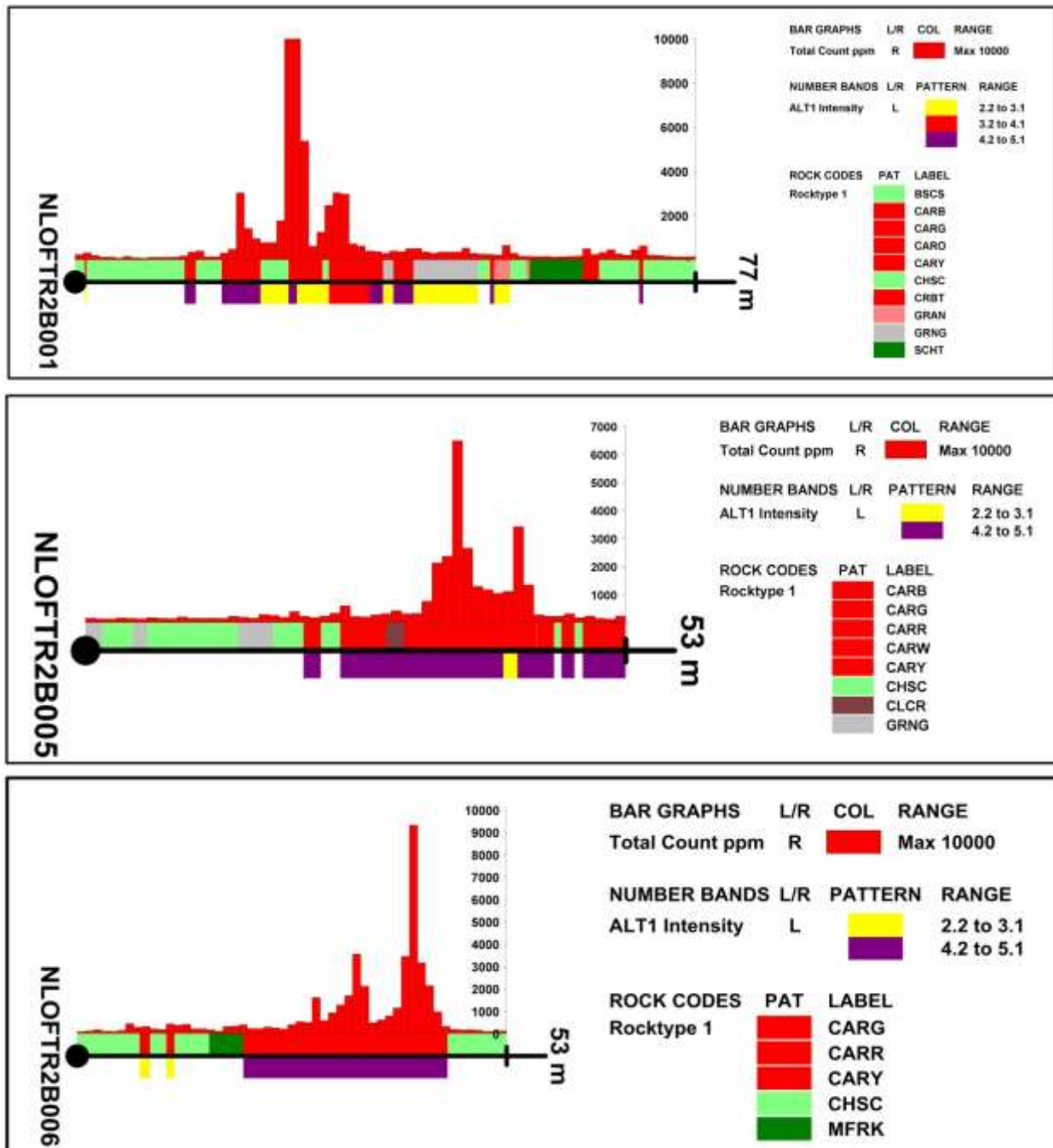


Figure 12.15 Strip logs of Trenches NBLOFTR2B001, 005 and 006, showing the relationship between lithologies, alteration and radiometrics. Upper coloured strip shows lithologies, carbonatites and related alteration lithologies in red (rock code key is in Appendix 3), mafic schists and gneisses in shades of green. Lower coloured strip is alteration intensity, high is purple moderate is yellow. Bar graph is total count radiometrics, measured with a GRS 125 Spectrometer. Location of trenches is shown in Figure 12.13.

The results of channel sampling and analysis of trench samples are summarized in Appendix 1 and confirm that the alteration zone is anomalous not only radiometrically but also geochemically. The alteration zone is generally characterized by significantly elevated REE, Y and Th contents, which are enriched by an order of magnitude over the country rocks.. The chondrite-normalized REE patterns of mineralized rocks clearly show the anomalous enrichment in the HREE (Figure 12.16). The altered and mineralized rocks are also significantly enriched in MnO and P₂O₅ as well as U, Ba, Nb and Zr. Similar patterns of enrichment are seen in the alteration zone in other trenches.

The alteration system and its associated radioactive and geochemical anomalies was encountered to varying degrees in all trenches in the 2B zone. However, the assays show that the zone is not consistently mineralized along its length. The best mineralized intersections in terms of both grade and width were encountered in Trenches NLOFTR2B001, 005 and 006. The assay results for these mineralized zones are illustrated in Figures 12.17, 12.18 and 12.19. Quoted intervals are horizontal, not true widths. In all three trenches, REE mineralization is HREE-enriched and developed over widths of several metres. There is clearly potential for the discovery of significant widths of REE mineralization in this or similar zones.

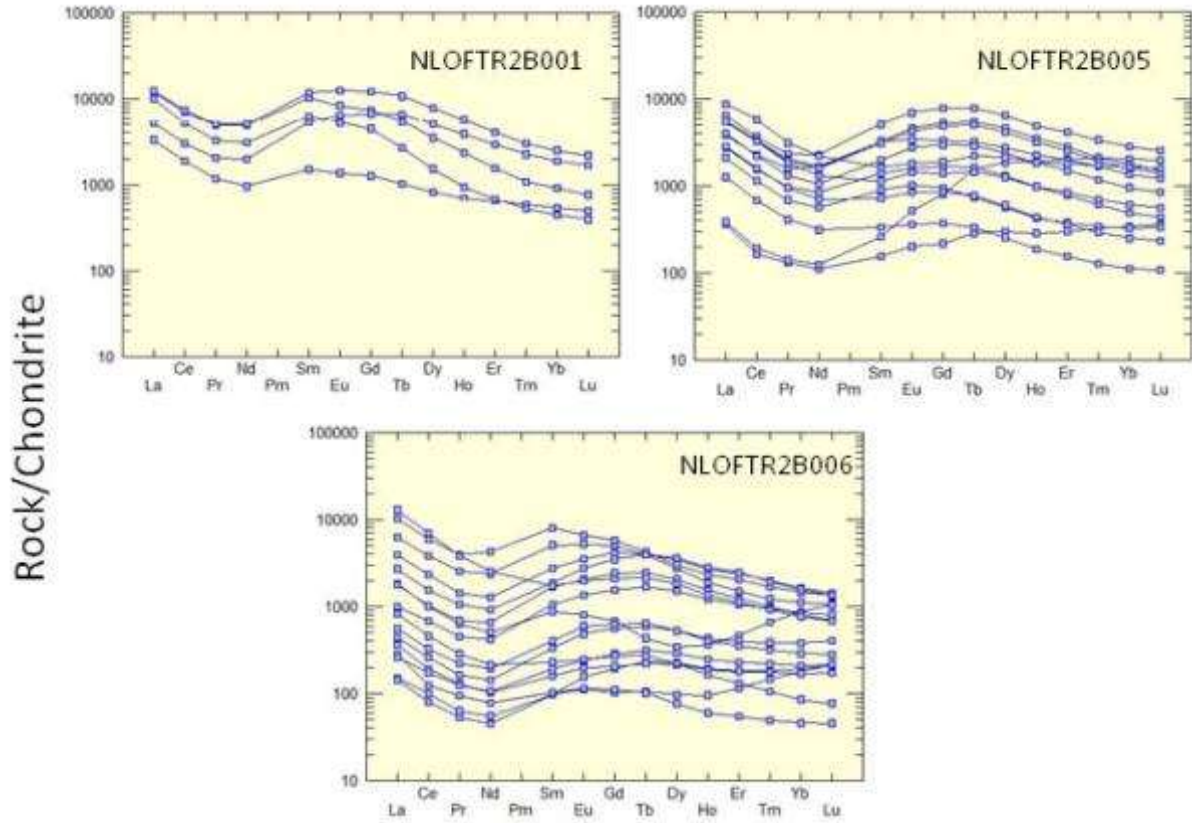


Figure 12.16 Chondrite-normalized REE patterns (Sun and McDonough, 1989) for mineralized samples in Trenches NLOFTR2B001, 005 and 006. The mineralization is consistently HREE-enriched.

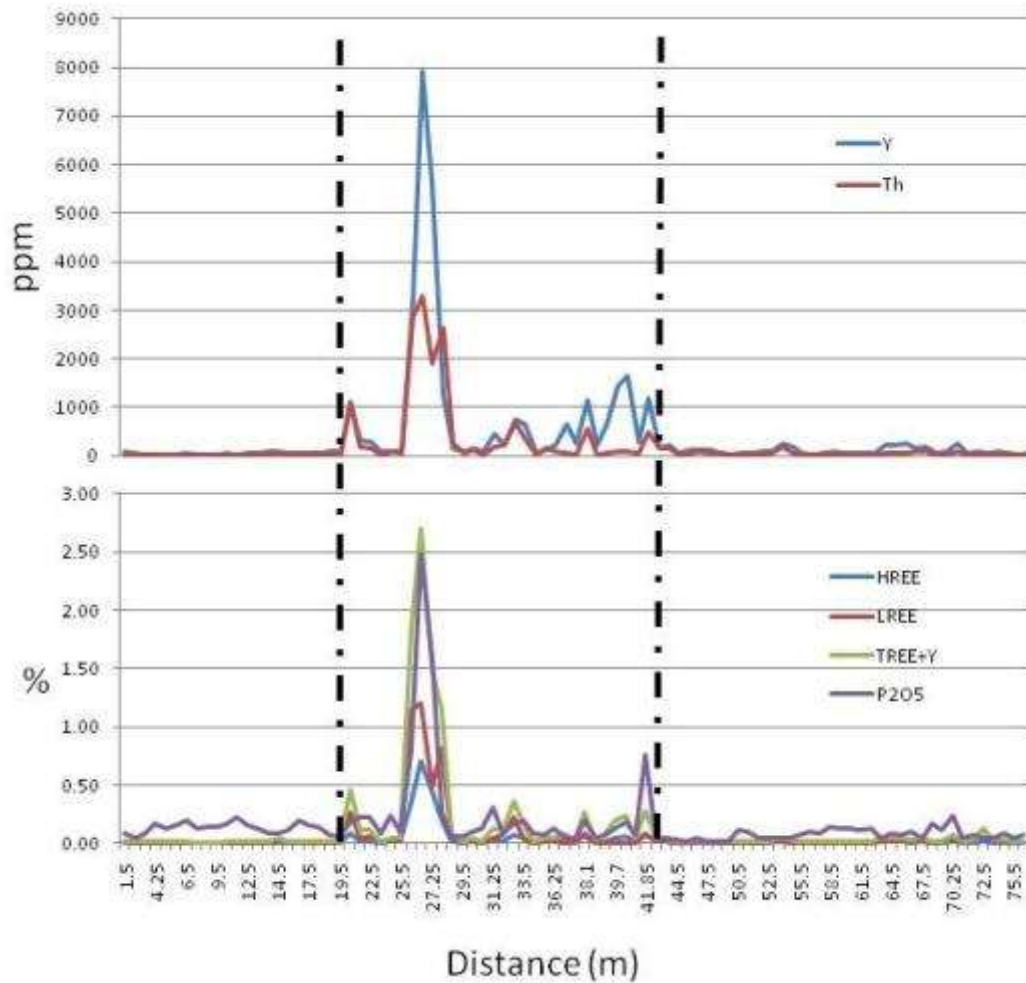


Figure 12.17 Geochemical signature over the zone of carbonatite, hydrothermal alteration in Trench NBLOFTR2B001. Heavy black dashed lines outline the zone of the anomalous geochemical signature.

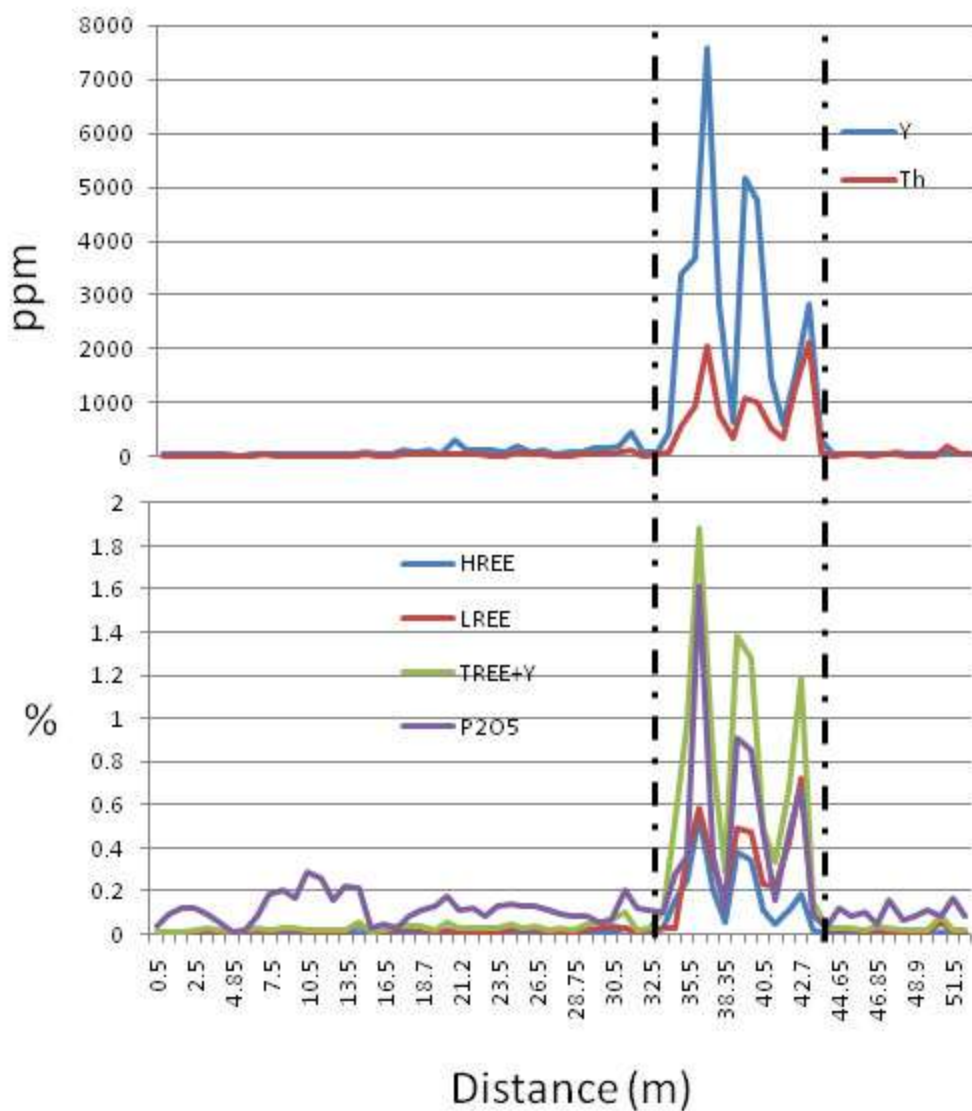


Figure 12.18 Geochemical signature of the mineralized zone in Trench NLOFTR2B005. Heavy black dashed lines outline the zone of the anomalous geochemical signature.

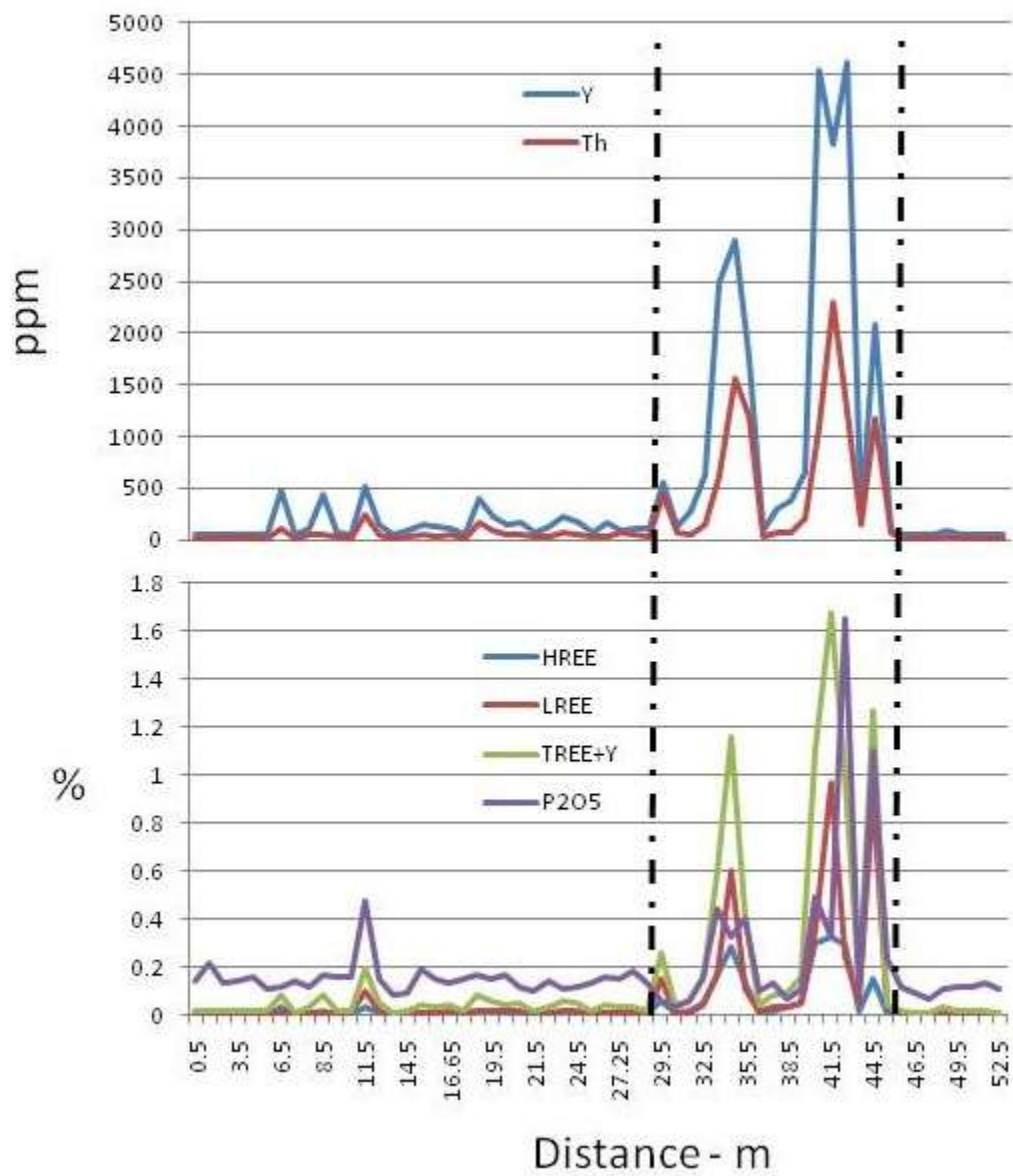


Figure 12.19 Geochemical signature of the mineralized zone in Trench NLOFTR2B006. Heavy black dashed lines outline the zone of the anomalous geochemical signature.

12.3.2 Area 4

Area 4 was chosen for initial investigation because of a significant thorium anomaly, coupled with a hyperspectral anomaly running through the centre of it and high REE values in regional samples in the vicinity (although very few samples were taken over the thorium anomaly itself). Detailed exploration consisted of geological mapping and extensive additional grab sampling of carbonatites in this area.

The results show that there is a prominent zone of carbonatization and mineralization that trends approximately E/W across the area that is particularly enriched in HREE (Figure 12.20). The zone has both significant width (up to 20 m in plan) and strike length (800 m). There is also an area in the SW quadrant of the area, which returned a large number of LREE-enriched samples. Assays from selected grab samples from these two areas are given in Table 12.3. This area is a very attractive target for follow up sampling and diamond drilling.

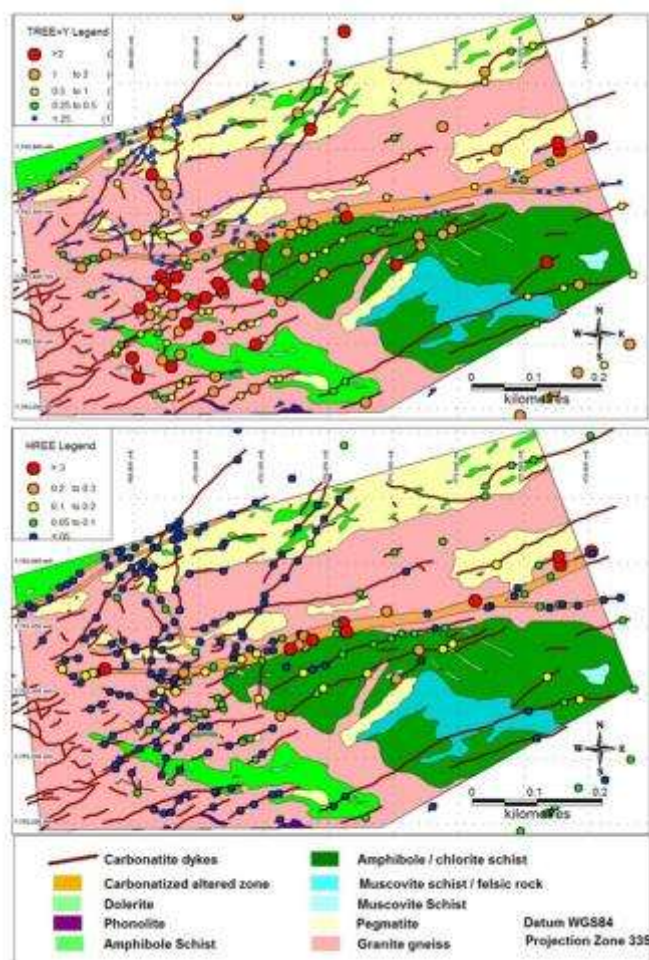


Figure 12.20 Location and TREE+Y, HREE+Y contents of lithogeochemical samples taken during detailed mapping of Area 4.

Table 12.3 High HREE and TREE+Y samples from surface grab samples in Area 4. HREE+Y and TREE+Y in percent, other elements in ppm. Ratio of HREE+Y to TREE+Y expressed as %.

Spl. #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	HREE+Y	TREE+Y%	% of Total as HREE + Y
HREE-enriched samples - central carbonatized zone																		
NLOFR1159	378	509	61.5	301	476	443	1915	634	4400	1040	3260	523	2840	450	29700	4.52	4.69	96.3
NLOFR1206	170	393	56.9	299	734	598	2300	584	4100	841	2390	326	1890	250	28600	4.19	4.35	96.2
NLOFR1158	154	268	37.9	187.5	282	295	1340	436	3110	756	2430	386	2110	316	24100	3.53	3.62	97.4
NLOFR1152	114	202	25.7	111	198	233	1000	319	2280	541	1725	283	1725	269	13400	2.18	2.24	97.1
NLOFR1226	26	44	5.2	31.1	208	225	957	253	1780	350	981	139	811	101.5	9320	1.49	1.52	97.9
NLOFR1218	68	157	22.1	117	310	258	1010	235	1485	288	763	104	604	78.1	8620	1.34	1.41	95.2
NLOFR1204	44	93	11.8	54.6	112	113.5	489	145	1085	255	785	110.5	628	82	8760	1.25	1.28	97.5
NLOFR1399	108	197	22.6	96.4	124	82.8	525	136	1010	228	637	90	520	73.8	8307	1.16	1.22	95.5
NLOFR1177	173	317	37.7	139	86.5	78.1	386	127	962	215	638	92.5	553	77.7	5420	0.85	0.93	91.9
NLOFR1217	140	366	58.5	323	601	266	815	136.5	697	124	318	41.1	242	32	3050	0.57	0.72	79.4
NLOFR1225	46	104	14.5	76.6	169	128.5	477	110.5	720	140	383	52.7	309	39.4	3530	0.59	0.63	93.5
NLOFR1319	23.9	52.2	6.54	34.5	69.3	52.8	310	83.2	632	149	454	67.3	420	62.2	5451	0.77	0.79	97.6
NLOFR1191	29.9	50.3	6.79	29.7	50.6	47	223	72.4	604	152	480	70.2	415	54	5650	0.78	0.79	97.9
Average	113	212	28	138	263	217	904	252	1758	391	1172	176	1005	145	11839	1.79	1.86	96.0
LREE-enriched samples, W quadrant																		
NLOFR1292	19100	28100	2230	6560	543	116	344	38.8	168	25.9	59.5	7.69	46.3	7.01	817	0.16	5.82	2.8%
NLOFR1387	20600	26900	2130	5860	413	72.8	281	17	72.6	13.7	37.3	5.39	33.7	5.14	444	0.10	5.69	1.7%
NLOFR1332	18000	26300	2120	5950	505	102	282	32.2	141	19.3	42.8	5.5	34.2	5.42	562	0.12	5.41	2.3%
NLOFR1413	15300	19000	1470	4010	279	51.4	205	12.6	48.2	7.6	19.3	2.58	15.8	2.45	188	0.06	4.06	1.4%
NLOFR1414	14800	18600	1470	4110	327	66.2	248	21.7	94.5	15.2	35.4	4.54	26.4	3.99	400	0.09	4.02	2.3%
NLOFR1287	10400	15500	1260	3900	412	93.7	301	33.5	167	26.7	66.7	8.58	53.2	7.75	736	0.15	3.30	4.5%
NLOFR1293	10000	14900	1190	3510	310	67.7	199	22.8	116	20.8	55.9	7.51	47.2	6.98	720	0.13	3.12	4.1%
NLOFR1368	10200	13700	1130	3130	279	63.4	206	20.6	101	17.4	54	6.82	44.9	6.81	501	0.10	2.95	3.5%
NLOFR1322	8850	12800	1010	2960	244	52.7	165	22.9	130	26.5	79.3	11.6	72.7	10.6	909	0.15	2.73	5.4%
NLOFR1328	8800	12600	1020	2920	278	60.2	163	18.1	81	13.7	36.3	5.04	31.7	4.69	425	0.08	2.65	3.2%
NLOFR1357	8250	12000	975	2790	270	57.6	173	21.1	110	19.8	53.4	7.24	43.1	6.2	588	0.11	2.54	4.3%
NLOFR1358	8220	11900	965	2770	272	59.8	174	19.7	99.8	18.3	51.4	7.32	45.7	6.57	514	0.10	2.51	4.0%
NLOFR1395	7370	9600	788	2270	182	24.4	126	9.1	40.5	6.9	17.9	2.55	16.3	2.54	163	0.04	2.06	2.0%
Average	12299	17069	1366	3903	332	68.3	220.5	22.3	105.4	17.8	46.9	6.3	39.3	5.9	536	0.11	3.60	3.0

Item 13: Drilling

13.1 2008 Reverse Circulation Drilling

There are no records of any drilling having been undertaken for REE's at Lofdal prior to NRE (Pty)'s involvement. In 2008, following the discovery of the Main intrusion, NRE (Pty) had a reverse circulation (RC) drill rig in the area testing the Cu-Au potential of the Lofdal copper mine. Prior to demobilizing that rig, it was decided to test a portion of the Main intrusion where a pre-existing road provided access and to test one easily accessible, well-exposed carbonatite dyke south of Lofdal farm. The holes were drilled without the benefit of any lithogeochemical sample results because the drill rig had to be demobilized for other commitments.

The locations that were drilled are shown in Figure 13.1. In the Main intrusion, six vertical holes were drilled, all of which cut mainly alternating intervals of white to grey carbonatite with lesser syenite and minor amphibolite. Holes ranged between 126 and 185 m depth for a total of 1016 m.

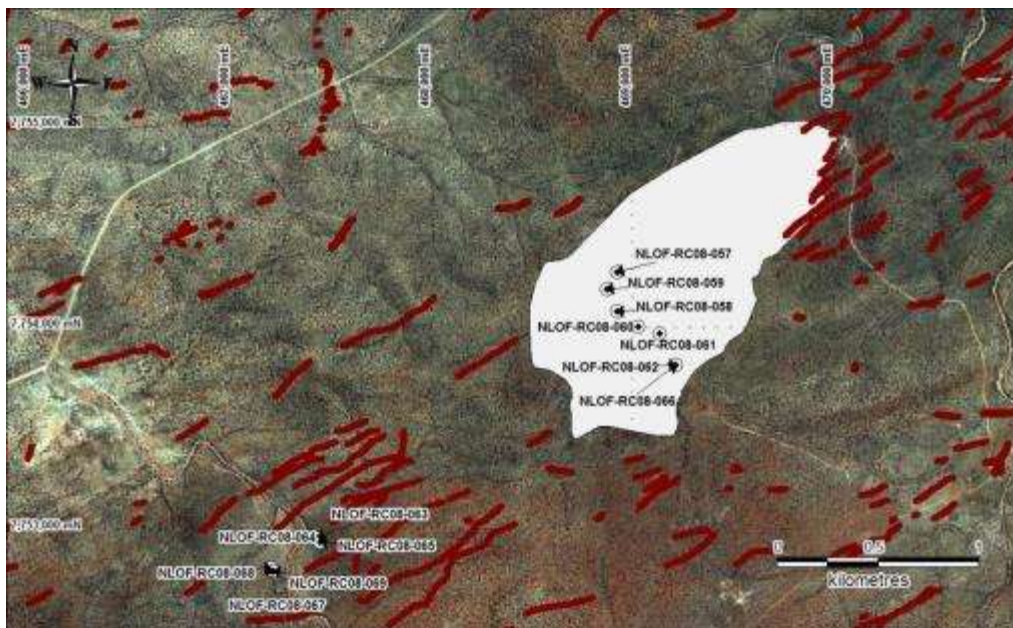


Figure 13.1 Location of 2008 RC holes. Main intrusion (white) and interpreted carbonatite dykes (red) shown for reference. Holes in the Main intrusion were vertical, holes to the SW were angle holes drilled in a northwesterly direction.

Approximately 2 km to the southwest, six angle holes of -45 and -60 degrees were drilled in a northwesterly direction to test exposed carbonatite dykes. All of the holes cut a variable succession of amphibolitic country rock, carbonatite and intrusive rocks, and ranged from 50 to 185 m in depth for a total of 815 m.

There was no summary written report of this drilling, although drill logs, assay results and both chip cards and chip trays of cuttings from the holes have been preserved by NRE (Pty) and are available for study. Assays from the Main intrusion drilling supports surface sample results that indicate weakly anomalous REE values in this intrusion. Assay results from the angle holes returned more encouraging intercepts of REEs related to the carbonatite dykes over widths of 1 to 5 m. Best reported intercepts included 5 m of 1.7% TREE+Y, 2 m of 1.3% TREE+Y and 1 m of 22.04% TREE+Y. The objectives of the program were served as it was demonstrated that significant REE mineralization was related to the dykes but not to the Main intrusion.

There were no quality assurance or quality control procedures applied to sampling and analytical procedures and the logging was not sufficiently detailed to be sure that lithologies have been correctly interpreted. Accordingly, these drill results are not considered to be sufficiently well controlled for further consideration in this report.

13.2 Diamond Core Drilling, 2010

13.2.1 Introduction

The 2010 diamond drilling program was the first targeted drill program for REE mineralization on the Lofdal property. GeoAfrica Prospecting Services cc was contracted by NRE to manage the drilling, logging and sampling of a diamond drill program in Area 2 with drill holes planned and positioned by NRE.

More specifically, for the purposes of this report, this drilling investigated the lateral and down dip continuity of the 2B Zone, a linear zone of REE mineralization associated with carbonatite dikes, albitites and hydrothermal alteration that has a surface expression extending more than 600 m along strike. Trench and drill hole positions are shown in Figure 13.2.

The drilling was carried out in October and November, 2010. Geologist G. Hayward oversaw the program in the field with support from P. Siegfried. Drilling and sampling was conducted within the framework of National Instrument 43-101 guidelines, the Canadian Securities standards for mineral resource and reserve reporting. Geologist P. Siegfried is a qualified person in terms of NI 43-101 reporting.

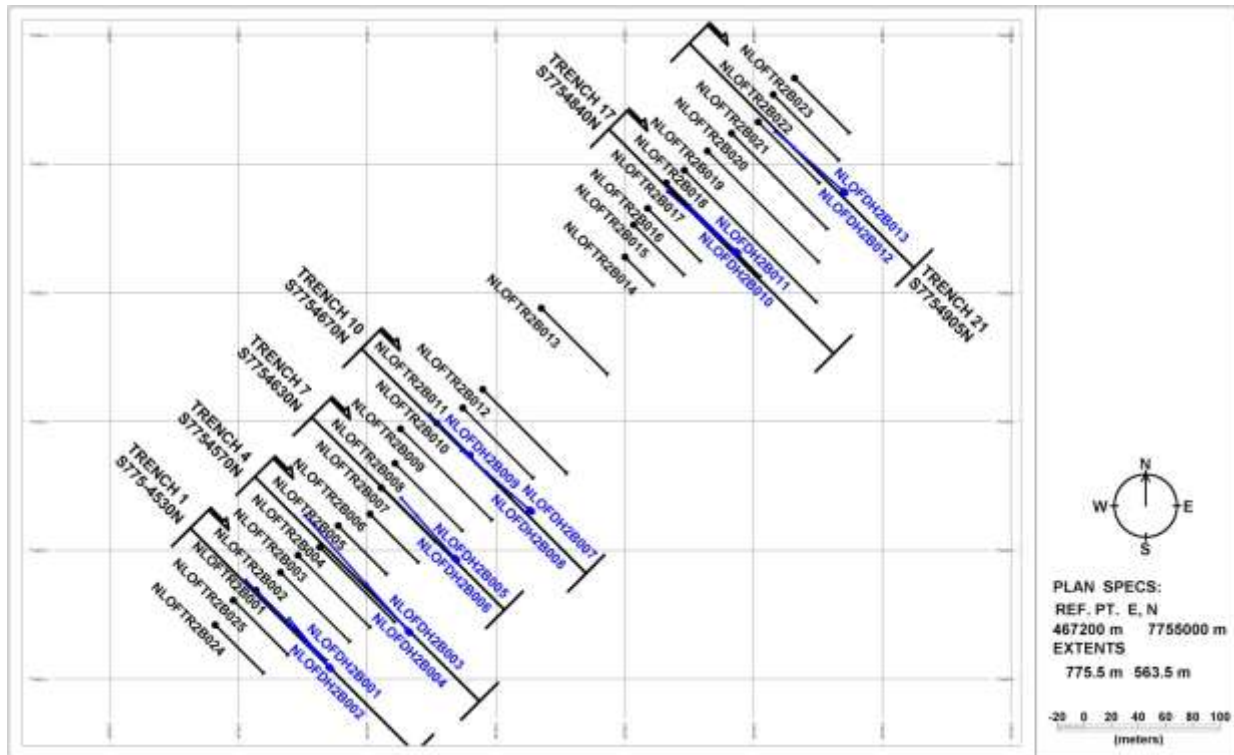


Figure 13.2 Map showing positions of drill holes and trenches on target Area 2B.

