THE ACID MINE DRAINAGE POTENTIAL OF THE PLATREEF, NORTHERN LIMB OF THE BUSHVELD COMPLEX, SOUTH AFRICA

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A dissertation submitted to the Faculty of Science, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Science

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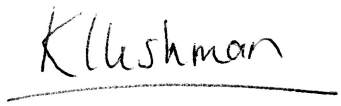
DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the Degree of Master of Science in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



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ABSTRACT

The Acid Mine Drainage (AMD) potential of rocks at an exploration project on the Platreef in the Northern Limb of the Bushveld Complex has been investigated. The Platreef Project, at an advanced stage of exploration, is located north of Mokopane in the Limpopo Province of South Africa. A total of 242 samples were selected from borehole core and 11 tailings samples were obtained from Mintek Laboratory. Quality control samples were inserted and all the rock samples were dispatched for whole rock geochemistry and static Acid Base Accounting (ABA) analysis. Once the static ABA results were received, a sub-set of 20 samples was selected for kinetic test analysis. Of the tailings samples, three were sent for whole rock geochemistry analysis, six for static ABA analysis and five for kinetic test analysis.

Using criteria developed within the context of coal mining in South Africa and based on international criteria, the static ABA results were used to classify the rocks according to acid producing potential. These results revealed that high risk acid producing (Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles, Feldspathic Pyroxenite, Hornfels and Marginal Zone Norite) and low risk acid producing rock-types (Pyroxenite, Dolerite, Quartz Feldspar, Aplite) may be mined at the Platreef site. The kinetic test and whole rock geochemistry results provided further insight into the acid producing potential of the rock types and revealed that Gabbro-Norite and Dolomite (altered to Calcsilicate Hornfels) have the potential to generate acid despite being classified as non-acid generating/potentially acid neutralizing. The tailings results proved contradictory and this is thought to be due to non-representative sampling. It is recommended that a new suite of representative tailings samples be generated and sent for static ABA and kinetic test analysis once the metallurgical treatment process has been finalised. Future work should be directed to better understand the merits and downfalls of the different analytical methods used to quantify AMD in order to better interpret contradictory results.

This laboratory based analysis of AMD potential provides a “worse case scenario” of the rock types to be mined. Weighted volume calculations of the mean sulphur content and the mean Net Neutralising Potential (Closed) of material to be mined initially on Turfspruit indicate that it is unlikely that AMD will be generated from the tailings dams or waste rock piles generated from mining in this region. This study has shown, however, that AMD could result if high risk acid producing Platreef material is stockpiled at the site prior to treatment for extended periods of time. Local zones of potentially acid-producing material may occur within rock volumes dumped over the Life of Mine (Marginal Zone Norite, Hornfels, Gabbro-Norite, and Dolomite) or exposed in the pit floor (Marginal Zone Norite, Hornfels, Dolomite), and these should be managed carefully to ensure that AMD does not result. The Quartzite samples produced contradictory results during this study and, as this rock type occurs in the Footwall to the Platreef, it is recommended that further Quartzite samples be sent for static ABA and kinetic test analyses. This study has identified the potential AMD risks facing the future mine at the Platreef Project and will enable the mine management to minimize these risks during the mine design phase. These results should fit into a larger framework of objectives and on-site conditions with time in order to effectively manage AMD risk over the Life of Mine.

To my Heavenly Father
Jesus Christ
and to
My Support Team:
Ryan Lishman, Alan Buckley and Beverley Buckley

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DISCLAIMER

The author of this Dissertation is not, and has never been, employed by Ivanhoe Nickel & Platinum Ltd and this document was created independently of the company. Ivanhoe Nickel and Platinum Ltd's involvement was limited to an informal edit of the final draft of the Dissertation.

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1. INTRODUCTION

Acid Mine Drainage (AMD) has been identified as a critical environmental problem facing the modern global mining industry. AMD occurs when mining activity causes the large scale exposure of waste rock (in the form of stockpiles or tailings dams) to oxygenated water which causes oxidation of the included sulphides to form sulphuric acid. The acidic water that results from AMD enters the local waterways surrounding the mine including streams, lakes, rivers and groundwater. AMD effectively sterilizes these waterways as it generates poor quality water that cannot be used by man and destroys aquatic life. The long term effects of AMD are devastating as acid will continue to leach from the exposed rocks until all the sulphides have been oxidized, a process that could take hundreds or thousands of years.

The rate of AMD generation is accelerated by a naturally occurring bacterium *Thiobacillus ferrooxidans* (also known as *Acidithiobacillus ferrooxidans*). This bacterium acts as a catalyst for the oxidation of sulphides and is ideally adapted to mine wastes as it can survive in water with a pH range of 1.5 to 6, but experiences optimal growth between pH 2 to 2.5 (Blowes *et al.*, 2003)**.** Metal leaching from the exposed rocks also occurs at a faster rate when exposed to the acidic waters generated by AMD. The dissolved metals are transported in solution to the waterways surrounding the mine where they are absorbed and concentrated by animals and plants. Once these metals have been absorbed into organic tissues and enter the food chain, metal poisoning may result in humans and animals.

Not only are the long term negative effects of AMD costly to the environment, but also to the mining industry: In 1989, Robert Kleinman, a researcher at the U.S. Bureau of Mines, stated that the US industry spends in excess of $1 million per day treating acidic mine water. In 1995, it was estimated that AMD in the US had polluted 180 000 acres of reservoirs and lakes as well as 12 000 miles of streams and rivers (Kleinman, 1989). The calculated cost for the rehabilitation of these waterways was estimated at $32 billion and $72 billion, respectively (Speart, 1995).

This tragic environmental and economic legacy of AMD related to mining has highlighted the need to predict AMD at exploration sites prior to the commencement of mining so that the necessary environmental management measures can be taken to protect local waterways over the LoM and into the future.

1.1. Previous Work

1.1.1. Acid Mine Drainage in South Africa

1.1.1.1. Acid Mine Drainage as a Result of Gold Mining

Hand in hand with South Africa's rich mining history, is an extensive legacy of AMD and its negative effects. The Witwatersrand region has been celebrated world-wide for its rich gold deposits which have been mined for over a century. The host rocks to the gold mineralization are conglomerate layers (approx 1-2m thick) consisting of quartz pebbles in a quartz sand matrix. Economic concentrations of gold occur in the matrix along with a variety of sulphide and oxide minerals. The most abundant sulphide mineral present is pyrite (FeS_2). The processes employed in the past to obtain gold from the host rock were highly selective, isolating and removing the gold from the ore and disposing of all other material to tailings dumps and slimes dams (Naicker *et al.*, 2003).

Recent research has shown that soils in the mining districts of the Witwatersrand region are contaminated with heavy metals and that the ground water within this mining

area is severely polluted and acidic as a result of AMD. The long term exposure of the tailings and slimes material to the atmosphere has allowed for the oxidation of the sulphide minerals, particularly pyrite (the most abundant sulphide) to form sulphuric acid which percolates through the dumps and tailings dams into the groundwater system. The surrounding waterways have been contaminated and the negative effects of AMD in the Witwatersrand region extend 10 km beyond the source (Naicker *et al.*, 2003).

Not only is AMD being generated from tailings and slimes material at surface in gold mining areas, but also from mined-out areas. Underground mining in the Witwatersrand goldfields commenced in 1886 and has penetrated to depths of up to 3500m. In order to mine, ground water has to be pumped out of the mining areas on an ongoing basis. Initially individual mines were responsible for their own pumping, but after the 1950s, certain mines closed down and the responsibility to dewater these areas was left to mines further downstream (Scott, 1995). This situation has resulted in dewatering being carried out by only a few remaining mines (Pulles *et al.,* 1995). Inevitably, the gold deposits will be worked out and all the mines will close. Since, backfilled rock piles and soil heaps in stopes underground contain pyrite, once dewatering ceases, the water table will recover and AMD will result (Scott, 1995).

There is evidence that reduced dewatering underground is already allowing the water table to recover in certain areas. In August 2002, the first incident of decanting of acid mine drainiage was recorded near Krugersdorp on the West Rand. This water flowed to surface via a borehole on Harmony Gold Mine (Pty) Ltd (Randfontein Operations). The polluted water rose to surface through a borehole upstream of the Krugersdorp Game Reserve. Since August 2002, a number of animal deaths (including aquatic life and mammals) have occurred in the Krugersdorp Game Reserve (Mail & Guardian Article, 12 April 2005). There is also concern that further decanting from abandoned mines has started to enter the Tweelopiespruit which runs into the Sterkfontein groundwater system. As the Sterkfontein caves are hosted by dolomite, acidic waters represent a threat to the fragile cave formations in the Cradle of Humankind World Heritage Site. Local farmers also utilize the water from the Tweelopiespruit for irrigation and drinking (Independent Online Article, 14 April 2005).

In an attempt to minimize the AMD when mining stops, various studies have been initiated, including an investigation into the predicted impacts of flooding previously dewatered mines (Scott, 1995) and the development of appropriate management procedures for the closure of underground gold mines (Pulles *et al.*, 2005). However, the prediction of AMD is very difficult owing to the variability of discharge from adits, the effects of stormwater runoff from the mines after heavy rainfall events and the characteristics of the catchment discharge which affects dilution (Gray, 1997). In addition, it is very difficult to trace all potential sources of AMD and often the resultant water degradation is diffuse with no single obvious source (Scott, 1995).

1.1.1.2. Acid Mine Drainage as a Result of Coal Mining

Coal mining activities commenced more than 100 years ago in South Africa (Hodgson *et al.*, 2007). Today South Africa is the sixth largest global coal producer with proven coal reserves measured in 19 coal fields, of which nine are currently producing. Seventy percent of recoverable reserves occur in three of the coal fields, namely, the Highveld, Waterberg and Witbank coal fields (Energy Information Administration, 2007). Coal deposits in South Africa typically consist of shales, mudstones, siltstones and sandstones which host coal containing clay minerals, quartz, carbonates, sulphides, quartz and glauconite. The most abundant sulphide mineral is pyrite (Geldenhuis and Bell, 1998).

The water quality in streams north of the Witbank Coalfield has deteriorated pointing to AMD generation at several operating and abandoned mines in the vicinity. An investigation at one such mine, The Loubert Coal Mine, revealed that AMD was being generated from old opencast backfilled workings (Geldenhuis and Bell, 1998). Recently widespread concern has been voiced over the water quality degradation observed at Loskop Dam, near Witbank (Sunday Independent Article, 10 February 2008). This problem is a direct result of AMD generated from abandoned coal mines in the Witbank coal field (*pers comm.* McCarthy, 2008). Growing awareness and concern of the impacts of AMD to the local waterways in the Witbank region has led to a desire to develop a strategy between all the mines to manage the AMD problem (Geldenhuis and Bell, 1998) and to several studies at the relevant mines.

One such study investigated the mineralogy of the Witbank and Highveld coalfields and attempted to relate the mineralogy with the acid producing potential of these different materials. The correlation between the XRF results and the acid-base data suggests that it should be possible to use mineralogical data to predict the acid producing potential of the coal (Pinetown *et al.*, 2007). This could prove to be a very useful tool in managing AMD in the Witbank and Highveld coal fields in the future.

Another study was carried out by Hodgson *et al.* (2007) in order to assist existing coal mines manage ground water effectively. This study aimed at addressing past shortfalls in mine planning and environmental management which gave rise to the current AMD problems in order to prepare current mines for closure in the future (Hodgson *et al.*, 2007). The hope is that, after the management practices recommended in the study are enforced, many more coal mines will be able to move towards legal closure minimizing AMD risk in the future.

In both gold and coal mining areas pyrite is the most abundant sulphide present in the host rocks and AMD has been generated as described in the overall equation for pyrite oxidation (Blowes *et al.*, 2003) below:

$$FeS_2(S) + 15/4O_{2(aq)} + 7/2H_2O_{(aq)} \rightarrow 2SO_4^{2-} + Fe(OH)_{3(s)} + 4H^+_{(aq)}$$

Extensive mining for gold and coal in South Africa has generated AMD that has drained into the surrounding waterways and now presents each of these industries with serious environmental problem that is going to require time, effort and finances to correct.

1.1.2. Acid Mine Drainage as a Result of Mining Magmatic Sulphide Deposits World-Wide

Magmatic sulphide deposits often occur in clusters creating extensive mining districts such as the Sudbury District in Canada. The historic working of these deposits or districts has resulted in extensive AMD and sites of severe environmental degradation.

An example of such a site is the decommissioned Nickel Rim Ni-Cu Mine near Sudbury, Ontario. Tailings deposition occurred from 1953 to 1958 at the Nickel Rim Ni-Cu mine. Since then, the water table has dropped 1 m, exposing the shallow tailings material (predominantly pyrrhotite) to increased oxidation. An investigation into the water quality showed that the tailings had generated acidic water with high concentrations of dissolved metals and SO_4^{2-}(Johnson *et al.*, 2000).

The well-known Sudbury District required rigorous environmental rehabilitation measures to improve the environment. Less famous sites exposed to environmental damage by AMD are the Noril'sk District in Russia (Foose *et al.*, 1995) and the Selebi Phikwe Ni-Cu Mine in Botswana (Ekosse *et al.*, 2004).

The sulphide ore mineralogy of magmatic sulphide deposits is characterized by pyrrhotite, pentlandite and chalcopyrite, which differs from the pyrite-dominated sulphide ore mineralogy of gold and coal mines (Foose *et al.*, 1995).

Although pyrite oxidation has been studied in depth, less attention has been focused on pyrrhotite oxidation in the past. After pyrite, pyrrhotite is the next most abundant iron sulphide in nature. A better understanding of pyrrhotite oxidation is therefore required to manage AMD from iron sulphides in mine wastes (Belzile *et al.*, 2004). Pyrrhotite has a less ordered structure than pyrite showing variations in chemical stoichiometry. Nonstoichiometric and stoichiometric compositions exist in which x in the formula $Fe_{(1-x)}S$ can vary from 0.125 (Fe_7S_8) to 0 (FeS) (Blowes *et al.*, 2003).

Acid is produced during pyrrhotite oxidation as shown in the series of reactions below (Belzile *et al.*, 2004):

$$Fe_{1-x}S + (2 - (1/2)x)O_2 + xH_2O \rightarrow (1-x)Fe^{2+} + SO4^{2-} + 2xH^+ \quad \text{.....(1)}$$

The ferrous iron is then oxidized to form ferric ions:

$$Fe^{2+} + 1/4O_2 + 2H^+ \rightarrow Fe^{3+} + 1/2H_2O \quad \text{.....(2)}$$

The ferric ions may then precipitate out of solution as ferric hydroxide (provided that the pH is not too low):

$$Fe^{3+} + 3H_2O \rightarrow Fe(OH)_{3(s)} + 3H^+ \quad \text{.....(3)}$$

Ferric iron acts as an oxidant for pyrrhotite, causing more acid generation:

$$Fe_{1-x}S + (8-2x)Fe^{3+} + 4H_2O \rightarrow (9-3x)Fe^{2+} + SO4^{2-} + 8H^+ \quad \text{.....(4)}$$

Under acidic conditions, large quantities of Fe^{3+} will remain in solution and act as an oxidant as shown in reaction (4), maintaining a cyclic reaction.

The bacterium *T. ferrooxidans* is also known to catalyse the oxidation of pyrrhotite and is a more effective oxidizing agent of pyrrhotite than of pyrite (Pinka, 1991 in Belzile *et al.*, 2004). It has been estimated that almost half the pyrrhotite oxidation activity noted on the uncovered tailings near Selebi-Phikwe was biologically catalyzed (Kock and Schippers, 2006).

Chalcopyrite ($CuFeS_2$) and pentlandite $(Fe,Ni)_9S_8$ are often associated with pyrite and pyrrhotite, but very little information is available regarding the oxidation reaction of these sulphides. Further research should be directed to understanding the oxidation of pyrrhotite, chalcopyrite and pentlandite as these three sulphide minerals have been identified as the principal acid-generating phases in magmatic sulphide deposits (Foose *et al.*, 1995).

1.1.2.1. Acid Mine Drainage as a Result of Mining in the Bushveld Complex, South Africa

The Bushveld Complex (BC) is the largest layered intrusion in the world covering an area of approximately 65 000 km^2 and varying in thickness from 7-9 km (Eales and Cawthorn, 1996). This extensive orebody hosts a wealth of valuable commodities including platinum group element (PGE) minerals, chromium, vanadium and refractory

minerals (McCarthy and Rubidge, 2005). The steadily increasing platinum price in recent years has fuelled further interest in the wealthy platinum deposits of the BC and today the BC is the site of intense mining and exploration activity.

The majority of mines on the BC are concentrated on the western and eastern limbs where the economic Merensky Reef and UG2 are being exploited. However, recent exploration efforts have focused on the northern and eastern limbs of the BC (Mbendi, 2008). The Platreef is the PGE-bearing reef of the northern limb (Sharman-Harris *et al.*, 2005) and has been the site of platinum prospecting and mining since the 1920s (Buchanan, 1988). Kinnaird *et al.* (2005) describe the Platreef as "a world-class magmatic-type nickel, copper and PGE mineral deposit hosted by a feldspathic pyroxenite-norite succession in the Bushveld Complex." The most prolific base metal sulphides in the Platreef, in order of decreasing abundance are: pyrrhotite, pentlandite, chalcopyrite and minor pyrite.

Acid Mine Drainage research in South Africa has historically focused on the gold and coal mining industries and no previous work has been carried out to investigate (or predict) the AMD potential of mined Bushveld rocks. The common perception is that mines in the BC will not generate AMD. This perception is supported by Foose *et al.* (1995) who state that "Platinum-group-element-rich deposits in large, layered intrusions tend to have low sulphide mineral abundances (1 to 5 weight percent) and low total-metal abundances. Consequently, they have a relatively restricted capacity to generate significant amounts of acidic and (or) metal enriched drainage. Most of the other economically extractable magmatic-sulfide deposits contain substantial amounts of sulphide minerals (most greater than 15 weight percent, many exceeding 40 weight percent) and large metal abundances. They have significantly greater potential for generating acid and (or) metal-enriched drainage."

Although the Platreef deposits are fundamentally low-sulphide deposits, and as such do not warrant a direct comparison with high-sulphide magmatic deposits such as Sudbury and Noril'sk, the recent surge of exploration and mining activity in the Platreef of the BC highlights the need for investigation into the AMD generating potential of these rocks.

1.2. The Site

The Platreef Project, located just north of Mokopane in the Limpopo Province of South Africa, was formed to explore the PGE, Ni and Cu potential of part of the Northern Limb of the BC. The Project site comprises the three farms, namely: Macalacaskop 243KR; Turfspruit 241 KR and Rietspruit 2KS (Figure 1).

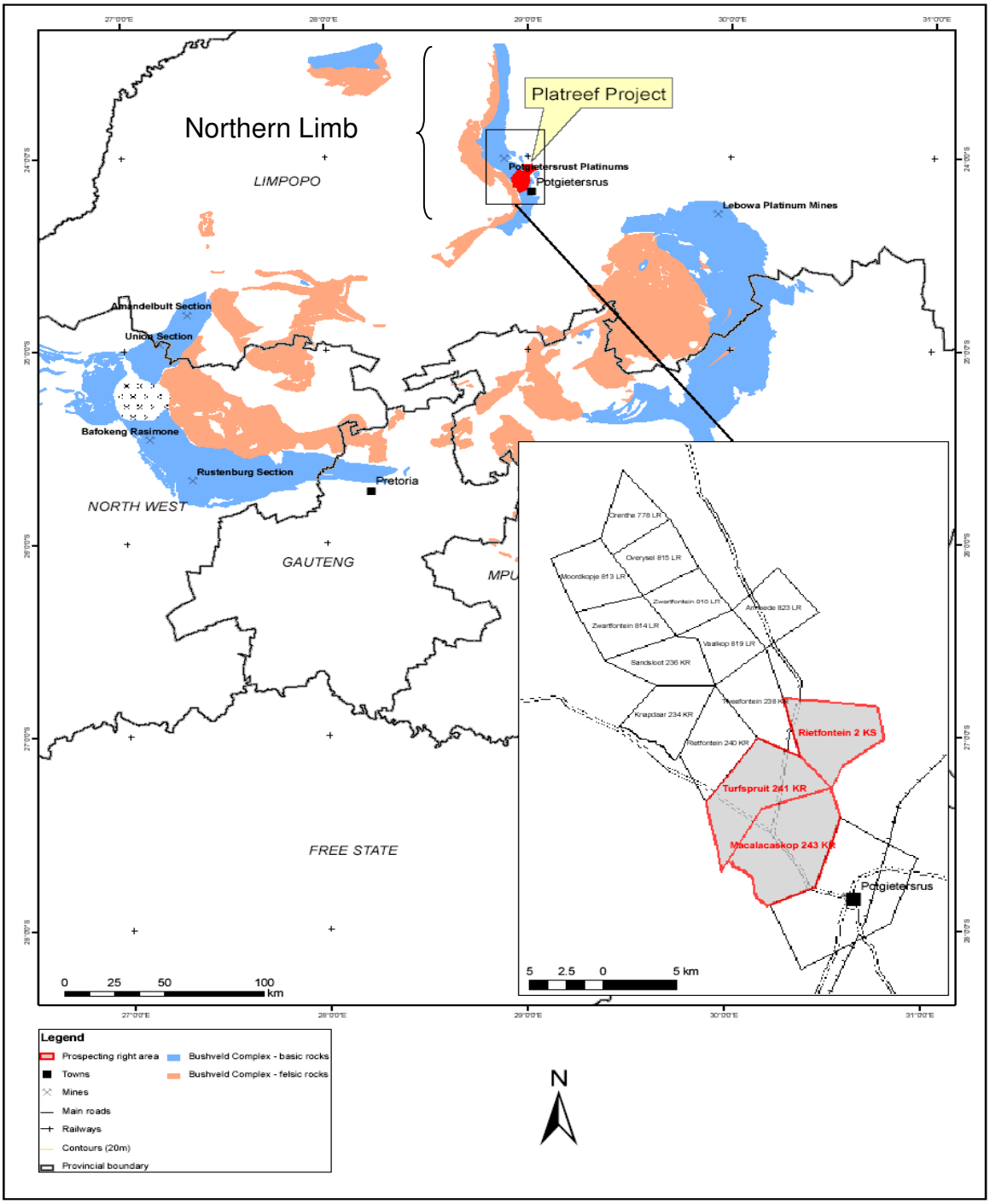

Figure 1: Location map for the Platreef Project showing the farms within the project boundaries (after White, 1994).

At the time this study was initiated, the exploration company was involved in an extensive diamond drilling programme. At that stage a large-scale open pit mine was being proposed with virtually no selective mining and a stripping ratio of 2:1 over the Life of Mine (LoM). The scale of mining was likely to be in the range of 50 000 to 120 000 tonnes per day and the LoM was expected to exceed 20 years. It was considered likely that large tonnages of waste rock would be stockpiled for extended periods of time.

2. AIM AND SCOPE OF THE STUDY

This study was conducted for a client during the author's employ with a geological consulting company. This study formed part of a broader environmental base-line study of the exploration site known as the Platreef Project detailing all matters relevant to the future management of the environment during mining. This component of the base-line study was requested in order to document the acid producing potential of all the rock types to be mined over the LoM in order to identify the rock types with the greatest potential to generate AMD so that the mining of these rock types could be carefully managed from an environmental perspective.

Owing to the project being at exploration stage, it was understood that this study would be predictive in nature and based on laboratory results. While it is acknowledged as sound environmental practice to conduct such a study, certain limitations to this approach need to be mentioned:

1) The grain sizes of the samples after preparation for analysis were far smaller than would be expected on a waste rock pile or tailings dam and therefore the surface area and oxidation rates were greater. Therefore, the laboratory results indicate a "worse case scenario" of the AMD potential of the rocks to be mined.

   As this study was to be used before mining commenced to highlight which rock types were of the most concern in terms of AMD, the "worse case scenario" was considered appropriate.

2) The time periods set aside for the laboratory analyses of the rock samples are insufficient for the real life simulation of the oxidation reactions which result in AMD, but are in accord with industrial norms.

   This is an unavoidable aspect of AMD laboratory analysis, therefore the client accepted that the results generated were the best results obtainable within realistic time frames.

3) As the project is at the exploration phase there are no waste rock piles or tailings dams present for sampling. As the tailings constitute a large portion of the material that will be exposed at surface over the LoM, it was unfortunate that this material was only available in limited amounts from preliminary metallurgical testwork and that the author did not have access to sampling this material.

   The client supplied 11 samples of Platreef material that had been sent for preliminary metallurgical bench-scale testing at Mintek Laboratory. It was understood that as the metallurgical treatment process of the Platreef ore was at conceptual phase only, the samples used were not representative of the average mill feed and could not be considered representative of the final tailings that will be produced after beneficiation.

3. METHODOLOGY

3.1. Geology, Mineralogy and Proposed Mining Method

A literature review of the geology of the Platreef was undertaken to provide a framework to the project. The geologists on site logged the cores and compiled a geological map of the project area. This map and the borehole logs were used to ensure that representative samples were selected for geochemical analysis.

The author has not carried out any geological or structural mapping, core logging or interpretation of the latter and has been reliant on the geological and structural information provided by the Platreef staff. No formal reports were available from the Platreef staff and information was largely provided by geologists from an electronic database of information or was gleaned from maps.

The author did not carry out an exhaustive quantitative mineralogical study, but noted the percentage sulphides and percentage feldspar present in each sample taken during sample selection.

Although a number of mining methods and plans were still under discussion at the time of undertaking this study, information was available on the most likely mine plan as well as the scale of mining and the expected LoM. From this generalized plan, it was possible to estimate the typical quantity of rock types to be dumped.

3.2. Geochemical Analysis

3.2.1. Sampling Procedure

3.2.1.1. Rock Core Samples

A total of 242 rock samples were collected from borehole cores over the period June to October 2003. A brief description of each sample was recorded including information pertaining to grain size, texture, percent feldspar and the presence of veins, faults, alteration and percent sulphides. The samples were bagged and labelled with marking pen on the bags and on aluminium tickets around the necks of the bags. Each sample batch was delivered for sample preparation at Set Point Laboratory (a commercial analytical facility) in Mokopane.

An attempt was made to ensure that samples were representative in respect of:

- the vertical stratigraphy to be mined.
- all the rock types to be mined over the LoM, and
- the entire region to be mined.

Table 1 summarizes sample representivity in terms of regional stratigraphy and rock types. For ease of reference and for practical reasons, abbreviations of the sampled lithologies have been used in the graphs presented in the Results Section.

Table 1: The number of samples and percentage samples of the total taken per rock type and stratigraphic unit.

Stratigraphy	Lithology	Abbreviation	Number of Samples	Percent of total samples
Hanging-wall	Gabbro-Norite	GN	42	17.35
	Mottled Anorthosite	MA	7	2.89
	Total		**49**	**20.24**
Platreef	Pegmatitic Gabbro-Norite	PGN	15	6.2
	Leuconorite	LN	9	3.72
	Melanorite	MN	22	9.09
	Norite Cycles	NC	21	8.68
	Pyroxenite	PX	16	6.61
	Feldspathic Pyroxenite	FPX	23	9.5
	Pegmatitic Feldspathic Pyroxenite	PFPX	11	4.54
	Serpentinite	SP	10	4.13
	Total		**127**	**52.47**
Footwall and Xenoliths	Marginal Zone Norite	MZN	9	3.72
	Hornfels	HF	25	10.33
	Dolomite	DM	11	4.55
	Quartzite	Q	5	2.07
I	**Total**		**50**	**20.67**
Intrusions	Dolerite Dykes or Sills	DO	5	2.07
	Quartz Feldspar Veins	QF	8	3.31
	Aplite Dykes	AP	3	1.24
	Total		**16**	**6.62**

The prospecting area was divided into four blocks from north to south and an effort was made to ensure that a range of samples was selected from each block. The positions of these blocks as well as the positions of the boreholes sampled are indicated on the map in Appendix 1. A summary of the sample descriptions recorded for each sample has been attached as Appendix 2.

