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9th August 2018

Australian Securities Exchange
PERTH WA

Dear Sirs

Minim Martap-Ngaoundal Bauxite Deposit: SRK Consulting Report

We refer to the ASX announcement dated 9 August 2018 by the Company (**ASX Announcement**).

Please find **attached** the SRK Consulting Report (Australia) Pty Limited (**SRK**) report in relation to the Minim Martap-Ngaoundal Bauxite Deposit referred to in the above announcement (**Minim Martap Report**).

The Minim Martap Report was prepared by SRK in September 2009 and has not been previously released to ASX or any similar exchange.

SRK has not been involved in the release of the Minim Martap Report by Canyon to ASX.

The Minim Martap Report has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2004 and the reporting of resources may not conform to the requirements under the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2012.

In reviewing the Minim Martap Report, Canyon refers parties to the ASX Announcement and in particular, the cautionary statements made on pages 1,3 and 7 of that announcement regarding the Report.

For and on behalf of the Board

Phillip Gallagher
Managing Director

Minim Martap-Ngaoundal Bauxite Deposit

Exploration Program and Resource Assessment

Cameroon Alumina Ltd

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HYD001
September 2009

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Bruce McConachie, Bruce Sommerville, Matthew Greentree and Roger Pooley

Executive Summary

SRK Consulting (Australasia) Pty Ltd ("SRK") has prepared an independent evaluation of the bauxite Resources of the Minim Martap-Ngaoundal deposit on behalf of Cameroon Alumina Limited ("CAL").

The purpose of the evaluation is to provide:

- An objective assessment of the bauxite resources in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), 2004, suitable for public reporting, and

- A qualification of the potential utilisation of the bauxite resources within the exploration leases considering all aspects affecting the recovery of the in-situ Resources.

Historically, many reports have been compiled covering the resource evaluation of the Minim Martap-Ngaoundal Bauxite. The deposit was first identified by German geologists in Cameroon and most extensively assessed by French geologists of the Bureau de Recherches Géologiques et Minières ("BRGM") between about 1960 and 1972. The final assessment by BRGM was done on behalf of Pechiney.

Although primary data from the BRGM assessment could not be accessed the summary description of the deposits reported by Gsell (1984) is published. Gsell (1984) reported a global resource based on the initial pitting work at 1.1 billion tonnes at 43% total alumina and 3.4% total silica and concluded there was one billion tonnes of bauxite resource in the region.

The purpose of the CAL 2009 exploration program was to understand the bauxite geology and develop a model of the resource to the maximum extent possible and to determine the requirements for bauxite mining and exploitation.

Mapping of the deposit was the first important requirement. Both Shuttle Radar Thematic Mapper ("SRTM") and detailed satellite image interpretations were required. Estimating the tonnage and grade characteristics, along with integrating the data with the previous BRGM work, was necessary to understand the previous focus and the relevance of the old results. Finally, SRK produced a conceptual mine plan based on the estimated Inferred and Indicated bauxite resources, assessed in accordance with the Joint Ore Reserves Committee ("JORC") Code.

To achieve the outcome required, SRK assisted CAL to establish a bauxite drilling and sampling program to cover the deposit plus recommended and checked various test work to enable the planning for mining and delivery of bauxite to a proposed plant site to the east of Martap.

SRK also conducted independent Quality Assurance/Quality Control ("QA/QC") reporting to ensure best practice reporting standards were achieved. Chemical analytical laboratory errors were tested by submitting duplicate XRF samples to Genalysis Laboratories in Perth for re-assay. Blind samples, blank samples and check duplicates were all run to ensure quality throughout the analytical process.

The combination of the information now available on the Minim Martap-Ngaoundal bauxite resources is considered adequate to permit the recognition of an Inferred Resource for 11 plateaux from Minim Martap and an Indicated Resource for 3 plateaux at Ngaoundal.

Resource Statement

The Indicated Resources (Simone, Judith and Bridgette at Ngaoundal) available to the Minim Martap-Ngaoundal bauxite project comprise

88 Mt at 1.3% total SiO_2 and 41.8% total Al_2O_3.

The Inferred Resources (11 Minim Martap plateaux) available to the Minim Martap-Ngaoundal bauxite project comprise

466 Mt at 2.2% total SiO_2 and 46.2% total Al_2O_3.

The total bauxite Resource available to the CAL project may be larger if there is economic bauxite in the southern Minim Martap plateau. However, the limited test analyses made on samples from pits in the southern Minim Martap plateau (at Josephine) demonstrated the presence of high silica non-economic laterite.

The current document, the second in the series by SRK that describe the Minim Martap-Ngaoundal bauxite deposit, is designed to be read in conjunction with an introductory document describing the geology and a following document describing the conceptual mining plan.

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Limitations

SRK, after due enquiry and subject to the Limitations of the Report hereunder, confirms that:

- The input, handling, computation and output of the geological data and Bauxite Resources information has been conducted professionally and accurately and to the high standards commonly expected within the Geosciences profession
- The interpretation, estimation and reporting of the Bauxite Resources Statement has been conducted professionally and competently to the high standards commonly expected within the Geosciences profession, and in accordance with the principles and definitions of the JORC Code
- In conducting this assessment, SRK has assessed and addressed all activities and technical matters which might reasonably be considered to be relevant and material to such an assessment conducted to internationally accepted standards. SRK has, after reasonable enquiry, been satisfied that there are no outstanding relevant material issues other than those indicated in this report.
- The conclusions presented in this report are professional opinions based solely upon SRK's interpretations

This Report has been prepared as an internal report only and has not been prepared for publication. At this stage, SRK grants no permission to publish this Report.

Disclaimer

SRK Consulting (Australasia) Pty Ltd (SRK) provided guidelines and objectives for the program of drilling and mapping that was carried out as part of this study, but did not provide continuous supervision of the drilling, sample collection, and assaying. The data upon which the mineral resources are based therefore are partly outside SRK's control. They are of reasonably consistent character and SRK directed a check sampling program which has given confidence that the data may be relied upon for the initial assessment presented.

The mineral resource model was developed by SRK using bulk densities and moisture content based on limited test work. The drill hole spacing is such that only inferred and indicated resources have been estimated. Analyses were carried out by three laboratories, and cross checks were made between them. Rock strength and trafficability were inferred from the observations on site, with only a very limited program of geotechnical testing. SRK laid out the crusher, ore transport conveyor, and the haul routes based on limited information. The routes were not inspected or surveyed in detail, and so the feasibility of these layouts is subject to further study. Local consultation may also affect the conveyor and road routes, and has not yet been attempted.

The data gathered should not be relied upon beyond formulating a further work program to evaluate the mineral resources, reserves, and engineering parameters to a bankable level. Cost estimates are believed to be accurate to +-25%.

SRK does not accept responsibility for any errors or omissions in the information supplied by others, and does not accept any consequential liability arising from commercial decisions or actions resulting from them. All Figures Tables and Appendices are preliminary versions.

Statement of Competency

Dr Bruce Alan McConachie is a geologist with extensive experience in economic resource evaluation and exploration. His career spans over 25 years and includes production, development and exploration experience in petroleum, bauxite, coal, iron ore and various industrial minerals.

Work history includes:
Comalco - 15 years (Rio Tinto-Alcan) - Chemist, Mine Geologist, Planning Engineer, Senior Geologist and Team Leader.
Australian Geological Survey Organisation / Bureau of Mineral Resources - 2½ years (Geoscience Australia) - Senior Research Scientist.
Santos for 7 years (Senior Geologist, Team Leader and Chief Geologist – Indonesia).
BHP Billiton for 2½ years - Global Bauxite Commodity Specialist and Manager Bulk Commodities.
Consultant - 2 years - Koumbia Bauxite Project – Guinea
Consultant - 1 year – SRK Consulting - Brisbane

Experience - Extensive relevant experience covering bauxite exploration programs, deposit evaluation, mine production, processing, transport and economic assessment. The range of deposits worked covers virtually all worldwide major bauxite mining operations, potential new developments and exploration areas.

Industry Group Memberships:
Australasian Institute of Mining and Metallurgy ("AusIMM")
American Association of Petroleum Geologists

Qualifications:
Graduate degrees in geology and analytical chemistry.
Master of Applied Science by research and thesis on the coal geology of the Bowen Basin, Queensland.
Doctor of Philosophy by dissertation on foreland and fold belt basin analysis to characterise petroleum and mineral systems and deposits.

My qualifications and experience meet the requirements to act as a Competent Person to report bauxite mineral resources under the JORC Code.

The data and interpretations presented in this document accurately reflect my view of the mineralisation and resources for the Ngaoundal and Minim Martap Bauxite Project.

....
Dr Bruce Alan McConachie

List of Abbreviations

Abbreviation	Meaning
%	percent, percentage
^{0}C	Degrees Celsius
Al_20_3	Alumina (Aluminium Oxide)
ABEA	Average Bayer Extractable Alumina (~145°C)
AMC	Alliance Mining Commodities Limited
AusIMM	Australasian Institute of Mining and Metallurgy
BRDC	Belgaum Research and Development Centre
BRGM	Bureau de Recherches Géologiques et Minières (France)
CAL	Cameroon Alumina Limited Gmbh
Cm	centimetre(s)
CMs	Continuous Mining Methods and/or Continuous Miners
Competent Person (JORC)	A geologist or engineer with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination thereof, has experience relevant to the subject matter of the mineral project and the technical report and is a member in good standing of a professional association
Dmt	dry metric tonnes
DSP	desilication product
Fe_20_3	Iron oxide (Iron)
Indicated Resource	An Indicated Resource is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed
Inferred Resource	An Inferred Resource is that part of a mineral resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes which may be limited or of uncertain quality and reliability
ISO	International Standards Organisation
JORC Code	Australia Code for Reporting of Mineral Resources and Ore Reserves, prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC), September 1999. Updated December 2004. Internationally accepted reporting code.
JORC Committee	Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia
kg/t	kilograms per tonne
Km	kilometre(s)
km^2	square kilometre(s)
Kt	kilotonne(s)
LOI%	Loss on Ignition (Water of Crystallisation) Also LOM (loss of moisture commonly at 1000°C
M	metre(s)
MEA	maximum extractable alumina

Abbreviation	**Meaning**
Mm	millimetre(s)
MPa	Mega Pascal
Mt	Million tonne(s)
Mtpa	Million tonnes per annum
QA/QC	Quality Assurance / Quality Control
ROM	Run of Mine
$Si0_2$	Silicon dioxide (Silica)
SRK	SRK Consulting (Australasia) Pty Ltd trading as SRK Consulting
SRTM	Shuttle Radar Thematic Mapper
T	tonne(s)
TAA	total extractable alumina
THA	trihydrate alumina
$Ti0_2$	Titanium dioxide (Titanium)
TOC	Total Organic Carbon
XRD	X-Ray diffraction
XRF	X-ray fluorescence

1 Program Objectives and Work Program

1.1 Program Objectives

Cameroon Alumina Limited ("CAL") requested SRK Consulting (Australasia) Pty Ltd ("SRK") prepare an independent evaluation of the bauxite Resources of the Minim Martap-Ngaoundal deposit.

The focus of this independent evaluation and report is to compile a resource statement based on the work to date and outline the project requirements going forward. The resource statement includes the following:

- Review of existing data and determination of inferred and measured resources;
- Data review and geostatistical analysis of each plateau including close spaced drilling;
- Check work to understand the validity of all analytical data; and
- Estimate of the bauxite resources (tonnage and chemical grades) in accordance with relevant guidelines and to briefly describe all the resources potentially available to the project.

1.2 Purpose of the Report

The purpose of this Report is to provide an independent technical assessment in accordance with the JORC Code to support CAL project compliance.

This Report complies with the technical property information required under various securities laws of Australia and may be included in information to be prepared in connection with the business requirements. This Report does not provide a valuation of the mineral assets or any comment on the fairness and reasonableness of any transactions related to the proposed use.

1.3 Reporting Standard

This Report is not a Valuation Report. Aspects reviewed in this Report do include issues related to value considerations; however SRK does not express an opinion regarding the specific value of the assets and tenements involved.

1.4 Work Program

The work required advice on the establishment of an evaluation program, ongoing monitoring of the work, a review of the drilling and analytical data available for the project and an assessment of the bauxite Resource, in accordance with the JORC Code (2004).

1.5 Project Team

The project team for the current document comprised Dr Bruce McConachie, the competent person for the resource statement; Mr Bruce Sommerville who undertook the geostatistical work; and, Dr Matthew Greentree who compiled the database and undertook the GIS analysis and mapping. Mr Roger Pooley provided the scheduling and mining input along with Mr Sunil Kumar who worked on the crusher and conveyor requirements.

1.6 Statement of SRK Independence

Neither SRK nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of SRK.

SRK has no prior association with Cameroon Alumina Limited in regard to the mineral assets that are the subject of this Report. SRK has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence.

SRK's fee for completing this Report is based on its normal professional daily rates plus reimbursement of incidental expenses. The payment of that professional fee is not contingent upon the outcome of the Report.

1.7 Consents

SRK consents to this Report being included, in full, in the CAL FEL2 study, in the form and context in which the technical assessment is provided, and not for any other purpose.

SRK provides consent for the information contained in its reports to be used by CAL on the basis that the technical assessments expressed in the Summary and in the individual sections of the Reports are considered with, and not independently of, the information set out in the complete Reports and the Cover Letter. For the purpose of public reporting, the reader is referred to the JORC code requirements.

2 Resource Overview

2.1 Background

The current document, the second in the series of the three reports , is designed to be read in conjunction with an introductory document describing the geology and a following document describing the indicative mining plan.

The reliability of any Resource estimation depends on the technical detail and quality of the exploration work, including the sampling and laboratory tests, the density of the exploration sampling grid, and on the methodology of the resource estimation. The geological complexity of the deposit, its geometry and variability of grade requirements govern the level of detailed work that must be completed to achieve confidence in the results. A history of successful mining or similar and nearby deposits combined with good geological control and focused relevant data, can reduce the risks associated with the Resource evaluation. The bauxite deposit of Minim Martap-Ngaoundal is currently the only significant deposit in Cameroon with major development potential and no similar operations have been conducted in the country.

Typically for plateau bauxites, 600 m drill spacing defines an Inferred Resource; 300 m spacing is used to define an Indicated Resource and 150 m spacing has been used to define a Measured Resource. Reserves attributed to 10 year mine plans typically require 150 m or 75 m spaced drilling and continuity controls in the form of sporadic close spaced drilling to establish geological continuity vectors and character. Pre-mine drilling may require 25 m spaced holes and blast hole drilling from 5-10 m spacing. Typical blast hole patterns are 4 x 6 m and 5 x 7.5 m depending on the expected nature of the fragmentation.

Because the Cameroon bauxite plateaux are mostly elongate and were assumed to have poorer peripheral grades, the concept of using a strike baseline and regular closer spaced cross lines was well suited to provide a quick evaluation of the Resource **(Fig. 2-1 and Appendix 13).**

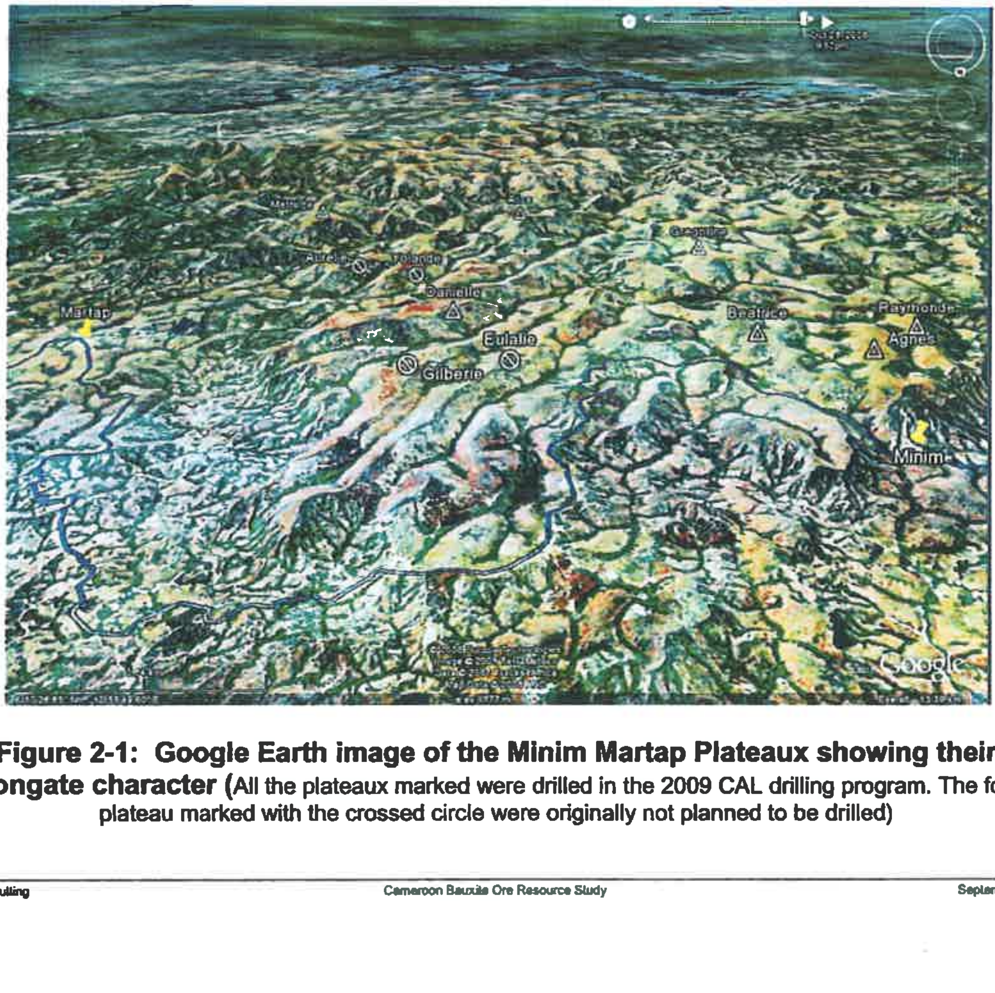


Figure 2-1: Google Earth image of the Minim Martap Plateaux showing their elongate character (All the plateaux marked were drilled in the 2009 CAL drilling program. The four plateau marked with the crossed circle were originally not planned to be drilled)

2.2 JORC Code (JORC, 2004)

Under the JORC code, a *'Mineral Resource' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories,* **(Fig. 2-2).**

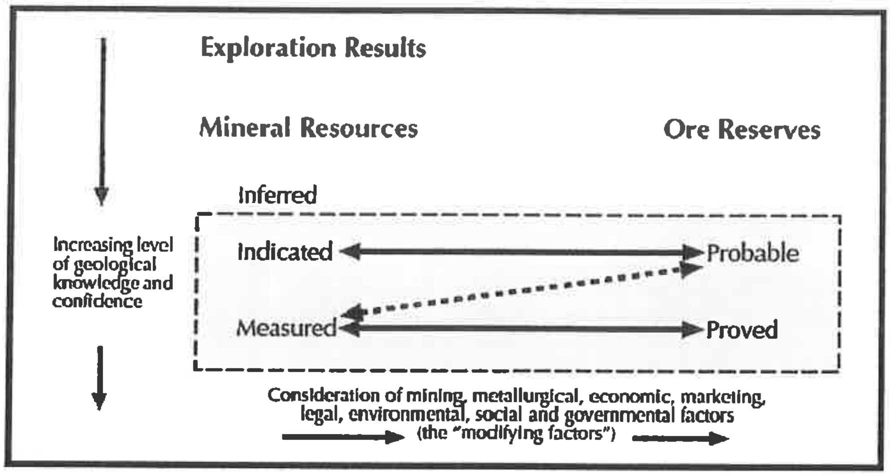


Figure 2-2: JORC Scheme for Reporting Exploration Results (JORC, 2004)

The resources in the Minim Martap-Ngaoundal project area were only known from old "BRGM" data, originally acquired for BRGM then later for Pechiney. At the time of evaluation (1960 to about 1972) it was common to refer to inferred/indicated mineral resources as reserves but this is no longer the case as the definitions have been strengthened and refined due to the lack of rigour and resulting mine development failures from the past. The nature of the geological environment relating to the bauxite plateaux in Cameroon is such that typically, a high degree of confidence could be assigned to the likelihood of conversion of the Inferred Resources to Indicated and Measured status (with diminution of the resource base) but several important issues have emerged from the CAL evaluation program and significant issues remain to be addressed.

Typically in Guinea, a similar latitude country in Sub-Saharan West Africa but with very much larger bauxite Resources, 300 m spaced drilling is assigned to an indicated status and 150 m spaced drilling is allocated to Measured Resource. This is comparable to other broad plateau settings such as occur on Cape York Peninsular at Aurukun, Weipa and Andoom, north Queensland, Australia. Pre-mine drilling at Weipa/Andoom was undertaken at 250 foot (nominal 75 m) spacing. The Weipa bauxites are thinner and require beneficiation though originally mainly to improve the handling properties, but now also for grade.

By contrast, at Minim Martap and Ngaoundal, although ore continuity appears reasonable, the elongated and highly elevated character of the plateaus, combined with the common division into high and low grade upper and lower sections and the very poor grades that can be encountered near plateau margins, all mean that short term grade control will be a challenge. The extent of the pre-mine drilling requirements will only be defined by careful examination of the results of targeted close spaced drilling.

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on *information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which may be limited or of uncertain quality and reliability.*

The Inferred Resource category is intended to cover situations where a mineral concentration or occurrence has been identified and limited measurements and sampling completed, but where the data are insufficient to allow the geological and/or grade continuity to be confidently interpreted. Commonly, it would be reasonable to expect that the majority of Inferred Mineral Resources would upgrade to Indicated Mineral Resources with continued exploration. However, due to the uncertainty of Inferred Mineral Resources, it should not be assumed that such upgrading will always occur.

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

Confidence in the estimate is sufficient to allow the application of technical and economic parameters, and to enable an evaluation of economic viability.

The next step for the Minim Martap-Ngaoundal Project resource evaluation is to establish a Measured mineral Resource as a basis for providing the technical and economic parameters to evaluate the economic viability of developing the project.

Under the JORC Code, a 'Measured Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

Mineralisation may be classified as a Measured Mineral Resource when the nature, quality, amount and distribution of data are such as to leave no reasonable doubt, in the opinion of the Competent Person determining the Mineral Resource, that the tonnage and grade of the mineralization can be estimated to within close limits, and that any variation from the estimate would be unlikely to significantly affect potential economic viability.

This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit. Confidence in the estimate is sufficient to allow the application of technical and economic parameters and to enable an evaluation of economic viability that has a greater degree of certainty than an evaluation based on an Indicated Mineral Resource.

An 'Ore Reserve' is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Ore Reserves are sub-divided in order of increasing confidence into Probable Ore Reserves and Proved Ore Reserves.

A 'Probable Ore Reserve' is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, *metallurgical, economic, marketing, legal, environmental, social and governmental factors These assessments demonstrate at the time of reporting that extraction could reasonably be justified.*

A 'Proved Ore Reserve' is the economically mineable part of a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.

A Proved Ore Reserve represents the highest confidence category of a Reserve estimate. The style of mineralisation or other factors could mean that Proved Ore Reserves are not achievable in some deposits.

2.3 Contingency

The JORC Code recognises different categories of Resources defined by their quality, continuity and confidence of extraction.

For the CAL Minim Martap-Ngaoundal Project area, there are now reliable data to characterize the project level Resources (refer to Sections 6 and 7of this report). Additional scout drilling data is required to expand the total Resources base and this additional Resource base for the project could be quickly established. It should be noted though that while the potential remains within the leases to identify additional Resources, currently available drilling and sampling data suggests that these tonnages will most probably not be high grade.

In addition, marginally lower grade material can be inferred from scout data (field observations and plateau area mapping) and these resources could be incorporated in the future as appropriate. Additional exploration work can often increase value and certainty and reduce risk and unnecessary expense in the case of bulk commodity developments.

The issues required to be addressed in this report are listed in Table 2-1 which is a summary extract from the JORC Code. These are addressed throughout this document and summarised in Section 8 which provides a final check list.

Table 2-1: Estimation and Reporting of Mineral Resources – summary extracts from the JORC Code (2004)

Geological interpretation	Nature of the data used and of any assumptions made. The effect, if any, of alternative interpretations on mineral resource estimation. The use of geology in guiding and controlling Mineral Resource estimation. The factors affecting continuity both of grade and geology.
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domain recognition, interpolation parameters and maximum distance of extrapolation from data points. The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. The assumptions made regarding recovery of by-products. In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. Any assumption behind modelling of selective mining units (e.g. non-linear kriging). The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.
Cut-off grades or Parameters	The basis of the cut-off grades) or quality parameters applied, including the basis, if appropriate, of equivalent metal formulae.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It may not always be possible to make assumptions regarding mining methods and parameters when estimating mineral resources. Where no assumptions have been made, this should be reported.
Metallurgical factors or assumptions	The basis for assumptions or predictions regarding metallurgical amenability. It may not always be possible to make assumptions regarding metallurgical treatment processes and parameters when reporting Mineral Resources. Where no assumptions have been made, this should be reported.
Tonnage factors (in situ bulk densities)	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used the frequency of the measurements, the nature, size and representativeness of the samples.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories. Whether appropriate account has been taken of all relevant factors, i.e. relative confidence in tonnage/grade computations, confidence In continuity of geology and metal values, quality, quantity and distribution of the data. Whether the result appropriately reflects the competent person's view of the deposit.
Audits or Reviews	The results of any audits or reviews of mineral resource estimates.

3 Exploration Work

The drilling locations completed by CAL in 2009 are shown on Figure 3-1 and Figure 3-2. On the basis of these programs, a significant bauxite resource was identified. These plateaux form the basis of the main project focus. While bauxite is occur known in other areas within the Minim Martap leases, the large volume, high quality and logistic simplicity of the focus area has proved most attractive for project start-up and can provide focus for future ore reserve delineation.

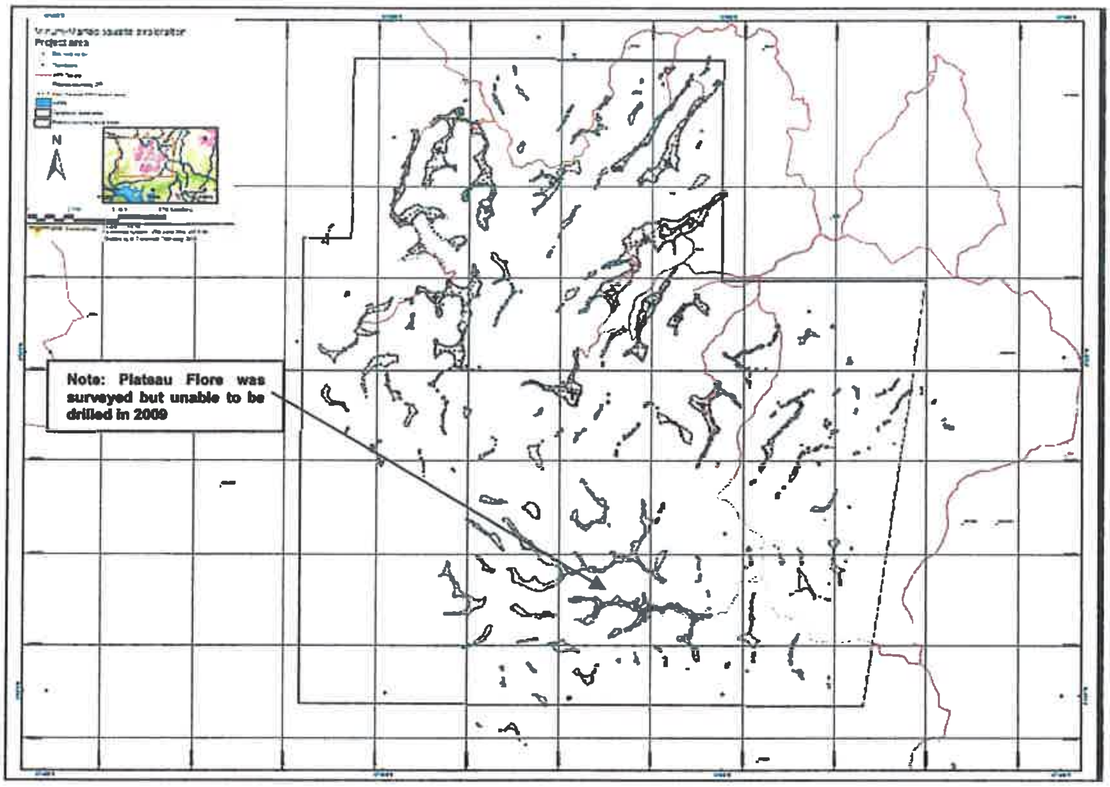


Figure 3-1: Drilling Undertaken in the Minim Martap Lease during 2009 (Appendix 11)

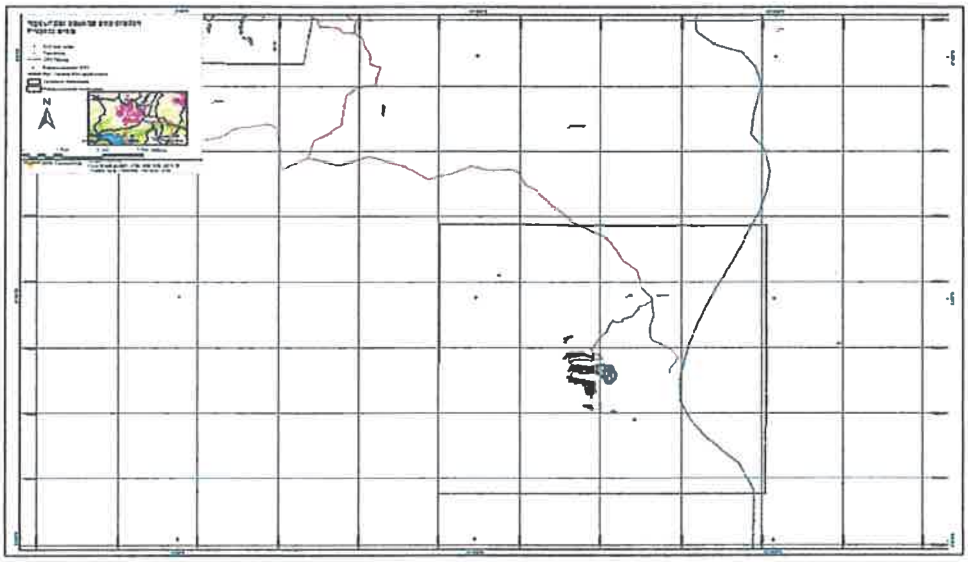


Figure 3-2: Drilling Undertaken in the Ngaoundal Lease during 2009 (Appendix 11)

3.1 Summary of Resource Definition Work Completed

Modern work on the Minim Martap-Ngaoundal bauxite resource definition commenced in 2006 with limited shaft sampling work by Aluminpro undertaken for Hydromine and reported in Aluminpro (2006) and Aluminpro (2008). Total XRF analyses were completed on a few samples to provide indicative confirmation of the presence of bauxite although the grades varied significantly from the results reported by the BRGM and Pechiney.

During 2009, CAL completed a reconnaissance exploration program covering 14 plateaux: Danielle, Mathilde, Alice, Beatrice, Aurelie, Raymonde, Eulalie, Agnes, Yolande, Aurelie and Gregorine at Minim Martap; plus Simone, Judith and Brigitte at Ngaoundal. The exploration program included auger, RAB, core and aircore drilling, using up to five rigs operated by two drilling contractor companies on site at peak times. A 15th plateau named Flores, located in the southern Minim Martap area was surveyed but unable to be drilled due to the onset of the rainy season.

Figure 3-3 shows a typical dry season scene on Danielle Plateau with rolling character and varying levels of vegetation and rubbly outcrop on the bare rocky surface common to many plateaux in the area.

Figure 3-3: Typical setting of Plateau Danielle with rolling plateau top

The edge of the plateau is marked by the line of trees in the distance behind the drill rig. The trees on the left mark the edge of the "duck" where bauxite is not developed

Total oxide% XRF analyses have provided a quick overview on the bauxite grades. Because the samples were acquired at one metre intervals useful profile information is now available to identify ROM scheduling issues particularly profile grade variations and floor control.

The limited digestion and mineralogy work to date has established the gibbsite-rich character of the bauxite at the CAL Minim Martap-Ngaoundal Project leases. Boehmite issues are minimal and based on currently available data, it appears that separate grades could be mined to allow blending of ore from Danielle and Ngaoundal. In the longer term Ngaoundal ore is vital to the maintenance of acceptable silica levels in the overall deposit.

Overall, the Minim Martap-Ngaoundal bauxite is gibbsite dominated but aluminogoethite is widespread and accounts for 3% to 5% of the total alumina in the deposit. In a typical low temperature Bayer plant setup, alumina reporting to the aluminogoethite will not be extractable. Aluminogoethite is not identified from typical digest work but can be accounted for by difference between the MEA and total oxide Al_2O_3 percentages. Aluminogoethite is only extracted by alteration of the goethite lattice structure to hematite and this does not occur in standard bomb digests.

The areas previously assessed by BRGM has been now tested and the 2009 drilling results clearly show that the deposits are not as large nor are the available alumina grades commonly as high as calculated by BRGM. The total amount of drilling work undertaken by the BRGM was approximately duplicated in the one field seasons activity by CAL. The resource is now defined to approximately the same drilling density as achieved by BRGM and Pechiney plus the layout and modern character of the test work carried out mean the deposit is now much better understood than was previously possible.

3.2 Survey and Line Clearing

All survey work is tied into the UTM WGS-84 co-ordinate system. Survey bench marks were not used. Because the hole spacing was approximately 500 by 250 m, only handheld GPS locations and elevations were taken. These are used to tie in the access roads and drill hole sites. All plateau survey data for the work completed has been collected by SIMA subcontracted to the drilling contractor Labogenie.

The first tack was to scout the plateau and place markers to locate and point the bulldozer (D6, D7 and D8 sizes plus CAT 988 rubber tyred loader used) to create an initial baseline access. The line clearing was mostly straight forward though access roads to the plateaux and creek crossings often needed additional work. **Figure 3-4** shows typical line clearing equipment on a plateau.

Figure 3-4: Line clearing operations

All drill holes were marked by placing a durable aluminium tag at each site. The hole locations were spot checked by the geologists at the time of drilling. A compilation of the survey data is provided in **Appendix 1**. All survey data was acquired using handheld GPS instruments. It is planned to collect differential GPS locations and more accurate elevations from the current drill holes during the next field season to improve the elevations. In Minim Martap the geologists collected location data over the actual site of the borehole. The geologists final (or spot check) hole location data was used at Minim Martap. At the Ngaoundal plateaux the original survey data was used and the drillers mad an effort to drill at the peg locations as marked by the surveyors.

Figure 3-5: Drill hole survey markers and tags

During the course of the program the surveyors marked the lease boundary with permanent markers (**Figure 3-5, 3-6** and 7).

Figure 3-6: Permanent marker with identity tag

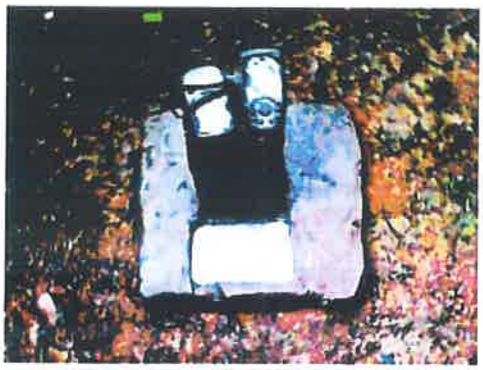


Figure 3-7: Checking marker location with 2 GPS units

3.3 Drilling Activity

Drilling at Minim Martap and Ngaoundal was undertaken between early January and mid May 2009 in conjunction with surveying and line clearing.

Flore, a southern plateau in Minim Martap was not able to be drilled. Restoration work on the road to Flore was washed away was washed away by the early rains. **Figure 3-8** shows some difficult sections on the main Flore access road. Attempts to make an alternate route also failed when the bulldozer became bogged (**Figure 3-9**).

Figure 3-8: Difficult road sections on the main access road to Plateau Flore

Figure 3-9: Attempted alternate access road to Plateau Flore

The bulldozer was bogged for several days before the route was abandoned.

3.3.1 Drill hole layout and nomenclature

Based on the reports of the BRGM, but without any access to the original primary data, the drilling program was laid out with a focus on the reported asymmetric grade distributions whereby the lengthwise plateau grade variations were much less than the cross plateau changes. A central baseline formed the focus and regular cross lines with closer spaced drilling was laid out. The drillhole nomenclature is provided in **Table 3-1** and the Plateau abbreviations in **Table 3-2**.

At the Minim Martap plateaux, drilling was carried out using a nominal grid comprised 500 x 250 metres ("m") drill hole spacing (**Figure 3-10**). This drill hole pattern included a central plateau baseline with holes spaced at 500 m intervals and regular cross lines with holes spaced at 250 m intervals.

The drill hole spacing for the 3 plateaux at Ngaoundal were laid out approximately 125 m (cross) x 250 m (long) with 125 m along the Simone long axis baseline.

Additionally, on each plateau, a cross of 16 close spaced drill holes was completed. These were 50 m spaced on the Minim Martap plateaux (**Figure 3-11**) but an additional grid of 16 holes drilled at 10 m spacing was drilled on Simone.

Table 3-1: Hole Nomenclature Scheme

	Name of Plateau	Year	Line	Direction	No of hole from base line
FOR Danilelle for Example	DA	08	B	N	0001
FOR Danilelle for Example	DA	08	C	S	0001

Note : B Denotes Base Line, C Denotes Cross Line, N Denotes North, S Denotes South, E Denotes East, W Denotes West

Table 3-2: List of Plateaus targeted for drilling in 2009

Plateau Name	NOMENCLATURE
Danielle	DA
Alice	AL
Gregorine	GR
Raymonde	RA
Beatrice	BE
Agnes	AG
Mathilde	MA
Judith	JU
Simone	SI
Brigette	BR
Yolande	YO
Aurelie	AU
Gilberte	GI
Eulalle	EU
Flore	FL (surveyed not drilled)

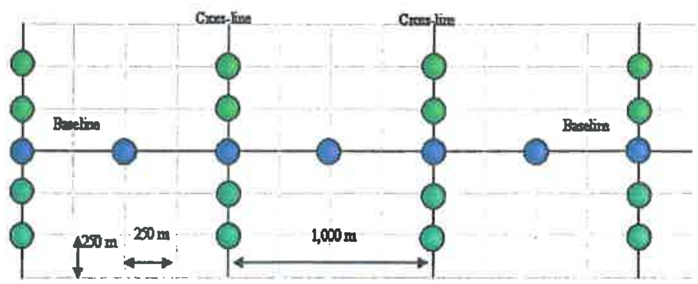


Figure 3-10: Basic drill hole line layout with base lines and cross lines

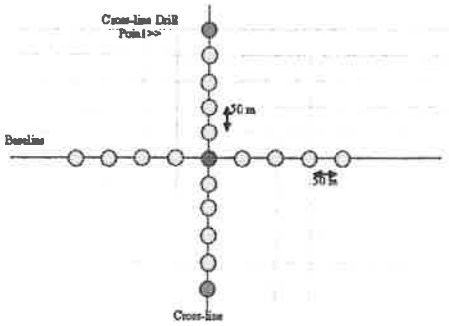


Figure 3-11: Detailed close spaced pattern drilling undertaken at 50 m spacing on each plateau

3.3.2 Auger, RAB and Aircore Drilling

The drilling comprised auger and RAB drilling on the Minim Martap plateaus with approximately three duplicate core holes planned for each plateau as control:

- The drilling on the Minim Martap plateaux was undertaken using RAB and Augers with core holes twinning selected open holes; and
- All the drilling at Ngaoundal was undertaken using a Wallace Air Core rig. Late in the season two conventional core holes were also drilled on Brigitte.