13.2.2 Method and Approach

Diamond core drilling was carried out using two Atlas Copco Christianson CS14 diamond drill rigs recovering NQ diameter core (47.6 mm). The drilling contractor was JGM Drilling, a Namibian registered company based in Windhoek. Drilling was conducted in a most professional manner with recoveries generally better than 95%.

Three target areas, which had already been trenched, were drill tested: 'Area 2B' (referenced above) with holes NLOFDH2B001 to NLOFDH2B013 respectively, 'Area' 2A with holes NLOFDH2A014 to NLOFDH2A016 and 'Area 2C' NLOFDH2C017 to NLOFDH2C020. The last two areas are not detailed as part of this report.

Current reporting is restricted to Area 2B. A total of 23 trenches tested the zone along a strike extent of approximately 600 m. In all but one instance, two boreholes were drilled per site on this target, with each pair of holes testing the vertical extent of the mineralized zone along a selected trench line. The selected trenches for drilling were NLOFTR2B001; NLOFTR2B004, NLOFTR2B007, NLOFTR2B010, NLOFTR2B017, and NLOFTR2B021. A summary of drill hole positions is provided in Table 13.1.

Table 13.1 Locational information for drill holes on the 2B Zone

HoleID	Easting	Northing	Elevation	Azimuth	Dip	Length
NLOFDH2B001	467070.527	7754509.326	962.08	316.2333	-50	145.89
NLOFDH2B002	467071.764	7754508.181	962.254	320.2333	-65	120.4
NLOFDH2B003	467131.914	7754537.226	959.819	318.2333	-50	188.15
NLOFDH2B004	467133.236	7754535.993	959.902	318.2333	-65	120.39
NLOFDH2B005	467168.075	7754593.795	954.889	318.2333	-50	98.2
NLOFDH2B006	467169.549	7754592.409	954.907	318.2333	-65	110.42
NLOFDH2B007	467226.379	7754631.238	950.336	311.2333	-50	110.23
NLOFDH2B008	467227.74	7754630.06	950.456	311.2333	-65	110.3
NLOFDH2B009	467180.068	7754674.007	949.967	315.2333	-50	69.93
NLOFDH2B010	467386.489	7754832.146	958.046	311.2333	-50	110.2
NLOFDH2B011	467387.888	7754830.891	958.076	314.2333	-65	125.43
NLOFDH2B012	467469.958	7754878.722	952.12	311.2333	-50	110.35
NLOFDH2B013	467471.135	7754877.851	952.136	311.2333	-65	125.65

The holes all had a similar azimuth (323° to 330°) and paired holes were drilled at inclinations of -50° and -65° respectively. The -50° hole was drilled first and when completed, the rig was moved 1 meter back following which the -65° hole was completed. In one instance, (Trench NLOF2BDH010, Figure 13.2) a third hole was drilled at -50° approximately 50 m ahead of the paired holes to ensure complete testing of the across-strike extent of the zone. The inclined holes were targeted to intersect steeply dipping carbonatite dikes, albitites and hydrothermally altered zones at depths of roughly 50 m and 100 m below surface. The actual depths of intersection were somewhat shallower (25 to 50 m) as the drilling showed that the mineralized zones were dipping at $\pm 50^{\circ}$ to 60° .

The rig setup was checked by the field geologist prior to commencement of drilling. The holes were collared with HQ to roughly 6 m. The overburden was 'cased-off' to the hard rock contact and the casing was left in the hole to ensure the integrity of the hole remained intact for later down-hole geophysical surveys.



Plate 13.1 Rehabilitated drill site (NLOFDH2B003, 004).

Once the hole was completed the area was rehabilitated under the direction of NRE (Pty)'s environmental consultants (Plate 13.1) and a concrete plinth constructed over the borehole collar. The casing was allowed to protrude approximately 0.3 meters above the plinth on which an aluminum plate was attached with the following information:

- GPS UTM Co-ordinates
- Borehole Number
- Hole Depth
- Month and Year

The top of the casing was sealed with a closed galvanized iron tube, which was riveted to the casing (Plate 13.2.).



Plate 13.2 Completed borehole showing concrete plinth, marker and cover.

All holes were down-hole surveyed with a Reflex EZ-TRC system to determine the borehole azimuth and inclination for plotting borehole traces.

The collars of the completed holes were DGPS surveyed by a professional surveyor (all surveys were done using the WGS84/UTM 33S coordinate system). The DGPS surveyed X, Y and Z position is taken as the collar position into the borehole database.

Careful drill monitoring was enforced to ensure intact core intersections. Run by run recoveries were monitored and recorded on a standard NRE (Pty) rock quality designation (RQD) sheet. RQD's are calculated per drill run by adding up the total length of the core pieces that are of a hard or competent nature (i.e. no breaks) and of 100 mm or more in length. This total is then divided by the length of the drill run.

$$RQD (\%) = (\sum \text{ core pieces } > 100 \text{ mm}) / \text{length of drill run} \times 100$$

This data was captured into an Excel spreadsheet and saved on the project database. Recoveries were calculated in the field by dividing the actual core recovered for that run by the length of the run as indicated by the drilling contractor. Only intersections with >90% recovery were considered representative.

Accurate meter marking of the core was done on site. Borehole depths were corrected for the entire hole. Depth corrections were done by identifying reliable drilling breaks and then rejoining and re-measuring the core. All zones of core loss were recorded.

The high point of all contacts and/or layering was used for orienting and marking the rejoined core. This ensured an even core split when halved for sampling. An orientation line was marked over the entire length of the re-joined core with arrows added frequently (every 20 cm) indicating the down hole direction. Core marking was completed with indelible paint marker. (Plate 13.3)



Plate 13.3 Drill core from Hole NBLOFDH2B001 showing high quality of core recovery with meterage marking and orientation

The core was then transported in an appropriately secure manner to the core yard in Khorixas.

Borehole cores were logged and sampled at the Khorixas core yard by a qualified geologist and all holes were logged and sampled as an *integrated process* by the same geologist. Boreholes were geologically logged on standard NRE (Pty) A3 logging sheets and later captured in project specific Excel spreadsheets. These have been imported into the company's Access database. ERN supplied the Access database geological dictionary used for logging, which was modified and updated by GeoAfrica.

A number of holes were radiometrically logged at the core logging facility using the RadEye PRD gamma scintillometer. A maximum and a minimum value in counts per second were recorded over each meter. This was later correlated with the downhole radiometric survey data and found to correlate reliably.

All borehole cores were digitally photographed when wet and all photos were captured on the central database. At this point, the core was ready to be marked up for sampling.

13.2.3 Downhole Geophysical Logging

Terratec Geoservices (Namibia) was contracted to survey a number of drill holes with a variety of down hole geophysical survey methods. The logging tools used included:

- three arm caliper/gamma as an initial test for the borehole integrity,
- dual compensated density/gamma side walled tool which provided a measure of the density of the material surrounding the borehole using the scatter of gamma rays from a small caesium radioactive source,
- magnetic susceptibility based on electromagnetic induction principles which gave a quantitative measurement of the amount of magnetic material in the rock,
- acoustic televiewer provided a 360° acoustic image of the borehole with directional information (dip and azimuth) of fractures and layers, and,
- down hole spectrometric record of the U, Th and K content of the rock.

At the time of writing, only the downhole spectrometric data has been received. The remaining data are still being processed.

13.2.4 Drilling Results

13.2.4.1 Continuity of 2B Zone

Drilling confirms that the mineralized carbonatite and associated hydrothermal alteration zones mapped at surface in outcrop and in the trenches are continuous in the subsurface. The key lithological, geochemical and geophysical features are illustrated on drill sections in Figure 13.3 and Appendix 3. A schematic interpretation of the alteration and structure in the alteration zone is given in Figure 13.4.

The mineralized zone and prospective lithologies were clearly encountered in the drill core and key features can be correlated between holes as indicated on the drill sections (Figure 13.3, and Appendix 3). A key result of the diamond drilling was the documentation of a suite of hydrothermally altered rocks associated with the mineralization and their mutual relationships. The alteration zones include varying proportions of albitite, albitized and carbonatized country rock and carbonatite dikes and veins as well as associated phonolitic rocks. All zones include intervals of intense shearing interpreted to represent pre-existing structures, and these structures may represent the pathways by which the igneous rocks and the associated fluid phases, including those carrying REE mineralization, penetrated the country rocks (Figure 13.4)

13.2.4.3 Country Rocks

The country rocks include deformed gneisses and schists of the Paleoproterozoic Huab Metamorphic Complex. Regionally the area is characterized by large fold structures within which various amphibolite facies metasedimentary rocks occur. The large structures, which characterize the boundaries between these domains, were, in many places, invaded by the carbonatite dikes and the fluids that produced the alteration zones.

The host rocks identified in the drilling in Area 2B largely consist of various types of chlorite schist. These are interpreted as having a metasedimentary origin with a possible volcanogenic component. The rocks are generally fine grained, dull dark green in colour and generally foliated with a strong planar fabric. In proximity to the alteration zones, the rocks become more compact and are often characterized by irregular, generally straight edged, white calcite veins of short nature.



Plate 13.4 Intensely carbonate veined and brecciated massive chlorite schist.

These form a characteristic 'brecciated' appearing rock in outcrop (Plate 13.4). In direct proximity and within the zone itself the rocks are strongly altered and transformed to various shades of brown, associated with a strong infiltration of carbonate.

Together with the chlorite schists, and more commonly towards the western and deeper parts of the area, various quartz biotite gneisses, amphibole gneisses, quartz-rich muscovite gneisses and quartz feldspar gneisses as well as pegmatites are encountered.

13.2.4.4 Alteration

The characteristic lithology of the alteration zones in the drill holes is albitite. The albitite is light grey to pink, and commonly displays an intense, variably developed, brittle brecciation (crackle breccia). The brecciation ranges from slight cracking and infusion by brown carbonatite and iron oxide veinlets, to complete brecciation with angular fragments surrounded by a matrix of later albitite and/or carbonatite (Plate 13.5A). Green chlorite or phlogopite is locally present as networks of veinlets in the matrix (Plate 13.5B). The origin of the albitites is uncertain. They locally have the appearance of crystalline rocks and may be an intrusive phase. However, many rocks in the alteration zone appear to be partially altered to an albitic assemblage with the preservation of ghosts of original foliation, suggesting that at least some of the albitite may have formed by replacement of the country rock by an alkali-rich fluid phase.

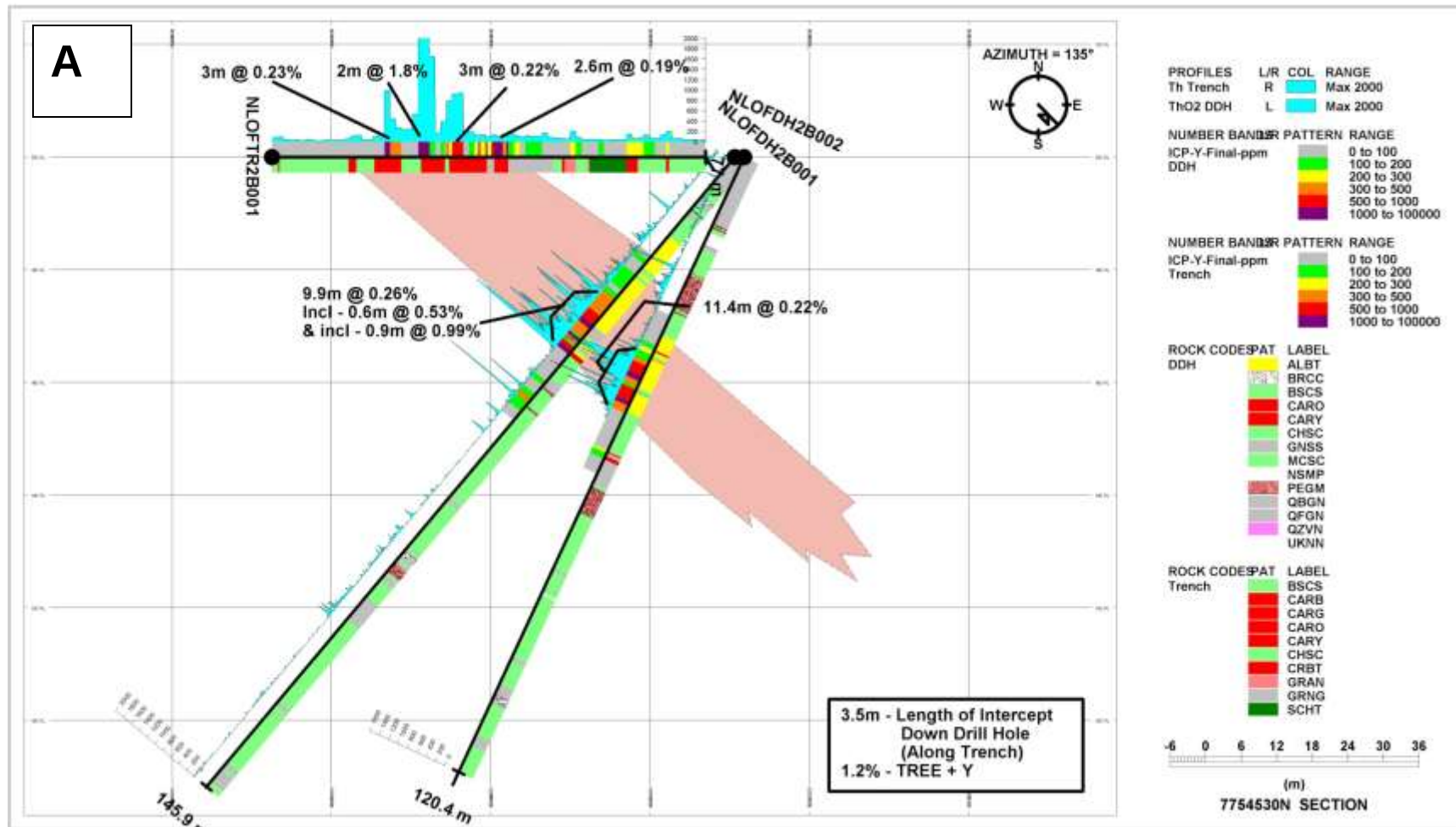


Figure 13.3 Drill sections under Trench NLOFTR2B001. Interpreted extent of alteration zone (brown shading) reflects the limits of alteration as mapped in drill core (see also figure 13.4). **A**, number bands show lithology (lower band) and ppm Y (upper). Rocktype legend key is in Appendix 3. Trench bar graph is total count radiometrics measured with a hand-held spectrometer. Radiometrics in drill holes measured by downhole spectrometer.

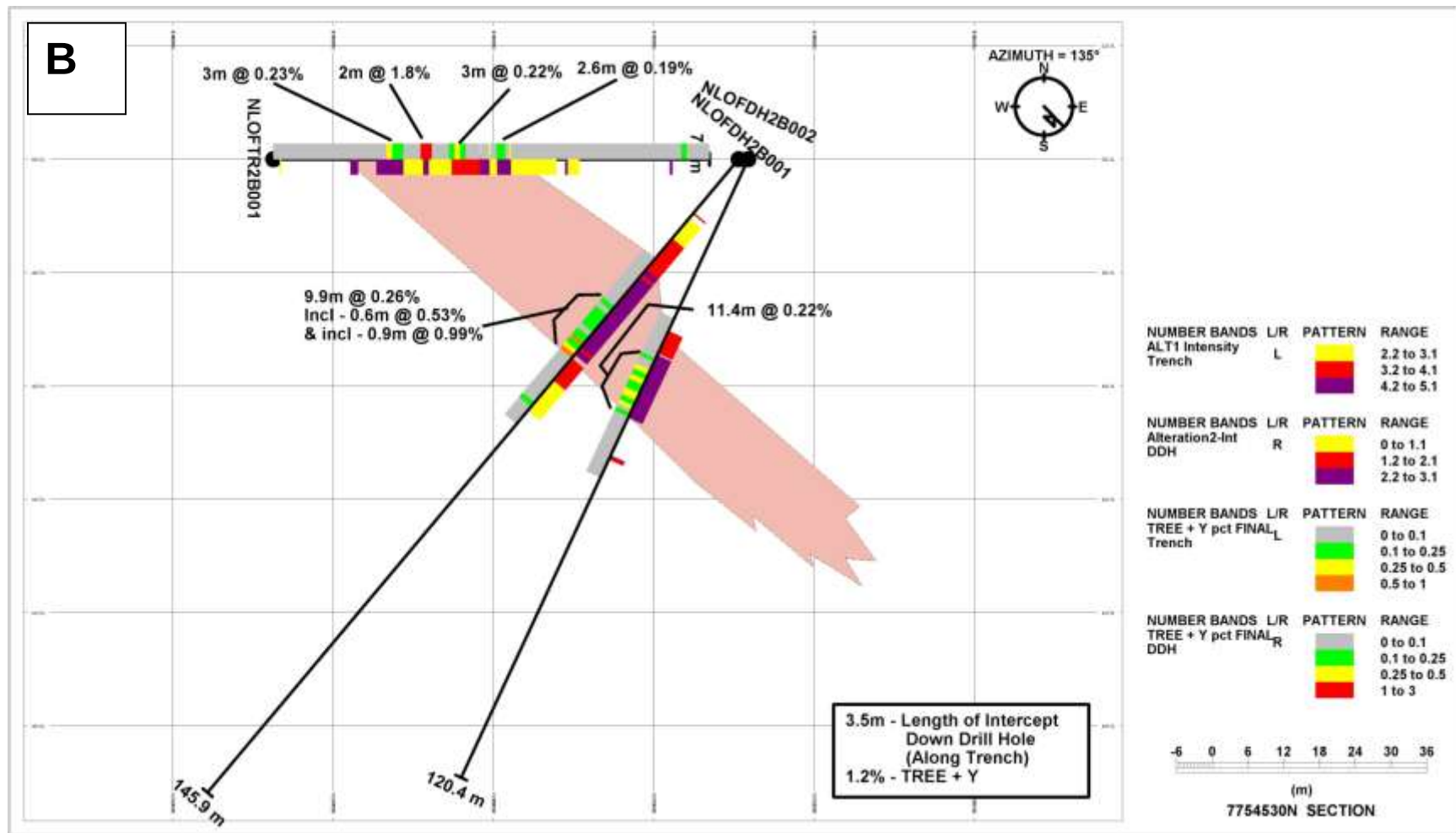


Figure 13.3 Drill sections under Trench NLOFTR2B001. Interpreted extent of alteration zone (brown shading) reflects the limits of alteration as mapped in drill core (see also figure 13.4); **B**, upper bar is TREE+Y, lower bar is alteration intensity on a scale of three (high to low, purple, red, yellow)

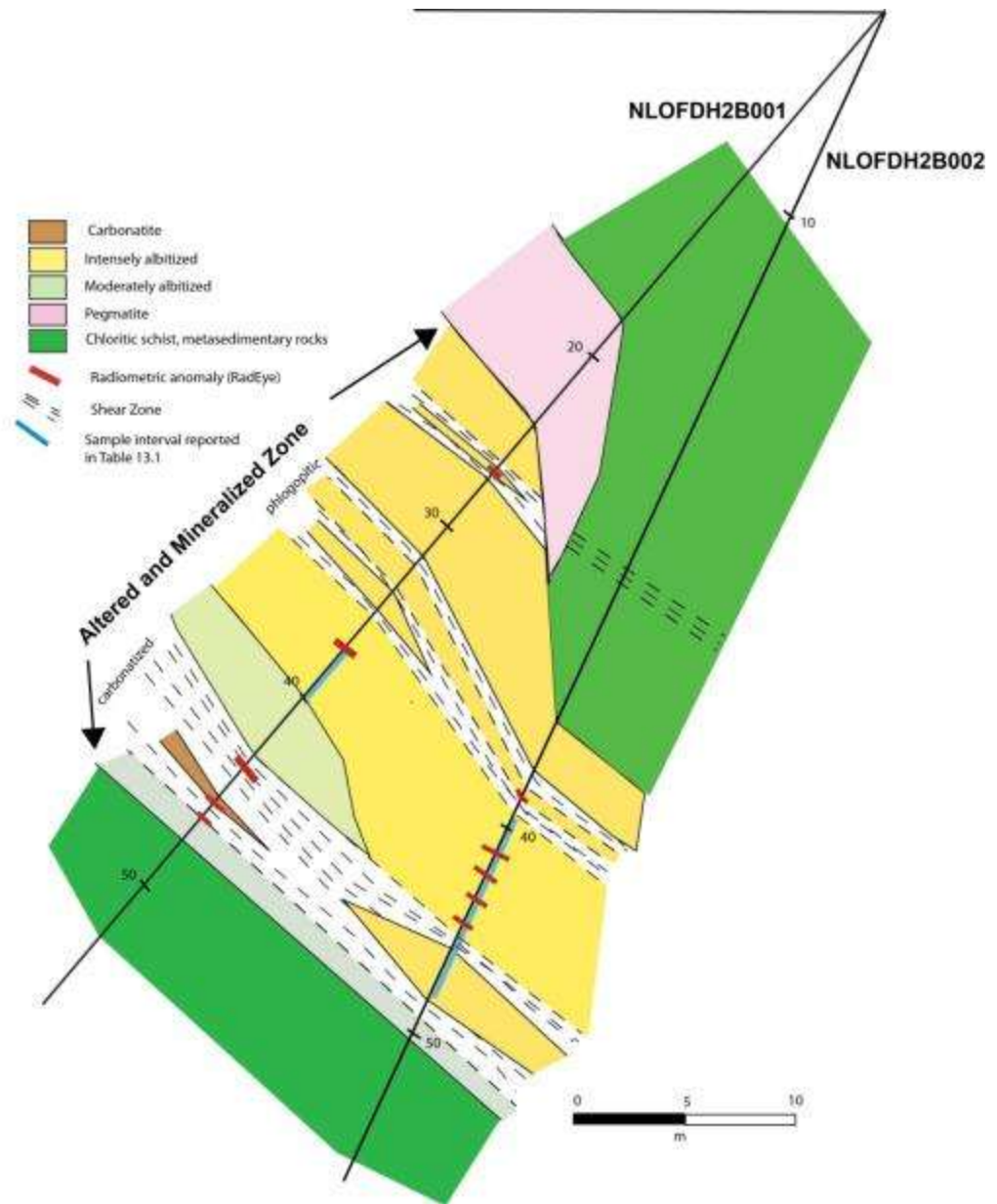


Figure 13.4 Interpretative schematic drill section of the Trench 1 section (drill holes NLOFDH001, 002) showing distribution of alteration facies, carbonatite and shear zones. Depth ticks in metres from surface.



Plate 13.5 A – white to grey massive albitite, fractured and veined by white calcite, and later by brown carbonate. B - shear zone infused with brown carbonate and green phlogopite. Core width is 5 cm.

Most alteration zones contain some carbonatite, although it is typically less abundant than is mapped at surface (Plate 13.6). The carbonatites are orange red to brown in colour, range from a few centimetres to about 2 m in thickness, and are most common near the footwall of the alteration zones. The rocks are fine to very fine grained, and often characterized by flow banding or streaming textures.

13.2.4.5 Structural Controls

Shearing is very common in the alteration zones (Plate 13.5B). In most sections, there is a prominent shear zone at or near the footwall, which is itself variably albitized and carbonatized. The shear zones range from centimetres to as much as 5 meters wide and the shear fabrics are cut by both albitite and carbonatite suggesting that they represent structures that pre-date the mineralization. There is a main footwall shear zone in most sections, which may be the controlling structure for much of the alteration and mineralization.

In terms of timing of events, the shear zones predate the hydrothermal alteration, but have clearly been reactivated during the alteration history of the zones as some alteration lithologies have been deformed. An early phase of carbonatization and albitization of the shear zones and the wall rocks, particularly in the hanging wall, was followed by intense albitization and complete replacement of large volumes of country rock with almost pure albite. This very brittle lithology was later fractured and infused with carbonate and iron oxide, and still later by potassium-rich fluids that formed phlogopite. Carbonatite dyking and veinlet formation appears to have occurred relatively late in the alteration history, followed by fracturing and mineralization by REE and Th-rich fluid phase which formed veinlets and breccia fill in the alteration zones.

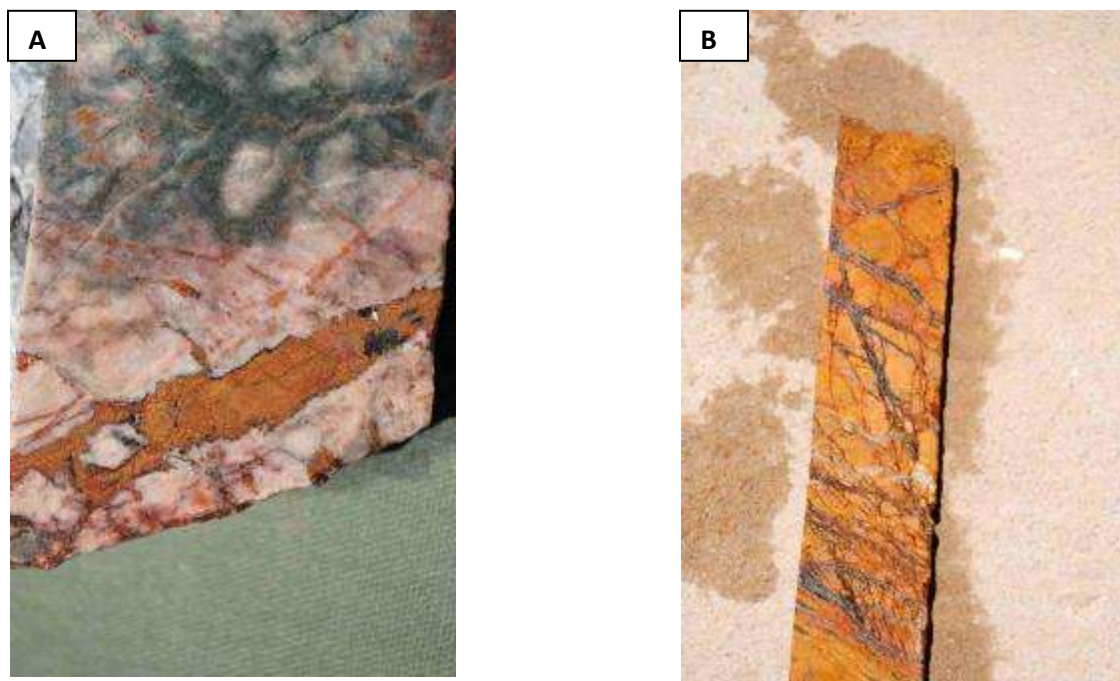


Plate 13.6 A – white to grey albitite with a vein of brown carbonatite; B – brown carbonatite cut by late calcitic veins. Core width is 5 cm.

13.2.4.6 Mineralization

Mineralization is associated with a variety of local features in the core. It is variably associated with brecciated albitite, carbonatite (where it typically occupies late fractures and vein networks) and phlogopitic hydrothermal alteration. The mineralization is typically associated with increased radioactivity in the downhole logs. Some typical zones of enhanced radioactivity and mineralization are illustrated in Plate 13.7.

The principal zone of alteration and mineralization appears from direct observation of contacts and foliation in drill core to be dipping towards the south at about 60°. However, correlation of the zone with surface exposures suggests that this dip may be variable and locally shallower. Overall dips of the zone indicated by correlating it from trenches to drill holes indicates that the alteration zones typically dip at between -50 and -60 degrees, but locally may be as shallow as -40 degrees. Whereas in outcrop the carbonatite dikes tend to pinch and swell, the alteration zone has been well documented to be continuous both laterally and with depth, and is generally between 22 m and 28 m wide.

REE mineralization in the drill holes was comparable to, but not as intensive over significant widths, as mineralization encountered in many of the trenches. In a number of holes, there were intersections of from 3 to 10 m with significant geochemically anomalous concentrations

of the REE (Figure 13.5; Appendix 2). Chondrite-normalized patterns show them to be similar in REE distribution to REE-enrichments in the trench samples – i.e. HREE-enriched (Figure 13.6). Detailed logging of the drill core indicates that in the 2B zone, REE mineralization as a geochemical anomaly is widespread, but the concentrations typically do not approach economic grades. The mineralization is interpreted to be late in the alteration sequence, based on the apparent localization of radioactivity and REE mineralization in late fracture veinlets, breccia fill, and alteration streams that cross cut both the albitite, the albitite crackle breccias and the carbonatites. REE mineralization is commonly, but not exclusively, associated with carbonatite and carbonatized host rock. There are a number of examples of REE-bearing veinlets in green phlogopitic alteration, and in albitite crackle breccia. Where present, the REE-bearing fractures are well-mineralized, and if areas are encountered where the density of late, REE-bearing alteration is sufficient, then economic grades over interesting rock volumes are possible.

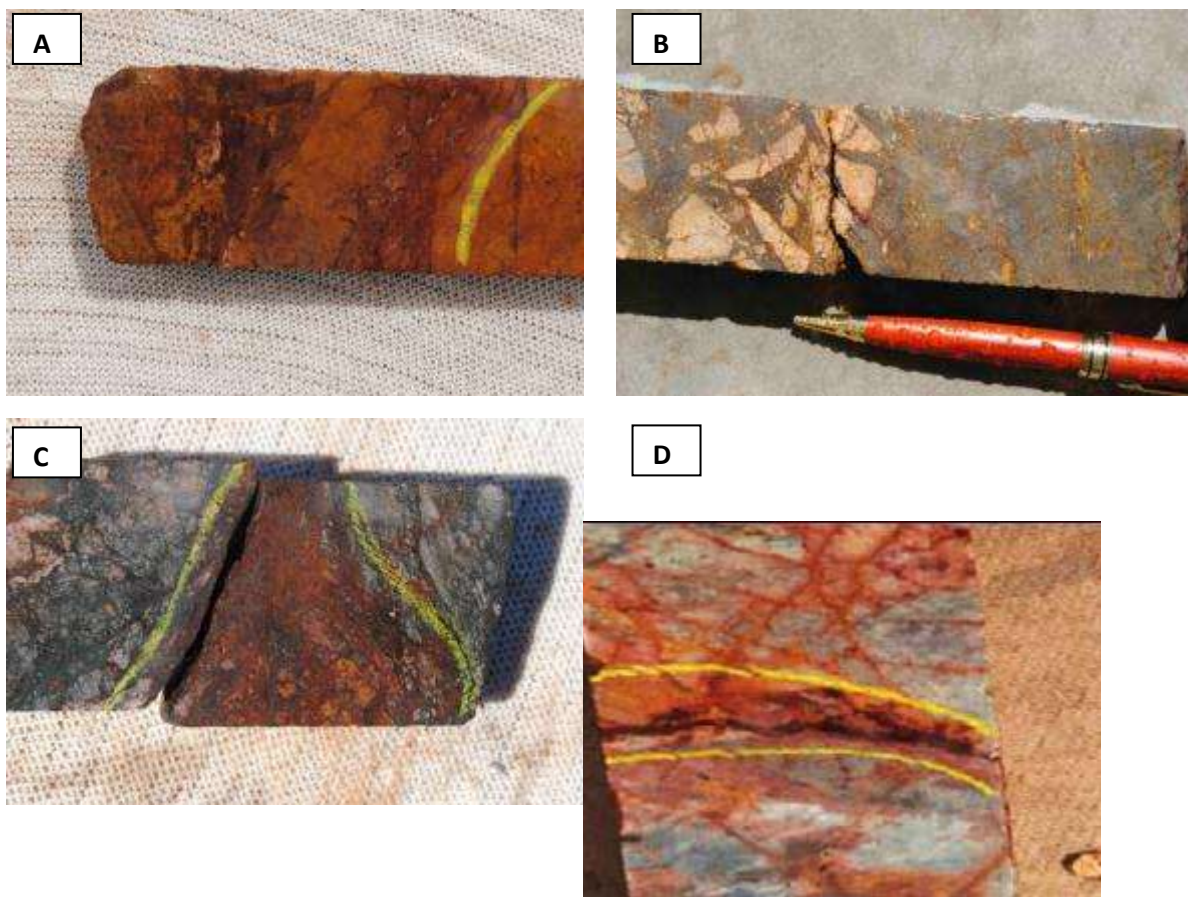


Plate 13.7 Mineralized zones in drill core: A – carbonatite that has been fractured and veined by fine grained assemblage of red iron oxides. Mineralization is in breccias to left of yellow line. B – mineralized phlogopite –

bearing alteration assemblage filling the interstices in an albitite crackle breccia; C – thin mineralized carbonatite dyke in an albitite crackle breccia; D – thin late mineralized veinlet in a carbonatized albitite breccia. Core is 5 cm wide.

13.2.4.7 Geophysical and Geochemical Signatures

The rocks were found to be variably magnetic with the highest susceptibilities recorded in the phonolite and carbonatite rocks. Magnetic susceptibility trends are weakly to moderately apparent from surface measurements although they may be more apparent in the downhole survey data. The radiometric signature, and specifically Th response, was particularly useful in both outlining the zone of alteration, and also to identify potentially high grade zones within the carbonatites.

Geochemical and radiometric information collected from the drill holes demonstrate that the geological, geochemical and radiometric anomaly represented by the alteration zones and identified in the trench mapping and sampling continues in the subsurface. The alteration zones remain open at depth on all drill sections. Clearly, the fluids that were responsible for the alteration were alkali-rich and carrying anomalous concentrations of REE when they ascended the structural zones. Although the hydrothermal system appears to have been anomalously enriched in the REE throughout its complex history, the greatest enrichment in Area 2B appears to have occurred relatively late in the history of the zone, when late fluids with significantly enhanced HREE contents mineralized late fractures in the already-altered rocks.

This scenario is supported by radiometric data. Observations in the trenches using both the RadEye PRD and the spectrometer demonstrated that the mineralized, carbonatized zones gave an anomalous radiometric response (Figure 13.3) and this was confirmed by the downhole radiometric surveys conducted after drilling was complete (Figure 13.3 and Appendix 3). Observations on the core using the RadEye and in the holes using downhole radiometric techniques, confirm that most of the alteration zone gives an anomalous radiometric response, and this is potentially an important exploration tool for targeting mineralization. Detailed examination of the drill core using the RadEye was successful in identifying specific zones up to 15 cm wide of significantly enhanced radioactivity in zones of fracture and breccia fill, veinlets, and phlogopitic alteration zones that represent late hydrothermal activity and are presently believed to also be the locus of the REE mineralization (Plate 13.7).

The geochemical signature of the alteration system in drill core is very similar to that seen in the trench samples (Figure 13.5) with significant enrichments in the REE, Y and Th and variable enrichments in Zr, Nb, Ba, U and MnO.