After sample preparation was completed at Set Point Mokopane, quality control (QC) samples were inserted and all the samples were dispatched to Set Point Laboratory in Gauteng for whole rock geochemistry and to the Institute for Groundwater Studies (IGS) for static Acid Base Accounting (ABA) analysis. A sub-set of samples was also sent to the assigned referee laboratory, Ultra Trace Laboratories, in Perth. Once the static ABA results were received, a sub-set of 20 samples was selected for kinetic test analysis at IGS. Owing to the extensive duration of the kinetic test procedure (20 weeks), the cost of this analysis is high. For this reason, only a limited number of kinetic tests could be performed. The details of the samples selected for kinetic test analysis are included in Appendix 3.

Table 2 shows the number of geochemical as well as static ABA and kinetic analyses carried out per rock type.

Table 2: Summary of number of analyses performed per rock type

Rock Type	Estimated Tonnes ($x10^6$) for Processing	Estimated Tonnes ($x10^6$) To Dump	Geochemical Analyses	Static ABA Analyses	Kinetic Test Analyses
GN	68.8	2000	42	42	5
MA		19.1	7	7	
PGN	29.5		15	15	
LN	19.4		9	9	
MN	99.9		22	22	1
MZN	20.9		9	9	
NC	91.2		21	21	
PX	42.0		16	16	
FPX	259		23	23	1
PFPX	61.7		11	11	
SP	51		10	10	
HF	75.4		25	25	4
DM		39.2	11	11	2
Q		45.8	5	5	2
G		8.8	3	3	
DO		9.8	5	5	
QF	26.9		8	8	
Total	**850.3**	**2122.7**	**242**	**242**	**15**

3.2.1.2. Quality Control

Quality Control measures were implemented for both the Whole Rock Geochemistry and Static ABA Analyses and two reports were compiled detailing the accuracy and precision of the Whole Rock Geochemistry and Static ABA results, respectively. The Executive Summaries of these reports have been included in Appendix 4.

3.2.1.3. Summary of Determinands Analysed

A summary of the determinands and calculations performed by the laboratories during the Whole Rock Geochemistry (Set Point Laboratory), Static ABA and Kinetic tests (IGS Laboratory) has been included in Appendix 5.

3.2.1.4. Whole Rock Geochemistry

The majority of determinands in the whole rock geochemistry analysis were determined by X-Ray Fluorescence Spectrometry (XRF) as shown in Appendix 5. PGE analyses were not undertaken as part of this study.

3.2.1.5. Static Acid Base Accounting

Static Acid Base Accounting (ABA) is a screening tool used to determine the acid generating and acid neutralising properties of geological material. The balance of these two properties is termed the Net Neutralising Potential and is used to classify the rock types to be mined in terms of acid generation potential. Static ABA tests are “user-friendly” because they are quick, economical, employ simple analytical procedures requiring straightforward interpretations and correlate with real-life operations as has been shown in case studies. The drawbacks of Static ABA tests are that reaction rates

and size effects are ignored, and simple stoichiometry and instant availability of reactive series are assumed (Usher *et al.,* 2003).

The various tests that form part of the Static ABA procedure are outlined below (Usher *et al.,* 2003). The detail of how each test was performed was supplied by IGS Laboratory staff.

3.2.1.5.1. Initial pH

The Initial pH refers to the pH of the leachate before oxidation has occurred. To measure this, 50g of de-ionized water was added to 5g of pulverized sample and the mixture was stirred. The sample was left to stand for 24 hours, at which point the Initial pH of the fluid was measured.

3.2.1.5.2. Final pH (Net Acid Generating Test pH)

The Final pH refers to the pH of the leachate after oxidation has occurred. A volume of hydrogen peroxide was added to 4g of pulverized sample and the Final pH was measured after 24 hours.

3.2.1.5.3. Acid Potential (AP)

The AP is a measure of the concentration of acid in the leachate after oxidation with hydrogen peroxide. The AP is expressed as kg/t $CaCO_3$ required to neutralize the sample.

3.2.1.5.4. Determinands in Solution

The concentration of determinands in the leachate after oxidation with hydrogen peroxide was recorded. These partial extraction results provide an estimate of the total number of kilograms of each determinand that may be leached by the weathering of a tonne of the original sample.

3.2.1.5.5. Neutralising Potential (NP)

Sulphuric acid was added to 1g of sample until the pH of the slurry/mixture was below 2.5 after 24 hours. The volume of sulphuric acid added was recorded. The acidified sample was then back-titrated with a known concentration of sodium hydroxide until the pH was stable at 7 after 24 hours.

The volume of sodium hydroxide added was recorded. The NP was then calculated from the recorded volumes of sulphuric acid and sodium hydroxide required and expressed in kg/t $CaCO_3$.

3.2.1.5.6. Net Neutralising Potential (NNP)

The Net Neutralising Potential (NNP) is calculated from the NP and AP values (NNP = NP – AP). The more negative the NNP, the greater the potential of the sample to produce AMD.

These NNP values are expressed as kg/tonne $CaCO_3$ per sample. Therefore samples with a positive NNP have capacity to neutralize AMD, whereas samples with negative NNP values may generate AMD.

It is also important to note that although low positive NNP values represent samples that will have an overall positive neutralising effect; these samples may produce AMD at some stage during the weathering process.

3.2.1.6. Kinetic Tests

Kinetic tests have been developed to profile the acid generating characteristics of samples relative to time. At IGS the humidity cells are used to simulate the weathering process in weekly cycles for a period of 20 weeks. At the end of each week, the pH is measured and the weathering products are collected in a rinse/leach process. The latter are measured in order to quantify the rate of oxidation, the reaction rates of the primary minerals and to describe the AMD characteristics of each sample analysed.

The weathering process is simulated, albeit at an accelerated rate, in a laboratory using a variety of procedures in order to record the rate of metal mobilization and transport over an extended period of time (Chemex Labs, 1997). At IGS, the humidity cell procedure has been adopted as the preferred kinetic test procedure as it has been referred to as the most widely used and recommended laboratory test in use for almost 30 years (ASTM, 1996). The IGS has also adopted the ASTM "standardised methodology" for humidity cell kinetic tests which is described in detail in Appendix 6.

3.2.1.7. Tailings Samples

Although the bulk of the sampling was focused on rock samples from core, it was realized that the bulk of the material mined from the Platreef would not be stockpiled in its pristine form but would be processed and discarded as tailings. Consequently it was considered necessary to test material that might approximate the tailings in grain size and composition.

There is no generic metallurgical circuit clone that can be applied to the South African PGE mining industry owing to the variation in mineralogy and physical properties of the ore from mine to mine. However, the standard mineral beneficiation in the PGE industry is concentration of PGE by flotation. In this technique, a mixture of milled ore and water is chemically adapted to allow for the attachment of certain mineral particles to air bubbles. The selected minerals rise with the bubbles to the surface of the pulp, creating a froth which is then removed, leaving the remaining minerals submerged in the pulp. Traditionally, flotation has been carried out in three steps: rougher, cleaner and recleaner (also known as Scavenger). A step prior to flotation may be introduced to reduce the volume of ore to be milled and floated without significantly affecting recoveries (Merkle and Mckenzie, 2002).

Platreef ore mineralized material was selected by Platreef staff and sent to Mintek Laboratory for metallurgical bench-scale testing. Unfortunately the details of the samples used were not available to the author. A simple bench-scale metallurgical recovery test was carried out by Mintek Laboratory on the samples provided. It is important to note that the metallurgical processing studies for the project were at a preliminary stage and have not been optimized nor had a decision been taken as to whether a magnetic separator will be warranted or how many concentrator circuits will ultimately be employed. Nevertheless, the tailings from this bench scale test most closely approximate the material that is likely to be discarded on the tailings dam.

The bench scale test procedure is outlined in Figure 2 and consisted of the following steps (*Pers comm.* Killick, 2008):

1. The milled mineralized sample was passed through a magnetic separator separating the magnetic material from the non-magnetic material. The magnetic material was collected and sent for further treatment in order to extract PGEs.
2. The remaining non-magnetic material known as "Mags Tailings" was processed through a Rougher Flotation Cell. The material that floated was separated out and collected as the PGE/Ni concentrate.

3. The remaining material known as Rougher tailings was sent to a Scavenger Flotation Cell. The material that floated was collected and added to the PGE/Ni concentrate.
4. The remaining material will be classed as Scavenger Tailings and this is the material that will be sent via a thickener to the tailings dam.

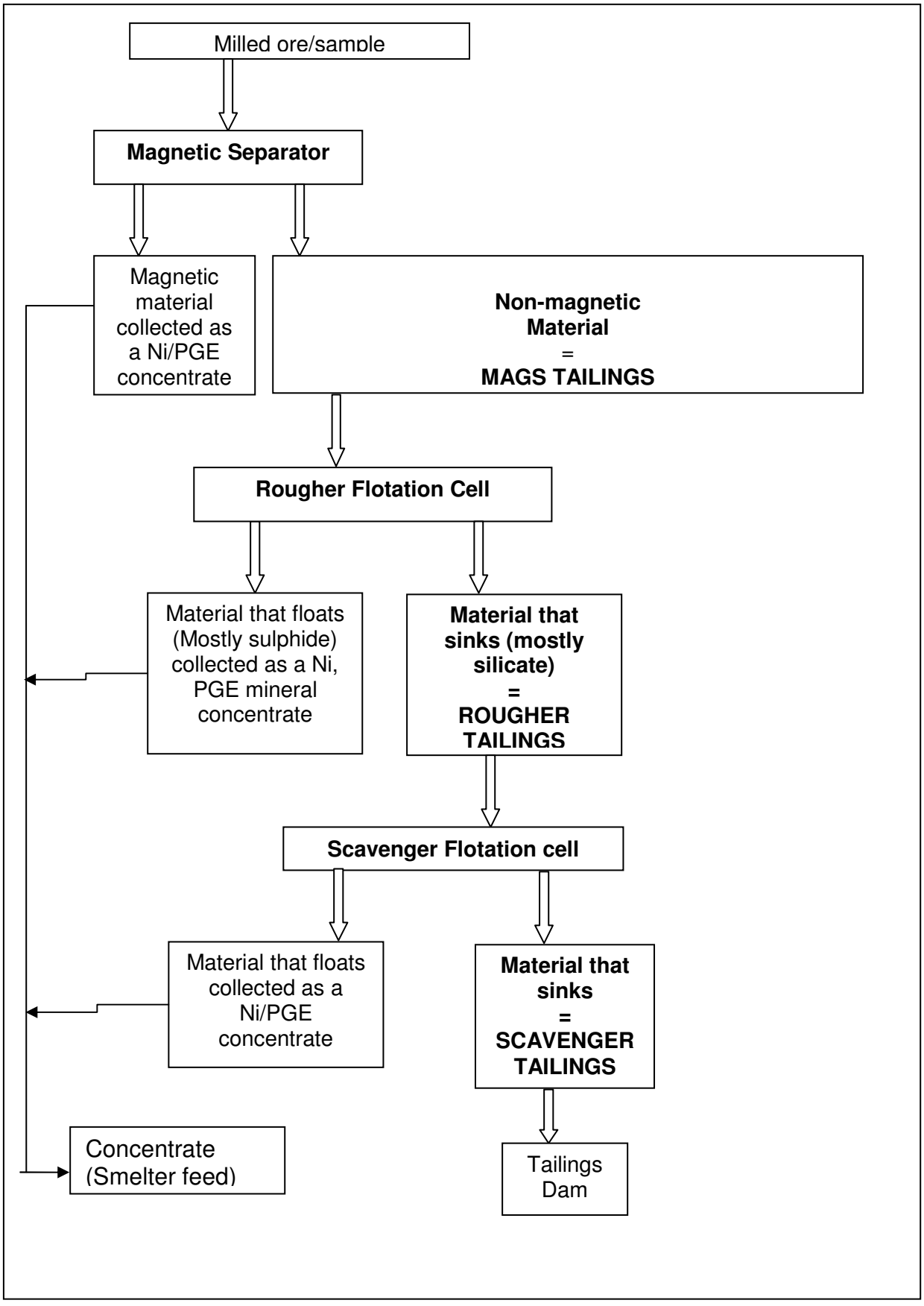

Figure 2: Bench scale recovery test procedure (*Pers comm.* Killick, 2008).

Samples of the tailings material were received from Mintek Laboratory and submitted for whole rock geochemistry, static ABA analyses and kinetic tests, as outlined in Table 3. Unfortunately the selection of samples was restricted by the limited amount of material available. It is also noteworthy that the tailings material sampled originated from Feldspathic Pyroxenite material as this rock type is most abundant in the Platreef.

Table 3: Details of the tailings samples provided by Mintek and submitted for kinetic tests, static ABA analysis and whole rock geochemistry analysis

Tailings Type	Abbreviation	Kinetic Tests	Static ABA Analyses	Whole Rock Geochemistry Analyses
Rougher Tailings High Grade Ore	RT HG Ore	MC276		
Rougher Tailings Low Grade ore	RT LG Ore	MC277		
Rougher Tailings High Grade Ore	RT HG Ore	MC278		
Rougher Tailings Low Grade Ore	RT LG Ore	MC279		
Rougher Tailings Oxidised Ore	RT Ox Ore	MC281		
Mags High Grade Ore	Mags HG Ore		MC282	
Mags Low Grade Ore	Mags LG Ore		MC283	
Mags Oxidized Ore	Mags Ox Ore		MC284	
Scavenger Low Grade Ore	Scav LG Ore		MC285	MC285
Scavenger Oxidized Ore	Scav Ox Ore		MC286	MC286
Scavenger High Grade Ore	Scav HG Ore		MC287	MC287

The whole rock geochemistry and static ABA test methodology for the analysis of the tailings material was identical to that described for the rock samples. The kinetic test methodology applied to the tailings material was almost identical to that described for the rock samples, the only deviation was that during the initial and weekly rinse/leach procedures, the fine tailings samples were allowed to soak for 40 minutes to 1.5hours, allowing suspended particles to settle.

4. RESULTS

4.1. Geology, Mineralogy and Proposed Mining Method

4.1.1. Geology

4.1.1.1. The Bushveld Complex

The world-renowned Bushveld Complex consists of the layered mafic and ultramafic rocks of the Rustenburg Layered Suite (RLS) at the base, a granite suite referred to as the Bushveld granites, overlain by the felsic volcanic rocks of the Rooiberg Group (Kinnaird *et al.*, 2005). The rocks of the RLS intruded into the Transvaal Supergroup at 2.05Ga (Harmer, 2000) and today cover an area of approximately 65 000 km^2 and vary in thickness from 7-9 km (Eales and Cawthorn, 1996). The RLS outcrops in five distinct limbs: the western, far western, northern, eastern and south-eastern (or Bethal) limbs (Figure 3). The western and eastern limbs are the most well known, with average lengths of approximately 200 km, while the south-eastern or Bethal limb is covered by younger sediments and was discovered on the basis of geophysics and drilling information (Eales and Cawthorn, 1996).

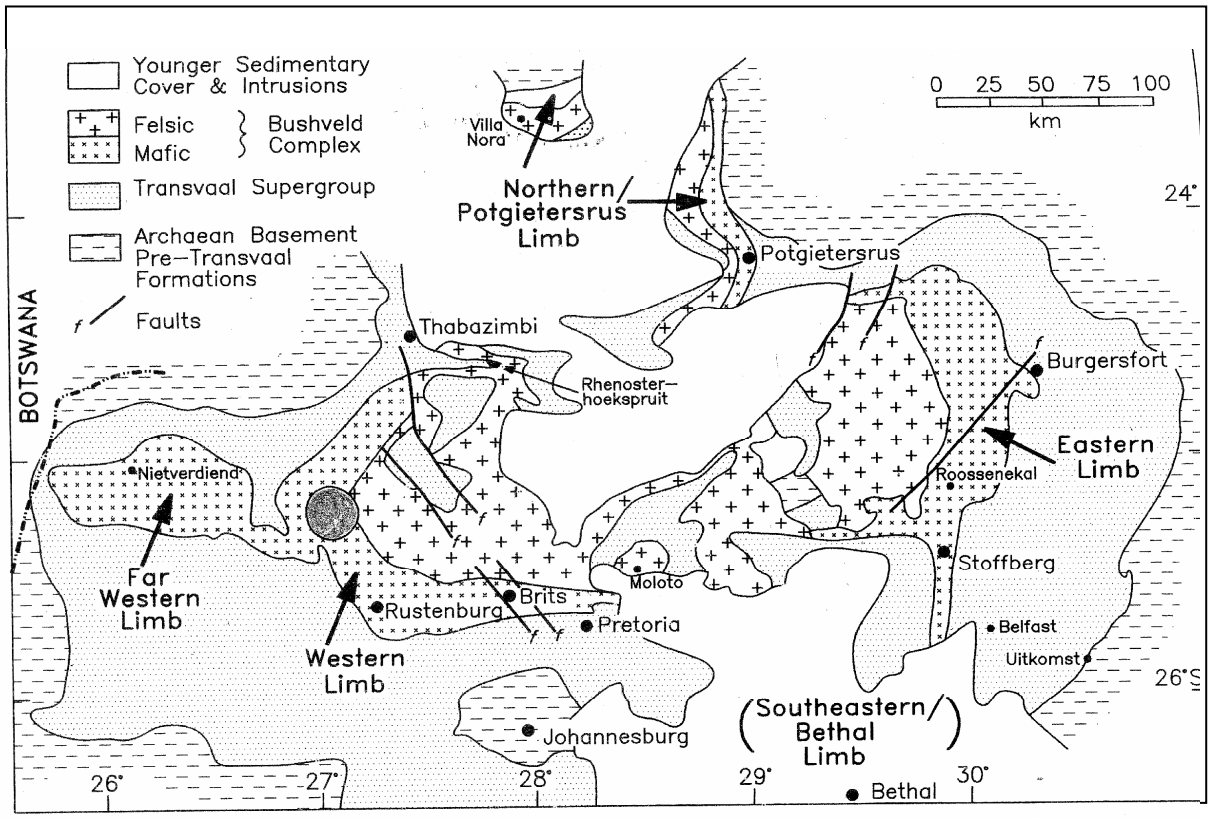

Figure 3: Simplified geological map of the Bushveld Complex (Eales and Cawthorn, 1996).

The stratigraphy of the RLS has traditionally been divided into Marginal, Lower (LZ), Critical (CZ), Main (MZ), Upper (UZ) Zones. Figure 4 shows the stratigraphy of the eastern and western limbs (Eales and Cawthorn, 1996). The precise boundaries between zones within the stratigraphy have been the subject of debate (Kruger, 1990) and lateral facies variations do cause changes in the sequence along strike (Eales and Cawthorn, 1996).

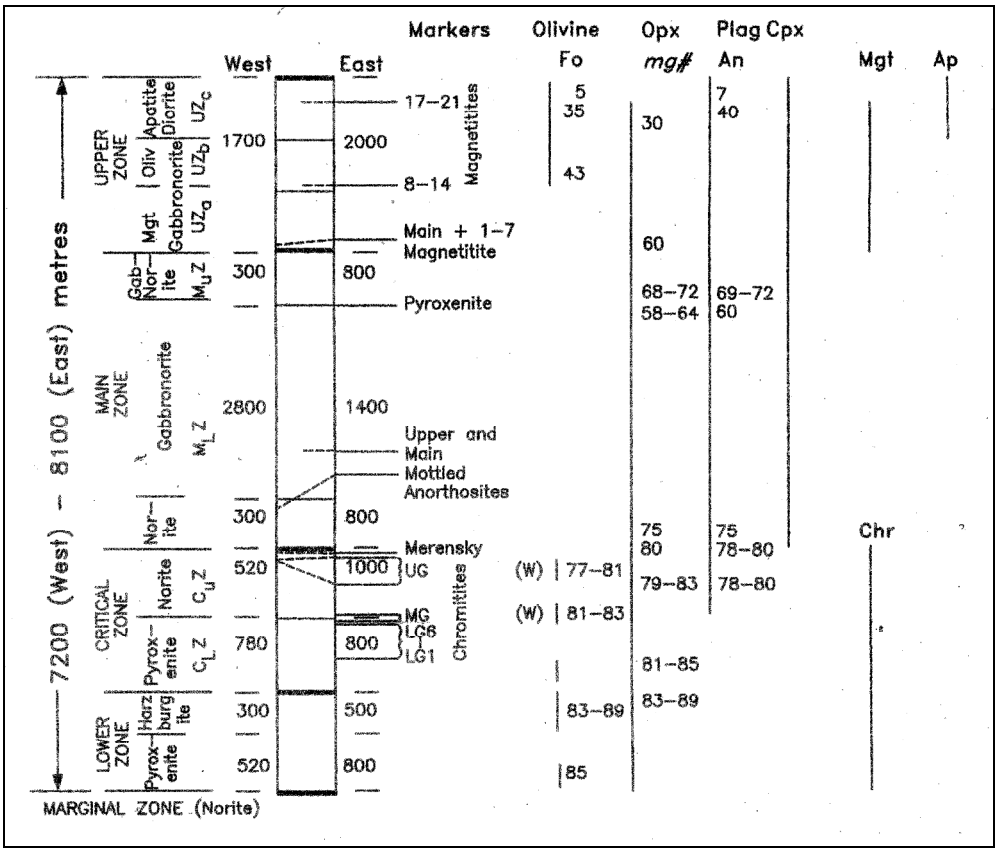

Figure 4: Generalized stratigraphic sections through the western and eastern limbs of the Bushveld Complex (Eales and Cawthorn, 1996).

4.1.1.2. History of Exploration in the Northern Limb

The PGE potential of the BC was first discovered in May 1924 by Dr Hans Merensky on the farm Maandagshoek in the Lydenburg area. The thorough investigation of Maandagshoek by Merensky eventually led him to discover the rich Merensky Reef. Identification of the Merensky Reef spurned further exploration interest in the northern limb of the BC during the mid to late 1920's (Buchanan, 1988). During this time, Dr Hans Merensky and Dr Percy Wagner displayed an "uncanny ability" to discover valuable areas of PGE mineralization, and Wagner was successful in the Potgietersrus region (Buchanan, 1998).

The mining activity in the Platreef seen in the 1920s was abandoned shortly afterwards owing to the Great Depression. Despite ongoing exploration during the 1960s, 1970s and 1980s, mining in the area only recommenced in 1992 with the opening of the Anglo American's Sandsloot and Zwartfontein open pit mines. The success of Anglo American as well as the increasing value of platinum has resulted in the Platreef once again being the focus of extensive exploration which has fuelled renewed research and interest in the geology of this region (Kinnaird and McDonald, 2005).

4.1.1.3. The Northern Limb

M. J. van der Merwe carried out most of the initial pioneering work on the northern limb and his research has formed a sound foundation for further investigations. He mapped the exposed limb which outcrops over a strike length of 110 km and has a maximum width of 15 km. Mapping was followed by "a trenching and drilling program and by laboratory and geophysical investigations," (van der Merwe, 1976). The outcome was

the first detailed geological map for the northern limb and a gravity model for the deep structure for mafic rocks (Kinnaird and McDonald, 2005).

Geographically, the northern limb stretches from just south of Mokopane to at least 30 km north of this town in the Limpopo province of South Africa (Kinnaird, 2005). The layered igneous lithologies strike north to northwest and dip 40° to 45°W (Kinnaird, 2004). The Platreef is the PGE-rich horizon in the northern limb of the BC (Sharman-Harris *et al.*, 2005) and has been defined as "the lithologically variable unit, dominated by pyroxenite, which is irregularly mineralised with PGE, Cu and Ni, between the Transvaal metasedimentary Footwall or Archaean basement and the overlying Main Zone gabbronorite," (Kinnaird *et al.*, 2005).

The Platreef rocks overlie progressively older lithologies from south to north in what has been referred to by Wagner (1929) as an "igneous transgression." From south to north the floor rocks to the Platreef constitute progressively older rocks of the Transvaal Supergroup and eventually constitute Archaean granite and gneiss (Kinnaird, 2004). The Platreef has an irregular Footwall contact, which is faulted in places (Kinnaird *et al.*, 2005). The Platreef is overlain by Main Zone gabbro norites. This contact is fairly uniform, but disturbed in places where interlayered norites and pyroxenites are evident (White, 1994). The contact has a planar, undulating surface which may be marked by a mottled textured anorthosite phase, especially in the Southern Platreef (Kinnaird, 2005).

Correlation of the stratigraphy of the northern limb with that of the other Bushveld limbs is not straightforward, although broad correlations between the ultramafic – mafic lithologies of the northern limb have been made by some authors with the RLS in the eastern and western limbs (van der Merwe, 1976; Von Gruenewaldt *et al.*, 1989 and White, 1994 in Holwell *et al.*, 2005). Marginal Zone Norite has been recorded on the farms Macalacaskop 243KR and Turfspruit 241KR (Sharman-Harris *et al.*, 2005). The Lower Zone occurs at the base of the succession south of farm Tweefontein and sporadically as satellite bodies within floor lithologies, (Kinnaird *et al.,* 2005). In the past, Wagner proposed that the Platreef may correlate with the Merensky reef observed in the eastern and western lobes of the Bushveld Complex. However, recent studies have proven that the Platreef sequence formed from a separate magma or mixture of magmas and that the Critical Zone of the RLS is largely, if not completely, absent from the northern limb (McDonald *et al.*, 2005).

The Main Zone is present and reaches a thickness of 2200m (Van der Merwe, 1976), which is less thick than in the eastern and western limbs (Sharman- Harris *et al.*, 2005). The Main Zone in the Northern Limb lacks certain marker horizons that are evident elsewhere in the Bushveld Complex (Van der Merwe, 1976). Cyclic units of magnetite, magnetite gabbro, gabbro and anorthosite (approximately 1500m thick) occurring above the Main Zone are thought to represent the Upper Zone (Sharman-Harris *et al.*, 2005). One magnetite layer has been correlated with the main magnetite layer seen elsewhere in the Bushveld Complex (van der Merwe, 1978 in Holwell, *et al.*, 2005).

4.1.1.4. The Platreef

Attempts to correlate the Platreef with the stratigraphy observed elsewhere in the BC by numerous authors have been inconclusive and are summarized in Kinnaird (2005) as follows: The Platreef has been related to the Critical Zone by Wagner (1929) and White (1994), the base of the main zone by Kruger (2005), a mixture of critical and main zone magmas by Cawthorn *et al*. (2002), a mixture of Lower Zone and Main Zone magmas by McDonald *et al*. (2005) or tectonic emplacement post Main Zone by Friese and Chunnett (2004). The debate revolving around the potential correlation between

the Platreef and the traditional RLS stratigraphy observed in the eastern and western limbs of the BC is still not resolved. Recent research, however, has revealed that the Platreef in the southern sector formed as a result of the multiphase emplacement of sills into the Transvaal metasedimentary succession (Kinnaird, 2005).