The characteristics of the drilling varied significantly:

- For example, the RAB drilling was initially used by Labogenie on Danielle Plateau but the setup was inefficient with a large, standalone, poorly maintained, trailer mounted compressor. In the first couple of days the front wheels and axle were pulled off the compressor, the radiator was hit and burst, the electrics failed causing the machine to catch fire and there were failures with the hose. The RAB drilling was eventually successful, although slow and sample collection was achieved but difficult;
- Eventually, it was possible to develop an auger drilling system and this was used for the remainder of the program. Because the Labogenie rigs were somewhat underpowered for the drilling specification required, reworking the hole was required but this meant there was potential for sample contamination. The evidence from the twinned core holes confirmed this was not a significant contamination problem although the technique is not favoured for future resource definition work where more accurate sampling and depth control will be required.

The locations of the drill holes and lease boundaries with the satellite image background are shown on

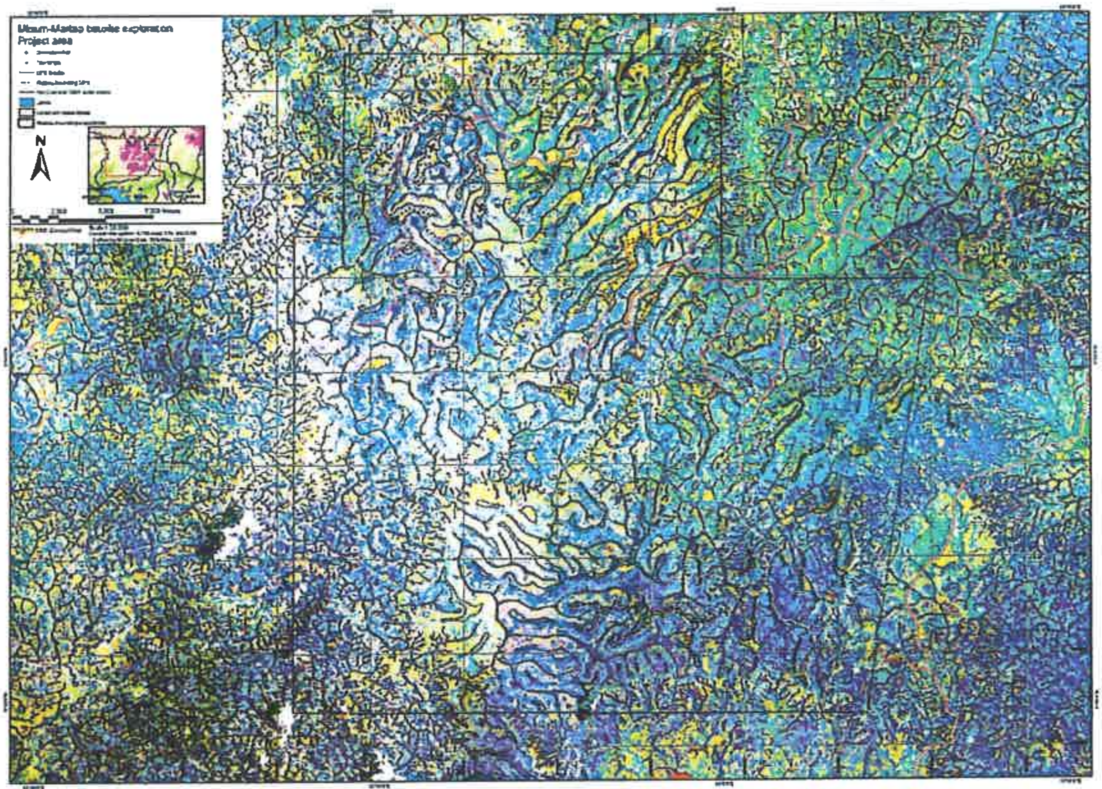


Figure 3-12 and **Figure** 3-13 and also **Appendix 9. Figures 3-14, 3-15** and **3-16** illustrate the three drilling techniques used. Movies of the drilling and sampling are presented in **Appendix 14**.

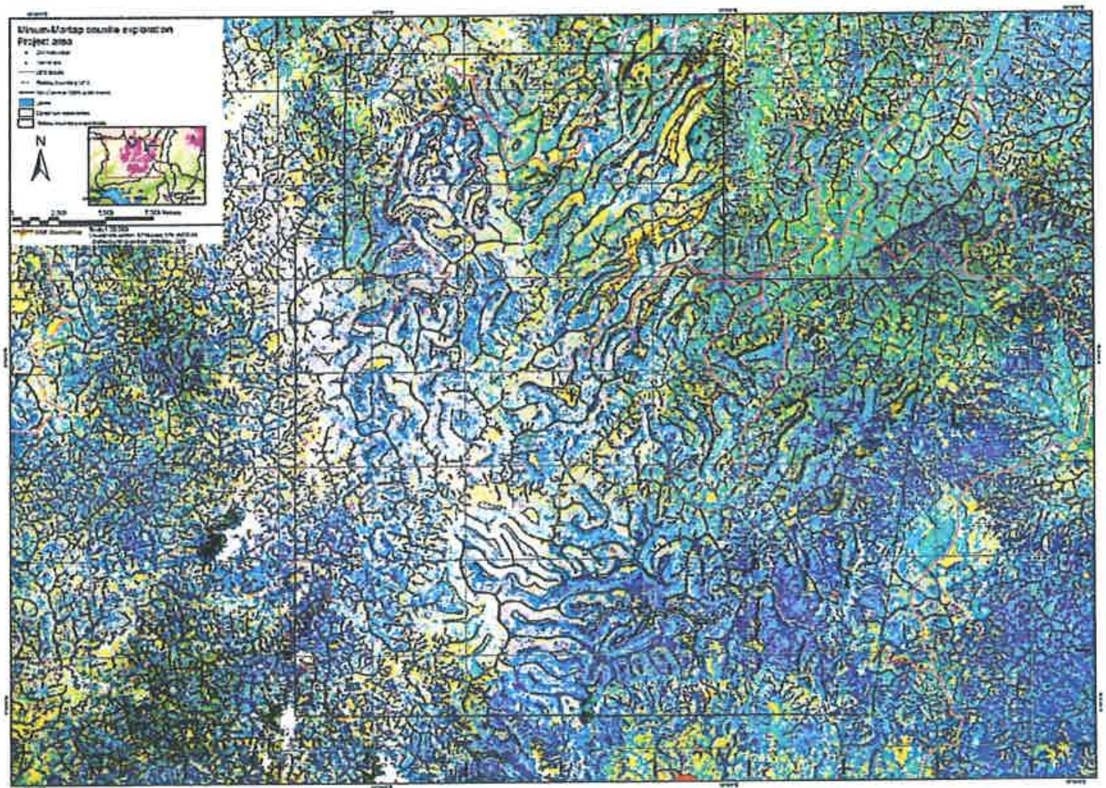


Figure 3-12: Minim Martap drillhole locations and lease boundary

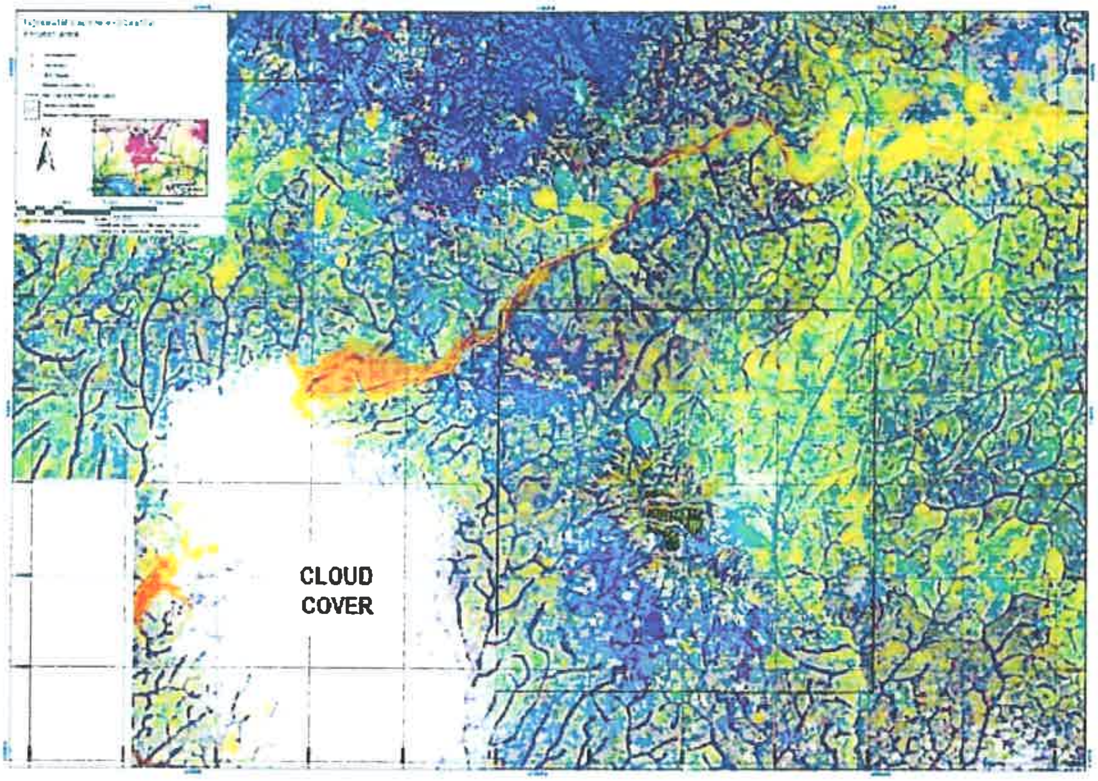


Figure 3-13: Ngaoundal drillhole locations and lease boundary

Table 3-3 shows the meterage and number of holes drilled on each plateau during 2009. In total, 852 holes were drilled. The proportion of each type of hole is shown in **Table 3-4**.

Table 3-3: Number of drill holes and meterage drilled during 2009 field season (Off holes were drilled to test for bauxite off the plateaux tops)

Plateau	Holes	Drill m
JUDITH	79	1558
BRIGITTE	26	487
SIMONE	152	2936
GILBERTE	49	550
EULALIE	41	428
AURELIE	35	339
YOLANDE	59	659
GREGORINE	69	821
RAYMONDE	74	843
AGNES	40	387
BEATRICE	50	516
MATHILDE	41	389
ALICE	47	483
DANIELLE	85	927
TOTAL	**847**	**11323**
Extra Off Danielle	1	6
Extra Off Brigette	4	29
TOTAL PROGRAM	**852**	**11358**

Table 3-4: Type of drilling method used for each plateau and percentage of drill hole type (plateau coverage) undertaken for each plateau during 2009 field season

AG	Auger	100%
AL	Auger	100%
AU	Auger	100%
BE	Auger	100%
BR	Air Core	100%
DA	Auger	23%
	RAB	77%
EU	Auger	100%
GI	Auger	100%
Gr	Auger	100%
JU	Air Core	100%
MA	Auger	98%
	RAB 1 hole	2%
RA	Auger	95%
	RAB 4 holes	5%
SI	Air Core	100%
YO	Auger	100%

Figure 3-14: RAB drilling on Danielle Plateau by Labogenie

(Note the large groundsheet used to catch the maximum sample and ensure minimal sample contamination)

Figure 3-15: Auger drilling on Gilberte Plateau by Labogenie

Figure 3-16: Air Core drilling and sampling on Simone Plateau by Wallis Drilling

3.3.3 Core Drilling

In addition to the open hole drilling, the program aimed to twin 3 open holes on each plateau with fully cored holes. In total, 24 core holes were drilled (or 3 per plateau). Some core holes were not completed (due to the onset of the wet season) or were stopped early due to several reasons, including stuck rods and equipment failure.

Average core recovery was 81% though this varied from about 50% at the start of the drilling to almost 100% by the end. Approximately 20 to 30% of the core was extracted as rubble and occasional subsurface voids and caverns were encountered. **Figure 3-17** shows the small crawler mounted core rig of Labogenie.

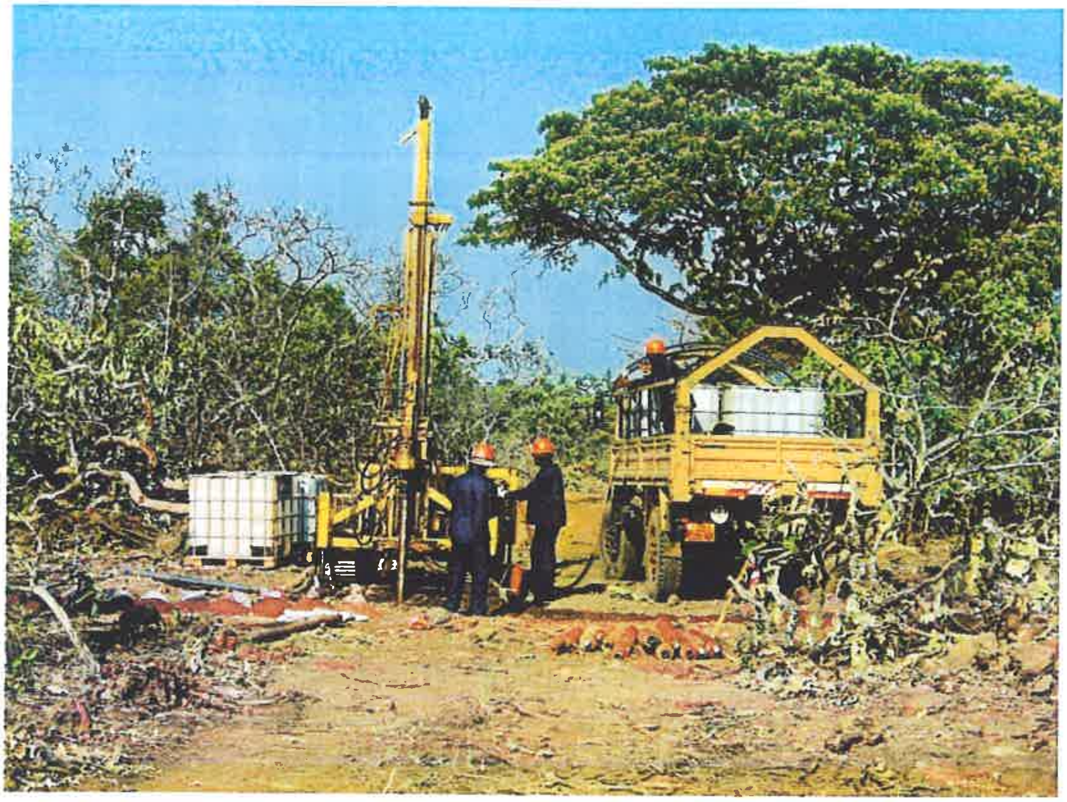


Figure 3-17: Crawler mounted core rig working on Danielle Plateau

The locations of the core holes are shown on **Figure 3-18** for the Minim Martap plateaus and on **Figure 3-19** for the Brigitte plateau at Ngaoundal.

Coring is used to provide relatively undisturbed, continuous samples through the bauxite horizon and confirm the overburden and floor character. Wireline HQ drilling (nominal core diameter of 66 mm) provided representative samples although typically the drill rate was slow. Lost circulation due to fractures sometimes occurred but this was not a particular problem. The core was logged on site and stored in wooden core boxes. The boxes were then covered for transportation to Labogenie's drilling yard in Yaounde where the core was split in half with a diamond bench saw for detailed sampling. Half of all cores were retained as representative samples through the deposit and photographs were taken.

Coring is not the preferred drilling method for the systematic sampling of bauxite, particularly small diameter HQ coring. The method is slow, relatively expensive, requires constant water, and the sample preparation is time consuming. There is also the possibility of creating an analytical bias, since the circulating water necessary to lubricate the core bit has a tendency to wash out fine quartz and kaolin from the bauxite. Because of all these considerations, **core drilling was only used to provide checks on the auger work and also samples for strength testing and density measurement.**

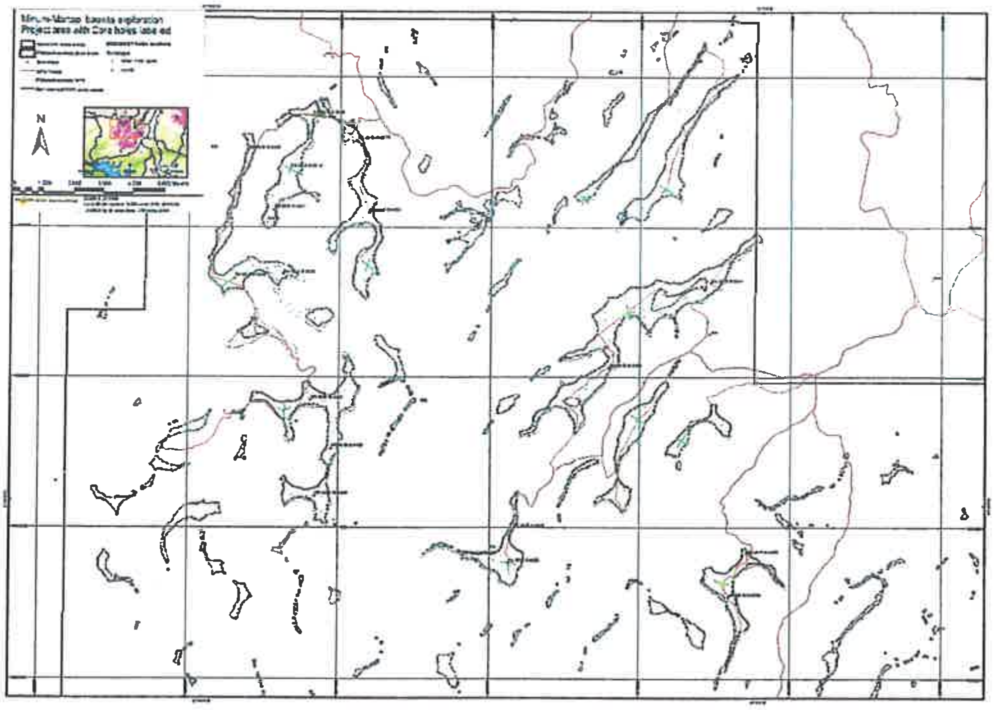


Figure 3-18: Core hole locations at Minim Martap (Appendix 11)

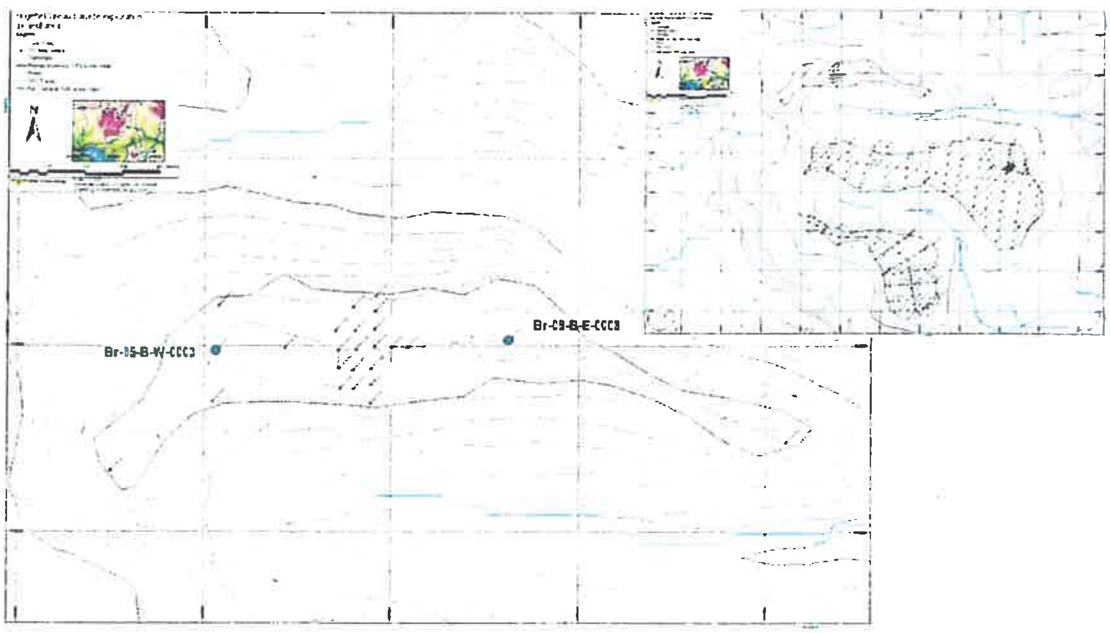


Figure 3-19: Core hole locations at Ngaoundal (large hole numbers)

A list of the 24 core holes drilled is presented in **Table 3-5.**

Table 3-5: Core holes drilled during the 2009 field campaign

Hole Number
AG-09-B-S-0005
AG-09-B-S-0012
AG-09-B-S-0021
AL-09-B-N-0003
AL-09-B-S-0006
AL-09-C-W-0018
BE-09-B-E-0022
BE-09-B-W-0004
BE-09C-E-0029
BR-09-B-E-0003
BR-09-B-E-0008
DA-09-B-E-0021
DA-09-B-E-0021A
DA-09-B-W-0062
Da-09-C-N-0057
GR-09-B-S-0033
GR-09-B-W-0013
GR-09-C-W-0041
MA-09-B-S-0009
MA-09-C-N-0020
MA-09-C-S-0038A
RA-09-B-S-0003
RA-09-C-E-0016
RA-09-C-E-0023

Grade profile comparisons were made for each of the twinned holes. Example plot comparisons with the auger and RAB holes are shown in **Figure 3-20**. Note the similar average grades. The auger data shows a distinct lag (i.e., the equivalent auger sample results are deeper than the core sample). Finer details can be seen in the core compared to the RAB samples. Because of the lag, an auger depth correction factor of 10% was applied to the deposit in proportion to the extent of auger drilling on each plateau.

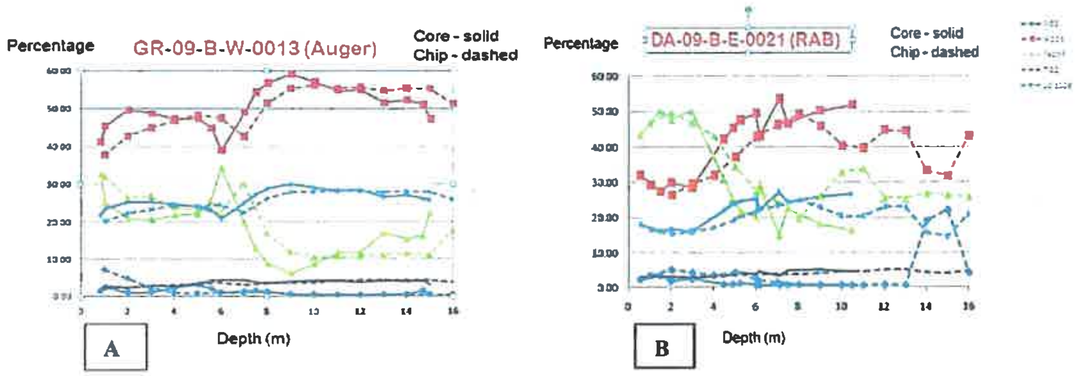


Figure 3-20: Example Auger (A) and RAB (B) drill grade profiles versus core drill grade profiles

Table 3-6 presents the average grade comparison between the open hole and core data.

Follow up analytical assessment work includes checking the good core recovery sections against the core hole grades.

Table 3-6: Comparison of average core drill hole grades with RAB and Auger hole grades for all cores drilled. Loss of silica and iron in the cores may be attributable to washing out of clays

	SiO2%	Al2O3%	Fe2O3%	TiO2%	LOI%	Recovery
Core	2.22	48.49	19.86	3.59	24.75	80.7%
Other	2.93	46.49	22.15	3.60	23.97	

Figure 3-21 shows a typical core recovery. In this example, the profile grades from rubbly ferruginous and lateritic to crystalline and gibbsite dominated in the lower part. The section is from 6 to 9 m in hole GR/09/B/W/0013 from plateau Gregorine.

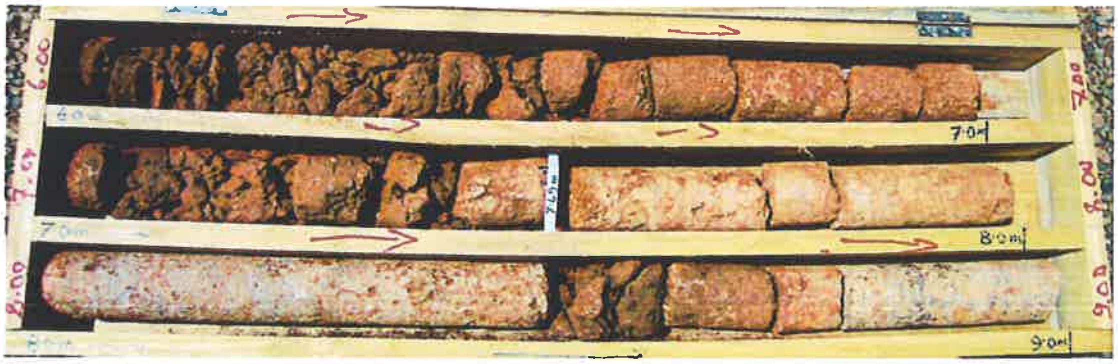


Figure 3-21: Typical boxed core GR-0013

Note: correctly labelled with a drillers tag and approximate end depths

Log descriptions for all cores are presented in **Appendix 2.**

Because of the onset of the wet season, core drilling was stopped prior to completion of the program but this has not significantly affected the outcome of the required objective.

3.3.4 Duplicate Check Drilling

The comprehensive diamond core hole check drilling undertaken as part of the exploration program provided a visual check on the deposit to determine the practical mining cut offs that could be applied by operators working the deposit as well as samples to check the open hole drilling assays and material for dry density analysis.

- At the Ngaoundal, a series of 8 duplicate holes were drilled to understand the close spaced variability. Seven duplicate holes were drilled at Simone and the deep hole at Judith was twinned.
- In addition, 3 duplicate holes were drilled at Alice were separately analysed at BRDC and Stewart Group labs.

Simone drill holes SI/0005 and SI/0146 illustrate the presence of sporadic intermediate kaolin layers and in the case of SI/0005, the potential for an erratic floor level (**Figure 3-22 and Figure** 3-23). **Figure 3-23** shows an example of very similar duplicate hole grade profiles.

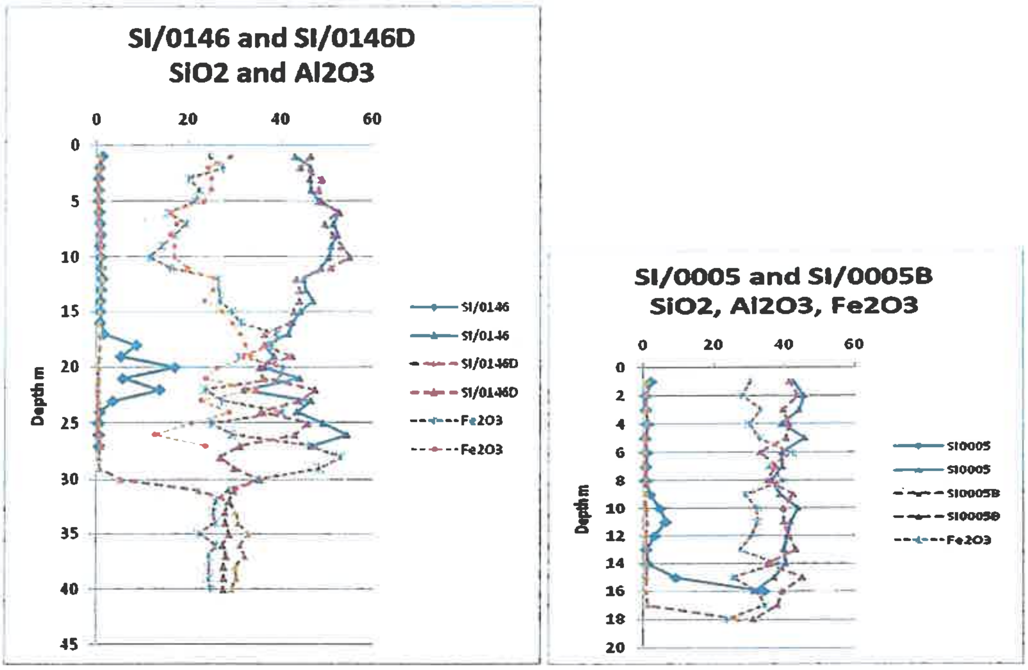


Figure 3-22: Simone duplicate drill holes showing a sporadic intermediate kaolin layer in hole SI/0146

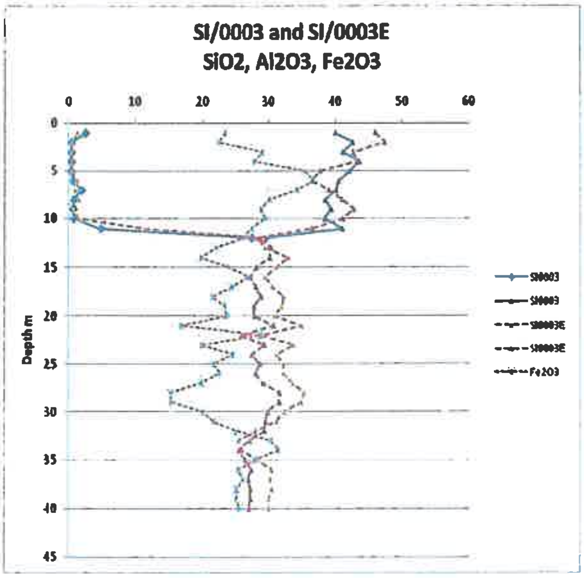


Figure 3-23: An example of twinned holes with very similar grade profiles to the floor at 12 m

3.4 Hydrology

The water table on the bauxite plateaux is typically below the base of the economic bauxite profile throughout most of the year. During the wet season the water table rises but quickly drains and mining is not likely to be impeded. The water level observations during the 2009 drilling program demonstrated that the plateau top water is in the form of a perched aquifer supported by the basal clay layer.

The higher elevations of the bauxite-rich plateaux aid the drainage. Water table levels on the plateaux are not currently monitored but this will need to be done during ongoing evaluation.

Trenches dug in the bauxite are commonly about half filled with water at the start of the dry season. It would be simple to create better sealed pond areas for long storage through the dry season once mined out areas become available.

Follow up programs need to include hydrogeological and hydrology studies to ensure potential mining impacts are minimised and water storage issues are understood.

4 Sample Preparation - Methods, Approach, Preparation Verification and Analyses

4.1 Sampling Methodology

The bauxite resources described here were outlined with carefully targeted drill patterns covering the entire surface of individual bauxite bearing plateaux, which were drilled to provide resource definition data. Although the coverage is often wide spaced, the number of drillholes per plateau is sufficient to ensure thickness and grade measurements will be reliable.

The sampling approach and procedures implemented by CAL were developed in conjunction with SRK to help ensure maximum value would be achieved by the work. The approach and procedures are similar to those employed for bauxite exploration in many areas of the world. **Figure 4-1** shows sampling by the Labogenie drilling crew. A general flow sheet summarising the sampling and sample preparation procedures is provided as **Figure 4-2**.

Factors that can significantly affect sampling results include poor recovery, failure to homogenise and sample cross-contamination.

4.1.1 On-site Sampling Recovery and Dispatch

The following sampling practise was undertaken during the 2009 site drilling program:

- Auger drilling produces about 30 kg/m of powdery sample with bauxite rock chips (**Figure 4-2**);
    - This material was sampled from the spiral and from a sheet covering the ground and the sample was then passed through a splitter and reduced to 1 to 2 kg;
        - Minim Martap plateaus - all samples were reduced with riffle splitters (Minim Martap)
        - Ngaoundal plateaus – all samples were reduced with a rotating cone splitter
    - Each sample was identified with the depth and placed into a sack marked with the drillhole and number of samples. Both internal tags and external markings were used for all bags and sacks.
    - The remainder of the sample was piled in a line and a detailed log of the characteristics is prepared by a company representative geologist (Figure 4-3); and
- Each sample was then double bagged with a depth tag inserted between the inner and outer bag. Each drill hole sample bag was put into a sack with the drill hole name and details recorded on a bagged note in the sack plus externally.
- All the samples collected from each hole in large woven plastic bags were then boxed for transportation to Yaounde. Each sample and sack was tagged internally and externally to ensure reliable identification. At Yaounde, the samples were stored at Labogenie's drilling yard until transferred to the Stewart preparation lab in Yaounde or sent via courier (aeroplane service) to BRDC at Belgaum in India.
- All samples were catalogued and dispatch and receipt notes were made and checked. In all, only a few percent of samples were problematic. It is though this related to the transport arrangements and some packing confusion in the field.

Sample numbers exceeded hole depths in some instances. Additionally, two sacks went missing. One hole was not surveyed in the field on Simone plateau (SI-09-C-N-0027) and once this hole is surveyed during the next field season, the results can be incorporated into the Resource estimation work.

Figure 4-1: Sample splitting and collection in double bags by Labogenie at Minim Martap

Where present, the top soil horizon, usually from less than 0.3 m was not sampled.

The upper iron-rich crust is sampled since this horizon will usually be mined with the underlying bauxite, although deeper stripping is possible and may be desirable if poor surface grades need to be avoided.

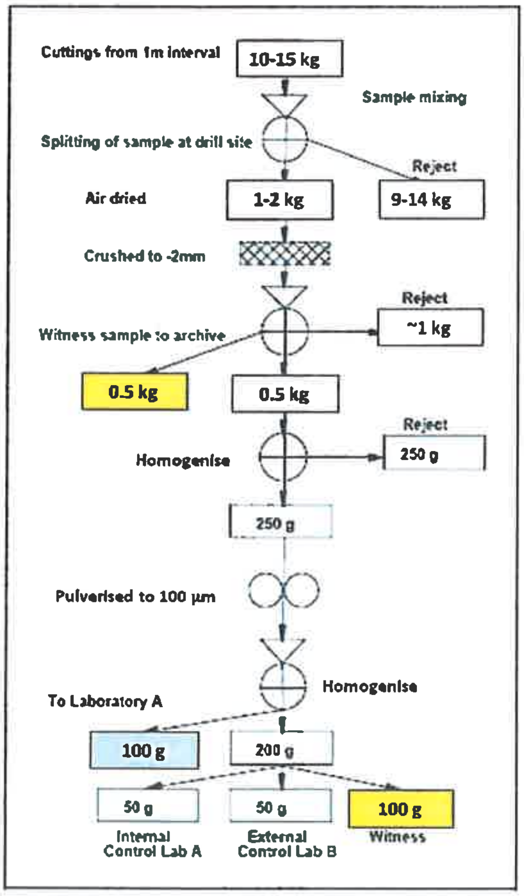


Figure 4-2: Typical prep lab flow sequence

Drill Hole :	DA/09/B/W/0069	Plateau :	DANIELLE	X:	12°57'04.1"	Y:	6°52'15.8"	Z:	1266	Depth :	7
Driller :	LABOGENIE	Rig Type :	AUGER	Date :	10.02.09			Geologist :	RDP	Samples :	7

Sample No	From (m)	To (m)	Lith	Facies		Colour		Phys Props	Hard	Humid	Observation
				Principal	Second	Principal	Second				
1	0	1	3/7	6	2	6	6	1/5	2	1	Mixed with top soil
2	1	2	7/3	2	3	3	3	1/5	3	1	Fe rich
3	2	3	3	2	3	3	3	1/5/3	2/1	1/2	Clay balls, Fe rich
4	3	4	3	2	3	3	3	1/5/3	2/1	1/2	Clay balls, Fe rich
5	4	5	3	2	3/5	3	9	1/5/3	1	2	Clay balls, Fe rich
6	5	6	3/4	2/5	3	3	9	3/5/1	1	2	Clayey, Fe rich
7	6	7	4	5	5	9/6	3	5	1	2/3	Clay touched

Lithology		Facies		Colour		Phys Props	Hardness	Humidity	EOH
1. Bauxite	6.Iron Band	1Conglomeratic	7. Skeletal	1.Black	7. Orange	1. Massive	1. Soft	1. Dry	**1. Basal Clay**
2. Lat. Bauxite	7.Iron Cap	2. Gravelly	8.Pisolitic	2.Gray	8. Rose	2. Organics	2. Hard	2. Moist	2. Excess Water
3. Laterite	8. Dolerite	3. Sandy	9. Oolitic	3.Brown	9. Yellow	3. Sticky	3. Very Hard	3. Saturated	3. Bedrock
4. Clay Band	9. Sediments	4. Silty	10.Fragmented	4.Light Brown	10. Beige	4. Friable			4. Machine failure
5. Basal Clay	10. Soil	5. Clayey	11.Brecciated	5. Violate	11. Crème	5. Cavity			
		6. Amorphous	12.Dolerite	6. Red	12. White	6. Concretions	EOH:		1

Figure 4-3: Example drilling lithology log from Danielle Plateau

4.1.2 Rock Samples

Rock types were logged to provide indications on physical characteristics, relevant for mining and material handling.

Rock (chip) samples were collected over 1 m intervals (RAB, Auger and Air Core). Sample lengths were not based on rock types and resource modelling was not controlled by rock types. Core was collected for the entire hole interval and subdivided as appropriate based on visual control.

Rock types have been checked against the analytical data and some correlations that will assist preliminary mining designs/plans have been recognised e.g. visual grade controls, rock strengths versus grade etc. Further study of this issue should enable better control of future drilling, sampling and trial mining activities.

4.1.3 Sample Preparation

Drilling methods and field sampling procedures are consistent with accepted standards for bauxite exploration. The size of sample retrieved per metre (about 10 kg), the sample recovery (>90%) and the method of drilling are deemed adequate to prevent excess random errors and/or sampling bias. For relatively homogenous materials, such as bauxite, with a maximum particle size of around 10 mm, approximately 1 kg should provide a representative sample. Samples were crushed or pulverised to -2mm prior to further splitting.