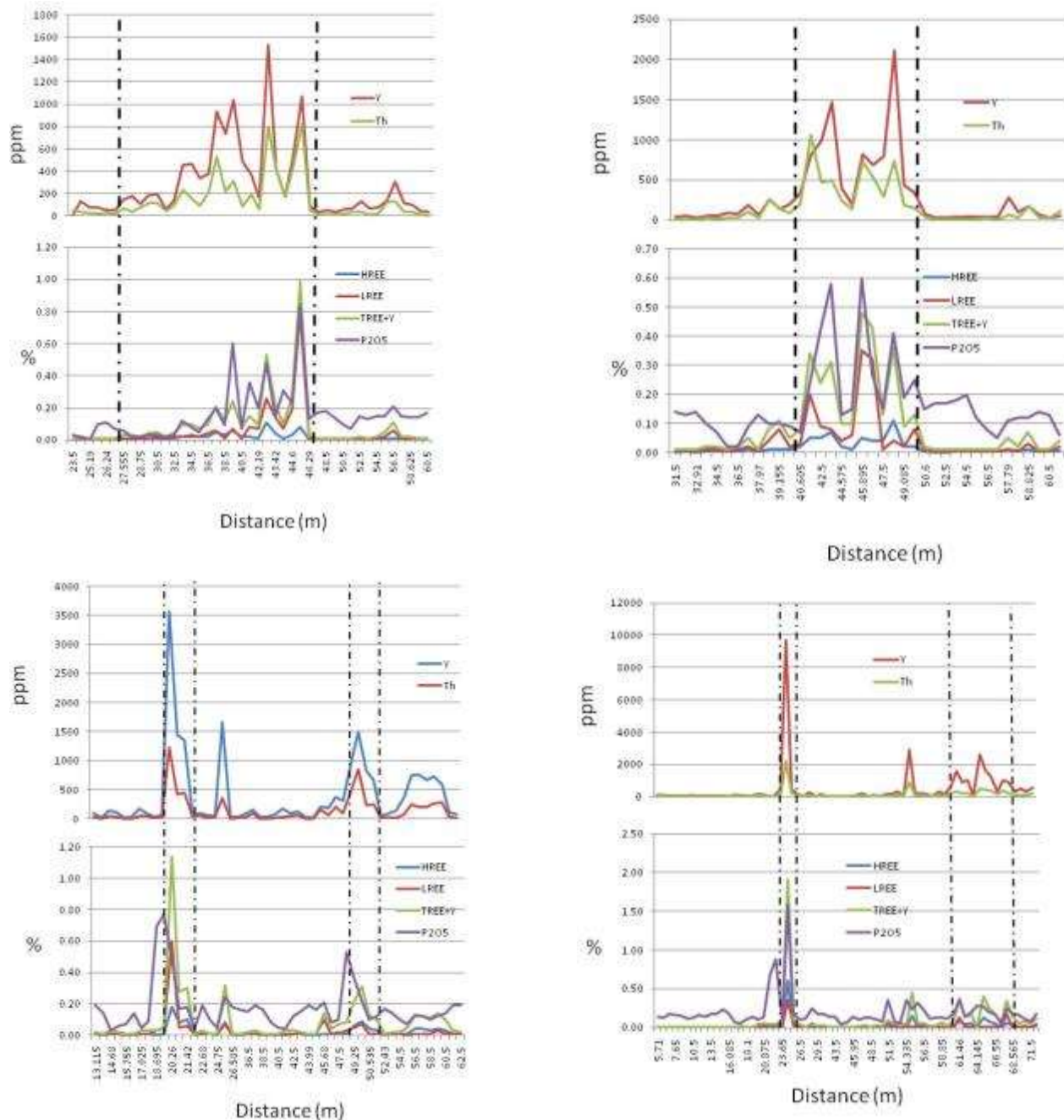


Figure 13.5 Geochemical signatures in the alteration zones in boreholes NLOFDH2B001 and 002 (upper left and right respectively) and NLOFDH2B005,006 (lower left, right respectively). A single zone was intersected in the former, while in the latter, the zone has bifurcated into two distinct zones. Geochemical signatures are similar to those identified in trench channel sampling and allow the zones to be readily traced between boreholes. Dashed lines encompass the geochemically-anomalous zones.

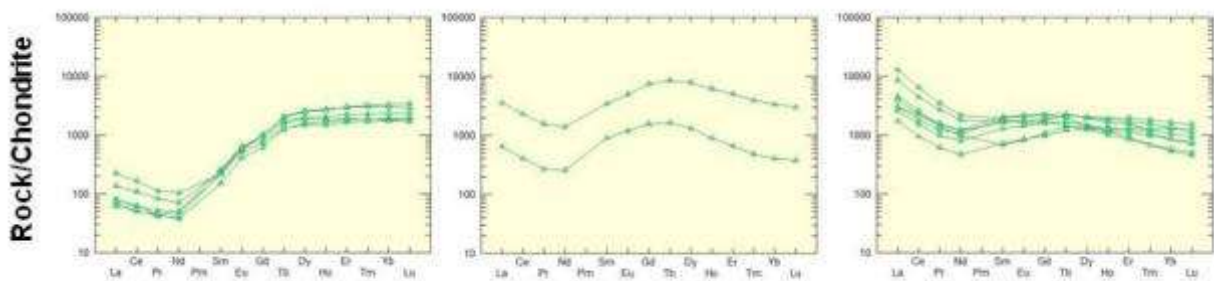


Figure 13.6 Chondrite normalized REE plots for the drill hole samples with Dy>300 ppm. All show significant relative enrichment in the HREE.

13.2.5 Summary

The results of the diamond drilling on the 2B Zone, coupled with the results of geological mapping and trenching, lead to several significant conclusions with regard to the nature of mineralization and the REE-potential of the Lofdal carbonatite complex:

- The 2B Zone represents a portion of a rare earth mineralizing system that is in part structurally controlled and has been clearly defined by geological mapping, trenching, diamond drilling and geophysics. The system is characterized by both hydrothermal and magmatic (intrusive) events, both of which exhibit tendencies towards enrichment in heavy rare earths. Significant concentrations of REE (>0.5% TREE+Y) to date are limited to relatively narrow (< 1 m), generally carbonatized, zones of veining, fracture fill and breccia fill related to late hydrothermal activity within a much broader (10-30 m) zone of albititic and carbonate alteration that is characterized by anomalous concentrations of HREE and Y;
- The alteration zones have a clear geochemical signature even in the absence of mineralization, characterised by enrichments in the REE (especially HREE), Y, and Th, and apparent variable enrichments in Zr, Nb, U and Ba. The association with Th gives the zones a good radiometric signature, and the combination of geological, geochemical and geophysical signatures provides a powerful toolbox for continued exploration of this complex;
- The alteration zones appear to be structurally-controlled, and most holes in the 2B zone have a large shear zone at or near the footwall of the alteration zone. Most of the alteration occurs in the structural hangingwall.

- The alteration zone is variably intense, and variably developed along the 2B zone. Intensity of albitization and carbonatization does not appear to be a reliable guide to REE mineralization;
- The 2B Zone contains a considerable volume of massive brown carbonatite in surface exposures, but considerably less in the subsurface. The zone contains an assemblage of igneous rocks, including phonolite and carbonatite, but is dominated by hydrothermal alteration assemblages, particularly white to grey albitite. Albitite is variably developed throughout the zone; in some areas the rocks have been incompletely replaced by an albitic assemblage, preserving remnants of the original textures. In others, the rock is completely replaced by almost pure albite. The albitites are typically brecciated and variably infused with red iron oxides and brown carbonate and are by far the dominant lithology in the alteration zones seen in drill core.
- Although much of the alteration sequence in the 2B Zone has been enriched in the REE, mineralization with significant grades appears to be relatively late in the sequence. The specific mineralized structures are believed to be late veinlets, fracture fill, and breccia fill, and appear to be related to late hydrothermal activity following the main episode of albitization, carbonatization and related hydrothermal alteration; This hydrothermal episode is characterized by HREE-enrichment, and products of this alteration episode would appear to be prime targets for exploration;
- Although economic concentrations of REE minerals have not been encountered in this first phase of drilling, the results are very encouraging. The system has been shown to carry rare earths, the REE assemblage has been shown to be HREE enriched, and there are interesting zones both within the 2B zone and several other similar zones on the property (e.g. Area 4 and Area 5) that may be associated with economic concentrations of rare earths.

The 2B Zone remains open along strike and should be further investigated down dip in the areas where the most anomalous concentrations of REE have been intersected to date.

Item 14: Sampling Methods and Approach

14.1 Regional Lithogeochemical Sampling

Regional lithogeochemical sampling was carried out in two campaigns between July and December, 2008, and between December, 2009 and February, 2010.

Samples were collected mainly from the carbonatite dykes along systematic traverses spaced at about 100 m. If the carbonatite outcrop had two or more recognizably different phases (differentiated mainly by colour), they were sampled separately. If a dyke could be followed along strike, more samples were collected up to 50 m in either direction, depending on outcrop. Two samples of about 1 kg were collected from the outcrop at each locality, one for analysis and one for archiving. Most samples included a mix of fresh and weathered rock. Sample locations were flagged with tape with the sample number written on it so that they could be revisited and GPS coordinates were recorded in the sample books.

Within parts of the Main and Emanyia intrusions, samples were taken at a considerably closer density along approximately 50 m spaced traverses and at intervals along these traverses ranging from 10 to about 50 m.

The two sampling campaigns resulted in 3497 samples being collected, mostly within an area of about 80 km². The grab samples are variably mineralized; with a significant number being well-mineralized (Table 11.1). Lithogeochemical sampling was biased towards relatively pure carbonatite as opposed to carbonate-altered country rock. Although carbonatite characteristics such as colour and alteration were recorded during sampling, there was no preferential bias towards particular types of carbonatite and with such a large number of samples selected more or less randomly by traversing, it is likely that the sample set constitutes a representative sampling of the carbonatites as a whole.

That being said, the sampling has shown that there is considerable variability of REE contents at outcrop scale and it is likely that in some outcrops, particularly those that have evidence of repeated structural disruption and hydrothermal alteration, that a sample taken in one locality might not be representative of the outcrop as a whole. The significance of any single analysis must be viewed in this context, and systematic chip or channel sampling of any outcrop with anomalous values will be required to determine if the tenor is potentially economic over the outcrop width.

It is the opinion of the lead author that this large regional lithogeochemical data has been collected in a professional and technically-sound manner and is likely to be representative of the carbonatites overall. Areas with a high proportion of anomalous HREE-enriched samples in any part of the complex, particularly when accompanied by significant widths of carbonatite

and/or carbonatization, present priority targets for further work. Representative analyses of more highly mineralized samples taken during the regional lithogeochemical program are presented in Table 11.1.

Future lithogeochemical sampling programs should consider:

- taking representative chip samples across an outcrop rather than a grab sample from just one location;
- sampling carbonate-altered rocks on the margins of or associated with carbonatite dykes as these may also carry REE values.

14.2 Outcrop Sampling in Areas 2 and 4

Detailed geological mapping and sampling of carbonatite dykes was carried out in Areas 2 and 4 as part of a detailed evaluation of these priority target areas (see Section 12.3).

In Area 2, mapping was carried out along systematic 100 m traverses. All carbonatite dykes greater than about 10 cm wide were sampled with a 1 kg grab sample and a second reference sample for archiving. Two or three different samples were taken from particularly wide dyke exposures. For dykes that could be followed in outcrop along strike, samples were similarly taken at about 20 m intervals along strike half way to the adjacent traverse lines.

In Area 4, coverage was via systematic traverses at 20 m spacing over the western half of the area. Sampling in the eastern half of the area was less intense, but is considered to have adequately outlined the mineralized zones. All carbonatite dykes greater than about 10 cm wide were sampled with a 1 kg grab sample and a second reference sample for archiving. Two or three different samples were taken from particularly wide dyke exposures.

Representative analyses of lithogeochemical grab samples from Area 4 are given in Table 12.3. It is the opinion of the lead author that the outcrop sampling in Areas 2 and 4 was carried out and documented in a professional and technically competent manner.

14.3 Trench Channel Sampling

Trenching has only been carried out in Area 2. The trenches were mapped by the project geologist who laid out sample intervals in the trench with aluminum marker tags. Two parallel cuts were then made in the outcrop in the centre of the trench bottom by a diamond saw wet with water. Channel samples were extracted from between the cuts with a hammer and chisel (Plate 14.1).

The geological mapping allowed the intervals of carbonatite and carbonate-altered rock to be identified and incorporated in the sampling strategy. The country rock in these trenches is dominantly mafic schist, which has been variably altered and infused with carbonatite veinlets. A characteristic of the mineralized zones is an elevated radiometric response that correlates with intensity of carbonatization and mineralization. Sampling was carried out at nominal 1 m intervals in all mineralized sections and in country rock intervals within mineralized sections. Sampling was extended at 1 m intervals at least 5 m beyond the margins of the mineralized zones, and if alteration seemed to continue, sampling continued as well.

The trenches were well cleaned and outcrop exposure was generally very good, suggesting that the sampling is substantially representative of the outcrop in the trenches. In some areas, however, thick calcrete has formed on top of the outcrop and could not be penetrated for sampling. In these cases, the calcrete was sampled and may not fully reflect the composition of bedrock beneath.

It is the opinion of the lead author that the sampling was carried out in a professional and technically competent manner.

Representative analytical results for mineralized samples are given in Appendix 1.



Plate 14.1 A - trench floor cut by diamond saw and ready for sampling. B - bagged samples in trench floor ready for collection

14.4 Diamond Drilling

14.4.1 Method and Approach

Sampling of the core was done at 1 m intervals, which were overridden by lithological breaks. Sample intervals were not less than 20 cm or greater than 150 cm. The generally uniform character of much of the alteration and mineralization dictated a consistent sampling interval; 1 m was chosen as optimal for efficiently identifying mineralized intervals while providing sufficient resolution to evaluate the width-distribution of mineralized sections. Sampling breaks were dictated by lithological breaks but breaks less than 20 cm were not sampled separately as assay intervals of such small width would have little significance in overall evaluation of the mineralization. Sampling was extended from 3 m above to 3 m below the carbonatite/hydrothermal alteration zone contacts in order to completely close off the mineralisation. Zones where erratic mineralisation was observed were carefully examined and sampled if necessary. All carbonatites, alkaline silicates and intensely carbonatised lithologies were systematically sampled.

Prior to cutting the core, sampling intervals and unique sample numbers were clearly marked above and below the orientation line drawn on the borehole core halves. The sampling intervals were entered on either side of the sample interval in blue paint marker on the lower half, and red paint marker on the upper half. Sample numbers were then clearly marked on each individual piece of core. The upper half of the core had sample numbers clearly marked with a red china-marker and the lower half of the core with a yellow china marker. This exercise was always done with the relative hardcopy of the special sampling sheet to avoid marking errors.

The core was then cut in half by means of a 2.2 mm diamond core cutting blade. Core was handled carefully during cutting and care was taken to ensure that the core was correctly orientated in the boxes after cutting with the aid of the down hole arrows.

The upper half of the core was then submitted for analysis and the lower half of the core retained in the core tray for future reference or additional test work. Gaps in the sample sequence were left for standards, blanks and lab duplicates in the course of the sampling process. Standards, blanks and duplicates were marked and given sample numbers as a separate process only after the main sampling process had been completed. This was done in order to avoid any possibility that sample numbers might inadvertently be swapped between samples and standards or blanks.

Each sample was given a unique, wet strength, sequential sample number tag and bagged in a 2 micron thick plastic sample bag with the sample number clearly marked on the bag in black paint marker. Two sample number tags were placed in each sample bag, one in the bag and the

other clearly visible on the outside of the bag. Bags were securely stapled closed and neatly and sequentially packed for dispatch. Borehole numbers and sampling intervals were entered on the sampling book stubs. It was crucial that there be no mistakes in sample numbering, so the responsible geologist performed the final check on the samples before the samples were packaged for dispatch to the laboratory.

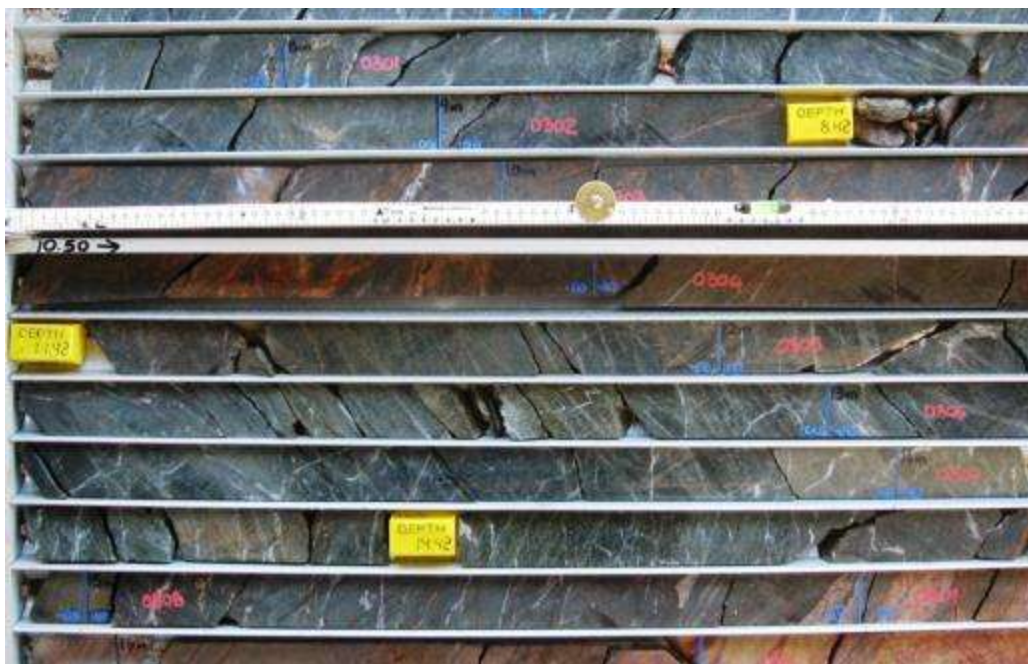


Plate 14.2 Example of logged and sampled borehole – NLOFDH2B006.

The half core retained in the core tray was clearly marked indicating metre marks (black), sampling intervals (blue) and sample numbers (red) (see Plate 14.2), and was then securely stored (see Plate 14.3). Drillers' breaks are recorded on yellow plastic blocks. All core boxes are clearly labelled and stored in a secure warehouse in Khorixas.

Samples were bagged in batches comprising fifteen samples, given a unique batch code and transported to Windhoek. Transport of the samples was completed by the client to the laboratory with no possibility of tampering occurring.

The samples were then prepared by Actlabs Namibia (PTY) Ltd. in Windhoek. The laboratory was instructed to mill the entire sample prior to removal of aliquots for analysis. Sample preparation and analytical instruction sheets were created in order to ensure clear instructions to the preparation and analytical laboratory.

A complete paper trail of instructions to the laboratory, delivery and reception of the samples at the laboratory was maintained (with signatures of the relevant persons involved at each stage).

All sampling and handling of the drill core was undertaken by GeoAfrica Prospecting Services and it is the opinion of the lead author that this work was carried out in a professional and competent manner.



Plate 14.3 Completed boreholes in the Khorixas storage facility.

Item 15: Sample Preparation, Analysis and Security

15.1 Regional lithogeochemical Samples

At the writing of this report, 3952 rocks samples had been collected during the regional sampling campaigns. 13 samples were lost prior to shipping, and 81 are still pending analysis. Analyses for 3764 rock samples have been completed.

15.1.1 Sample preparation

15.1.1.1 July 2008 – December 2008

The following procedures are set out as described by NRE (Pty) personnel who were part of the sampling program.

2308 samples were collected during this campaign. Samples were placed in plastic bags in the field along with a sample identification slip and sealed with staples. The sample number was written in indelible marker on the outside of the bag. After each day, samples were sorted and counted. Samples to be analyzed were packed in plastic containers and shipped by company trucks to the Windhoek office where samples were re-packed and accompanying papers were prepared.

The samples were sent to Analytical Laboratory Services (ALS) in Windhoek for preparation. ALS used a Keegor jaw crusher with 3 inch by 5 inch hardened steel plates and a Siebtechnik pulveriser with hardened steel bowls. Samples were crushed to 1 to 2 mm and a split of more than 100 g taken off with a riffle splitter. The split was pulverised, and divided into sample and duplicate. The sample was sent for analysis and the duplicate retained. At times of overload in the ALS facility, some samples were sent to to Namibia Custom Smelters in Tsumeb for preparation. The authors have no details of which or how many samples were sent to Tsumeb for preparation, or of the procedures in use at that laboratory

After crushing and pulverization, the pulps were returned to the Windhoek office of NRE (Pty) and shipped by DHL to ALS Chemex laboratories Vancouver for analysis. NRE (Pty) has maintained a complete inventory of archived pulps in Windhoek and Halifax.

During this campaign, there was no QA/QC protocol in place for samples, and no blanks, standards or duplicates were inserted as part of the sample preparation process. This shortcoming was recognized after the fact and in 2010, it was addressed through re-analysis of the 10% of samples with the highest REE contents with implementation of the company's QA/QC protocols, including insertion of the company's standards and blanks (see section

15.1.1.2). A total of 232 pulps from the original samples, plus 40 new QA/QC samples were sent for re-analysis to ALS-Chemex in Vancouver in May, 2010.

Comparison of the original and re-assay values for the samples show acceptable results. This is illustrated by the comparative plots of LREE and HREE+Y in Figure 15.1. Similar plots for the individual REE do not reveal any issues with the values. Analyses of standard samples STD1, STD2 and STD3 (STD3 also functioned as a blank) were inspected and generally fall within +/- 10% of the average value determined by the 4 referee laboratories although at least two of the blank samples were slightly elevated in the LREE, suggesting a precision issue with these elements at very low concentrations.

It is the opinion of the lead author that the re-assay of these samples demonstrates that the original assays which lacked proper QA/QC protocols can nonetheless be relied upon for the purposes of the analyses, i.e., to identify samples that are anomalously enriched in the REE, and to use this information for target selection and prioritization.

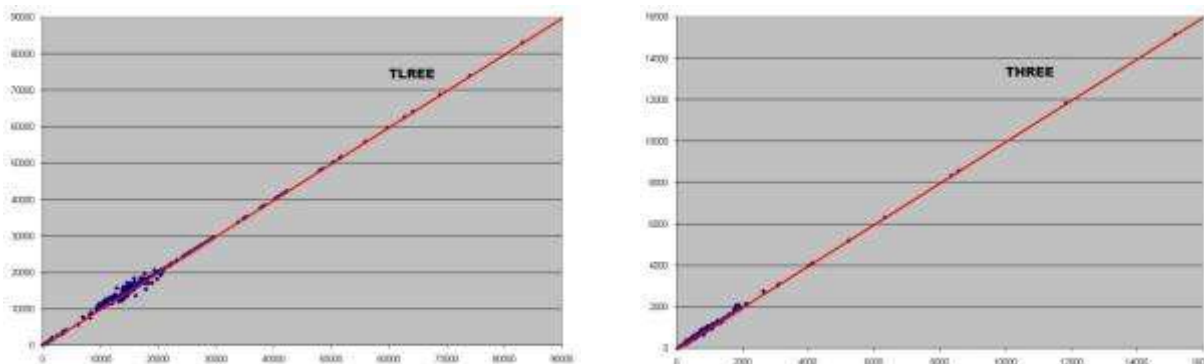


Figure 15.1 Comparison of original and re-assay values for LREE and HREE+Y for 232 samples from the 2008 sampling campaign. All values in ppm.

15.1.1.2 December 2009 – February, 2010

1469 samples were taken during the December 2009 to February 2010 campaign and subsequent regional sampling. The sampling procedure was modified from the earlier campaign. Samples were prepared for shipping directly in the Lofdal camp and packed in plastic containers closed with pull ties on the side. All accompanying papers were prepared in the camp. The samples were transported by company trucks to the Windhoek office and then by Cargo Logistics (courier) to the ALS Chemex laboratory in Johannesburg for sample preparation.

In the sample preparation lab, samples were fine-crushed to 70% at -2 mm or better (code CRU-31) and split using a riffle splitter. Splits were pulverized in low chrome steel mill to 85% passing 75 micron or better (code PUL-31)..

For this sampling campaign, a QA/QC protocol was implemented employing 1 duplicate, 1 standard and one blank inserted for every 40 samples and managed by sample numbers as follows:

- **Duplicate** on sample PREFIX0020, a **Standard** on sample PREFIX0039, and **Blank** on sample PREFIX0040
- **Duplicate** on sample PREFIX0060 a **Standard** on sample PREFIX0079, and a **Blank** on sample PREFIX0080
- **Duplicate** on sample PREFIX0100 a **Standard** on sample PREFIX00129, and a **Blank** on sample PREFIX0120

Duplicate and blank samples were inserted from the start. Standard samples (STD1) were inserted beginning at sample NLOFR0927 after late January when 3 rounds of referee analyses on the samples had been completed (see Appendix 4). During this program, it was observed that lithological/geochemical differences at outcrop scale were compromising the quality of duplicates and the duplicate procedure was changed. Sample sites that were pre-designated in the QA/QC protocol as a FIELD DUP site were sampled with a 2 Kg sample which was placed in one sample bag with a sample tag. A second bag with the next logical sample number was marked and a tag inserted but left empty. The prep lab was instructed to crush the sample, riffle split it as per usual for coarse rejects, then riffle split the un-rejected fraction again to create the laboratory duplicate. The paired sample bags were then filled with each part of the sample from the second split and the prep lab created the pulps from the now separated duplicate sample pairs.

15.1.2 Analysis

The pulverised samples were shipped by air to the ALS Chemex analytical facility in North Vancouver, Canada for analysis. A 30 to 50 gram pulp split of each sample was analysed for quantitative REE and trace element abundances by lithium metaborate fusion followed by acid digestion and ICP-MS finish. Trace elements were acquired with trace element package ME-MS81 and overlimit samples were reanalysed to higher resolution levels using trace element package ME-MS81h. A subset of samples was also analysed for major elements and loss on ignition (LOI). Major elements were determined by lithium metaborate fusion, acid dissolution and ICP-MS finish using analytical package ME-ICP06. LOI was determined by heating to 1010 C

for one hour, with the weight loss reflecting species lost at this temperature and for this time period.

The ALS Chemex laboratories are registered to ISO 9001:2008 for their quality management system for the provision of assay and geochemical analytical services. The laboratory has received ISO 17025 accreditations for specific laboratory procedures but this accreditation does not include the analysis of REE by ICP-MS.

15.1.3 Quality control

The purpose of a quality control and quality assurance program is to monitor the precision of the analytical results independently from the laboratory and to identify sample batches that might be significantly contaminated or otherwise compromised. It is the lead author's opinion that the QA/QC protocol established and implemented by NRE (Pty) for the lithogeochemical sampling program validate the analytical results reported herein.

15.1.3.1 Standards

NRE (Pty) commenced inserting samples of an internal standard (STD1) with approximately 2.1% TREE+Y in late January, 2010 to test the accuracy of the laboratory analyses. The preferred values for the standard were determined by analysis at three laboratories (ALS Chemex, SGS, Intertek) in early 2010, and by a fourth referee laboratory, Activation Laboratories, in late 2010. Referee analyses of the standards are in Appendix 4.

Three standards were eventually placed into use, obtained from outcrops in the Lofdal area. STD1 was a HREE-rich standard, STD2 a LREE-rich standard, and STD3 contained only minor amounts of all REE and functioned as a blank. Commercially-available REE standards are difficult to obtain and it is accepted practice for REE companies to develop internal standards. ERN NRE (Pty) sourced rock samples of appropriate composition based on previous analytical results. The samples were crushed in a jaw crusher using hardened steel plates and pulverized using hardened chrome steel bowls in a commercial preparation laboratory in Okahandja. The samples were homogenized and 50 g splits were placed in individual zip lock bags.

During the regional lithogeochemical sampling program, the standards were analysed 21 times, 15 with the normal submission of samples, and 6 times during the re-assay of samples from the 2008 campaign. Results for REE and Y are given in Appendix 7. Samples that are >15% different from the preferred values are highlighted. Gd and Y, in particular, are systematically lower than

the average referee analyses by more than 10% and this leads to a 10 to 15% underestimation particularly of TREE+Y.

This is not a critical problem for the practical purposes to which these samples are being put. The aim of the grab sampling is to identify areas where increased REE (and particularly HREE) concentrations are found and can be targeted for follow up. A systematic slight underestimation of the absolute concentrations does not impair the ability to make this sort of interpretation.

15.1.3.2 Duplicates

Field duplicates and later laboratory duplicates were inserted by NRE (Pty) as described in Section 15.1.1.2 to monitor sampling, sample preparation and analytical precision.

Plots of the duplicate analyses are given in Appendix 5. As recognized by NRE (Pty) staff, there is some scatter in the duplicate data from early samples and much of this variability may result from sample inhomogeneity. Later analyses using laboratory duplicates from the same homogenized sample are more consistent. It is the author's opinion that the analyses can be relied upon for the purposes to which they are being put – i.e. to identify areas of anomalous REE concentration for follow up.

15.1.3.3 Blanks

For the regional sampling, a blank was sourced from a marble quarry near Karibib. It was analysed 67 times during the 2009-2010 sampling campaign and the re-analysis of the 2008 samples. Results are shown in Table 15.2 and Figure 15.2.

Two samples (2.9% of total) show clear evidence of contamination through elevated levels of almost all REE. In most other samples, the overall analyses are within range of the detection limits and do not suggest a concern with the regional lithogeochemical analyses, again considering the use to which they are being put.

Table 15.2 Summary of blank analyses for the regional sampling program (67 analyses). All values in ppm.

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Mean	1.76	2.93	0.30	1.03	0.28	0.11	0.37	0.07	0.40	0.08	0.21	0.03	0.18	0.03	2.13	1.18
StDev	4.36	7.21	0.72	2.58	0.76	0.35	1.02	0.21	1.31	0.28	0.75	0.11	0.71	0.11	6.53	1.75
Max	33.20	52.20	4.59	17.00	6.05	2.81	8.05	1.72	10.60	2.26	6.16	0.86	5.86	0.94	52.60	9.92
Min	0.25	0.25	0.02	0.05	0.02	0.02	0.03	0.01	0.03	0.01	0.02	0.01	0.02	0.01	0.25	0.03

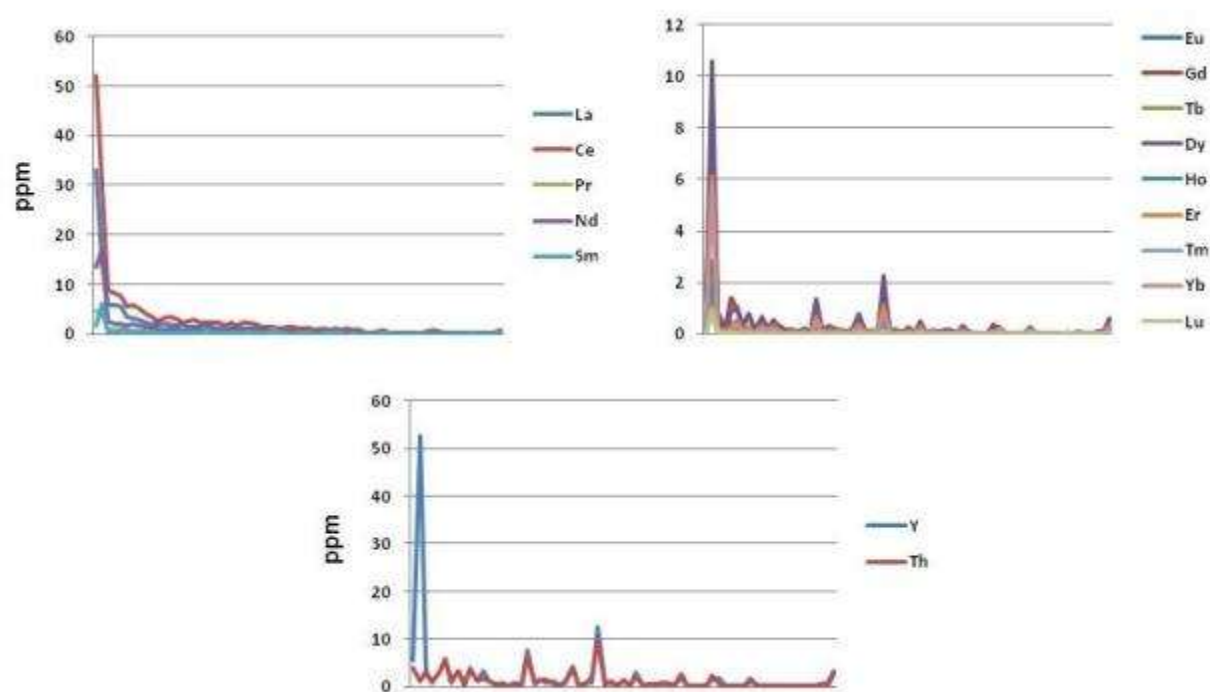


Figure 15.2 Summary of blank analyses for regional lithogeochemical samples. 2 samples have very high values suggesting either contamination or mix-up of samples. All others are within acceptable limits.

15.2 Samples Collected during 2010 detailed geological program (including trenches)

The entire detailed geological mapping and trenching program was managed and carried out under contract by Remote Exploration Services of Cape Town, South Africa.

During detailed geological mapping in Area 2 an additional 36 lithogeochemical grab samples were taken from carbonatite dykes and related rocks. During detailed mapping in Area 4, 287 lithogeochemical grab samples were taken.

Trenches in Area 2 were channel sampled and 1707 samples were taken of which 1104 were from Area 2B. Results from samples collected from trenches in Areas 2A, 2C, and 2D were not available at the time of writing.

15.2.1 Sample preparation

All samples were placed in a plastic bag at the point of sampling with a paper tag with the sample number. The bag was folded over and sealed with staples. A second paper tag with the sample number was stapled to the folded part of the bag.

An aluminum tag was then etched with the sample number and placed in a second bag along with the stapled sample bag. The outer bag was then sealed with a plastic zip lock (Plate 15.1A).

The sample was recorded in the sample book and a GPS waypoint taken in the centre of the sample interval.



Plate 15.1 A - samples double bagged and tagged in camp prior to shipping. B – lay out area for samples. Rice bags filled with samples on left under the tree, individual samples layed out in sequence on right.

At the end of each day, all bagged samples were inspected in the Lofdal camp and compared to sample book records to ensure that all were accounted for. They were then laid out in sequential order with standards and blanks inserted (Plate 15.1B) according to the QA/QC protocol (see Section 15.1.1.2).

Samples were double bagged in large plastic bags. First, the sample numbers to be included in the bag were written in indelible marker on the outside of a woven rice bag, which had been placed over a heavy plastic bag. Samples corresponding to the numbers on the bag were then placed in the inner plastic bag, ensuring that each sample was present. Grab samples were sent in bags with 20 samples. Trench samples were larger and were sent 10 to a bag. When the samples designated for a bag had been selected and placed in the inner plastic bags, the inner plastic bag was ziplocked, and then the outer bag ziplocked over top of it.

Samples were transported to the Actlabs sample preparation lab in Windhoek by employees of Stern Link Ltd., contracted by NRE (Pty). NRE (Pty) personnel did not directly participate in any

of the sampling or sample transportation to the laboratory. Persons transporting the samples to Windhoek accepted custody of the samples in writing.

Samples were prepared for analyses at the ActLabs sample preparation facility in Windhoek. Upon delivery, an ActLabs representative inspected and verified receipt in writing.

The samples were prepared using sample prep package RX1 in which samples are crushed to 95% passing 2 mm and pulverised to 95% passing 105 microns. When the samples arrived at the lab, they were laid out and samples checked against the included sample list to verify that all samples were present and correctly numbered. An internal sample tracking sheet was then prepared to track progress of the samples through the lab.

The Windhoek lab had one sample preparation line when the first samples were delivered. This was expanded to two lines shortly after, each with a terminator jaw crusher and pulveriser with hardened steel bowls.