The geology of the Platreef is complex comprising three to four feldspathic pyroxenites alternating with heterogeneous zones of interlayered rocks of both sedimentary and igneous origin. Sedimentary rocks in these zones include cordierite spinel hornfels, clinopyroxenites, calc-silicates and graphite-bearing serpentinites and igneous rocks include serpentinised peridotites and pyroxenites. These rocks have all been serpentinized to varying degrees. The most abundant rock type in the heterogeneous zones is the hornfels which is thought to have originated from pyritic black shales. An extensive hornfels layer (striking approximately 1500m) has been recorded on Turfspruit. Clinopyroxenite xenoliths and metaquartzite xenoliths have also been recorded in the southern sector of the Platreef (Kinnaird, 2005).

Xenoliths of Footwall rocks have been incorporated into the Platreef (Buchanan, 1988). Towards the south of the northern limb, xenoliths tend to be comprised of hornfelsed calc-silicate and siliciclastic rocks such as shales, mudstones, siltstones and banded iron formation. However, towards the north, carbonate and meta-calc-silicate xenoliths are more typical (Hutchison and Kinnaird, 2005).

The Platreef varies in thickness, with a maximum thickness of 400m occurring in the south thinning to less than 50m in the north (Kinnaird, 2004). The fault geometry of the Platreef is pre-Bushveld and is dominated by a steeply dipping set of N-S striking faults. A secondary set of ENE and ESE striking faults has been recorded with a dip of 50 – 70° to the south (Kinnaird, 2004). Irregular floor topography appears to control the overall geometry of the Platreef (Kinnaird, 2004). Two structural depressions (one on Macalacaskop and one on Turfspruit) occur within the Footwall in the southern Platreef. The Platreef is thicker in these basins (400m thick in the Macalacaskop basin and 250m thick in the Turfspruit basin) and thinner on the basin flanks (Kinnaird, 2005). The regional dip of the Platreef is approximately 40 – 45° to the west, although large variations in the dip direction are evident. On Macalacaskop, Turfspruit and Rietfontein the dip varies from 20 to 60° near surface (Hutchison and Kinnaird, 2005).

4.1.1.5. Mineralisation

Kinnaird *et al.* (2005) describe the Platreef as “a world-class magmatic-type nickel, copper and PGE mineral deposit hosted by a feldspathic pyroxenite-norite succession in the Bushveld Complex.” In the southern sector the sulphide content of the Platreef ranges from <1% locally to >30% in some intersections. The most prolific base metal sulphides in the Platreef, in order of decreasing abundance are: pyrrhotite, pentlandite, chalcopyrite and minor pyrite. The average grade of Cu in the Platreef lies between 0.1 and 0.25%; while the overall grade of Ni is 0.15 to 0.35%. The average PGE grade is 1-2g/t with >10g/t occasionally recorded for short intersections. The sulphides are disseminated or net-textured and vary in size from a few microns to 2cm grains of pyrrhotite and pentlandite with chalcopyrite and minor pyrite (Kinnaird *et al.*, 2005). The sulphide content of the Platreef is considered greater than that of the Merensky Reef (Sharman-Harris *et al.*, 2005).

4.1.1.6. The Platreef Prospect

The study area for this project is in the southern sector of the Platreef and includes the farms Rietfontein 2KS, Turfspruit 241KR and Macalacaskop 243KR as shown in Figure 1. Exposure of the Platreef in the prospect area is poor and the distribution of rocks types at surface has been sourced and interpreted by project geologists from borehole data. This information has been used in conjunction with the geological map of the Platreef [modified after White (1994), in Viljoen and Schurman (1998)] to compile the geological map as presented in Appendix 7. In the project area, the Platreef strikes approximately northwest – southeast and the core/ layering intersection angle observed in the core suggests the dip varies between 10^{o} and 50^{o}.

4.1.1.6.1. The Hanging-wall

The Hanging-wall to the Platreef comprises fairly homogeneous Main Zone Gabbro-Norite. Hornfels and Pyroxenite xenoliths occur. The interface between the Main Zone and the Platreef itself is marked by a Mottled Anorthosite also known as the Mottled Marker. This unit is considered part of the Hanging-wall to the Platreef as it does not contain significant proportions of sulphide minerals or PGE.

4.1.1.6.2. The Platreef

Although variable across the prospect, a typical lithological sequence on the Platreef Prospect is summarized in Table 4.

Table 4: A typical lithological sequence on the Platreef Prospect.

Thickness (Metres)	Stratigraphy	Lithology	
0-350	Main Zone (Hanging-wall)	GN	Gabbro-Norite
0.5 – 20	Mottled Anorthosite (Hanging-wall)	MA	Mottled Anorthosite
100-400	Platreef	PGN LN MN NC PX FPX PFPX SP	Pegmatitic Gabbro-Norite Leuconorite Melanorite Norite Cycles Pyroxenite Felspathic Pyroxenite Pegmatitic Feldspathic Pyroxenite Serpentinite
	Footwall and Xenoliths	MZN HF DM Q	Marginal Zone Norite Hornfels Dolomite Quartzite
	Intrusions	DO QF AP	Dolerite Dykes or Sills Quartz Feldspar Veins Aplite Dykes

Regional Variation in Composition

The composition of the Platreef changes its character gradationally from the north to the south of the property as shown in Table 5.

Table 5: Generalized proportion of rocks comprising the mineralised body.

Rock Type	North (Volume %)	South (Volume %)
Gabbro-Norite	8	6
Mottled Anorthosite	3	3
Pegmatitic Gabbro-Norite	4	3
Leuconorite	1	2
Melanorite	5	13
Norite Cycles	6	12
Pyroxenite	5	3
Felspathic Pyroxenite	26	24
Pegmatitic Feldspathic Pyroxenite	12	3
Serpentinite	6	5
Marginal Zone Norite	3	2
Hornfels	15	5
Dolomite	6	2
Quartzite	1	8
Dolerite	1	1
Quartz Feldspar	2	3
Aplite	1	1

In the Hanging-wall, the proportion of Gabbro-Norite rocks is slightly greater in the north than the south. In the Platreef, there is a greater proportion of Melanorite and Norite Cycles in the south relative to the north, while there are more Pegmatitic Feldpathic Pyroxenite and Hornfels rocks in the north. In the footwall, there is a greater proportion of Dolomite rocks in the north relative to the south and a greater proportion of Quartzite rocks in the south.

4.1.1.7. The Footwall

The Footwall to the Platreef is formed by various units of the Transvaal Supergroup. To the north of the project area (on northern Turfspruit 241 and Rietspruit 2 KS) the Footwall consists predominantly of calcsilicate hornfels and dolomite of the Duitschland Formation, while shales and quartzites of the Duitschland Formation and Timeball Hill Formation constitute the Footwall in southern Turfspruit 241KR and Macalacaskop 243 KR. Marginal Zone Norites of the RLS also occur within the Footwall.

4.1.1.7.1. Intrusions

Several dykes of different composition are known to transect the Northern Limb. Two sub-parallel aplitic dykes are shown passing from the north-eastern part of Macalacaskop on to the southern part of Turfspruit. These bodies strike approximately north-south and have near-vertical dips. Dolerite was intersected in the boreholes indicating that dolerite dykes or sills have intruded the Platreef.

4.1.1.7.2. Soil Horizons and Weathering Depths

From the available sections and from core logging it is observed that the soil thickness throughout the area varies from an average of 5m in the northern section of the prospect to 0m in the south with a maximum of 10m observed in the north. The weathering depth

varies from between 10 to 24m below surface with an average observed weathering depth of 16m below surface.

4.1.2. Mineralogy

Each sample was described during the sample selection process and these core logging details have been included as Appendix 2. Within each sample description is a record of the percentage sulphide minerals present. As pyrite oxidation has been the cause of AMD problems in coal and gold mines in South Africa, the presence of pyrite in the samples was recorded.

The observations of the core samples provided in Appendix 2 shows the predominant sulphide mineralogy of the Platreef prospect constitutes pyrrhotite (FeS), pentlandite $(Fe,Ni)_9S_8$ and chalcopyrite ($CuFeS_2$). Pyrite (FeS_2) is also present, but to a far lesser extent than the other sulphide minerals.

The observations were used to plot Figures 5, 6 and 7. It must be emphasized that these observations were made from hand specimen and are semi - quantitative only. Where mineralogical descriptions were provided numerically, (i.e the sulphide mineral content was described as 15 to 20%), a mean value (i.e.17.5% sulphide mineral content) was allocated to that sample.

Figure 5 shows the percentage samples of each rock type that contained sulphides.

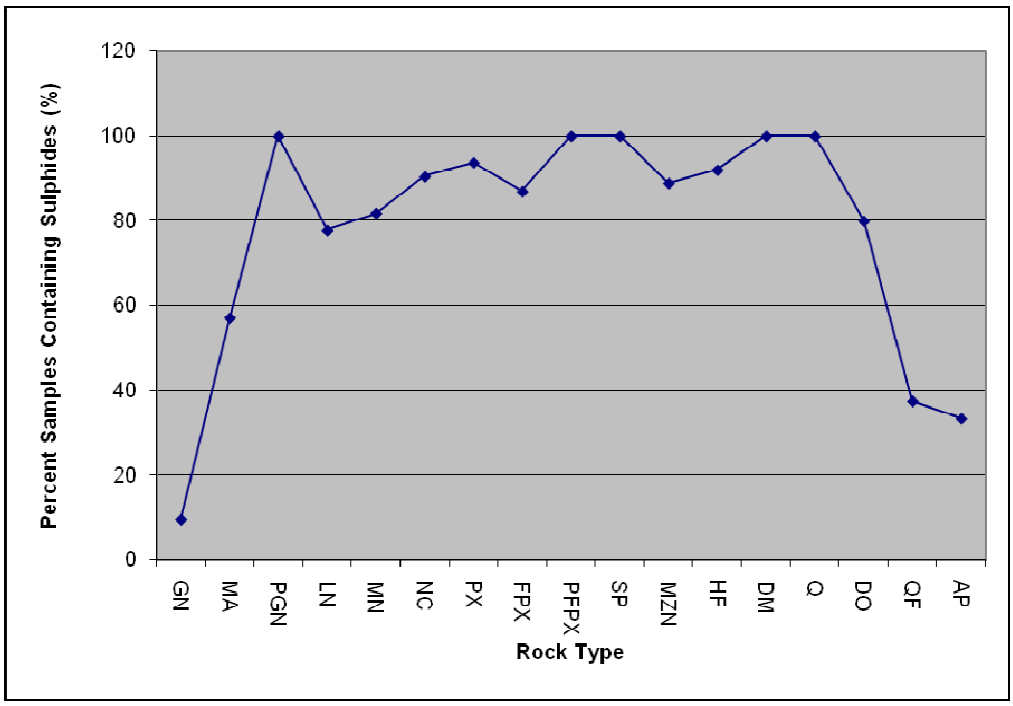

Figure 5: Percentage of samples of each rock type containing sulphides.

With respect to the Hanging-wall, a low percentage (9.52%) of Gabbro-Norite samples contained sulphides. However, 57.14% of the Mottled Anorthosite samples contained sulphides.

On average, 91.35% of the Platreef rock types sampled collected contained sulphides. All the Pegmatitic Gabbro-Norite, Pegmatitic Feldspathic Pyroxenite and Serpentinite samples contained sulphides. Similarly, on average, 95.22% of the Footwall and xenolith

rock types sampled contained sulphides. All the Dolomite and Quartzite samples contained sulphides.

With respect to the intrusion rock types sampled, 80% of the Dolerite samples contained sulphides, while only 37.50% and 33.33% of Quartz Feldspar and Aplite, respectively, contained sulphides.

Figure 6 shows the average sulphide content within the samples collected for each rock type.

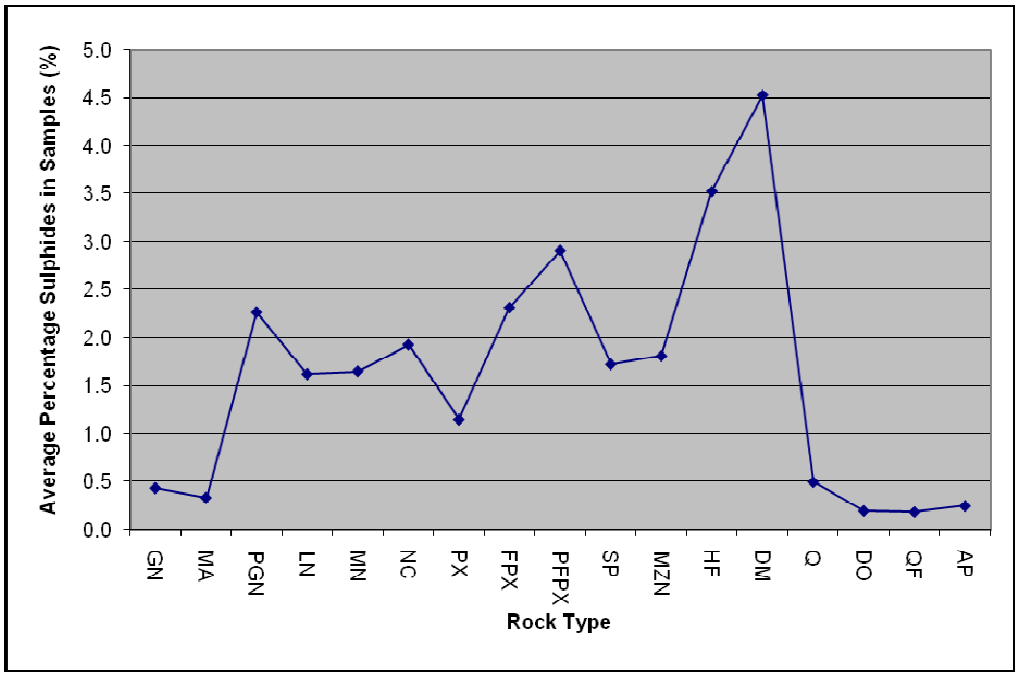

Figure 6: The average sulphide content within samples collected for each rock type.

The Hanging-wall rock types contain relatively low average percentage sulphides per sample including 0.44% and 0.34% for Gabbro-Norite and Mottled Anorthosite, respectively.

The Platreef rock types recorded an average of 1.95% sulphides per sample, ranging from 2.91% (Pegmatitic Feldspathic Pyroxenite) to 1.15% (Pyroxenite). The Footwall and xenoliths samples collected contained on average 2.59% sulphides. These rock types showed a relatively great range of results varying from an average of 0.5% sulphides recorded in the Quartzite samples, to 1.81% in the Marginal Zone Norite samples, 3.52% in the Hornfels samples and 4.52% in the Dolomite samples.

The intrusion rock types contained a relatively low average sulphide content per sample of 0.21%.

Figure 7 shows the percent samples of each rock type that contained pyrite.

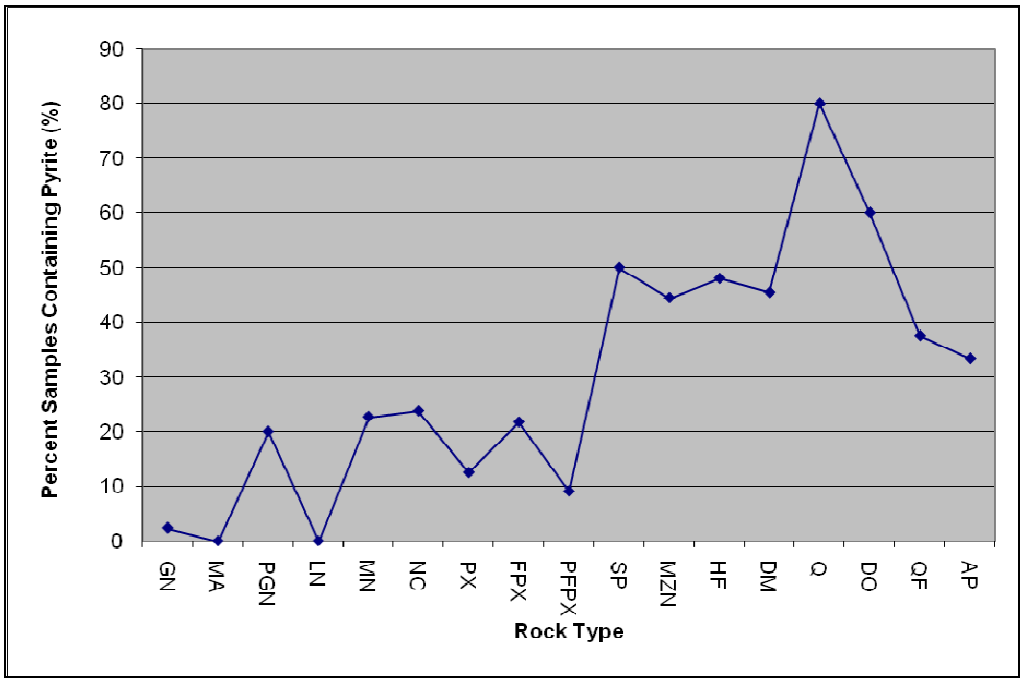

Figure 7: The percent samples of each rock type containing pyrite.

Only 2.38% of the Gabbro-Norite samples collected contained pyrite, while pyrite was not observed in any of the Mottled Anorthosite samples.

On average, approximately 20% of the Platreef samples contained pyrite. However, it is noteworthy that none of the Leuconorite samples recorded pyrite, while on average 50% of the Serpentinite samples contained pyrite. Approximately 45% of the Footwall and xenolith samples contained pyrite (Marginal Zone Norite, Hornfels and Dolomite). It is noteworthy that 80% of the Quartzite samples contained pyrite.

With respect to the Intrusion rock types, approximately 37.5 and 33.33% of the Quartz Feldspar and Aplite rock types contained pyrite, while 60% of the Dolerite samples contained pyrite.

4.1.3. Proposed Mining Method

Although a number of mining methods and plans were still under discussion at the time of writing it was necessary to adopt a generalized version of the most likely mine plan that could be used as a basis for designing the sampling programme for the baseline study. Consequently, the following assumptions were made:

- An open pit was the most likely mining method.
- The pit or pits could have a cumulative long axis of 2.5 km and a final depth unlikely to exceed 350m below surface
- The open pit(s) would be concentrated on the eastern part of the farm Turfspruit, along the outcrop position of the Platreef.
- There will be virtually no selective mining and the stripping ratio would be about 2:1 over the LoM.
- The scale of mining is likely to be in the range of 50 000 to 120 000 tonnes per day and the LoM is expected to exceed 20 years.

Based on the above assumptions, Table 6 shows the estimated tonnages of rocks to be processed and dumped over the LoM as predicted from the provisional mine plan in use at the time of sampling. Subsequent refinements to the mine plan have tended to

reduce the pit size, and thus Table 6 probably represents maximum figures and these are used as a basis for this study.

Table 6: The estimated tonnages of rocks to be processed and dumped over the Life of Mine.

Abbreviation	Lithology	Estimated Tonnes ($x10^6$) for Processing)	Estimated Tonnes ($x10^6$) Directly To Dump)
GN	Gabbro-Norite	68.8	2000
MA	Mottled Anorthosite		19.1
PGN	Pegmatitic Gabbro-Norite	29.5	
LN	Leuconorite	19.4	
MN	Melanorite	99.9	
MZN	Marginal Zone Norite	20.9	
NC	Norite Cycles	91.2	
PX	Pyroxenite	42.0	
FPX	Felspathic Pyroxenite	259	
PFPX	Pegmatitic Feldspathic Pyroxenite	61.7	
SP	Serpentinite	51	
HF	Hornfels	75.4	
DM	Dolomite		39.2
Q	Quartzite		45.8
AP	Aplite		8.8
DO	Dolerite		9.8
QF	Quartz Feldspar Veins	26.9	<1
Total		**850.3**	**2122.7**

Although the mine management have not planned to dump Hornfels or Marginal Zone Norite during the LoM, it is possible that xenoliths of this material within the Platreef may be selectively mined and dumped if they are found to dilute the grade during the mining process (*pers comm.* Killick, 2004).

4.2. Geochemical Analysis

4.2.1. Analytical Results

4.2.1.1. Laboratory Results

The results of the laboratory analyses have been included as follows:

- The Set Point Laboratory whole rock geochemistry results are attached as Appendix 8. (Note that, in the interests of achieving conservative results, where the values recorded were below detection limit, a value of half the detection limit was assigned to the sample and applied in subsequent calculations),

- The Ultra Trace whole rock geochemistry results are attached as Appendix 9;

- The IGS Static ABA Results are attached as Appendix 10 (Note that where the values recorded were below detection limit, a value of half the detection limit was assigned to the sample and applied in subsequent calculations);

- The IGS Kinetic Test Results are attached as Appendix 11.

4.2.1.2. Geochemical and Static ABA Statistical Databases

Two geochemical databases including classical statistical parameters such as the mean, standard deviation, mode and range per rock type of the geochemical and static ABA results are included as Appendices 12 and 13, respectively. During the geochemical analyses, determination of H_2O^- was omitted in error by the laboratory from the first batch, while the analyses of N and F were purposely omitted after the first sample batch. Set Point Laboratory reported total Fe as Fe_2O_3 as well as FeO determined titrimetrically. The necessary calculations have been made to reflect the true amount of Fe_2O_3 in the samples in the attached geochemical database. These calculations involved converting the Fe_2O_3 and FeO values reported to Fe (multiplying by the stoichiometric factors 0.6994 and 0.7773, respectively), subtracting these values in order to work out how much Fe was available to form Fe_2O_3 and then converting this amount of Fe back into Fe_2O_3 (multiplying by stoichiometric factor 1.43).

4.2.2. Interpretation of the Geochemical Results

4.2.2.1. Static ABA Results

The criteria used to classify the acid producing potential of the samples analysed are those used by Usher *et al*. (2003). Although these criteria were applied within the context of coal mining in South Africa, they are based on international criteria and are similar to those applied by Akabzaa *et al*. (2006) in their study to investigate the acid generating status of selected mines occurring in the Ashanti Metallogenic Belt of Ghana.

The criteria used to classify the samples in terms of acid generation potential should not be used in isolation, but should be used in combination to categorise material from non-acid generating to acid-generating with a "slight grey area inbetween" Usher *et al*. (2003).

The criteria include:

Net Acid-Generating Test (Nag) pH

Final pH in Nag Test	**Acid-generating Potential**
>5.5*	Non-acid generating
3.5 to 5.5	Low risk acid-generating
<3.5	High risk acid-generating

**The 5.5 upper limit is derived from the carbon dioxide/pure water equilibrium pH of 5.69. Any sample tested with deionised water commonly used in laboratories requires this value to be used as reference rather than a theoretical neutral pH of 7*

Net Neutralising Potential (NP-AP)

NNP<0	Sample has the potential to generate acid
NNP>0	Sample has the potential to neutralise acid produced
-20>NNP<20	If the sample has an NNP value within this range, its acid-producing potential remains inconclusive and other criteria should also be considered in order to determine its acid generation status.

Neutralising Potential Ratio (NPR) NP/AP-

Price *et al.* (1997) provide the following screening criteria based on the NPR generated during static ABA analysis:

Potential for AMD	**Initial NPR Screening Criteria**	**Comments**
Likely	<1	Likely AMD generating.
Possibly	1 to 2	Possibly AMD generating if NP is insufficiently reactive or is depleted at a faster rate than sulphides.
Low	2 to 4	Not potentially AMD generating unless significant preferential exposures of sulphides along fracture planes or extremely reactive sulphides in combination with insufficiently reactive NP.
None	>4	No further AMD testing required unless materials are to be used as a source of alkalinity.

Percent Sulphide-Sulphur and NPR

Soregaroli and Lawrence (1998) have shown that a sample is required to have a minimum content of 0.3% sulphide–sulphur in order to generate acid for an extended period of time. It is thought that material with a sulphide–sulphur content below 0.3% may produce acid for a short period of time, but that acid production would not be sustainable. This observation has been combined with the NPR to create a set of criteria as shown below:

Sulphide-Sulphur Content and NPR	**Acid Generation Status**
Samples with <0.3% sulphide-sulphur with NPR values greater than 4	Low Probablility of Acid Generation
Samples with <0.3% sulphide-sulphur with NPR values less than 4	Inconclusive Probability of Acid Generation
Samples with >0.3% sulphide-sulphur with NPR values greater than 1	Inconclusive Probability of Acid Generation
Samples with >0.3% sulphide-sulphur with NPR values less than 1	High Probability of Acid Generation

The Institute for Groundwater Studies did not provide percent sulphide-sulphur, so this was calculated using the below calculations (Usher *et al.*, 2003):

AP = Sulphur X 31.25 (Open System)

AP = Sulphur X 62.5 (Closed System)

An *open dissolution* system is defined as a system where water (such as pore water or surface water) is in contact with a gas phase, allowing for interchange of CO_2 and O_2 in

particular. A *closed dissolution system* is defined as a system where no gas phase is present into which carbon dioxide can escape when calcite dissolves. Such a situation may prevail below the water table or below the surface of tailings ponds.

If limestone is added to a stockpile in an attempt to neutralize AMD, CO_2 will be produced as part of the neutralization reaction. In an open system, any CO_2 produced will escape into the atmosphere. However, in a closed system this will not be possible and any CO_2 produced will react with water to form carbonic acid. A closed system represents, therefore, a "worse case scenario" in terms of the number of moles of $CaCO_3$ required to neutralise AMD.

The results below have been presented for both open and closed systems and it should be remembered that the closed system scenario is the more conservative approach and is unlikely to exist in real situations. The mean results have been calculated for each rock type in the discussion below, the individual sample results per rock type have been included in Appendix 14.

4.2.2.1.1. Hanging-wall

Figures 8 and 9 show the Mean Final pH against Mean Net Neutralising Potential (NNP) values for Gabbro-Norite and Mottled Anorthosite recorded for open and closed systems, respectively.

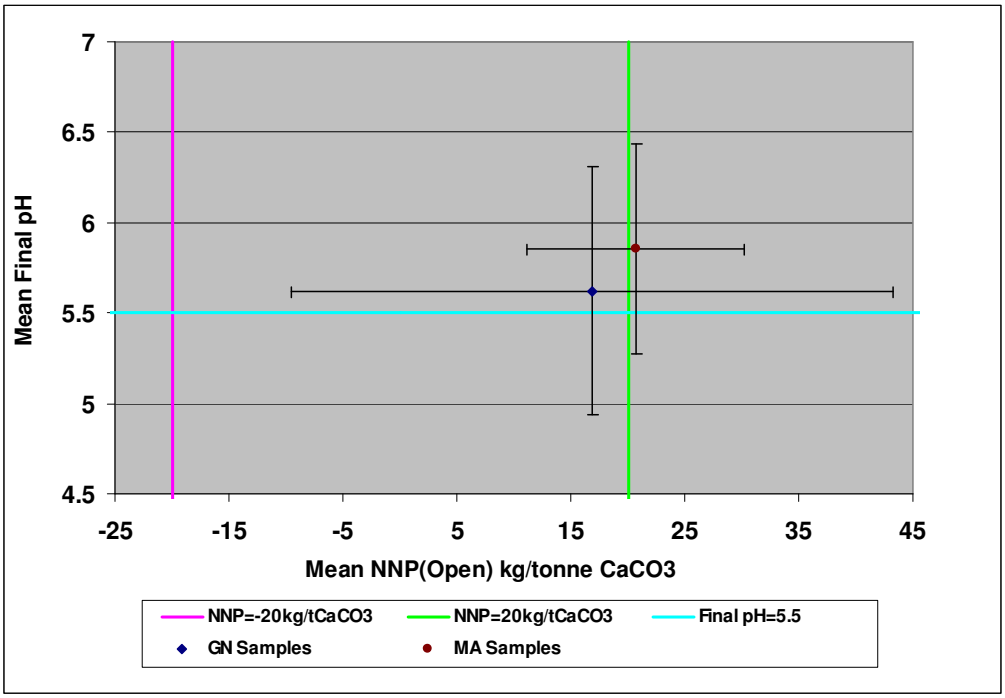

Figure 8: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Gabbro-Norite (GN) and Mottled Anorthosite (MA) lithologies (Open System).