For the CAL leases, the bauxite was defined from the X-ray fluorescence (XRF) total chemical analyses then selected samples were composited over the bauxite intervals to provide samples for the reactive silica and available alumina determinations. As there was no time, in the current reporting timeframes, to revisit the selection of cut offs following the determinations of reactive silica and available alumina, the total XRF cuts have been carried through to the final Resource compilations. However, it is likely that further refinement will only have a very small impact on the resource.

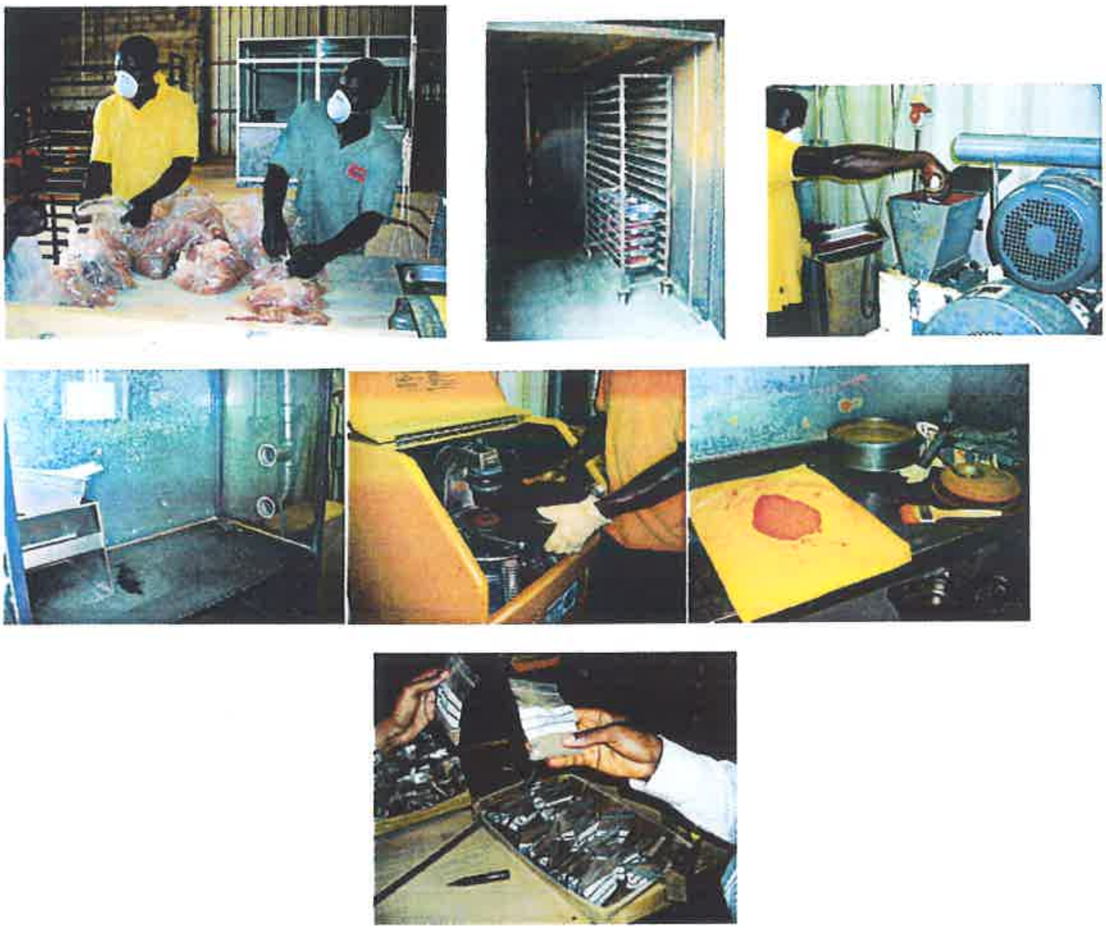


Figure 4-4: Sample Preparation at the Stewart Prep Lab Yaounde

From top left, sample unbagging, drying, crushing, splitting, pulverising, homogenisation and splitting, final sample for dispatch to analytical laboratory

At the preparation laboratory, sample reduction was carried-out in conformity with recognised standards. Well-trained employees worked under the supervision of skilled and experienced laboratory managers (**Figure 4-4**). Sample preparation at the Stewart preparation laboratory in Yaounde and the BRDC laboratory in Belgaum were both audited by the author.

- Drying each sample before it was sent to the crusher or pulveriser for reduction;
- Each sample was then crushed by a 15 cm jaw crusher or pulveriser to -2 mm;
- Each sample was split to leave a 500 g retained sample and then grinding with a disk pulveriser to 100 µm;
- After homogenization by rolling the sample in a plastic sheet, each sample is spread to about one cm thick and divided from which a 100 g sample is progressively and randomly scooped into a pre-labelled plastic bag;
- For internal laboratory quality control, at every 40th sample, a duplicate 100 g sample is also prepared. One sample is included in the sequence of samples to be analysed and the other is analysed to check reproducibility; and
- The samples were packaged in fully labelled plastic sleeves and finally put in metal cases, sealed with steel straps and made ready for shipping to the laboratory.

4.2 Analytical Procedures

All XRF analytical work was undertaken by Stewart Group Laboratories in Ireland and BRDC at Belgaum in India.

A program of independent validation of these laboratories for their XRF analytical methods has not yet been carried out but samples have been prepared and the work will be completed by Genalysis laboratory in Perth this year.

The reactive silica and available alumina analyses were undertaken by Genalysis in Perth, Western Australia and BRDC at Belgaum.

4.2.1 XRF and LOI Analyses

All XRF and LOI work for the CAL samples have been undertaken by Stewart Group Laboratories in Ireland and BRDC at Belgaum in India. Check analyses have been submitted to Genalysis in Perth.

Loss of Ignition ("LOI") determination by Thermogravimetric Analyses ("TGA") followed the Alcan procedure:

- Moist – 105°C, Nitrogen on, hold 20 min and weigh to 0.05% tolerance;
- Ramp to 1000°C at 25C per minute; and
- LOI – 1000°C, Nitrogen off, hold 20 min and weigh to 0.05% tolerance.

XRF fusion discs were prepared by casting in rocking furnaces.

The BRDC Belgaum – Sample preparation and XRF Procedure was conducted as follows:

- Oven Dry Sample;
- 10 Mesh pulverise;
- 1kg sampled and stored;
- Remainder crushed to 100 um;
- Stored in sample packet and dried in oven;
- Samples taken for LOI and XRF analysis; and
- Remainder stored with 1kg -10 mesh samples (50g).

4.2.2 Total Organic Carbon (TOC)

Total Organic Carbon ("TOC") analysis work is in progress at Genalysis on the CAL bauxites and although organic carbon levels are very unlikely to be a problem, work is scheduled to demonstrate this will not an issue.

The 'desert-like' bauxite-rich plateau areas (**Figure 4-5**), evident on the satellite data images , and one focus of the TOC testing program should be the relative abundance of TOC and character of sample profiles between the 'desert-like' areas and the more vegetated areas.

Most plateaus in the CAL bauxite leases have little vegetation but in some areas significant clearing will be required (**Figure 4-5**). Root raking and burning may be desirable in more heavily vegetated areas to improve the topsoil for regeneration. This is a common practice in bauxite mines such as Weipa, Australia.

The satellite imagery data was very useful in helping to distinguish the vegetation cover. **Figure 4-6** shows a comparison between Eulalie and Gilberte plateaus. The yellowish tone is "bauxite desert". Further work is recommended to assess bauxite thickness and grade variations versus the satellite image spectral domains.

Figure 4-5: Typical area of minimal soil cover (bauxite desert) from Raymonde Plateau (left) and typical area of light vegetation and thin soil cover over bauxite (10-20 cm) from Danielle Plateau (right)

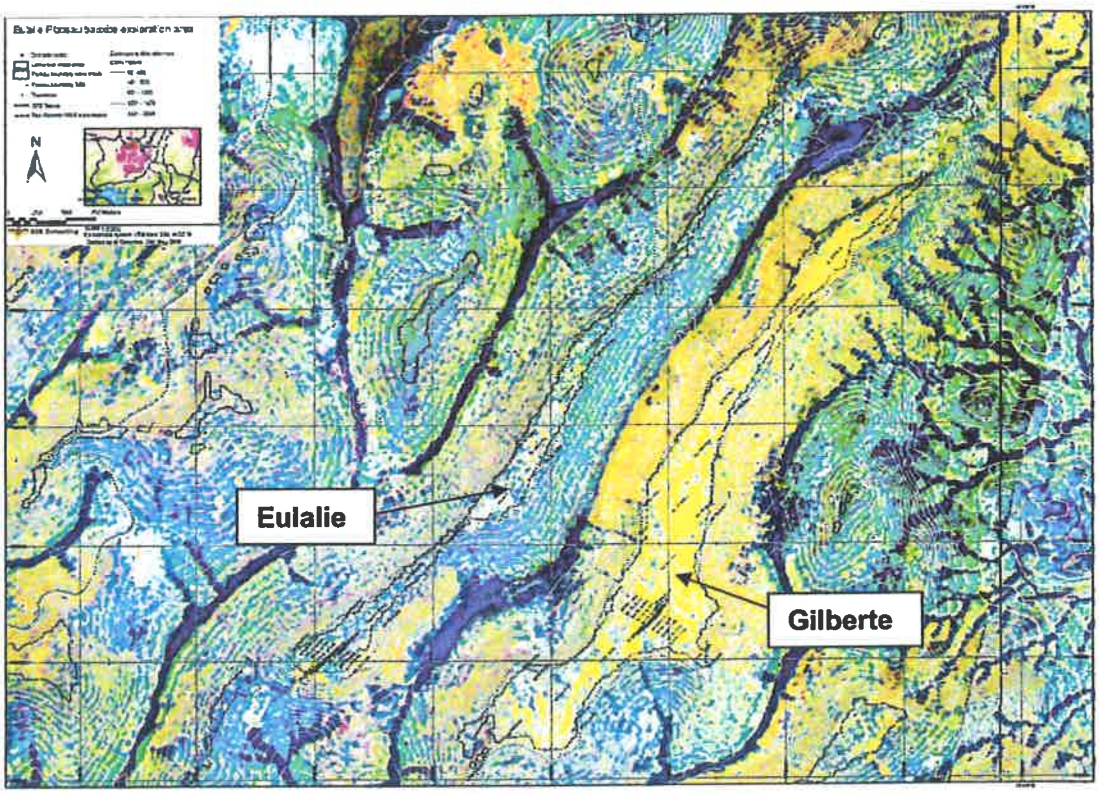


Figure 4-6: A comparison between Eulalie and Gilberte plateaus on the high resolution satellite image

4.2.3 Trace Elements

Based on an initial review, although there are unlikely to be any deleterious elements in the Minim-Martap and Ngaoundal bauxites, as a check, it is planned to screen selected samples for a broad range of elements.

4.2.4 Bomb Digests

Bomb digests to determine the available alumina and reactive silica were conducted by the BRDC laboratory at both low and high temperature conditions. The temperatures tested were 150°C and 225°C.

Genalysis conducted a series of extraction tests at 145°C and 235°C.

Because high temperature digestion requires particular and careful optimisation of both the grinding procedure and the digestion conditions, the high temperature reactive silica and available alumina can only be considered indicative.

The bomb digest procedures used are specified in **Appendix 4.**

4.3 Certification of Laboratories

Stewart Group, Ireland, is an accredited public testing service and the laboratory complies with the necessary standards requirements. OMAC, the parent company, is accredited to ISO 17025 by the Irish National Accreditation Board (INAB). INAB is a member of the International Laboratory Accreditation Cooperation (ILAC) and is a signatory to the ILAC Mutual Recognition Arrangement whose signatories include Canada, USA, Australia, South Africa, Japan, EU countries and many others.

BRDC is ISO 9000 certified and is skilled in the analysis and testing of bauxite and alumina. The BRDC facility was originally set up by Alcan.

Genalysis, Perth, Western Australia is fully accredited and experienced in bauxite analysis. The Genalysis laboratory is certified to the ISO 9001 standard.

4.4 Adequacy of Sample Preparation, Security and Analyses Checks (Blind Samples)

Sample preparation followed accepted practices and standards for bauxite, and was carried out under skilled supervision (refer also to Section 4.1.3).

The assays, covering the full requirement of bauxite characterisation, were carried out by reputable laboratories with proven a track record and experience in bauxite analysis. Analytical methods complied with the industry standard procedures. The nature and extent of quality control measures were sufficient to ensure reliable assay results.

Chemical analytical laboratory errors were tested by submitting duplicate XRF samples to Genalysis in Perth for re-assay. It should be stressed that all laboratories used are certified IS0 9000 and ran standards and blanks during the test work. In the case of the XRF analyses, no significant differences were detected between laboratories. Bomb digest procedures were slightly different between BRDC and Genalysis and samples from different plateaux were analysed at each laboratory.

Security of the samples and the chain of custody are considered to have been appropriate, given that field supervision was undertaken by Labogenie and closely monitored by CAL. During drilling and prior to sample dispatch, the samples were stored in a locked store at Martap. Sample sacks were boxed for safe transport to Yaounde. Prepared samples were shipped from Yaoundé to the Stewart Group laboratory in Ireland and Genalysis in Perth in sealed metal cases and all material arrived in good condition. Full 1 kg samples were professionally packed before being air freighted to BRDC Belgaum, India where they arrived in good condition.

Blind samples were submitted to each lab. No indication of bias was observed **(Table 4-1).**

Table 4-1: List of Blind samples submitted to Stewart and BRDC Labs

Sack	Hole	m	Lab
Blind Hole 1	DA/09/C/N/0010	8	BRDC
Blind Hole 2	DA/09/C/N/0011	10	BRDC
Blind Hole 3	DA/09/C/S/0009	11	BRDC
Blind Hole 4	DA/09/B/C/0024	6	BRDC
Blind Hole 5	DA/09/C/S/0026	10	BRDC
Blind 10	GI-09-C-W-0002	3	STEWART
Blind 11	GI-09-C-W-0002a	12	STEWART
Blind 12	GI-09-C-E-0004	11	STEWART
Blind 13	GI-09-B-S-0005	10	STEWART
Blind 14	GI-09-B-S-0007	8	STEWART
Blind 15	GI-09-C-E-0008	11	STEWART

Figure 4-7 and **Figure** 4-8 show the cross plots and example grade profile checks for the BRDC laboratory. **Figure 4-9** and **Figure** 4-10 show the same data for the Stewart Group laboratory.

It can be observed that while the data from both laboratories is well within acceptable tolerance limits, the BRDC data exhibits more scatter. This became more apparent when the bomb digest work was reported. Although the low temperature available alumina data is comparable between the laboratories, when fewer samples are analysed at BRDC significant variation from an expected trend can occur. Most importantly there appears to be no significant bias from either laboratory. Scatter is higher at BRDC than at Stewart group but was within acceptable limits.

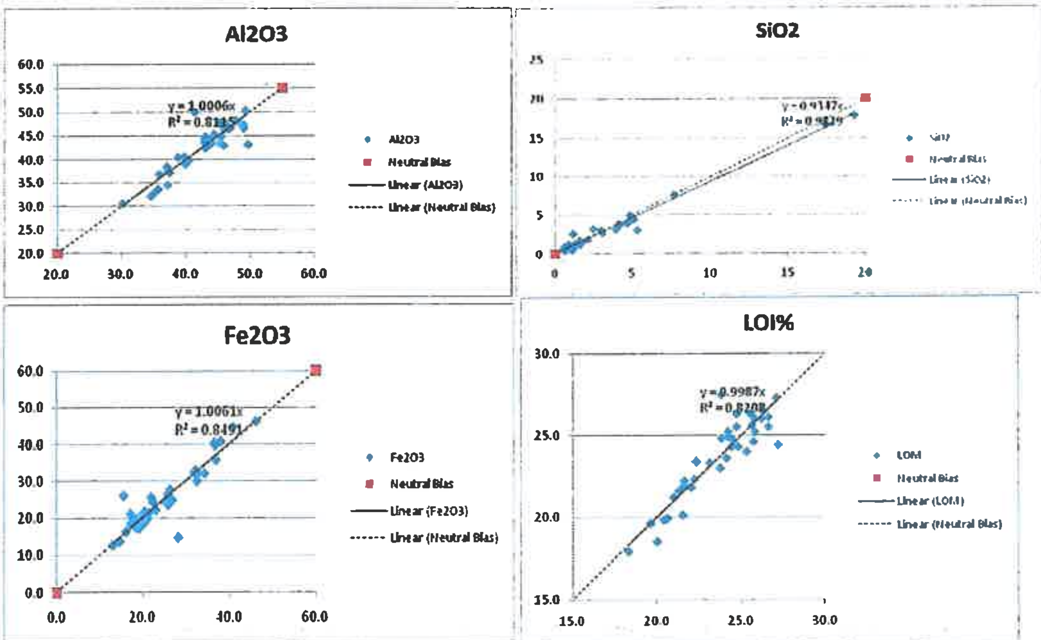


Figure 4-7: Cross plot of Blind samples versus Original samples submitted to the BRDC laboratory

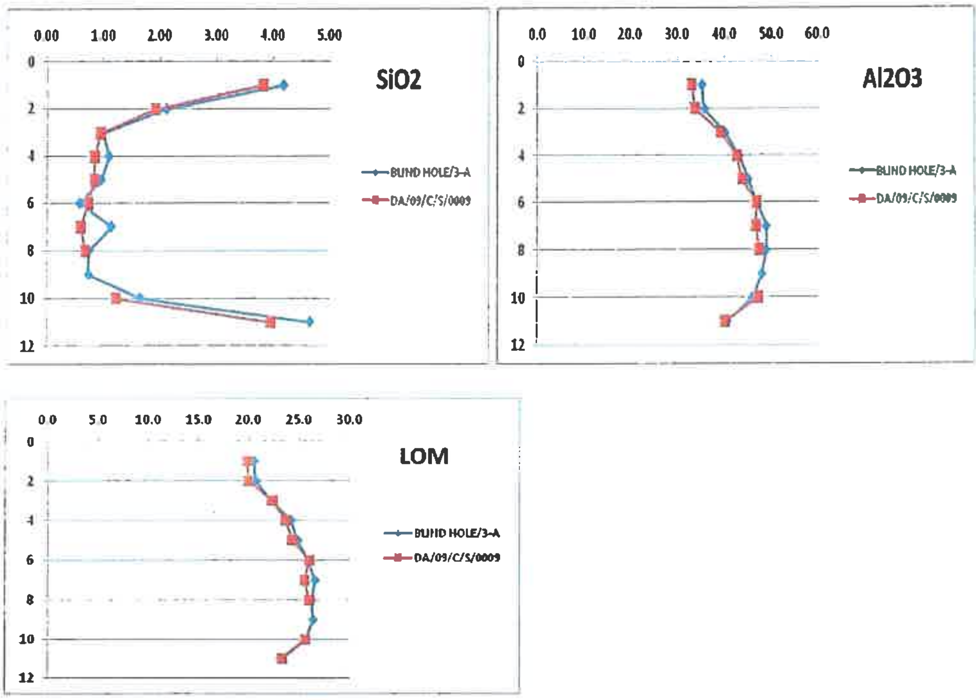


Figure 4-8: Grade profiles of blind and original samples versus depth submitted to BRDC laboratory

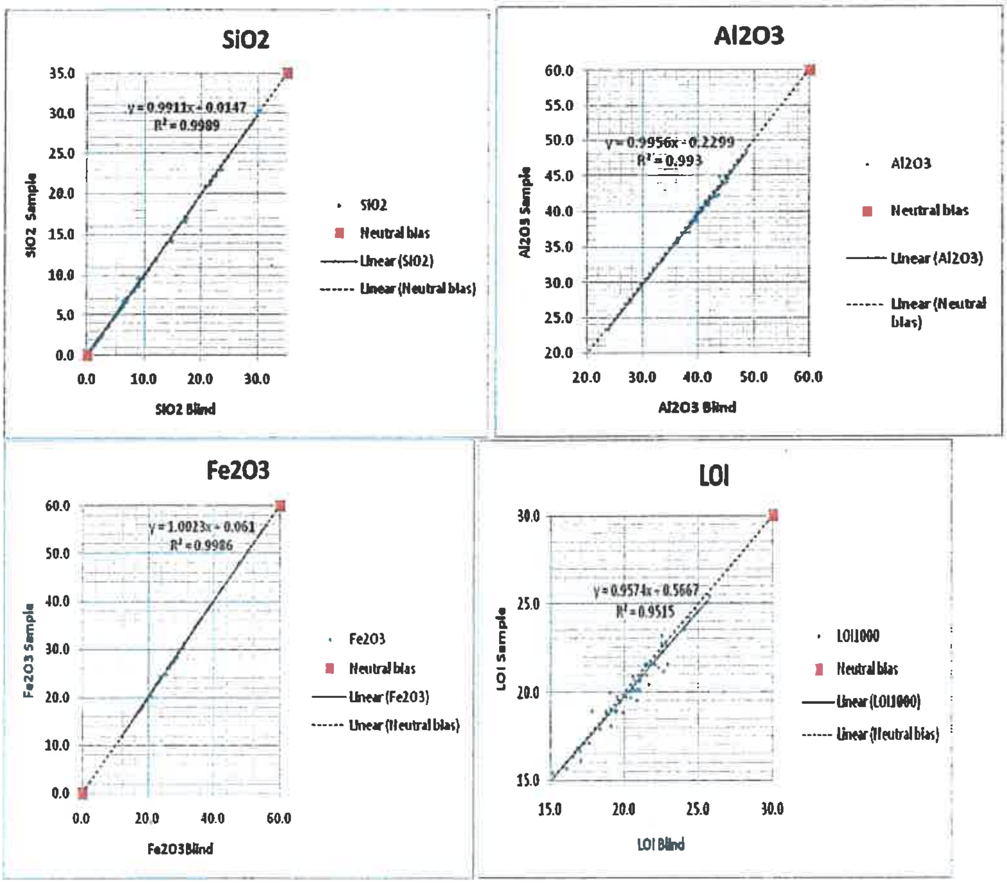


Figure 4-9: Cross plot of Blind samples versus Original samples submitted to Stewart group laboratory

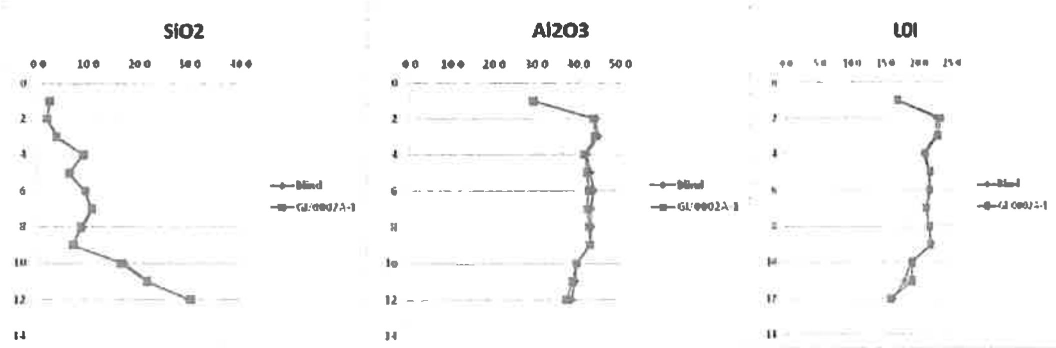


Figure 4-10: Grade profiles of blind and original samples versus depth submitted to Stewart Group laboratory

5 Bauxite Characterisation Studies

The test work undertaken has enabled the Minim Martap-Ngaoundal bauxites to be understood from the perspective of primary data, thus allowing resource potential to be understood using modern criteria. In addition, some deficiencies of the deposit have been recognised and ways to minimise the impact of potential problems can now be addressed.

5.1 Conventions Used

All units quoted in this report are metric. The project co-ordinate system is based on WGS84. Key terms and nomenclature are listed below:

- **T.SiO_2:** Total silica, including reactive silica, free silica (quartz) and silicate minerals (if any).
- **T.Al_2O_3:** Total chemical alumina, including other bauxite minerals (gibbsite, boehmite and diaspore) and alumina contained in other minerals (i.e. goethite).
- **R.SiO_2:** Reactive silica, i.e., the silica present as silicate, generally in the mineral
- Kaolinite, a phyllosilicate clay. Chemistry: $Al_2Si_2O_5(OH)_4$, Aluminum Silicate Hydroxide.
- **THA.Al_2O_3:** The amount of alumina extractable when using the low temperature (145-150°C) process conditions (alumina content of gibbsite)
- **b.Al_2O_3:** The amount of alumina extractable when using the higher temperature (200°C) process conditions (alumina content of boehmite)
- **MEA.Al_2O_3:** The amount of alumina extractable when using the high temperature (ca.235°C) process conditions (alumina content of gibbsite, boehmite and diaspore).
- **Quartz/Silicate:** The amount of silica that is present often as the mineral quartz and is not reactive with caustic soda at low processing temperatures (ca. 145-150°C).

Bayer Sodalite (DSP – desilication product): The waste reaction product from bauxite digestion with the general formula $3(Na_2O.Al_2O_3.2SiO_2.0\text{-}2H_2O).2NaX$, where X can be any of a number of anions, including CO_3^{2-}, SO_4^{2-}, Cl^-, OH^- and $Al(OH)_4^-$.

In low temperature alumina plants, kaolin is the main form of reactive silica but in high temperature plants some quartz is consumed in the digestion process depending on the residence time in the digester. This means that although monohydrate in the form of boehmite and aluminogoethite can be extracted, the losses of alumina associated with the Bayer sodalite increase. Low temperature extraction is most economical for greenfield alumina refining due to the lower capital and infrastructure requirements provided the bauxite has a suitable THA component.

5.2 Bauxite Description

The Minim Martap-Ngaoundal bauxite deposit occurs as dissected flow basalt landscapes that form relatively flat plateaux rising steeply from the surrounding granitic planes. The bauxites comprise the indurated caps covering virtually the entire surfaces of the plateaux drilled. Erosional ramps and benches provide reasonable vehicle access to all the plateaux. Many bauxite-bearing plateaux are known within the lease area and potential to define more resources is reasonable though the scout work undertaken during the course of the current program indicated the grades could be very poor to non-economic bauxite. This was confirmed by analysis of shaft samples at several locations but many plateaux remain to be tested and further scout drilling is highly recommended.

The bauxite comprises the upper horizon of the laterite alteration profile. It is composed of oxides and hydroxides of aluminium and iron with lesser amounts of titanium and silica. Trace levels of phosphorus and vanadium are ubiquitous. Bauxite is developed where the Al_2O_3 content exceeds the Fe_2O_3 content and the silica in the form of kaolinite does not occur at deleterious levels. Aluminium dominance is widespread in the Minim Martap-Ngaoundal bauxite plateaux tested in the 2009 drilling campaign.

The bauxite horizon typically varies in thickness from 3.0 to over 30.0 m and is usually hard near the surface. The bottom 2.0 to 3.0 m of the horizon is moist and friable and most affected by the fluctuating water table which is highest at the end of the wet season. It is within these few metres that a rapid drop in Al_2O_3 content and increase in SiO_2 is observed as the profile transitions to illitic and kaolinitic clays. Purple, white and variegated mottled clays are commonly observed although the high iron content trough the deposit can disguise the transition by masking the colour change.

Because the precursor for the Minim Martap-Ngaoundal bauxite is widespread basalt flows of the Ngaoundere (Adamawa) Plateau, little regional variation is observed throughout the deposits tested in 2009 although in general Minim Martap id high alumina and high silica compared to Ngaoundal which is low alumina and low silica. Rapid and large local variations are common however, and probably relate the specific local bauxitising conditions and slight variations in the parent rock compositions. In addition it is though that some of the higher silica-higher alumina bauxites may derive from more granite influenced andesitic compositions produced as incorporation of country rock into the basalt flows.

5.3 Total Chemical Analyses

Drilling data comprises auger RAB and core samples taken at one metre intervals and analysed at BRDC Belgaum and Stewart Group, Ireland by XRF for SiO_2, Al_2O_3, CaO, Fe_2O_3, K_2O, P_2O_5, TiO_2, MnO, ZrO_2, V_2O_5, LOI 1000 at BRDC and SiO_2, Al_2O_3, CaO, Fe_2O_3, K_2O, MgO, P_2O_5, TiO_2, MnO, Cr_2O_3, LOI 1000 at the Stewart laboratory. Duplicates and standard checks were routinely run during these analytical programs.

Typical elemental analyses of major (highlighted) and minor elements based on the BRDC XRF analyses of the Aluminpro Danielle and Simone bauxite samples are shown in **Table 5-1.**

Table 5-1: Typical averages for major and selected minor elements (major elements and average P and V levels highlighted)

	LOM (%)	ZrO2 (%)	ZnO (%)	Fe2O3 (%)	MnO (%)	Cr2O3 (%)	V2O5 (%)	TiO2 (%)	CaO (%)	K2O (%)	P2O5 (%)	SiO2 (%)	Al2O3 (%)	MgO (%)
Averages	24.43	0.08	0.01	24.97	0.04	0.07	0.11	3.96	0.01	0.01	0.16	1.64	44.14	0.06

Grade distributions for the major and significant minor elements based on the BRDC XRF analyses of the Aluminpro Danielle and Simone bauxite samples are shown in **Figures 5-1, 5-2 and 5-3.**

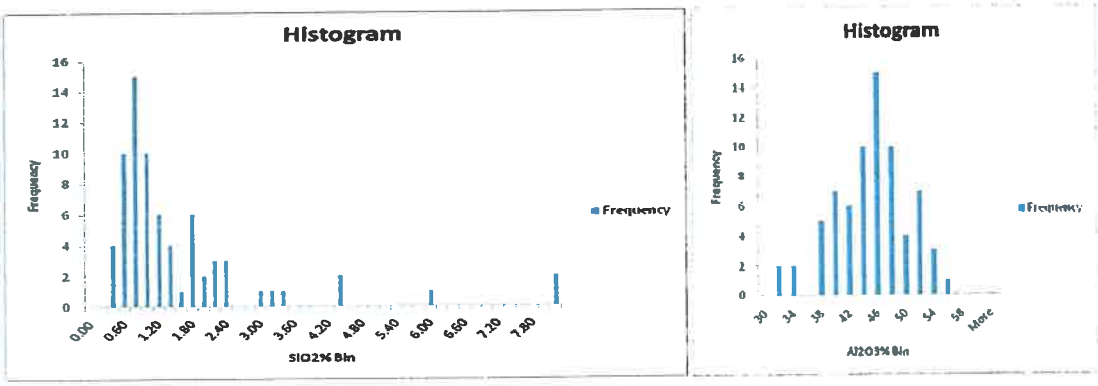


Figure 5-1: Silica and alumina distributions in Danielle and Simone (Based on the Aluminopro 2006 sampling)

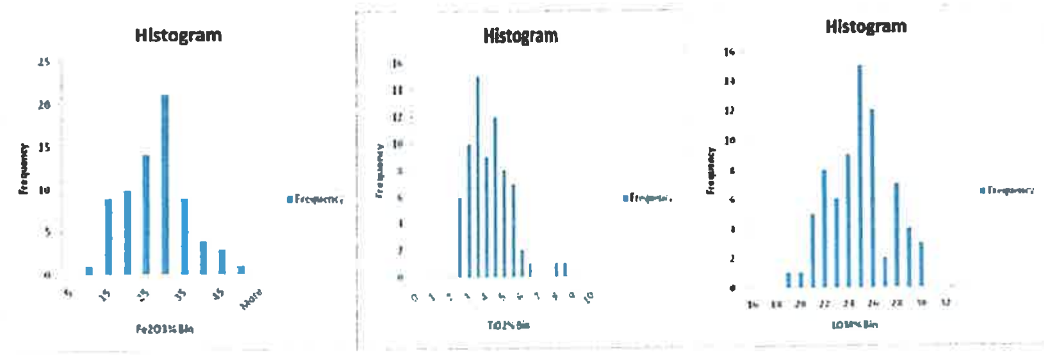


Figure 5-2: Fe_2O_3 T_iO_2 and LOI distributions in Danielle and Simone (Based on the Aluminopro 2006 sampling)

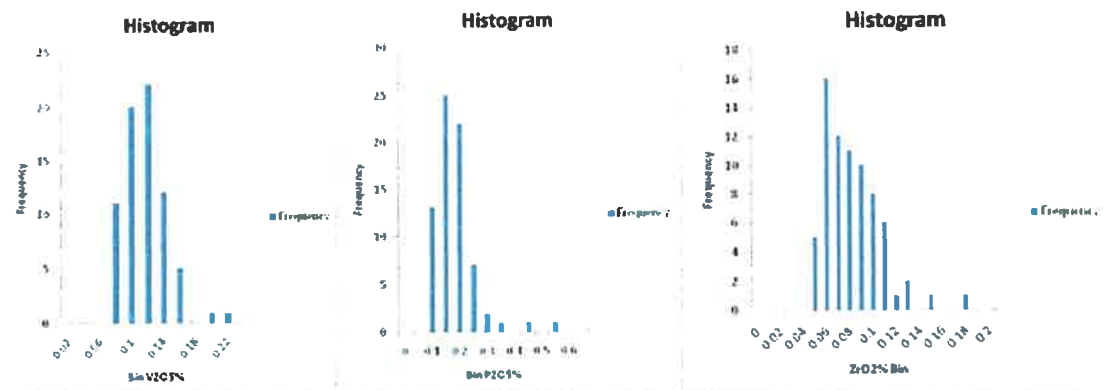


Figure 5-3: Some minor element distributions in Danielle and Simone (Based on the Aluminopro 2006 sampling)

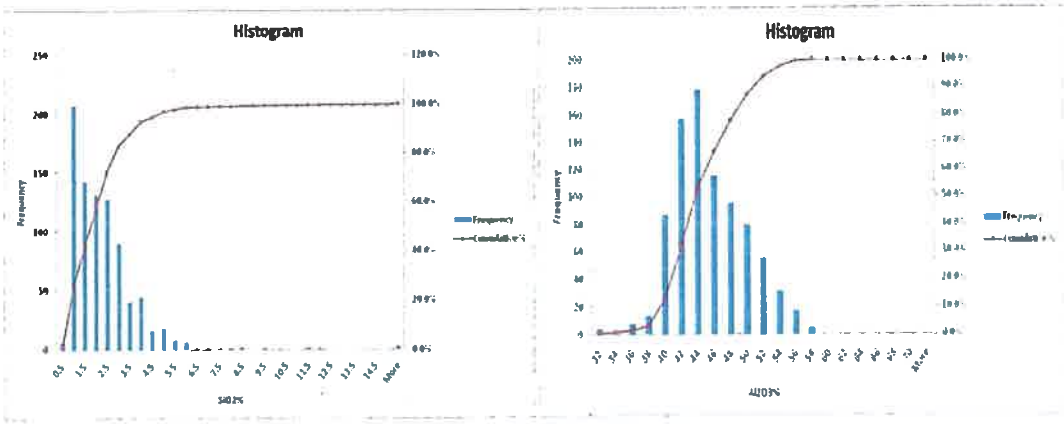


Figure 5-4: Silica and alumina distributions for all average bauxite drill hole grades from the 14 drilled plateaux

Figure 5-4 shows the 2009 drilling distributions for the silica and alumina from the 14 plateaux drilled. Comparing Figure 5-1 with the larger and more widespread data set of Figure 5-4 shows smoother character but more importantly different means and peaks that were not represented in the fewer earlier sample sets.

Figure 5-5 shows the bauxite hole average data for Fe_2O_3 versus Al_2O_3. The graph illustrates the higher iron and lower alumina content of the Ngaoundal Plateaux. Very few holes deviate from the iron-alumina trend and those that do are likely to be the poor grade, siliceous laterites from the edges of the plateaux.

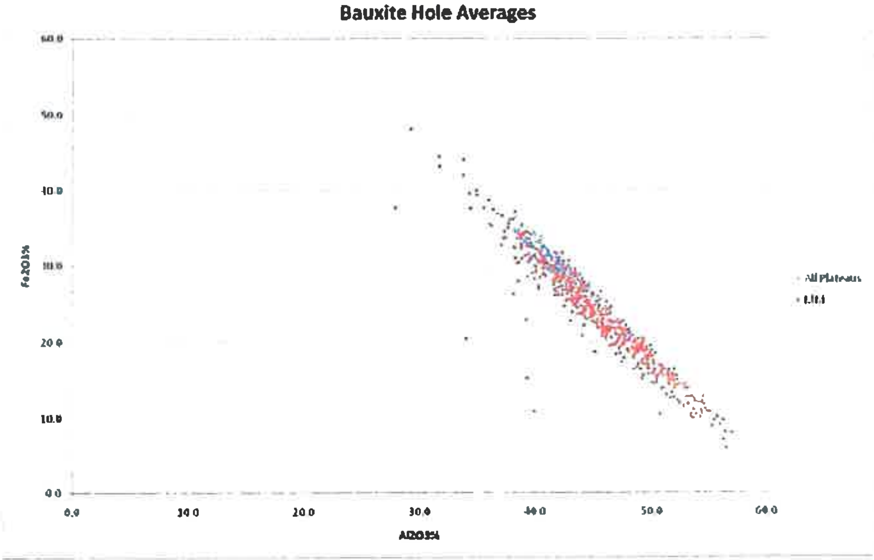


Figure 5-5: Total alumina versus total iron content of the bauxite section from each drill hole

Figure 5-6 illustrates the SiO_2 versus Al_2O_3 plot for all the bauxite hole average data separated into the individual plateaux. The following **Figure 5-7** illustrates the same data on a log linear scale to better differentiate the plateau clusters. The 3 Ngaoundal plateaux occupy the low silica-low alumina domain. Danielle is also low in silica but much higher in alumina.