Samples were crushed in a jaw crusher set to pass material between 1 mm and 2 mm. The entire sample was crushed, not split, placed in numbered sample bags, and put in line for the pulveriser. The pulveriser bowls were determined to be optimized for homogenization of samples at about 1 kg. Any samples in excess of 1 kg were pulverised in batches and then returned to sample bags. Samples were homogenized in a stainless steel riffle splitter and a 15 g sample and duplicate were drawn from the splitter after homogenisation for analysis.

The splits were placed in Ziploc bags and readied for shipping to lab in Canada. The duplicate pulps are stored at the ActLabs facility in Windhoek.

15.2.2 Analysis

Pulp samples were shipped by air to the Activation Labs analytical facility in Ancaster, Ontario, Canada, where they were analysed for major element oxides, rare earth elements and other trace elements. The analytical package used was Code 8, REE Assay Package which uses a lithium metaborate fusion, multi acid digestion, and ICP-OES finish for major element oxides, Sc, Be, V, m Sr, Y, and Zr, and ICP-MS finish for other trace elements including the REE. For samples with >0.3% P_2O_5 , Nb_2O_5 and ZrO_2 was determined by fusion XRF. The REE are among the most difficult elements to analyze properly under a wide range of concentrations and to a high degree of analytical precision. The lithium metaborate fusion and ICP-MS finish is the current industry standard for high quality REE analyses and it also provides state of the art analyses of a number of other elements that are important indicator minerals in REE deposits (e.g., Zr, Nb, Hf).

Actlabs' Quality System is accredited to international quality standards through the International Organization for Standardization /International Electrotechnical Commission (ISO/IEC) 17025 (ISO/IEC 17025 includes ISO 9001 and ISO 9002 specifications) with CAN-P-1758 (Forensics), CAN-P-1579 (Mineral Analysis) and CAN-P-1585 (Environmental) for specific registered tests by the SCC.

15.2.3 Quality Control

15.2.3.1 Duplicates and Standards

One laboratory duplicate was inserted in every 40 samples according to NRE (Pty) QA/QC protocols (see Section 15.1.1.2). One standard was likewise inserted in every 40 samples. Two in-house standards were supplied by NRE (Pty) (STD1 and STD2). These have undergone 'round robin' analyses at 4 independent laboratories (Appendix 4), but are not certified.

Results of duplicate analyses conducted during trench and drill core sample analyses are presented in Appendix 6. In general, duplicate analyses are within acceptable limits and do not indicate any systematic concerns with respect to analytical quality.

Results of standard analyses are given in Appendix 7. STD1 was analysed 42 times during these analyses. There is no systematic deviation from the accepted values although approximately 5% of the analyses deviate from the accepted 4-laboratory average by more than 10%. STD 2 was analysed 50 times during analysis of trench samples. The analyses for Pr, Gd., Tb and Lu are generally more than 10% deviant from the accepted averages (almost always lower). With the exception of these four elements, less than 5% of other analyses deviate more than 10% from the accepted average. Inspection of the referee analyses for STD2 shows that there was significant discrepancy among the labs for these elements with resulting large standard deviations and it is the opinion of the lead author that the refereed average is not within acceptable limits for this material to be used as a standard. It is recommended that the company discontinue use of this standard and seek a high-REE standard for which a round robin analysis provides a better preferred value.

15.2.3.2 Blanks

Blank analyses are in Appendix 8 and summarized in Figure 15.3.

During analysis of the first batch of samples from the channel sampling of trenches, the in-house blank STD-3 was used to monitor for contamination. This blank was analysed 7 times and all analyses are within tolerances for very low concentrations of REE, Y and Th. They do not indicate any issues with regard to sample preparation or analysis.

The blank used to evaluate analyses of the trench samples following the first batch were dolomite rock sourced and provided by ActLabs in Windhoek. The blank was analysed 63 times during this analytical campaign.

Repeated analyses show that this material is an acceptable blank for REE analyses with all REE as well as Y and Th present in concentrations near their detection limits. There are no anomalies in the analyses that suggest anything more than normal difficulties of analysing these elements at very low concentrations and the blank analyses are interpreted to indicate that there was no contamination or systematic analytical issues during analysis of these samples.

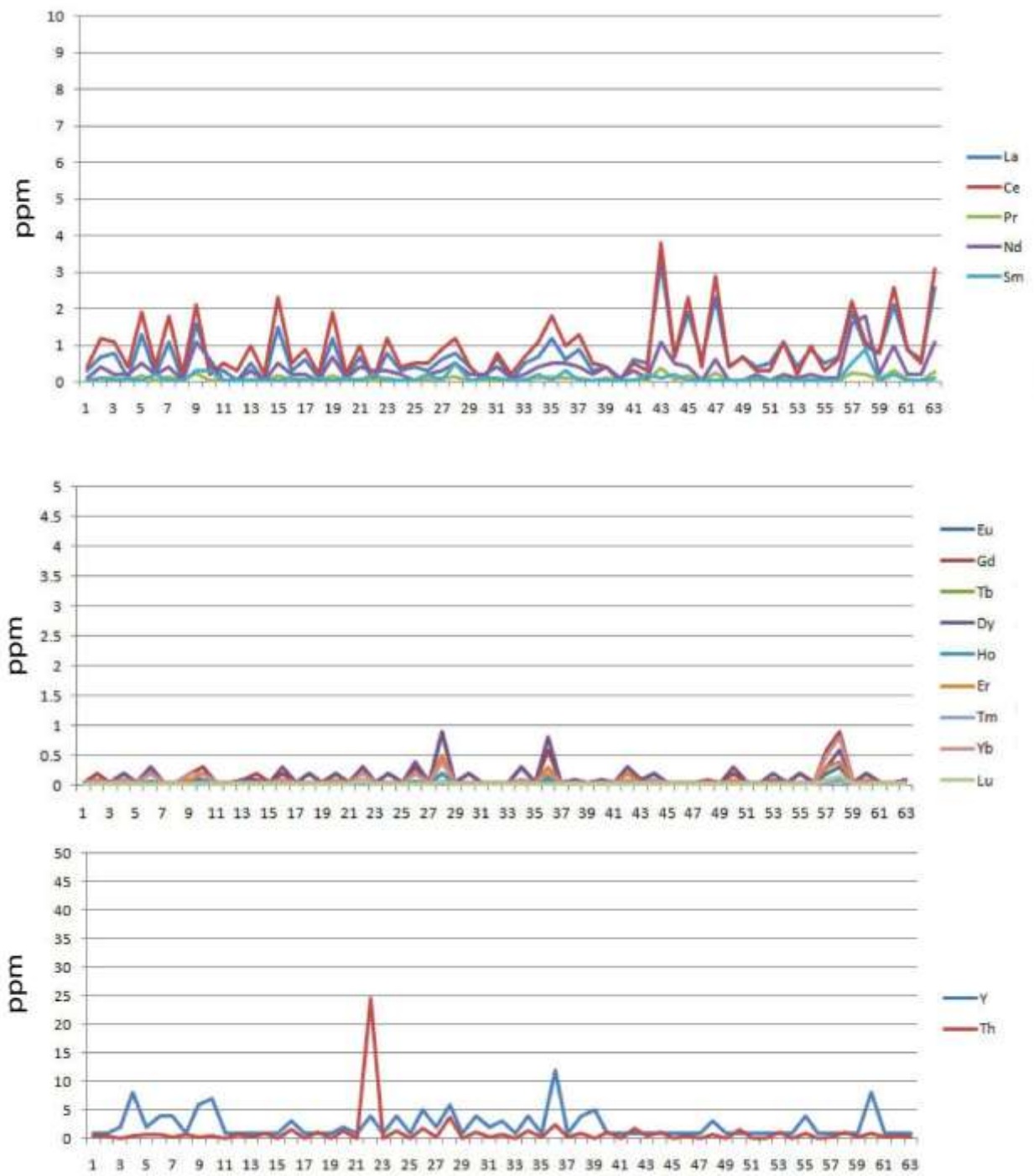


Figure 15.3 Analyses of blank material as part of the analytical process for trench channel samples. Individual samples are plotted on the horizontal axis, with sequential numbers for ease of display.

15.3 Diamond Drill Core Analyses

All aspects of the diamond drill program were carried out according to protocols developed for NRE (Pty) by GeoAfrica Prospecting Services Ltd.

15.3.1 Sample collection

The core was cut in half by means of a 2.2 mm diamond core cutting blade. Care was taken to ensure that the core was correctly orientated in the boxes after cutting with the aid of the down hole arrows. The upper half of the core was then submitted for analysis and the lower half of the core retained in the core tray for future reference or additional test work.

Each sample was given a unique, wet strength, sequential sample number tag and bagged in a 2 micron thick plastic sample bag.

Two sample number tags were placed in each sample bag, one in the bag and the other clearly visible on the outside of the bag. Bags were securely stapled closed and neatly and sequentially packed ready for dispatch. Borehole number and sampling intervals were entered on the sampling book stub.

15.3.2 Analysis

All samples were analyzed by ActLabs, based in Canada, with the sample preparation at the ActLabs laboratory in Windhoek. Details of sample preparation and analytical methods were the same as for the trench samples and are given in Section 15.2.1 and 15.2.2.

15.3.3 Quality control

The QA/QC analysis was done on a batch by batch basis by NRE (Pty). Approximately 5 % of the pulps will be submitted to an independent laboratory for additional QA/QC controls.

15.3.3.1 Duplicates and Standards

One laboratory duplicate was inserted in every 40 samples according to NRE (Pty) QA/QC protocols (see Section 15.1.1.2). One standard was likewise inserted in every 40 samples. Two in-house standards were supplied by NRE (Pty) (STD1 and STD2). As previously noted, these have undergone 'round robin' analyses at 4 independent laboratories, but are not certified. Two additional standards were inserted for the diamond drill hole protocol, SARM 1, a sample

of Bushveld Granite, which is a standard for REEs certified by the South African Bureau of Standards (but lacking certification for Pr, Ho, Er, Tm and Yb), and AMIS 185, a certified standard for rare earth elements comprised of material from the Wigu Carbonatite Complex in Tanzania.

Results of duplicate analyses conducted during trench and drill core sample analyses are presented in Appendix 6. In general, duplicate analyses are within acceptable limits and do not indicate any systematic concerns with respect to analytical quality.

In-house standards STD1 and STD2 were analysed 6 times and 4 times respectively during the drill core analyses. STD1 analyses are generally within 10% of the accepted value (with the exception of two Th analyses). STD2 analyses show problems with Gd, Tb and Lu similar to those identified for the trench samples (see Section 15.2.3.1). As previously noted, it is the author's opinion that this reflects a problem with the standard itself rather than with the laboratory analyses.

SARM1 was analysed 8 times during the drilling campaign. Five of the Tb analyses are below the certified value by more than 10% but at such a low absolute concentration (3 ppm), this is not unexpected. Likewise, analyses of AMIS185 gave good results within tolerances for the very abundant LREE and the more abundant HREE (Eu and Gd), but was less successful in the HREE Tb to Lu where most samples were more than 10% lower than the expected value. Neither of these standards contains the levels of HREE that would provide a good measure of the quality of HREE analyses in mineralized rocks from Lofdal and it is recommended that their use be discontinued and that the company either locate or develop a HREE-specific standard.

15.3.3.2 Blanks

Blanks were sourced from Magaliesberg quartzite and comprise 98.9% SiO₂. The blank was analysed 29 times during analysis of drill core samples and the results are summarized in Figure 15.4.

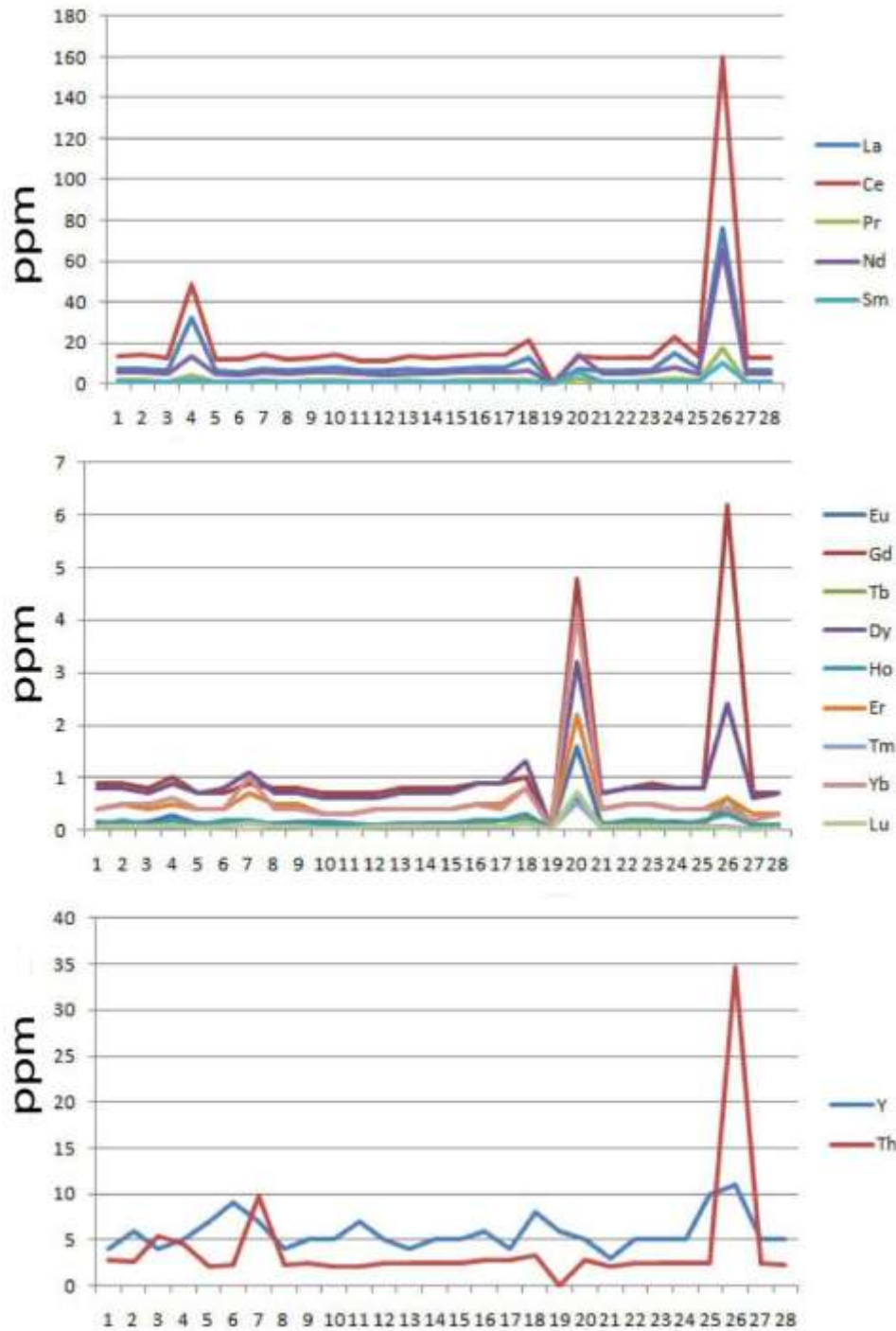


Figure 15.4 Analyses of blank material as part of the analytical process for diamond drill core samples. Individual samples are plotted on the horizontal axis, with sequential numbers for ease of display.

As a general comment, levels of the LREE in this material are on the order of 6 to 8 ppm for La and 13 to 14 ppm for Ce with proportionately high concentrations for the other LREE. These are not ideal for a blank, which should have concentrations of these elements near detection limits. It is recommended that this material not be used as a REE blank in future drill sample analyses.

Blank analyses are generally acceptable and with four exceptions do not suggest systematic problems with sample contamination during preparation or analysis. The four exceptions are:

1. The sample labelled “4” has anomalously high LREE, but normal HREE and Y-Th;
2. The sample labelled “19” has anomalously low concentrations of all elements and does not appear to be an analysis of the Magaliesberg quartzite;
3. The sample labelled “20” has anomalously high HREE, but normal LREE and Y-Th;
4. The sample labelled “26” has anomalously high concentrations of all elements and either reflects a contamination event during sample preparation and analysis or a mis-labelled sample.

Problems 1, 3 and 4 may indicate anomalies during the sample analytical process and samples affected by these blanks should be re-analysed according to company QA/QC protocols.

Item 16: Data Verification

16.1 2008 to 2010 Regional Lithogeochemical data

All of the regional lithogeochemical analyses were carried out by ALS Chemex Laboratories in North Vancouver. The author has reviewed the analytical procedures and laboratory procedures, and a random selection of laboratory standards, blanks and duplicates to ensure that the analyses meet the laboratory's quality standards. Results of company-introduced blanks, standards and duplicates are presented elsewhere in this report. Although most are within acceptable tolerances, a few of these analyses lie outside reasonable tolerances. No re-analysis of samples or batches was carried out as a result of this and it is possible that some samples in batches with problem analyses of blanks, duplicates or standards may be outside analytical tolerances as a result of issues related to sample preparation or laboratory procedures. There is no evidence that this is a widespread problem and the author does not believe that there are any systematic laboratory concerns regarding the data quality.

Approximately 100 of the samples were selected randomly by the author and an element-by-element comparison was conducted between the original certificate of analysis and the company database. No discrepancies were found between the certificates and the database. A random selection of approximately 20 samples with overlimit analyses were selected for element-by-element comparison with the database and in each case, there were no discrepancies. Standard geochemical diagrams including element-element X-Y plots and spider diagrams for the rare earths were generated for substantial portions of the data set and examined for outliers and anomalies. Samples with highly anomalous geochemical characteristics (a very small subset of the data) are easily identified and, when necessary, have been excluded from further participation in interpretation. The data appear to be generally internally consistent and analysis of the geochemical patterns has not lead to systematic concerns regarding the data quality.

More than 100 of the sample sites have been revisited on the ground, the sample flags verified where still legible, and the location verified by GPS. The recording of sample locations appears to be accurate.

Based on operating results, data examination and manipulation, historical descriptions, and first hand accounts of geologists involved in the sampling programs, it is the lead author's opinion that the sampling, sample preparation, assaying, and security of samples during these campaigns were conducted in an industry acceptable manner, and that the data can be relied upon for the purposes to which they are being put – i.e. identification and prioritization of REE exploration targets in the Lofdal area.

16.2 Trenching and Lithogeochemical sampling in Areas 2 and 4

Sample acquisition and handling took place under strict protocols described elsewhere in this report and managed by Remote Exploration Services Ltd. The lead author observed all stages of the sampling process and monitored it periodically, and is of the opinion that it was done well.

Sample preparation and analysis was monitored by in-house laboratory quality control blanks, standards, and duplicates which have been reviewed by the authors. Company blanks, standards and duplicates were also inserted and have been reported elsewhere in this report. It is the author's opinion that these data can be relied upon for identification of target areas and mineralized zones within the trenches.

Item 17: Adjacent Properties

There is no active or recent exploration for rare earths on adjacent properties and no information that is relevant to the rare earth potential of the Lofdal property. NRE (Pty) has an application pending for EPL 4208 (Florida) (see Figure 6.3) which may host favourable geological extensions of the Lofdal carbonatite complex to the southwest.

Item 18: Mineral Processing and Metallurgical Testing

No mineral processing or metallurgical testing analyses have been carried out in the Lofdal area.

Item 19: Mineral Resource and Mineral Reserve Estimates

There are no mineral resources or reserves to report from the Lofdal property as of February 18, 2011.

Item 20: Other Relevant Data and Information

Since the completion of the diamond drill program in November, 2010, a comprehensive geophysical interpretation has been carried out that, for the first time, incorporates the ERN 2010 high resolution airborne radiometric and magnetic survey. The interpretation was carried out by Dr. Branko Corner of Corner Geophysics Ltd. cc in Swakopmund, Namibia and provides a more detailed magnetic, radiometric and structural interpretation to contribute to ongoing field mapping in areas that have already been identified to have high exploration potential. The results, summarized in Figure 20.1, provide a structural interpretation that is consistent with the previous structural interpretation provided by NPA Fugro (see Section 12.2.2.2). The interpretation further confirms the close correlation between radiometric signal and the presence of carbonatite dykes and the dominant northeast and north-northeast trends of the carbonatite-bearing structures. It clearly identifies the radiometric signal associated with Area 2B, and the strong similar signatures in Areas 1, 4 and 5 that are currently being mapped. A focus of the interpretation was to investigate the relationship between geophysical signals and intrusive plugs like the Emania intrusion. The Emania intrusion generates a distinctive geophysical signature characterised by a VTEM low and similar signatures are seen that require ground truthing including a series of VTEM anomalies passing through Area 6 (labelled V2

through V6 on Figure 20.1) that have similar geophysical characteristics to the Emanyia intrusion.

Figure 20.1 also shows that there is a characteristic geophysical signature over syenites of the Main intrusion characterised by a strong high uranium signal. Regional lithogeochemical samples taken from syenites of the Main intrusion were locally enriched in Nb, with approximately 20% of samples carrying greater than 1000 ppm Nb, but did not generally return high uranium values. Reverse circulation drilling near the uranium anomaly, but off its axis (Figure 13.1), returned a number of analyses of greater than 1000 ppm Nb and greater than 200 ppm U. A suite of grab samples of syenite taken over the axis of the anomaly in a single traverse in late 2010 returned Nb assays averaging 4,800 ppm and ranging from 1,520 to 14,400 ppm, and U assays averaging 500 ppm and ranging from 196 to 970 ppm. As previously noted, the reverse circulation drill sampling and analysis was not carried out according to any QA/QC protocol and the numbers cannot be presumed to be precise or accurate. The 2010 grab samples were taken under the ERN QA/QCNRE (Pty) QAQC protocol but the standards have not been optimized for Nb and U and the assays cannot be presumed to be accurate or precise. However, taken as a whole, the information suggests an exploration potential for the property that requires further evaluation, including geological mapping and systematic outcrop sampling with appropriate QA/QC.

Item 21: Interpretation and Conclusions

The Lofdal property is a high quality, greenfield exploration project that warrants comprehensive exploration for rare earth elements. The Lofdal carbonatite complex is a diverse and robust igneous-hydrothermal system that from all present data exhibits significant potential to host deposits of rare earth elements. Exploration to date has not defined a mineralized zone of economic size and grade but has identified significant areas of heavy rare earth enrichment and a significant number of high quality targets for further exploration on a district scale.

The association of rare earths with carbonatites is well known and there are many advanced exploration projects targeting this deposit type. The large majority of these are LREE-enriched, with limited potential for production of HREE. What is unique at Lofdal is the significant enrichment in heavy rare earths associated with the carbonatites, and the dominance of xenotime as one of the principal REE-bearing minerals. This presents a significant opportunity to discover a deposit of economic significance.

The Lofdal carbonatite complex is a large intrusive system with a significant component of hydrothermal alteration and mineralization. The intrusive centre for the system seems to be in the area of the Main intrusion, which is exposed over an area of about 2,000 m x 800 m and may be considerably larger, according to preliminary gravimetric data. The carbonatites in this area are grey to white, and although exhibiting typical carbonatite LREE-enriched chondrite normalized patterns, the absolute concentrations of the REE are sub-economic. The other intrusive plug that has been identified is the Emania intrusion, which by its composition, associated minerals, and rare earth contents, appears to have more of a hydrothermal component. It is also a LREE-rich body, but has absolute concentrations that are significantly higher than the Main intrusion and a more fractionated REE distribution. Although not an initial priority, the Emania intrusion presents a prospective drill target because of the locally high concentrations of REE and the size of the body.

The corridor between the Main and Emania intrusions is about 3.5 km long and characterized by a number of small nepheline syenite bodies that appear to be related to, but intruded earlier than, the carbonatites. Coarse diatreme breccias are widespread and are apparently related to the intrusion of the syenite. The intrusive centre of the complex was a dynamic system. The abundance of breccias suggests that it was also explosive and the widespread hydrothermal alteration indicates that it was volatile-rich. The syenites are typically closely associated with the carbonatite intrusions suggesting that they utilized the same pathways during ascent. The corridor between the two intrusions is, therefore, considered to be highly prospective.

The emplacement of the nepheline syenites was associated with regional fracturing of the metamorphic basement rocks, mainly along NNE/SSW to NE/SW structures that may locally result from reactivation of older basement structures, and a suite of phonolite dykes was emplaced in these fractures. These fracture systems remained active during subsequent emplacement of the carbonatites which were sometimes emplaced in and/or adjacent to the phonolites in the same system and sometimes in nearby parallel fractures. The intrusion of these carbonatite dykes was accompanied by significant brecciation and alteration of both pre-existing silicate intrusives and the adjacent metamorphic wall rocks, producing sometimes wide zones of variable carbonatite and silicate intrusion accompanied by carbonatized, altered rocks and breccia. Some of the carbonatites, and some of the hydrothermally-altered rocks, were mineralized with significant quantities of rare earths. The intrusion and the REE mineralization was accompanied by variable fenetisation of the wall rocks, now manifested in phlogopite-rich intervals near the margins of the altered zones.

The carbonatite/carbonatized alteration zones are locally very extensive along strike and can be traced over 100's of metres. The 2B zone, the only zone to date that has been investigated in 3 dimensions, is part of a dyke system that can be traced along strike for more than three km. Similar dykes with regional extent are found elsewhere on the property and most have segments where sampling has identified anomalous proportions of HREE-rich samples. One very significant outcome of the 2010 diamond drilling program is the recognition and characterization of hydrothermal alteration and structural controls associated with the mineralizing event. All observations and information in the 2B zone drill core suggests that the hydrothermal alteration zones are characterized by both a geochemical signature of elevated REE's, Y, and Th, and by radiometric anomalies. Although the zones locally are very wide, the most intense REE mineralization appears to have been introduced late in the hydrothermal sequence, and to date has been observed to occupy relatively narrow, late hydrothermal corridors within the larger alteration systems. This being said, the 2B zone is exposed on surface over widths ranging from 15 to more than 120 m. The most intense alteration zone at its widest point measures up to 27 m in drill core. These are attractive exploration targets and the focus must be to identify zones with consistently high HREE values over economic widths. Although not the focus of this report, the author is aware of ongoing geological mapping and sampling that is confirming the association of discrete carbonatite dykes or dyke swarms with broad alteration haloes in a number of areas on the property.

Observations in the 2B zone trenches, and particularly in the 2B zone diamond drill holes, suggest that the HREE-enrichment is controlled by hydrothermal activity related to carbonatite emplacement. This being the case, there would seem to be significant opportunity for HREE mineralization to occur both in the carbonatites and in the related hydrothermally-altered

silicate rocks. This has not been tested by sampling on a regional scale. To this point in time, only the 2B zone has been substantially tested. The testing of this target has yielded much valuable information about the nature of the intrusions and related alteration, and the nature of the mineralization. The zone remains robust and open at depth and should be further tested below the current level of exploration. There are many other targets of similar potential in the area of the property that have been identified by regional lithogeochemical sampling that have the potential to host significant HREE mineralization. There is also a large area outside of the present target area, but within the regional Th anomaly that defines the prospective area, that has significant potential for further discoveries.

The nature of the HREE-mineralizing event remains elusive and, in particular, its timing with respect to the intrusion of the carbonatite plugs. There remains the possibility of a magmatic episode that is contemporaneous with (and perhaps the source of) the HREE-enriched hydrothermal fluids. Exploration on the property must be carried out with the possibility of a HREE-enriched primary intrusive body in mind.

Item 22: Recommendations

Exploration to date at Lofdal has demonstrated the potential of the project to lead to the discovery of an economic rare earth deposit. It is recommended that the Company take a staged approach to development with provisions at milestone events. The immediate focus should be to rapidly work towards the delineation of mineral resources within the priority target areas already identified. Based on the successful outcome of the first phase, a feasibility study would be undertaken to advance the project to production.

- Phase I - Property scale exploration directed at an initial drill discovery and delineation of 43-101 compliant inferred and indicated resources for scoping of a preliminary economic assessment, with continued regional prospecting (CDN\$6.4M)
- Phase II - Delineation of a 43-101 compliant mineral reserve and accompanying feasibility study (CDN\$7.0M).

22.1 Phase I Program and Budget

Exploration at Lofdal should continue to be directed towards the identification of areas or dyke segments of sufficient volume, with REE concentrations that could constitute an economic deposit. Because of the significantly higher value for certain HREE (europium, dysprosium and terbium) a continued focus on the high potential HREE targets should be maintained. However given the significant price increases and continued demand for all REE, the LREE-rich areas should not be marginalized. The program conducted to date on the 2B zone has significantly increased the company's understanding of the geological character of the "carbonatite dykes" most notably in demonstrating that the dykes can occur within much broader alteration zones that have also been enriched in REE mineralization. This previously unrecognized form of REE mineralization can be mapped at surface and given the prolific number of carbonatite dykes within the carbonatite complex, the potential exists to delineate additional and larger mineralized systems (i.e. within Areas 1, 4, 5 and 8 as shown on Figure 22.1).

The most valuable exploration tools demonstrated to date at Lofdal have been geological mapping, lithogeochemical sampling, geophysical surveys and diamond drilling. While trenching provided detailed confirmation of the zone, it proved to be a labour intensive and expensive exploration method given the large volume of sampling that is required because of the uncertainty of zone boundaries. Diamond drilling, on the other hand, provided clear visual definition of zone boundaries and allowed focused sampling which is probably more cost effective in the long term. Trenching should be considered more as a reconnaissance tool and only undertaken on a close spaced, systematic basis when carrying out more definitive (resource) evaluations once economic grades have been established in exploration drill holes.

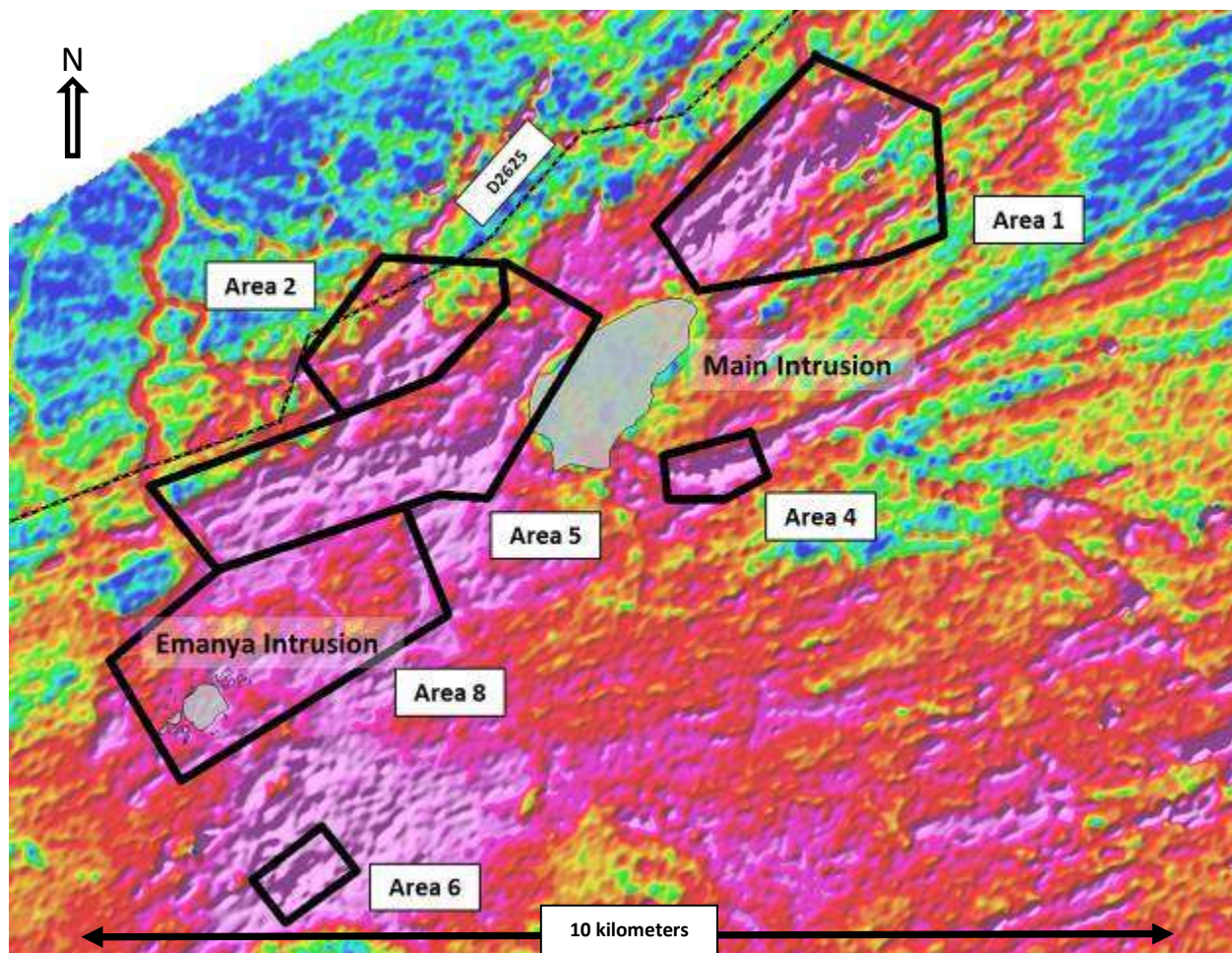


Figure 22.1 Recommended priority areas for detailed geological mapping. Area 2 and Area 4 already mapped and presented in this report. Coloured grid is shadowed thorium channel from 2010 airborne survey with Main and Emanya intrusions for reference

One of the greatest challenges at Lofdal remains the sheer number of valid targets to test over such a large surface area. It is recommended that the next phase of exploration test multiple target areas, primarily focused on the dykes in HREE-rich zones but also making preliminary investigations of some of the other potential environments including the intrusive LREE target at Emanya and the apparent sediment-hosted occurrences in Area 6 and Area 1. While regional prospecting provided the basic framework for target area selection, including the program just completed in the 2B zone, it is strongly recommended that more comprehensive mapping be undertaken in the next stages. Geological mapping such as was carried out by RES in Area 2 and Area 4 has proven to be an effective guide to the most prospective portions of the zones and in future should precede drill site selection. Field mapping geologists are now able to recognize

the alteration zones at surface having had the benefit of detailed observation of the rocks in drill core in the 2B zone. Similarly, it has been demonstrated that the association of REE mineralization and alteration with radiometric anomalies, in particular with thorium, provides for more refined target selection. The company is undertaking more detailed ground radiometric coverage (12.5 m line spacing) in Areas 4, 5 and 6 and that data should be scrutinized to determine if it can help focus drill site selection.

A more thorough evaluation of the extensive geophysical database should be undertaken by a qualified geophysicist in consultation with the mapping geologists to determine if any new target areas might be identified. The current regional geophysical database comprises radiometrics, magnetics and electromagnetics coupled with an extensive collection of remotely sensed data (Aster, Landsat and hyperspectral). Unless specifically recommended by the geophysicist, it may not be necessary to acquire any additional regional geophysical data. As noted above, the value of detailed ground radiometrics will be determined based upon the evaluation of the Area 4, 5 and 6 data from the 12.5 m spaced surveys.

The recommended approach is therefore continued geological mapping of priority areas coupled with selective chip and/or channel sampling where possible and geophysics to select the next drill targets. Drilling should remain 100% core rather than reverse circulation. Rather than focusing on any single zone, the initial drill program should be more exploratory in nature and cover a multiple number of target zones. Trenching need only be considered in areas where drill access may be too complicated, a situation unlikely to be encountered in the priority areas identified to date.