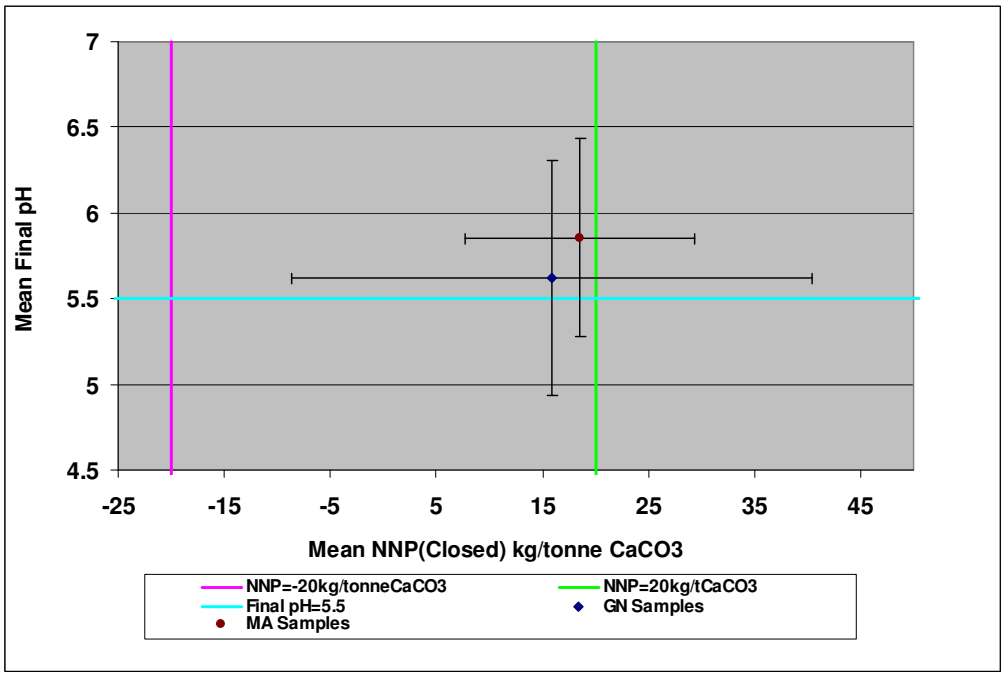

Figure 9: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Gabbro-Norite (GN) and Mottled Anorthosite (MA) lithologies (Closed System).

The mean Final pH and mean NNP values for Gabbro-Norite shown in figures 8 and 9 indicate that these rock types are unlikely to be acid producing. The mean NNP (Open) for both Mottled Anorthosite and Gabbro-Norite recorded values greater than 0 kg/tonne $CaCO_3$ indicating that these materials may neutralise any acid produced. However, as the mean NNP (Open) value for Gabbro-Norite and the mean NNP (Closed) values for Gabbro-Norite and Mottled Anorthosite fall between 20 and -20 kg/tonne $CaCO_3$, the acid producing potential is considered inconclusive and should be ascertained using other results. Both mean Final pH values for Gabbro-Norite and Mottled Anorthosite plot above 5.5 indicating that these materials are non-acid generating.

The relatively high standard deviation of the mean NNP (Open) and NNP (Closed) values recorded for Gabbro-Norite may be of concern considering that large volumes of Gabbro-Norite will be dumped during the LoM. For this reason, the Gabbro-Norite sample results have been examined in more detail in Figures 10 (Open System) and 11 (Closed System).

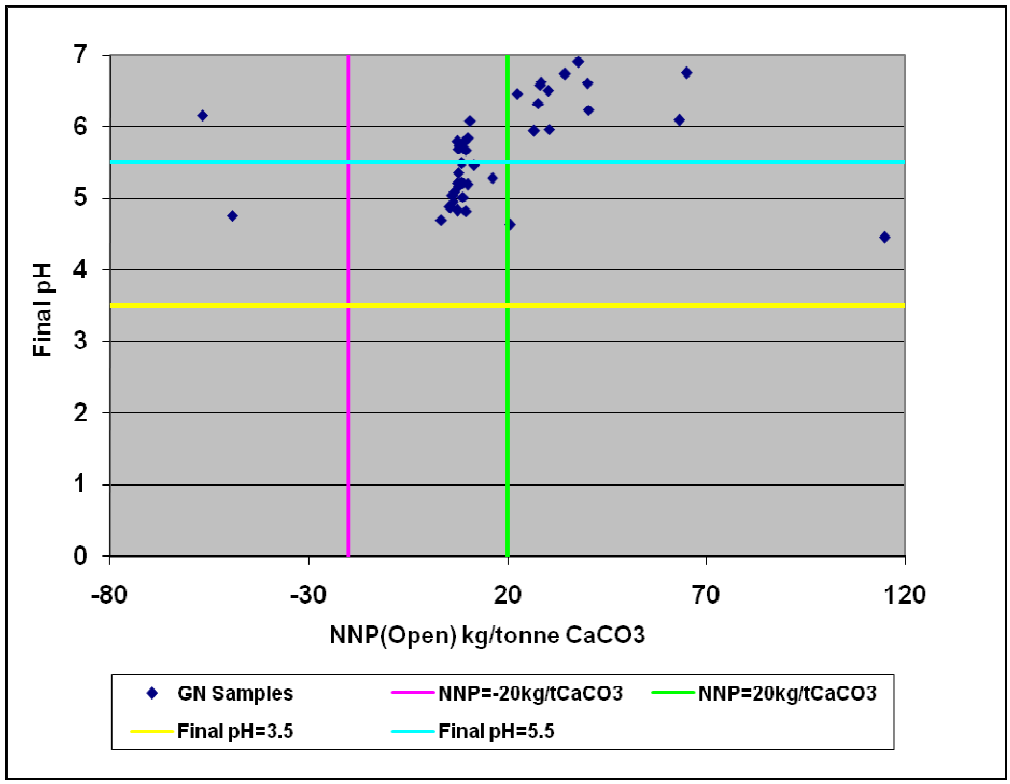

Figure 10: Final pH against Net Neutralizing Potential (NNP) for Gabbro-Norite (GN) Samples (Open System).

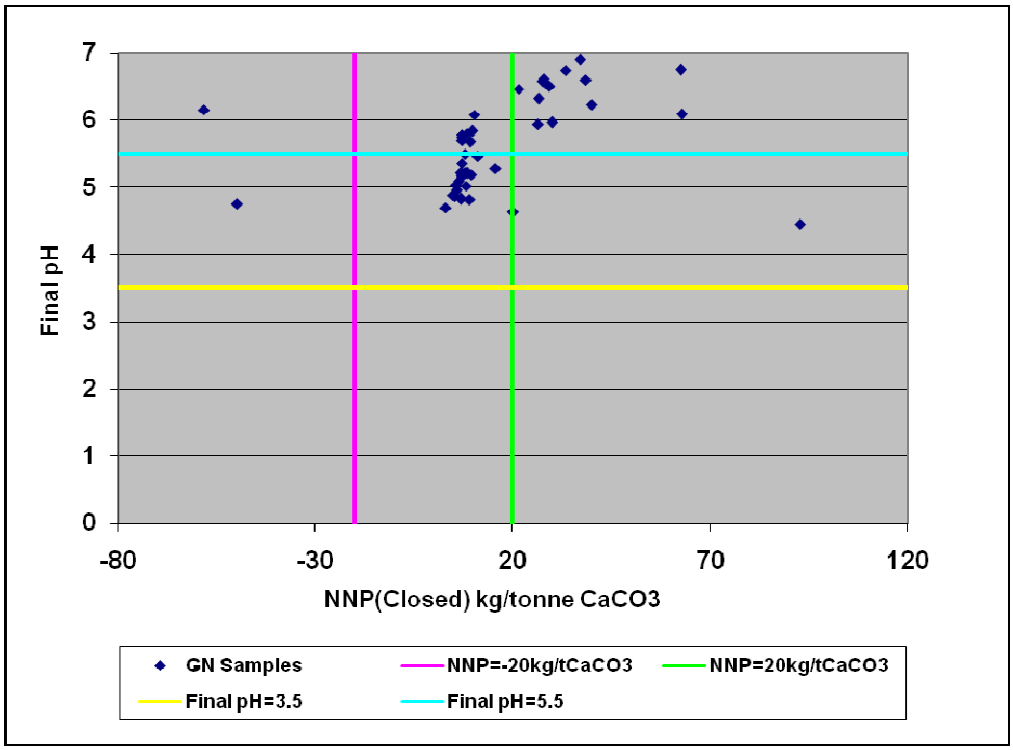

Figure 11: Final pH against Net Neutralizing Potential (NNP) for Gabbro-Norite (GN) Samples (Closed System).

In both the open and closed systems the NNP value for forty out of the forty-two Gabbro-Norite samples (95.2%) was above 0 kg/tonne $CaCO_3$. Fifteen of these samples recorded NNP values greater than 20 kg/tonne $CaCO_3$ and therefore have the potential to neutralise acid produced. All except two of these samples recorded a Final pH above 5.5 indicating that these samples are non- acid generating. Of the twenty-five samples that recorded NNP (Open) values greater than 0, but less than 20 kg/tonne $CaCO_3$, eight recorded Final pH values greater than 5.5 indicating non-acid generating material, while seventeen recorded Final pH values greater than 3.5, but less than 5.5, indicating a low risk of acid generation. Only two of the Gabbro-Norite samples (5%) recorded NNP values less than -20 kg/tonne $CaCO_3$. indicating a potential to generate acid. However, one of these samples recorded a Final pH above 3.5 indicating a low risk of acid generation and the other a Final pH above 5.5 characteristic of non-acid generating material.

Figures 12 and 13 record the Mean Net Neutralising Potential Ratio (NPR) against the mean sulphide-sulphur content for Gabbro-Norite (GN) and Mottled Anorthosite (MA) in open and closed systems, respectively.

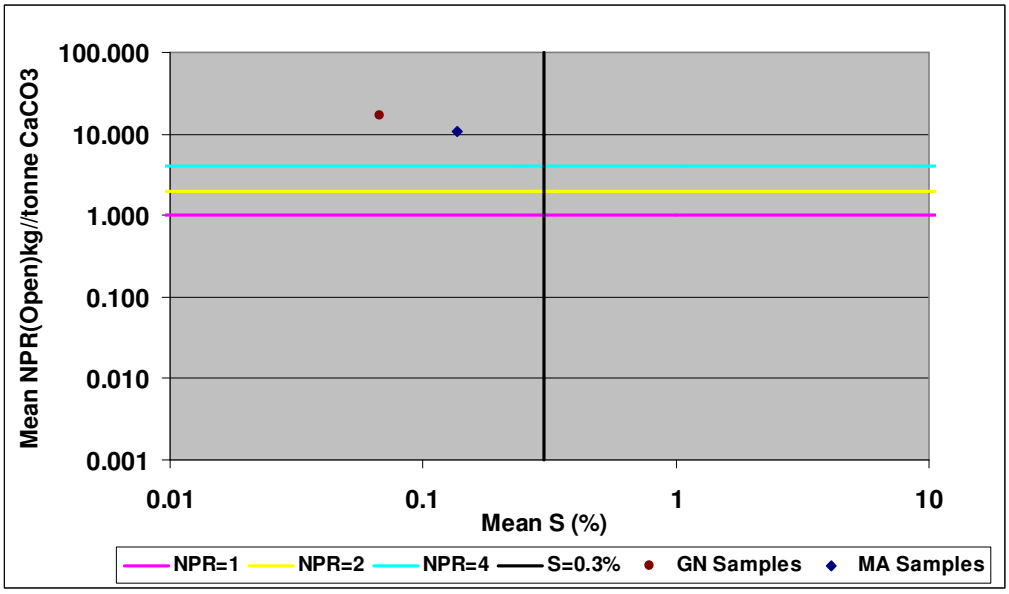

Figure 12: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Gabbro-Norite (GN) and Mottled Anorthosite (MA) lithologies (Open System).

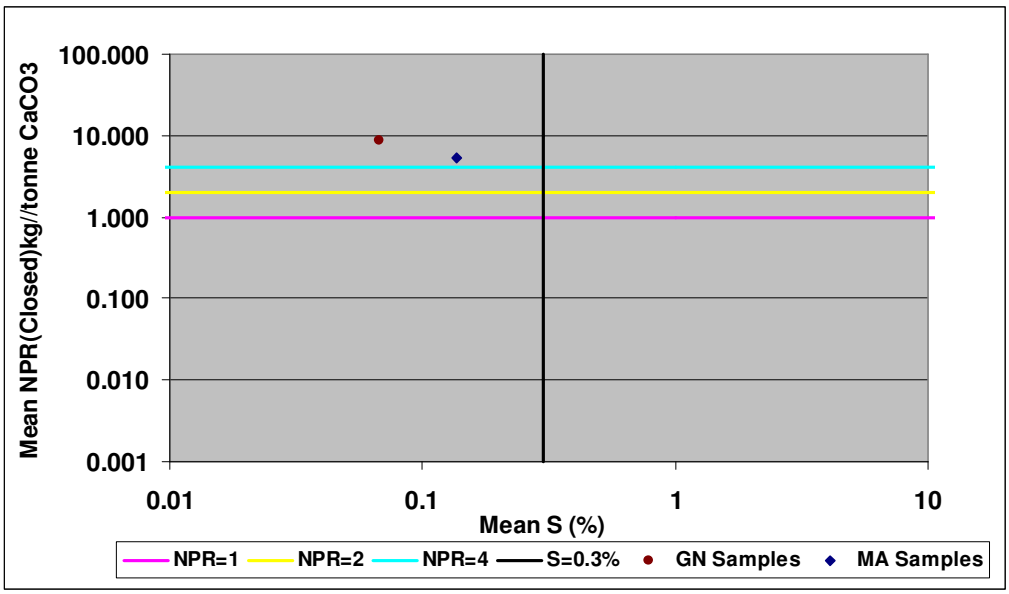

Figure 13: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Gabbro-Norite (GN) and Mottled Anorthosite (MA) lithologies (Closed System).

The figures show that both Hanging-wall lithologies plot with mean sulphide-sulphur values of less than 0.3% and mean NPR (Open) and NPR (Closed) values greater than 4, indicating a low probability of acid generation.

4.2.2.1.2. Platreef

Leuco – Norite, Pyroxenite, Pegmatitic Feldspathic Pyroxenite and Serpentinite

Figures 14 and 15 show the Mean Final pH against Mean Net Neutralising Potential (NNP) values for Leuco – Norite, Pyroxenite, Pegmatitic Feldspathic Pyroxenite and Serpentinite recorded for open and closed systems, respectively.

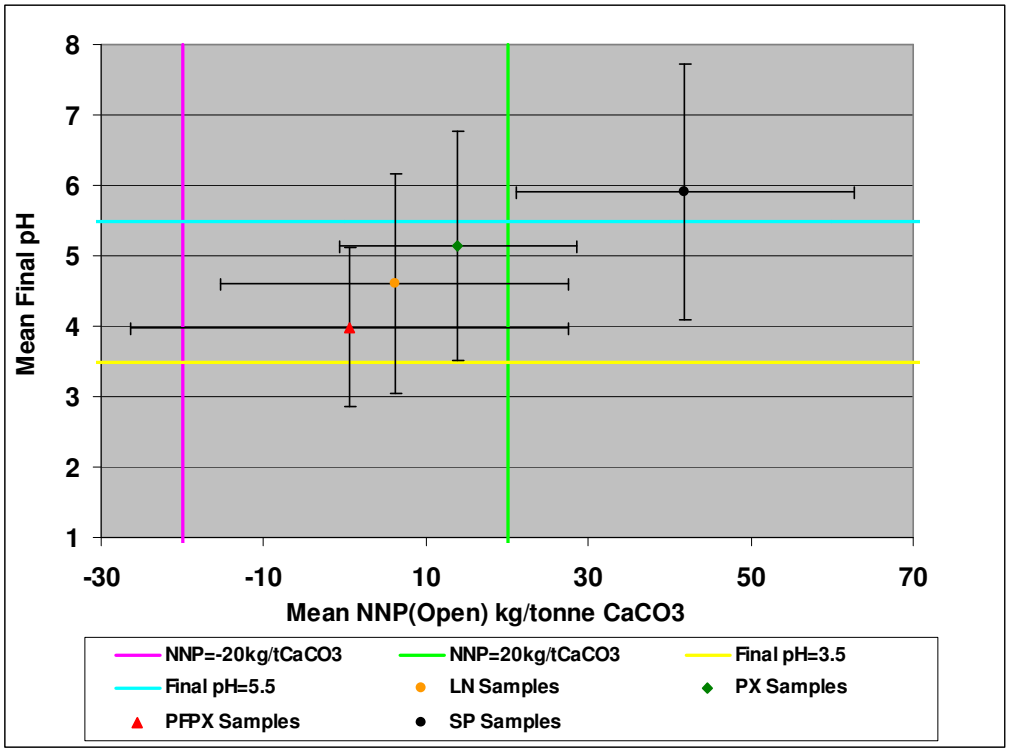

Figure 14: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Leuco – Norite (LN), Pyroxenite (PX), Pegmatitic Feldspathic Pyroxenite (PFPX) and Serpentinite (SP) lithologies (Open System).

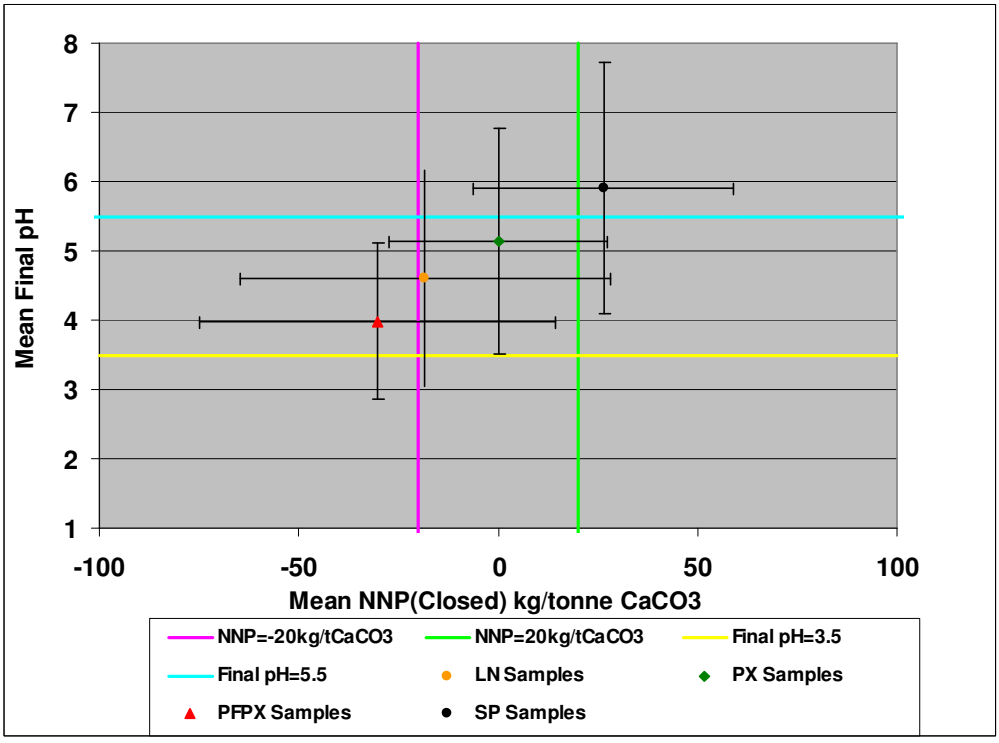

Figure 15: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Leuco – Norite (LN), Pyroxenite (PX), Pegmatitic Feldspathic Pyroxenite (PFPX) and Serpentinite (SP) lithologies (Closed System).

As can be seen, the mean NNP (Open) and NNP (Closed) values for Serpentinite are above 20 kg/tonne $CaCO_3$ indicating that this rock type has the potential to neutralise acid produced. The mean Final pH is above 5.5 which substantiates that this rock type is non-acid generating.

The mean NNP (Open) values for Pyroxenite, Leuconorite and Pegmatitic Feldspathic Pyroxenite are between 0 and 20 kg/tonne $CaCO_3$ indicating that these materials may neutralise any acid produced, but that the acid producing potential of these rocks is considered inconclusive and should be ascertained using other results. In a closed system, the mean NNP value for Pyroxenite remains positive, while the mean NNP values for Leuconorite and Pegmatitic Feldspathic Pyroxenite are negative, indicating that these materials have the potential to generate acid. However, as the mean NNP (Closed) value for Leuconorite falls between 20 and – 20 kg/tonne $CaCO_3$, the acid producing potential is considered inconclusive and should be ascertained using other results. Of particular concern is the mean NNP (Closed) value of Pegmatitic Feldspathic Pyroxenite which is below -20 kg/tonne $CaCO_3$.

The mean final pH values for Pyroxenite, Leuconorite and Pegmatitic Feldspathic Pyroxenite are above 3.5, but less than 5.5, indicating a low risk of acid generation.

Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite

Figures 16 and 17 show the Mean Final pH against Mean Net Neutralising Potential (NNP) values Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite recorded for open and closed systems, respectively.

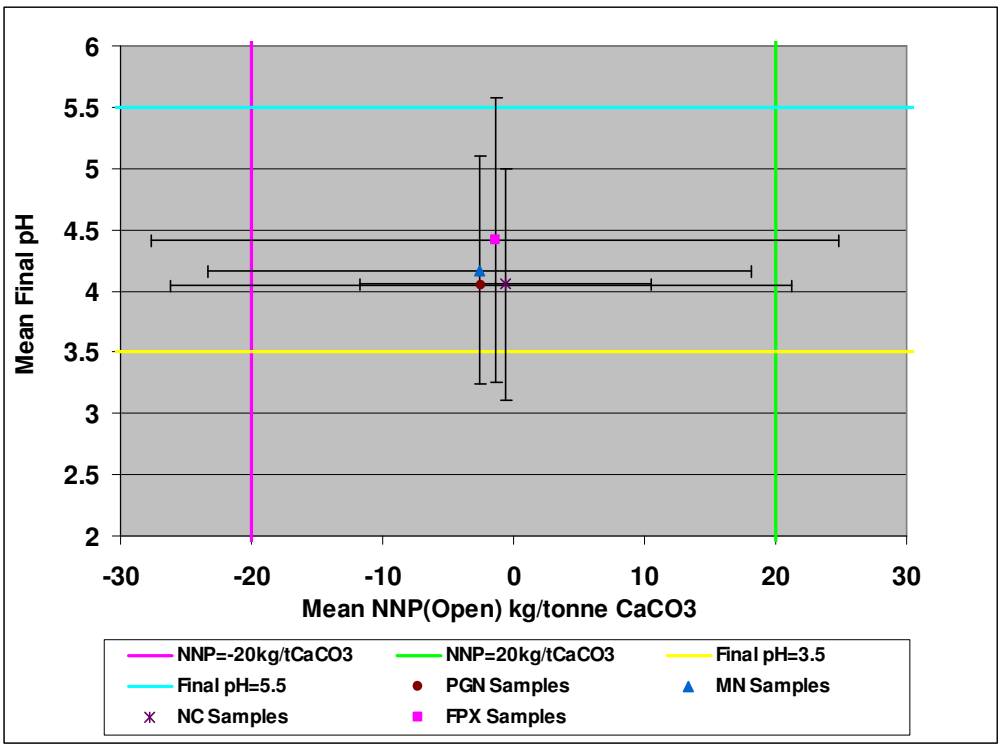

Figure 16: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Pegmatitic Gabbro-Norite (PGN), Melanorite (MN), Norite Cycles (NC) and Feldspathic Pyroxenite (FPX) lithologies (Open System).

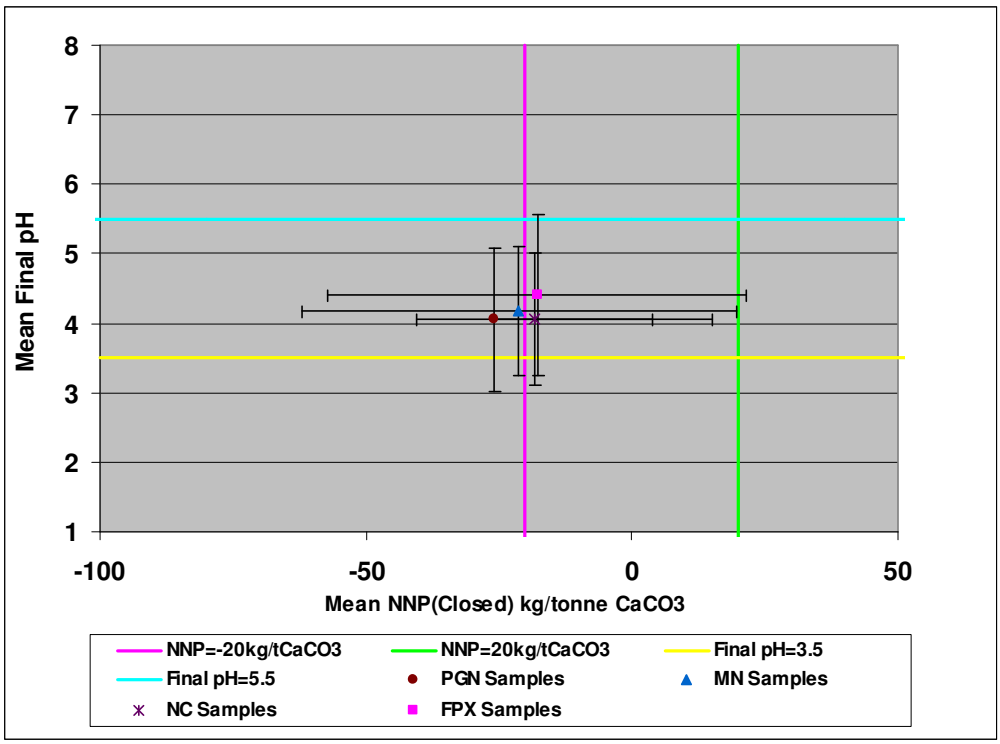

Figure 17: Mean Final pH against Mean Net Neutralizing Potential (NNP) Pegmatitic Gabbro-Norite (PGN), Melanorite (MN), Norite Cycles (NC) and Feldspathic Pyroxenite (FPX) lithologies (Closed System).