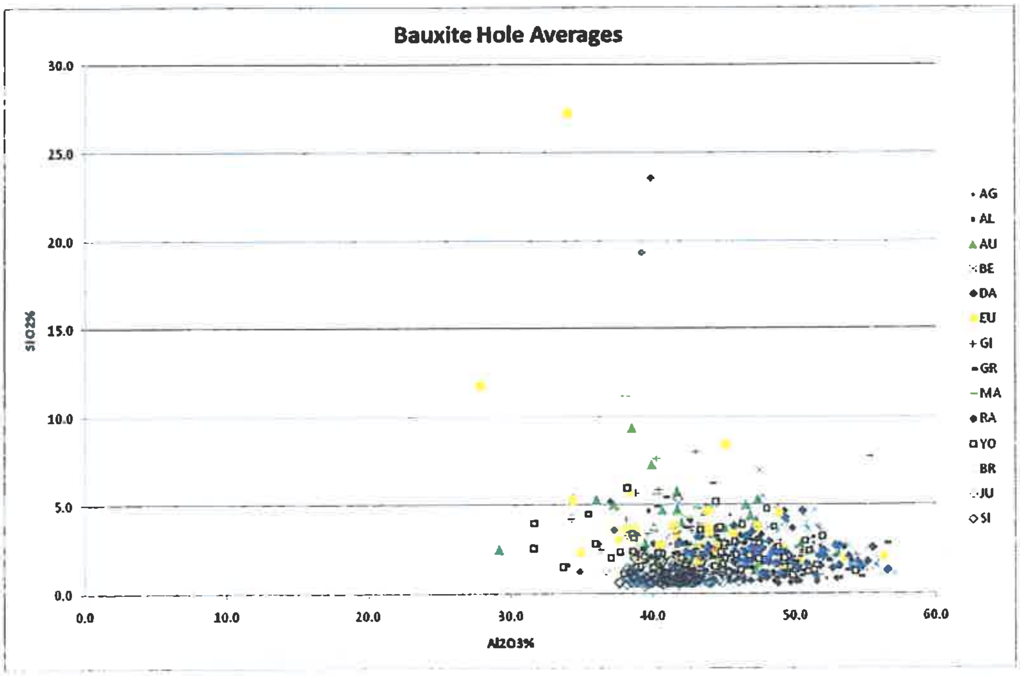


Figure 5-6: Total alumina content versus total silica content of the bauxite/laterite hole grades for each individual plateau tested

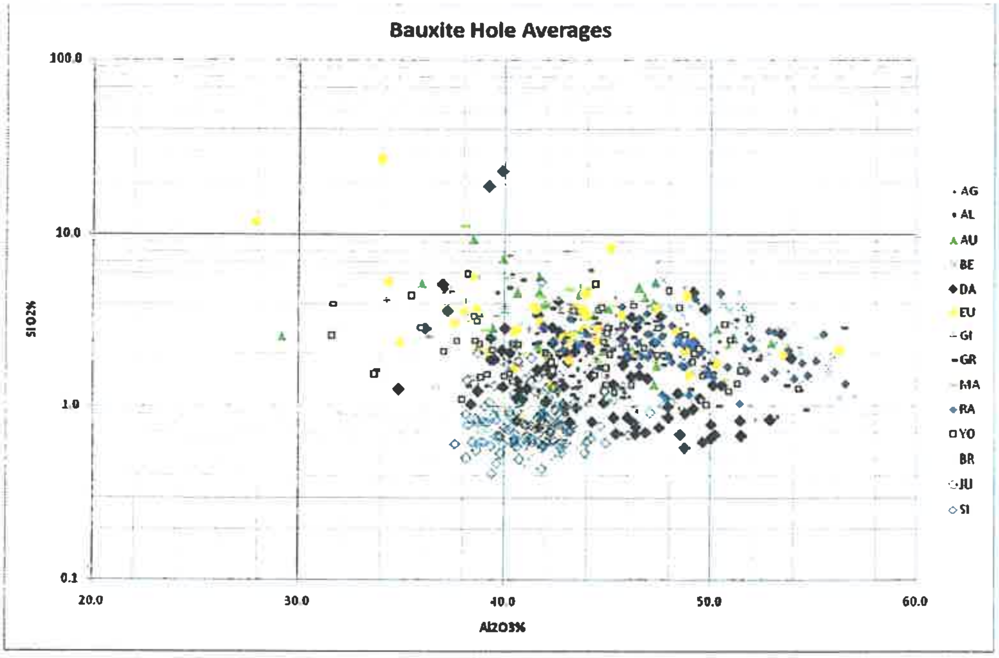


Figure 5-7: Total alumina content versus log scale total silica content of the bauxite/laterite hole grades for each individual plateau tested (all hole data)

Figure 5-8 illustrates the detailed breakdown of the 3 Ngaoundal plateaux. Some higher silica holes occur but very few high alumina holes and nothing higher than 50%. The issue with the high silica areas is that they mainly relate to the deep section and the peripheral plateau domains so there may not be much volume and further drilling to establish the correct model is essential.

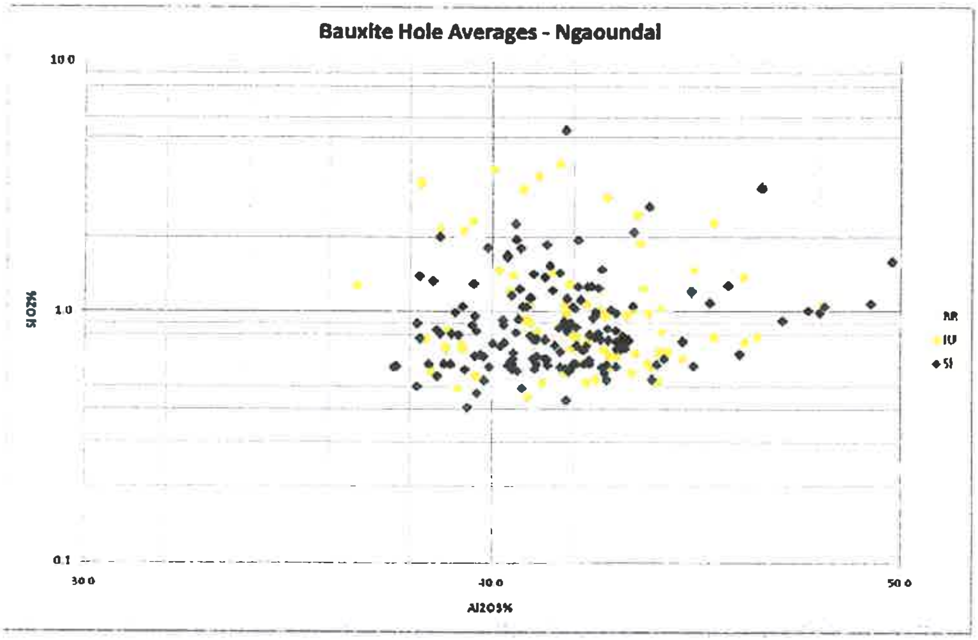


Figure 5-8: Total alumina content versus log scale total silica content of the bauxite/laterite hole grades for each Ngaoundal plateau tested

Figure 5-9 illustrates the detailed breakdown of the Minim Martap plateaux. Compared to Ngaoundal, additional higher silica bauxite is present. Although again some high silica grades relate to peripheral plateau areas. Danielle contains most of the lowest silica bauxite.

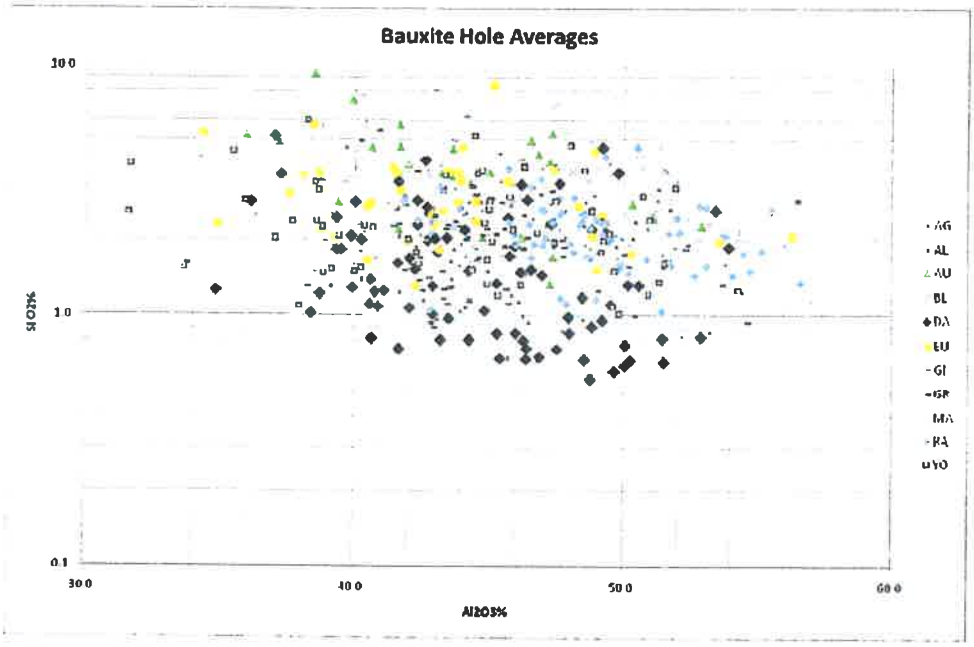


Figure 5-9 : Total alumina content versus log scale total silica content of the bauxite/laterite hole grades for each Minim Martap plateau tested

Figure 5-10 compares the Danielle bauxite to all the individual meter-wise analyses from that plateau including the limited overburden and floor. Only 2 non-bauxite samples deviate significantly from the iron alumina trend and both occur in the excluded area referred to as the duck.

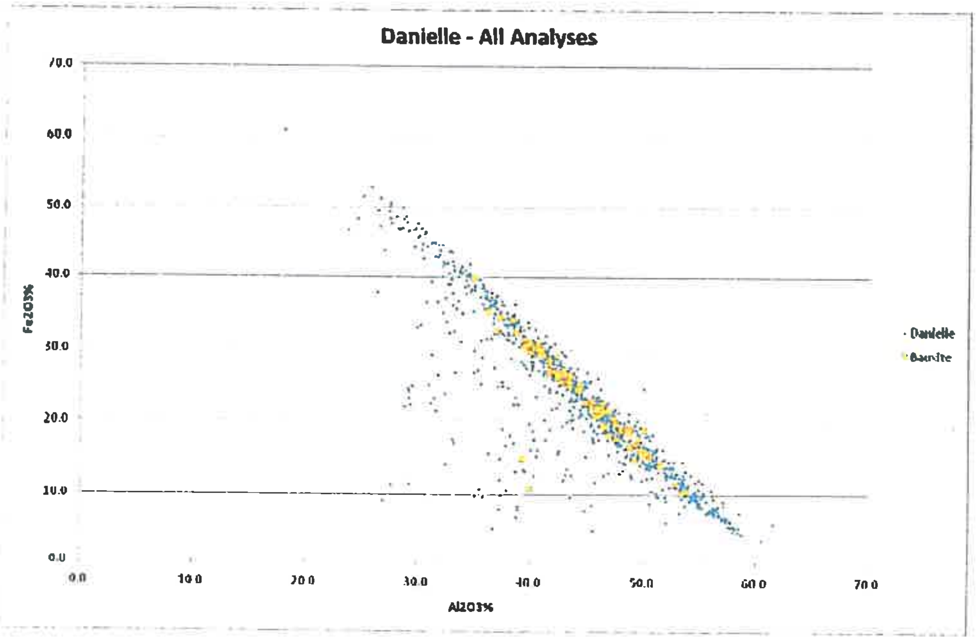


Figure 5-10: Iron versus alumina plot showing the comparison between all analysed samples and the bauxite hole average grades

On a plot of silica versus alumina, the Danielle bauxite hole average data clusters among the majority of the data **(Fig. 5-11)**. This is strongly suggestive that inadequate floor was drilled to allow clear definition in all cases. Despite this outcome, it is considered that there is enough control to reasonably extrapolate the floor over most of the plateau area. Danielle was the first plateau drilled when the water table was highest and because the auger and RAB had difficulty working below the dry bauxite zone. Some holes were simply unable to be continued.

By enhancing the plot using a log linear scale and over-plotting the geostatistical block grades **(Fig. 5-12)** it is possible to see the reduction in variation caused by block averaging. If high silica marginal plateau areas are discrete it may be possible to significantly alter the block grades with further work.

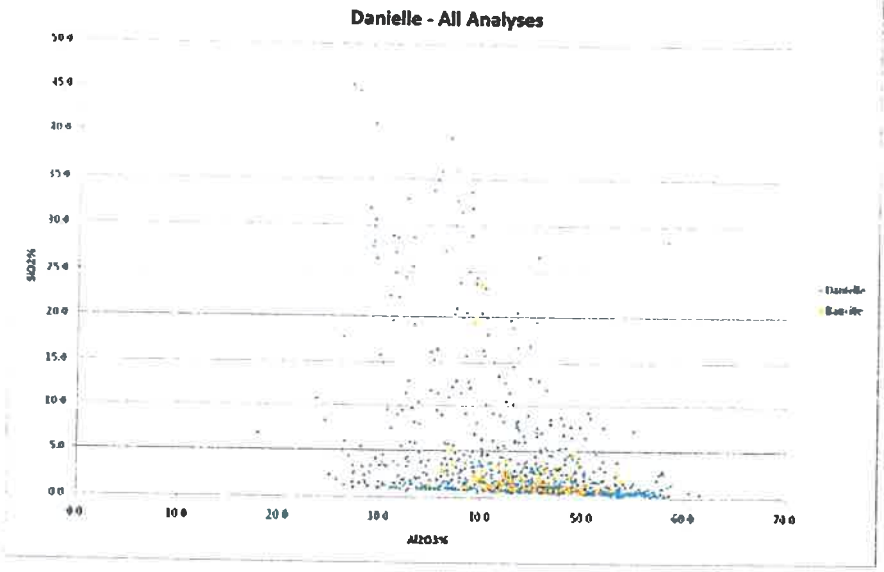


Figure 5-11: Silica versus alumina plot showing the comparison between all analysed samples and the bauxite hole average grades. Note the two duck holes with poor high silica grades of 19% and 24% respectively

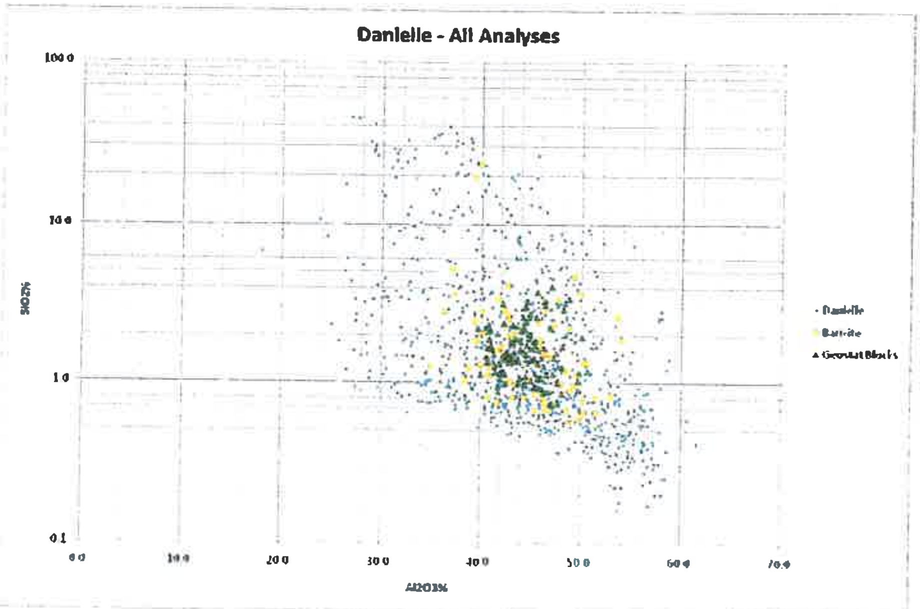


Figure 5-12: Silica versus alumina plot of the individual drill holes, bauxite hole averages and geostatistical block grades

Using the Simone deep individual meter-wise hole data and the bauxite hole average data it is possible to observe a wider swath of data than occurs on Danielle plus more floor intersections **(Fig. 5-13)**. On the silica versus alumina plot **(Fig. 5-14)**, particularly the enhanced log linear version (Fig. 5-15) it is possible to recognise the floor intersections and also a significant number of high silica hole intersections.

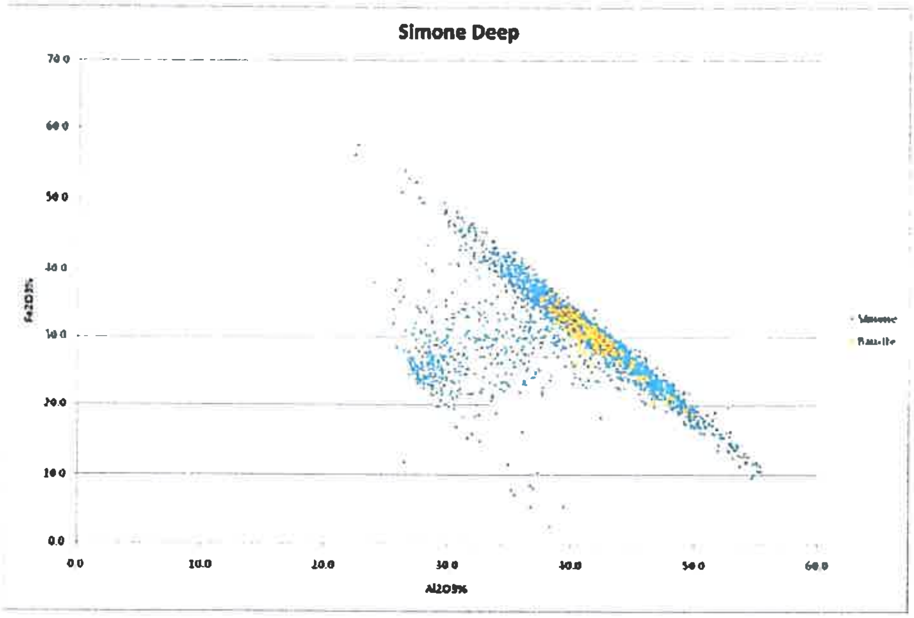


Figure 5-13: Iron versus alumina plot showing the comparison between all analysed samples and the bauxite hole average grades

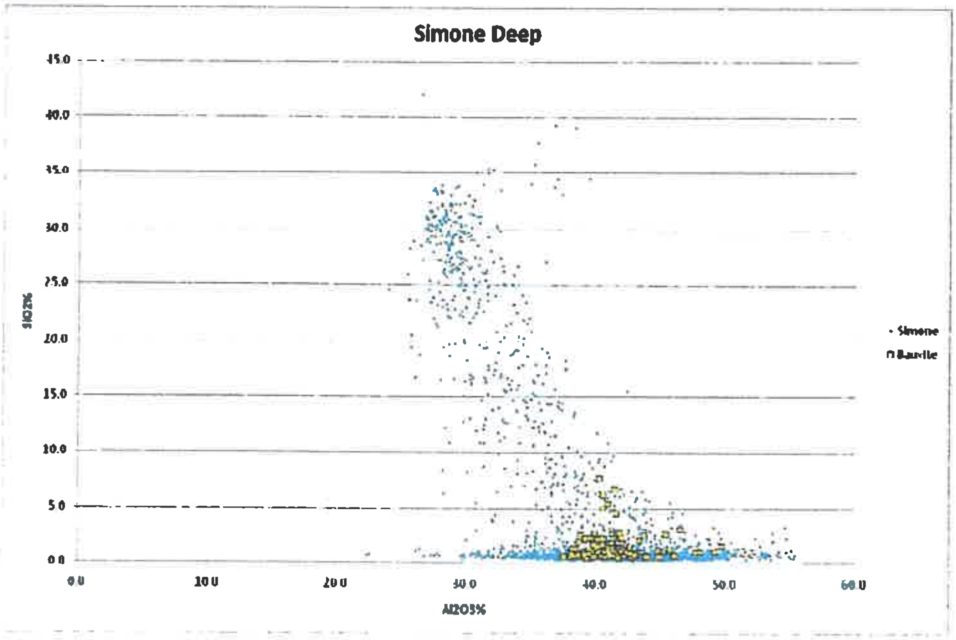


Figure 5-14: Silica versus Alumina plot for Simone deep analyses and bauxite holes

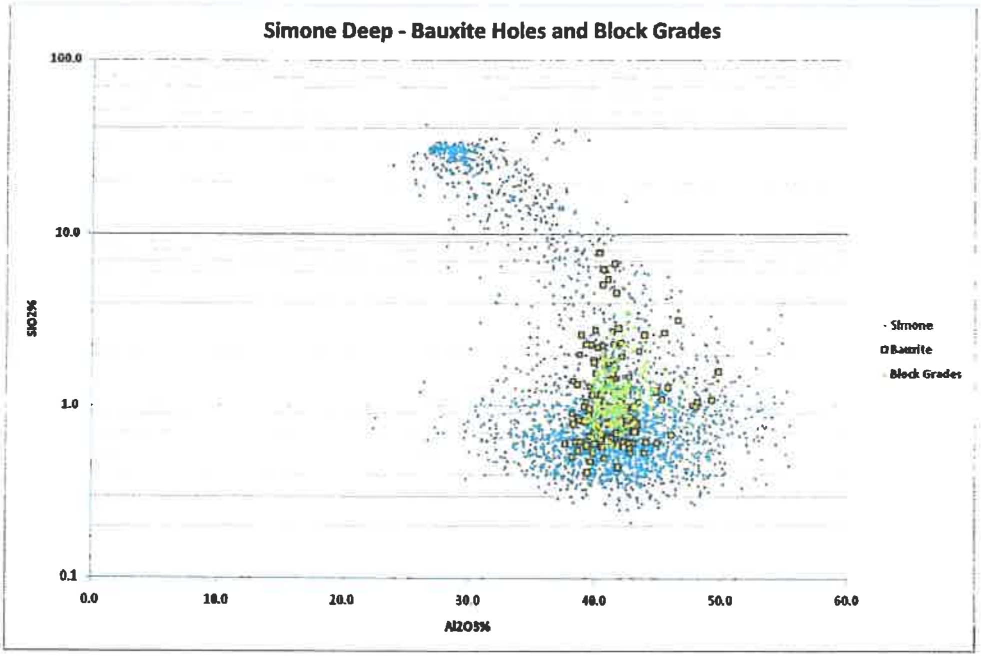


Figure 5-15: Silica versus Alumina plot for Simone deep analyses, bauxite holes and 100 m block grades (log linear scale)

Figure 5-16 illustrates the Simone meter-wise intervals compared to the bauxite hole averages. The Simone deep and Simone shallow overplots illustrate the significant silica difference between the two options. If the kaolinitic layers can be mined to waste it should be possible to produce the Simone deep tonnage at approximately the Simone shallow grade.

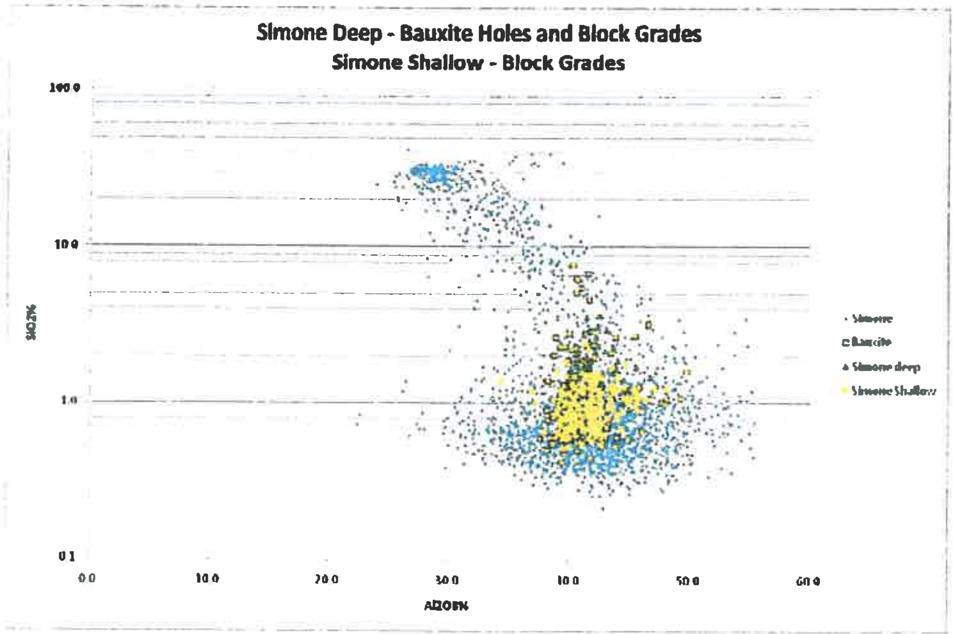


Figure 5-16: Silica versus Alumina plot comparing Simone deep and Simone shallow block grades (100 m blocks, log linear scale)

Figure 5-17 plots all the individual sample data points as silica versus alumina that were collected from the Minim Martap-Ngaoundal bauxite deposit during the 2009 drilling campaign. An envelope surrounding these grades is all that can be extracted from individual holes or sections of holes or geographic areas within the entire deposit tested.

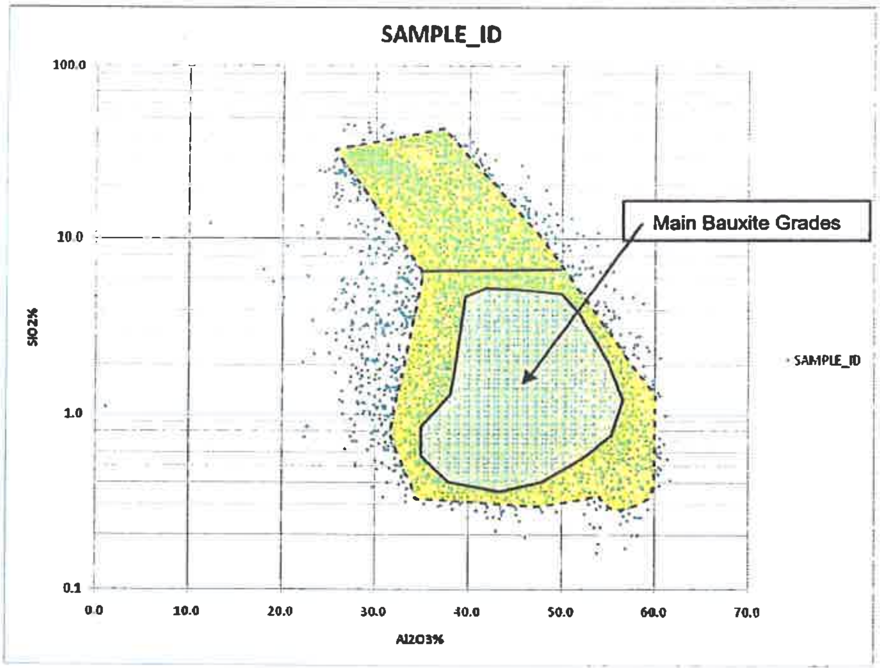


Figure 5-17: Distribution of all individual meterwise analytical data for the Minim Martap-Ngaoundal deposit. The lower area marks the bauxite domain (log-linear scale)

5.4 Grade Continuity Studies

Grade variations across the plateaux are significant but high grade areas tend to form clearly defined regions such that the aerial extent of the higher grade areas is definable and separate mining of the better grades from any individual plateau should be possible. This is particularly the case for Minim Martap but will be more difficult for the Ngaoundal plateaux.

A geostatistical study was undertaken for each plateau to assess the spatial variance. The results for Danielle are presented in **Figure 5-18**. The data alignment is N68° and N158°. N68° approximately aligns with the plateau long axis and N158° is the cross direction. All thickness work was based upon uncorrected auger data.

From this work it is possible to conclude that the bauxite grade variations across the plateaux are more pronounced with average shorter ranges than the grade variations aligned with the plateaux axes. Ranges of about 300m were typically observed across the plateaux for TiO_2 and LOI with ranges around 600 m determined for the long axis. Silica ranges varied between 500m across the plateau to 1500 m along the long axis of the plateau. Alumina and thickness showed rather more uniform variations, but with a much higher degree of scatter in the cross direction where limited data was available.

A small, but as yet poorly defined nugget effect is present on all Danielle variograms except silica.

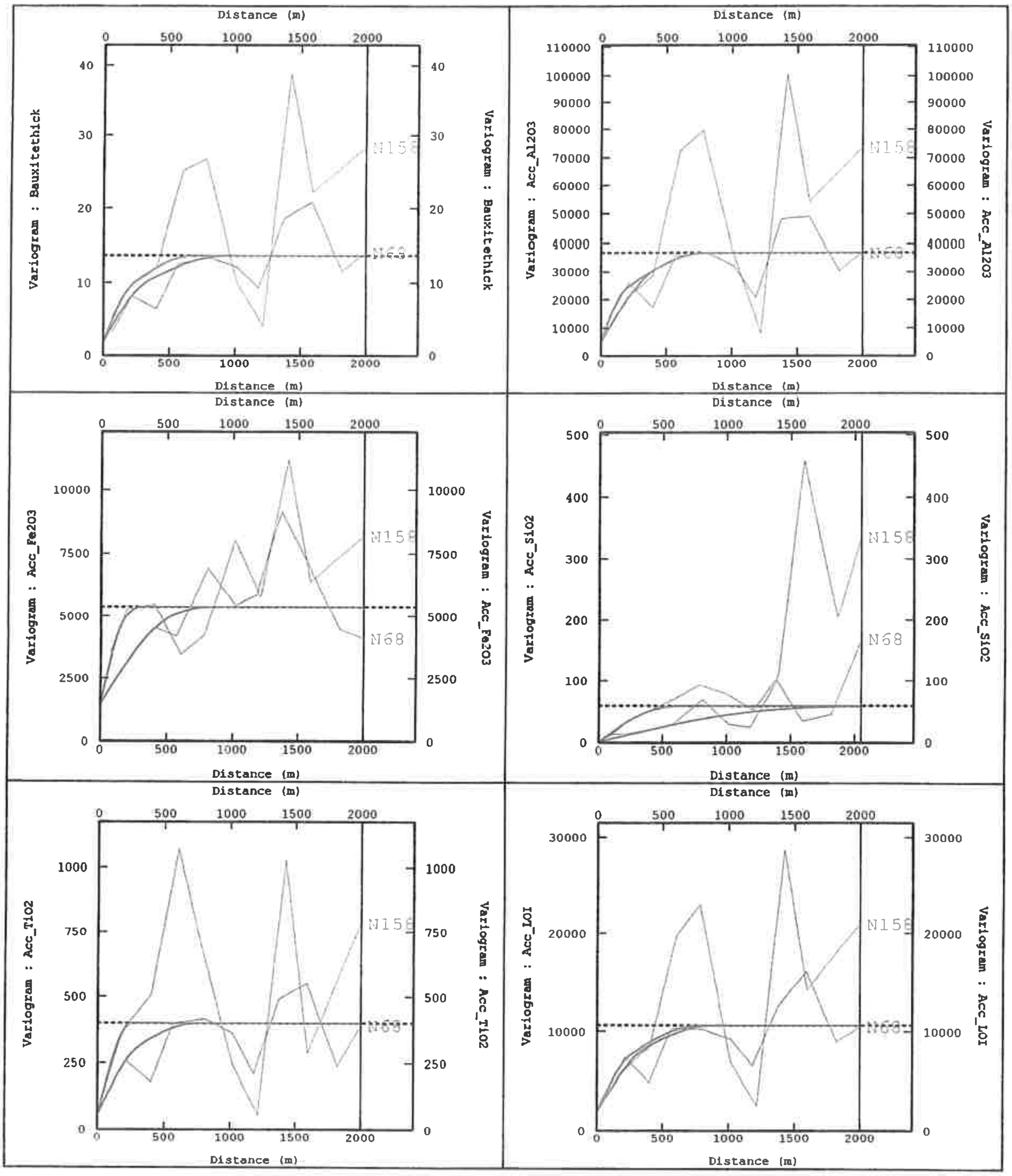


Figure 5-18: Variograms from Danielle Plateau

Top Left = Length, Top Right = Al2O3 Accumulation,

Center Left = Fe2O3 Accumulation, Center Right = SiO2 Accumulation,

Bottom Left = TiO2 Accumulation, Bottom Right = LOI Accumulation,

Figure 5-18 summarises the variograms for each grade element for plateau Danielle.

Table 5-2: Variogram Summary

Plateau	Variogram Source
Alice	Developed from Alice data. Poor Quality – Modelled isotropically.
Agnes	Gregorine variogram with sills normalised to the variance of Agnes.
Aurelie	Danielle variogram with sills normalised to the variance of Aurelie.
Beatrice	Gregorien variogram with sills normalised to the variance of Beatrice.
Danielle	Modelled from Danielle Data.
Eulalie	Danielle variogram with sills normalised to the variance of Eulalie.
Gilberte	Danielle variogram with sills normalised to the variance of Gilberte.
Gregorine	Poor Quality
Mathilde	Alice variogram with sills normalised to the variance of Mathilde.
Raymonde	Gregorine variogram with sills normalised to the variance of Raymonde.
Yolande	Poor quality from Yolande data.
Bridget	Judith variogram with sills normalised to the variance of Bridget.
Judith	Poor quality from Judith data.
Simone	Reasonable variogram from Simone Data.

Average bauxite thickness varies between the plateaus ranging from 7 to 11 m across Minim Martap. Danielle average thickness is 8.6 m. At Ngaoundal, the bauxite is commonly much thicker with the average at Simone being 15.5 m.

Checks of auger drilling against core data show good correlation and existing analytical data shows no significant bias. Regular close spaced drilling on each plateau demonstrated good thickness continuity of the bauxite which is to be expected for this type of ore body averaging about 10 m thickness. The 50 m close spaced drilling also commonly highlighted rapid lateral grade variations that will require careful control during mining, considering that each 50 m block will represent about one days mine output at approximately 10 mTpa.

Basic mapping was produced for each plateau. This comprised basic data maps with and without satellite imagery background. Chemical grade and bauxite thickness maps were then constructed for each plateau. These comprised Al_2O_3, SiO_2, bauxite thickness, overburden thickness and floor depth.

Examples from Danielle Plateau are presented in **Figures 5-19, 5-20, 5-21, 5-22, 5-23, 5-24** and **5-25.** The basic maps show the topography including the break of slope plateau outline model and the GPS field derive boundary. The grade and thickness maps illustrate the relative mining conditions across the plateau and are the parameters used to create the resource models.