As was done in Area 2 and Area 4, staged mapping at 1:5000 and then 1:1000 scale should be undertaken in:

- Area 1 – covering the extensive zones of radiometric anomalies northeast of the Main intrusion coincident with regional lithogeochemical sampling which indicated zones of HREE enrichment
- Area 5 – covering the extensive zones of radiometric anomalies close to the south-eastern contact with the Main intrusion and extending to the west coincident with regional lithogeochemical sampling which indicated zones of HREE enrichment
- Area 8 – a proposed new priority area to cover the extensive LREE-anomalous dykes, associated syenite intrusions and agglomerates/breccias between the Main intrusion and surrounding the Emanyia intrusion. This program would also specifically focus on Emanyia as a distinct target.

There is little doubt that a comprehensive drill program will evolve from this mapping and in addition to the targets generated in Areas 1, 5 and 8, a follow up drilling program in the 2B zone

should be undertaken to test the zone to a depth of 100 vertical meters. Area 4 and Area 6 are effectively ready for drilling as is Emanyā. A total of 7,500 m is recommended for testing all of the above areas. The diamond drilling program should also incorporate downhole radiometrics and perhaps other downhole geophysical surveys that may be proven effective in mapping the REE enriched zones.

It is anticipated that the mapping and exploratory drilling will result in identification and confirmation of 1 or more targets with potential for the delineation of a significant REE deposit. The identification of such a target will lead to a substantial focused program to record the essential mineralogical characteristics of the deposit, outline a 43-101 compliant resource and carry out the preliminary economic assessment.

There still remains considerable mineralogical and, as favourable zones are confirmed, metallurgical work to be undertaken. While the elevated levels of thorium provide an excellent guide for exploration and often in pinpointing areas of high HREE potential, it remains to be determined that the association with thorium can be dealt with in terms of extraction. One of the more pressing issues to deal with in any foreseeable outcome at Lofdal will therefore be the separation and handling of thorium. As favourable zones are identified, focused mineralogical studies should be undertaken to not only identify REE-bearing mineral phases but to also characterize the residence of thorium and its physical relationship to the REE mineralization – as separate mineral phases or encapsulating the REE minerals. It is also recognized that the viability of any economic considerations for a REE deposit ultimately rest upon the metallurgical characteristics of the deposit as it relates to processing and extraction. A significant contingency should therefore be budgeted for the appropriate test work to be carried out on representative samples of any potential “ore”. This component of the program will require the engagement of a qualified person and laboratory with recognized expertise in rare earth deposit mineralogy and extraction methodologies.

Based on the variability in dyke thickness and rare earth fractionation seen to date, it is expected that the delineation of 43-101 compliant resources will demand fairly close spaced drilling for this purpose on something like a 25 x 50 m grid. It is expected that the resources of interest will likely be at or near surface and represent an open pit mine resource within 200 meters of surface. A total of 15,000 m is therefore budgeted for resource development. The program would be designed to deliver a 43-101 compliant resource in the inferred and indicated categories together with sufficient metallurgical and baseline studies to support a preliminary economic assessment.

All of the above can be considered in a first phase exploration budget as outlined below.

Recommended Budget for Phase I at Lofdal (CDN\$)

Geological Mapping	
1:5000 Scale	200,000
1:1000 Scale	50,000
Analyses	35,000
Regional Prospecting	75,000
Establishment of Field Camp	25,000
Geophysical Compilations	50,000
Diamond Drilling - Exploration (7,500 m)	1,125,000
Diamond Drilling – Resource (15,000 m)	2,250,000
Analyses	270,000
Geological Support	292,500
Geophysical Surveys	
Downhole	150,000
Surface	50,000
Mineralogical Studies	75,000
Metallurgical Testing	800,000
Environmental Monitoring	170,000
Preliminary Economic Assessment	<u>200,000</u>
Total	5,817,500
Contingency (10%)	<u>581,750</u>
TOTAL PHASE I	6,399,250

The total recommended budget for Phase I is therefore CDN\$6,399,250. This does not provide for in-country operational costs, exploration programs outside of Lofdal, corporate budgeting or related head office expenditures.

22.2 Phase II Program and Budget

Phase II is contingent on the delineation of a 43-101 compliant resource with supporting documentation in favour of the economic viability for the development of a rare earth mining operation at Lofdal. As with any mineral deposit, this stage of development would require a comprehensive feasibility study with a compliant mineral reserve. The mineral reserve must be based upon mineral resources in the indicated and measured categories. Under guidelines of

National Instrument 43-101, inferred mineral resources (as envisioned in Phase I) cannot be used for purposes of estimating mineral reserves.

The feasibility study must therefore be supported with additional (infill) drilling to move Phase I mineral resources into the higher confidence categories of indicated and measured resource. The economic viability of the project must be demonstrated to much higher levels of confidence which would be considered bankable for purposes of project financing. This would encompass a complete evaluation of mining costs, engineering design, concentrating and/or extractive processes, environment impact assessments and construction. While at this point conceptual in nature for Lofdal, the costs associated with feasibility studies and related activities are generally understood within the mining industry for various commodity sectors as reflected in the proposed Phase II budget below.

Recommended Budget for Phase II at Lofdal (CDN\$)

Diamond Drilling (15,000 m)	2,250,000
Analyses	500,000
Geological Support	360,000
Metallurgical Testing (including bulk sampling)	1,500,000
Environmental Impact Assessment	500,000
Engineering and Costing	750,000
Report	<u>500,000</u>
Total	6,360,000
Contingency (10%)	<u>636,000</u>
TOTAL PHASE II	6,996,000

The total recommended budget for Phase I and Phase II is therefore CDN\$13,395,250. This does not provide for in-country operational costs, exploration programs outside of Lofdal, corporate budgeting or related head office expenditures.

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Item 24: Date and Signature Pages

Certificate of Qualified Person

I, H. Scott Swinden PhD, PGeo, do hereby certify that:

1. I am a Consulting Geologist of:
Swinden Geoscience Consultants Ltd.
3 Crest Road
Halifax, Nova Scotia B3M 2W1.
CANADA
2. I have the following academic qualifications:

Ph.D.(Earth Sciences) 1988	Memorial University of Newfoundland
M.Sc.(Geology) 1976	Memorial University of Newfoundland
B.Sc.(Honours in Geology) 1970	Dalhousie University
3. I am a member in good standing of the Association of Professional Geoscientists of Nova Scotia, (No. 085), the Geological Association of Canada, the Canadian Institute of Mining, Metallurgy and Petroleum, and the Society of Economic Geologists, and Adjunct Professor of Earth Sciences at Dalhousie University, Halifax, Nova Scotia.
4. I have worked as a geologist and administrator in mineral exploration and public sectors for more than 33 years since my first degree.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I am responsible for the preparation of all sections of the technical report entitled “43-101 Technical Report on the Rare Earth Element Occurrences in the Lofdal Carbonatite Complex, Kunene Region, Khorixas District, Namibia” and dated February 18, 2011, amended date April 4, 2011, except Sections 13.2.1, 13.2.2, 13.2.3, 14.4 and 15.3.1”.
7. I most recently visited the property for 19 days between November 25 and December 14, 2010.

8. I have been an independent consultant to Namibia Rare Earths Inc. on the property which is the subject of this report since July, 2010.
9. I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.
10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that Instrument and Form.
11. To the best of my knowledge, information and belief as of the date hereof, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
12. 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 this 4 April, 2011



H. Scott Swinden PhD., PGeo

I, Peter Roy Siegfried, MAusIMM do hereby certify that:

1. I am a Consultant of:

GeoAfrica Prospecting Services cc
23 Schanzenweg, Eros, Windhoek
P.O. Box 24218, Windhoek
NAMIBIA

2. I graduated with a degree in Geology from the University of Cape Town in 1986. In addition, I obtained a MSc from the University of Cape Town in 1989 in Economic Geology.
3. I am a member of the Australian Institute of Mining and Metallurgy (No. 221116), and have been a member in good standing since 2004.
4. I have worked as a geologist for a total of 25 years since my graduation from university.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43- 101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 13.2.1, 13.2.2, 13.2.3, 14.4 and 15.3.1 of the “Technical Report on the Rare Earth Element Occurrences in the Lofdal Carbonatite Complex, Kunene Region, Khorixas District, Namibia” and dated February 18, 2011, amended date April 4, 2011. I visited the Lofdal Project between September 24, 2010 and November 8, 2010 for a total of 19 days.
7. I have been an independent consultant to Namibia Rare Earths on the property that is the subject of the Technical Report during the period August 2010 to November 2010.
8. To the best of my knowledge, information and belief as of the date hereof, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.
10. I have read National Instrument 43-101 and Form 43-101F1, and the 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 this 4 April, 2011.

A handwritten signature in dark ink, appearing to read 'Peter Siegfried', with a long horizontal stroke extending to the right.

Peter Siegfried

Appendix 1: Significant Intersections from Trench Channel Sampling

Loc'n	From	To	Width	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Total % HHREE	Total % TREE +	% of Total as HREE+Y
			(m)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	+ Y	Y	HREE+Y
Trench 1	20	23	3	370.3	554.0	55.9	217.7	105.7	38.2	128.6	20.7	114.0	21.1	54.4	7.5	45.3	6.3	579	0.10	0.23	43.8
	26	28	2.0	2337.5	3455.0	362.5	1757.5	1286.8	471.8	1573.5	237.8	1134.0	181.9	382.0	43.7	244.3	31.8	4479	0.88	1.80	48.8
	31	34	3.0	295.0	438.8	47.1	221.8	147.8	52.1	172.2	25.4	126.7	21.4	51.0	6.4	38.7	5.4	584	0.11	0.22	48.5
	39.4	42	2.6	21.5	39.6	5.3	29.4	45.1	25.8	102.5	22.8	155.3	33.6	97.9	13.9	85.1	12.2	1177	0.17	0.19	92.5
	72	73	1.0	260.0	576.0	64.8	269.0	51.8	5.9	34.3	4.9	26.7	4.9	14.2	2.0	12.6	1.9	65	0.02	0.14	12.4
Trench 2	22	23.8	1.8	338.7	516.6	49.3	200.1	116.8	47.2	154.1	24.9	133.5	23.8	63.4	8.8	55.1	8.0	664	0.12	0.24	49.2
	25	27.4	2.4	274.4	429.2	44.8	244.3	221.9	70.9	203.9	26.2	121.8	19.8	49.4	6.6	40.8	5.7	633	0.12	0.24	49.2
	32.7	37	4.3	218.0	346.2	35.0	160.9	135.3	52.9	177.9	29.5	159.8	28.6	72.8	10.0	62.4	9.2	825	0.14	0.23	61.5
	41	44	3.0	144.4	243.5	25.9	109.5	81.8	33.5	107.0	17.8	101.0	19.5	54.5	7.9	50.3	7.2	701	0.11	0.17	64.5
	47	48	1.0	138.0	234.0	26.0	119.0	77.1	29.3	80.7	12.1	62.2	11.0	26.9	3.2	18.2	2.4	331	0.06	0.12	49.3
Trench 3	57	57.5	0.5	286.0	528.0	56.8	213.0	38.3	14.1	40.0	7.2	39.1	6.7	15.5	1.7	8.6	1.0	174	0.03	0.14	21.5
	1	2	1.0	1030.0	1510.0	140.0	425.0	46.9	12.2	34.2	4.6	23.3	4.3	12.1	1.7	11.3	1.7	147	0.03	0.34	7.4
	11	12	1.0	348.0	540.0	54.2	185.0	63.1	31.7	141.0	29.9	172.0	29.0	69.7	8.4	48.0	6.7	772	0.13	0.25	52.4
	22	24	2.0	2409.2	3357.0	290.0	1005.5	282.9	106.2	350.4	55.0	272.5	44.7	113.2	14.8	94.3	13.7	1199	0.23	0.96	23.6
	25	27.4	2.4	52.9	76.5	9.2	38.7	19.9	7.6	27.0	4.4	22.9	4.0	10.5	1.4	9.1	1.4	101	0.02	0.04	48.9
Trench 4	34	35	1.0	215.0	343.0	34.8	145.0	72.2	29.1	101.0	18.9	105.0	18.7	48.8	6.8	42.1	6.1	571	0.09	0.18	53.9
	37	38	1.0	130.0	214.0	24.0	130.0	124.0	46.0	147.0	23.3	114.0	18.1	42.3	5.2	31.1	4.4	514	0.09	0.16	60.3
	40	41	1.0	136.0	222.0	24.6	122.0	86.8	31.7	105.0	16.7	87.1	14.9	36.5	4.7	26.4	3.6	430	0.08	0.13	56.1
	43	44	1.0	401.0	688.0	76.8	352.0	259.0	107.0	377.0	66.9	368.0	63.2	151.0	17.9	97.1	12.9	1711	0.30	0.47	62.6
	65	67	2.0	143.0	252.0	29.2	105.0	51.0	25.2	108.0	24.8	147.0	28.0	69.2	9.0	49.1	6.4	805	0.13	0.19	68.7
Trench 4 incl	75	77.4	2.4	381.1	568.9	61.7	201.3	60.7	26.4	99.2	19.8	110.4	20.5	50.0	6.5	37.3	5.1	514	0.09	0.22	41.1
	24	30	6.0	1558.3	2098.3	176.6	571.5	131.2	48.3	151.6	22.7	120.8	21.3	58.9	8.1	50.1	7.1	599	0.11	0.56	19.3
	27	29	2.0	3955.0	5310.0	434.0	1361.5	234.2	84.0	259.3	38.6	208.7	36.4	99.9	13.4	83.3	11.8	1030	0.19	1.32	14.2
	32.2	35	2.8	355.1	534.8	59.3	269.9	170.1	69.4	244.1	46.4	284.4	53.6	142.6	18.6	105.2	14.2	1581	0.26	0.39	64.8
	78.6	80	1.4	345.4	620.7	69.6	250.7	83.4	36.1	132.9	27.3	175.4	33.9	86.5	11.2	61.9	8.6	947	0.15	0.29	52.6
Trench 5	81	82	1.0	395.0	760.0	76.5	287.0	42.0	13.1	40.6	7.3	47.1	9.5	26.5	3.5	20.7	3.1	246	0.04	0.20	21.1
	33	44	11.0	817.4	1229.9	116.8	483.1	268.3	130.0	502.0	93.7	545.1	96.7	245.1	32.1	184.3	25.3	2676	0.45	0.74	60.8
	36	40	4.0	1129.0	1669.3	159.2	674.7	450.7	232.8	918.9	167.0	937.3	159.2	383.7	46.9	260.2	34.7	4295	0.74	1.15	64.6
	11	12	1.0	281.0	459.0	44.6	172.0	50.6	24.6	86.0	17.2	107.0	18.9	46.6	6.0	35.6	5.0	511	0.09	0.19	46.0
	29	45	16.0	648.2	961.4	93.2	407.0	236.1	96.0	354.5	59.4	329.4	56.6	144.3	19.1	112.6	16.0	1595	0.28	0.51	54.3
Trench 6	32	36	4.0	560.5	886.8	91.7	419.2	312.5	132.3	495.3	80.7	434.0	71.8	175.3	22.7	133.4	18.8	1947	0.35	0.58	60.7
	39	45	6.0	1235.8	1801.5	170.1	735.8	382.4	152.0	561.1	95.7	536.1	92.4	234.0	29.6	164.1	21.9	2662	0.45	0.89	51.3
	14	15	1.0	286.0	445.0	44.1	167.0	51.2	24.3	98.1	21.1	129.0	21.8	51.9	6.4	34.0	4.4	592	0.10	0.20	49.7
	29	30	1.0	25.6	38.0	4.9	23.3	22.0	14.8	66.9	16.9	126.0	27.4	86.6	13.9	93.8	14.7	763	0.12	0.13	91.5
	36	38	2.0	26.2	40.8	5.3	23.2	20.0	13.8	67.1	20.0	161.0	37.7	122.0	19.2	132.0	20.3	1050	0.16	0.18	93.4
Trench 7	41.5	43.4	1.9	48.3	56.8	7.5	32.3	22.5	14.6	74.2	23.3	193.2	45.0	146.2	23.3	151.6	23.0	1387	0.21	0.22	92.6
	46.6	51	4.4	478.8	705.1	68.1	241.9	68.3	29.6	100.6	16.9	92.5	16.9	47.6	7.3	48.1	7.4	460	0.08	0.24	34.6
	11	12	1.0	259.0	421.0	43.3	162.0	48.1	18.8	75.5	13.7	80.7	14.7	41.8	6.2	39.2	5.8	443	0.07	0.17	44.2
	15.3	15.7	0.4	26.1	47.2	5.8	25.1	30.4	26.3	137.0	41.4	338.0	81.1	269.0	42.6	283.0	41.6	2145	0.34	0.35	96.2
	23	24	1.0	39.9	62.2	7.2	28.0	15.9	11.5	55.5	15.7	119.0	26.4	83.4	13.1	88.7	13.8	725	0.12	0.13	88.3
Trench 8	53	59	6.0	79.4	103.9	12.5	46.0	30.0	20.1	105.4	31.3	247.6	53.9	169.5	26.6	182.0	29.9	1546	0.24	0.27	89.9
	62	63.3	1.3	5694.6	7984.6	661.2	1935.2	206.8	66.7	224.6	46.1	319.8	66.6	198.9	29.8	187.0	26.5	1787	0.30	1.94	15.2

Loc'n	From	To	Width	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Total % HHREE	Total % TREE +	% of Total as HREE+Y
			(m)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	+ Y	Y	HREE+Y
Trench 9	6	7	1.0	281.0	441.0	41.8	130.0	19.7	5.7	18.8	3.3	21.6	4.3	12.7	1.9	11.8	1.8	111	0.02	0.11	17.4
	9.8	10	0.2	1480.0	2450.0	249.0	808.0	118.0	39.4	138.0	34.9	262.0	54.3	150.0	21.0	117.0	15.9	1575	0.24	0.75	32.0
	12.4	13	0.6	952.0	1620.0	173.0	560.0	104.0	40.9	153.0	31.9	217.0	43.8	120.0	15.2	84.1	11.6	1380	0.21	0.55	38.1
	14	15	1.0	427.0	813.0	101.0	423.0	256.0	86.9	286.0	34.0	135.0	18.8	40.9	4.8	25.7	3.6	507	0.11	0.32	36.1
	24	25	1.0	80.5	130.0	13.5	48.5	21.9	12.2	52.7	13.2	102.0	23.7	79.9	14.3	108.0	18.3	630	0.11	0.13	78.2
	27	28	1.0	170.0	285.0	29.1	96.0	28.7	13.9	57.0	11.0	66.2	11.7	29.1	3.7	21.3	3.1	302	0.05	0.11	46.0
	74	75	1.0	1080.0	1470.0	131.0	394.0	49.4	15.6	49.9	10.6	70.1	14.1	42.3	6.3	40.9	6.0	394	0.06	0.38	17.2
	79	84	5.0	246.3	363.3	35.4	128.4	53.6	21.5	76.8	13.7	76.3	14.0	37.8	5.1	32.0	5.2	354	0.06	0.15	43.5
Trench 10	95.7	96.5	0.8	4475.0	5996.3	500.8	1437.8	129.0	41.3	119.4	20.9	129.6	26.1	75.7	11.3	74.2	11.1	731	0.12	1.38	9.0
	4	10	6.0	133.3	223.0	25.1	115.0	58.0	21.8	77.7	15.2	101.7	20.6	60.6	9.2	60.7	9.1	684	0.11	0.16	65.7
	20	20.5	0.5	9.8	19.7	2.5	12.5	13.5	9.7	48.8	15.0	118.0	26.6	82.7	12.4	77.6	11.6	727	0.11	0.12	95.1
	40	41	1.0	420.0	643.0	56.4	185.0	25.1	5.9	19.9	3.6	24.3	5.1	15.5	2.4	15.0	2.3	147	0.02	0.16	15.3
	63	66	3.0	38.2	59.5	6.5	27.8	19.1	14.2	66.8	18.7	148.5	34.5	114.8	19.2	134.7	21.0	963	0.15	0.17	91.0
Trench 11	78.5	79.6	1.1	491.5	703.2	61.2	202.5	26.6	9.6	36.1	7.8	53.6	10.9	31.7	4.7	29.3	4.3	297	0.05	0.20	24.6
	3.2	5	1.8	119.5	236.1	28.7	128.0	75.9	30.5	103.3	20.5	135.3	28.2	84.2	12.6	81.3	12.2	831	0.13	0.19	69.5
	13	14	1.0	32.1	50.8	5.8	24.6	14.5	10.1	52.6	15.7	121.0	27.0	78.7	12.7	89.4	13.3	816	0.12	0.14	90.6
	37.5	38	0.5	491.0	937.0	107.0	377.0	90.1	37.5	134.0	26.2	143.0	23.4	52.4	6.7	35.4	4.8	598	0.11	0.31	34.6
	52	60.4	8.4	45.9	65.3	7.8	30.0	20.2	12.9	59.3	16.9	130.4	29.5	93.7	14.4	93.7	14.1	818	0.13	0.15	88.3
Trench 12	65	66	1.0	252.0	260.0	40.5	161.0	53.3	17.3	57.0	8.4	42.5	7.0	17.6	2.2	13.0	1.9	191	0.04	0.11	31.8
	68.3	69	0.7	3020.0	3930.0	309.0	909.0	88.1	22.1	76.3	11.5	71.3	15.6	54.6	9.8	71.4	11.4	512	0.09	0.91	9.4
	61	62	1.0	155.0	290.0	57.0	436.0	226.0	58.8	195.0	25.7	120.0	23.9	72.4	12.1	85.4	12.2	664	0.13	0.24	52.2
Trench 13	77	79	2.0	1501.5	2042.0	168.8	541.0	119.5	43.0	137.0	23.0	122.4	21.3	58.5	8.9	57.8	9.6	555	0.10	0.54	19.2
	25.5	26	0.5	34.1	54.4	6.2	26.6	18.6	13.0	59.7	19.2	163.0	43.3	173.0	33.0	257.0	43.3	1337	0.21	0.23	93.9
	39.5	40.5	1.0	156.0	234.5	26.1	117.8	61.3	24.8	85.4	15.9	99.0	19.4	58.0	8.7	58.6	8.9	551	0.09	0.15	60.9
Trench 14	44	45	1.0	53.8	91.5	10.5	45.5	32.7	21.5	106.0	29.4	209.0	44.3	135.0	19.0	114.0	15.8	1460	0.22	0.24	90.2
	1	2	1.0	209.0	531.0	61.5	244.0	30.9	6.7	16.4	1.8	8.0	1.3	3.1	0.4	2.6	0.4	33	0.01	0.12	6.4
	10	11	1.0	99.1	172.0	18.0	77.7	51.1	23.9	87.6	18.2	123.0	26.4	81.0	12.6	85.1	13.4	725	0.12	0.16	74.1
	12.7	15	2.3	384.7	640.9	66.1	339.1	221.4	75.2	205.8	23.6	104.9	16.8	48.9	8.0	60.2	10.0	455	0.10	0.27	37.9
Trench 15	26	27	1.0	149.0	254.0	25.0	93.0	22.6	9.8	46.0	11.4	84.0	17.2	42.1	4.8	22.4	2.8	428	0.07	0.12	55.2
	18.5	20	1.5	126.4	269.7	31.0	124.6	39.7	16.4	58.3	9.9	59.5	11.9	34.3	5.4	36.9	5.9	317	0.06	0.11	48.4
	23	25	2.0	170.3	296.8	31.6	129.0	64.7	27.2	95.2	14.3	77.1	13.6	36.9	5.5	38.0	6.1	328	0.06	0.13	48.1
	28	29	1.0	19.6	38.8	4.7	22.2	23.3	16.3	77.4	20.9	165.0	37.5	123.0	21.3	157.0	26.2	1096	0.17	0.18	94.1
	30	31	1.0	131.0	217.0	23.7	91.3	40.1	19.6	73.7	14.2	79.2	13.5	33.9	4.5	28.4	4.1	351	0.06	0.11	55.3
	34	35	1.0	173.0	321.0	35.0	129.0	26.9	11.4	37.6	7.6	48.5	9.0	25.1	3.5	22.7	3.3	270	0.04	0.11	39.0

Loc'n	From	To	Width	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Total % HHREE + Y	Total % TREE + Y	% of Total as HREE+Y
			(m)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)			
Trench 16	4	5	1.0	297 0	478 0	48.8	177 0	58.6	24.2	90.4	17.2	104 0	19.6	52.4	6.7	37.2	5.1	483	0.08	0.19	44.2
	28	29	1.0	276 0	406 0	46.9	197 0	123 0	51.5	166 0	26.5	143 0	27.6	80.8	12.6	84.2	13.2	749	0.14	0.24	56.4
	31	33	2.0	39.7	59.3	6.7	25.5	13.9	9.5	47.1	13.9	114 0	27.1	91.3	15.2	103 8	16.1	812	0.12	0.14	89.6
	37	38	1.0	302 0	454 0	51.1	180 0	46.5	17.8	40.6	5.3	25.0	4.3	11.4	1.6	9.8	1.5	109	0.02	0.13	18.0
	42	43	1.0	293 0	496 0	54.9	183 0	35.1	13.2	45.0	8.7	53.3	9.8	24.7	3.2	18.8	2.7	299	0.05	0.15	31.1
Trench 17	28	29	1.0	367 0	628 0	71.9	272 0	90.6	33.9	114 0	19.0	107 0	20.1	51.7	6.9	40.8	5.6	571	0.10	0.24	40.4
	37	41	4.0	503 9	811.7	88.7	435 9	272 8	98.6	290.1	39.2	196 9	35.6	95.2	12.9	75.5	10.9	985	0.18	0.40	46.5
	100	101	1.0	368 0	625 0	82.5	492 0	265 0	66.2	156 0	13.4	45.8	5.7	14.5	1.9	11.7	1.7	145	0.05	0.23	20.1
Trench 18	20	20.4	0.4	180 0	296 0	30.7	143 0	105 0	37.3	116 0	13.2	51.4	8.0	19.1	2.6	17.5	2.8	197	0.05	0.12	38.1
	34.4	36	1.6	296 3	500.6	53.8	293.1	232.6	71.0	215 2	25.4	107 0	16.4	37.7	5.0	31.2	4.6	416	0.09	0.23	40.3
	73	74	1.0	207 0	495 0	60.8	234 0	31.2	7.7	16.6	2.2	10.1	1.6	4.0	0.5	2.8	0.4	43	0.01	0.11	8 0
	133	134	1.0	35.2	58.8	7.8	34.9	18.2	10.7	57.6	16.8	119 0	26.1	73.9	10.9	60.2	8.2	700	0.11	0.12	87.5
Trench 19	21	22	1.0	273 0	480 0	50.6	186 0	52.1	21.6	72.7	13.8	82.2	13.9	35.0	4.5	25.7	3.7	406	0.07	0.17	39.5
	39	45	6.0	119.6	189 8	22.0	96.6	77.8	33.2	115 3	25.5	187 3	39.9	116.6	17.2	109.1	16.1	1315	0.20	0.25	79.6
	96	99	3.0	129.4	386 0	87.5	783 3	451.7	115.4	244 8	21.5	68.4	6.9	12.7	1.6	10.9	1.6	196	0.07	0.25	27.0
Trench 20	11	12	1.0	41.8	109 0	24.2	294 0	227 0	56.0	194 0	14.3	46.0	6.9	19.6	2.9	19.1	2.8	240	0.06	0.13	46.4
	32	33	1.0	142 5	246 0	28.0	150 5	125 0	39.0	143 0	19.0	91.6	13.8	32.4	4.7	29.0	4.3	367	0.07	0.14	51.8
	44	46	2.0	31.3	60.4	7.4	32.3	28.8	17.7	90.9	24.8	193 8	40.6	128 0	21.3	134.7	20.4	1153	0.18	0.20	91.9
Trench 21	0	1	1.0	569 0	933 0	107 0	509 0	428 0	167 0	622 0	109 0	659 0	124 0	301 0	42.5	228 0	29.7	3741	0.60	0.86	70.3
	3.3	5	1.7	71.5	134.1	25.7	264 0	222 9	63.5	199 8	28.0	149 5	27.1	69.1	10.5	64.7	9.6	872	0.15	0.22	67.5
	19	20	1.0	117 0	201 0	27.0	186 0	152 0	40.0	115 0	14.1	66.3	10.5	24.5	3.4	21.1	3.1	318	0.06	0.13	47.4
	27	28	1.0	30.5	45.0	6.5	28.5	23.9	16.0	81.1	22.4	173 0	38.6	120 0	18.5	111 0	16.0	1181	0.18	0.19	93.0
	30	31	1.0	19.4	34.2	4.3	19.1	17.9	12.8	60.8	17.9	141 0	31.8	101 0	16.0	101 0	15.0	751	0.12	0.13	92.9
	61	62	1.0	35.0	87.0	19.9	196 0	130 0	38.2	103 0	14.7	81.1	15.9	45.5	6.3	39.3	5.8	551	0.09	0.14	65.8

Appendix 2: Significant Intersections from Diamond Drilling

Hole ID	From	To	Width	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Total % HREE + Y	Total % TREE + Y	% of Total as HREE+Y
			(m)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)			
DDH 1	36	45.9	9.85	435.1	661.5	65.6	236.9	94.7	34.3	123.9	21.7	127.7	23.6	62.5	8.5	50.2	6.9	680	0.11	0.26	43.3
including	42.4	43	0.6	708.0	1090.0	115.0	488.0	280.0	91.9	335.0	54.7	315.0	56.7	142.0	17.4	97.1	12.7	1532	0.27	0.53	49.8
including	45	45.9	0.9	2610.0	3760.0	350.0	1110.0	214.0	69.9	235.0	40.6	229.0	40.5	106.0	14.4	85.6	12.1	1070	0.19	0.99	19.1
DDH 2	38.8	50.2	11.4	282.3	471.2	44.8	166.7	65.9	28.1	98.4	19.0	118.7	23.0	66.4	10.0	65.1	9.5	729	0.12	0.22	53.1
DDH 3	11.7	12.2	0.5	715.0	1370.0	150.0	545.0	253.0	99.7	369.0	80.7	509.0	107.0	282.0	39.7	221.0	27.5	3376	0.51	0.81	62.8
	24.5	25.2	0.7	259.0	437.0	43.9	141.0	25.3	8.8	32.6	7.1	44.3	9.1	24.3	3.6	20.9	2.8	259	0.04	0.13	31.3
	46	55.6	9.6	616.9	853.7	78.7	283.9	115.2	46.5	175.1	32.6	185.8	37.7	114.8	16.6	100.6	13.6	1093	0.18	0.38	48.2
including	47	49	2.0	667.5	1007.5	103.8	463.5	274.5	105.8	379.0	59.4	300.5	56.9	158.0	20.2	106.7	13.2	1629	0.28	0.53	52.9
including	50.4	52	1.6	2568.0	3369.6	289.2	898.9	231.5	91.2	329.7	58.2	304.3	57.6	167.0	23.1	140.7	19.0	1623	0.28	1.02	27.7
	57.4	57.8	0.4	337.0	478.0	43.2	144.0	36.2	16.2	56.2	11.6	64.7	12.4	35.2	4.9	29.2	3.9	339	0.06	0.16	35.6
DDH 4	13.7	14.1	0.4	823.0	1410.0	144.0	564.0	219.0	80.9	289.0	49.5	267.0	51.3	142.0	17.9	98.0	12.5	1458	0.25	0.56	43.8
	25	26	1.0	188.0	317.0	29.5	99.1	40.8	17.8	67.6	12.5	63.6	10.9	26.0	3.1	16.4	2.1	280	0.05	0.12	42.6
	50	59.4	9.4	258.1	374.9	36.7	143.4	73.3	34.2	136.6	31.6	216.7	45.3	139.0	20.2	135.4	19.7	1269	0.20	0.29	69.8
including	50	51	1.0	926.0	1360.0	136.0	573.0	308.0	124.0	453.0	84.8	493.0	93.1	254.0	31.3	179.0	23.6	2441	0.42	0.75	55.8
including	56	57	1.0	14.6	30.9	4.2	23.5	40.0	36.7	200.0	65.0	510.0	114.0	369.0	57.5	401.0	60.0	3249	0.51	0.52	97.8
DDH 5	20	21.7	1.7	720.8	975.6	94.7	328.7	155.3	69.3	292.2	57.9	357.5	66.8	183.0	24.9	148.8	21.2	2058	0.33	0.56	59.0
including	20	20.5	0.5	2040.0	2670.0	256.0	832.0	255.0	101.0	379.0	77.8	519.0	108.0	323.0	45.7	275.0	38.8	3566	0.54	1.15	47.3
	25.2	26.2	1.0	215.0	324.0	33.3	144.0	77.8	35.8	151.0	35.7	264.0	56.1	162.0	20.9	111.0	14.1	1667	0.25	0.33	76.0
	45.4	46	0.6	314.0	448.0	48.0	182.0	53.8	20.7	51.5	8.0	43.7	8.0	21.9	3.0	18.3	2.7	209	0.04	0.14	27.0
	49	51.9	2.9	78.7	140.8	14.9	59.1	35.8	18.0	76.7	20.5	157.9	36.2	115.0	17.9	115.8	17.3	951	0.15	0.19	82.3
	56	61	5.0	31.0	58.9	6.5	26.1	14.2	9.4	45.3	13.4	111.8	26.7	86.8	13.6	88.2	13.2	703	0.11	0.12	89.1
DDH 6	24	25	1.0	829.0	1390.0	148.0	651.0	526.0	286.0	1530.0	320.0	2000.0	347.0	831.0	100.0	567.0	76.3	9660	1.57	1.93	81.6
	54.7	55.1	0.4	16.1	31.9	3.9	19.0	35.8	35.7	174.0	58.1	475.0	104.0	311.0	48.5	324.0	48.8	2901	0.45	0.46	97.7
	60	73	13.0	74.5	132.2	13.8	49.7	17.8	10.8	49.4	15.9	131.0	30.1	94.8	14.7	95.3	14.4	848	0.13	0.16	81.9
DDH 7	18.2	22.4	4.2	963.6	1391.7	123.7	367.9	45.8	15.5	58.6	11.9	79.5	16.7	48.4	7.5	51.6	7.6	474	0.08	0.37	21.1
including	20.2	22.4	2.3	1632.0	2352.3	209.7	621.8	77.8	26.6	101.4	20.7	138.9	29.0	84.0	13.0	88.8	13.0	830	0.13	0.62	21.6
	59	59.8	0.8	44.2	114.0	15.4	69.1	23.7	10.6	46.2	12.7	91.8	20.0	58.3	9.0	58.2	8.3	576	0.09	0.12	77.0
	64.5	65.5	1.0	32.4	59.5	7.0	33.8	22.8	16.3	85.7	30.2	249.0	58.8	182.0	30.0	201.0	29.2	1802	0.27	0.28	94.5
	81	83.2	2.2	40.3	79.4	8.7	36.3	24.4	21.3	121.6	44.4	373.1	89.3	280.5	45.2	301.2	44.2	2586	0.39	0.41	95.4
DDH 8	20.8	24.3	3.5	519.1	761.3	64.0	220.6	49.0	22.6	99.4	24.0	165.8	33.6	92.6	12.7	80.9	11.6	914	0.15	0.31	47.4
including	20.8	21.1	0.3	2040.0	2810.0	227.0	717.0	82.3	25.3	64.4	11.3	72.4	15.0	48.2	7.6	60.9	10.5	404	0.07	0.66	10.9
including	23.3	24.3	1.0	1080.0	1590.0	133.0	461.0	104.0	47.8	219.0	52.2	344.0	64.7	154.0	17.4	91.6	11.6	1702	0.27	0.61	44.5
	74	76	2.0	133.3	246.4	24.7	99.5	29.8	15.3	62.5	17.2	136.0	31.7	99.9	14.8	101.8	14.2	891	0.14	0.19	72.2
	90	94	4.0	70.8	147.5	16.6	70.5	40.3	21.4	82.1	20.0	145.3	32.2	98.8	14.4	98.2	13.7	937	0.15	0.18	80.9
DDH 9	24	26.7	2.7	11.8	23.9	3.1	14.5	17.9	15.0	78.4	24.9	193.4	44.0	139.6	21.9	147.5	21.7	1287	0.20	0.20	96.5

Hole ID	From	To	Width	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Total % HREE + Y	Total % TREE + Y	% of Total as HREE+Y
DDH 10	22.7	24	1.3	101.2	203.1	24.4	99.2	42.5	23.8	93.7	20.3	132.4	24.7	65.1	8.1	43.6	5.9	658	0.11	0.15	69.6
	29	32.1	3.1	293.1	461.8	54.3	316.1	204.7	60.4	157.1	17.4	69.4	10.8	26.3	3.6	23.0	3.6	304	0.07	0.20	33.7
including	29	29.4	0.4	869.0	1280.0	161.0	1140.0	690.0	172.0	373.0	31.5	101.0	15.0	40.0	5.9	39.2	6.1	469	0.13	0.54	23.2
DDH 11	24.4	34	9.6	283.0	477.4	59.8	292.1	176.3	56.2	160.2	22.4	110.5	20.5	59.4	9.2	62.5	10.0	556	0.11	0.24	45.3
including	30	31	1.0	1260.0	1990.0	239.0	1180.0	766.0	237.0	653.0	77.2	272.0	39.7	109.0	17.4	131.0	23.5	900	0.25	0.79	31.2
DDH 12	31.7	32.2	0.5	151.0	323.0	50.4	390.0	225.0	56.6	148.0	12.9	40.3	4.8	11.3	1.3	8.9	1.3	112	0.04	0.15	25.9
	43.2	44	0.9	34.4	65.5	7.4	32.6	20.1	12.9	61.0	15.4	117.0	24.9	78.1	12.5	79.7	11.5	804	0.12	0.14	88.4
	48.4	50	1.7	658.7	1151.6	130.9	794.2	462.0	107.2	335.2	38.6	155.6	24.7	65.2	9.0	55.6	7.9	787	0.16	0.48	33.2
DDH 13	39	40	1.0	153.0	310.0	43.5	291.0	173.0	45.2	107.0	8.6	28.1	3.9	9.8	1.2	8.7	1.4	95	0.03	0.13	24.1
	52	55	3.0	172.6	302.8	32.1	158.5	103.4	37.7	117.9	19.0	111.8	22.9	68.1	10.0	68.4	10.5	695	0.12	0.19	60.1
	57	59.2	2.2	245.6	428.7	43.3	205.4	124.2	41.6	128.8	17.6	85.4	14.6	35.7	4.2	25.1	3.5	398	0.08	0.18	41.9

Appendix 3: Drill Sections for the 2B Zone

Drill sections under trenches NLOFTR2B004, 010, 017, 021. Interpreted extent of alteration zone (brown shading) reflects the limits of alteration as mapped in drill core. In Sections labelled “A”, number bands show lithology (lower band) and ppm Y (upper). Rocktype legend key is below. Trench bar graph is total count radiometrics measured with a hand-held spectrometer. Radiometrics in drill holes measured by downhole spectrometer.