The mean NNP (Open) values for Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite are less than 0 kg/tonne $CaCO_3$ indicating that these materials have the potential to produce acid. However, as the mean NNP (Open) values for these rocks fall between 20 and – 20 kg/tonne $CaCO_3$, the acid producing potential is considered inconclusive and should be ascertained using other results. The closed system environment causes the mean NNP values of these rock types to decrease to approximately -20 kg/tonne $CaCO_3$. The mean Final pH for these samples recorded between 3 and 5.5 indicating a low risk of acid generation.

The mean Final pH values for Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite are all above 3.5 and below 5.5, indicating a low risk for acid generation.

Figures 18 and 19 record the Mean Net Neutralising Potential Ratio (NPR) against the mean sulphide-sulphur content for Leuconorite, Pyroxenite, Pegmatitic Feldspathic Pyroxenite, Serpentinite, Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite lithologies in open and closed systems, respectively.

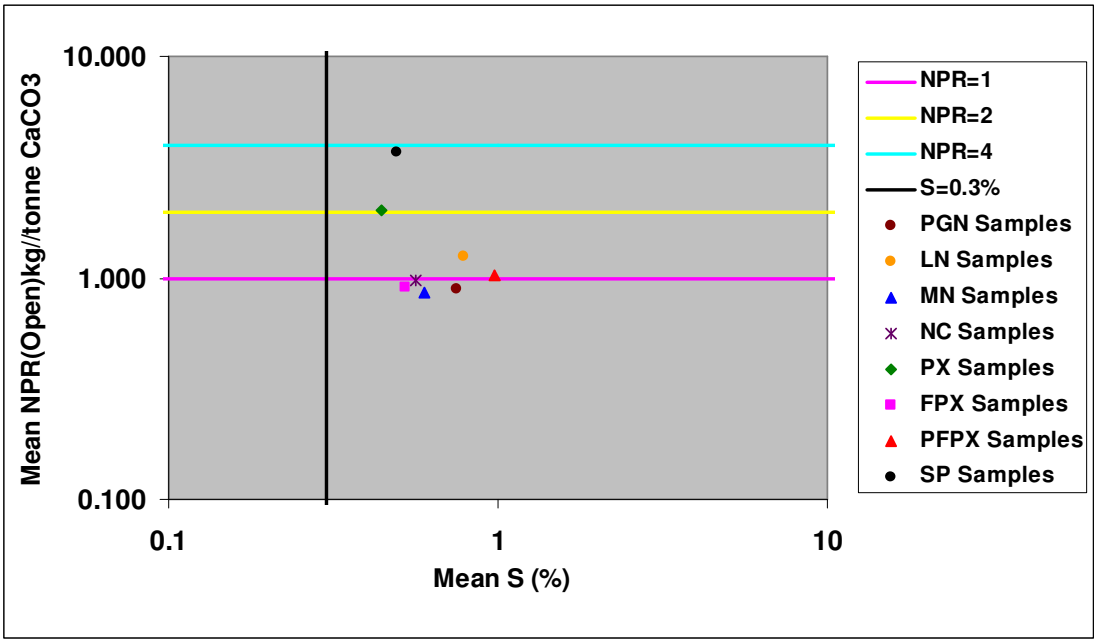

Figure 18: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Leuco – Norite (LN), Pyroxenite (PX), Pegmatitic Feldspathic Pyroxenite (PFPX), Serpentinite (SP), Pegmatitic Gabbro-Norite (PGN), Melanorite (MN), Norite Cycles (NC) and Feldspathic Pyroxenite_FPX lithologies (Open System).

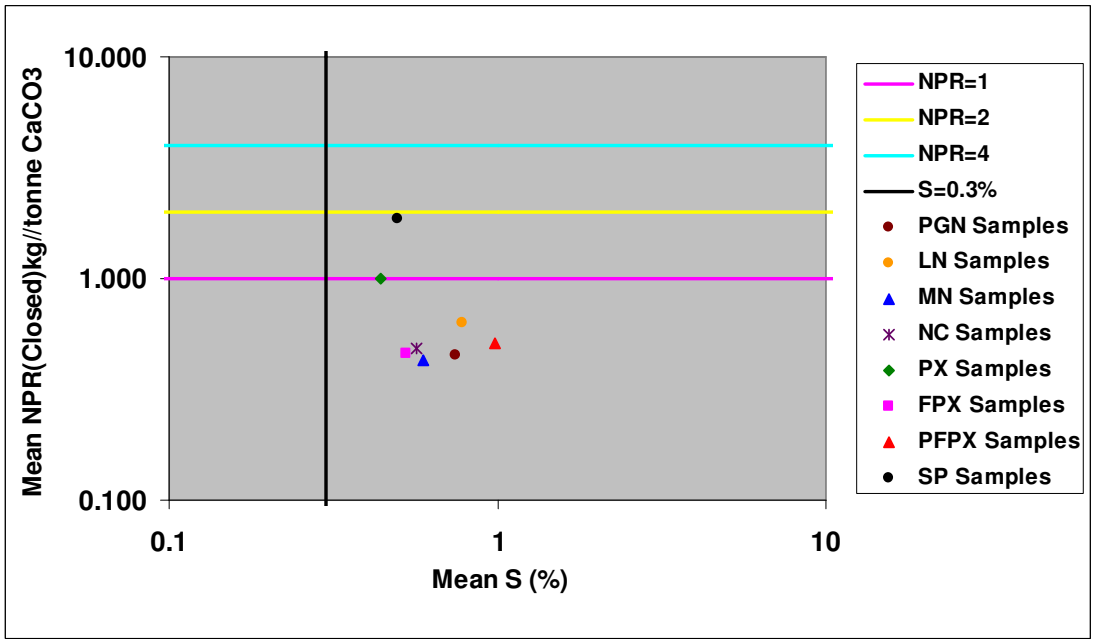

Figure 19: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Leuco – Norite (LN), Pyroxenite (PX), Pegmatitic Feldspathic Pyroxenite (PFPX), Serpentinite (SP), Pegmatitic Gabbro-Norite (PGN), Melanorite (MN), Norite Cycles (NC) and Feldspathic Pyroxenite_FPX lithologies (Closed System).

The figures above show that all the Platreef rock types contain more than 0.3% sulphide-sulphur. The Serpentinite, Pyroxenite, Leuconorite and Pegmatitic Feldspathic Pyroxenite samples have NPR (Open) values greater than 1, indicating an inconclusive probability of acid generation. It is noteworthy that the mean NPR (Open) values for Serpentinite and

Pyroxenite are 3.7 and 2, respectively. However, the Norite Cycles, Feldspathic Pyroxenite, Melanorite, and Pegmatitic Gabbro-Norite mean NPR (Open) values plot below 1, indicating a high probability of acid generation.
In a closed system, only the Serpentinite and Pyroxenite samples plot with a mean NPR above 1, while all the other PR rock types plot below 1.

4.2.2.1.3. Footwall

Dolomite and Quartzite

Figures 20 and 21 below show the Mean Final pH against Mean Net Neutralising Potential (NNP) values for Dolomite and Quartzite recorded for open and closed systems, respectively.

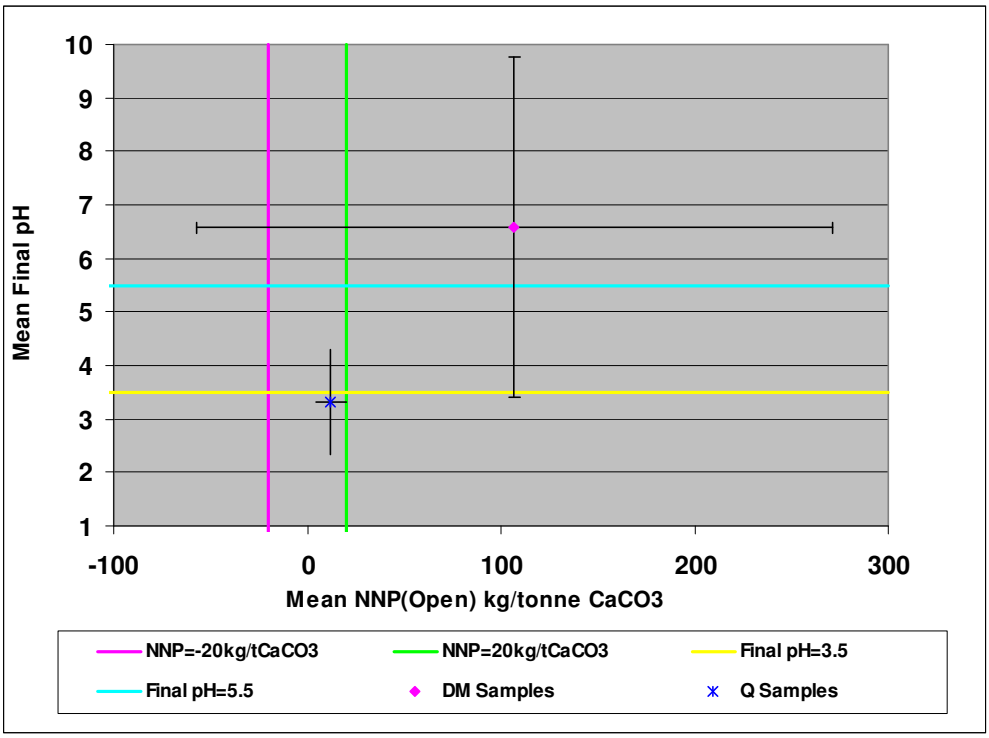

Figure 20: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Dolomite (DM) and Quartzite (Q) lithologies (Open System).

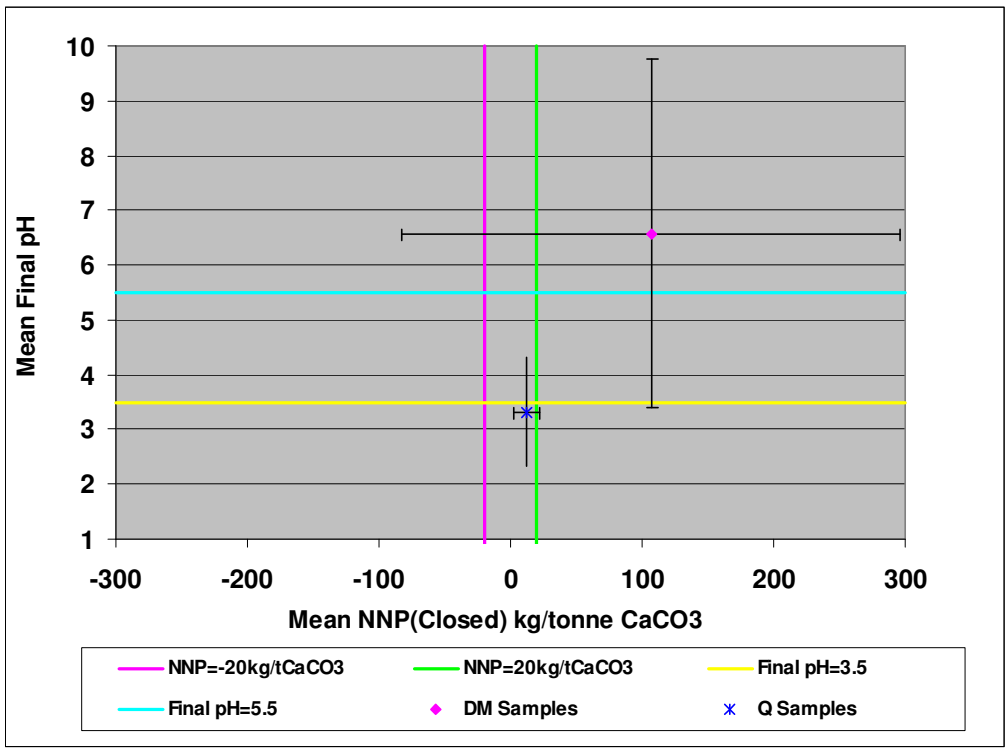

Figure 21: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Dolomite (DM) and Quartzite (Q) lithologies (Closed System).

The mean NNP (Open) and NNP (Closed) values for Quartzite plot above zero, but between -20 and 20 kg/tonne $CaCO_3$ indicating that these samples have the ability to neutralise acid, but that their acid producing potential is inconclusive and should be verified with further tests. The mean Final pH recorded for the Quartzite samples is below 3.5 indicating a high risk of acid generation.

The mean NNP (Open) and NNP (Closed) values for Dolomite plot at 106.88 and 77.13 kg/tonne $CaCO_3$, respectively, indicating a strong potential to neutralise acid produced. The mean Final pH value for Dolomite is greater than 5.5 indicating that this material is generally non-acid generating.

The relatively very high standard deviation presented for the NNP (Open), NNP (Closed) and Final pH results is noteworthy as Dolomite will be dumped during the LoM. For this reason, the individual Dolomite sample results are plotted in figures 22 (Open System) and 23 (Closed System).

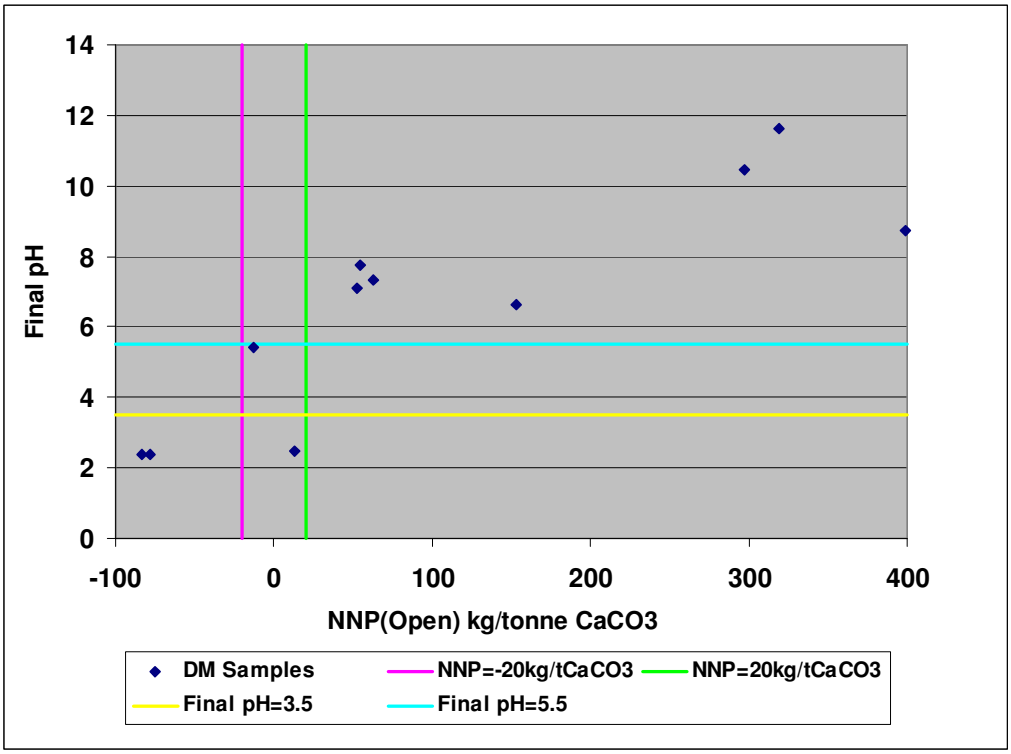

Figure 22: Final pH against Net Neutralizing Potential (NNP) for Dolomite (DM) Samples (Open System).

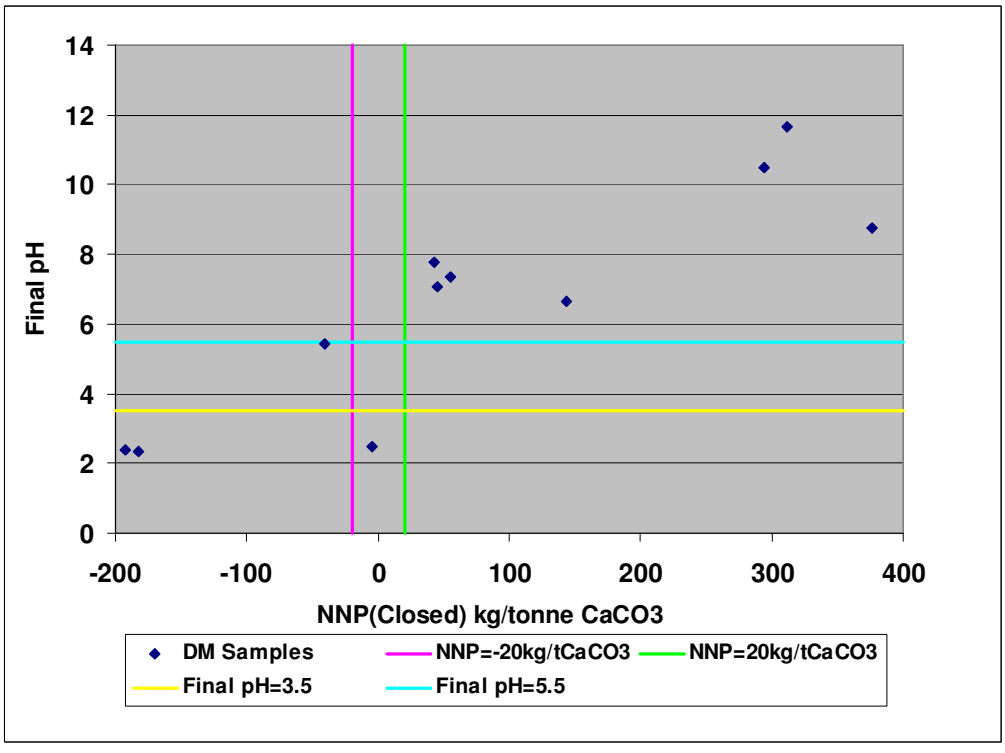

Figure 23: Final pH against Net Neutralizing Potential (NNP) for Dolomite (DM) Samples (Closed System).

As can be seen above, seven out of the eleven Dolomite samples (63.6%) plotted with NNP (Open) and NNP (Closed) values greater than 20 kg/tonne $CaCO_3$ and Final pH values greater than 5.5. These results indicate that these samples have the ability to neutralise acid produced and are themselves non-acid generating. The majority of dolomite at Platreef is of this type.

A further two of the Dolomite samples (18.2%) plotted with NNP (Open) values between -20 and 20 kg/tonne $CaCO_3$. Although the acid generating characteristics of these samples are considered inconclusive, one of these samples recorded a Final pH below 3.5 indicating a high risk of acid generation, the other sample showed a Final pH of 5.42 indicating a low risk of acid generation.

The remaining two Dolomite samples (18.2%) recorded NNP (Open) values below -20 kg/tonne $CaCO_3$ and Final pH values less than 3.5 indicating that these samples are considered high risk in terms of acid generation. They represent narrow high-sulphide lenses (generally <1m), typically in the Platreef Footwall, that constitute only a very small percentage of the overall mineralisation.

In the closed system environment only one Dolomite sample (9.1%) recorded NNP value between -20 and 20 kg/tonne $CaCO_3$, while three samples (27.3%) plotted with NNP values below -20 kg/tonne $CaCO_3$.

Hornfels and Marginal Zone Norite

Figures 24 and 25 show the Mean Final pH against Mean Net Neutralising Potential (NNP) values for Hornfels and Marginal Zone Norite recorded for open and closed systems, respectively.

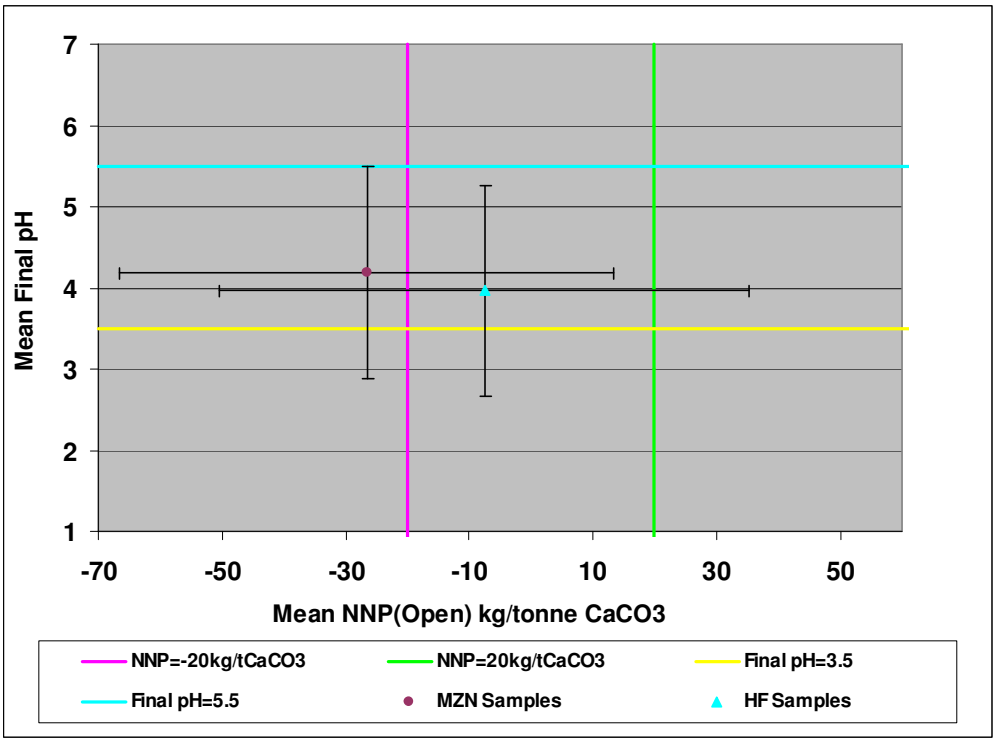

Figure 24: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Hornfels (HF) and Marginal Zone Norite (MZN) lithologies (Open System).

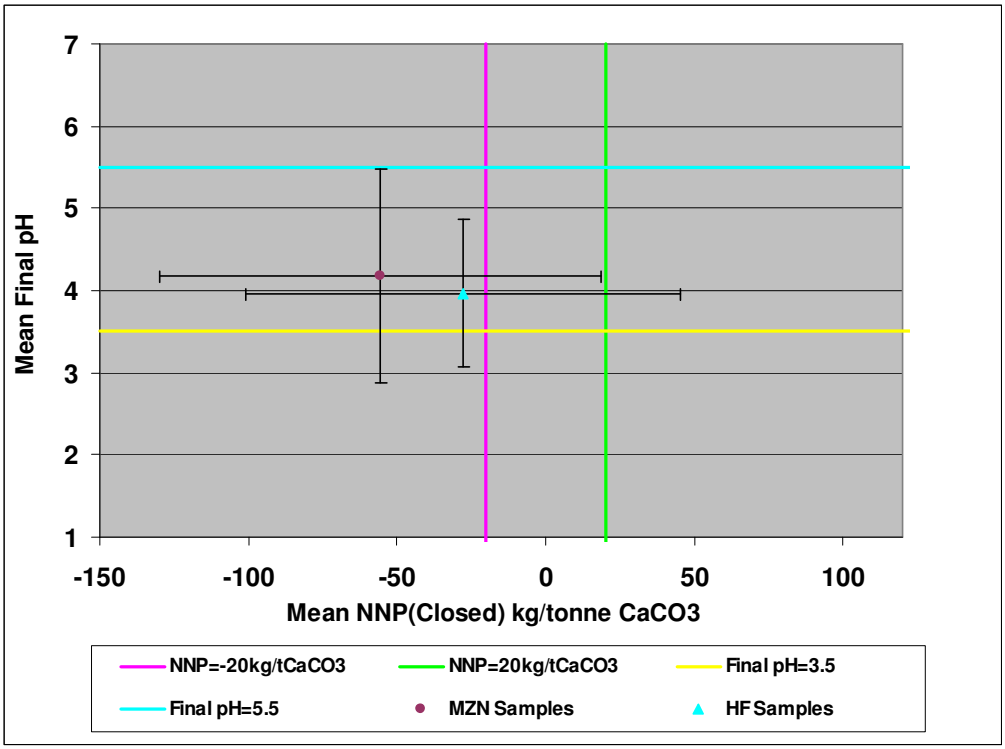

Figure 25: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Hornfels (HF) and Marginal Zone Norite (MZN) lithologies (Closed System).

As can be seen the mean NNP (Open) and NNP (Closed) values for Marginal Zone Norite are less than -20 kg/tonne $CaCO_3$, indicating that this rock type has the potential to generate acid. The mean Final pH value lies between 3.5 and 5.5 indicating a low risk of acid generation

In an open system the mean NNP for the Hornfels samples plots between -20 and 20 kg/tonne $CaCO_3$, while in a closed system this mean value shifts below -20 kg/tonne $CaCO_3$ indicating that Hornfels material has the potential to generate acid. The mean Final pH of the Hornfels samples is between 3.5 and 5.5 indicating a low risk of acid generation.

Although Hornfels and Marginal Zone Norite are not listed as waste material in the mine plan, these rock types occur in the Footwall and within the Platreef as xenoliths, so there is a chance that this material will be stockpiled at some stage during the LoM. The relatively high Standard Deviation seen in the NNP (Open), NNP (Closed) results for Hornfels and Marginal Zone Norite are therefore of interest and the sample results have been provided below:

Figures 26 and 27 show the Final pH against Net Neutralising Potential (NNP) values for Hornfels samples recorded for open and closed systems, respectively.

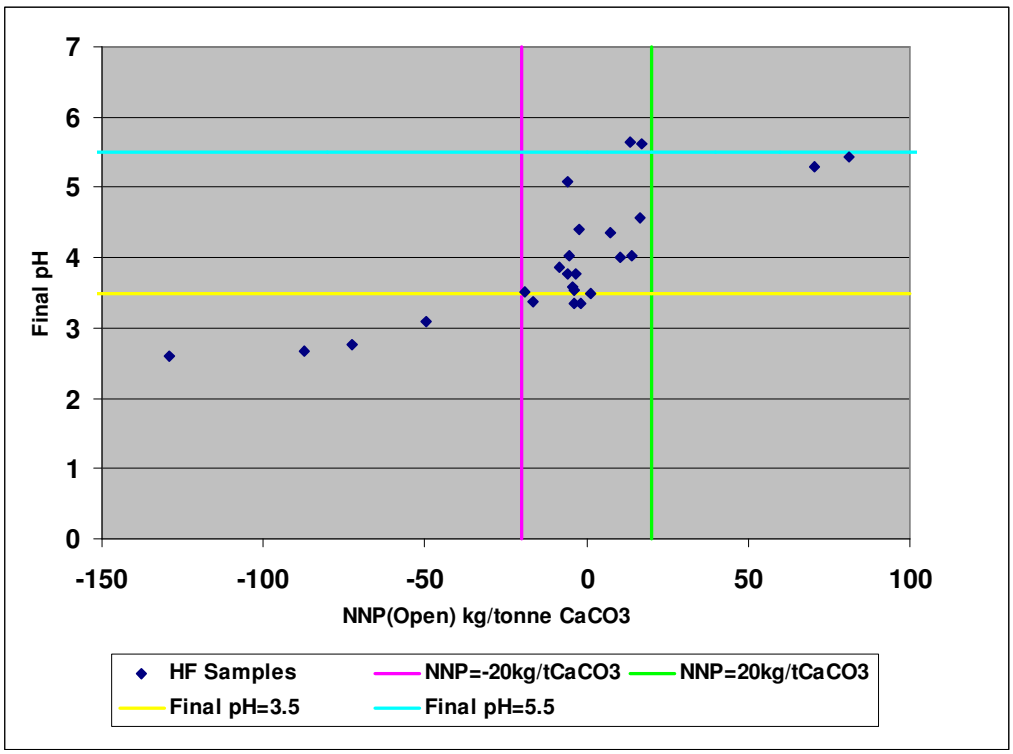

Figure 26: Final pH against Net Neutralizing Potential (NNP) for Hornfels (HF) samples (Open System).