The full mapping data set is contained in **Appendices 9, 10 & 11.**

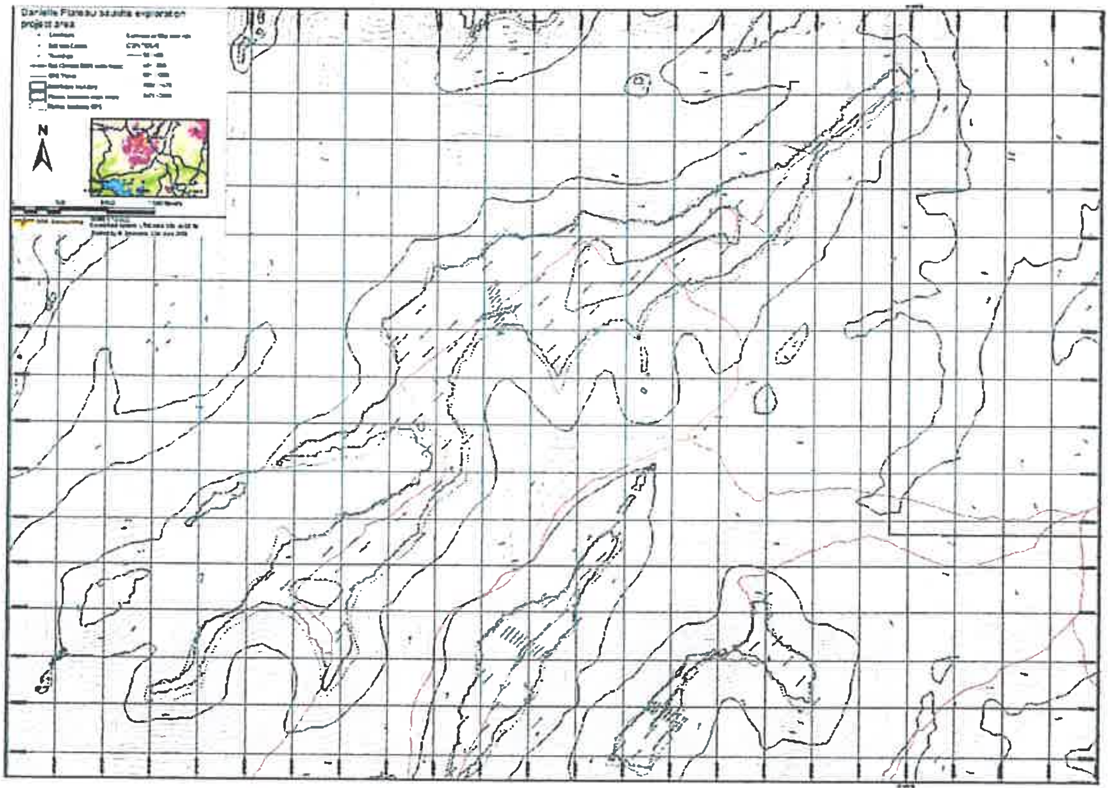


Figure 5-19: Basic plateau drill hole map (no satellite)

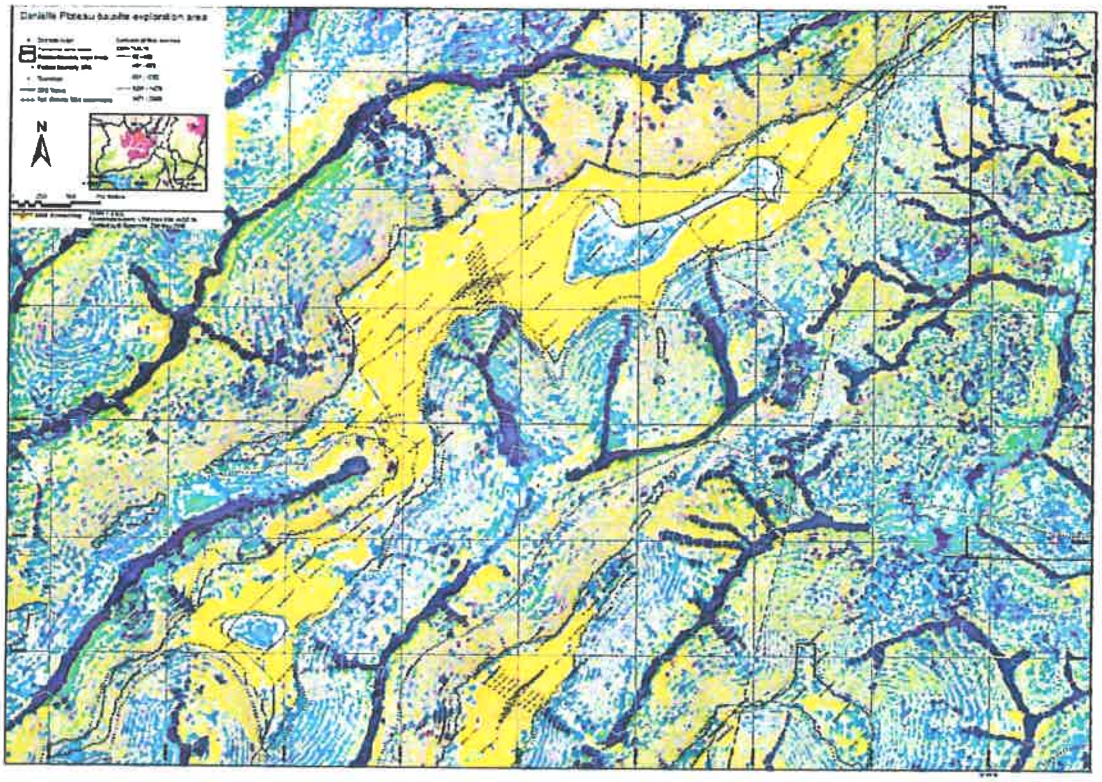


Figure 5-20: Danielle Plateau with high resolution satellite data
Note: yellowish areas are "bauxite deserts"

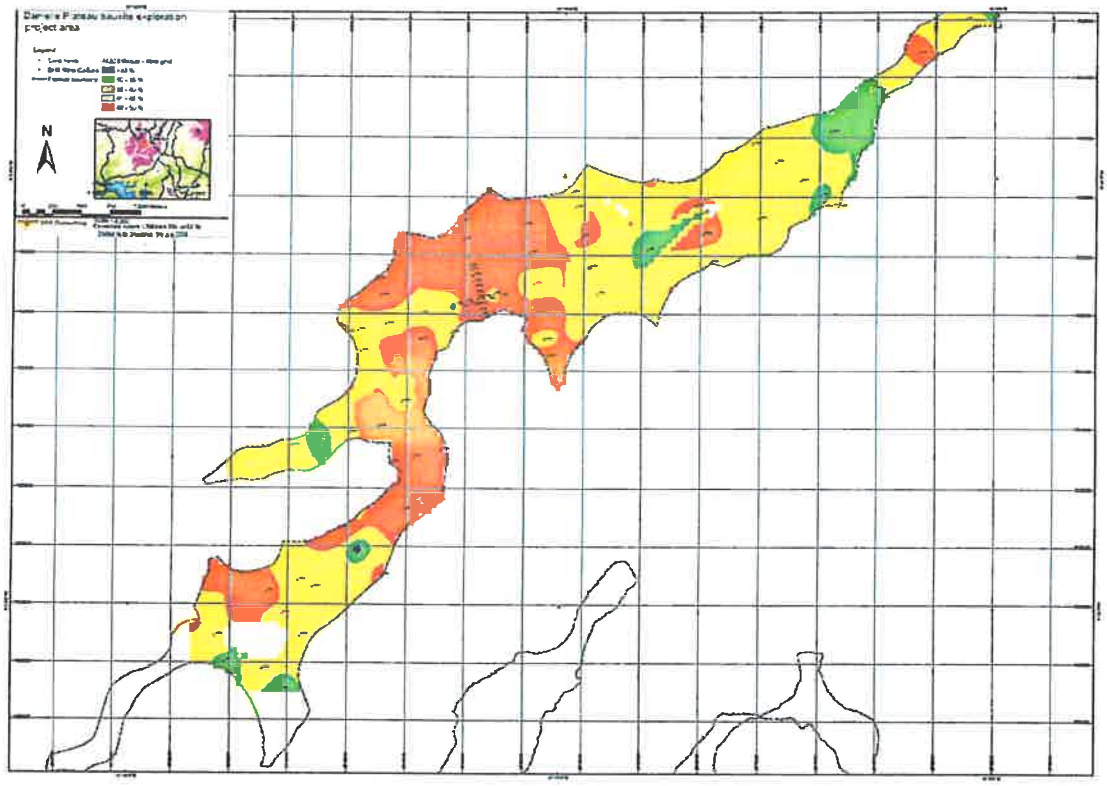


Figure 5-21: Danielle Plateau bauxite hole average Al_2O_3% (XRF Total) distribution

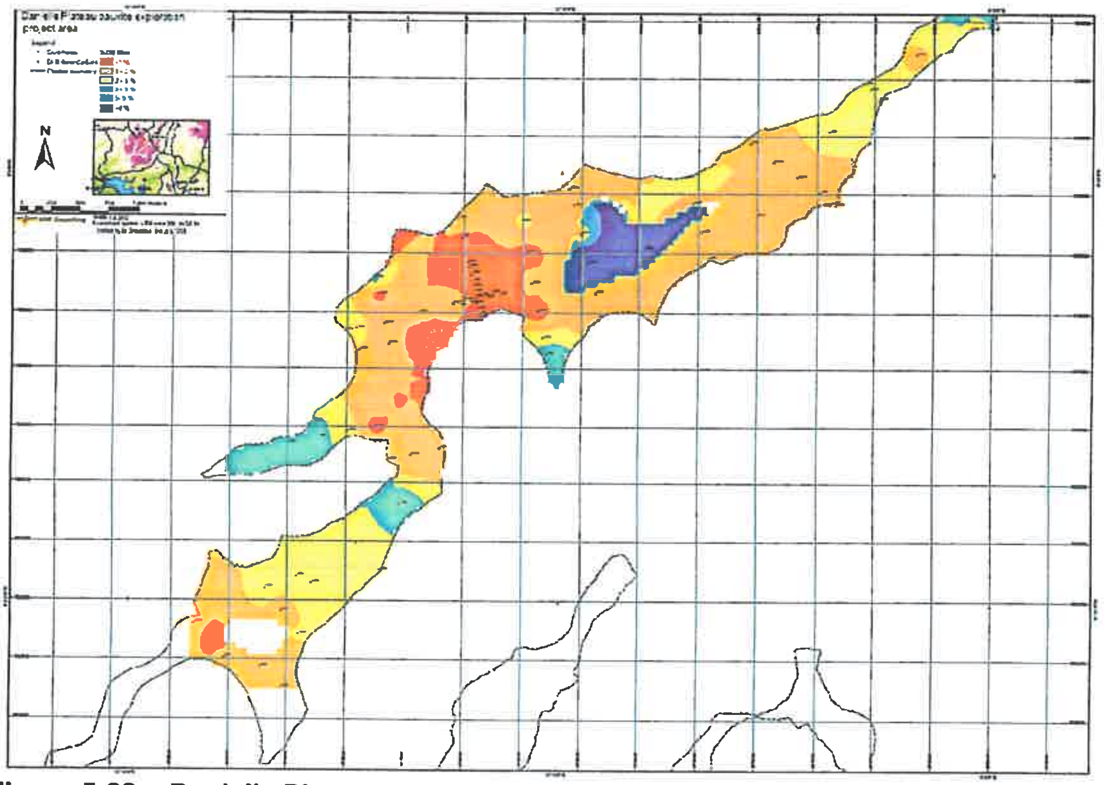


Figure 5-22: Danielle Plateau bauxite hole average SiO_2% (XRF Total) distribution

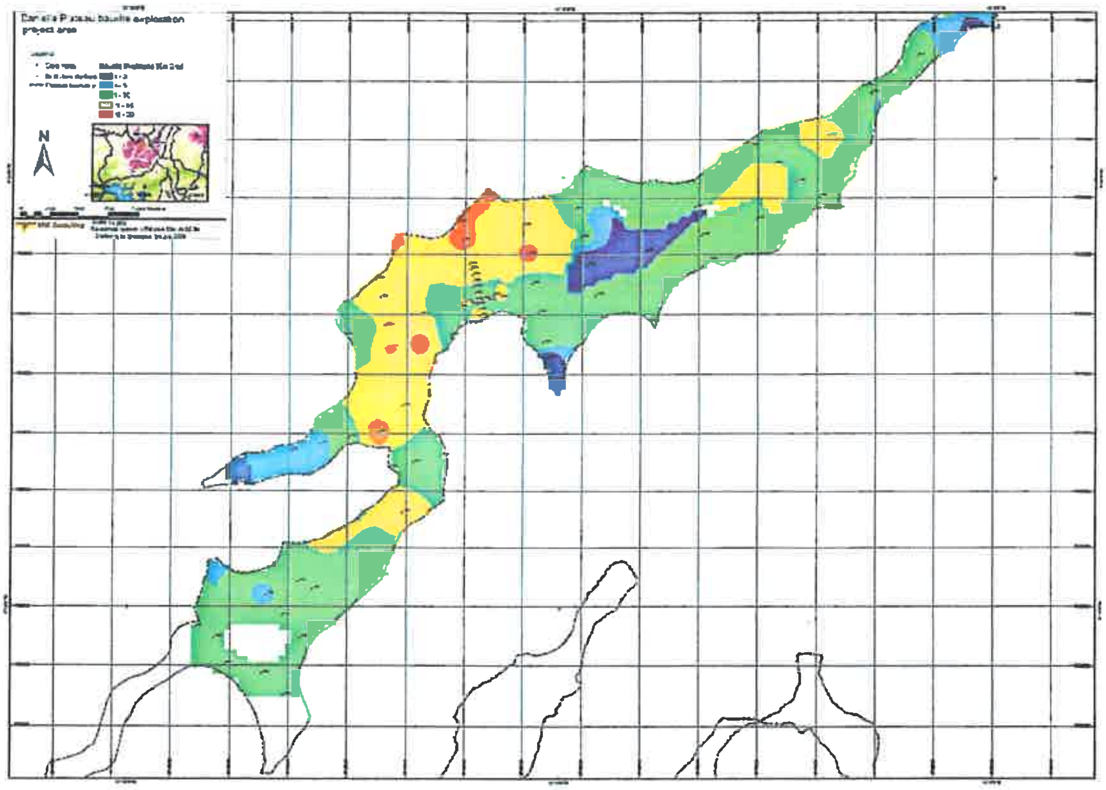


Figure 5-23: Danielle Plateau bauxite hole average thickness (m) distribution

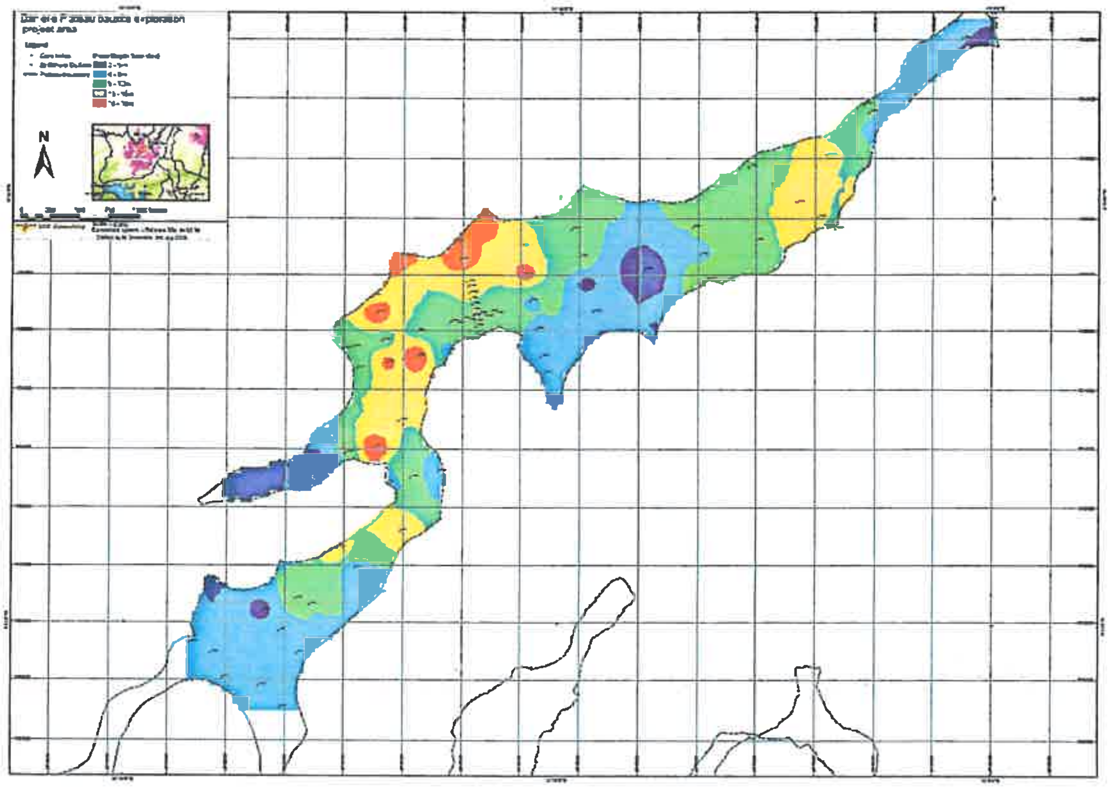


Figure 5-24: Danielle Plateau bauxite hole average floor depth (m) distribution

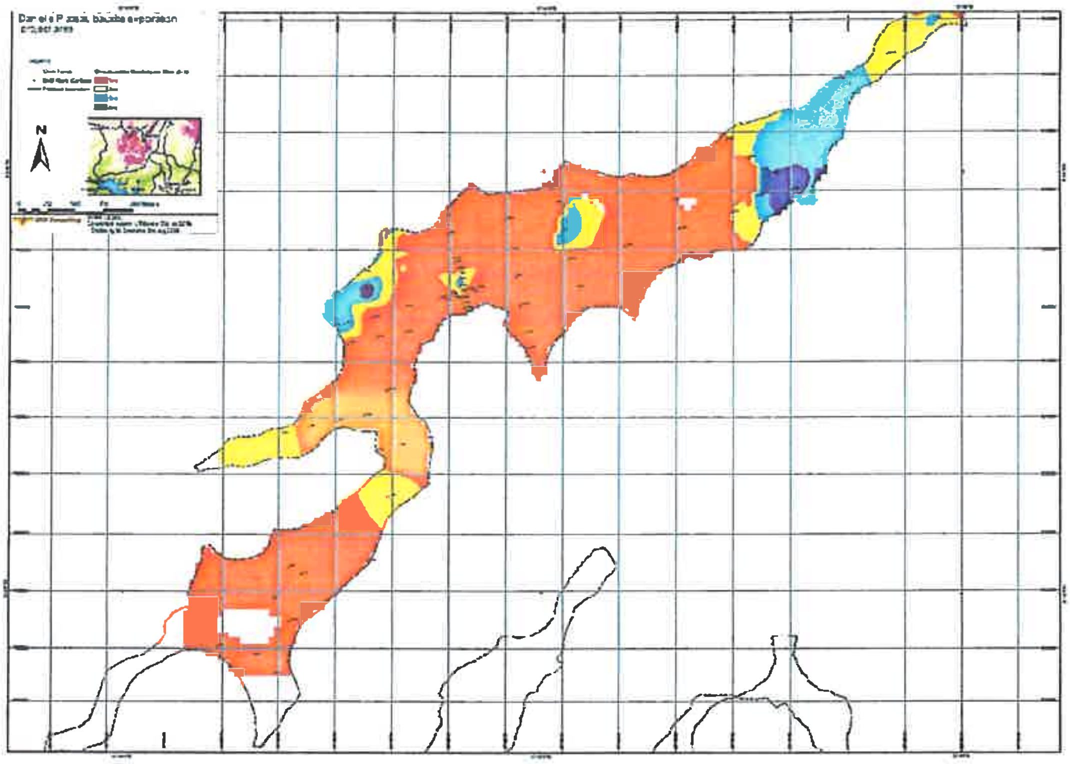


Figure 5-25: Danielle Plateau bauxite hole average overburden thickness (m) distribution

In addition to the mapping, drill hole sections were produced across each plateau to assist with the understanding of the vertical and horizontal controls on the deposit grade and thickness. These ranged from regional plateau-wide scales to assess the regional issues, through to sections along the close spaced drilling to understand local variability.

Two examples from Danielle are shown in **Figures 5-26, 5-27** and **5-28.** The sections and section location maps are enclosed in **Appendix 12.** The close spaced drilling typically shows significant variability. The regional line demonstrates that local plateau elevation is not a significant grade control factor. Vertical exaggeration has been used to improve the visualisation. A poster presentation on Danielle Plateau drilling is presented in **Appendix 20.**

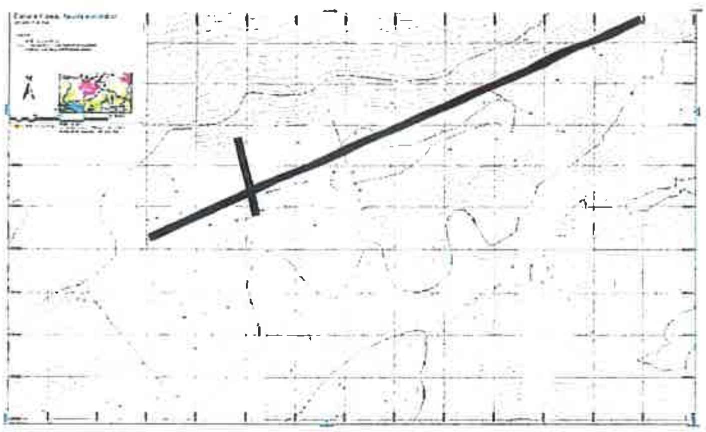


Figure 5-26: Section location map for Plateau Danielle (Sections shown Fig. 5-27 N-S and Fig. 5-28 SW-NE following)

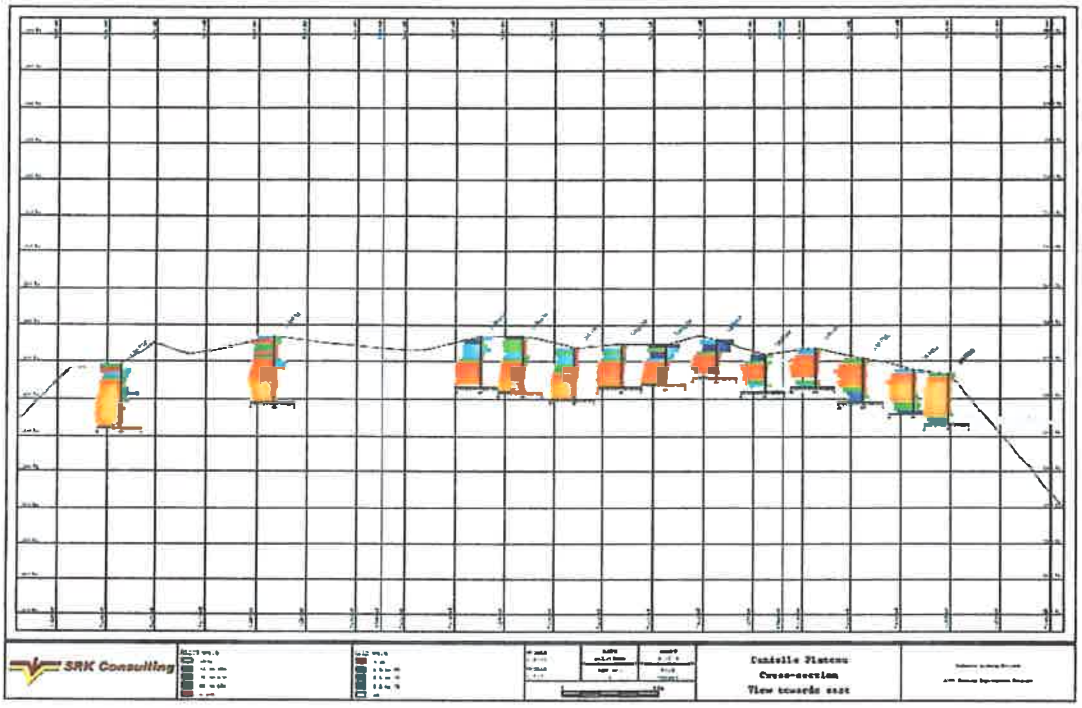


Figure 5-27: Alumina and Silica meter-wise depth profiles along the close spaced drilling at Danielle

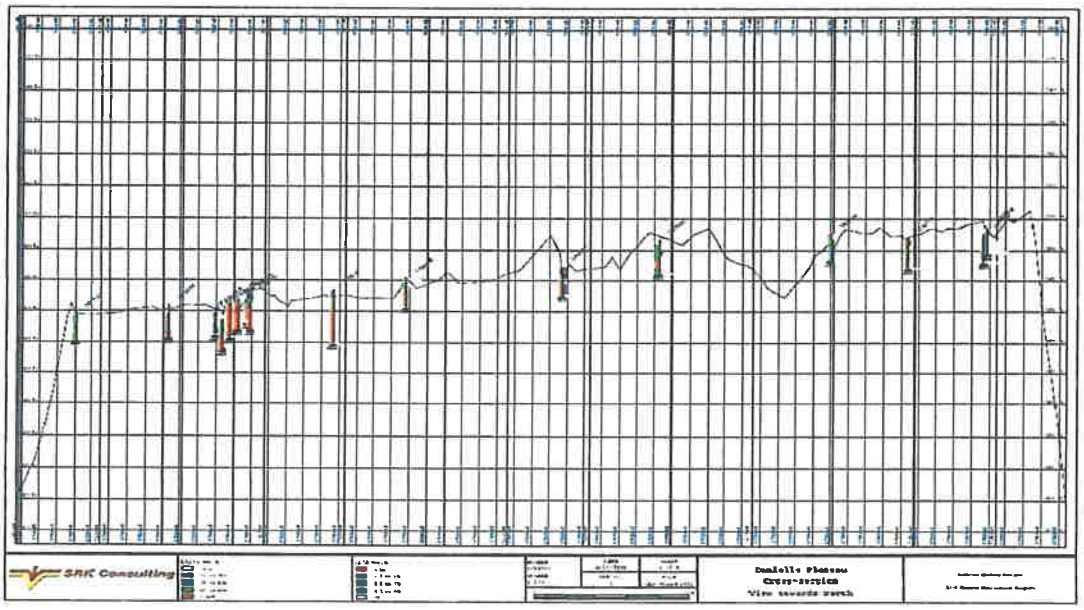


Figure 5-28: Alumina and Silica meter-wise depth profiles along the regional drilling at Danielle. Holes are projected on to the line of section.

5.5 Evaluation of the Close Spaced Drilling Results

A preliminary analysis of the close spaced drilling results was performed. This consisted primarily of observation of continuity. Poor continuity of the bauxite grade character was commonly observed, particularly in plateaux like Danielle and Simone. Further consideration of the local scale variability including some geostatistical treatment will be needed prior to the implementation of closer spaced drilling.

5.6 Mineralogy, Petrology, XRD

Following the XRF analysis work, selected composites were prepared to determine the reactive silica and available alumina for the bauxite interval in representative drill holes across the deposits. This greatly reduced the number of analyses required but further work will be needed as the results are still not conclusive.

XRD analyses are scheduled but not currently available.

Based on the reactives and available analytical work, the main mineral in all samples is expected to be gibbsite. Small amounts of boehmite are known to be present based on the bomb digest tests.

Silica is likely to be present as quartz, kaolin and illite. The iron bearing phases are presumed to be goethite and hematite.

The distribution of aluminagoethite relates directly to the available alumina content **(Fig. 5-29)**. The level of alumina substitution in iron is commonly low and the distribution is definable such that there will be no significant impact on the mining operation as long as the presence is incorporated into the mine scheduling by using available alumina estimates.

Some reactive silica and available alumina data was available at the time of the current study. By making model calculations of the mineral components it was possible to achieve a good THA correlation between the measured and calculated values and the calculated data accounts well for the aluminogoethite. Some illitic clay **(Fig. 5-30)** is thought to be present along with kaolinite and the impact remains to be determined. Further work is planned to assess the relative predictive capacity of simple regression models, multielement regression and mineralogy determinations to predict the available alumina.

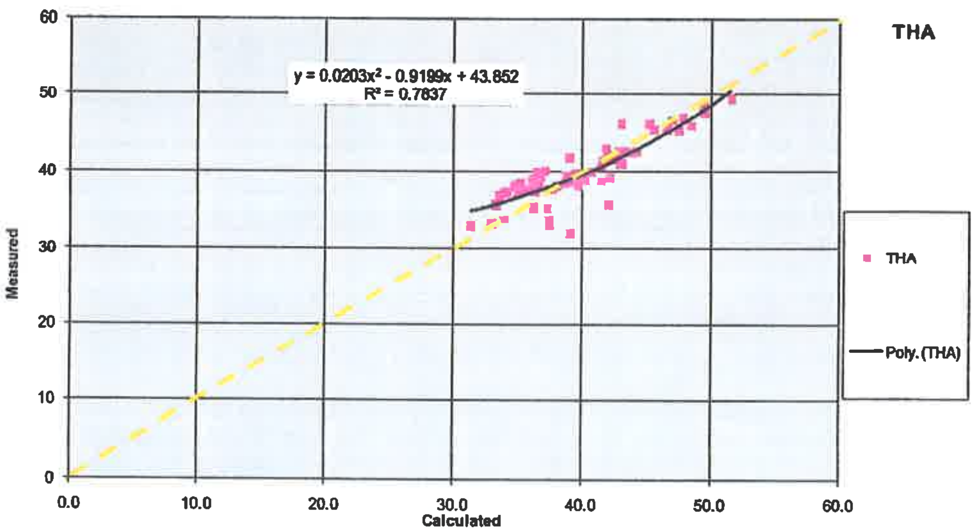


Figure 5-29: Calculated versus measured THA following goethite correction

General Illite Information

Chemical Formula: (K,H3O)(Al,Mg,Fe)2(Si,Al)4O10[(OH)2,(H2O)]

Composition: Molecular Weight = 389.34 gm

Potassium	6.03 %	K	7.26 %	K_2O
Magnesium	1.87 %	Mg	3.11 %	MgO
Aluminum	9.01 %	Al	17.02 %	Al_2O_3
Iron	1.43 %	Fe	1.95 %	FeO
Silicon	25.25 %	Si	54.01 %	SiO_2
Hydrogen	1.35 %	H	12.03 %	H_2O
Oxygen	55.06 %	O		
	100.00 %		95.27 %	= TOTAL OXIDE

Empirical Formula: [illegible]

Figure 5-30: Illite Elemental Composition

For the purpose of the current study, a simple correlation was established to assess the primary impacts on reactive silica and available alumina for the BRDC and Genalysis data (**Tables 5-3 and 5-4**).

Table 5-3: Correlation coefficients comparing mineralogy with XRF total elemental analyses based on the BRDC reactive silica and available alumina data (b – boehmite)

	Al2O3%	SiO2%	Fe2O3%	TiO2%	LOI%	Silicate/Qtz%	Mono+b+K%	Al Goethite%	Al Kaolin%	Al150	Si150	b-Al2O3
Al2O3%	1											
SiO2%	-0.46	1.00										
Fe2O3%	-0.89	0.02	1.00									
TiO2%	0.13	-0.25	-0.12	1.00								
LOI%	0.96	-0.62	-0.79	0.13	1.00							
Silicate/Qtz%	-0.39	0.89	0.01	-0.20	-0.55	1.00						
Mono+b+K%	-0.40	0.94	-0.01	-0.25	-0.55	0.82	1.00					
Al Goethite%	0.29	0.37	-0.52	0.63	0.44	0.56	0.91	1.00				
Al Kaolin%	-0.05	0.93	-0.05	-0.42	0.00	0.60	0.51	0.17	1.00			
Al150	0.90	-0.77	-0.63	0.21	0.95	-0.66	-0.76	-0.19	-0.31	1.00		
Si150	-0.42	0.94	0.04	-0.24	-0.55	0.73	0.89	0.17	1.00	-0.72	1.00	
b-Al2O3	-0.21	0.48	0.10	-0.06	-0.15	0.58	0.70	0.49	0.33	-0.56	0.33	1.00

Table 5-4: Correlation coefficients comparing mineralogy with XRF total elemental analyses based on the Genalysis reactive silica and available alumina data

(b – boehmite, d - diaspore)

	SiO2%	Al2O3%	Fe2O3%	TiO2%	LOI%	Al% 145	Al% 230	rSi (Si_k)%	Rsi (MEA)%	Al% b+d	Quartz attack	% 143+bd	Al Goethite
SiO2%	1.000												
Al2O3%	-0.245	1.000											
Fe2O3%	0.158	-0.986	1.000										
TiO2%	-0.255	0.238	-0.309	1.000									
LOI%	-0.329	0.957	-0.959	0.325	1.000								
Al% 145	-0.369	0.978	-0.957	0.265	0.952	1.000							
Al% 230	-0.386	0.977	-0.957	0.264	0.958	0.994	1.000						
rSi (Si_k)%	0.853	-0.105	0.009	-0.150	-0.158	-0.217	-0.229	1.000					
Rsi (MEA)%	0.960	-0.170	0.080	-0.210	-0.253	-0.307	-0.320	0.921	1.000				
Al% b+d	-0.209	0.114	-0.115	0.026	0.166	0.068	0.175	-0.138	-0.154	1.000			
Quartz attack	0.612	-0.205	0.181	-0.212	-0.304	-0.314	-0.321	0.206	0.571	-0.096	1.000		
Al% 143+bd+k	-0.294	0.985	-0.975	0.252	0.959	0.989	0.993	-0.117	-0.219	0.162	-0.303	1.000	
Al Goethite	0.371	-0.348	0.364	-0.174	-0.419	-0.482	-0.509	0.108	0.334	-0.308	0.612	-0.506	1.000

Using the basic correlations it is clear that silica is the primary control on reactive silica and alumina is the main control on available alumina. The precise nature of the correlation depends on the regression applied and for the purpose of the current exercise a simple best fit model was chosen in each case. The models tested are illustrated in **Figures 5-31, 5-32, 5-33 and 5-34.**

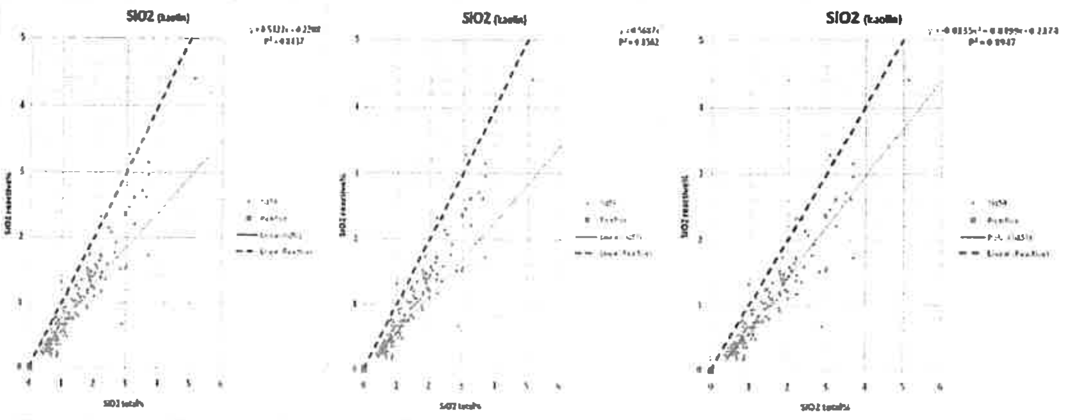


Figure 5-31: Reactive silica correlations using BRDC data. The first is a simple linear regression and the second version adds a zero-zero origin. The fit currently used is the polynomial trend shown in the right graph

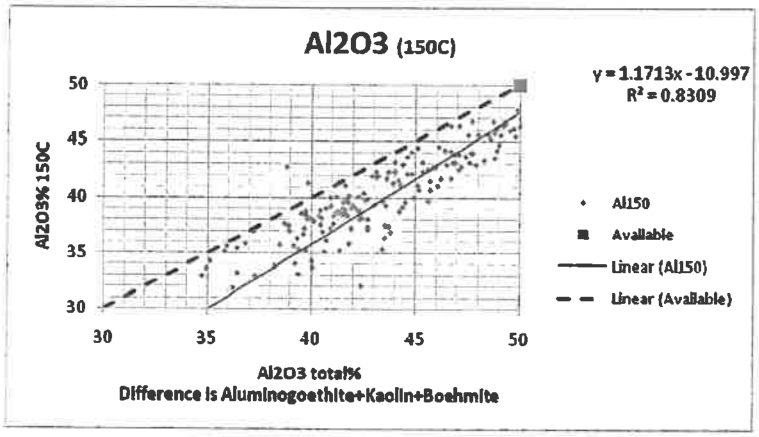


Figure 5-32: Available alumina from BRDC data

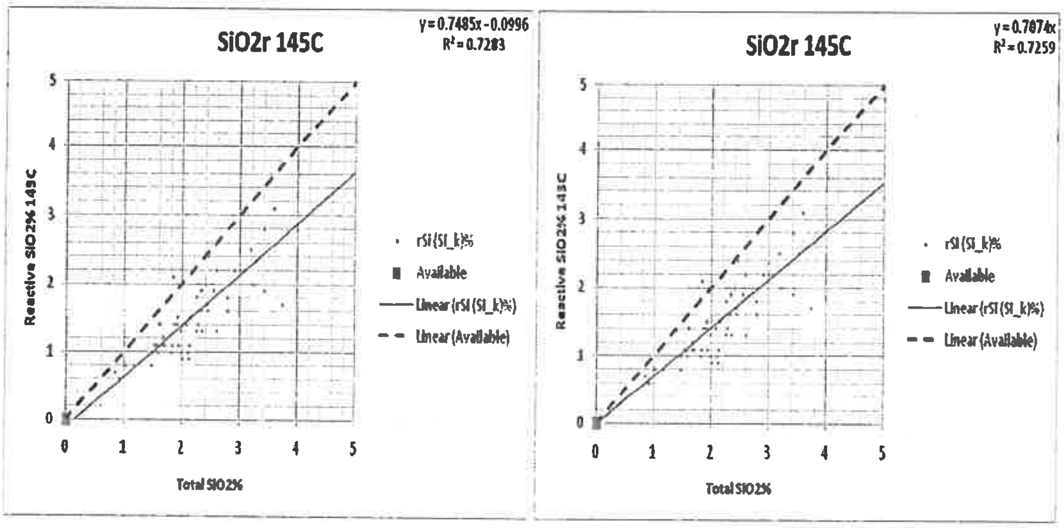


Figure 5-33: Reactive silica correlations using Genalysis data.

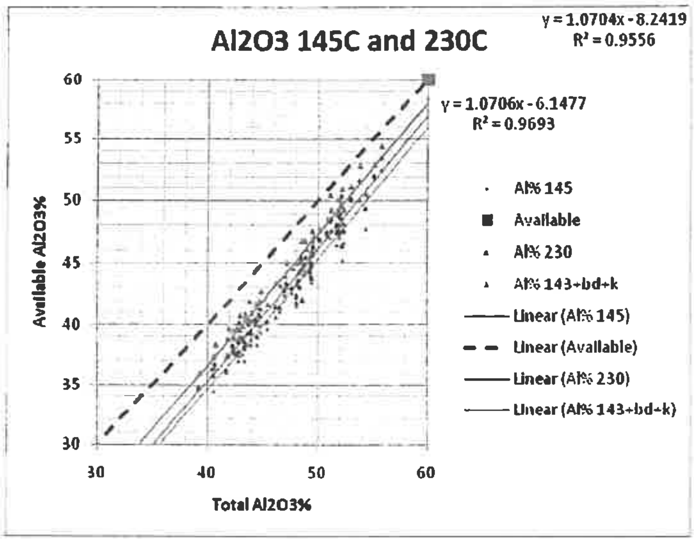


Figure 5-34: Available alumina data from Genalysis. Aluminogoethite corresponds to the difference between Al_2O_3% and the 1:1 trend line

The plateaux analysed by Genalysis comprised AU, RA, BE, EU, GI, GR, AG, YO while DA, SI, JU, BR, MA, AL were analysed by BRDC. A consistent dataset across the area is highly recommended and the simplest and cheapest solution is to derive a set of microwave digests from selected samples.

Multielement regression analysis was used to refine the reactive silica and available data (**Table 5-5**). This indicated some potential for slight improvement over the simple regression models and further work on this methodology is recommended in conjunction with the microwave digest program.

Table 5-5: Multi Element Regression Analysis for Genalysis Si-145C Data

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.875722448							
R Square	0.766889806							
Adjusted R Square	0.746076396							
Standard Error	0.315779							
Observations	62							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regression	5	18.37072161	3.674144	36.84595	1.59E-16			
Residual	56	5.584117098	0.099716					
Total	61	23.95483871						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	14.86037398	8.18549102	1.815453	0.07481	-1.53713	31.25788	-1.53713	31.25788
SiO2%	0.624165587	0.108445695	5.755559	3.78E-07	0.406923	0.841408	0.406923	0.841408
Al2O3%	-0.216303907	0.09795301	-2.20824	0.031338	-0.41253	-0.02008	-0.41253	-0.02008
Fe2O3%	-0.168596784	0.082510082	-2.04335	0.045734	-0.33388	-0.00331	-0.33388	-0.00331
TiO2%	-0.126983303	0.114803383	-1.10609	0.273415	-0.35696	0.102996	-0.35696	0.102996
LOI%	-0.01470345	0.11065705	-0.13287	0.894769	-0.23638	0.206969	-0.23638	0.206969

5.7 Geotechnical Appraisal - Physical Characteristics

Bauxite in the Minim Martap and Ngaoundal leases is somewhat typical of basalt derived bauxite formed under similar conditions such as occur in Guinea. It is quite hard near the surface grading to softer and moister near the base of the bauxite. Abundant fractures, fissures and vugs, often filled with iron oxide and hydroxide minerals, occur throughout the profile.

Table 5-6: Uniaxial strength tests on 9 core samples from Plateaux Gregorine, Agnes and Raymonde

Référence	Profond (m)	Ho (mm)	Ø (mm)	So (cm^2)	Sc (cm^2)	Γ (t/m^3)	Contrainte (bars)	Résistance à la rupt. (MPa)
GR/09/12150013	14.20	130.9	66.23	34.45	35.37	1.85	20.13	2.013
GR 0033	7.75	129.125	66.5	34.73	36.07	2.03	44.5	4.45
AG/09/B/S/0012	0.70	129.7	66.7	34.94	35.75	2.08	6.2	0.62
AG/09/B/S/0021	0.35	133.1	66.3	34.52	35.56	2.21	46.0	4.60
GR 00 13	0.50	135.25	66.5	34.73	35.24	1.90	37.6	3.76
RA 0003	5.30	128.0	66.03	34.24	34.57	2.1	17.9	1.79
GR 0041	3.45	138.2	66.5	34.73	35.04	1.97	23.3	2.33
RA 0003	0.5	132.5	66.5	34.73	35.84	2.12	107.6	10.76
GR/09/W0013	6.65	85.65	66.3	34.52	34.82	1.76	8.1	0.81

The limited uniaxial strength test work on cores from the deposit suggests relatively weak rock overall (**Table 5-6**).

5.8 Measurements of In Situ - Density and Moisture Content

Several approaches were used to assess the in situ dry bauxite density and the moisture content. These comprised principally dry density measurements on HQ core conducted in the field and at the laboratory of Labogenie in Yaounde plus measurement of wet bauxite from two aircore drillholes drilled at the side and edge of the Simone Plateau.