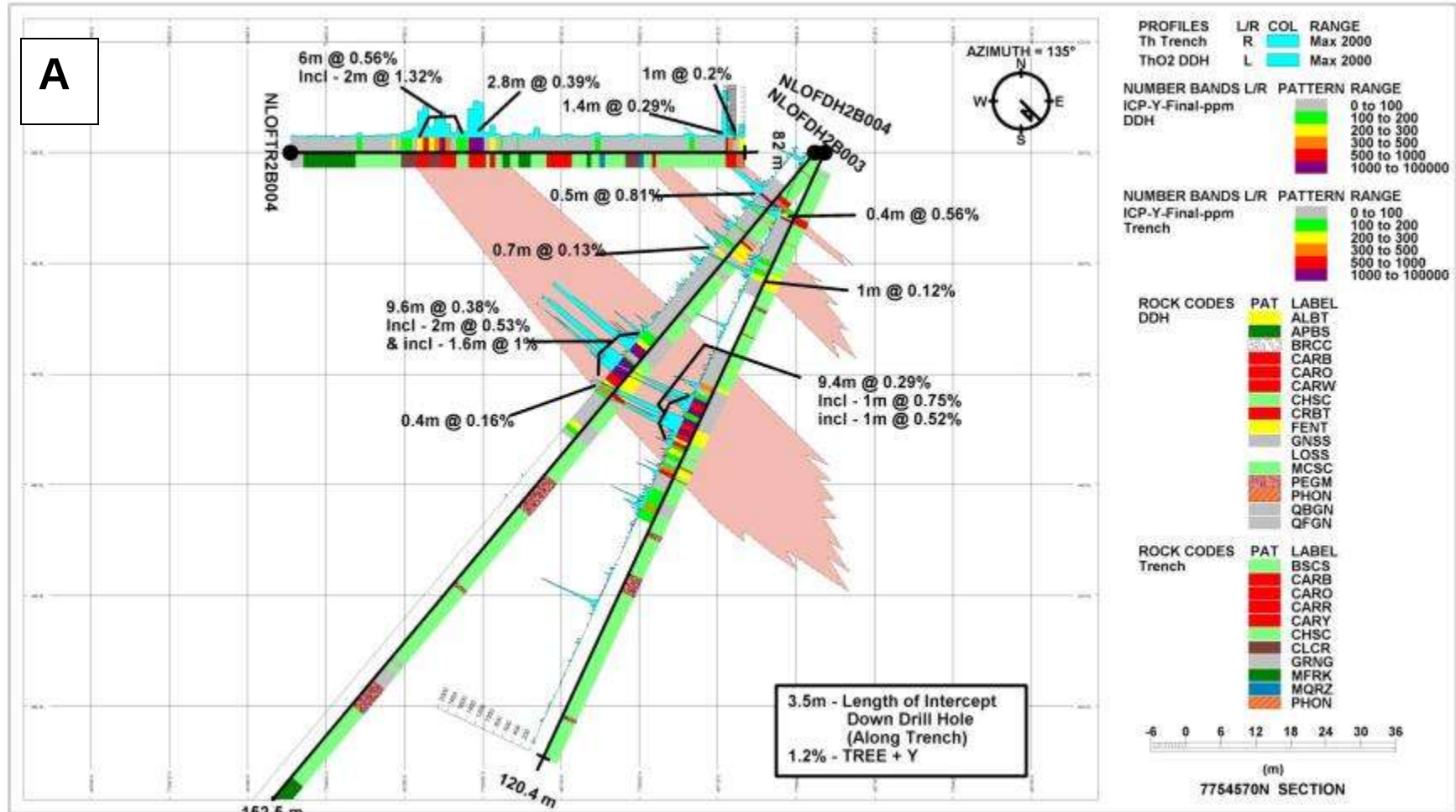
In Sections labelled “B”, upper bar is TREE+Y, lower bar is alteration intensity on a scale of three (high to low, purple, red, yellow)

Key to Lithological codes, Appendix 3 and Figure 13.3. Note that colour codes are different in some details for trenches and drill holes.

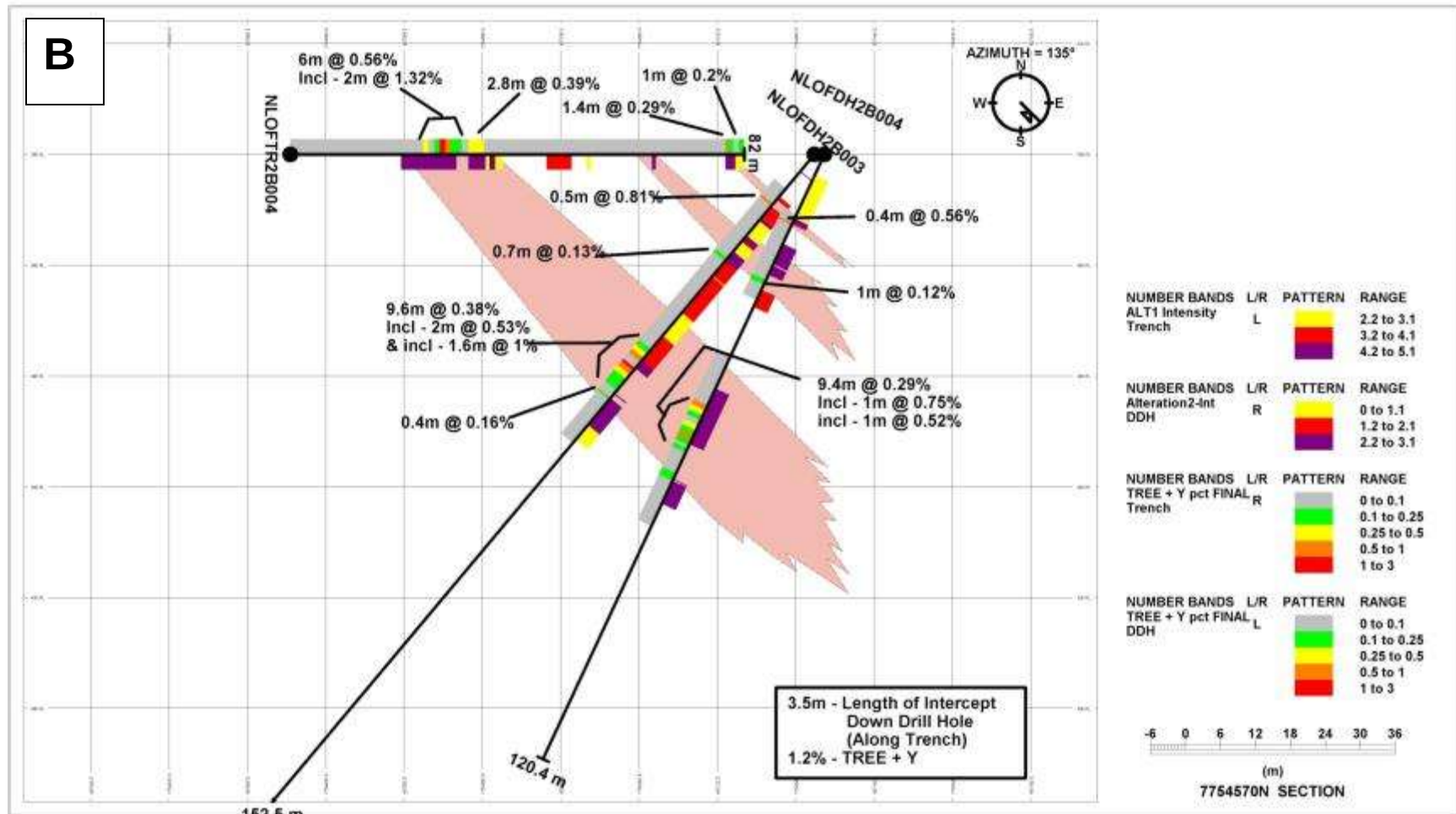
ALBT	Albitite
APBS	Amphibolite Schist
APBG	Amphibolite gneiss
BRCC	Breccia
BSCS	Biotite schist
BTGN	Biotite gneiss
CARB	Red-brown carbonatite
CARG	Grey-brown carbonatite
CARO	Orange carbonatite
CARR	Red carbonatite
CARW	Grey/white carbonatite
CARY	Yellow-brown or cream carbonatite
CHSC	Chloritic Schist
CLCR	Calcrete
CRBT	Carbonatite
FENT	Fenite
GNSS	Gneiss
GRAN	Granite
GRNG	Granite gneiss
MCSC	Mica Schist
MCVS	Muscovite schist
MFRK	Undifferentiated mafic rock
MQRZ	Meta-quartzite
NSMP	No Sample
PEGM	Pegmatite
PHON	Phonolite
QBGN	Quartz biotite gneiss

QFGN	Quartz feldspar gneiss
QMGN	Quartz muscovite gneiss
QZVN	Quartz vein
SCHT	Schist

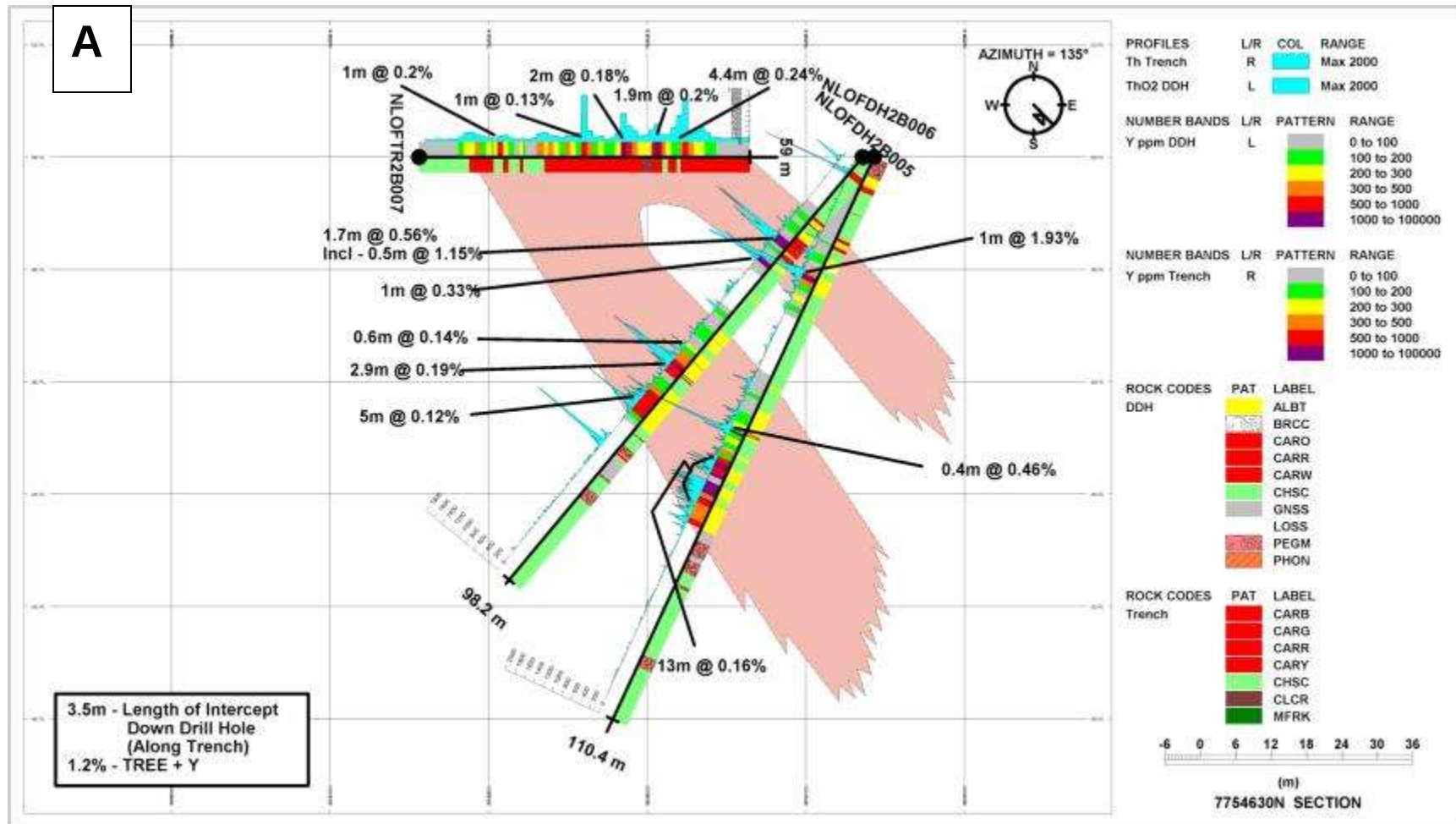
Trench NLOFTR2B004

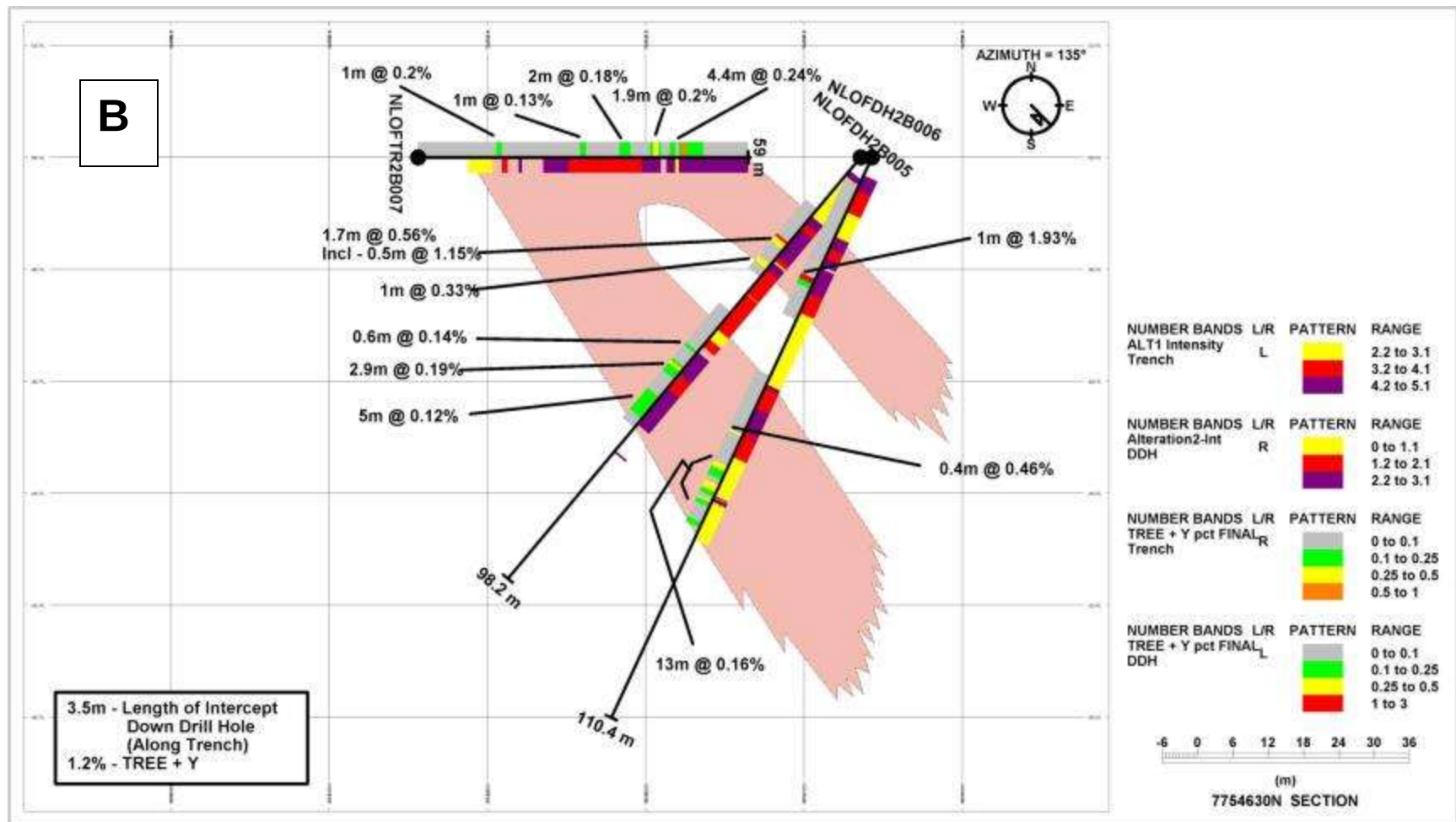


B

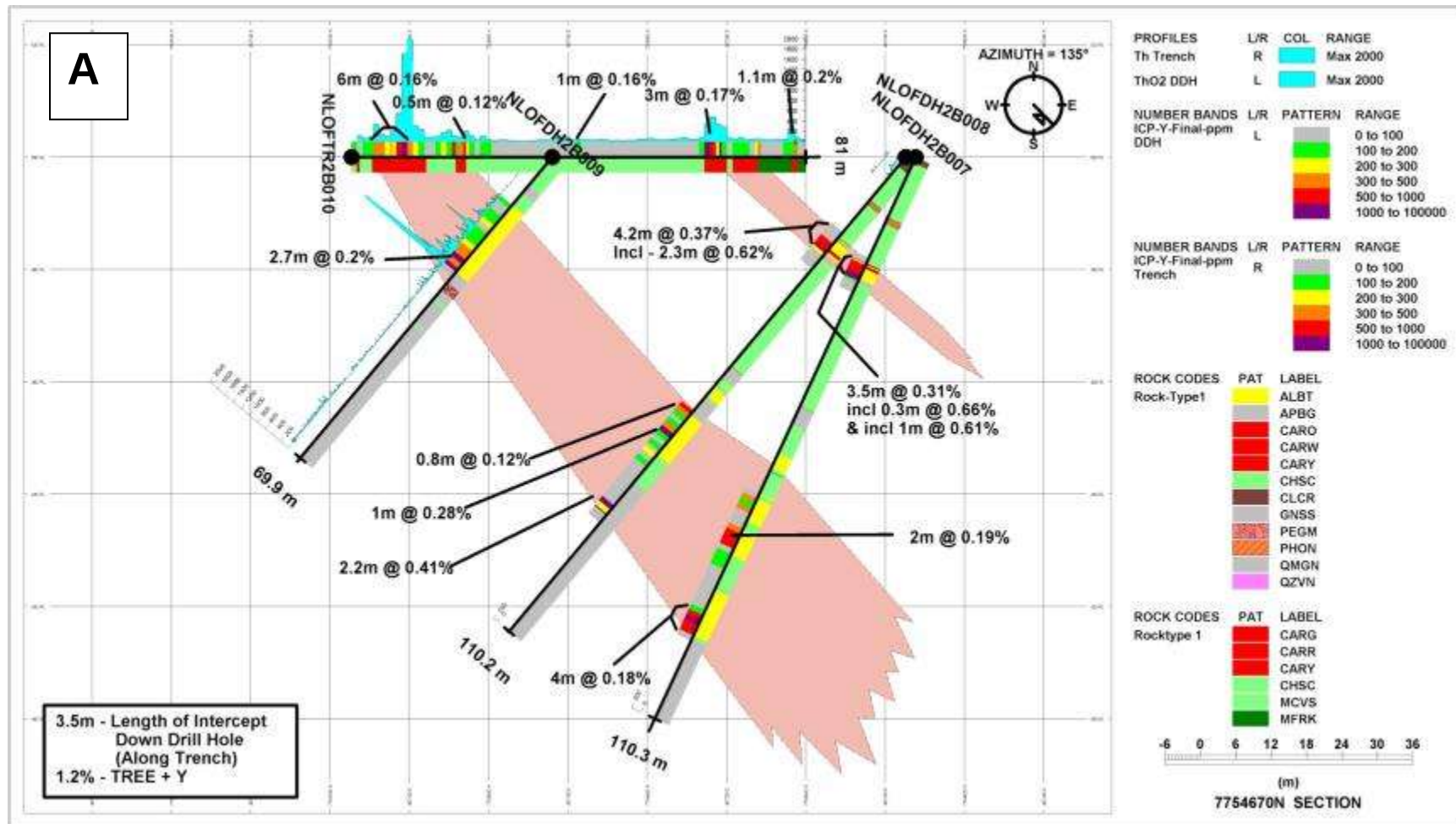


Trench NLOFTR2B007

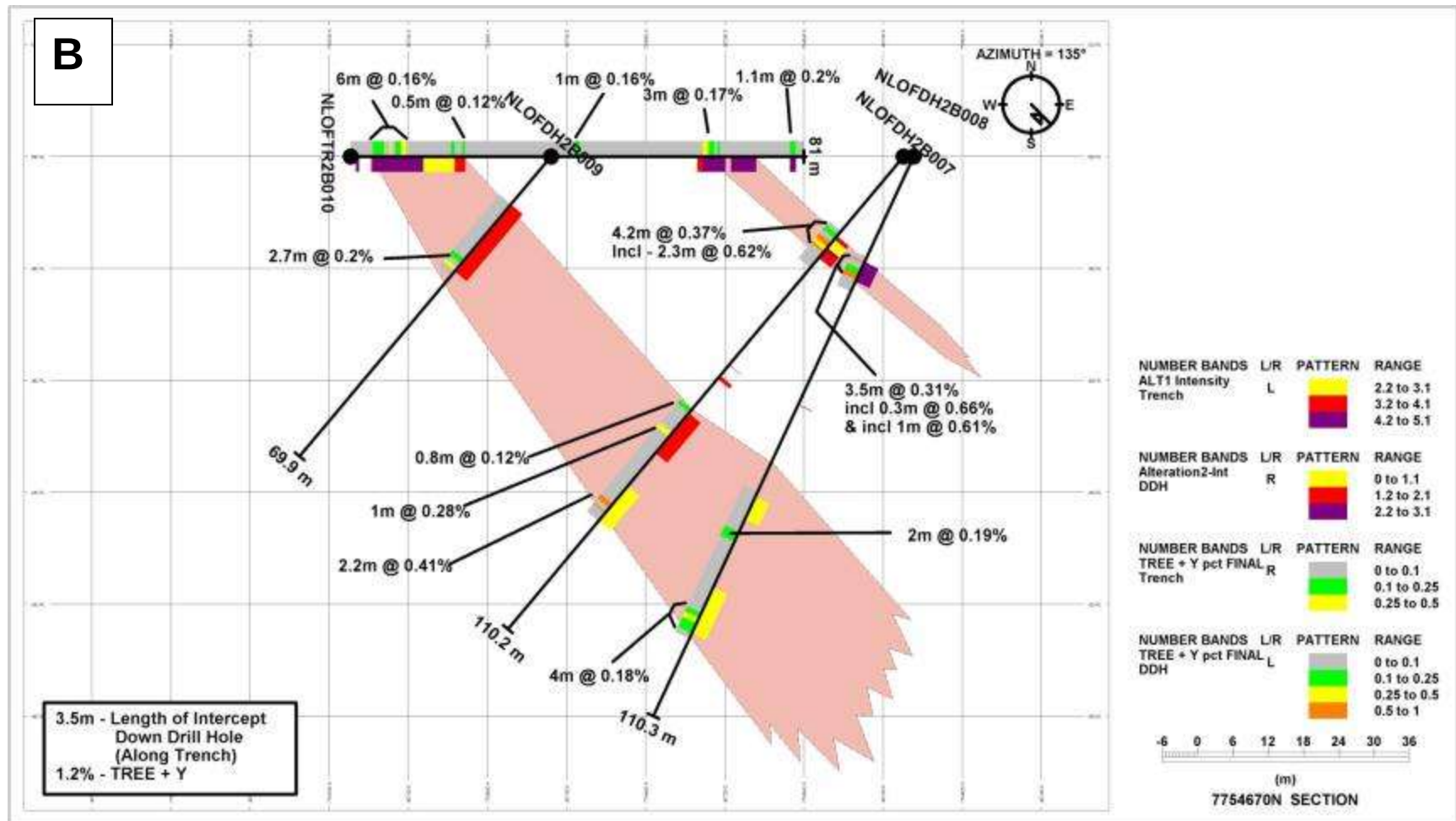




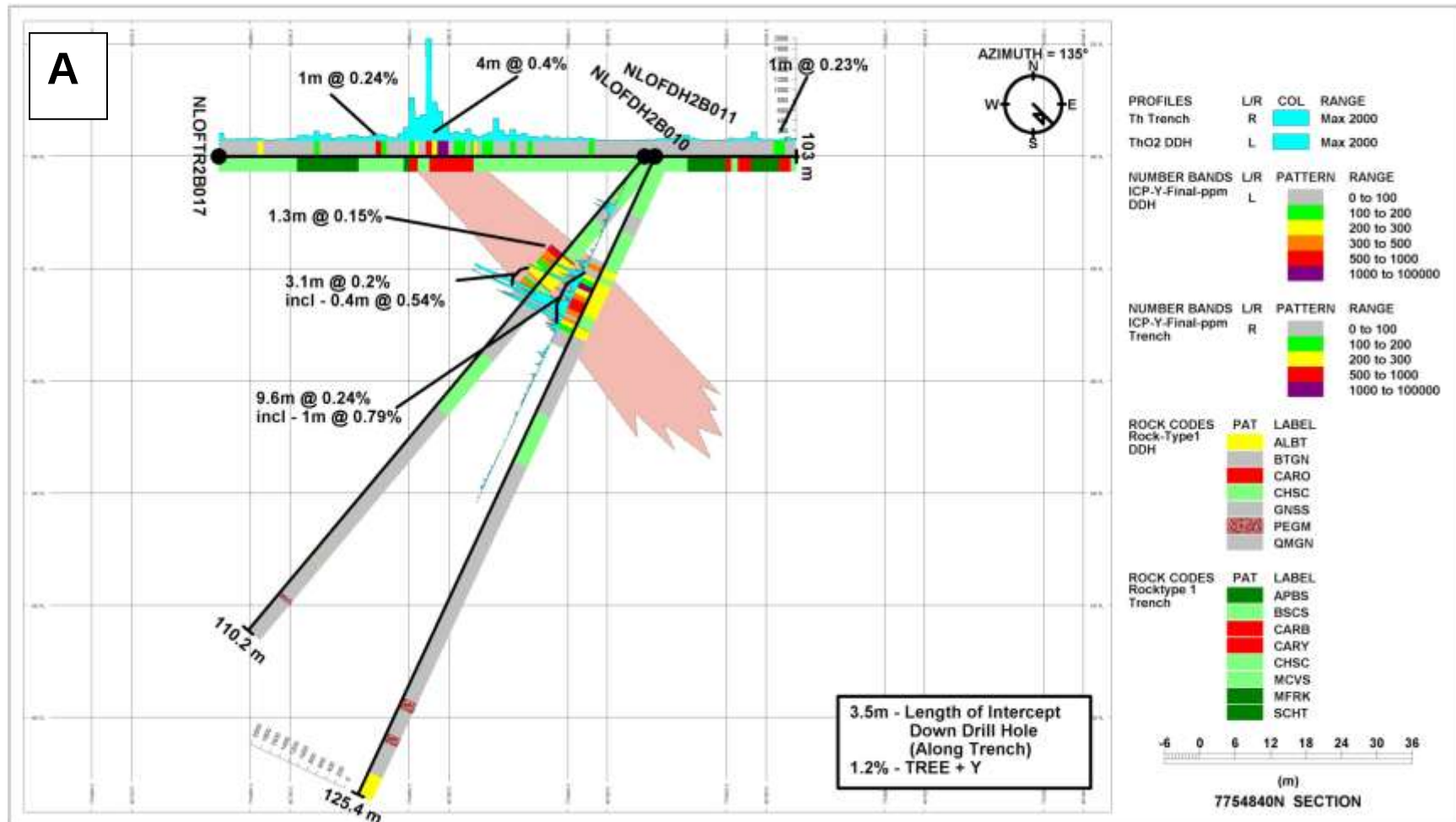
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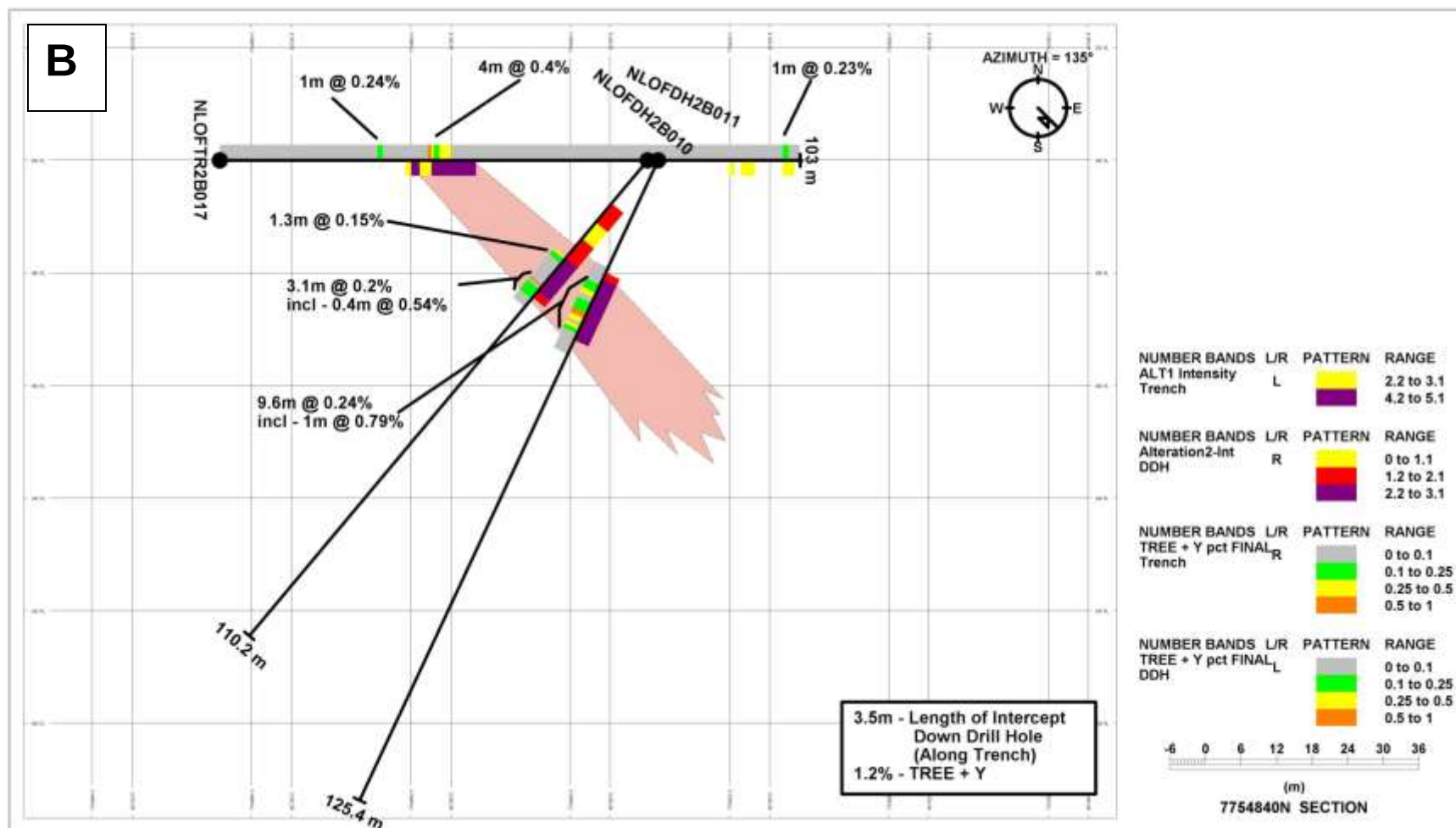