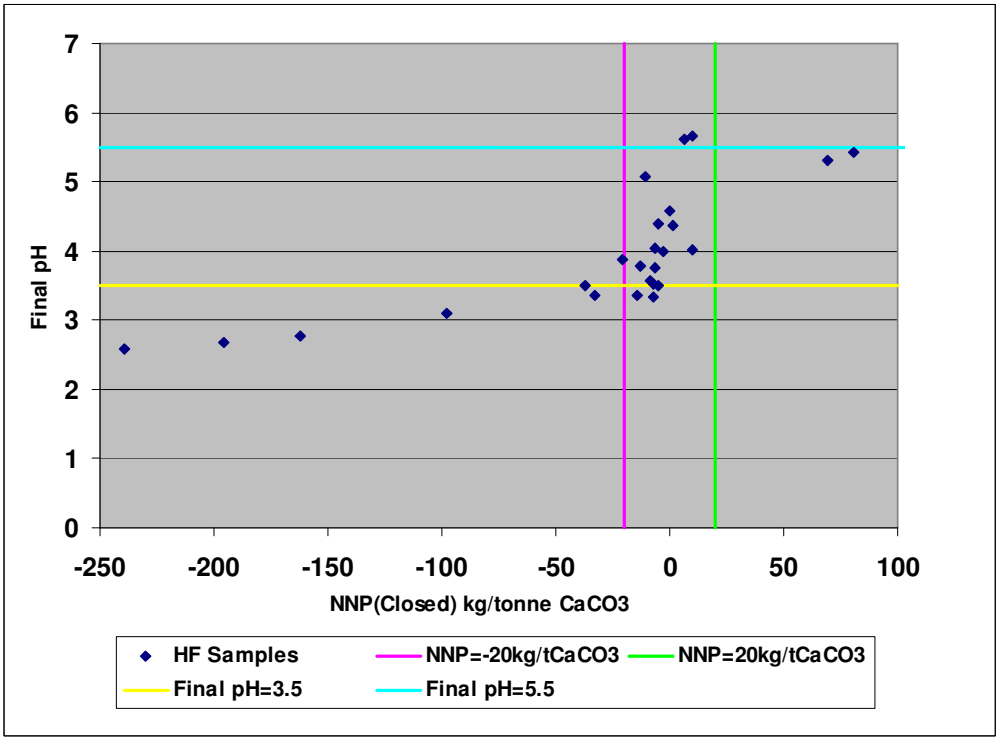

Figure 27: Final pH against Net Neutralizing Potential (NNP) for Hornfels (HF) samples (Closed System).

In both the open and closed systems two of the twenty-five Hornfels samples (8%) plot with NNP values greater than 20 kg/tonne $CaCO_3$ and Final pH values just less than 5.5 indicating these samples have the potential to neutralise acid produced and are considered low risk in terms of acid generation.

In an open system environment, 19 of the Hornfels samples (76%) plot with NNP values between -20 and 20 kg/tonne $CaCO_3$. Of these samples, three recorded Final pH values below 3.5 indicating a high risk of acid generation, fourteen samples plotted with Final pH values equal to or above 3.5 and below 5.5 indicating a low potential of acid generation and two plotted with Final pH values greater than 5.5 characteristic of non-acid generating material.

Four of the Hornfels samples (16%) plot with NNP values less than -20 kg/tonne $CaCO_3$ and Final pH values less than 3.5 indicating high risk of acid generation.

In the closed system, 16 of the Hornfels samples (64%) plot between -20 and 20 kg/tonne $CaCO_3$ with two samples plotting with Final pH values greater than 5.5, 12 samples plotting with Final pH values between 3.5 and 5.5 and two samples plotting with Final pH values less than 3.5.

Seven of the Hornfels samples (28%) plot with NNP values equal to and less than -20 kg/tonne $CaCO_3$. Of these samples, two have Final pH values equal to and greater than 3.5, while 5 have Final pH values less than 3.5.

Figures 28 and 29 show the Final pH against Net Neutralising Potential (NNP) values for Marginal Zone Norite samples recorded for open and closed systems, respectively.

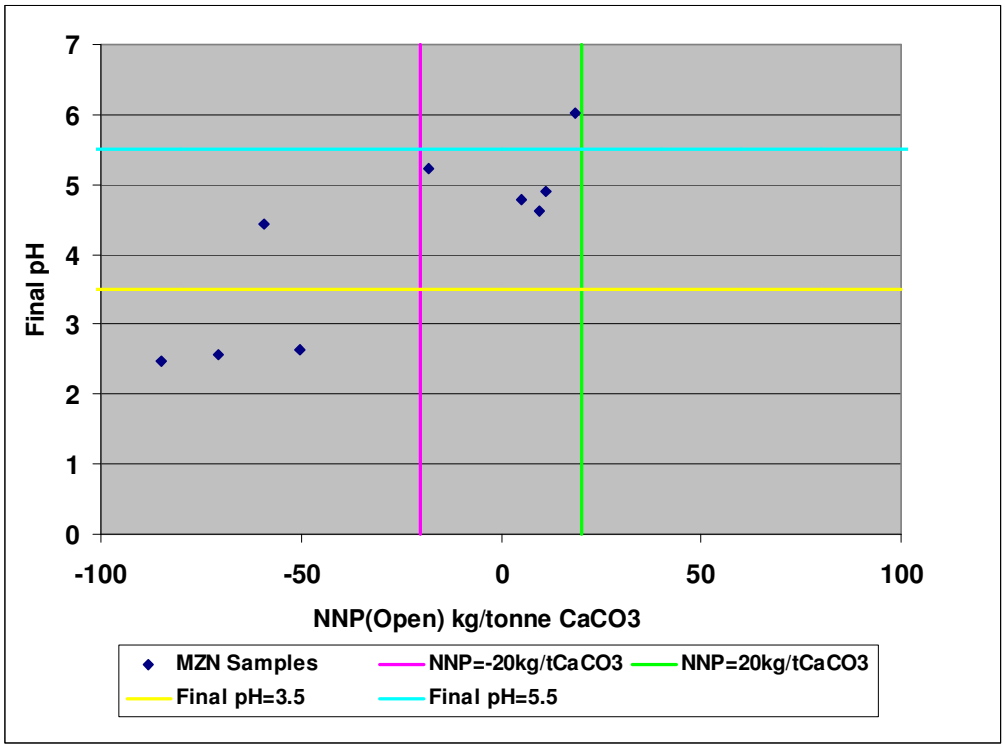

Figure 28: Final pH against Net Neutralizing Potential (NNP) for Marginal Zone Norite (MZN) samples (Open System).

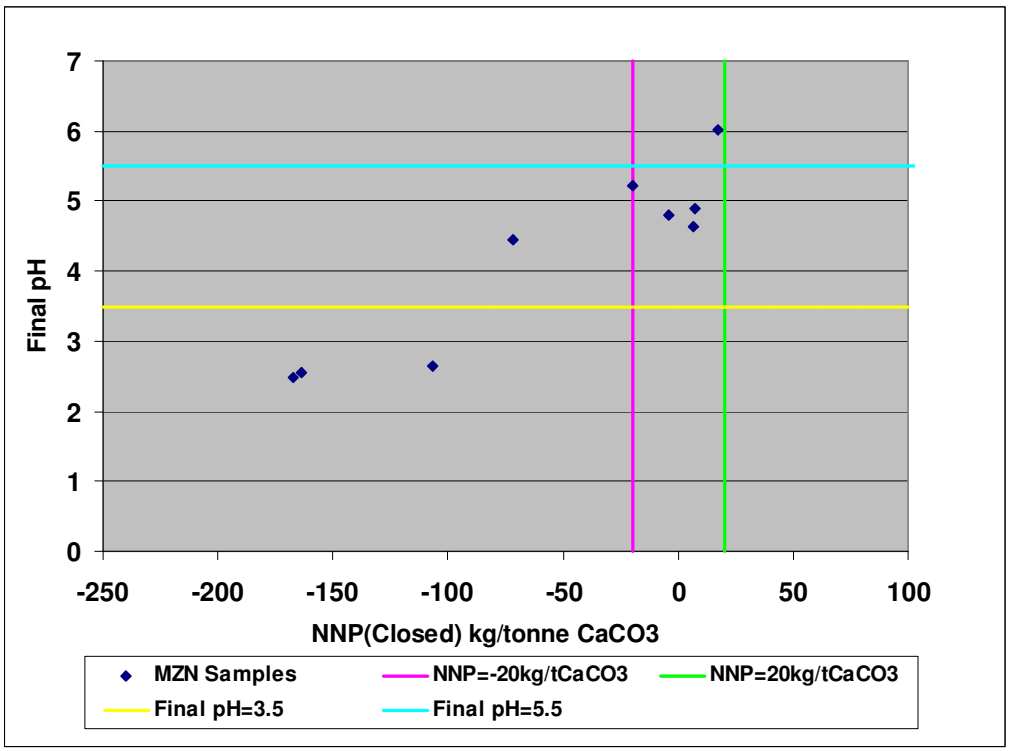

Figure 29: Final pH against Net Neutralizing Potential (NNP) for Marginal Zone Norite (MZN) samples (Closed System).

In both the open and closed systems, four of the nine Marginal Zone Norite samples (44.4%) plot with NNP values less than -20 kg/tonne $CaCO_3$ indicating a potential to generate acid. Of these samples, one sample has a Final pH value greater than 3.5 and less than 5.5 indicating a low risk of acid generation, while the other 3 samples have Final pH values less than 3.5 indicating a high risk of acid generation. The remaining five of the Marginal Zone Norite samples (55.6%) plot with NNP values between -20 and 20 kg/tonne $CaCO_3$. Of these samples, one sample has a Final pH value greater than 5.5 indicating a potential to neutralise acid produced, while the remaining four samples have Final pH values between 3.5 and 5.5 indicating a low risk of acid generation.

Figures 30 and 31 record the Mean Net Neutralising Potential Ratio (NPR) against the mean sulphide-sulphur content for Marginal Zone Norite, Hornfels, Dolomite and Quartzite samples in open and closed systems, respectively.

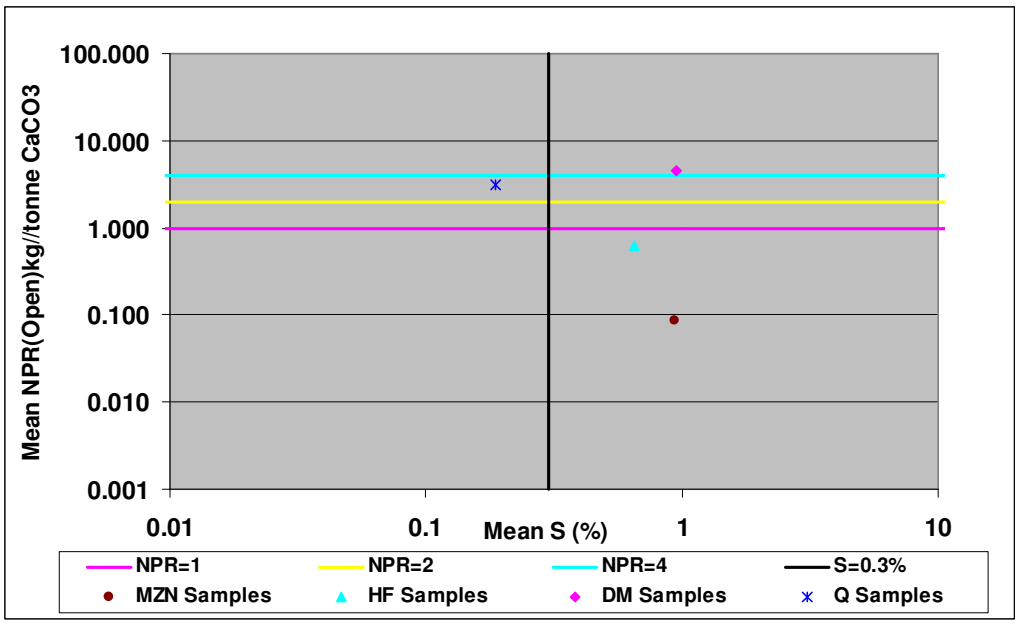

Figure 30: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Marginal Zone Norite (MZN), Hornfels (HF), Dolomite (DM) and Quartzite (Q) lithologies (Open System).

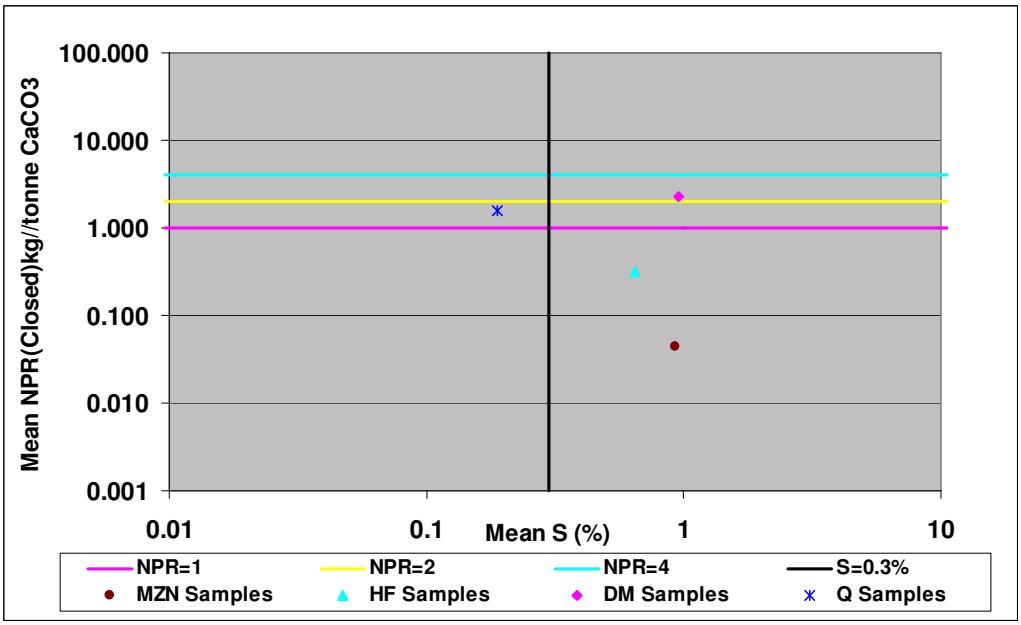

Figure 31: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Marginal Zone Norite (MZN), Hornfels (HF), Dolomite (DM) and Quartzite (Q) lithologies (Closed System).

In an open system, the mean NPR for the Dolomite samples is 4.59, while in a closed system this value drops to 2.29. The mean sulphide-sulphur value is greater than 0.3% for the Dolomite material. These results indicate an inconclusive probability of acid generation.

The Quartzite samples plot with a mean NPR (Open) value of 3.08 which drops to 1.54 in a closed system. The mean sulphide-sulphur content is below 0.3%. These results indicate an inconclusive probability of acid generation.

In an open system, the Hornfels samples plot with a mean NPR value of 0.63 which drops to 0.31 in a closed system. The mean sulphide-sulphur content is 0.65%. These results indicate a high probability of acid generation.

The Marginal Zone Norite samples plot with a mean NPR (Open) value of 0.09 and a mean NPR (Closed) value of 0.04. The mean sulphide-sulphur content is 0.93%. These results indicate a high probability of acid generation.

4.2.2.1.4. Intrusions

Figures 32 and 33 show the Mean Final pH against Mean Net Neutralising Potential (NNP) values for Dolerite, Quartz Feldspar and Aplite recorded for open and closed systems, respectively.

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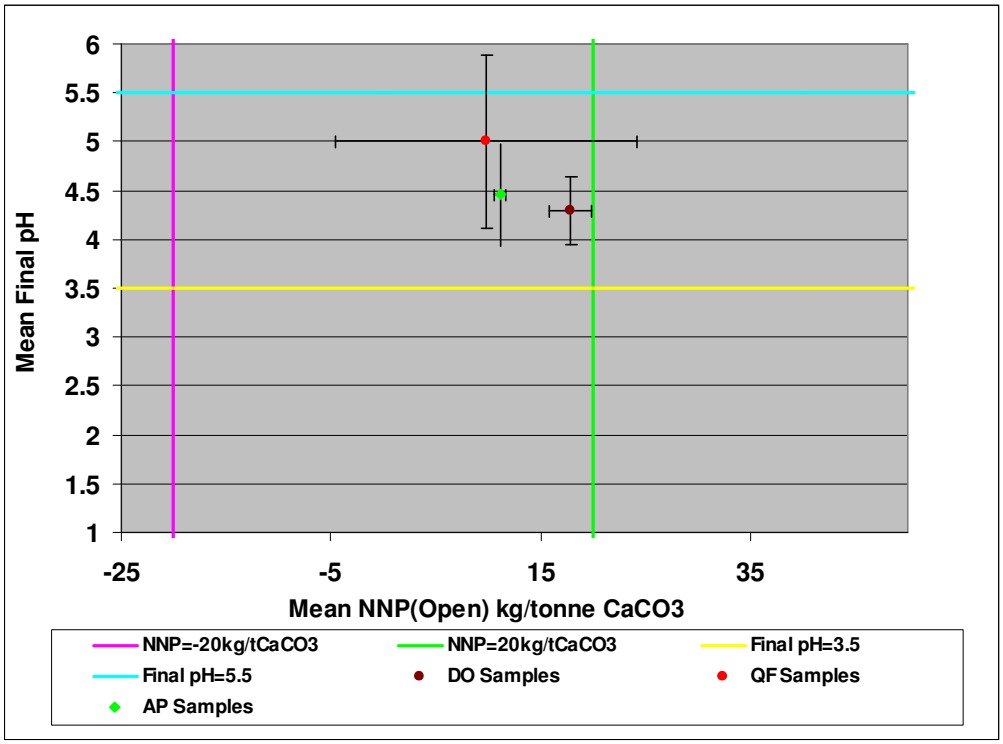

Figure 32: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Dolerite (DO), Quartz Feldspar (QF) and Aplite (AP) lithologies (Open System).

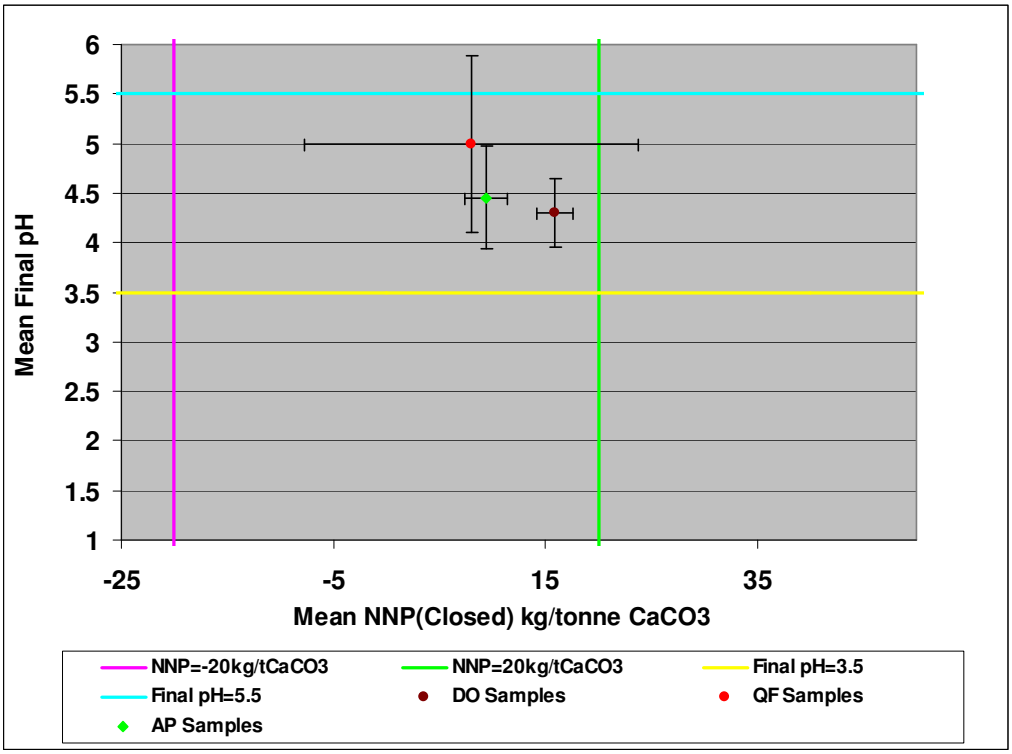

Figure 33: Mean Final pH against Mean Net Neutralizing Potential (NNP) for Dolerite (DO), Quartz Feldspar (QF) and Aplite (AP) lithologies (Closed System).

With respect to the Intrusive lithologies, approximately 37.5 and 33.33% of the Quartz Feldspar, Dolerite and Aplite plot between -20 and 20 kg/tonne $CaCO_3$. The mean Final pH values for these rock types plot between 3.5 and 5.5 indicating a low risk in terms of acid generation. The mine plan indicates that Dolerite and Aplite are likely to be generated as waste rocks during mining. The relatively small standard deviation in the NNP and Final pH results for these rock types indicate minor variation from the mean results presented above.

Figures 34 and 35 record the Mean Net Neutralising Potential Ratio (NPR) against the mean sulphide-sulphur content for Dolerite, Quartz Feldspar and Aplite recorded for open and closed systems, respectively.

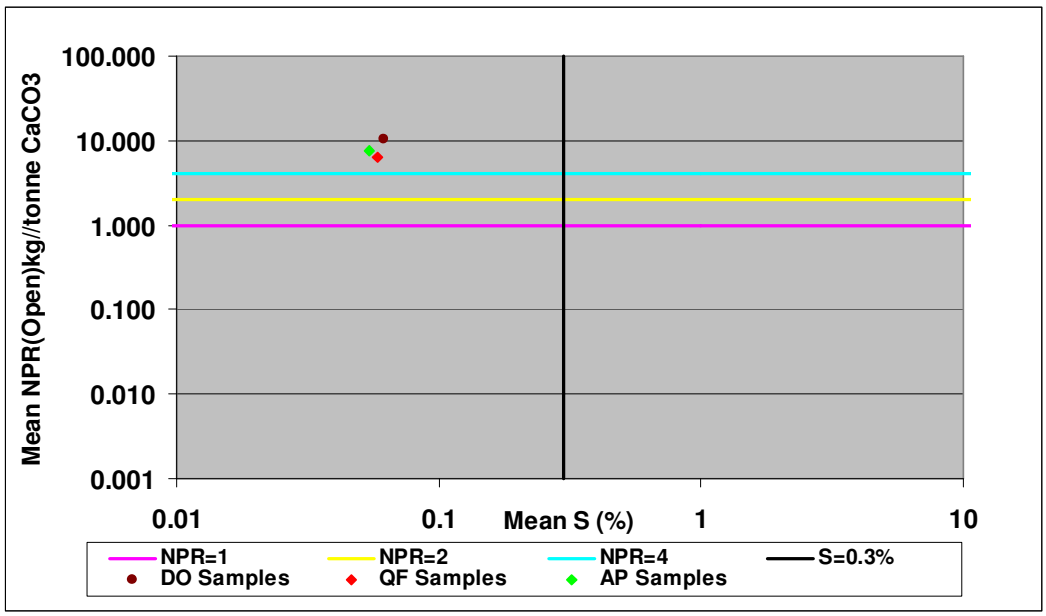

Figure 34: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Dolerite (DO), Quartz Feldspar (QF) and Aplite (AP) lithologies (Open System).

In the open system environment, the intrusive rock types plot with less than 0.3% sulphide-sulphur and an NPR value greater than 4. This indicates that these rock types have a low probability of acid generation.

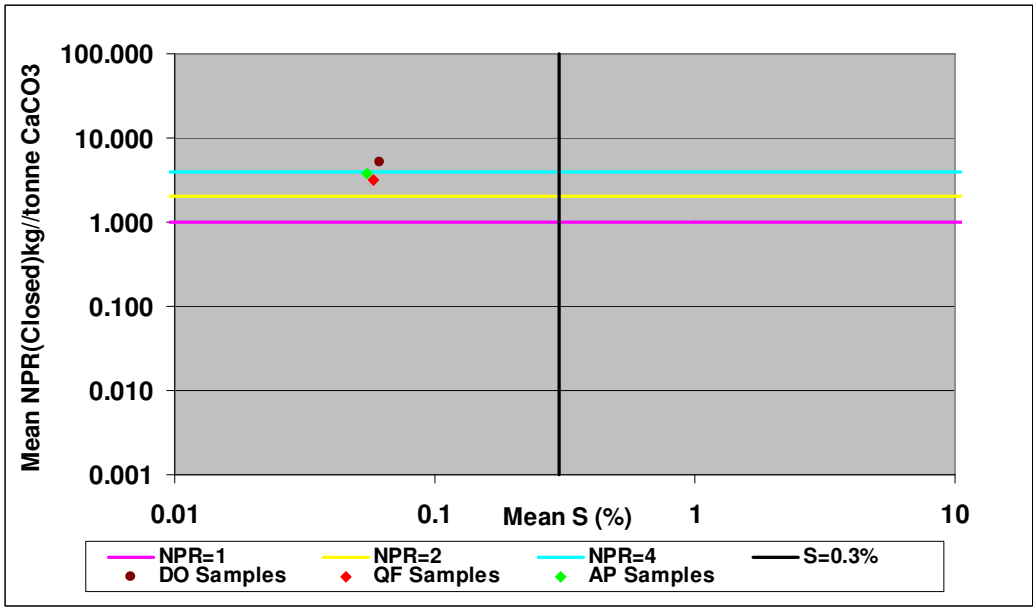

Figure 35: Mean Neutralising Potential Ratio (NPR) against mean sulphide-sulphur content for Dolerite (DO), Quartz Feldspar (QF) and Aplite (AP) lithologies (Closed System).

In the closed system environment, all the intrusive lithologies recorded less than 0.3% sulphide-sulphur content. The Dolerite samples recorded a mean NPR above 4, while the Quartz Feldspar and Aplite samples plotted with NPR values between 2 than 4. These results indicate that in closed system conditions the Dolerite samples still have a

low probability of acid generation, while the Quartz Feldspar and Aplite samples have an inconclusive probability of acid generation.

4.2.2.1.5. Tailings Samples

Figures 36 and 37 show the Final pH against Net Neutralising Potential (NNP) values for the tailings samples recorded for open and closed systems, respectively.