For the aircore samples, moistures of 10 to 14% were assumed based on the analysis of many bagged samples analysed at Labogenie. In addition some spot core samples were measured to gauge the density of specimens of some of the heaviest and most competent bauxite from Danielle and Simone plateaux.

The down hole plots of all the measurements are presented in **Figure 5-35**. Previously, the dry bulk density has always been assumed to be 2.2 as was reported by BRGM (Bardosy and Alva, 1990) and used by Gsell (1984) to calculate the resources.

Histogram plots of the individual sample measurements and the hole average samples are presented in **Figures 5-36** and **5-37**.

Core recovery for the exploration program was 81% overall and of the recovered core about 20-30% was rubble and unsuitable for easy volume/density calculation.

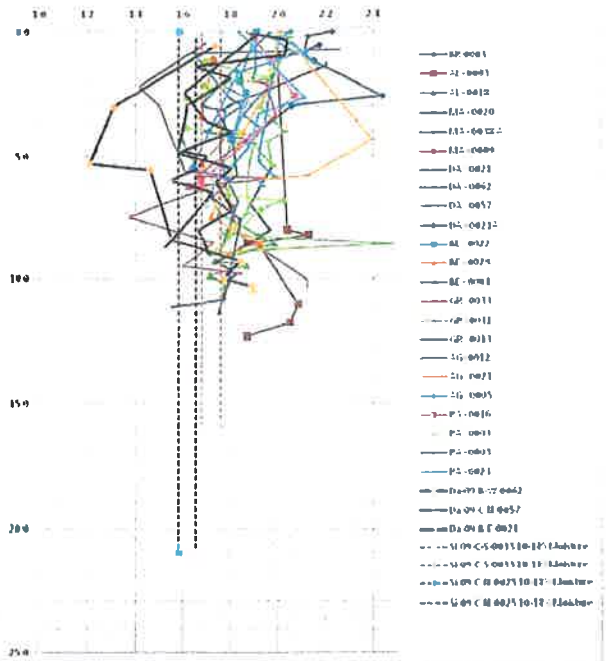


Figure 5-35: Measured dry densities from core plus measured open hole densities assuming moisture ranges from 10 to 14%

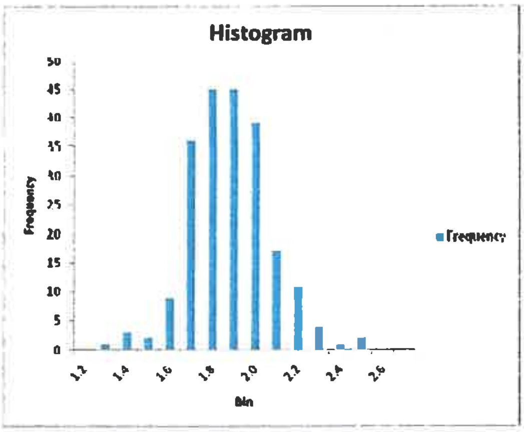


Figure 5-36: Plot of density measurements for all core samples (only competent sticks were used)

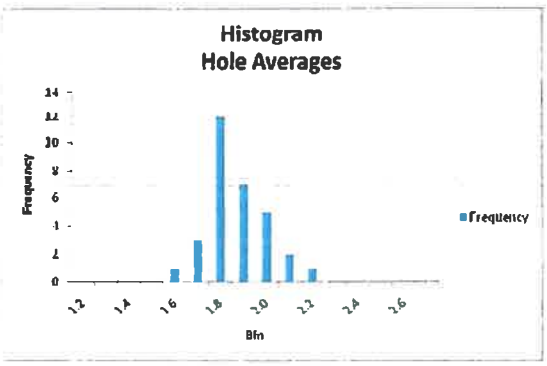
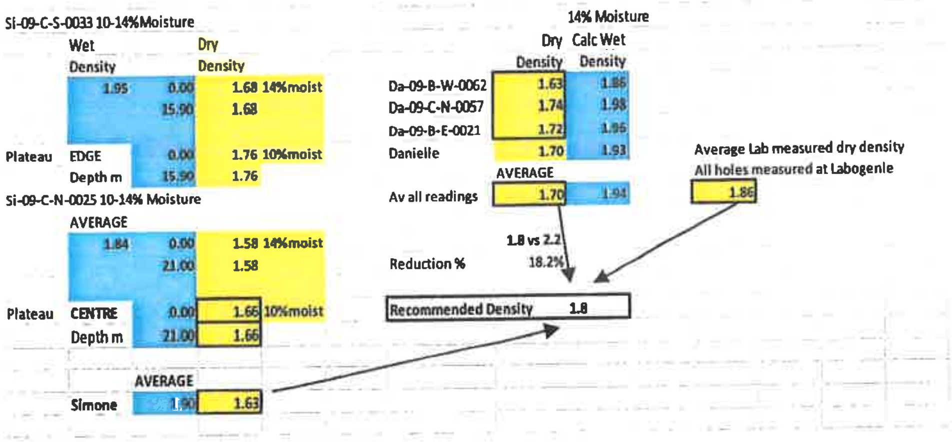


Figure 5-37: Plot of all hole average densities measured during the 2009 field program

The result of the density work is that an average of 1.8 has been used for the calculation of resources from the deposit (**Table 5-7**).

Table 5-7: Summary of density measurements undertaken at the Simone plateau and from Danielle core in the field and by Labogenie in their facility at Yaounde



The major issues with the density work can be summarised as follows:

- Moisture is assumed to be nil (Measured densities were sun dried in the field and oven dried at Labogenie).
- Broken core was not measured – fractures and vugs may be more common.
- Fewer samples were available in particular cores.
- Losses and washouts were possible in particular lithofacies.
- Distribution of lithofacies is not currently defined.

In the authors opinion the density of 1.8 t/m^3 is reasonable for this kind on vuggy but competent material. The density range of dry bauxites varies typically from 1.3 to 2.0 t/m^3 with a maximum range of about 1.1 to 2.2 t/m^3.

As a check, test measurements of two more dense samples are presented in **Table 5-8 and Figure 5-38.** The results should be near the upper lever of the density distribution.

Table 5-8: Core measurements from 2 core samples shown below

Core	Diameter mm	Radius cm	Length mm	Length cm	Weight kg	Air Dried Density
Danielle Gibbsite	67.0	3.4	70.00	7.00	0.485	1.97
Simone Core Plug	30.0	1.5	74.00	7.40	0.110	2.10
						2.03

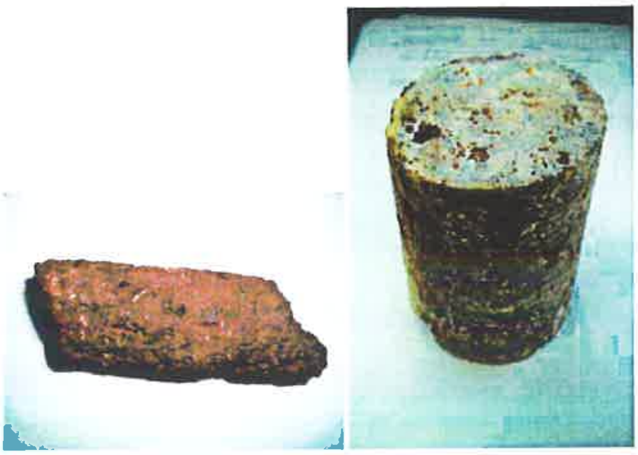


Figure 5-38: Core samples from Simone and Danielle considered the more dense bauxite (for measurements see Table 2-14)

Table 5-9: Typical moisture analyses (water content%) from Labogenie showing average for the hole

Ref. N°	Bore hole N°	Depth(m)	Gros weight(g)	Dry weight(g)	weight of moisture retained in p(g)	total moisture(g)	water content(%)
71	DA/09/B/E/21	1	4058.8	3626.9		431.9	11.9
68	DA/09/B/E/21	2	3359.7	2939.3		420.4	14.3
76	DA/09/B/E/21	3	1741.6	1526.8		214.8	14.1
67	DA/09/B/E/21	4	3497.3	3045.5		451.8	14.8
64	DA/09/B/E/21	5	2898.8	2550.4		348.4	13.7
78	DA/09/B/E/21	6	3204.5	2880.6		323.9	11.2
72	DA/09/B/E/21	7	2252.2	2060.8		191.4	9.3
79	DA/09/B/E/21	8	2740.6	2536.3		204.3	8.1
66	DA/09/B/E/21	9	3084.9	2834.7		250.2	8.8
65	DA/09/B/E/21	10	2516	2273.7		242.3	10.7
73	DA/09/B/E/21	11	2426.2	2183.3		242.9	11.1
75	DA/09/B/E/21	12	5754.6	5059.4		695.2	13.7
80	DA/09/B/E/21	13	3448.3	2953.1		495.2	16.8
69	DA/09/B/E/21	14	2639.4	1975.4		664	33.6
70	DA/09/B/E/21	15	2878.7	1939.7		939	48.4
74	DA/09/B/E/21	16	1676.9	1326.3		350.6	26.4
77	DA/09/B/E/21	16.5	2395.6	1939.7		455.9	23.5
							17.1

Table 5-10: Typical moisture analyses (water content%) from Labogenie showing average moisture for the hole without the lower presumed clayey layer

Ref. N°	Bore hole N°	Depth(m)	Gros weight(g)	Dry weight(g)	weight of moisture retained in p(g)	total moisture(g)	water content(%)	
71	DA/09/B/E/21	1	4058.8	3626.9		431.9	11.9	
68	DA/09/B/E/21	2	3359.7	2939.3		420.4	14.3	
76	DA/09/B/E/21	3	1741.6	1526.8		214.8	14.1	
67	DA/09/B/E/21	4	3497.3	3045.5		451.8	14.8	
64	DA/09/B/E/21	5	2898.8	2550.4		348.4	13.7	
78	DA/09/B/E/21	6	3204.5	2880.6		323.9	11.2	
72	DA/09/B/E/21	7	2252.2	2060.8		191.4	9.3	
79	DA/09/B/E/21	8	2740.6	2536.3		204.3	8.1	
66	DA/09/B/E/21	9	3084.9	2834.7		250.2	8.8	
65	DA/09/B/E/21	10	2516	2273.7		242.3	10.7	
73	DA/09/B/E/21	11	2426.2	2183.3		242.9	11.1	
75	DA/09/B/E/21	12	5754.6	5059.4		695.2	13.7	
80	DA/09/B/E/21	13	3448.3	2953.1		495.2	16.8	
69	DA/09/B/E/21	14	2639.4	1975.4		664		33.6
70	DA/09/B/E/21	15	2878.7	1939.7		939		48.4
74	DA/09/B/E/21	16	1676.9	1326.3		350.6		26.4
77	DA/09/B/E/21	16.5	2395.6	1939.7		455.9		23.5
							12.2	

Table 5-11: Measured and inferred moisture contents likely to occur in Minim Martap and Ngaoundal bauxites

	DRY SEASON (Clay removed)
DA MA	10.5
DA	12.2
Ngaoundal	13.0
GE BE RA EU AU YO AG	11.3
YO (start rain)	13.1

Suggested Values	Sept-May	June-Aug
	DRY	WET (est)
MM	11	14
NG	13	16

Typical moisture data is presented in **Table 5-9**. The significance of removing clay layers is obvious (**Table 5-10**). The recommended averages derived from the data are in **Table 5-11**.

Further work is recommended to firmly establish both the bank density and the in situ moisture content and to assess variations across the deposit.

5.9 Estimated Hardness and Rippability

Hardness in the field comprises mainly dry, massive and tough grading to soft towards the base of the bauxite. Although the dry density of the bauxite is only 1.8 t/m^3 the material is reasonable abrasive, particularly the near surface layer. The material will likely be rippable (**Table 5-12**) by a large bulldozer and should fragment well following blasting.

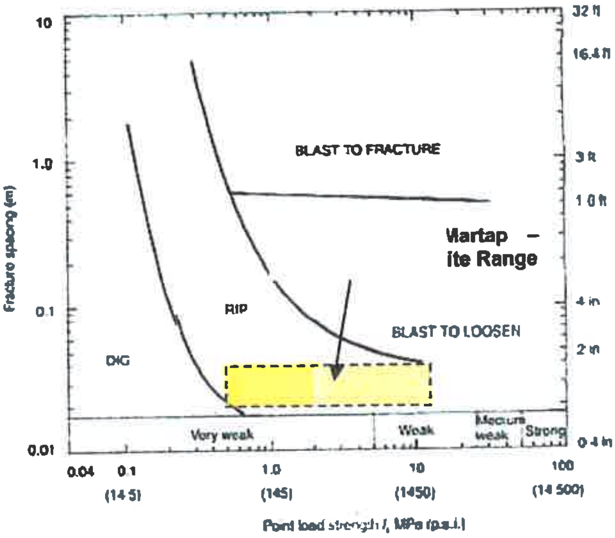
Hardness measurement ranged from 1 to 10 MPa and the close but erratic fracture spacing suggests blasting should not be required (**Fig. 5-39**).

Table 5-12: Rock Rippability Rating Chart (Note 1.7-10 MPa is rated very weak to poor rock)

Rippability rating chart (after Weaver, 1975). With the permission of the Institution of Civil Engineers of South Africa

	Rock class				
	I	II	III	IV	V
Description	**Very good rock**	**Good rock**	**Fair rock**	**Poor rock**	**Very poor rock**
Seismic velocity (m/s)	> 2150	2150–1850	1850–1500	1500–1200	1200–450
Rating	26	24	20	12	5
Rock hardness (MPa)	Extremely hard rock (> 70)	Very hard rock (20–70)	Hard rock (10–20)	Soft rock (3–10)	Very soft rock (1.7–3.0)
Rating	10	5	2	1	0
Rock weathering	Unweathered	Slightly weathered	Weathered	Highly weathered	Completely weathered
Rating	9	7	5	3	1
Joint spacing (mm)	> 3000	3000–1000	1000–300	300–50	< 50
Rating	30	25	20	10	5
Joint capacity	Non-continuous	Slightly continuous	Continuous – no gouge	Continuous – some gouge	Continuous – with gouge
Rating	5	6	3	0	0
Joint gouge	No separation	Slight separation	Separation < 1 mm	Gouge < 5 mm	Gouge > 5 mm
Rating	5	5	4	3	1
Strike and dip orientation*	Very unfavourable	Unfavourable	Slightly unfavourable	Favourable	Very favourable
Rating	15	13	10	5	3
Total rating	100–90	90–70†	70–50	50–25	<25
Rippability assessment	Blasting	Extremely hard ripping and blasting	Very hard ripping	Hard ripping	Easy ripping
Tractor selection	—	DD9G/D9G	D9/D8	D8/D7	D7
Horsepower	—	770/385	385/270	270–180	180
Kilowatts	—	575–290	290/200	200–135	135

* Original strike and dip orientation now revised for rippability assessment.
† Ratings in excess of 75 should be regarded as unrippable without preblasting.



Possible excavation methods related to strength and degree of fracturing of rock (modified from US Dept of Navy, 1982). *Note:* Rock strength classifications refer to ranges listed in Table

Figure 5-39: Excavation strength with the likely Minim Martap–Ngaoundal bauxite upper section range shown

The floor is softer than the upper layers and should be rippable as is done in many other bauxite mines. Ripping the floor to facilitate environmental regeneration should be relatively easy. Hard ironstone floor was not a feature of the deposit and where penetrated, a transitional floor seems to be the most common situation.

5.10 Handling Characteristics and Sizing

ROM bauxite provided to customers is expected to have a granulometry of 80% passing 300 to 400 mm and this should be readily achievable with following sizing and crushing. This product specification assumes blasting and primary crushing.

For alumina plant feed, grinding tests will need to be carried out to assess the power requirements. Standard Bond index measurements will allow characterization of -250um, -500 um, -1 mm and -2 mm sizings.

5.11 Deep Drilling

During the program a request was made by the Cameroon Department of Mines to test the depth extent of potential deposits. To address this requirement a deep hole was drilled on Brigitte Plateau to 60m. **Figure 5-40** shows the grade profile from the bore hole.

No deep bauxite was encountered, unlike the ambiguous character of the outcrop section where float bauxite eroded from the top of the plateau gives the appearance of possible additional bauxite at lower levels. The change to a low iron, more kaolinitic band can be seen at about 46 m depth and continuing to about 58 m.

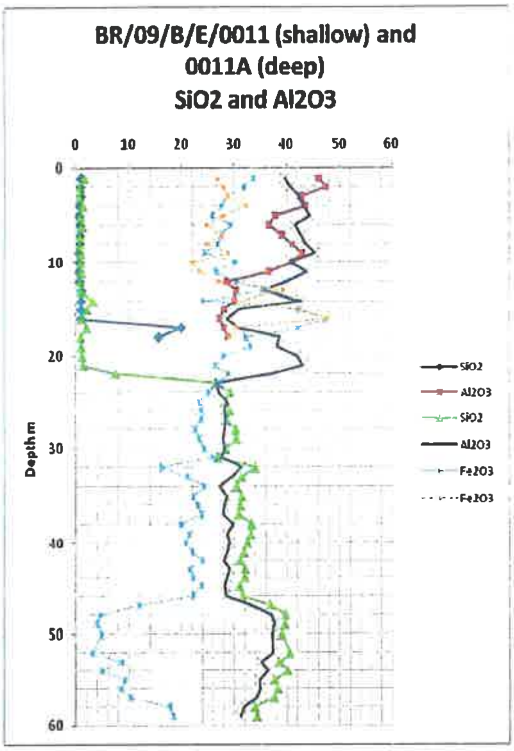


Figure 5-40: Deep drillhole grade profile indicating the absence of any bauxite below 22 m depth

5.12 Bulk Samples

Based on the drilling data for Danielle and Simone, two bulk samples were chosen to represent the deposit. These were a **Daniel Average** and an **80:20 Danielle-Simone Blend** that included high silica samples in the blend. The samples were composited and analysed for reactive silica and available alumina as follows:

- the DABulk they indicated 41.3/1.2
- the DA-Si Blend they indicated 40.1/1.16

Simone bulk sample locations are shown in **Figure 5-41.** Danielle Bulk sample locations are shown in **Figure 5-42.** Samples incorporated into the blend are shown in **Table 5-13.**

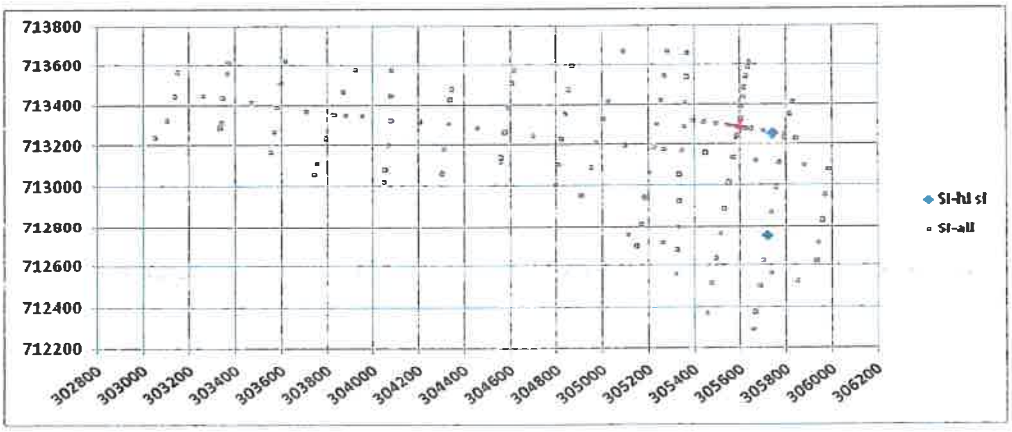


Figure 5-41: Simone bulk sample locations

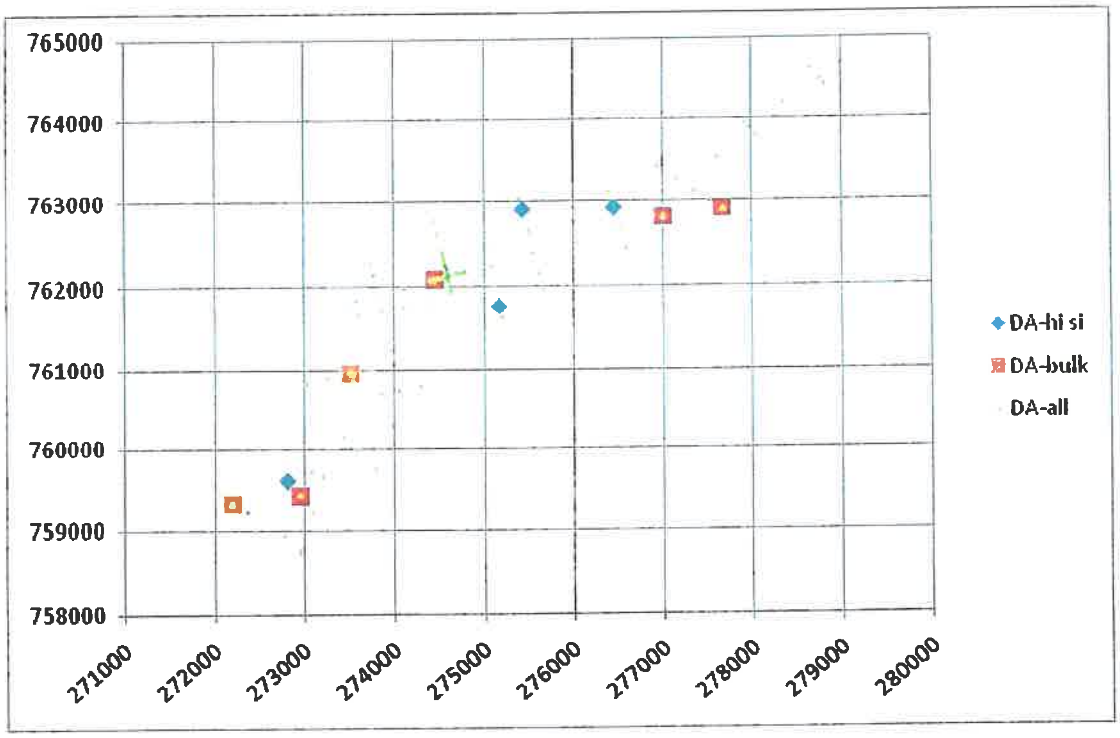


Figure 5.42: Daniel Bulk Sample locations (DA-bulk) and (DA-hi si) for the Daniel Simone blend

Table 5-13: List of drill holes used to create the Bulk Samples

		SAMPLE_ID	CoordX	CoordY	CoordZ	DBF_HOLE_ID		Hole type	Soil	Water Table	Date	TO METRES	SiO2%	Al2O3%	Fe2O3%	TiO2%	LOI 1000%	LAB
SI-hi si	SI0147	SI-09-C-S-0147	305715.1	712746.0	1384	SI0147	SI	NG Air Core			31/03/2009	27	1.50	42.68	27.42	3.73	23.85	BRDC
	SI0029	SI-09-C-E-0029	305738.4	713252.8	1386	SI0029	SI	NG Air Core			15/03/2009	27	0.88	41.79	29.84	3.81	22.82	BRDC
DA-hi si	DA0010	DA-09-C-N-0010	276451.6	762916.6	1265	DA0010	DA	MM RAB	0.20		23/01/2009	8	1.47	46.19	20.64	4.68	25.68	BRDC
	DA0079	DA-09-C-S-0079	275189.3	761772.9	1270	DA0079	DA	MM RAB			2/02/2009	9	2.02	43.01	26.54	3.59	24.03	BRDC
	DA0073	DA-09-C-N-0073	272810.8	759598.3	1268	DA0073	DA	MM Auger			12/02/2009	9	2.31	47.30	20.45	3.29	25.00	BRDC
	DA0013	DA-09-C-N-0013	275432.1	762902.5	1260	DA0013	DA	MM RAB	0.10		25/01/2009	9	1.60	41.62	28.04	4.14	23.07	BRDC
DA-bulk	DA0052	DA-09-B-W-0052	274452.1	762095.5	1267	DA0052	DA	MM RAB			27/01/2009	10	1.71	45.78	21.53	4.83	25.29	BRDC
	DA0022	DA-09-B-E-0022	276994.6	762809.8	1288	DA0022	DA	MM RAB	0.10		23/01/2009	11	1.68	42.08	27.15	4.72	23.55	BRDC
	DA0074	DA-09-B-W-0074	272948.2	759416.4	1270	DA0074	DA	MM Auger			12/02/2009	7	1.49	44.27	25.14	3.89	24.43	BRDC
	DA0008	DA-09-C-SE-0008	277667.5	762908.4	1285	DA0008	DA	MM Auger	0.20		18/01/2009	11	1.99	42.72	25.52	4.62	24.30	BRDC
	DA0036	DA-09-C-N-0036	272182.3	759318.2	1285	DA0036	DA	MM RAB			12/03/2009	6	1.33	45.32	22.18	4.55	25.85	BRDC
	DA0040	DA-09-C-N-0040	273510.7	760959.5	1253	DA0040	DA	MM RAB			5/02/2009	10	2.19	44.11	24.58	4.09	24.24	BRDC

6 Mineral Resources Estimate

The reliability of any resource estimate depends on the technical level of exploration, sampling and laboratory tests, density of the exploration grid and the method of estimation. The geological complexity of the deposit, its geometry and variability of grade govern the level of detailed work that must be done.

In the case of the Minim Martap bauxite in Cameroon, the layered nature of the deposit, relatively good bauxite continuity and the knowledge derived from previous exploration means that quite reliable understanding of the areas explored was quickly achieved.

6.1 Modelling

A simple model was applied to generate and check the resource in the current evaluation. These comprise a polygonal block model based on an area of influence for each drill hole sampled on the regular grid and a plateau level definition based on area and average thickness and grade of bauxite drilled.

Semivariograms have demonstrated that the current drill spacing applied to the resources are basically within the range of influence of the individual samples. Thickness and grade continuity is highly likely as the geological model is well defined and the semivariogram ranges are around 300 to 600 m. This result is consistent with data from major bauxite areas. Contours and plots of grade and thickness data readily show areas of better and poorer character indicating the potential for selective bauxite grade extraction. What is not yet shown is the impact and continuity of upper and lower bauxite grade variations that will be vital for short term mine planning.

The resource model is robust at the regional scale for each plateau tested. With more than 30 bauxite holes on each plateau it can be considered that the thickness, grade and character of the bauxite are statistically meaningful.

The statistical data for all the bauxite/laterite intersections drilled in the initial exploration program in 2009 are presented in **Table 6-1**. A total of 845 drill holes were incorporated into the resource model; one hole on Simone was not recorded in the survey data and therefore could not be used in the resource estimate.

Table 6-1: Statistical data for all the bauxite/laterite intersections drilled in the initial exploration program in 2009

	Bauxite Thickness (M)	*TO METRES*	*SiO2%*	*Al2O3%*	*Fe2O3%*	*TiO2%*	*LOI 1000%*
Mean	10.5	13.5	2.1	44.5	25.1	3.9	23.5
Standard Error	0.2	0.2	0.1	0.2	0.2	0.0	0.1
Median	10.0	11.1	1.8	43.6	26.5	3.8	23.3
Mode	7.0	11.1	1.3	46.2	30.3	3.2	23.5
Standard Deviation	4.9	6.2	1.9	4.5	6.6	0.6	1.9
Sample Variance	24.3	38.9	3.4	20.0	43.4	0.4	3.8
Kurtosis	2.1	12.9	70.6	0.1	-0.2	8.1	0.7
Skewness	1.2	2.8	6.5	0.3	-0.4	1.5	0.2
Range	34.0	55.0	26.8	29.1	42.2	7.8	14.1
Minimum	0.0	5.1	0.4	27.9	5.9	1.6	15.1
Maximum	34.0	60.1	27.2	57.0	48.1	9.3	29.2
Sum	8875.0	11399.2	1760.8	37572.9	21226.6	3274.7	19892.8
Count	846	846	845	845	845	845	845

6.2 Methodology

The basic exploration of the CAL Minim Martap-Ngaoundal bauxite leases involved comprehensive, though wide spaced drilling of the bauxite-bearing plateaux combined with routine XRF chemical analyses of each metre drilled. From the alumina, silica and LOI data it was possible to recognize the likely bauxite intersection based on a series of cutoff grades (Section 5.13) and this was used to create composite samples for available alumina and reactive silica determinations.

Once reactive silica and available alumina work is checked and understanding of the distribution of the various mineral species is clear, it will be possible to confidently attribute reactive silica and available alumina to the individual samples and re-composite as required, probably on a plateau by plateau basis. The resources described in this document, are based directly on the composite analyses from the total chemical data but this should provide an adequate, first pass, estimate of the resource potential.

Further work is necessary to characterize the individual plateau characteristics to better understand and quantify the potential for grade extraction which is not yet optimized.

To provide an overview, the grade data was compiled into regional maps able to be printed in large format. The regional maps for alumina and silica are presented in **Figures 6-1** and **6-2.**

The grade tonnage profiles for Danielle and Simone were determined for the total chemical analyses and the reactive silica and available alumina data (discussed in Section 5.21). All the data need to be reviewed on an individual plateau basis, particularly the high grade northwest plateaux where the variations in grade are high and segregation of ore panels looks encouraging.

6.3 Grade Cutoffs

The cutoff grades for the overburden and floor varied a little through the project. Initially the following cutoffs were applied to the overburden and floor

- 3% SiO_2 and 30% Al_2O_3,
- 4%SiO_2 and 40% Al_2O_3 and
- 5% SiO_2 and 50% Al_2O_3.

Consideration was made of the LOI and some flexibility for inclusion was allowed if the LOI was above 20%.

Overall, where the floor was intersected, it was easy to recognise as a rapid chemical change from high to low alumina and low to high silica. The bauxite section exhibited clear bounds for most areas on all plateaux. When it came to some of the high silica plateau, it was apparent that incorporation of what were siliceous bauxite holes would potentially aid the development of the geological model and thus averaged grade sections were made for the laterites or siliceous bauxite occupying the bauxite layer.

It is proposed to use the existing work to make an analysis of the floor and overburden with the aim of identifying individual cut grades for the various plateaux. It must be recognised that relatively little floor was drilled during the program and the issue will potentially increase the cost of required ongoing resource definition work if the situation is not better understood.

All grade selections were made prior to any reactive silica or available alumina information due to the time constraints. It is likely that further refinement of the grade cut offs will only have a very small impact on the resource and the more important task is to consider the grades distributions and the issue of high silica, poor grade plateau margin zones and the vertical distribution of grades where split seam mining may provide significant high grade potential. In addition to the grade parameters, it was considered that 3 m represented the minimum bauxite layer to be defined.

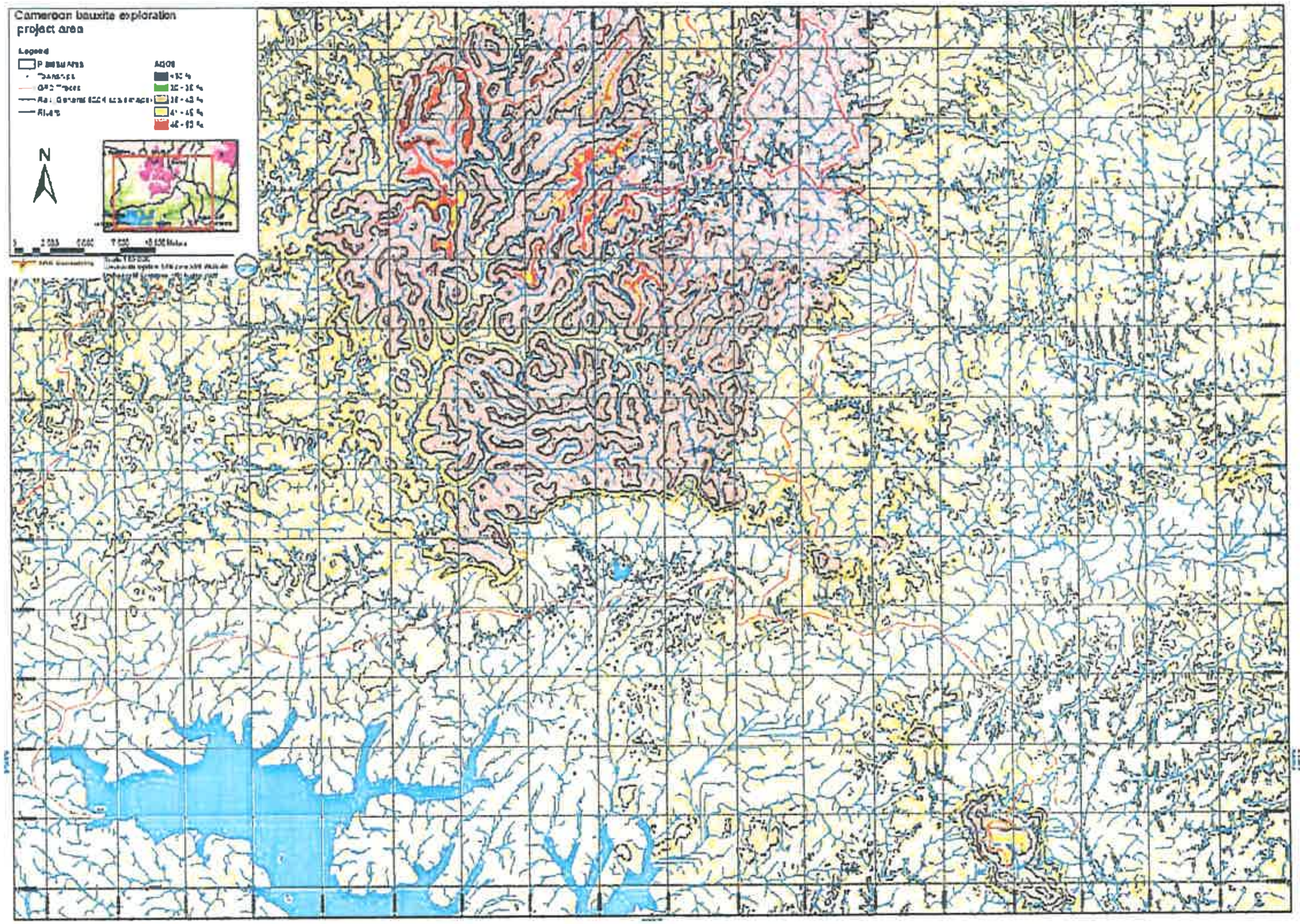


Figure 6-1: Alumina grade distribution for the plateaux drilled in 2009 (Appendix 10)

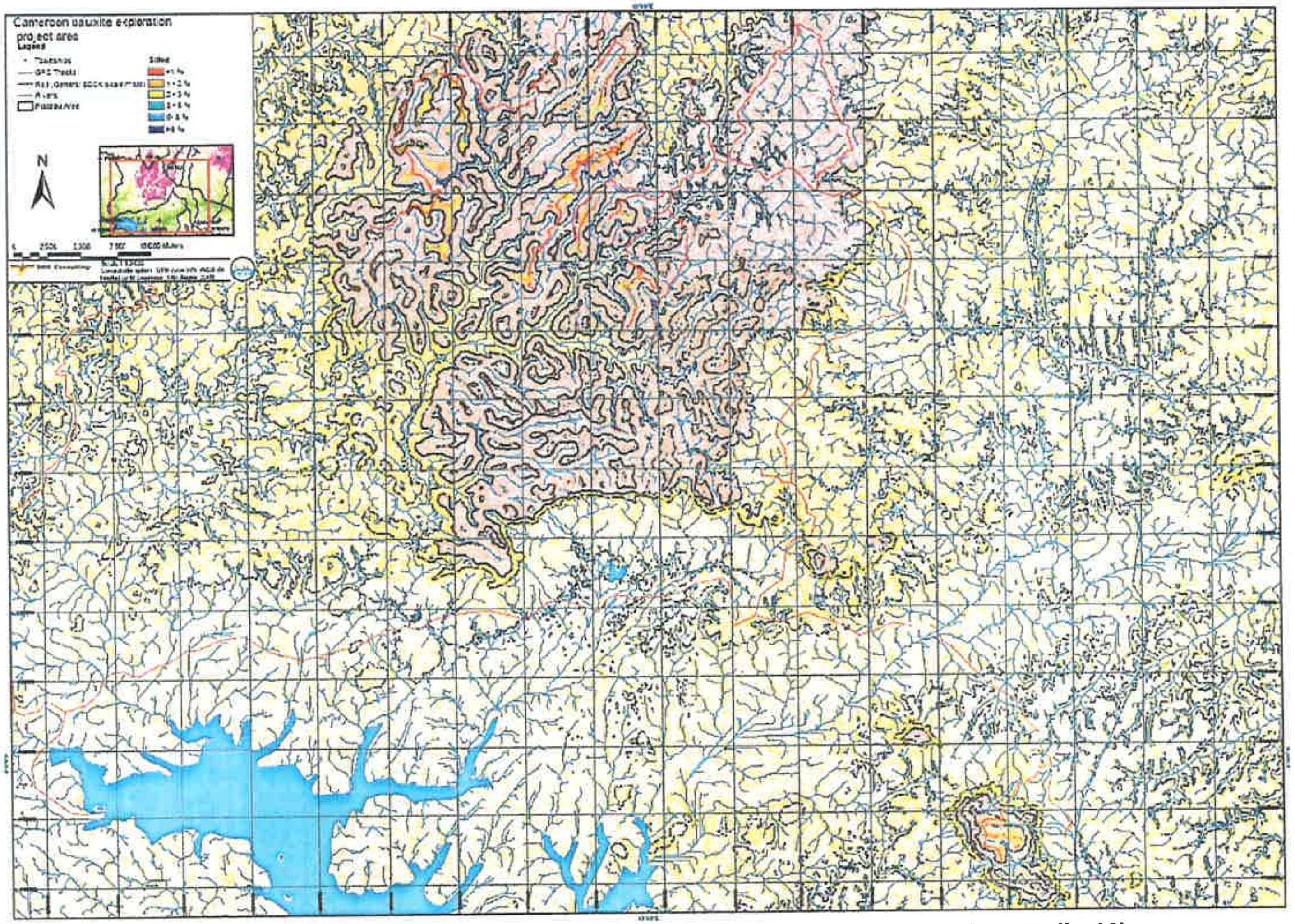


Figure 6-2: Silica grade distribution for the plateaux drilled in 2009 (Appendix 10)

6.4 Deposit Grade Estimation

The bauxite deposits are thin laterally extensive sheets at the top of plateaux and therefore a two dimensional approach to resource estimation has been adopted. The steps involved in the two dimensional estimate are:

1. Preparation of the accumulation variables (Length * Grade).
   a. For several deposits, some holes had no coordinates. These holes were ignored but were mostly duplicates reducing their importance in the resource estimate.
   b. For Gillberte, hole GI-09-B-S-0009 had coordinates that plotted in Eulalie. The true location of the hole could not be resolved from the documentation and was subsequently ignored.
   c. For Simone one hole was not picked up by the surveyors (SI-09-C-N-0027). A clear gap to be checked occurs at the presumed approximate location of the drill hole.
2. Data analysis of the accumulation variables and length was then required. This included the development of two dimensional variograms. As many of the plateaux have limited data, variography was difficult and in some cases not possible. In these cases, the variogram from a neighbouring plateau was used with the sills of the variogram normalised to the variance of the data.
3. Establishment a two dimensional grid. Block sizes were based on the drill spacing and range from 100 m x 100 m to 250 m to 250 m. Block origin and sizes for each plateau are shown in **Table 6-2.**
4. Selected blocks within the bauxite limits for estimation (**Figure 6-3**). In this case a block is selected if the block centre is inside the bauxite limit.
5. Ordinary kriging of Length and the Al_2O_3, Fe_2O_3, SiO_2, TiO_2 and LOI accumulations. 10 holes in Simone and 1 hole in Raymond were found to have duplicate coordinates with other holes. These result in kriging errors, as such these data have been filtered out and have not been used during for kriging. A list of problematic holes is presented in **Table 6-3.**
6. Calculation of grade estimate such that Estimated Grade = Estimated Accumulation / Estimated Length. An example of grade estimates for Al_2O_3 is shown in **Figure 6-4.**

A density of 1.8 t/m^3 has been applied as an average for the deposit. Block tonnages are calculated as (block size * estimated thickness * density).