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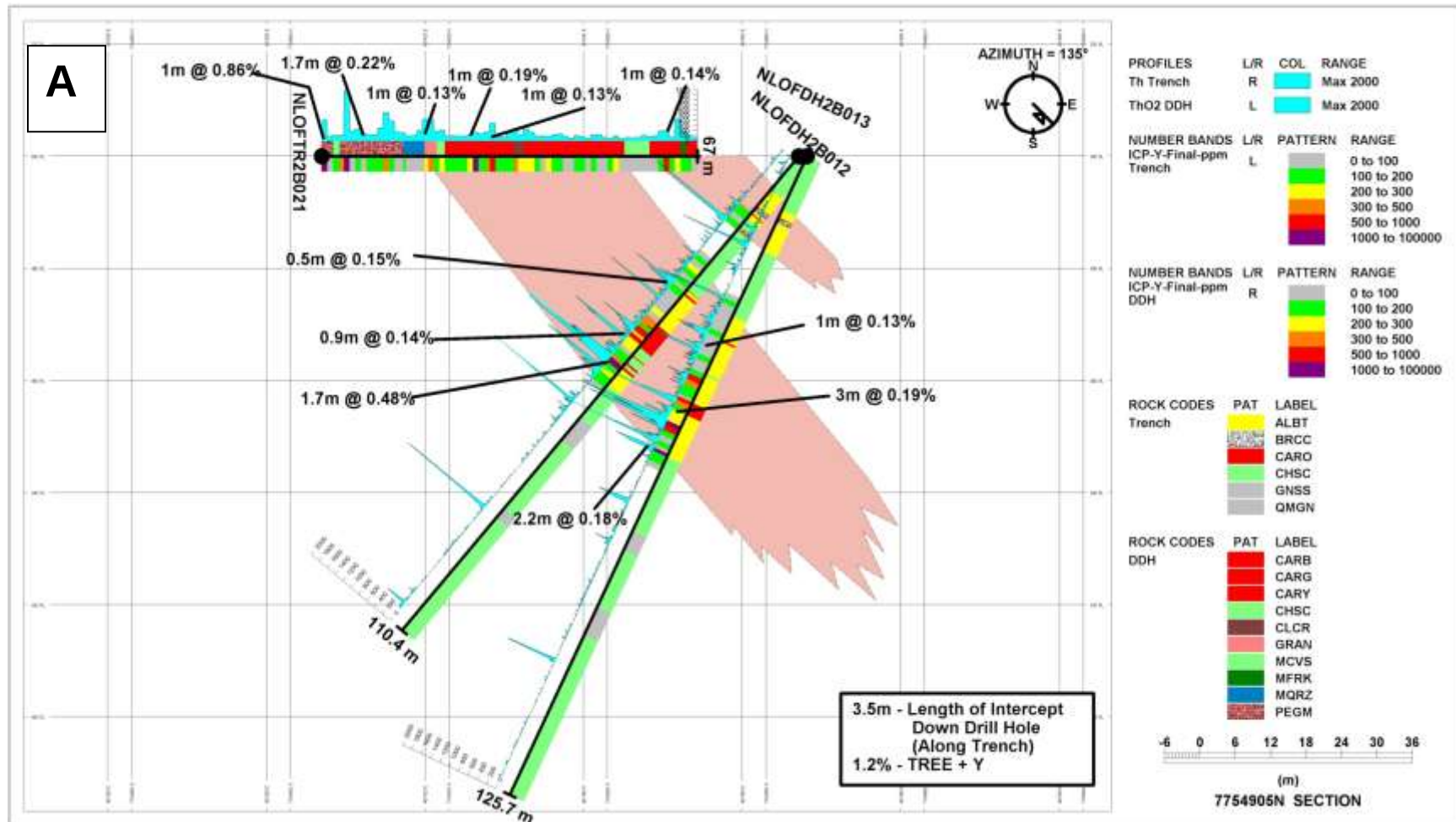


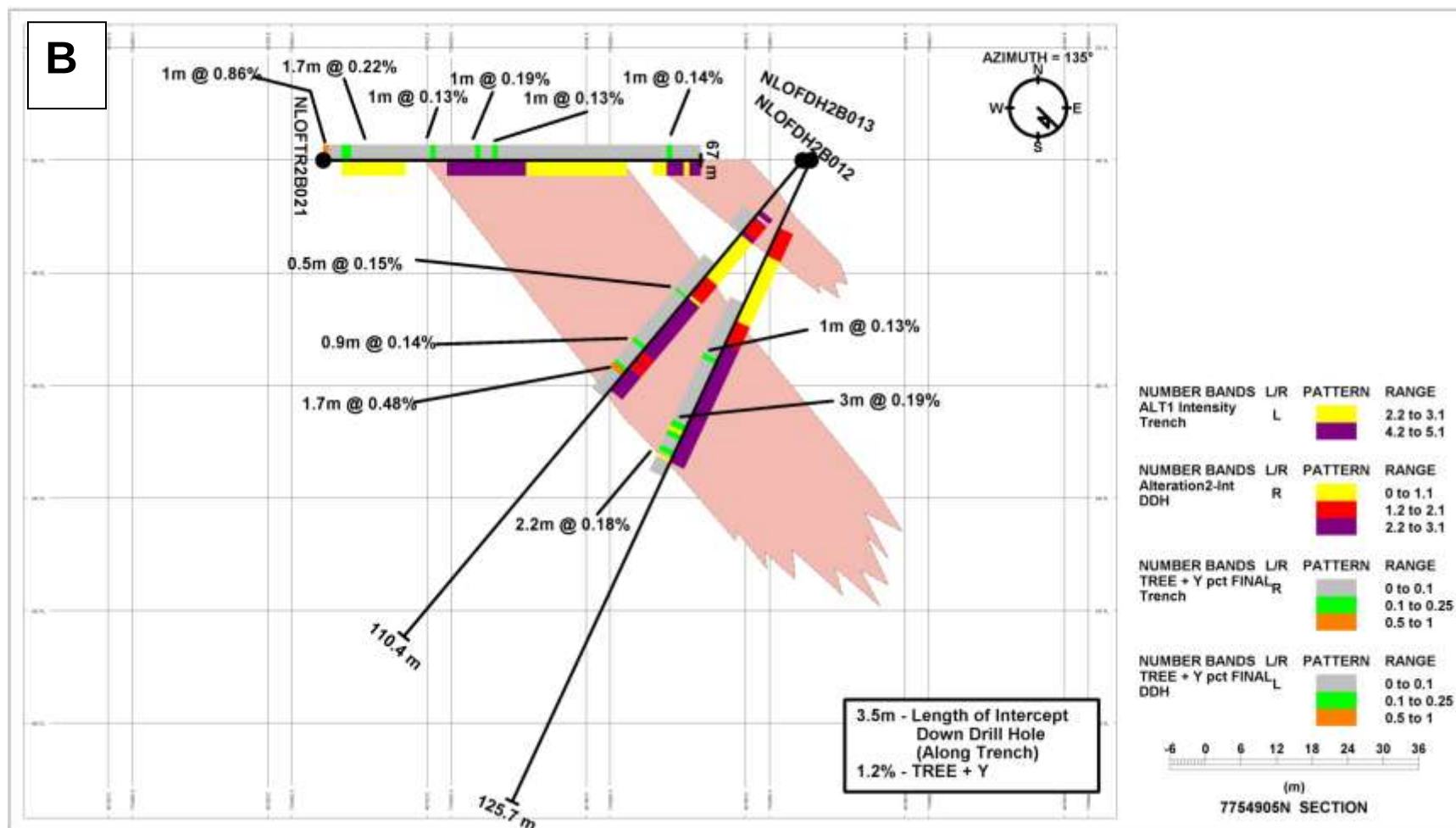
Trench NLOFTR2B017





Trench NLOFTR2B021





Appendix 4: Round Robin Analyses of Standards and Blanks for Regional Lithogeochemical Sampling

NRE (Pty) staff commissioned the creation of 3 REE standards from material gathered on the Lofdal project site to cover the range of REE concentrations observed and/or expected in rocks in this area. STD1 has a high REE content, STD2 a medium REE content, and STD3 a low REE content. In addition, a blank sample was sourced from a marble quarry near Karibib in Namibia. Samples were collected at the site and taken to an independent sample preparation laboratory owned by Dr. Claus Wibbleman in Okahanja. Each sample was crushed, pulverized, and homogenized and 50 gram samples were placed in small labelled ziploc bags. In January, 2010, 5 samples of each standard were sent to ALS-Chemex, SGS and Intertek labs for referee analysis. More recently 5 samples of each standard were sent to Actlabs for a fourth round of referee analysis. Results of these analyses, and the preferred values for the standards resulting from these analyses, are given in Tables A1.1, A1.2 and A1.3.

STD1

	Lab	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average	ALS-Chemex	463	927.4	113.1	515.8	962	506.6	1630	323.4	1974	367.6	966.4	127.1	689.4	86.5	9992	5000
StDev		8.00	12.70	2.30	8.07	15.76	9.29	28.94	6.66	40.22	7.23	19.81	3.11	14.91	1.73	205.72	
Average	Intertek	489.24	967.98	116.89	527.72	995.04	468.76	1851.6	325.17	1967.3	372.54	978.92	126.74	689.22	87.954	10868.8	8319.4
StDev		5.02	12.33	1.45	6.49	10.10	3.81	16.12	2.55	18.66	1.88	2.97	0.88	3.56	0.50	89.53	94.80
Average	SGS	498.4	1042	119.8	552.2	1012.6	504.8	1828	348.4	1976	392.6	1062	136.2	721.6	94.04	10700	6816
StDev		4.62	4.47	1.92	5.07	15.45	2.68	13.04	4.34	30.50	3.85	27.75	1.79	3.36	0.29	316.23	85.32
Average	Actlabs	480.4	976.8	112.8	566.4	1024	463.8	1692	320.8	1956	373	936.2	120.6	678.6	91.12	10576	8312
StDev		8.79	14.70	1.64	9.48	15.17	8.58	39.62	6.76	37.82	8.25	18.07	2.88	15.26	2.32	128.37	217.88

Average	All Labs	482.8	978.5	115.6	540.5	998.4	486.0	1750.4	329.4	1968.3	376.4	985.9	127.7	694.7	89.9	7952.8	7815.8
StDev	All Labs	14.8	43.5	3.4	21.5	27.4	21.2	97.9	12.4	31.2	11.2	51.0	6.1	19.4	3.3	4578.5	744.1

Table A1.1 Referee analyses (5 analyses for each laboratory) for internal standard STD-1. All values in ppm.

STD2

	Lab	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average	ALS-Chemex	6656.00	9698.00	858.40	2760.00	203.90	41.34	221.60	16.25	74.90	13.64	53.42	6.18	44.26	5.28	497.20	104.16
StDev		179.81	271.24	30.94	71.06	6.97	0.59	5.94	0.28	1.39	0.33	0.83	0.12	0.57	0.14	38.72	3.82
Average	Intertek	6520.77	9725.01	869.76	2451.29	201.59	39.31	99.08	12.76	69.64	13.52	38.23	5.45	35.78	4.61	456.64	118.01
StDev		48.12	33.12	8.65	27.29	1.71	0.44	0.48	0.05	0.46	0.14	0.30	0.06	0.20	0.04	8.20	2.35
Average	SGS	6124.00	9304.00	844.60	2336.00	211.60	42.32	160.00	21.68	92.56	16.86	58.22	7.69	46.12	6.53	498.40	134.60
StDev		56.83	58.14	9.45	18.17	1.95	0.99	2.00	0.43	0.98	0.30	0.16	0.08	0.71	0.08	3.36	2.19
Average	Actlabs	6228.00	9400.00	791.20	2468.00	213.00	38.80	131.80	13.98	73.92	15.18	46.10	6.62	42.96	6.38	487.60	115.20
StDev		71.90	113.80	6.98	25.88	2.74	0.46	3.03	0.64	0.33	0.11	2.46	0.10	0.55	0.11	2.51	8.41

Average	All Labs	6382.19	9531.75	840.99	2503.82	207.52	40.44	153.12	16.17	77.76	14.80	48.99	6.48	42.28	5.70	484.96	117.99
StDev	All Labs	240.09	233.40	34.64	164.85	6.18	1.60	46.31	3.53	9.04	1.41	7.85	0.84	4.05	0.82	25.17	12.05

Table A1.2 Referee analyses (5 analyses for each laboratory) for internal standard STD-2. All values in ppm.

STD3

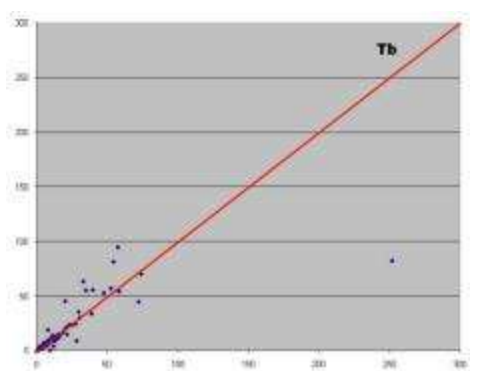
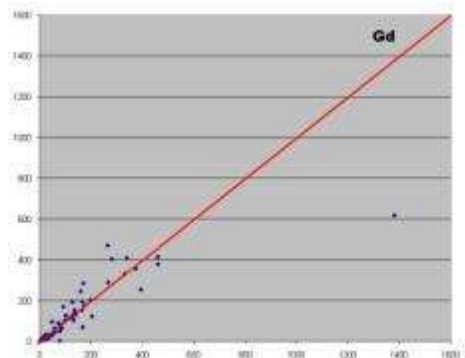
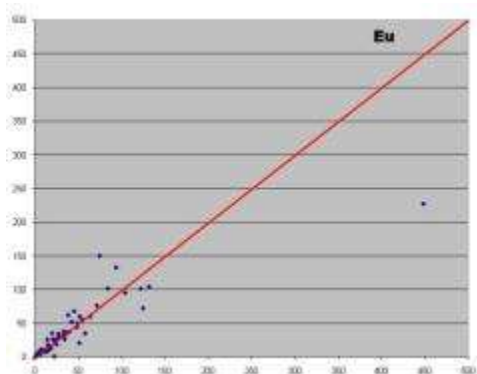
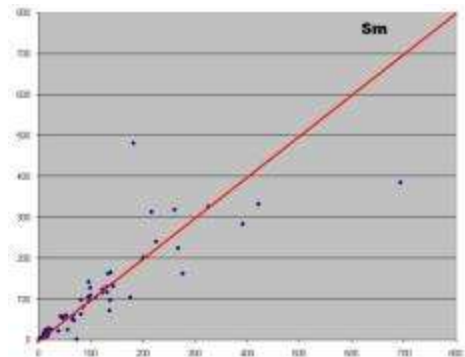
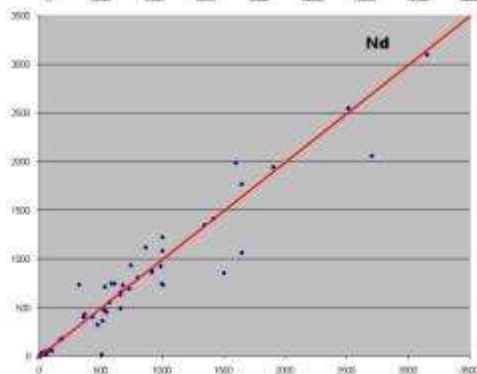
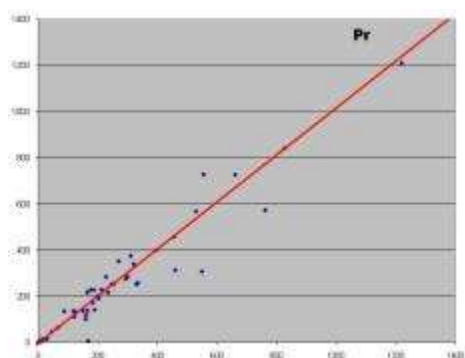
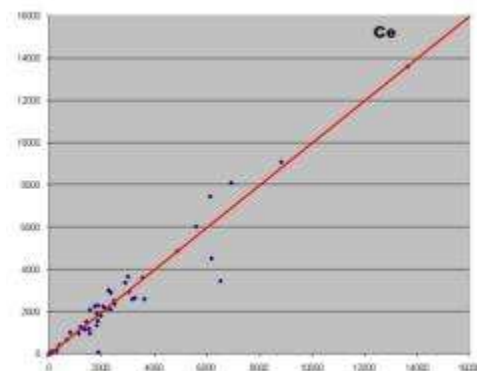
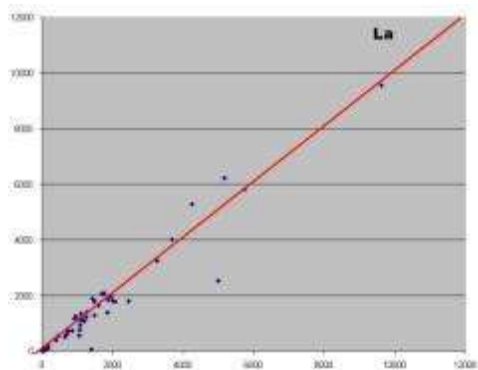
	Lab	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average	ALS-Chemex	0.71	1.1	0.094	0.3	0.031	0.018	0.068	0.009	0.057	0.01	0.033	0.005	0.021	0.006	0.32	0.17
StDev		0.72	1.11	0.10	0.31	0.02	0.01	0.05	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.16	0.12
Average	Intertek	1.57	2.378	0.221	1.052	0.118	0.024	0.068	0.012	0.058	0.01	0.04	0.005	0.026	0.004	0.438	0.39
StDev		2.90	4.23	0.37	0.90	0.08	0.02	0.04	0.01	0.03	0.01	0.02	0.00	0.01	0.00	0.18	0.29
Average	SGS	0.05	0.05	0.025	0.05	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.05	0.025	0.35	0.07
StDev		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.03
Average	Actlabs	1.26	1.96	0.198	0.72	0.24	0.088	0.3	0.05	0.34	0.06	0.16	0.025	0.1	0.02	2	0.94
StDev		0.57	0.76	0.07	0.19	0.05	0.03	0.12	0.00	0.17	0.02	0.09	0.00	0.06	0.00	1.22	0.40

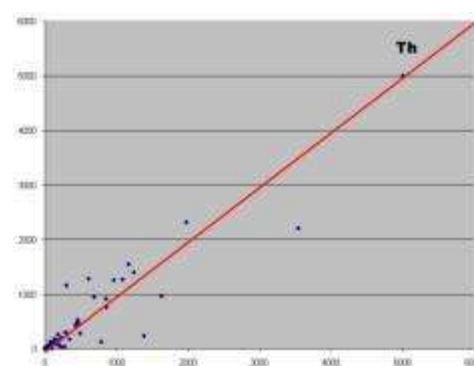
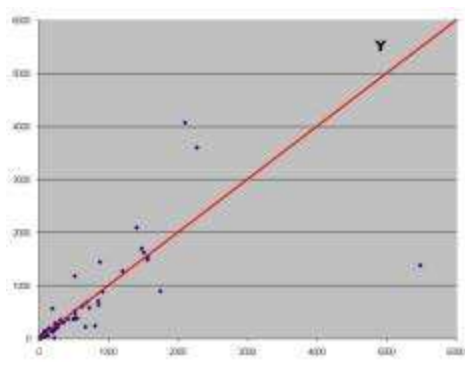
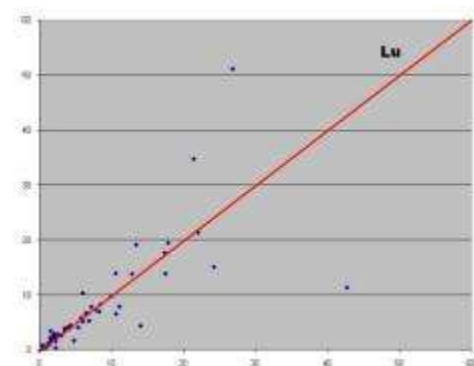
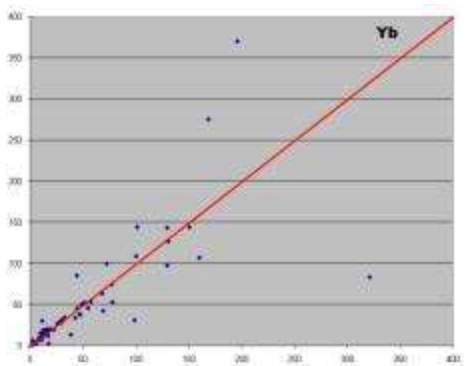
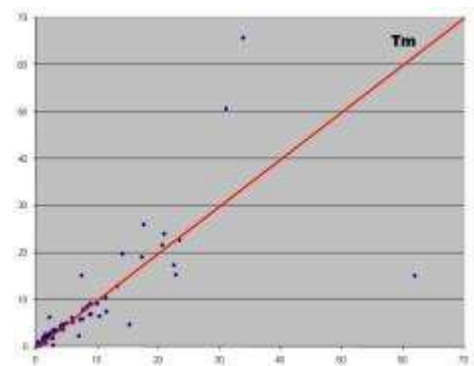
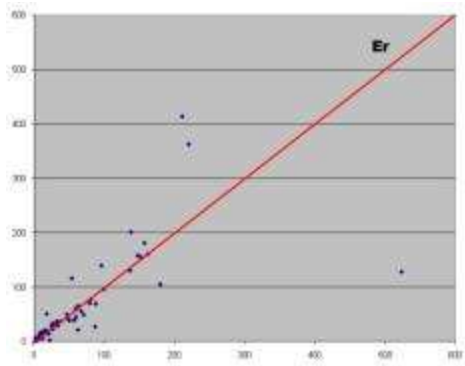
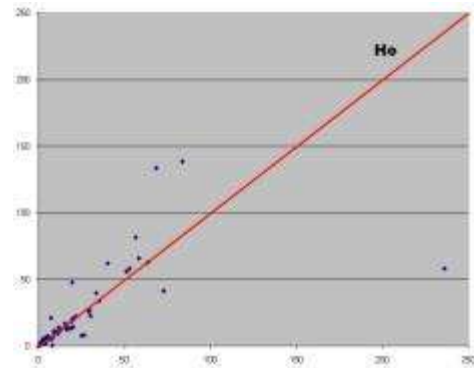
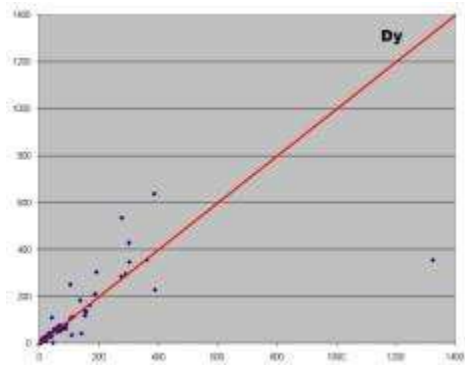
Average	All Labs	0.78	1.18	0.11	0.47	0.07	0.02	0.05	0.02	0.05	0.02	0.03	0.01	0.03	0.01	0.37	0.392
StDev	All Labs	1.72	2.54	0.22	0.67	0.06	0.01	0.04	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.16	0.293

Table A1.3 Referee analyses (5 analyses for each laboratory) for internal standard STD-3. All values in ppm.

Appendix 5: Plots of Duplicates for Regional Lithogeochemical Sampling

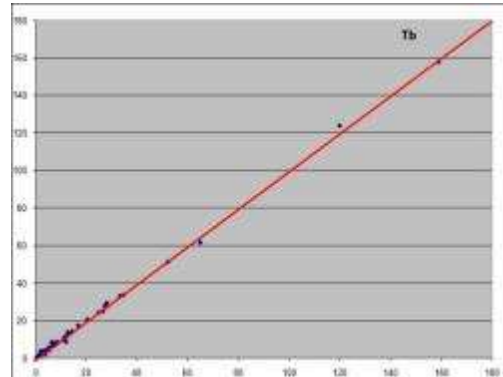
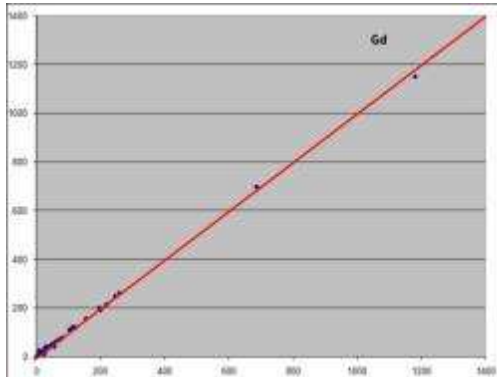
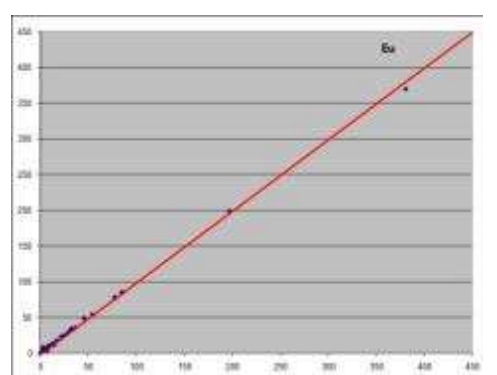
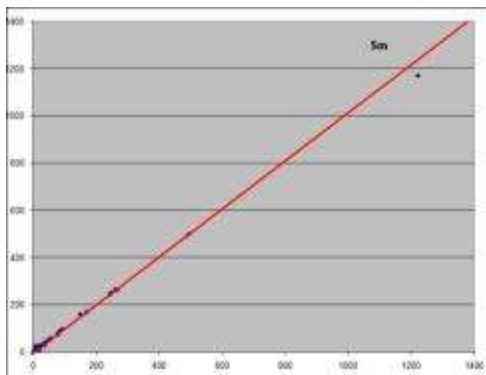
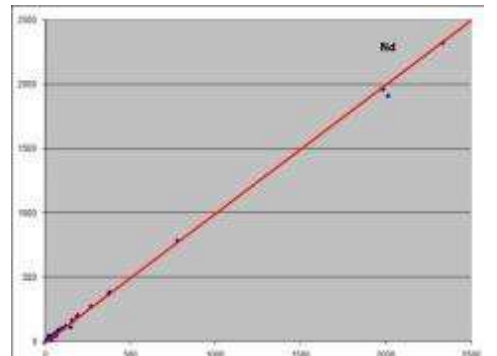
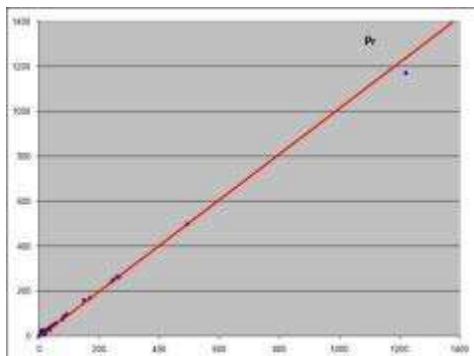
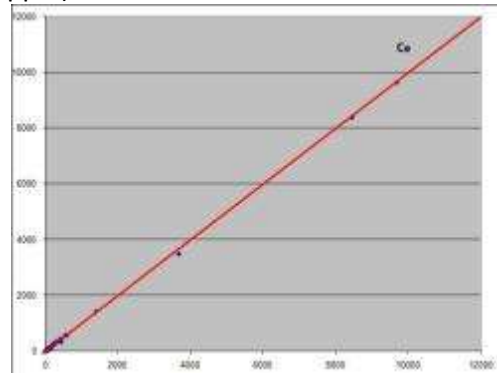
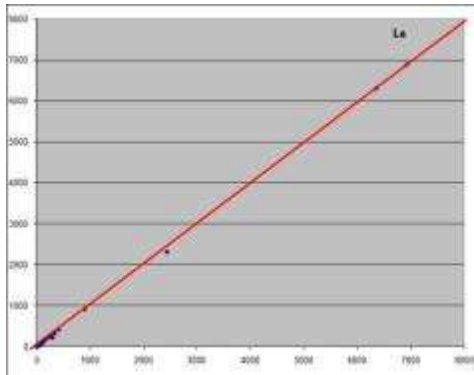
(All values in ppm)

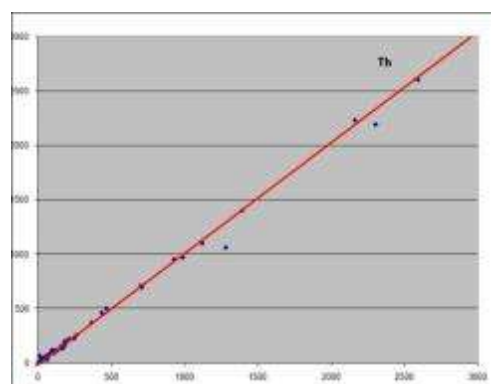
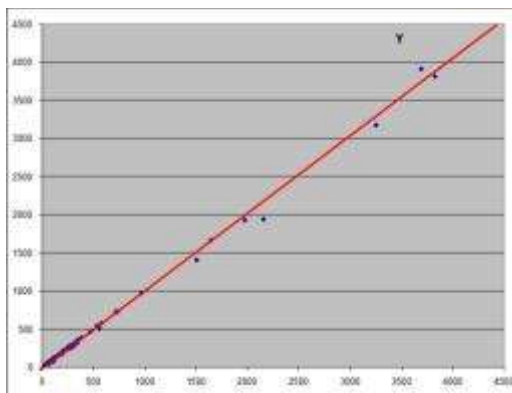
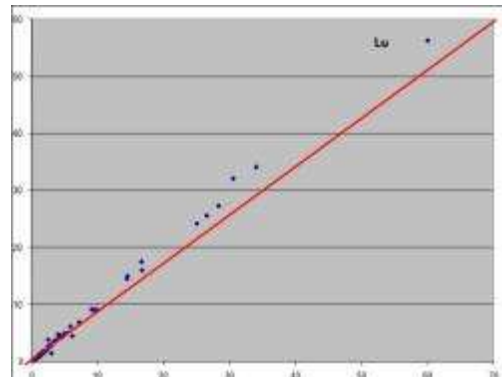
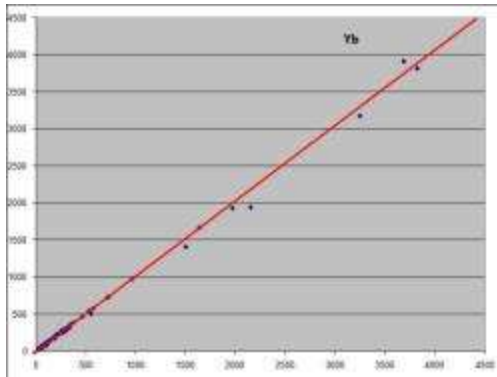
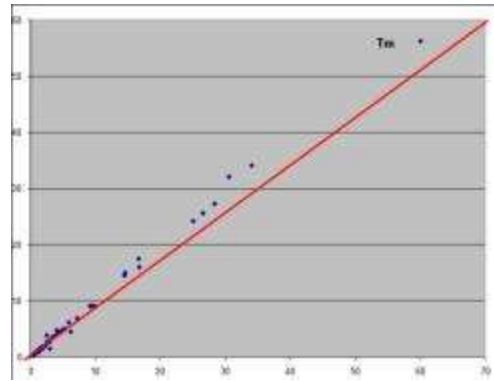
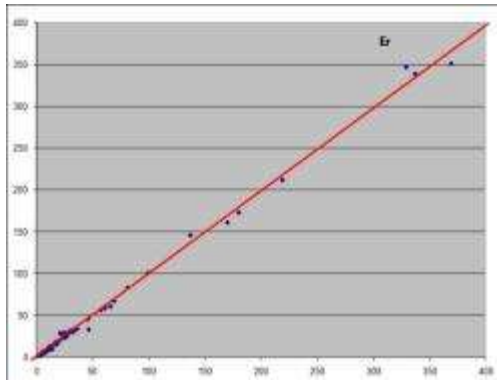
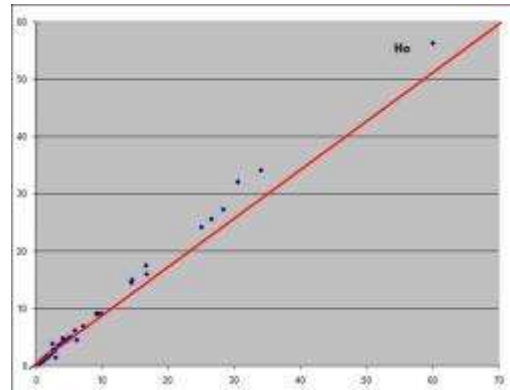
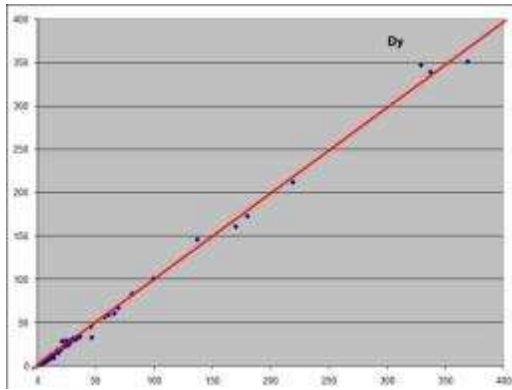




Appendix 6: Plots of Duplicates for Trenching and Diamond Drilling

(All values in ppm)





Appendix 7 – Analyses of Standards Used During Regional Lithogeochemical Sampling, Trenching and Diamond Drilling.

Summary of analyses of STD1 during the regional lithogeochemical program. Top rows (Average All and St. Dev.) are averages of five analyses from each of four referee laboratories (preferred values). Samples highlighted in purple are >15% different from preferred values.

STD1 (All values in ppm)

Sample-No	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th	LREE	HREE	TREE+Y
Average All	483	979	117	532	990	493	1770	332	1972	378	1002	130	700	89.5	10520	7568	3100.3	6867.6	20488.1
St. Dev.	14.8	50.1	3.4	16.9	25.3	18.9	104.6	12.6	29.0	12.1	47.6	4.9	17.8	3.5	444.5	796.9			

Regional Lithogeochemical Campaign, 2009-2010

NLOFR0927	449	897	109	500	956	479	1465	305	1840	345	941	119	651	83.1	9320	5000	2911 0	6228.1	18459.1
NLOFR0957	483	961	117	536	1005	497	1525	317	1875	350	958	124	659	85.1	9450	5000	3102 0	6390.1	18942.1
NLOFR0987	464	926	116.5	516	988	474	1465	303	1820	339	920	117.5	629	80.9	9540	5000	3010 5	6148.4	18698.9
NLOFR1017	449	960	109.5	488	923	487	1535	334	1855	392	918	135	657	93.3	9000	5000	2929 5	6406.3	18335.8
NLOFR1517	502	1000	125.5	515	1005	505	1560	318	1940	333	949	114.5	690	85.6	12450	5000	3147 5	6495.1	22092.6
NLOFR1547	484	947	116.5	481	899	511	1570	310	1900	329	954	113	650	82.3	10550	5000	2927 5	6419.3	19896.8
NLOFR1577	520	1050	128.5	519	1030	496	1455	289	1800	309	890	109.5	633	77.9	11550	5000	3247 5	6059.4	20856.9
NLOFR1607	434	883	111	486	964	471	1450	302	1825	337	906	116.5	633	80.8	9290	5000	2878 0	6121.3	18289.3
NLOFR1637	435	935	106.5	479	904	482	1530	335	1860	395	932	136.5	663	94	9030	5000	2859 5	6427.5	18317.0
NLOFR1667	430	922	105.5	476	907	478	1515	332	1860	396	936	136	664	93.5	8950	5000	2840 5	6410.5	18201.0
NLOFR1827	455	927	112.5	494	914	492	1520	318	1850	358	956	120.5	649	84.5	9000	5000	2902 5	6348.0	18250.5
NLOFR1879	441	879	109	478	905	484	1525	319	1865	359	964	122.5	653	86.1	9240	5000	2812 0	6377.6	18429.6
NLOFR1899	437	870	109.5	492	931	484	1560	324	1850	358	921	122	659	85	8800	5000	2839 5	6363.0	18002.5
NLOFR1919	419	832	105	475	916	478	1565	324	1870	361	916	122	659	84.8	8870	5000	2747 0	6379.8	17996.8
NLOFR1939	436	866	108	483	919	477	1555	320	1855	360	907	122	662	84.2	8850	5000	2812 0	6342.2	18004.2

Re-assay of 2008 Samples

ER12617Z	484	954	119	536	993	527	1680	341	2030	379	982	129.5	705	90.6	9760	5000	3086 0	6864.1	19710.1
ER12867Z	471	932	115.5	509	952	503	1670	330	1970	380	975	128.5	699	87.8	9560	5000	2979 5	6743.3	19282.8
ER13887Z	467	941	118.5	512	958	521	1685	335	2010	381	987	132	704	90.6	9560	5000	2996 5	6845.6	19402.1
ERN15229Z	456	911	113	497	954	505	1620	312	1955	372	960	127	630	90.1	9350	5000	2931 0	6571.1	18852.1
ERN15500Z	478	939	117	497	915	496	1580	319	1835	359	929	127.5	659	86	9850	5000	2946 0	6390.5	19186.5
ERN18190Z	447	895	111	477	888	503	1560	313	1840	354	928	124.5	659	85	9330	5000	2818 0	6366.5	18514.5

Two standards were used during trenching (STD1, STD2); Two additional standards (SARM1 and AMIS185) were also used during drilling. Preferred values from four referee laboratories for in-house standards and certified values for SARM1 and AMIS185 are given ("Average All"). Analyses that are 10% greater or less than preferred values are highlighted.