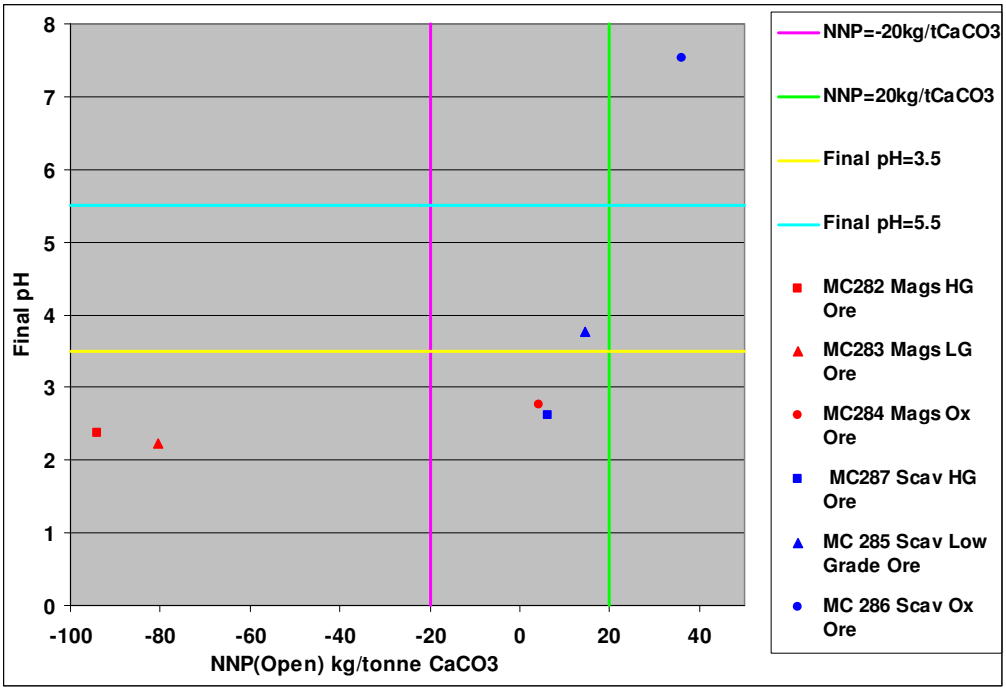

Figure 36: Final pH against Net Neutralizing Potential (NNP) for the Tailings Samples (Open System).

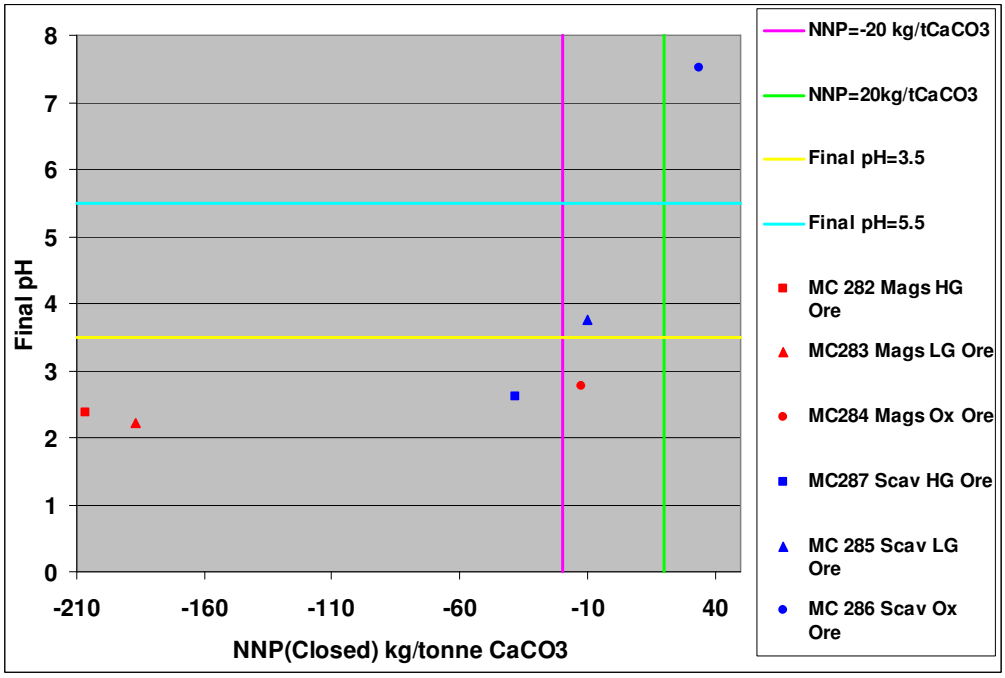

Figure 37: Final pH against Net Neutralizing Potential (NNP) for the Tailings Samples (Closed System).

The figures show that the Mags High Grade Ore and Mags Low Grade Ore Tailings are very likely to produce acid in both open and closed systems. The Scavenger High Grade Ore and Mags Oxidized Ore have Final pH values indicative of high risk of acid-generating and in the closed system environment, the NNP value for the Scavenger High Grade Ore sample indicates that this material has the potential to generate acid. The NNP results for the Scavenger Low Grade Ore sample in both open and closed systems are inconclusive, while the Final pH indicates that this material is low risk acid generating. In both open and closed systems, the NNP and Final pH results show that the Scavendger Oxidized Ore sample has the potential to neutralise acid produced and is considered non-acid generating.

Figures 38 and 39 record the Net Neutralising Potential Ratio (NPR) against the sulphide-sulphur content for the tailings samples in open and closed systems, respectively.

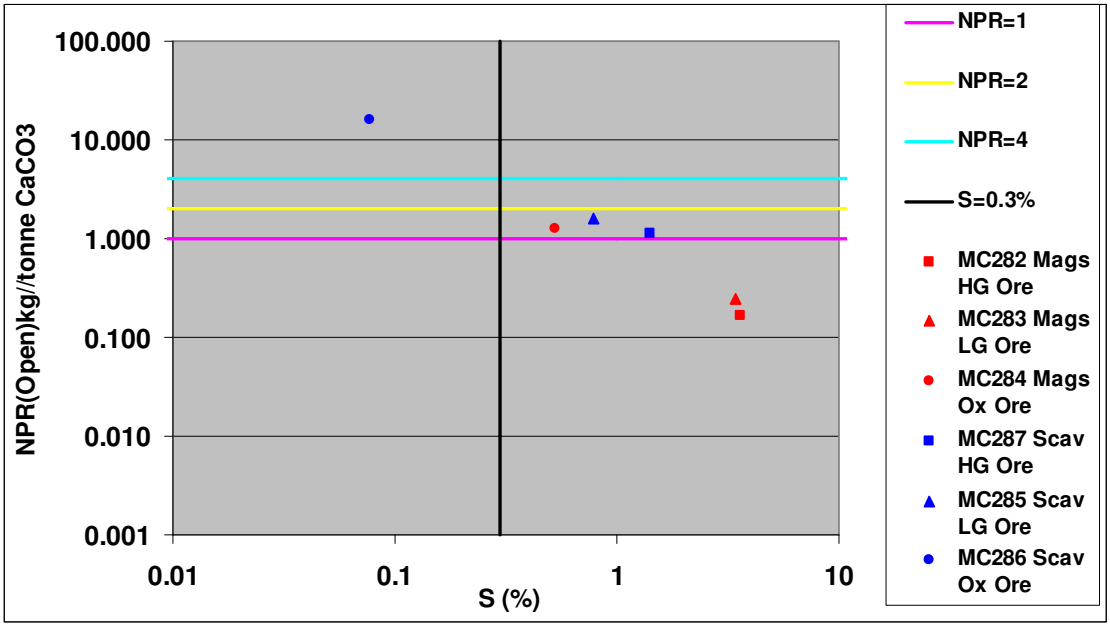

Figure 38: Neutralising Potential Ratio (NPR) against sulphide-sulphur content for the Tailings Samples (Open System).

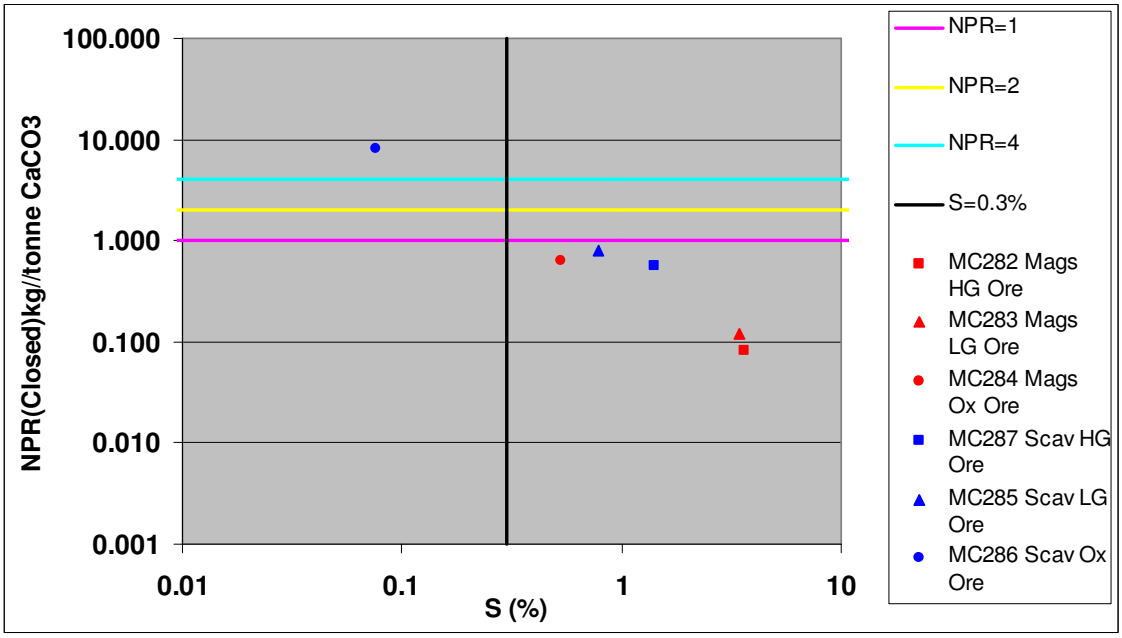

Figure 39: Neutralising Potential Ratio (NPR) against sulphide-sulphur content for the Tailings Samples (Closed System).

In both the open and closed systems, the Mags High Grade and Mags Low Grade Ore samples record greater than 0.3% sulphide-sulphur and NPR values less than 1 kg/tonne $CaCO_3$, indicating a high probability of acid generation. In both systems, the Scavenger Oxidized Ore recorded less than 0.3% sulphide-sulphur and an NPR value greater than 4, indicating a low probability of acid generation.

In the Open System, the Mags Oxidized Ore, Scavenger High Grade and Scavenger Low Grade Ore recorded sulphide-sulphur content greater than 0.3% and NPR values greater than 1, indicating an inconclusive probability of acid generation.

In the closed system, the Mags Oxidized Ore as well as the Scavenger High Grade and Low Grade Ore samples record sulphide-sulphur values greater than 0.3% as well as NPR values less than 1, indicating a high probability of acid generation.

4.2.2.2. Kinetic Test Results

As mentioned in Section 3.2.1, IGS was responsible for performing Kinetic Tests on selected samples in order to profile the acid generating characteristics of the samples relative to time. Examination of these results revealed extreme variation in pH values each week for each sample, and it became evident that the pH meter at IGS was not well calibrated throughout the test period. The results presented in this section represent a Five Point Moving Average of the data which smoothes the pH calibration errors in the laboratory and allows general trends in the data to be detected. The sample results are included as Appendix 15 for reference.

4.2.2.2.1. Gabbro-Norite

Figure 40 shows the variation in pH of the leachate from each of the five Gabbro-Norite samples with time as well as the variation in the mean pH with time as the kinetic tests progressed.

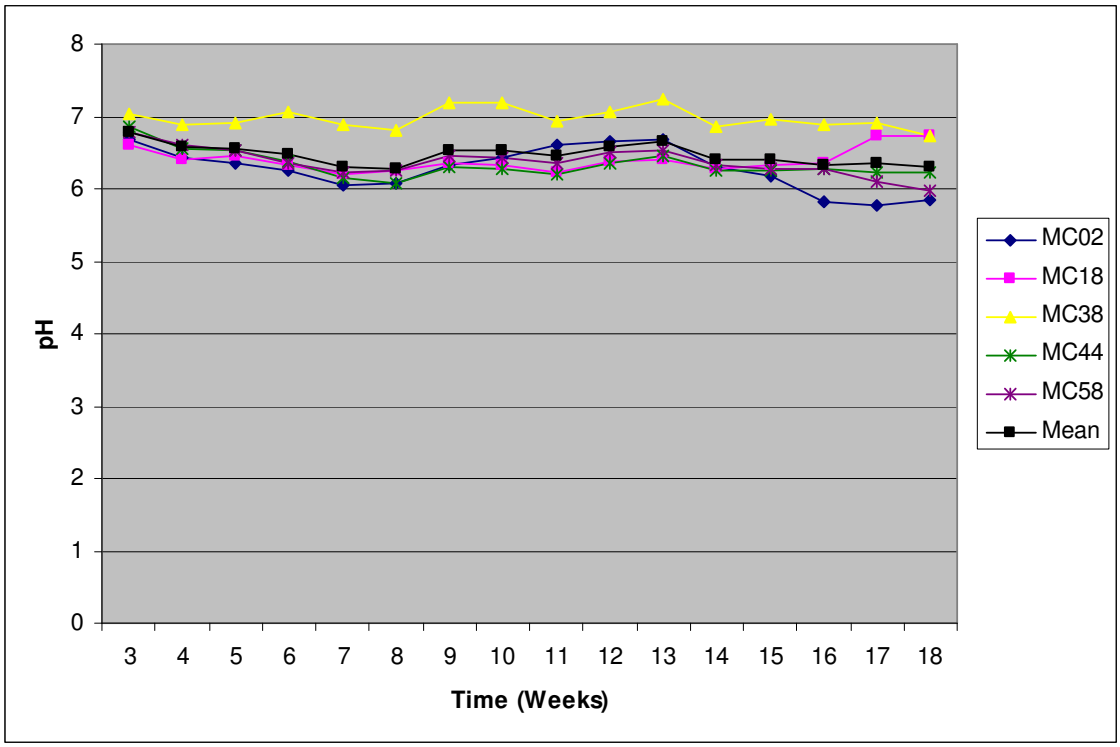

Figure 40: Variation in pH of each Gabbro-Norite sample submitted for kinetic tests as well as variation in the mean pH.

Figure 40 shows that the overall pH trend of the Gabbro-Norite samples was to vary slightly between pH 6 and 7 throughout the test period. It is interesting that MC18 recorded an increase in pH towards the end of the test period (Appendix 15). The samples recorded a pH variation ranging from 5.1 at week 15 (MC02) to 8.57 at week 18 (MC18) (Appendix 15).

4.2.2.2.2. Hornfels

Figure 41 shows the variation in pH of the leachate from each of the four Hornfels samples with time as well as the variation in the mean pH with time as the kinetic tests progressed.

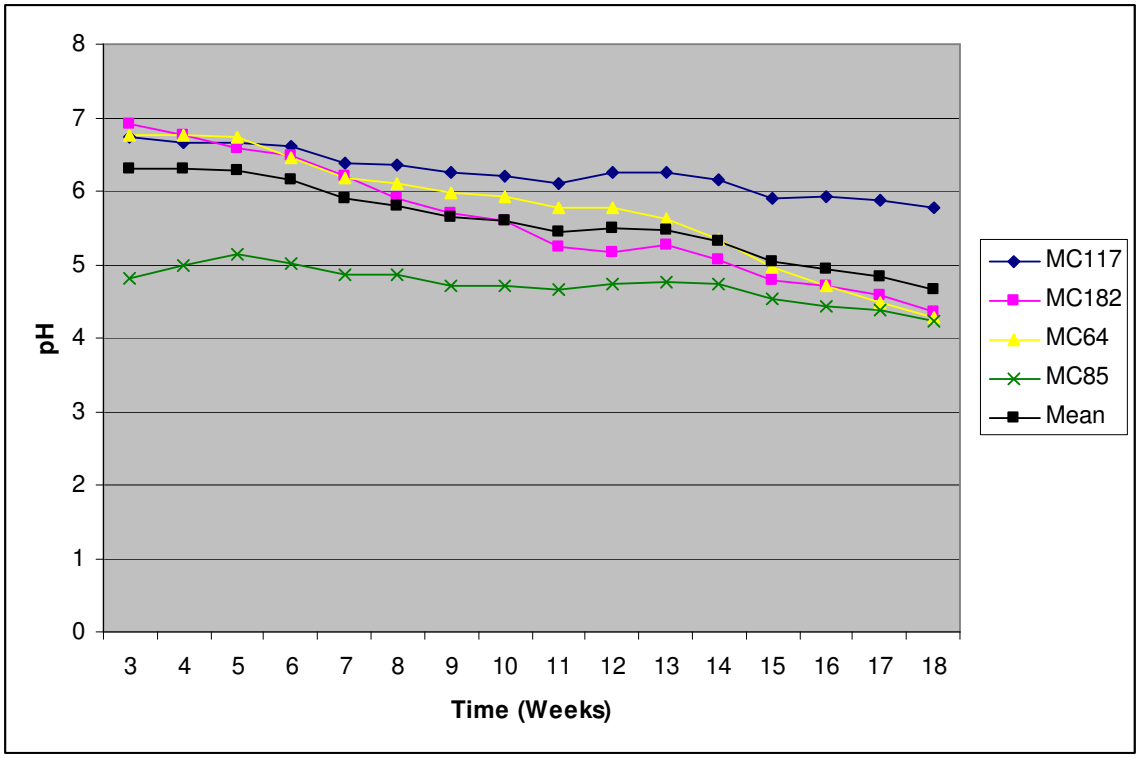

Figure 41: Variation in pH of each Hornfels sample submitted for kinetic tests as well as variation in the mean pH.

The overall pH trend in the Hornfels samples was to decrease from weakly acidic to acidic with time. It is noteworthy that MC85 recorded an acidic initial pH at week 3 which decreased only slightly to a more acidic pH at week 19. The samples recorded a pH variation ranging from 7.69 at week 2 (MC64) to 3.95 at week 17 (MC85) (Appendix 15).

4.2.2.2.3. Dolomite

Figure 42 shows the variation in pH of the leachate from each of the two Dolomite samples with time as well as the variation in the mean pH with time as the kinetic tests progressed.

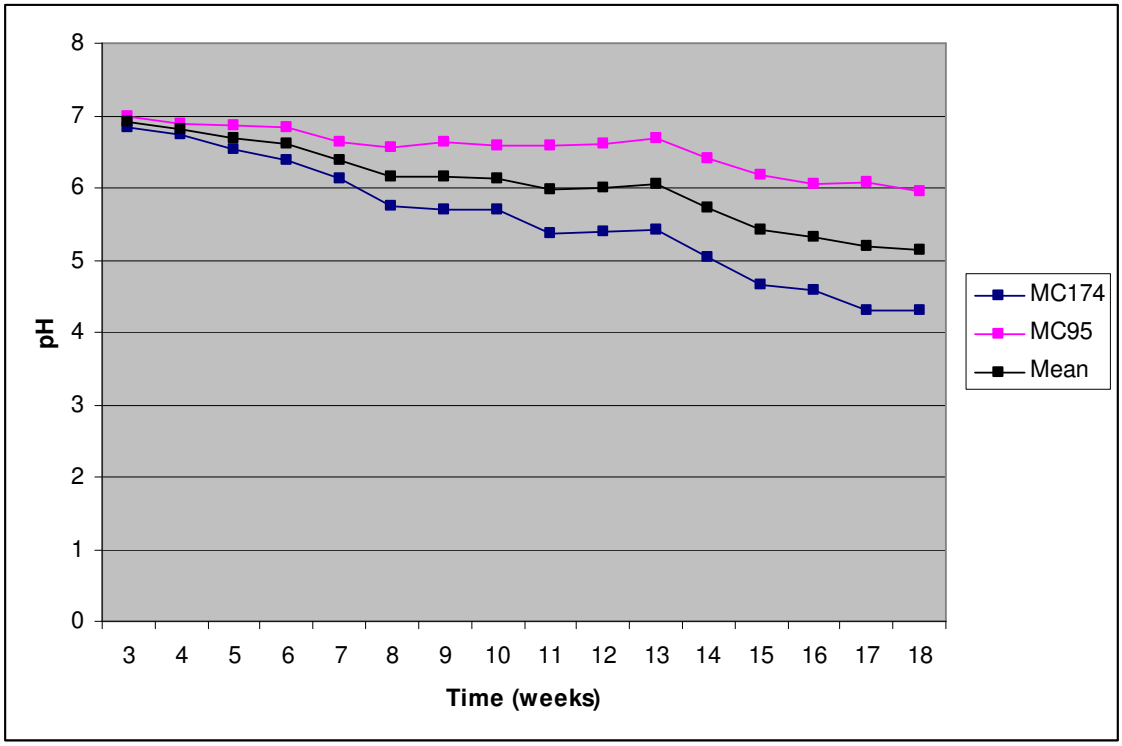

Figure 42: Variation in pH of each Dolomite sample submitted for kinetic tests as well as variation in the mean pH.

The overall pH trend in the Dolomite samples was to show a step-like decrease from neutral to acidic over time. The samples recorded a pH variation ranging from 7.02 at week 3 (MC95) to 4.07 at week 18 (MC174) (Appendix 15).

4.2.2.2.4. Quartzite (Q)

Figure 43 shows the variation in pH of the leachate from each of the two Quartzite samples with time as well as the variation in the mean pH as the kinetic tests progressed.

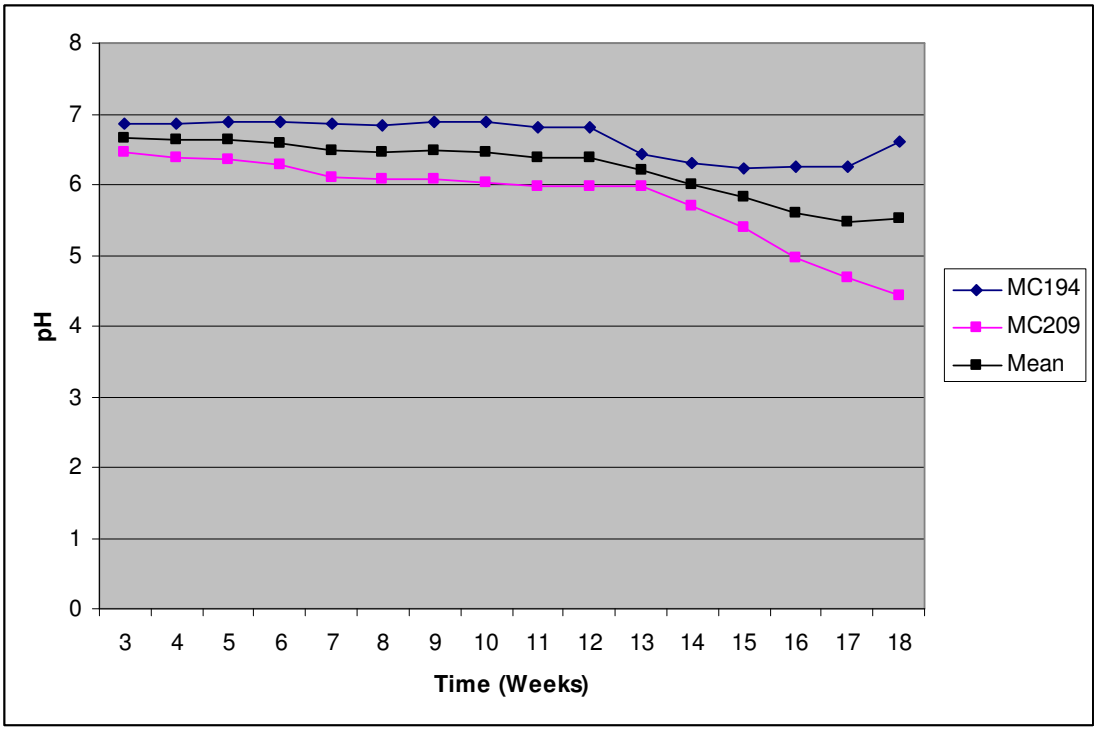

Figure 43: Variation in pH of each Quartzite sample submitted for kinetic tests as well as variation in the mean pH.

The overall pH trend of the Quartzite samples was to remain slightly acidic (between pH 6 and 7) for the first 12 weeks of the test period and then to decrease to acidic at the end of the test period. It is noteworthy that the pH of sample MC194 increased towards the end of the test period. The samples recorded a pH variation ranging from 7.1 at week 2 (MC194) to 3.84 at week 17 (MC209) (Appendix 15).

4.2.2.2.5. Feldspathic Pyroxenite and Melanorite

Figures 44 and 45 show the variation in pH with time of the Feldspathic Pyroxenite and Melanorite samples, respectively.

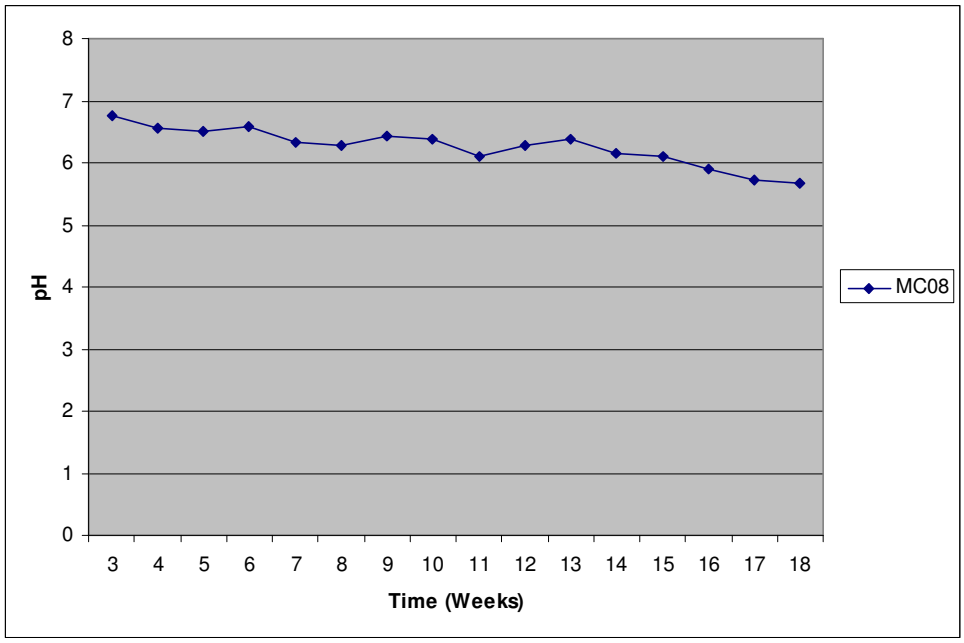

Figure 44: Variation in pH recorded for the FPX sample over the period of the kinetic test.

The Feldspathic Pyroxenite sample showed a near-neutral initial pH of 6.76, which decreased only slightly to a pH of 5.68 at the end of the test period. The sample recorded a pH variation ranging from a maximum pH of 7.46 at week 7 to a minimum pH of 5.04 at week 17 (Appendix 15).