The small amount of overburden waste associated with the deposit is shown in **Table 6-4**. This was off grade bauxite rejected during drill hole bauxite selection. A study to define the characteristics of overburden is proposed for as part of the ongoing work. In addition it is proposed to study the soil horizon typically 10 to 30 cm that is relatively widespread on the plateaux but poorly defined form the current data.

Table 6-2: Block Model Origin and Block Size by Plateau

Plateau	X Min	Y Min	Size X (m)	Size Y (m)	Number X	Number Y
Alice	267,400	752,400	150	150	35	35
Agnes	261,000	764,000	150	150	30	45
Aurélie	275,000	756,000	100	100	35	35
Beatrice	263,000	762,000	150	150	30	48
Danielle	271,000	757,000	250	250	35	35
Eulalie	272,400	764,900	200	200	30	35
Gilberte	273,000	764,000	200	200	30	35
Grégorien	261,200	752,400	150	150	40	60
Matilde	276,300	749,000	200	200	25	35
Raymonde	260,000	760,000	150	150	40	60
Yolande	273,000	755,000	100	100	35	55
Bridget	302,200	714,000	100	100	30	15
Judith	302,600	711,200	100	100	25	25
Simone	302,250	711,500	100	100	45	35

Note: Block Origin is the coordinate at the block centre.

Table 6-3: List of problematic duplicate holes.

Hole	X	Y
SI-09-B-W-0003	303581.6	713386.3
SI-09-B-W-0005B	304079.2	713323.1
SI-09-B-E-0009	304973.1	713209.4
SI-09-C-S-0015-A	305496.6	712633.1
SI-09-B-E-0057	305768.6	713111.4
SI-09-B-W-0081 A	303259.2	713448.8
SI-09-B-W-0087 A	303707.5	713367.4
SI-09-B-E-0117 B	305225	713184
SI-09-B-E-0117-C	305225	713184
SI-09-C-S-0146D	305734	712868.8
RA-09-C-W-0014	261088.7	763005.5

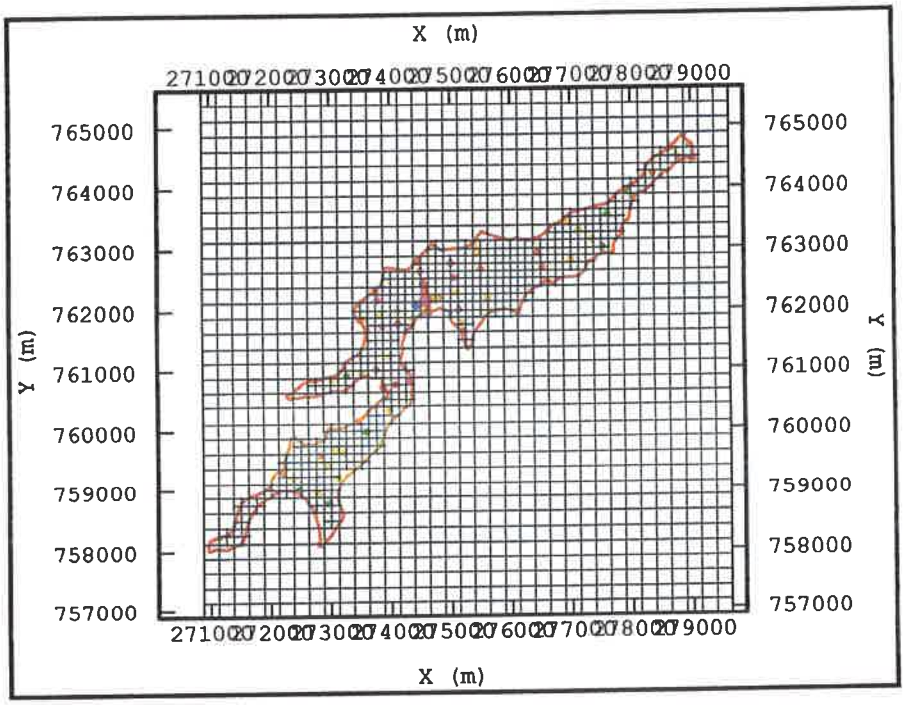


Figure 6-3: Estimation Grid (Danielle)

Dots = Data location (coloured by Al2O3).

Blue Grid = All blocks.

Blue Cross = blocks selected for Estimation.

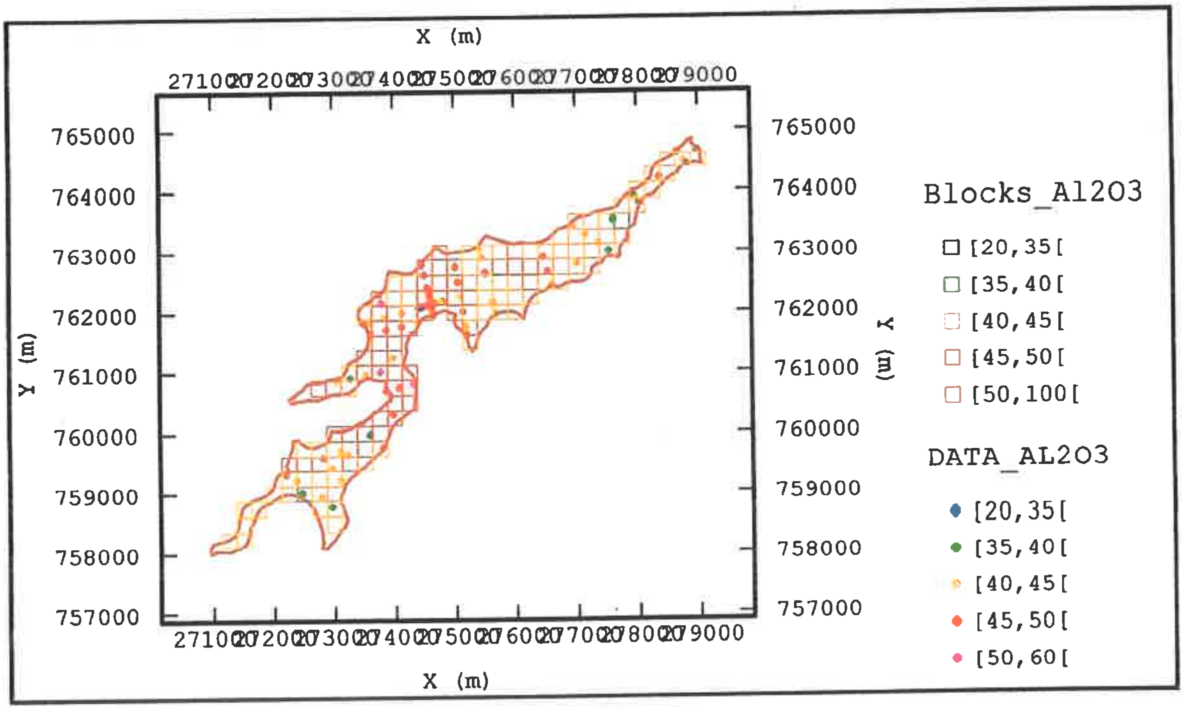


Figure 6-4: Al_2O_3 Estimates (Danielle)

Dots = Data location (coloured by Al_2O_3 XRF Total).

Squares = Estimated Al_2O_3 grades.

Table 6-4: Overburden tonnages (overburden is not included in the resources summary but soil veneer is currently carried in the resource)

	Not included in current resouce					Included in current resource		Soil veneer	
Plateau	Plateau	Total m^3	Den 1.8	Tonnage OB	GPS area m^2	Thick m	Total m^3	Den 1.8?	Tonnage OB
Agnes	AG	0	1.8	0	2319116	0.3	695734.9	1.8	375697
Alice	AL	0	1.8	0	1908601	0.3	572580.3	1.8	309193
Aurélie	AU	62500	1.8	112500	891131	0.3	267339.4	1.8	144363
Beatrice	BE	285000	1.8	513000	2814530	0.3	844359	1.8	455954
Bridget	BR	0	1.8	0	396146	0.3	118843.8	1.8	64176
Danielle	DA	3250000	1.8	5850000	7397117	0.3	2219135	1.8	1198333
Eulalie	EU	0	1.8	0	1050734	0.3	315220.2	1.8	170219
Gilberte	GL	10000	1.8	18000	2726681	0.3	818004.3	1.8	441722
Gregorine	GE	250000	1.8	450000	4680501	0.3	1404150	1.8	758241
Judith	JU	0	1.8	0	804161	0.3	241248.3	1.8	130274
Matilde	MA	0	1.8	0	2071551	0.3	621465.2	1.8	335591
Raymonde	RA	1500000	1.8	2700000	4499695	0.3	1349909	1.8	728951
Simone	SI	250000	1.8	450000	1985832	0.3	595749.7	1.8	321705
Yolande	YO	500000	1.8	900000	2102573	0.3	630772	1.8	340617
	Total	6.1 m^3		11.0 mT		Total	10.7 m^3		5.8 mT

6.5 Model Validation

Because the geological model is quite well understood and geostatistically tested, and the number of drill holes is statistically adequate in each of the bauxite resource plateaux, it is possible to place a high degree of confidence on the calculated global in situ resource estimates. This means that both polygonal modelling and plateau wide resource estimation have validity and can be used to cross check the results of the different approaches.

At this stage, the relatively wide drill spacing has meant it has only been possible to produce a coarse block model. Further drilling will be required to obtain extra analytical data to establish a more reliable grade tonnage distribution. The geostatistical indications to date are that the grade variations are sufficiently small and the higher grade pods adequately compartmentalized that selective extraction of a significant proportion of the selected grade resources should be achievable. The mining requirements, particularly short term scheduling must be better quantified by further work on the grade data and additional drilling, if they are to be satisfactorily modelled.

6.6 Resource Calculations – Details and Assumptions

Relative standard errors can be attributed to each of the elements that are incorporated into the tonnage and grade estimates. These can be indicatively assessed in terms of the contained extractable alumina content of the resource.

Standard errors provide simple measures of uncertainty in a value because if the standard error of several individual quantities is known then the standard error of a function of the quantities can be calculated. The standard error of the sample mean depends on both the standard deviation and the sample size.

The standard error of the mean ("SEM") of a sample from a population is the standard deviation of the sample divided by the square root of the sample size.

$$S_E = \frac{\hat{\sigma}}{\sqrt{n}}$$

where

$\hat{\sigma}$ is the standard deviation of the sample, and n is the size (number of items) of the sample.

The standard error falls as the sample size increases, as the extent of chance variation is reduced; this idea underlies the sample size calculation for a controlled trial, for example. By contrast, the standard deviation will not tend to change as we increase the size of our sample. To indicate the uncertainty around the estimate of the mean measurement, the best estimate is the standard error of the mean. The standard error ("SE") is most useful as a means of calculating a confidence interval. For a large sample, a 95% confidence interval is obtained as the values 1.96 x SE either side of the mean (Altman and Bland, 2005).

The alumina content is calculated by using the following formulae:

Alumina Content = Area x Ore Thickness x Density x Available Alumina

The main error is likely to be the available alumina content as it is the end product of the calculation and the extraction conditions are not yet optimized.

The surface area is relatively poorly constrained due to the nature of the plateaux outlines. Two models have been generated based on the break of slope and field measured GPS outlines.

To put this in perspective, the GPS area of Plateau Danielle is 7 397 117 m^2. The SRTM break of slope area is 5 334 362 m^2. This gives a tonnage difference of 31 342 558 t (**Table 6-5**). A detailed map showing the difference for the northwest part of the plateau is shown in **Figure 6-6**. An analysis of the drill holes between the two boundaries indicated that they are mostly bauxite or the section contains thin bauxite with some overburden (**Table 6-6**). The lateral continuity in this zone is currently unknown but it is reasonable to conclude that the area of bauxite is between the break of slope model and the physical plateau edge boundary defined by the field GPS mapping.

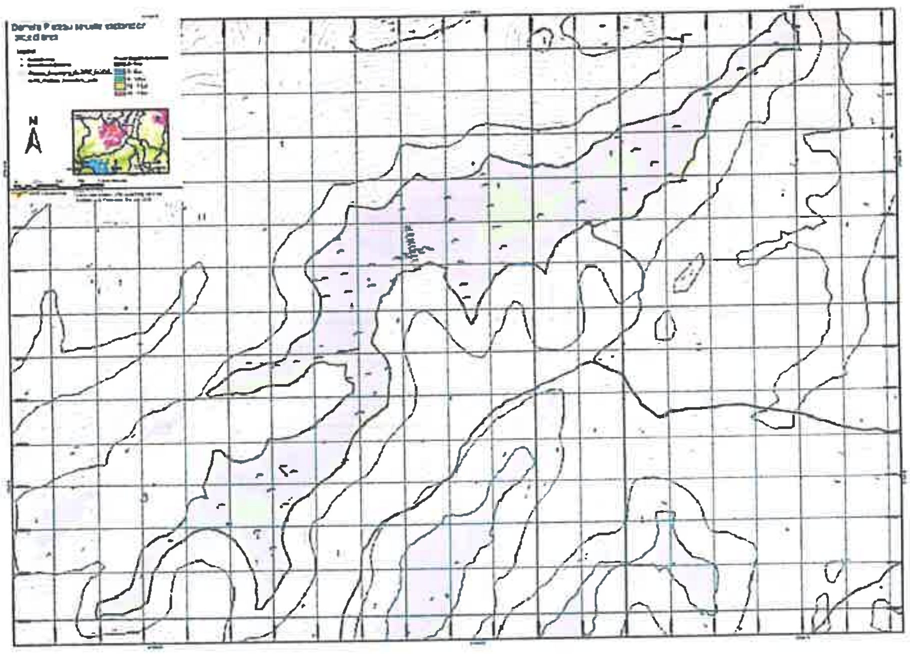


Figure 6-5: Area comparison between the GPS area and the break of slope area on Danielle Plateau

Table 6-5: Area comparison between the GPS and SRTM plateau boundaries. Note a check of the SRTM area (SRTM bruce) indicated that the "Duck and Egg" were correnctly accounted for and a final outcome of 131 blocks was used to adjust for the Duck and Egg plus a small area outside the lease boundary

AREA COMPARISON	Area	Duck	Egg	Bauxite Area	1.8*8.8	mT		Thickness	Density	Tonnage	
GPS	8110745	583831	129597	7397117	15.84	117.2		8.7	1.8	115,838,852	Difference
SRTM	6047790	583831	129597	5334362	15.84	84.5		8.8	1.8	84,496,294	31,342,558
131 250m blocks	8187500	9 blocks	3 blocks	7250000	15.84	114.8	119 250 Blocks				
SRTM bruce				5234000	15.84	82.9					

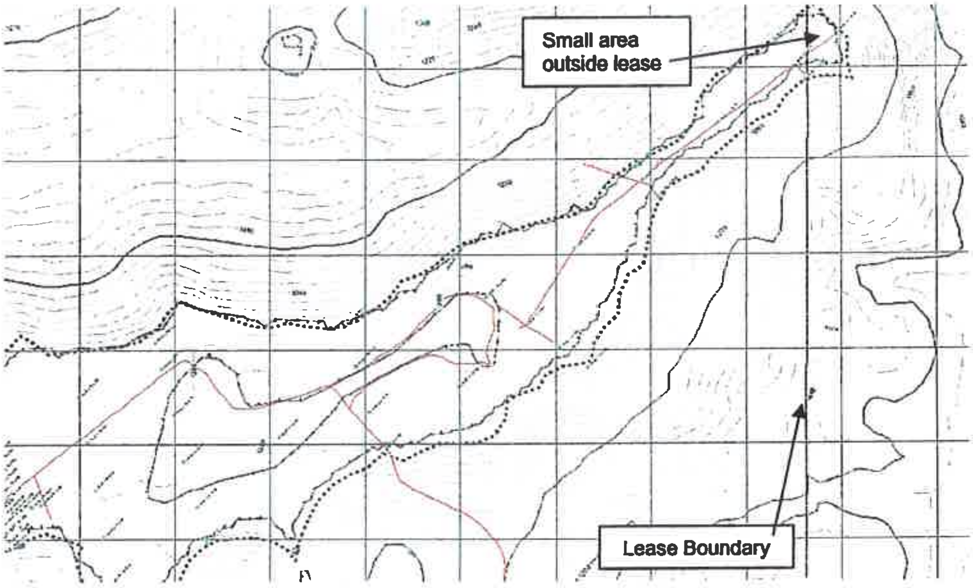


Figure 6-6: Detail of the plateau area models from Northeast Danielle

Table 6-6: Hole between the break of slope and GPS area outlines

	Hole	Thick m	SiO2	Al2O3	Fe2O3	TiO2	LOI			
DA-09-C-S-0078	DA0078	1	4.64	49.20	15.10	3.7	26.60	BRDC	Poor grade and no data	
DA-09-C-S-0015	DA0015	8	1.25	41.13	29.31	4.3	23.24	BRDC	Bauxite	
DA-09-C-S-0003	DA0003	3	1.83	39.53	30.65	4.3	22.88	BRDC	2 m OB	
DA-09-C-S-0002	DA0002	2	1.28	39.95	31.05	4.2	22.75	BRDC	1 m OB	
DA-09-B-E-0016	DA0016	4	5.19	37.03	32.63	3.2	21.13	BRDC	1 m OB	
DA-09-C-N-0001	DA0001	7	3.29	46.20	21.41	3.2	25.04	BRDC	Bauxite	
DA-09-C-N-0004	DA0004	5	2.07	39.90	29.88	5.0	22.22	BRDC	3 m OB	
DA-09-C-N-0032	DA0032	15	1.31	50.17	15.95	4.8	26.89	BRDC	Bauxite	1 m OB
DA-09-C-N-0065	DA0065	5	2.85	46.42	19.44	5.0	25.48	BRDC	3 m OB	
DA-09-C-N-0043	DA0043	6	1.18	48.47	19.08	4.4	26.05	BRDC	Bauxite	
DA-09-C-S-0068	DA0068	5	2.42	45.72	20.70	5.2	25.12	BRDC	Bauxite	1 mOB
DA-09-C-S-0045	DA0045	5	1.86	53.92	10.46	3.8	29.22	BRDC	Bauxite	
DA-09-C-S-0034	DA0034	6	0.82	40.65	30.33	3.9	23.48	BRDC	Bauxite	
DA-09-C-N-0028	DA0028	12	0.66	51.51	14.61	5.1	27.31	BRDC	Bauxite	
DA-09-C-S-0054	DA0054	10	0.91	48.81	18.56	4.7	26.22	BRDC	Bauxite	

In order to derive a better understanding of the likely resource it is possible to derive the tonnages and calculate the distributions based on the known statistics. For a plateau such as Danielle, the result is shown in **Figure 6-7**. The component sensitivities for depth area and density are also presented. In the case of Danielle where drilling is sparse and the plateau edge difficult to gauge, the distribution is wide and 80 to 150 mT is the calculated as the 95% confidence limits. This range of possible outcomes suggests an inferred level resource.

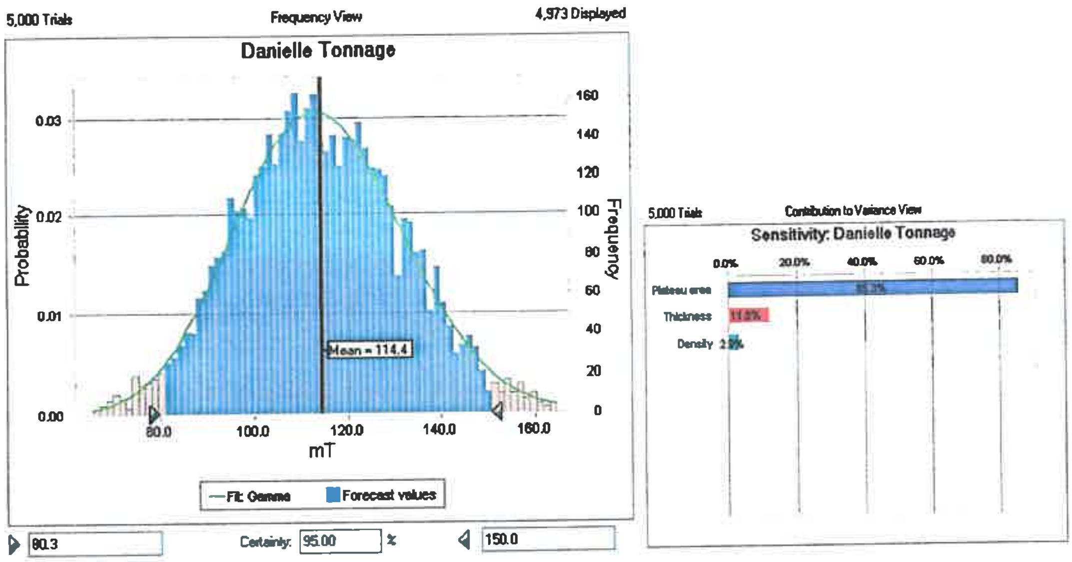


Figure 6-7: Danielle Tonnage distribution and component sensitivity

By comparison with Danielle, the Simone plateau is more tightly drilled and has a clearer and much less rugose outline (Fig. 6-8). The GPS and break of slope area models are in closer agreement. The level of confidence within the plateau bauxite volume is much more reliably constrained and this outcome is reflected in the tonnage distribution and component sensitivities (Fig. 6-9). The 95% confidence level ranges from 45 to 59 mT and this is characteristic of an indicated resource.

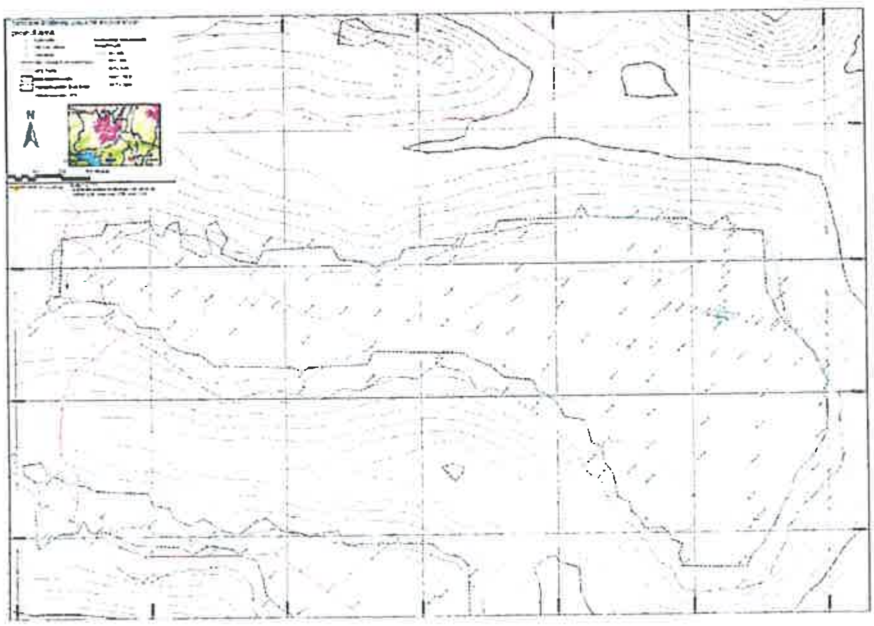


Figure 6-8: Simone plateau areas defined by the GPS and break of slope boundaries

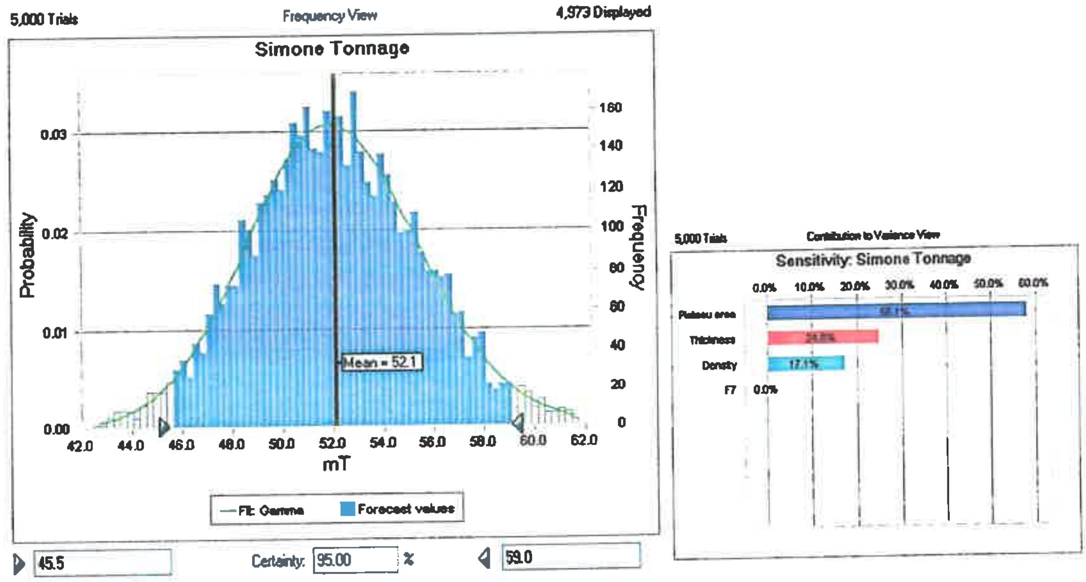


Figure 6-9: Danielle Tonnage distribution and component sensitivity

Relative standard errors on ore thickness relate to the metre sampling interval. In a practical mining sense, the incorporation of a small amount of floor or overburden can significantly reduce the grade but all indications to date are that the floor will be of fairly uniform character. During mining however, if the floor is encountered it is usually only in a small spot and the floor level is lifted over a wide area by comparison. The effect of any dilution by poorer grade material is therefore expected to be minimal. **Figure 6.10** shows the bauxite floor exposed in the bottom of the trench on Plateau Danielle.

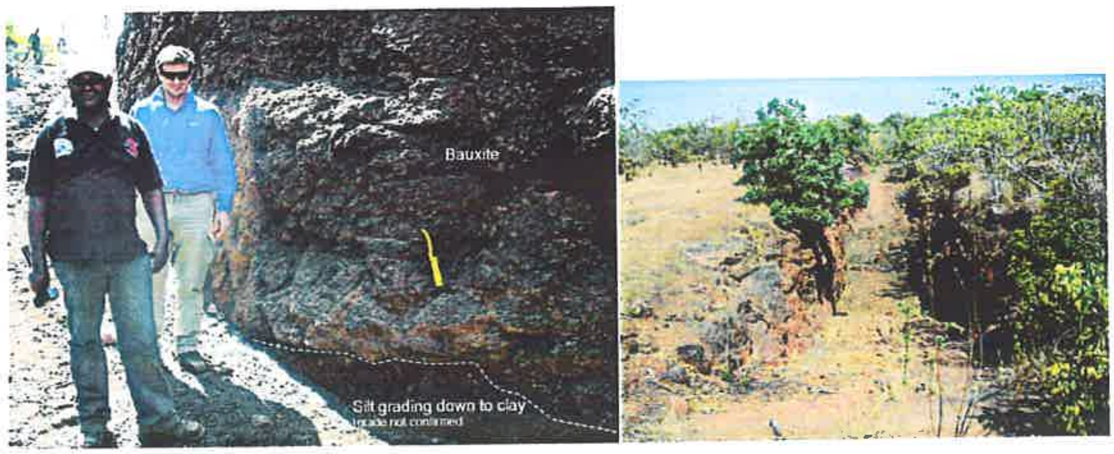


Figure 6-10: Profile in the trench on Plateau Danielle. The trench (from ~1972) in the dry season

Volumetric errors need to be considered in relation to the relative variances of the ore thickness and surface area which combined give the total relative errors on the volume. Ore thickness variance is presented in **Tables 6-7** and **6-8.** The standard error for the total bauxite resource was calculated at 0.42 to 0.5 m for Plateaux Danielle and Simone.

Table 6-7: Statistics related to Danielle Plateau bauxite thickness (m)

Danielle Thickness	
Mean	8.564705882
Standard Error	0.426518398
Median	8
Mode	7
Standard Deviation	3.93230533
Sample Variance	15.46302521
Kurtosis	0.180625423
Skewness	0.388215741
Range	18
Minimum	0
Maximum	18
Sum	728
Count	85
Confidence Level(95.0%)	0.848178593

Table 6-8: Simone deep and Simone shallow bauxite thickness (m) statistics

Simone deep		*Simone SHALLOW*	
Mean	16.40458015	Mean	15.16030534
Standard Error	0.477291564	Standard Error	0.421224454
Median	16	Median	15
Mode	16	Mode	16
Standard Deviation	5.462851645	Standard Deviation	4.821134233
Sample Variance	29.84274809	Sample Variance	23.24333529
Kurtosis	-0.651456363	Kurtosis	-0.388221366
Skewness	0.31267782	Skewness	0.405380923
Range	24	Range	22
Minimum	7	Minimum	7
Maximum	31	Maximum	29
Sum	2149	Sum	1986
Count	131	Count	131
Confidence Level(95.0%)	0.944264265	Confidence Level(95.0%)	0.833342194

In situ density is a potential error mainly because it is calculated from the regional work. Variation is derived from the standard error on the mean of available density measurements (**Table 6-9**). At a 2.5% relative standard deviation it means that within the 95% confidence interval the hole average bulk density could vary from about 1.77 to 1.83 t/m^3. This seems a narrow range, but it is based on a reasonable quantity of measured data and there is no particular evidence of bias.

Table 6-9: Hole average and individual measured density data statistics for the Minim Martap-Ngaoundal bauxite (m^3/t)

	Hole av distribution	*Data distribution*
Mean	1.830767656	1.83418284
Standard Error	0.023357126	0.012851773
Median	1.791244889	1.831
Mode	#N/A	1.619004017
Standard Deviation	0.130046975	0.188443988
Sample Variance	0.016912216	0.035511136
Kurtosis	0.14417087	1.106168356
Skewness	0.499269896	0.186536745
Range	0.55610171	1.267226325
Minimum	1.581756054	1.210353515
Maximum	2.137857763	2.47757984
Sum	56.75379734	394.3493107
Count	31	215
Confidence Level(95.0%)	0.047701616	0.025332274

6.7 Total Chemical Grades, Available Alumina, Reactive Silica

The total chemical grade statistics are shown in **Tables 6-10** and **6-11** for Danielle and Simone. It is obvious that the grade standard errors for the individual plateaux are significantly higher than for the deposit average because of the fewer number of samples. The comparison between the Simone deep and shallow thicknesses and grades is summarised in **Table 6-12.**

Table 6-10: Grade statistics for Danielle Plateau (XRF total) data

DA grades	SiO2	Al2O3	Fe2O3	TiO2	LOI1000
Mean	2.122079918	44.61873535	23.36010987	4.374549369	24.67074552
Standard Error	0.346140568	0.460409941	0.682379203	0.071400628	0.213417302
Median	1.328333333	44.28333333	22.74166667	4.398571429	24.89
Standard Deviation	3.191258354	4.244769918	6.291225398	0.658281262	1.9676103
Sample Variance	10.18412988	18.01807166	39.579517	0.43333422	3.871490293
Kurtosis	33.95998874	-0.647959882	-0.484591316	0.152979458	-0.444526007
Skewness	5.623281612	0.049026068	0.034960931	0.164759465	-0.013166415
Range	23.0175	19.03666667	29.63	3.255	8.803333333
Minimum	0.57	34.88333333	10.25333333	2.755	20.41666667
Maximum	23.5875	53.92	39.88333333	6.01	29.22
Sum	180.376793	3792.592505	1985.609339	371.8366964	2097.013369
Count	85	85	85	85	85
Confidence Level(95.0%)	0.688338466	0.915575642	1.356985853	0.141987976	0.424403701

Table 6-11: Grade statistics for Simone Plateau deep (XRF total) data

Si deep grades	SiO2	Al2O3	Fe2O3	TiO2	LOI
Mean	1.272505529	41.52888546	30.17981048	3.821058896	22.35403173
Standard Error	0.092383793	0.177039135	0.257894403	0.031417198	0.089759976
Median	0.885867377	41.30352721	30.31017145	3.787841197	22.20055147
Standard Deviation	1.138983898	2.182685046	3.179535735	0.387337228	1.106635311
Sample Variance	1.297284319	4.764114011	10.10944749	0.150030128	1.224641711
Kurtosis	13.09951597	2.324687482	2.40139876	-0.198939617	2.126262374
Skewness	3.341227988	1.165958407	-1.17967818	0.239926755	1.117171773
Range	7.358958333	12.17340372	17.88493128	1.837074288	6.161163996
Minimum	0.409375	37.60625	18.44551202	3.043084517	20.298836
Maximum	7.768333333	49.77965372	36.3304433	4.880158805	26.46
Sum	193.4208405	6312.39059	4587.331193	580.8009522	3397.812823
Count	152	152	152	152	152
Confidence Level(95.0%)	0.182531796	0.349793727	0.509547475	0.062074065	0.177347662

Table 6-12: Simone deep compared to Simone Plateau shallow thickness (m) and grade average drill hole results (XRF totals) comparison

Simone deep										
Thickness	Al2O3	Fe2O3	SiO2	TiO2	LOI	Blocl X	Block Y	Density	Volume	Tonnes
15.46	41.81	29.90	1.26	3.78	22.47			1.8	30306900	54,552,420.00
Simone Shallow										
Thickness	Al2O3	Fe2O3	SiO2	TiO2	LOI			Density	Volume	Tonnes
14.58	41.91	29.90	0.99	3.77	22.57			1.8	28573000	51,431,400.00

The standard relative error on available alumina is generally small in spite of the addition of sampling, assaying and estimation errors. For all average bauxite grade holes the statistics are presented in **Table 6-1** (Section 6.1). This indicates a relatively small standard error for alumina of 0.2 and for silica of 0.1. Because the errors associated with laboratory bias and sampling are not yet fully tested, and the reactive silica and available alumina require further clarification, there is little additional analysis that can be derived from the individual grade data.

Within the CAL bauxite leases, the mineralisation is not fully tested. Exploration potential remains but must be considered limited as the plateau were not considered for drilling by previous operators. For all these reasons, the upside resource potential is likely to be limited.

6.8 Resources Categories

Resource categorisation is commonly based primarily of the grid size, all other things being equal. This is not the case when we compare air core drilling at Simone to the combination of RAB and auger drilling at Danielle. In Guinea bauxite resources are described as inferred if the drill spacing is 600 m and indicated for a drill spacing of 300 m. Measured resource data in Guinea is assessed on a 150 m grid.

Similar scale bauxite areas occur at Weipa, Australia. These are assessed at 250 ft (75 m) spacing for pre-mine evaluation. Resources are determined from 500 ft (150 m), 1000 ft (300 m) and 2000 ft (600 m) spaced drilling.

Based on the results of the variography described previously, and the errors associated with the volumes and grades, the CAL bauxite resources are categorised by as Inferred at Ngaoundal and Indicated at Minim Martap. The Indicated status of the Ngaoundal plateaux was derived primarily from:

- the closer spaced drilling,
- the use of air core for clean sampling and
- reliable depth control of the derived samples.

Each factor adds significantly to the reliability of the Ngaoundal estimate. A perspective depiction on the cover of the current document graphically illustrates the data distribution of the Ngaoundal drilling.

6.9 Mineral Resource Volume/Grade Assumptions

The geology, resource and mining work to date suggests the practicality of supplying bauxite to a domestic refinery. The specified levels of available alumina and reactive silica (although needing further refinement) are likely to be reasonably attractive and the bauxite can be processed at a predictable cost.

The current mineral resource estimate is based on all available geological data, resource modelling and the understanding of the sampling techniques and constraints. Mining loss and dilution have not been considered for the purpose of defining the in situ resources, however the indications suggest losses will be small to moderate.

Intermediate sub-grade material inside the bauxite appears to be uncommon and holes with this style of mineralization were rejected at Danielle by domaining the Duck and Egg areas. All other holes were incorporated into the resource block modelling. Only a small amount of overburden waste mainly in the form of siliceous ferruginous laterite was encountered and such material was not included in the resource. Thin stripping estimated at 0.3m is presumed to be required to remove the thin organic-rich near surface layer. This will be better defined when the organic carbon data are analysed. Currently, the sacrificial organic layer is included as part of the resource.

Over the deposit, thin soil cover where it occurs, was rejected from the first metre sample at the drill site. Currently the first metre is consider whole and included as part of the resource. Work to evaluate the soil cover is recommended.

6.10 Mineral Resource Statement (Tables 6-13 and 6-14)

The current document was prepared in accordance with the JORC Code using all the data available at the time.

The reported bauxite mineral resources are not materially affected by any known environmental, permitting and legal, title, taxation, socio-economic, marketing, political, or other relevant issues. If present, they are as described in the current reports. Environmental and socioeconomic issues associated with the bauxite mining activities are the subjects of other reports currently in preparation.

Estimates of mineral resources are not considered to be affected materially by mining, metallurgical, infrastructure and factors other than those described in this technical report. No bauxite need be sterilized, that SRK is aware of, by permanent roads or the proposed railway additions.

The inferred status of the Minim Martap bauxite resources is based on extensive drilling using a nominal drill hole grid spacing of 500 x 250 metres. This was derived from a central plateau baseline with holes spaced at 500 m intervals and regular cross lines with holes spaced at 250 m intervals. Core hole checks of the auger drilling enabled reasonable depth corrections to be made for the purpose of resource estimation. Nearly all drill holes were incorporated into the geological resource model and were used to derive the in situ resource block model. In future, the possibility exists to cut resources **(Fig. 6-11)** and target better grades but much of the opportunity lies with upper and lower split seam mining and this is too poorly defined with the current data.