STD1 (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average All			482.8	978.5	115.6	540.5	998.4	486.0	1750.4	329.4	1968.3	376.4	985.9	127.7	694.7	89.9	7952.8	7815.8
St. Dev.			14.8	43.5	3.4	21.5	27.4	21.2	97.9	12.4	31.2	11.2	51.0	6.1	19.4	3.3	4578.5	744.1
NLOFDH2B001	DDH	NLOFDDH0030	520	984	119	563	1090	451	1720	322	1970	374	966	125	692	90.7	10540	8350
NLOFDH2B002	DDH	NLOFDDH0090	452	951	108	506	947	442	1650	304	1830	353	922	120	674	91.6	10520	8390
NLOFDH2B005	DDH	NLOFDDH0270	489	948	119	574	963	452	1670	313	1880	345	910	119	681	91.6	10390	8130
NLOFDH2B006	DDH	NLOFDDH0330	508	951	116	559	979	456	1620	299	1880	359	922	119	678	92	9819	8190
NLOFDH2B008	DDH	NLOFDDH0420	476	943	114	529	959	461	1670	302	1830	349	907	117	651	80.9	10060	8260
NLOFDH2B012	DDH	NLOFDDH0550	493	1030	118	562	1010	479	1720	303	1830	349	919	126	685	90.8	9989	8160
NLOFTR2B001	Trench	NLOFR2309	464	933	110	530	962	434	1600	306	1840	341	883	119	667	89.3	10200	8550
NLOFTR2B001	Trench	NLOFR2349	493	969	117	557	1020	458	1680	322	1920	360	941	122	688	92.5	10600	8160
NLOFTR2B001	Trench	NLOFR3469	478	948	115	560	983	466	1560	309	1850	354	922	115	634	83.2	9907	8560
NLOFTR2B002	Trench	NLOFR2389	512	1020	117	565	1020	463	1770	324	1920	356	930	123	694	94	10490	8390
NLOFTR2B002	Trench	NLOFR2429	473	947	112	537	961	429	1590	294	1790	346	923	116	655	88.3	10160	8360
NLOFTR2B002	Trench	NLOFR3509	489	966	118	579	986	474	1560	309	1870	357	926	116	640	83.6	9982	8710
NLOFTR2B003	Trench	NLOFR2469	476	952	119	559	986	444	1640	328	1920	352	919	126	710	94.7	10240	7970
NLOFTR2B003	Trench	NLOFR2509	462	942	116	546	959	455	1670	308	1850	343	904	122	692	92.1	10360	8030
NLOFTR2B003	Trench	NLOFR3549	477	898	113	493	914	429	1560	314	1810	348	870	122	667	88.4	10130	8290
NLOFTR2B004	Trench	NLOFR2549	510	940	116	543	962	459	1690	313	1850	333	878	121	699	92.3	10320	8280
NLOFTR2B004	Trench	NLOFR2589	492	947	112	557	936	440	1690	307	1840	341	900	118	646	86.3	11710	8280
NLOFTR2B004	Trench	NLOFR3589	503	951	118	536	985	465	1660	306	1880	354	916	115	654	90.2	10790	7840
NLOFTR2B005	Trench	NLOFR2629	513	991	114	563	964	460	1670	311	1950	362	926	120	691	92.6	11240	8380
NLOFTR2B006	Trench	NLOFR2669	499	964	112	557	962	448	1670	313	1920	355	915	118	675	90.2	10760	8030
NLOFTR2B006	Trench	NLOFR2709	488	971	117	580	970	450	1690	316	1870	346	903	119	670	88.7	10870	8020
NLOFTR2B007	Trench	NLOFR2749	486	951	115	574	971	451	1720	316	1900	353	941	124	676	90	10830	8110
NLOFTR2B007	Trench	NLOFR2789	514	968	120	589	985	467	1710	338	2000	368	945	123	697	95.3	11260	8390
NLOFTR2B008	Trench	NLOFR2829	461	908	108	507	962	457	1710	303	1740	313	832	110	658	87.9	10810	8590
NLOFTR2B008	Trench	NLOFR2869	454	906	118	544	983	463	1590	296	1800	346	912	119	681	93.8	10330	8200
NLOFTR2B008	Trench	NLOFR2909	500	956	120	544	995	451	1680	314	1890	349	896	116	665	89.4	10030	8000
NLOFTR2B009	Trench	NLOFR2949	460	971	113	535	965	455	1640	307	1850	352	907	118	664	90.8	9993	7880

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFTR2B009	Trench	NLOFR3029	513	957	120	573	1010	453	1680	309	1820	338	877	116	674	91	10410	8300
NLOFTR2B010	Trench	NLOFR3069	508	985	113	567	1010	448	1650	308	1860	350	888	114	668	90.6	10600	8040
NLOFTR2B010	Trench	NLOFR3109	518	1020	115	577	980	462	1680	309	1890	359	918	119	680	90.9	10210	8190
NLOFTR2B010	Trench	NLOFR3149	514	1000	113	560	943	443	1600	300	1840	349	906	118	679	90.2	10210	8330
NLOFTR2B011	Trench	NLOFR3189	486	969	108	531	970	447	1610	297	1840	357	978	127	666	88.5	10440	8270
NLOFTR2B011	Trench	NLOFR3229	471	958	121	556	1000	421	1560	302	1850	359	978	127	700	93.4	10990	8030
NLOFTR2B012	Trench	NLOFR3269	524	978	119	561	993	435	1670	325	1740	349	879	122	662	86.4	10200	8250
NLOFTR2B012	Trench	NLOFR3309	515	1010	120	545	990	446	1730	335	1870	362	895	125	695	81.2	10440	8490
NLOFTR2B012	Trench	NLOFR3349	476	983	121	559	1000	470	1640	332	1880	376	937	124	685	84.9	10080	8280
NLOFTR2B013	Trench	NLOFR3389	482	956	111	537	949	444	1650	317	1890	341	920	117	642	83		8160
NLOFTR2B013	Trench	NLOFR3429	483	994	114	564	994	478	1690	331	1840	352	906	123	680	86.3	9899	8620
NLOFTR2B014	Trench	NLOFR3749	513	975	116	550	989	454	1680	297	1860	353	912	121	686	90.9	9492	8460
NLOFTR2B015	Trench	NLOFR3789	495	996	113	550	996	474	1690	316	1930	368	922	120	691	92.2	9512	8370
NLOFTR2B015	Trench	NLOFR3829	457	948	116	547	1010	482	1850	337	1970	356	915	122	699	94	10310	8060
NLOFTR2B016	Trench	NLOFR3869	475	941	117	558	999	433	1610	301	1830	348	913	122	707	96	9807	8130
NLOFTR2B016	Trench	NLOFR3909	465	929	117	532	974	434	1640	312	1820	346	877	115	684	97.8	10100	8260
NLOFTR2B017	Trench	NLOFR3949	475	952	119	546	970	462	1610	307	1860	347	908	122	701	93.1	9515	8320
NLOFTR2B017	Trench	NLOFR3989	495	975	109	551	968	455	1660	314	1900	358	955	123	683	91.1	9375	8330
NLOFTR2B024	Trench	NLOFR3629	532	1050	115	556	978	478	1720	329	1950	362	930	127	678	96.7	9706	7970
NLOFTR2B025	Trench	NLOFR3669	463	930	117	541	1010	444	1630	296	1820	353	911	118	685	96.2	9642	8120
NLOFTR2B025	Trench	NLOFR3709	467	945	115	555	966	464	1580	296	1820	336	871	115	697	95.6	9711	8270

STD2 (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average All			6382	9532	841	2504	207.5	40.44	153.1	16.17	77.76	14.8	48.99	6.48	42.28	5.7	484.96	117.99
St. Dev.			240.1	233.4	34.64	164.9	6.18	1.6	46.31	3.53	9.04	1.41	7.85	0.84	4.05	0.82	25.17	12.05
NLOFDH2B005	DDH	NLOFDDH0290	6290	9200	774	2500	213	41.1	142	13.3	76.4	16.7	50.4	7.14	44.5	6.52	487	126
NLOFDH2B006	DDH	NLOFDDH0370	6070	9150	777	2390	208	39.4	119	13.5	72.4	15.5	49	7.03	42.8	6.42	446	117
NLOFDH2B008	DDH	NLOFDDH0460	6210	9100	818	2330	211	40	116	13	74.8	15.5	50.2	6.79	44.3	6.23	484	123
NLOFDH2B012	DDH	NLOFDDH0530	6150	9300	784	2300	199	38.6	101	12.2	71.4	14.1	45.7	6.62	42.6	6.14	465	115
NLOFTR2B001	Trench	NLOFR2329	6250	9060	801	2400	209	38.4	114	14.1	71.8	15	43.9	6.54	42.3	6.22	488	112
NLOFTR2B001	Trench	NLOFR2369	6290	9390	775	2380	209	37.9	104	12.9	72.2	15.1	44.4	6.73	43.7	6.33	488	113
NLOFTR2B001	Trench	NLOFR3449	6030	8920	772	2330	194	38.2	108	12.7	68.2	14.3	44.6	6.51	42.5	5.99	468	117
NLOFTR2B002	Trench	NLOFR2409	6200	9340	785	2450	208	37.9	121	14.2	71.9	14.1	43.5	6.44	41.9	6.18	487	120
NLOFTR2B002	Trench	NLOFR3489	5770	8500	727	2240	184	35.9	98.4	11.2	65.5	13.6	43.3	5.85	37.4	5.32	486	112
NLOFTR2B003	Trench	NLOFR2449	6230	9220	792	2480	204	39.2	130	14.4	76.4	15.2	46.6	6.85	44	6.53	532	118
NLOFTR2B003	Trench	NLOFR2489	6030	9060	756	2400	197	37.6	135	14.4	75.8	15.1	44.5	6.75	42.5	6.18	528	116
NLOFTR2B003	Trench	NLOFR3529	6140	9000	787	2320	208	39.1	122	13	75.2	15.7	50.9	7.03	45.3	6.46		123
NLOFTR2B004	Trench	NLOFR2529	6040	8860	746	2360	196	37.5	136	14	74.4	14.7	44.3	6.65	42.3	6.14	528	122
NLOFTR2B004	Trench	NLOFR2569	6240	9340	753	2450	202	38.6	112	13.7	74.7	14.9	45.3	6.74	42.2	6.15	554	122
NLOFTR2B004	Trench	NLOFR3569	6200	9180	787	2470	218	41	136	14	73.7	15.1	45.3	6.79	43	6.46	513	129
NLOFTR2B005	Trench	NLOFR2609	6220	9250	745	2420	200	38	110	13.3	74.1	14.8	45.7	6.63	41.2	6.02	560	125
NLOFTR2B005	Trench	NLOFR2649	5990	8960	724	2370	195	38	122	14.2	75.9	15	47.1	6.98	43.5	6.43	576	128
NLOFTR2B006	Trench	NLOFR2689	6160	9050	781	2490	207	39.8	114	14.5	78.8	15.8	47	7.13	45.2	6.62	516	127
NLOFTR2B006	Trench	NLOFR2729	5950	8890	756	2440	201	38.3	109	12.6	75.8	15.1	47.4	6.94	43.8	6.34	533	122
NLOFTR2B007	Trench	NLOFR2769	6200	9210	777	2500	206	39.6	123	14.6	78.2	15.3	44.6	6.7	42.7	6.34	528	120
NLOFTR2B007	Trench	NLOFR2809	6100	9130	724	2450	204	39.5	126	15.6	76.3	15.1	45.3	6.87	43.2	6.38	519	118
NLOFTR2B008	Trench	NLOFR2849	6180	9020	757	2380	201	37.9	113	13.8	73.9	15	45.5	6.5	41.9	6.36	496	121
NLOFTR2B008	Trench	NLOFR2889	6000	8800	740	2380	204	38.9	113	14.3	76	15.4	45.9	6.95	42.9	6.46	496	126
NLOFTR2B009	Trench	NLOFR2929	5800	8700	749	2260	202	37.9	115	13.8	74.6	14.6	43.7	6.69	41.9	6.21	499	123
NLOFTR2B009	Trench	NLOFR2969	6200	8970	757	2390	204	38.6	119	13.3	73.3	15.1	46.1	6.76	45.4	6.99	464	115
NLOFTR2B009	Trench	NLOFR3009	6230	9190	760	2460	209	37.3	118	14	75.2	15.6	46.7	6.6	41.5	6.36	494	131
NLOFTR2B010	Trench	NLOFR3049	5890	8840	743	2410	207	38.4	119	13.5	72.8	15.3	48	6.83	42.9	6.36	495	128
NLOFTR2B010	Trench	NLOFR3089	5940	8960	763	2360	207	37.6	126	13.6	73.3	14.8	47.3	6.96	42	6.33	491	121
NLOFTR2B010	Trench	NLOFR3129	6150	9160	760	2430	199	38	117	13.5	72.9	15.6	47.9	6.97	42.4	6.23	493	122
NLOFTR2B011	Trench	NLOFR3169	6070	9140	790	2450	207	38.5	119	13.1	73.2	15.1	48.4	7.3	43.6	6.41	503	118
NLOFTR2B011	Trench	NLOFR3209	6280	9280	758	2250	207	39.5	128	12.5	75.6	14.8	46.3	6.87	42.2	6.28	490	120
NLOFTR2B011	Trench	NLOFR3249	6070	9050	756	2290	197	37.3	128	14.9	74.1	14.7	45.2	6.61	41.9	6.3	485	120
NLOFTR2B012	Trench	NLOFR3289	6090	9070	762	2440	215	39	109	11.7	74.8	15.5	50.5	7.1	44.6	6.55	495	131

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFTR2B013	Trench	NLOFR3369	6230	9490	804	2420	208	39.9	142	13.4	74.8	15.5	47.2	6.72	42.5	5.73	479	118
NLOFTR2B013	Trench	NLOFR3409	6150	8730	755	2230	188	32.4	94.4	11.1	62.7	12.8	41.5	5.67	36.6	5.15	491	102
NLOFTR2B014	Trench	NLOFR3769	6160	9200	773	2300	199	38.5	110	13.4	71.5	14.8	46.3	6.74	43.1	6.32	456	112
NLOFTR2B015	Trench	NLOFR3809	6130	9180	774	2290	199	38.7	99.6	12.6	71.1	14.8	45.7	6.67	42.4	6.23	458	113
NLOFTR2B015	Trench	NLOFR3849	6370	9300	785	2420	217	42.1	114	14.4	81.4	16.8	49.5	7.48	47.3	6.97	519	119
NLOFTR2B016	Trench	NLOFR3889	6340	9280	776	2300	209	39.2	119	13.8	75.8	15.6	47.4	7.22	44.2	6.5	455	124
NLOFTR2B016	Trench	NLOFR3929	6240	8870	780	2380	207	39.6	131	14.4	74.7	15	47.8	6.88	45.4	6.62	460	123
NLOFTR2B017	Trench	NLOFR3969	6090	9050	764	2400	202	38.8	132	14.9	74.3	15	45.8	6.73	44.5	6.5	466	122
NLOFTR2B017	Trench	NLOFR4009	6080	9100	794	2310	201	37.7	111	13	68.5	13.2	42.7	6.5	41.8	6.16	466	114
NLOFTR2B024	Trench	NLOFR3609	6000	8780	801	2410	202	39.8	141	13.4	73.7	15	49.1	6.64	42.3	6.63	445	124
NLOFTR2B024	Trench	NLOFR3649	6220	9200	776	2360	210	39.1	118	13.3	71.4	15	44	6.61	41.7	6.28	450	117
NLOFTR2B025	Trench	NLOFR3689	6030	9050	745	2420	200	38.3	140	14.7	75	14.6	43.5	6.29	42.4	6.21	456	118
NLOFTR2B025	Trench	NLOFR3729	6100	8980	746	2250	207	38.5	126	13.8	72.6	14.6	44.4	6.83	43.2	6.34	452	114

SARM1 (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
Average All			109	195		72	15.8	0.35	14	3	17					2	143	51
NLOFDH2B001	DDH	NLOFDDH0010	123	218	22.4	79	16.8	0.32	14.5	2.8	19.7	4.4	13.9	2.14	14.3	2.19	130	57.2
NLOFDH2B003	DDH	NLOFDDH0110	108	200	20.6	66.6	13.6	0.3	13.4	2.6	17.4	4	12.5	2.09	13.9	2.06	127	52.9
NLOFDH2B003	DDH	NLOFDDH0170	116	207	22.1	78.3	15.4	0.32	14.4	2.8	18	4.1	13.9	2.17	14.1	2.08	126	53.9
NLOFDH2B005	DDH	NLOFDDH0250	114	199	20.2	69.5	14	0.33	13	2.5	17.6	4	13.3	2.12	14.4	2.27	137	58.4
NLOFDH2B006	DDH	NLOFDDH0310	119	216	21.1	76.1	14.2	0.32	14.1	2.6	18.5	4.1	13.1	2.05	13.8	2.2	123	53.9
NLOFDH2B008	DDH	NLOFDDH0440	119	214	21.1	78.9	15.6	0.34	13.8	2.6	18.6	4.2	13.8	2.05	14.6	2.15	128	54
NLOFDH2B010	DDH	NLOFDDH0490	116	213	20.5	69.5	14.6	0.32	14.7	2.8	18.4	4	12.3	1.97	14	2.29	128	49.6
NLOFDH2B012	DDH	NLOFDDH0570	102	188	20	66.3	14	0.33	13.1	2.4	16.2	3.5	11.7	1.91	12.9	2.03	126	44.4

AMIS185 (All values in ppm)

HoleID	Spl type	Spl # Average All	La 30030	Ce 40750	Pr 3510	Nd 8205	Sm 556	Eu 94.2	Gd 244	Tb 15.3	Dy 21.4	Ho 2.7	Er 4.24	Tm 0.35	Yb 2.75	Lu 0.56	Y 54.3
NLOFDH2B001	DDH	NLOFDDH0050	30000	40900	3510	8130	593	101	222	10.3	18.8	1.1	1.1	0.09	0.4	0.06	50
NLOFDH2B003	DDH	NLOFDDH0150	27100	39600	3180	8560	522	85.5	205	10.1	21.7	1.6	2.3	0.22	1.1	0.15	52
NLOFDH2B006	DDH	NLOFDDH0350	27500	39700	3350	8360	533	96.3	211	9.6	15.7	1.3	1.8	0.15	0.8	0.13	49
NLOFDH2B007	DDH	NLOFDDH0390	28900	38800	3450	9350	566	87.3	225	7.7	20.7	1.2	1.2	0.08	0.5	0.1	51
NLOFDH2B009	DDH	NLOFDDH0480	29000	39200	3470	9420	580	89	234	10.4	20.9	1.2	1.2	0.07	0.4	0.08	51

Appendix 8 – Analyses of Blanks Used During the Trenching and Diamond Drilling.

The in-house blank STD-3 was used for one batch in the trenching samples, the dolomite blank for the rest. The Magiesberg Quartzite blank was used for diamond drilling.

STD3 (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFR2B001	Trench	NLOFR2310	0.4	0.6	0.06	0.2	0.1	0.025	0.2	0.05	0.2	0.05	0.05	0.025	0.05	0.02	3	7.2
NLOFR2B001	Trench	NLOFR2330	1.2	1.6	0.17	0.6	0.1	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.2
NLOFR2B001	Trench	NLOFR2350	0.3	0.5	0.06	0.2	0.2	0.06	0.2	0.05	0.3	0.05	0.1	0.025	0.05	0.02	2	1.2
NLOFR2B001	Trench	NLOFR2370	1.5	2.4	0.23	0.8	0.1	0.025	0.1	0.05	0.1	0.05	0.1	0.025	0.05	0.02	1	0.3
NLOFR2B002	Trench	NLOFR2390	0.3	0.6	0.06	0.3	0.1	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	4	0.9
NLOFR2B002	Trench	NLOFR2410	2	3.2	0.33	1.1	0.2	0.05	0.2	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	0.9
NLOFR2B002	Trench	NLOFR2430	0.2	0.3	0.025	0.1	0.2	0.07	0.3	0.05	0.3	0.05	0.1	0.025	0.1	0.02	2	7.5

Dolomite Blank for Trench Samples (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFR2B003	Trench	NLOFR2450	0.3	0.4	0.025	0.1	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.5
NLOFR2B003	Trench	NLOFR2470	0.7	1.2	0.1	0.4	0.1	0.025	0.2	0.05	0.1	0.05	0.05	0.025	0.1	0.02	1	0.4
NLOFR2B003	Trench	NLOFR2490	0.8	1.1	0.1	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	2	0.1
NLOFR2B003	Trench	NLOFR2510	0.1	0.4	0.025	0.2	0.1	0.06	0.2	0.05	0.2	0.05	0.1	0.025	0.1	0.02	8	0.4
NLOFR2B004	Trench	NLOFR2530	1.3	1.9	0.17	0.5	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	2	0.7
NLOFR2B004	Trench	NLOFR2550	0.2	0.4	0.025	0.2	0.2	0.08	0.3	0.05	0.3	0.05	0.2	0.025	0.2	0.02	4	0.8
NLOFR2B004	Trench	NLOFR2570	1.1	1.8	0.13	0.4	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	4	0.2
NLOFR2B004	Trench	NLOFR2590	0.05	0.2	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.6
NLOFR2B004	Trench	NLOFR3570	1.6	2.1	0.25	1.1	0.3	0.09	0.2	0.05	0.2	0.05	0.1	0.025	0.2	0.02	6	0.3
NLOFR2B004	Trench	NLOFR3590	0.4	0.2	0.05	0.6	0.3	0.1	0.3	0.05	0.2	0.05	0.2	0.025	0.2	0.04	7	0.4
NLOFR2B005	Trench	NLOFR2610	0.3	0.5	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFR2B005	Trench	NLOFR2630	0.05	0.3	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.7
NLOFR2B005	Trench	NLOFR2650	0.5	1	0.08	0.3	0.05	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	0.3
NLOFR2B006	Trench	NLOFR2670	0.05	0.2	0.025	0.05	0.05	0.025	0.2	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	0.9
NLOFR2B006	Trench	NLOFR2690	1.5	2.3	0.18	0.5	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFTR2B006	Trench	NLOFR2730	0.6	0.9	0.07	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B007	Trench	NLOFR2750	0.1	0.2	0.025	0.05	0.1	0.025	0.2	0.05	0.2	0.05	0.05	0.025	0.05	0.02	1	1.2
NLOFTR2B007	Trench	NLOFR2770	1.2	1.9	0.19	0.7	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B007	Trench	NLOFR2790	0.1	0.2	0.025	0.1	0.1	0.06	0.2	0.05	0.2	0.05	0.1	0.025	0.05	0.02	2	1.3
NLOFTR2B007	Trench	NLOFR2810	0.7	1	0.08	0.4	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B008	Trench	NLOFR2830	0.05	0.05	0.025	0.3	0.2	0.07	0.3	0.05	0.3	0.05	0.1	0.025	0.2	0.06	4	24.7
NLOFTR2B008	Trench	NLOFR2850	0.8	1.2	0.11	0.3	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B008	Trench	NLOFR2870	0.3	0.4	0.025	0.2	0.05	0.025	0.2	0.05	0.2	0.05	0.05	0.025	0.05	0.02	4	1.3
NLOFTR2B008	Trench	NLOFR2890	0.4	0.5	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B008	Trench	NLOFR2910	0.3	0.5	0.06	0.2	0.2	0.08	0.3	0.05	0.4	0.05	0.2	0.025	0.2	0.02	5	1.7
NLOFTR2B009	Trench	NLOFR2930	0.6	0.9	0.1	0.3	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	2	0.2
NLOFTR2B009	Trench	NLOFR2950	0.8	1.2	0.13	0.5	0.5	0.21	0.9	0.2	0.9	0.2	0.5	0.06	0.4	0.05	6	3.8
NLOFTR2B009	Trench	NLOFR2970	0.4	0.4	0.05	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B009	Trench	NLOFR2990	0.05	0.05	0.025	0.2	0.1	0.025	0.2	0.05	0.2	0.05	0.05	0.025	0.05	0.02	4	1.1
NLOFTR2B009	Trench	NLOFR3010	0.7	0.8	0.08	0.4	0.1	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	2	0.2
NLOFTR2B009	Trench	NLOFR3030	0.05	0.2	0.025	0.1	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	3	0.7
NLOFTR2B010	Trench	NLOFR3050	0.5	0.7	0.07	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B010	Trench	NLOFR3070	0.7	1.1	0.11	0.4	0.2	0.07	0.3	0.05	0.3	0.05	0.1	0.025	0.1	0.02	4	1.3
NLOFTR2B010	Trench	NLOFR3090	1.2	1.8	0.15	0.5	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.2
NLOFTR2B010	Trench	NLOFR3110	0.6	1	0.1	0.5	0.3	0.16	0.6	0.1	0.8	0.1	0.3	0.025	0.2	0.02	12	2.4
NLOFTR2B010	Trench	NLOFR3130	0.9	1.3	0.11	0.4	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.2
NLOFTR2B010	Trench	NLOFR3150	0.3	0.5	0.025	0.2	0.05	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	4	0.9
NLOFTR2B011	Trench	NLOFR3170	0.4	0.4	0.1	0.4	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	5	0.1
NLOFTR2B011	Trench	NLOFR3190	0.05	0.05	0.025	0.1	0.05	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	1.2
NLOFTR2B011	Trench	NLOFR3210	0.6	0.5	0.025	0.3	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B011	Trench	NLOFR3230	0.5	0.3	0.025	0.1	0.2	0.07	0.3	0.05	0.3	0.05	0.2	0.025	0.1	0.02	1	1.8
NLOFTR2B011	Trench	NLOFR3250	3.3	3.8	0.39	1.1	0.1	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	0.4
NLOFTR2B014	Trench	NLOFR3750	0.7	0.7	0.09	0.5	0.2	0.06	0.2	0.05	0.2	0.05	0.1	0.025	0.1	0.02	1	1.1
NLOFTR2B014	Trench	NLOFR3770	1.9	2.3	0.18	0.4	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B015	Trench	NLOFR3790	0.6	0.4	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.4
NLOFTR2B015	Trench	NLOFR3810	2.3	2.9	0.23	0.6	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B015	Trench	NLOFR3830	0.4	0.4	0.025	0.05	0.05	0.06	0.1	0.05	0.05	0.05	0.05	0.025	0.05	0.02	3	0.8
NLOFTR2B015	Trench	NLOFR3850	0.7	0.7	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B016	Trench	NLOFR3870	0.4	0.3	0.025	0.2	0.1	0.06	0.2	0.05	0.3	0.05	0.1	0.025	0.05	0.02	1	1.6
NLOFTR2B016	Trench	NLOFR3890	0.5	0.3	0.025	0.05	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B016	Trench	NLOFR3930	1.1	1.1	0.1	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05
NLOFTR2B017	Trench	NLOFR3950	0.4	0.2	0.025	0.1	0.05	0.025	0.1	0.05	0.2	0.05	0.05	0.025	0.05	0.02	1	1.1
NLOFTR2B017	Trench	NLOFR3970	0.9	1	0.09	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.05

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFTR2B017	Trench	NLOFR4010	0.7	0.6	0.025	0.1	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.1
NLOFTR2B024	Trench	NLOFR3630	1	1.1	0.2	1.8	0.9	0.3	0.9	0.1	0.6	0.1	0.4	0.08	0.8	0.15	1	1.1
NLOFTR2B024	Trench	NLOFR3650	0.8	0.8	0.08	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.2
NLOFTR2B025	Trench	NLOFR3670	2.1	2.6	0.32	1	0.2	0.025	0.2	0.05	0.2	0.05	0.1	0.025	0.05	0.02	8	1
NLOFTR2B025	Trench	NLOFR3690	0.9	0.9	0.08	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.2
NLOFTR2B025	Trench	NLOFR3710	0.6	0.5	0.05	0.2	0.05	0.025	0.05	0.05	0.05	0.05	0.05	0.025	0.05	0.02	1	0.4
NLOFTR2B025	Trench	NLOFR3730	2.6	3.1	0.29	1.1	0.1	0.025	0.1	0.05	0.1	0.05	0.05	0.025	0.05	0.02	1	0.2

Magaliesberg quartzite Blank for diamond drilling (All values in ppm)

HoleID	Spl type	Spl #	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y	Th
NLOFDH2B001	DDH	NLOFDDH0020	7	13.3	1.41	5.4	1.1	0.16	0.9	0.1	0.8	0.1	0.4	0.06	0.4	0.07	4	2.8
NLOFDH2B001	DDH	NLOFDDH0040	7.5	14.1	1.37	5.3	1.1	0.14	0.9	0.1	0.8	0.2	0.5	0.07	0.5	0.07	6	2.6
NLOFDH2B002	DDH	NLOFDDH0060	6.5	12.4	1.26	4.8	1	0.16	0.8	0.1	0.7	0.1	0.4	0.07	0.5	0.08	4	5.5
NLOFDH2B002	DDH	NLOFDDH0080	32.4	48.7	4.12	13.2	1.6	0.27	1	0.2	0.9	0.2	0.5	0.08	0.6	0.11	5	4.6
NLOFDH2B003	DDH	NLOFDDH0100	6.3	12	1.23	4.5	0.8	0.12	0.7	0.1	0.7	0.1	0.4	0.06	0.4	0.05	7	2.1
NLOFDH2B003	DDH	NLOFDDH0120	6	11.7	1.25	4.4	0.8	0.13	0.7	0.1	0.8	0.2	0.4	0.06	0.4	0.07	9	2.3
NLOFDH2B003	DDH	NLOFDDH0140	7.3	13.9	1.44	5.3	1	0.16	0.9	0.2	1.1	0.2	0.7	0.14	1	0.14	7	9.8
NLOFDH2B003	DDH	NLOFDDH0160	6.7	11.8	1.29	4.9	0.9	0.14	0.8	0.1	0.7	0.1	0.5	0.06	0.4	0.06	4	2.3
NLOFDH2B004	DDH	NLOFDDH0180	6.9	12.5	1.36	5.3	1	0.15	0.8	0.1	0.7	0.1	0.5	0.06	0.4	0.06	5	2.5
NLOFDH2B004	DDH	NLOFDDH0200	7.9	14.2	1.45	5.3	0.9	0.15	0.7	0.1	0.6	0.1	0.3	0.025	0.3	0.05	5	2.1
NLOFDH2B004	DDH	NLOFDDH0220	6.2	11.4	1.2	4.5	0.8	0.12	0.7	0.05	0.6	0.1	0.3	0.025	0.3	0.05	7	2.2
NLOFDH2B005	DDH	NLOFDDH0240	6.2	11.2	1.18	4.4	0.9	0.11	0.7	0.1	0.6	0.1	0.4	0.06	0.4	0.07	5	2.4
NLOFDH2B005	DDH	NLOFDDH0260	7.4	13.2	1.38	5.1	0.9	0.14	0.8	0.1	0.7	0.1	0.4	0.06	0.4	0.07	4	2.4
NLOFDH2B005	DDH	NLOFDDH0280	6.7	12.3	1.29	4.9	0.9	0.14	0.8	0.1	0.7	0.1	0.4	0.06	0.4	0.06	5	2.4
NLOFDH2B006	DDH	NLOFDDH0300	7.2	13.2	1.36	5.3	0.9	0.14	0.8	0.1	0.7	0.1	0.4	0.06	0.4	0.07	5	2.4
NLOFDH2B006	DDH	NLOFDDH0320	7.7	13.9	1.42	5.5	1	0.18	0.9	0.1	0.9	0.2	0.5	0.08	0.5	0.07	6	2.9
NLOFDH2B006	DDH	NLOFDDH0340	7.6	14.1	1.45	5.4	1.1	0.18	0.9	0.2	0.9	0.2	0.5	0.07	0.4	0.07	4	2.8
NLOFDH2B006	DDH	NLOFDDH0360	12.5	21.2	1.99	6.7	1.1	0.22	1	0.2	1.3	0.3	0.8	0.13	0.8	0.13	8	3.4
NLOFDH2B007	DDH	NLOFDDH0410	6.6	12.4	1.31	4.8	0.8	0.13	0.7	0.1	0.7	0.1	0.4	0.06	0.4	0.07	3	2.1
NLOFDH2B008	DDH	NLOFDDH0430	6.5	12.4	1.26	5.2	1	0.15	0.8	0.1	0.8	0.2	0.5	0.07	0.5	0.07	5	2.5
NLOFDH2B008	DDH	NLOFDDH0450	6.8	13	1.34	5.5	1	0.15	0.9	0.1	0.8	0.2	0.5	0.07	0.5	0.07	5	2.4
NLOFDH2B009	DDH	NLOFDDH0470	14.8	22.5	2.36	8	1.1	0.17	0.8	0.1	0.8	0.1	0.4	0.06	0.4	0.07	5	2.4
NLOFDH2B011	DDH	NLOFDDH0500	7.3	13.2	1.39	4.8	0.9	0.13	0.8	0.1	0.8	0.2	0.4	0.06	0.4	0.07	10	2.4
NLOFDH2B012	DDH	NLOFDDH0520	76.3	160	17.7	66	10.4	0.42	6.2	0.6	2.4	0.3	0.6	0.07	0.4	0.05	11	34.7
NLOFDH2B012	DDH	NLOFDDH0540	6.2	12.4	1.3	4.9	0.8	0.1	0.7	0.1	0.6	0.1	0.3	0.025	0.2	0.02	5	2.4
NLOFDH2B012	DDH	NLOFDDH0560	6.4	12.7	1.32	5	0.9	0.09	0.7	0.1	0.7	0.1	0.3	0.025	0.3	0.04	5	2.3