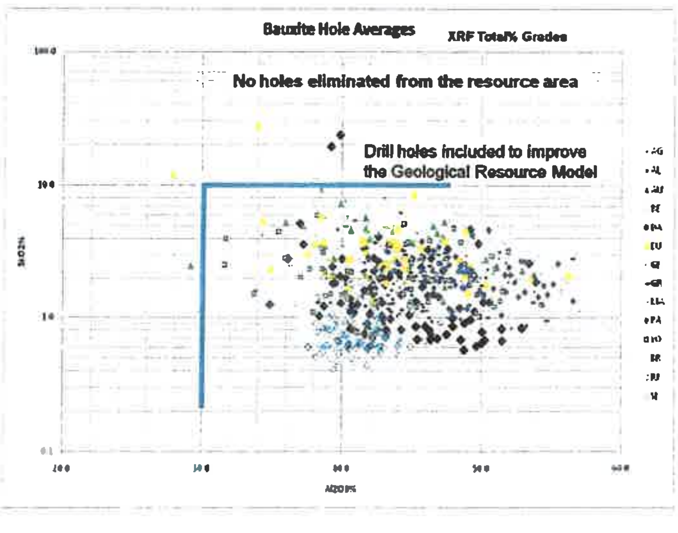


Figure 6-11: Bauxite hole average grades for the Minim Martap-Ngaoundal Bauxite Deposit **Note: Silica versus alumina plot, XRF total grades**

The resource statement in **Table 6-13** presents the geological resources comprising virtually all the explored bauxite assessed in the 2009 drilling campaign. Grade components, representing part of the resource that may be separately extractable, based on the grade-tonnage curves are not reported as the existing data requires additional work and further drilling is also needed. Once completed, the improved level of understanding should permit the definition of smaller volumes at higher grades and these may be separately mineable. Higher grades could significantly improve project economics, however the details of the achievable grades will only emerge with improve resource understanding.

At Ngaoundal, clean sampling and good depth control was achieved by use of air core drilling and the drill spacing was closed to approximately 125 m (cross) x 250 m (long) with 125 m along the Simone long axis baseline. The closer spaced drilling also has allowed the recognition that the bauxite is of overall more uniform grade character, except for the inclusion of sporadic kaolin bands in the Simone deep model. At this stage it is not known if the clayey layer might be separably minable as waste. The Ngaoundal resources (Plateaux Simone, Judith and Brigitte) are catagorised as Indicated Resource status.

Although it is not usually appropriate to sum Inferred and Indicated resources, noting the relative tonnage distributions described previously and the small relative difference in grade errors, for Simone (Indicated) and Danielle (Inferred), a total Inferred and Indicated Resource available to the project can be suggested (**Table 6-13**).

Table 6-13: The Resources of the 14 plateau drilled in the 2009 program (In situ, ROM dilution and waste not considered)

Notes: Danielle summary rejects material within the "egg" and "Duck" Shapes. Simone summary is for the Deeps Data. Plateau Limits – area is based on the area of the outline defining the limits in two Dimensions. Number of Data includes any data with duplicate coordinates.

Area	Code	Plateau	Plateau Limits: Area (GPS) m²	Plateau Limits: Area %	Block Model: Vol m³	Density t/m³	Tonnes (In situ) t	Tonnes (In situ) Auger depth corr	Tonnage %	Thickness m	Al2O3 %	Fe2O3 %	SiO2 %	TiO2 %	LOI %
North	AL	Alice	1,908,601	5.4%	17,017,875	1.80	31688128.66	28,519,316	4.8%	9.22	47.20	19.94	1.85	4.13	25.98
North	AG	Agnes	2,319,116	6.5%	18,591,750	1.80	34493143.19	31,043,829	5.2%	8.26	46.99	22.12	2.50	3.64	24.04
North	AU	Aurélie	891,131	2.5%	6,645,500	1.80	11713872.45	10,542,485	1.8%	7.30	46.67	19.87	3.20	4.00	24.28
North	BE	Beatrice	2,814,530	7.9%	21,416,400	1.80	37093600.84	33,384,241	5.6%	7.32	50.76	16.38	2.69	3.88	25.03
North	DA	Danielle	7,397,117	20.8%	70,586,875	1.80	114790946.13	112,150,754	18.8%	8.62	44.79	23.26	1.57	4.52	24.77
North	EU	Eulalie	1,050,734	2.9%	8,057,200	1.80	14109957.04	12,698,961	2.1%	7.46	41.68	28.34	2.69	3.65	22.35
North	GI	Gilberte	2,726,681	7.6%	22,681,600	1.80	40334012.28	36,300,611	6.1%	8.22	42.73	26.07	3.06	3.77	22.44
North	GR	Gregorine	4,680,501	13.1%	49,364,775	1.80	89728875.56	80,755,988	13.5%	10.65	45.28	25.48	1.96	3.53	23.24
North	MA	Matilde	2,071,551	5.8%	16,896,400	1.80	29168125.36	26,309,649	4.4%	7.82	45.35	21.48	3.14	3.93	24.78
North	RA	Raymonde	4,499,695	12.6%	41,061,150	1.80	73537377.92	66,551,327	11.2%	9.08	49.18	19.00	2.11	4.18	25.05
North	YO	Yolande	2,102,573	5.9%	17,710,400	1.80	31321188.00	28,189,069	4.7%	8.28	46.02	23.66	2.26	3.93	23.71
South	BR	Bridget	396,146	1.1%	5,575,300	1.80	10461947.53	10,461,948	1.8%	14.67	41.31	29.41	0.94	4.20	23.09
South	JU	Judith	804,161	2.3%	12,795,100	1.80	22314187.59	22,314,188	3.7%	15.42	41.97	29.39	1.36	3.92	22.49
South	SI	Simone	1,985,832	5.6%	30,306,900	1.80	55271406.14	55,271,406	9.3%	15.46	41.81	29.90	1.26	3.78	22.47
North	Sub-total	Inferred	32,462,230	91.1%	290,029,925	1.80	507,979,227	466,446,231	85.2%	8.80	46.15	22.46	2.20	4.00	24.26
South	Sub-total	Indicated	3,186,139	8.9%	48,677,300	1.80	88,047,541	88,047,541	14.8%	15.36	41.79	29.72	1.25	3.87	22.55
Grand Total (All insitu resources)			35,648,370	100.0%	338,707,225	1.80	596,026,769	554,493,772	100.0%	9.77	45.50	23.53	2.06	3.98	24.00

Based on current exploration data and with due consideration to the estimation errors described in the previous sections, the reportable bauxite mineral resources may be simplistically scheduled as shown in **Table 6-14**.

Table 6-14: Geological Resources – Conceptual Schedule (In situ, ROM dilution and waste not considered)

Notes: Danielle summary rejects material within the "egg" and "Duck" Shapes. Simone summary is for the Deeps Data. Plateau Limits – area is based on the area of the outline defining the limits in two Dimensions. Number of Data includes any data with duplicate coordinates.

Plateau	GPS Area m2	THICK m	Al2O3	Fe2O3	SiO2	TiO2	LOI	Auger Factor	Density	Volume m3	Tonnes	Auger Corrected Tonnes	Mine Cumulative	Cumulative Grades	Al2O3	Fe2O3	SiO2	TiO2	LOI	Al2O3 Av	SiO2 r
Danielle	7397117	8.6	44.8	23.3	1.6	4.5	24.8	0.977	1.8	63,772,748	114,790,946	112,150,754	112,150,754		44.79	23.26	1.57	4.52	24.77	41.46	1.06
Matilde	2071551	7.8	45.3	21.5	3.1	3.9	24.8	0.902	1.8	16,204,514	29,168,125	26,309,649	138,460,403		44.90	22.92	1.87	4.41	24.77	41.58	1.26
Simone	1985832	15.5	41.8	29.9	1.3	3.8	22.5	1.000	1.8	30,706,337	55,271,406	55,271,406	193,731,810		44.02	24.91	1.70	4.23	24.11	40.57	1.14
Alice	1908601	9.2	47.2	19.9	1.8	4.1	26.0	0.900	1.8	17,604,516	31,688,129	28,519,316	222,251,125		44.43	24.28	1.72	4.22	24.35	41.04	1.16
Judith	804161	15.4	42.0	29.4	1.4	3.9	22.5	1.000	1.8	12,396,771	22,314,188	22,314,188	244,565,313		44.20	24.74	1.68	4.19	24.18	40.78	1.13
Eulalie	1050734	7.5	41.7	28.3	2.7	3.6	22.3	0.900	1.8	7,838,865	14,109,957	12,698,961	257,264,274		44.08	24.92	1.73	4.16	24.09	40.64	1.17
Aurélie	891131	7.3	46.7	19.9	3.2	4.0	24.3	0.900	1.8	6,507,707	11,713,872	10,542,485	267,806,760		44.18	24.72	1.79	4.16	24.10	40.76	1.21
Bridget	396146	14.7	41.3	29.4	0.9	4.2	23.1	1.000	1.8	5,812,193	10,461,948	10,461,948	278,268,707		44.07	24.90	1.76	4.16	24.06	40.63	1.19
Yolande	2102573	8.3	46.0	23.7	2.3	3.9	23.7	0.900	1.8	17,400,660	31,321,188	28,189,069	306,457,776		44.25	24.78	1.81	4.14	24.03	40.84	1.22
Raymonde	4499695	9.1	49.2	19.0	2.1	4.2	25.0	0.905	1.8	40,854,099	73,537,378	66,551,327	373,009,103		45.13	23.75	1.86	4.14	24.21	41.85	1.26
Gilberte	2726681	8.2	42.7	26.1	3.1	3.8	22.4	0.900	1.8	22,407,785	40,334,012	36,300,611	409,309,714		44.92	23.96	1.97	4.11	24.05	41.60	1.33
Agnes	2319116	8.3	47.0	22.1	2.5	3.6	24.0	0.900	1.8	19,162,857	34,493,143	31,043,829	440,353,543		45.06	23.83	2.00	4.08	24.05	41.77	1.36
Beatrice	2814530	7.3	50.8	16.4	2.7	3.9	25.0	0.900	1.8	20,607,556	37,093,601	33,384,241	473,737,784		45.46	23.30	2.05	4.06	24.12	42.23	1.39
Gregorine	4680501	10.7	45.3	25.5	2.0	3.5	23.2	0.900	1.8	49,849,375	89,728,876	80,755,988	554,493,772		45.44	23.62	2.04	3.99	23.99	42.20	1.38

Bauxite mineral resources are not reported in terms of metal content but in terms of bauxite grades.

The grade components considered in this simple schedule are available alumina and reactive silica. In all, four sets of data were estimated providing the total chemical grades, available alumina (Al-150) and reactive silica at 150°C (Si-150). The very simple long term schedule on a plateau by plateau basis, suggests reactive silica should be maintained within the range 1.05% to 1.39% and available alumina in the range 40.57% and 42.23%.

Table 6-15 presents a summary breakdown of the characteristics of the 14 bauxite plateaux drilled in the CAL 2009 campaign.

Table 6-15: Summary of the bauxite plateau resource data from the 2009 exploration program

Rank By Area (GPS)			Rank by Thickness (uncorrected)		Rank by Tonnes (uncorrected)			Rank by Al2O3% (Total)		Rank by SiO2% (Total)	
Deposit	Area	Area %	Deposit	Thickness	Deposit	Tonnes	Tonnage %	Deposit	Al2O3 %	Deposit	SiO2 %
Danielle	8,115,984	22%	Simone	15.46	Danielle	127,056,375	21%	Beatrice	50.76	Bridget	0.94
Gregorine	4,680,501	13%	Judith	15.42	Gregorine	88,856,595	15%	Raymonde	49.18	Simone	1.26
Raymonde	4,499,695	12%	Bridget	14.67	Raymonde	73,910,070	12%	Alice	47.20	Judith	1.36
Beatrice	2,814,530	8%	Gregorine	10.65	Simone	54,552,420	9%	Agnes	46.99	Danielle	1.57
Gilberte	2,726,681	7%	Alice	9.22	Gilberte	40,826,880	7%	Aurélie	46.67	Alice	1.85
Agnes	2,319,116	6%	Raymonde	9.08	Beatrice	38,549,520	6%	Yolande	46.02	Gregorine	1.96
Yolande	2,102,573	6%	Danielle	8.62	Agnes	33,465,150	5%	Matilde	45.35	Raymonde	2.11
Matilde	2,071,551	6%	Yolande	8.28	Yolande	31,878,720	5%	Gregorine	45.28	Yolande	2.26
Simone	1,985,832	5%	Agnes	8.26	Alice	30,632,175	5%	Danielle	44.79	Agnes	2.50
Alice	1,908,601	5%	Gilberte	8.22	Matilde	30,413,520	5%	Gilberte	42.73	Beatrice	2.69
Eulalie	1,050,734	3%	Matilde	7.82	Judith	23,031,180	4%	Judith	41.97	Eulalie	2.69
Aurélie	891,131	2%	Eulalie	7.46	Eulalie	14,502,960	2%	Simone	41.81	Gilberte	3.06
Judith	804,161	2%	Beatrice	7.32	Aurélie	11,961,900	2%	Eulalie	41.68	Matilde	3.14
Bridget	396,146	1%	Aurélie	7.30	Bridget	10,035,540	2%	Bridget	41.31	Aurélie	3.20
Total	36,367,236	100%			Total	609,673,005	100%				

Figures 6-12 and **6-13** show the tonnage grade resource distributions for Danielle and Simone. The volumetric distributions of the Indicated and Inferred Resource volumes based on the standard errors, shown previously in **Tables 6-7**, and **6-8** should be considered when interpreting the cumulative grade-tonnage data.

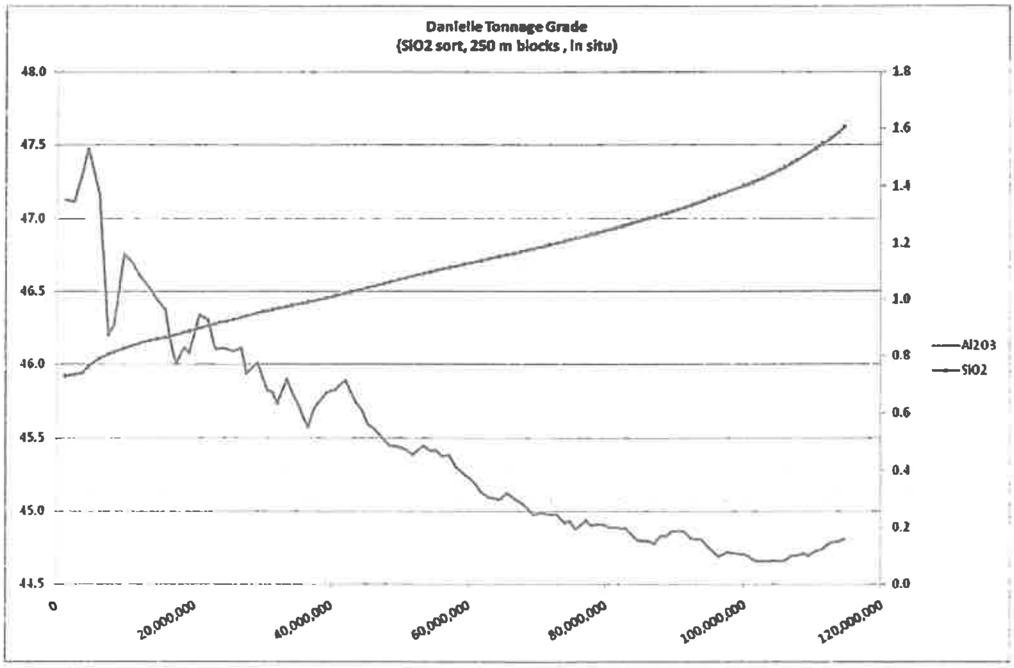


Figure 6-12: Cumulative block model grade tonnage curve for Danielle Plateau

Note: x axis is tonnage, left axis is total XRF alumina, right axis is total XRF silica, based on silica sort

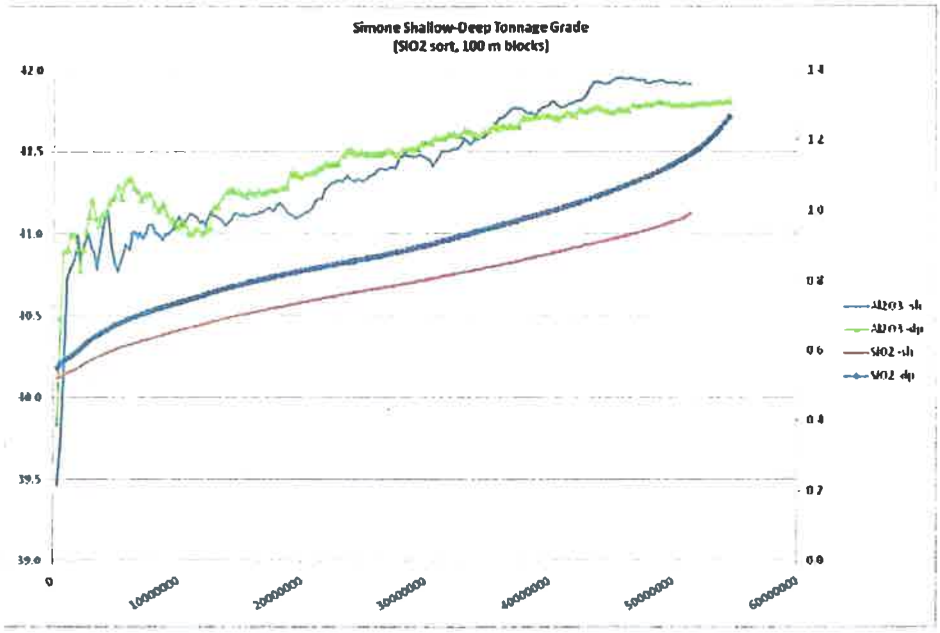


Figure 6-13: Block grade tonnage curves for Simone deep (dp) and Simone shallow (sh) cumulative block models. **Note: x axis is tonnage, left axis is total XRF alumina, right axis is total XRF silica, silica sorts**

6.11 Indicative Product Bauxite Product Specifications

The practical consideration is that the start-up mining operation needs to be constrained to a manageable area. The start-up operation currently identified comprises Danielle bauxite blended with Simone bauxite.

A high grade component of any resource represents a selected part of the total and it can vary within the practical limits of the grade-tonnage curve. The entire grade tonnage curve represents a single grade product comprising the entire geological resource. Smaller tonnages at higher grades or larger tonnages at lower grades or indeed several program product grade steps may be the eventual outcome targeted depending on economics or the size and type of the eventual project implemented. Two block grade plots (**Figs. 6-14 and 6-15**) illustrate some of the cut-off options available with the current limited data. Much better estimates will be needed to maximise the value of the resource but it is considered the current data is sufficient to define the problems and identify the requirements to implement the further work.

The bauxite is unsuited to be utilised as traded bauxite. The low alumina character means there is little capacity to support high transport costs to the coast.

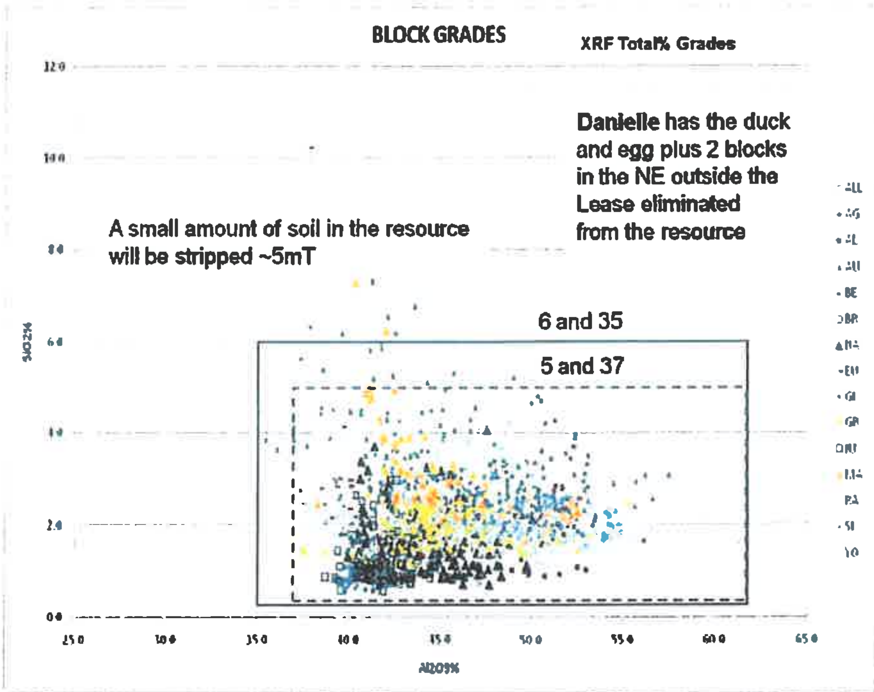


Figure 6-14: Block Grade silica versus alumina plot (XRF total grades) illustrating some potential cutoffs that could be applied to the Minim Martap-Ngaoundal bauxite deposit

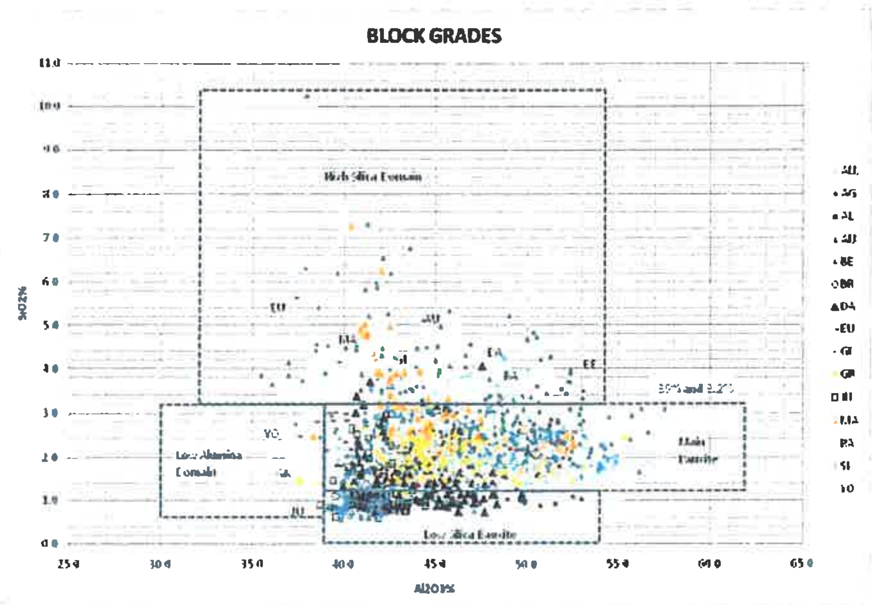


Figure 6-15: Block Grade silica versus alumina (XRF total grades) plot illustrating the character domains of the Minim Martap-Ngaoundal bauxite deposit based on a simple block model derived for all the resource data

7 Requirements for Conversion of Inferred/Indicated Resources to Measured Resources and Reserves and Additional Potential Resources

7.1 Drilling Required

A conceptual infill drilling program shown in the following table will provide the necessary data to upgrade the resource categories and allow detailed mine planning (**Table 7-1**).

Table 7-1: Conceptual drilling program required to provide the detailed information for Measured Resources and Reserves in the Minim Martap–Ngaoundal Project. Note: the indicated resource represents fill in of the existing auger 250m x 1000 m drilling

Air core coverage				Air core coverage				Air core coverage			
Measured Reserve				Measured Resources				Indicated Resources			
Initial Production	3	yrs		10 year Plan	10	yrs		25 year Plan	25	yrs	
Drill Space m	50		50	Drill Space m	50		100	Drill Space m	250		500
Thick m	10			Thick m	10			Thick m	10		
Density	2			Density	2			Density	2		
Tonnage	50000	T		Tonnage	100000	T		Tonnage	2500000	T	
t/annum	10000000		10 mT	t/annum	10000000		10 mT	t/annum	10000000		10 mT
Drill Holes/a	200			Drill Holes/a	100			Drill Holes/a	4		
Total Holes	600			Total Holes	1000			Total Holes	100		
Tonnage	30	mT		Tonnage	100	mT		Tonnage	250	mT	
Reconnaissance Drilling											
Plateaux	10										
Holes/plateau	40										
Total Holes	400										

According to the JORC (2004) guidelines, the requirements to convert indicated and measured resources to probable reserves relate to consideration of the mining, metallurgical, economic, marketing, legal, environmental, social and governmental modifying factors.

The above factors, along with digest sample testing to derive a first pass understanding of the process character of the bauxite have all helped to demonstrate the value of the Minim Martap-Ngaoundal bauxite.

7.2 Mining Lease Recommendations

The areas currently covered by the Minim Martap and Ngaoundal leases are very different in character. The Ngaoundal lease has abundant area where no bauxite is present. Minim Martap actually misses a few small areas of bauxite that occur outside the current exploration lease. Overall however, in both cases the leases capture the all of the resource that can be considered economic.

Figure 7.1 presents a relinquishment suggestion that excludes the areas that are almost certain to contain no economic bauxite, and an as such represents the maximum area that can be safely relinquished while retaining a simple polygonal shape. The bauxite areas are highlighted on the figure. Further relinquishments could be achieved but retention of the maximum area possible is essential for long term viability and cost minimisation.

Table 7-2 presents the statistics for the proposed relinquishments.

Table7-3 presents the boundary points for the suggested retained areas.

Figure 7-1: Suggested possible relinquishments to achieve mining leases for Minim Martap and Ngaoundal (known and potential bauxite areas highlighted)

Table 7-2: Comparison between the old exploration leases and the proposed new mining leases

Plateau Area (km2)	Old	New	Difference	% of original area
Ngoundal	415.72	37.47	378.25	9.01%
MM	996.9	838.08	158.82	84.07%

Table 7-3: Proposed Mine Leases (Decimal Degrees, UTM and Latitudes and Longitudes)

REGION	ET_X	ET_Y	UTM_Y	UTM_X	LONG	LAT
NGAOUNDAL	13.21904	6.47981	716590	303050	13° 13' 8.536" E	6° 28' 47.322" N
NGAOUNDAL	13.25836	6.46788	715255	307395	13° 15' 30.086" E	6° 28' 4.357" N
NGAOUNDAL	13.24858	6.43258	711355	306300	13° 14' 54.888" E	6° 25' 57.287" N
NGAOUNDAL	13.28039	6.40823	708650	309810	13° 16' 49.402" E	6° 24' 29.623" N
NGAOUNDAL	13.25274	6.40506	708310	306750	13° 15' 9.869" E	6° 24' 18.219" N
NGAOUNDAL	13.21784	6.42135	710125	302895	13° 13' 4.227" E	6° 25' 16.867" N
NGAOUNDAL	13.19871	6.46500	714960	300795	13° 11' 55.340" E	6° 27' 54.007" N
MINIM-MARTAP	12.82822	6.94343	768045	260040	12° 49' 41.601" E	6° 56' 36.340" N
MINIM-MARTAP	12.88289	6.97880	771930	266100	12° 52' 58.388" E	6° 58' 43.663" N
MINIM-MARTAP	12.99829	6.97885	771880	278855	12° 59' 53.838" E	6° 58' 43.850" N
MINIM-MARTAP	12.99825	6.87013	759855	278800	12° 59' 53.697" E	6° 52' 12.482" N
MINIM-MARTAP	13.09223	6.82324	754626	289168	13° 5' 32.014" E	6° 49' 23.677" N
MINIM-MARTAP	13.08701	6.78655	750570	288575	13° 5' 13.227" E	6° 47' 11.579" N
MINIM-MARTAP	13.06904	6.76740	748460	286580	13° 4' 8.542" E	6° 46' 2.647" N
MINIM-MARTAP	13.05903	6.66769	737435	285430	13° 3' 32.522" E	6° 40' 3.667" N
MINIM-MARTAP	12.95115	6.67037	737780	273500	12° 57' 4.139" E	6° 40' 13.325" N
MINIM-MARTAP	12.93261	6.66111	736765	271445	12° 55' 57.386" E	6° 39' 40.013" N
MINIM-MARTAP	12.86575	6.66124	736810	264050	12° 51' 56.683" E	6° 39' 40.453" N
MINIM-MARTAP	12.79164	6.80360	752595	255925	12° 47' 29.915" E	6° 48' 12.958" N
MINIM-MARTAP	12.79156	6.87008	759950	255950	12° 47' 29.629" E	6° 52' 12.304" N
MINIM-MARTAP	12.82819	6.87052	759980	260000	12° 49' 41.496" E	6° 52' 13.883" N

7.3 Additional Resources Available to the Project

Apart from the known resources, the southern Minim Martap Plateaux offer some scope for additional bauxite. The only plateau sampled as part of the 2009 exploration was Josephine. The results were disappointing due to the very poor grades.

Table 7-4: Results of the Josephine Plateau bauxite exploration sampling

LAB NO.	Sample			SiO2	Al2O3	Fe2O3	TiO2	LOI1000
270	JO/0001-1	JO/0001	1	10.65	42.95	18.72	2.24	23.37
271	JO/0001-2	JO/0001	2	10.96	39.64	23.97	2.49	22.30
272	JO/0001-3	JO/0001	3	20.40	37.82	18.19	1.58	20.40
273	JO/0001-4	JO/0001	4	14.22	41.93	20.38	0.86	22.44
274	JO/0001-5	JO/0001	5	30.79	41.61	5.61	0.72	19.62
275	JO/0001-6	JO/0001	6	37.84	37.20	5.48	0.78	16.74

It is possible that there was sufficient work done at the time of BRGM to allow the best selection of the plateaux explored by drilling. But certainly BRGM did not check all the plateau areas.

Satellite image mapping has enabled the definition of about 659 plateau areas but many are very small. Even if the bauxite is thick and of suitable grade there is unlikely to be more than about a couple of hundred million tonnes of additional resources.

The named plateaux are presented in **Appendix 8. Figure 7-2** illustrates the areas of the various plateaux within the leases. Further work is needed to define the exploration potential by grouping smaller areas and determining the aggregated potential of many of the smaller close packed plateaux.

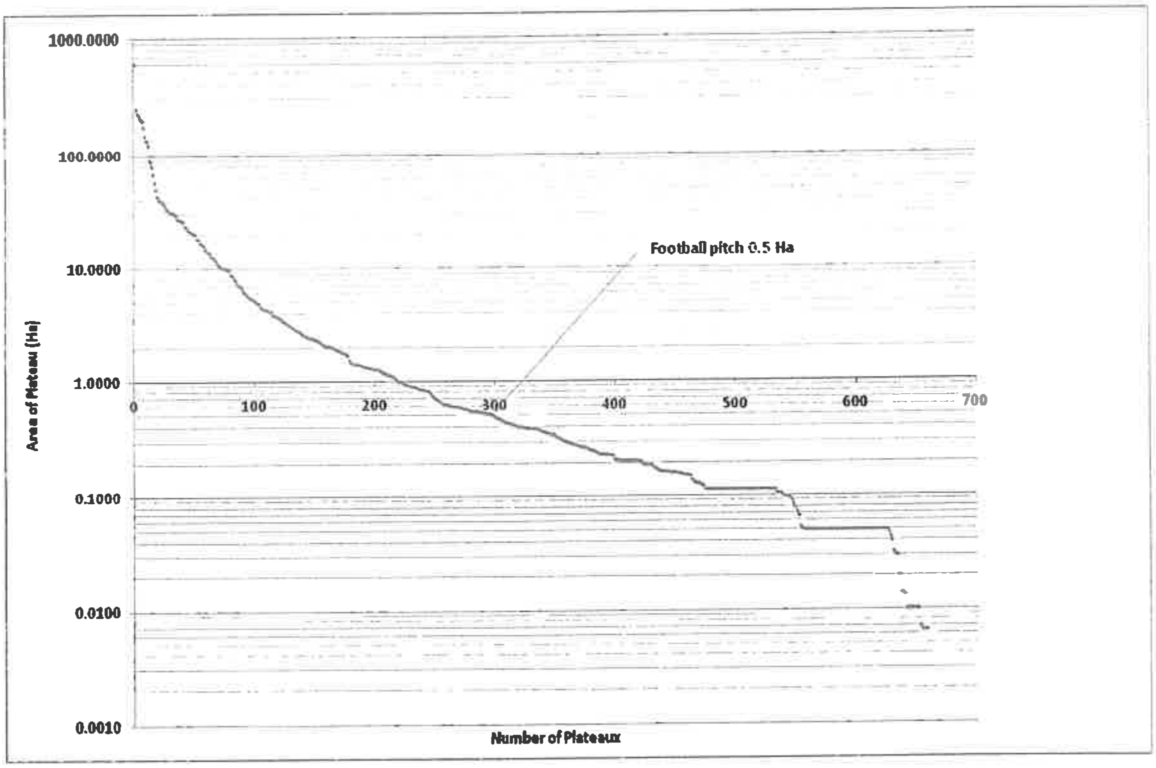


Figure 7-2: Individual plateau area sort for the 659 plateaux areas currently defined

During the 2009 exploration program the Flore Plateau was surveyed but drilling could not be conducted due to the arrival of the wet season.

8 Summary Check List

A concise list of the attributes addressed in the Minim Martap-Ngaoundal bauxite resource statement covering the Cameroon Alumina Limited leases in the Republic of Cameroon is presented in **Table 8.1.**

Table 8.1: Check list for JORC compliance

Geological interpretation	Drilling data comprises samples taken at one metre intervals and analysed by XRF for SiO_2, Al_2O_3, CaO, Fe_2O_3, K_2O, P_2O_5, TiO_2, MnO, ZrO_2, V_2O_5, LOI 1000 at BRDC and SiO_2, Al_2O_3, CaO, Fe_2O_3, K_2O, MgO, P_2O_5, TiO_2, MnO, Cr_2O_3, LOI 1000 at the Stewart lab. Checks of auger samples against core data show good correlation and no significant bias. Regular spaced sampling across the bauxite plateaus demonstrated good continuity of the bauxite thickness but significant grade variability.
Estimation and modelling techniques	Current estimations are based on polygonal block models (100 and 250 m) with an overview check derived from area and average thickness. The key assumption is the lateral continuity of the bauxite and floor. The continuity was confirmed with 20 close spaced (50 m) drill holes and 3 core holes were drilled on each plateau to confirm the visual levels and check the open hole data. Geostatistical analysis of the plateaux enabled the grade range to be assessed and the result was found to be very similar to the results described by BRGM. Historical data from BRGM bauxite was not used for bulk density or moisture as the results of the test work showed a significant difference. Reactive silica and available alumina were measured for drill hole composites compiled from the metre chemical analyses. A regression analysis was then used to determine the relationship between the chemical and reactive/available analyses. ABEA extraction temperature of 145°C and an MEA extraction temperature of 235°C were used. Checks of this work are currently in progress.
Cut-off grades or parameters	The basis of the cut-off grade(s) and quality parameters for bauxite are complex as the commodity value depends upon many factors. The total chemical cut-offs applied to the vertical profile were based on several ranges. Overall total silica was targeted at <3% and total alumina >30%. For high alumina plateaux, total silica <5% was used when the total alumina was >50%. These cutoff values align with the natural character of the bauxite profiles on the plateaux included in this resource assessment such that the bauxite layer of the profile is widely developed on each plateau reported to contain a resource. The non uniform grade profiles mean there was significant capacity to improve the resource grade by selective mining. A final block model cutoff could be used to determine and plan extraction of a high grade component of the resource.
Mining factors or assumptions	Bauxite mining in the Minim Martap and Ngaoundal leases is assumed to be a truck and shovel operation. Removal of the thin overburden will likely be done by bulldozer. Pit development will enable working faces to incorporate a range of grade estimates helping to ensure stable ROM production. Pit size and blending will depend on close spaced drilling. Overburden and floor dilution should be minimal as the cores and open hole log descriptions to date have demonstrated good visual control will be possible. Mining factors have been applied to the current resources. Bulk sampling and reconciliation of a trial pit during the pre-mine development are viewed as the next steps to address these issues.
Metallurgical factors or assumptions	Based on the detailed chemical analyses, reactive silica and available alumina data it is possible to assess the metallurgical amenability. No particular problems are envisaged. Although TOC has not yet been assessed (test work still underway) this is known to generally not be a problem and this is assumed to be the case for the bauxite resource described herein.

Tonnage factors (in situ bulk densities)	The in situ bulk density was measured at average 1.8 t/m^3 and this value has been used across the deposit. The resource assessment is based on one metre samples of vertical drill holes typically 10 to maximum 60 m deep. The samples were riffle or rotary split and rigorously treated to ensure representativeness of the final 100 g sample submitted for analysis. Because the bauxite will be utilized raw and not beneficiated only small representative duplicates have been retained. All cores were split and half core samples have been stored for future reference
Classification	The main basis for the classification of the Mineral Resources into varying confidence categories is the drill hole spacing and geostatistical study. Inferred resources are typically described from the 250 x 500 m drilling and indicated resources from 125 x 250 m spacing. Appropriate account has been taken of all relevant factors, i.e. relative confidence in tonnage/grade computations, confidence in continuity of geology and metal values, quality, quantity and distribution of the data. The result appropriately reflects the Competent Persons view of the deposit.
Audits or reviews	The results of the drilling program and the estimated resources have been peer reviewed and checked to the maximum extent possible in the timeframe available.

9 Conclusions

The work on the Minim Martap Ngaoundal Project and the resource modelling are now sufficiently advanced to consider the resources to have reached inferred status at Minim Martap and indicated status at Ngaoundal.

The factors that allow classification of inferred and indicated ore resources all appear satisfied by the evaluation work. Each of the modifying factors has been considered and the deposit now appears to satisfy all the requirements necessary for inferred and indicated resources.

Exploration was undertaken by several drilling techniques that have each been checked and are considered to have provided reliable samples. At Ngaoundal, clean sampling and good depth control was achieved and the drill spacing was closed to approximately 125 (cross) x 250 (long) with 125 m along the Simone long axis baseline. At Minim Martap, the sampling was checked and the depth control and plateau definition, in conjunction with the 500 m base lines and 1 km spaced cross lines at 250 m are considered appropriate for inferred resources. On each plateau, close spaced drilling defined the local variability and the level observed is considered manageable.

As a general comment, it is clear that additional vertical profile work plus better understanding of the plateau edge grade variations is needed to improve the resource definition and enable detailed scheduling.

The indicated resources available to the Minim Martap-Ngaoundal bauxite project comprise 88 mT at 1.3% total SiO_2 and 41.8% total Al_2O_3.

The inferred resources available to the Minim Martap-Ngaoundal bauxite project comprise 466 mT at 2.2% total SiO_2 and 46.2% total Al_2O_3.

Closer spaced drilling to define measured resources will enable extraction of different grade blocks and improve the project start-up economics at the expense of tonnage.

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Appendices

SRK Report Distribution Record

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