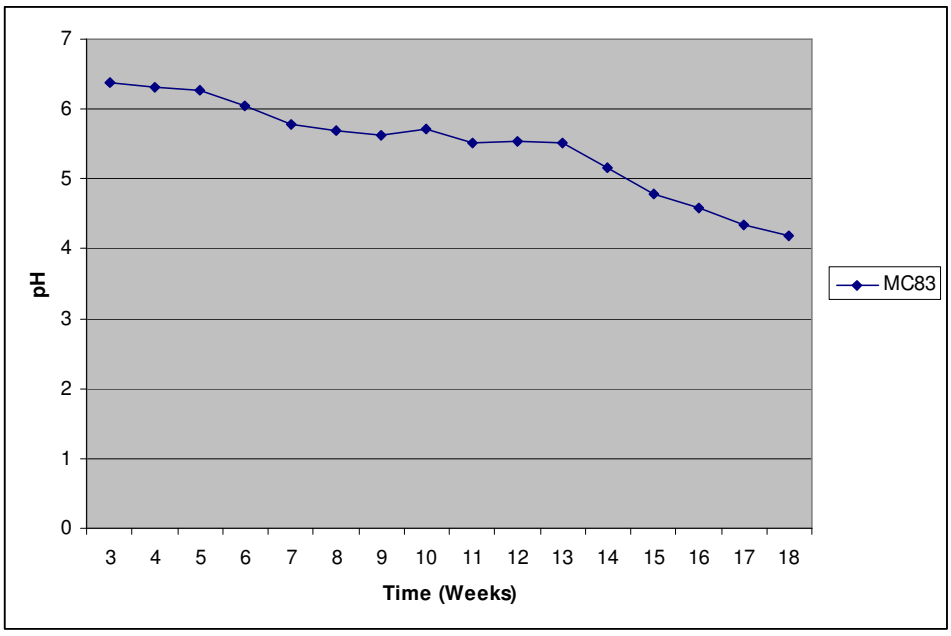

Figure 45: Variation in pH recorded for the Melanorite (MN) sample over the period of the kinetic test.

The Melanorite sample recorded a step like decrease from weakly acidic (pH of 6.38) at the beginning of the test period, to acidic (pH of 4.18) towards the end. The sample recorded a pH variation ranging from 7.28 at week 2 to 4.11 at week 17 (Appendix 15).

4.2.2.2.6. Tailings

Five samples of Rougher Tailings material were submitted for kinetic test analysis (Table 3). Figure 46 shows the variation in pH of the leachate from each of the five tailings samples with time as well as the variation in the mean pH over the kinetic test period.

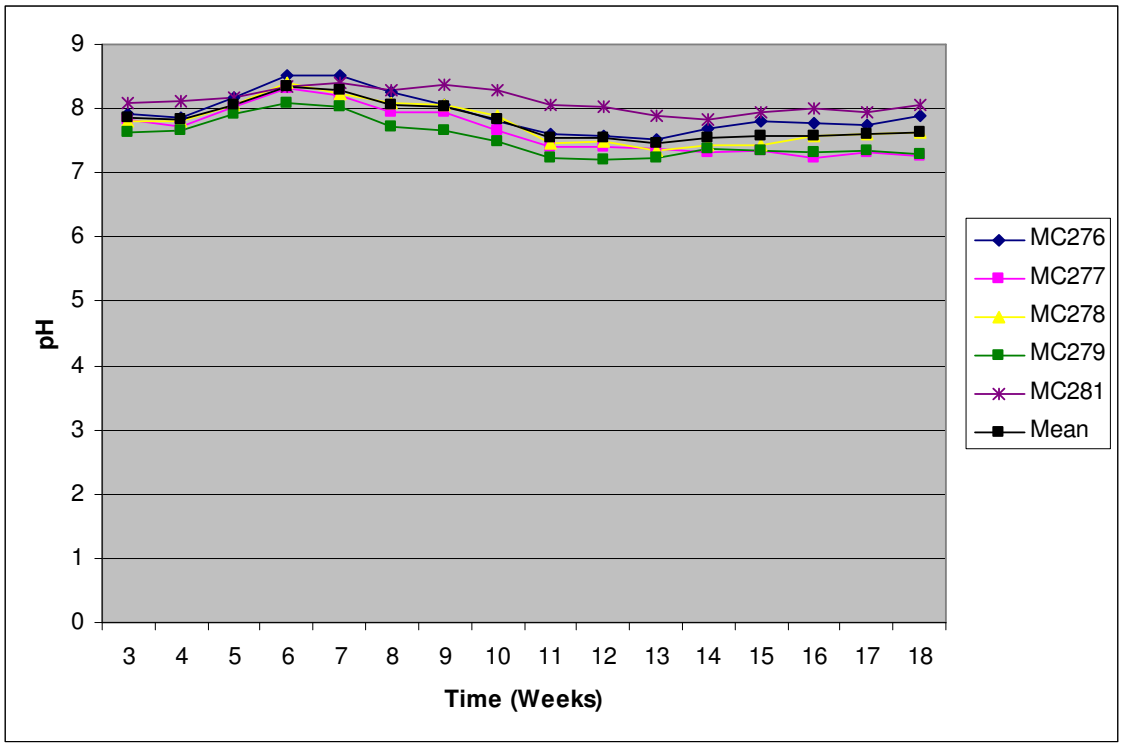

Figure 46: Variation in pH of each sample of Rougher Tailings submitted for kinetic tests as well as variation in the mean pH.

The overall pH trend in the tailings samples was to remain alkaline and fairly constant throughout the test period. The samples recorded a pH variation ranging from 9.35 at week 7 (MC276) to 6.75 at week 10 (MC279) (Appendix 15).

4.2.2.3. Whole Rock Geochemistry Results

As mentioned in Section 4.2.1, the whole rock geochemistry results have been provided in Appendices 8 (Database of Set Point Laboratory results) and 12 (database of classic statistical parameters) for reference purposes. The scope of this study to investigate the AMD generating potential of the rocks to be mined has focused the interpretation of results primarily on the static ABA and kinetic test results. However, Figure 47 showing the relationship between the mean percent sulphur content (whole rock geochemistry) and the mean NNP (static ABA) provides insight into the reactive sulphur content of the rocks to be mined and is included below.

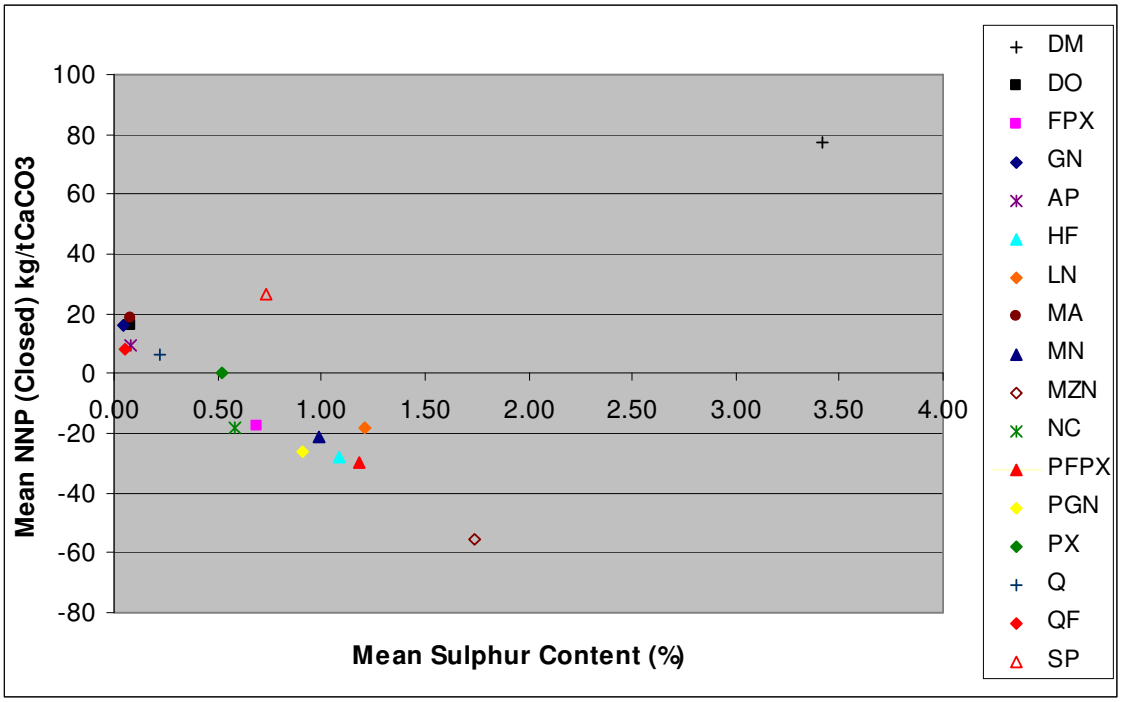

Figure 47: Mean sulphur content (Whole Rock Geochemistry Results) versus the Mean NNP (Closed Static ABA Results) for all the rock types sampled.

Figure 47 shows that as the mean sulphur content increases for the majority of the rock types analysed, the mean NNP value decreases. All the rock types with a sulphur content greater than 0.5% are net acidifying except Pyroxenite, Serpentinite and Dolomite. It is noteworthy that while the results for Pyroxenite plot along the general trend of the graph, the results for Serpentinite and Dolomite occur as outliers.

5. DISCUSSION

5.1. Rock Samples

5.1.1. Static ABA Results

The mean static ABA results have been used to classify the rock types to be mined into four categories: Non-acid Generating/Potentially Acid Neutralizing Rock Types (Appendix 16), Low Risk Acid Producing Rock Types (Appendix 17), High Risk Acid Producing Rock Types (Appendix 18) and Rock Types with Inconclusive Acid Producing Potential (Appendix 19).

5.1.1.1. Non-acid Generating/Potentially Acid Neutralising Rock Types

Appendix 16 shows that the majority of the static ABA results indicate that the Gabbro-Norite, Mottled Anorthosite, Serpentinite and Dolomite rock types are considered non-acid generating and have the potential to neutralize acid produced.

5.1.1.2. Low Risk Acid Producing Rock Types

Dolerite, Quartz Feldspar, Aplite and Pyroxenite are considered to be low risk acid producing rock types. Although the mean NNP results for these rock types (summarized in Appendix 17) revealed a potential to neutralize acid produced, these results were not considered conclusive and other criteria were considered. The percent sulphide-sulphur and NPR results revealed that Dolerite, Quartz Feldspar and Aplite are unlikely to produce acid, while the acid generating potential of Pyroxenite was considered inconclusive. In a Closed System environment, the Quartz Feldspar and Aplite results were also considered inconclusive. However, all of these rock types recorded a mean Final pH representative of a low risk of acid generation.

5.1.1.3. High Risk Acid Producing Rock Types

Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles, Feldspathic Pyroxenite, Hornfels and Marginal Zone Norite have been classed as high risk acid producing rock types. Appendix 18 shows that the mean NNP results for all these rock types recorded a potential to generate acid. Despite the fact that all these rock types recorded a mean Final pH value suggesting a low risk of acid generation, the acid producing potential was confirmed by the percent sulphide-sulphur and NPR results which recorded a high probability of acid generation for all these rock types.

5.1.1.4. Rock Types with Inconclusive Acid Producing Potential

As shown in Appendix 19, Leuconorite, Quartzite and Pegmatitic Feldspathic Pyroxenite produced test results which were contradictory. For this reason, it is suggested that more samples of these rock types should be taken and further static ABA tests performed.

5.1.2. Kinetic Test Results

The Kinetic test results provide further insight into the acid producing potential of the rock types analysed.

5.1.2.1. Gabbro-Norite

The kinetic test results of the Gabbro-Norite samples were not alkaline as expected, but the overall trend was a slightly acidic mean pH which remained constant over time.

5.1.2.2. Dolomite

The kinetic results of the Dolomite samples contradicted the static ABA results as the mean pH showed a step-like decrease from neutral to acidic over time.

The sample description database (Appendix 2) shows that the percentage sulphides present in the Dolomite samples taken ranged from <0.5% to 30%. Closer inspection of the Dolomite samples which recorded the potential to generate acid in both the static ABA and kinetic tests revealed that these samples are not representative of the majority of Dolomite samples taken as they recorded relatively high percentage sulphur in the Whole Rock Geochemistry results.

Figure 47 plots the Mean NNP versus the mean sulphur content of each rock type. Figure 47 shows that all the rock types with a mean sulphur content greater than 0.5% were net acidifying except Pyroxenite, Serpentinite and Dolomite. This indicates that these rock types are able to buffer the effects of reactive sulphur (Acid Potential) to various degrees. The buffering potential of serpentinite is confirmed by Germain *et al*. (1994) in Foose *et al*. (1995) which states that, "serpentine also can be an effective buffer and field studies document that serpentine significantly increases mine water pH." Figure 47 shows that, although Dolomite contains the highest mean average sulphur content, this rock type also has the greatest ability to buffer acidifying effects of reactive sulphur, producing a positive mean NNP.

The whole rock geochemistry results show that the rocks classified as Dolomites by the Platreef staff contain less CO_2 that is expected in typical Dolomites. It is thought therefore that the Dolomites at the Platreef site have been altered to various degrees to Calcsilicate Hornfels. As Calcsilicate Hornfels has less buffering ability than typical Dolomite, certain sulphidic "Dolomite" samples recorded the potential to generate acid over time.

5.1.2.3. Hornfels, Melanorite and Feldspathic Pyroxenite

The kinetic test results for the Hornfels samples as well as the Melanorite samples confirmed that these materials will produce acid over time. The results for the Feldspathic Pyroxenite sample analysed were surprising in that the sample showed a near-neutral initial pH which decreased only slightly at the end of the test period.

5.1.2.4. Quartzite

The kinetic test results of the two Quartzite samples analysed suggested that this material may produce acid over time and therefore, confirms that further tests on Quartzite material should be carried out.

5.2. Tailings Material

5.2.1. Static ABA Results

The static ABA results have been used to classify the tailings samples into three categories: Potentially Acid Neutralizing Rock Types, Low to High Risk Acid Producing Rock Types and High Risk Acid Producing Rock Types.

5.2.1.1. Potentially Acid Neutralizing

All of the Static ABA results confirm that the Scavenger Oxidized Ore sample is considered non-acid generating and has the potential to neutralize acid produced.

5.2.1.2. Low to High Risk Acid Producing

The Scavenger Low Grade Ore sample can be classed as low to high risk acid producing as the final pH indicates low risk acid generating, while the percent sulphide-sulphur and NPR results show that this material has the ability to produce acid in a closed system.

5.2.1.3. High Risk Acid Producing

The majority of the Static ABA results indicate that the Mags High Grade, Low Grade and Oxidized Ore samples together with the Scavenger High Grade sample can be considered high risk acid producing.

As the Mags Tailings are the first to be separated out from the ore during the beneficiation process (Figure 2, Section 3.2), it is probable that these samples still contained a relatively high sulphide content which resulted in these samples being classified as high risk acid producing.

According to the Platreef staff involved in sampling Platreef material for metallurgical bench-scale testing by Mintek Laboratory, the tailings material analysed during this study originated from Feldspathic Pyroxenite as this rock type is abundant in the Platreef.

Figures 48 and 49 show the individual Feldspathic Pyroxenite sample results for open and closed systems, respectively.

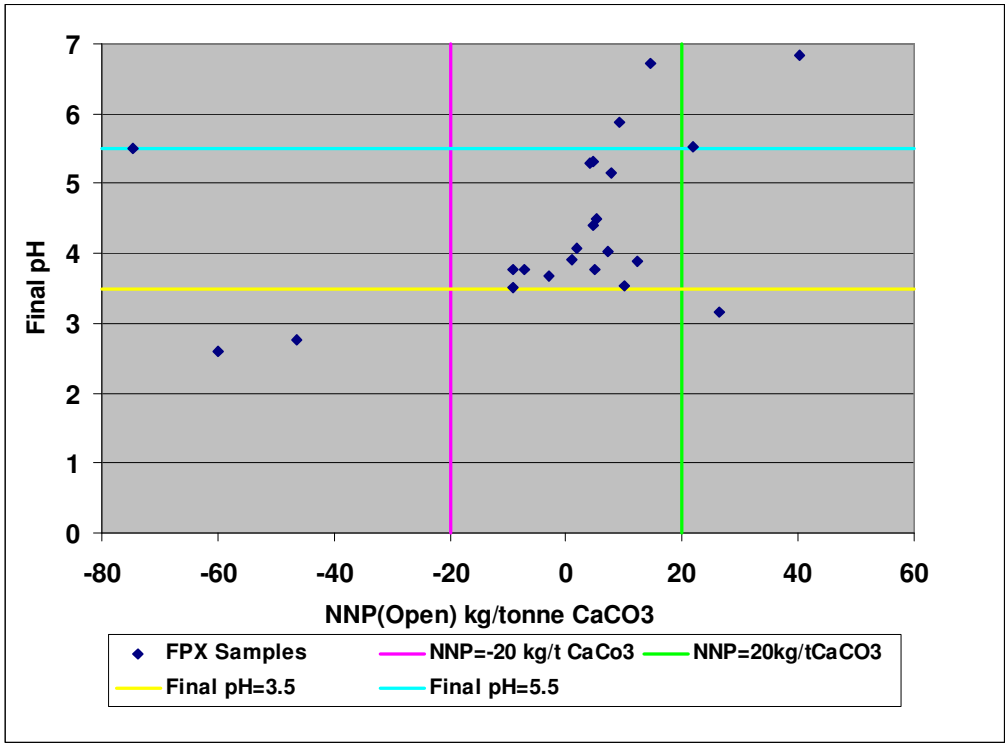

Figure 48: Final pH against Net Neutralizing Potential (NNP) for Feldspathic Pyroxenite Samples (Open System).

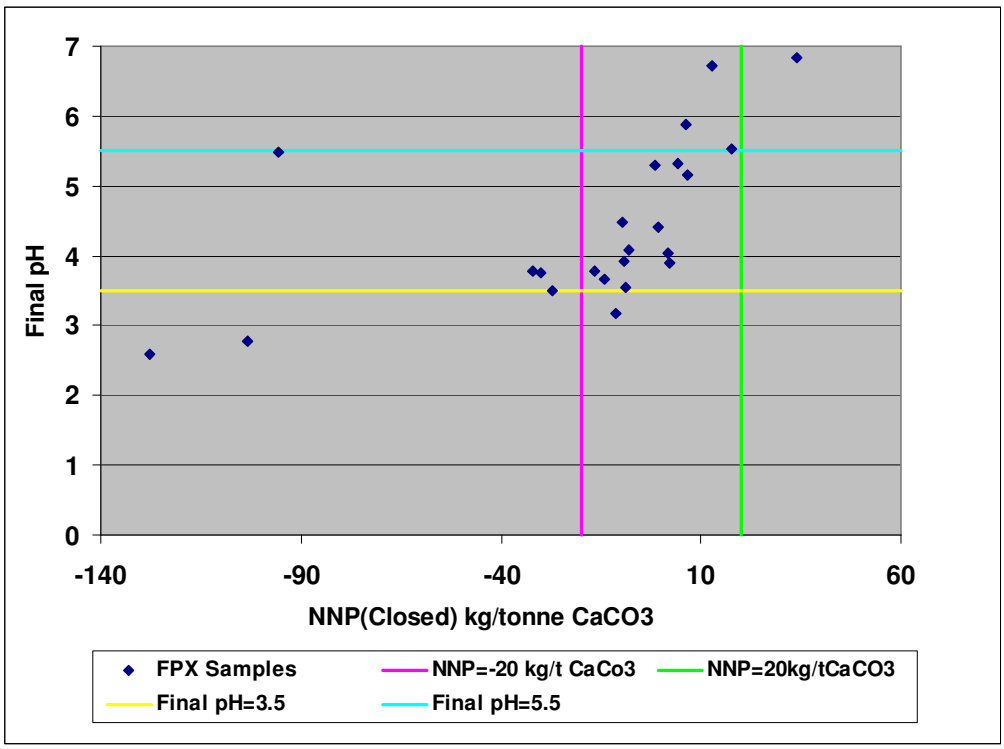

Figure 49: Final pH against Net Neutralizing Potential (NNP) for FPX Samples (Closed System).

The Mags High Grade Ore and Mags Low Grade Ore samples recorded NNP (Open) and NNP (Closed) values lower than any of the Feldspathic Pyroxenite samples analysed during this study. As shown in Figures 48 and 49, only two out of twenty three Feldspathic Pyroxenite samples plotted with very low negative NNP (Open) and NNP (Closed) values. During sample selection, the author strived to collect samples considered representative of typical Platreef material to be mined. The author was not privy to sample collection criteria used by Platreef staff in selecting metallurgical samples.

It is of concern that the Scavenger Low Grade Ore sample has been classed as low to high risk acid producing and the Scavenger High Grade sample considered high risk acid producing. The Scavenger Tailings represent the material separated from the concentrate in the final stage of beneficiation and most of the sulphur content of the material should be removed at this stage. This may imply that further work should focus on milling of the tailings to an optimal grain size in order to liberate sulphide.

5.2.2. Kinetic Test Results

The continuously alkaline nature of the Rougher Tailings samples indicates that this material is unlikely to generate acid over time. The Rougher Tailings represent the material separated out from the concentrate after the second stage of beneficiation. The kinetic test results indicate that the beneficiation process at this point has removed most of the sulphide minerals.

The kinetic test results contradict the static ABA results as the kinetic test results show that the Rougher Tailings are unlikely to generate acid over time, while the static ABA results have been used to classify the High and Low Grade Scavenger Tailing as high risk acid generating and low to high risk acid generating, respectively. As the Scavenger Tailings represent the material separated from the concentrate in the final stage of beneficiation they should contain less sulphide material than the Rougher Tailings. The

kinetic test results of the Rougher Tailings indicate that most of the sulphide material has been successfully removed during beneficiation at this stage of the treatment process, therefore, it is surprising that the Scavenger Tailings have high acid producing potential. It is possible that the Rougher Tailings were generated from different samples than those used to generate the Mags and Scavenger Tailings.

5.3. Projected Platreef Material and Waste Rock Piles

As mentioned in Section 2, the limitations of a laboratory based analysis of the AMD potential of rock types at an exploration site is that it presents a ”worse case scenario” as there are no existing waste rock piles or tailings dams to sample. At the time of writing, it was considered most likely that mining would commence with an open pit on Turfspruit (*pers comm.* Kinnaird, 2008) where the Platreef geology is at surface. In an attempt to address these shortcomings, borehole logs were reviewed to the east (5 boreholes), centre (5 boreholes) and west (5 boreholes) of this area in order to provide the relative abundance of the various rock types that would be present in Platreef material and waste rock piles as mining progresses down-dip. These relative abundances were then used to calculate the weighted mean percent sulphur likely to be produced by the Platreef material and waste rock piles (see Appendix 20). This weighted mean percent sulphur was then plotted on Figure 47 and the weighted mean NNP (Closed) result read off for each rock type. The results are presented for the Platreef package and the waste rock piles, respectively, below.

5.3.1. Platreef Material

The projected weighted volume calculations of the Platreef material in the Turfspruit Platreef East, Central and West areas shown in Table 7 reveal that the mean percent sulphur contained in each rock type will generate mean NNP (Closed) values between -20 and 20 kg/tonne $CaCO_3$. According to Usher *et al*. (2003), the acid producing potential of samples within this range is considered inconclusive and other criteria should also be considered in order to determine acid generation status.

Table 7: Weighted percent sulphur and NNP (Closed) values for Platreef on Turfspruit Platreef East, Central and West.

	Weighted Mean Percent Sulphur	**Weighted Mean NNP (Closed)** (kg/tonne $CaCO_3$)
Turfspruit Platreef East		
Platreef	0.346	1.23
Turfspruit Platreef Central		
Platreef	0.5216	-5.56
Turfspruit Platreef West		
Platreef	0.3055	2.8

It is important to note that Usher *et al*. (2003) also state that samples with NNP values greater than zero have the potential to neutralize acid, while samples with NNP values less than zero have the potential to generate acid. The Platreef material on Turfspruit Platreef Central recorded a weighted mean NNP (Closed) value of -5.56 kg/tonne $CaCO_3$ and therefore has the potential to generate acid. However, all the Platreef material will be sent to a metallurgical plant where the beneficiation process will remove at least 90% of the sulphur content. Table 8 below shows the weighted mean percent sulphur value (reduced by 90%) and the weighted mean NNP value of the Platreef tailings material.

Table 8: Weighted percent sulphur and NNP (Closed) values for Platreef tailings material on Turfspruit Platreef East, Central and West.

	Weighted Mean Percent Sulphur	**Weighted Mean NNP (Closed)** (kg/tonne $CaCO_3$)
Turfspruit Platreef East		
Platreef Tailings	0.0346	13.28
Turfspruit Platreef Central		
Platreef Tailings	0.0522	12.6
Turfspruit Platreef West		
Platreef Tailings	0.0305	13.44

As can be seen, once the weighted mean sulphur content has been reduced by beneficiation, all the Platreef material to be mined initially (where the Platreef is at surface on Turfspruit) will record positive weighted mean NNP value less than 20 kg/tonne $CaCO_3$. While these results are still considered inconclusive, the positive NNP values indicate a potential to neutralize acid, and, therefore, it is thought unlikely that these rock types will pose an AMD risk when dumped in tailings dams.

5.3.2. Waste Rock Piles

Table 9 shows the projected weighted volume calculations of the waste rock piles to be generated on Platreef East, Central and West. The weighted mean percent sulphur content in each area will generate weighted mean NNP (Closed) values between -20 and 20 kg/tonne $CaCO_3$, indicating an inconclusive potential to generate acid.

Table 9: Weighted percent sulphur and NNP (Closed) values for waste rock piles on Turfspruit Platreef East, Central and West.

	Weighted Mean Percent Sulphur	**Weighted Mean NNP (Closed)** (kg/tonne $CaCO_3$)
Turfspruit Platreef East		
Waste Rock Pile	0.6676	-11.21
Turfspruit Platreef Central		
Waste Rock Pile	0.2757	-1.75
Turfspruit Platreef West		
Waste Rock Pile	0.3576	0.78

Bearing in mind that the weighted mean NNP (Closed) values for the areas are considered inconclusive in terms of predicting AMD potential, it is noteworthy that the waste rock piles projected for Turfspruit Platreef East and Central recorded negative weighted mean NNP (Closed) values of -11.21 and -1.75 kg/tonne $CaCO_3$, respectively, indicating a potential to generate acid. Closer inspection of the results presented in Appendix 20 shows that the relatively high volumes of Footwall rocks (Dolomites, Quartzites and Marginal Zone Norites) to the east of the Platreef in Turfspruit, have contributed to the relatively high weighted mean percent sulphur and the negative weighted mean NNP (Closed) value of the waste rock piles.

The waste rock pile on the west of the Platreef on Turfspruit recorded a low positive weighted mean NNP (Closed) of 0.78 kg/tonne $CaCO_3$, indicating a potential to neutralize acid. In this area, the Footwall rocks have decreased in relative abundance in the projected waste pile, while Gabbro-Norites of the Hanging-wall have increased. The weighted positive mean NNP (Closed) value indicates that the waste rock pile in this region is unlikely to pose an AMD risk.

6. CONCLUSION

The static ABA results have shown, using published criteria based on international studies, that some of the rocks to be mined and tailings material to be generated at the Platreef Project included low risk acid generating as well as high risk acid generating material. According to Soregaroli and Lawrence (1998), a sample with a minimum content of 0.3% sulphide-sulphur has the ability to generate acid for an extended period of time. All the rock types and tailings samples with high risk acid producing potential at the Platreef Project contained more than 0.3% sulphide-sulphur. Therefore, despite relatively low sulphide mineral abundances, these materials may generate AMD if exposed to the atmosphere for extended periods of time.

As most of the high risk acid producing rock types are Platreef ore rocks (including Pegmatitic Gabbro-Norite, Melanorite, Norite Cycles and Feldspathic Pyroxenite), they will be sent for beneficiation where the sulphur content of the material will be reduced by at least 90% before being sent to a tailings dam. Of concern in terms of AMD potential are the high risk acid producing Footwall rocks (Marginal Zone Norite and Hornfels) which also occur within the Platreef as xenoliths. It is possible that xenolith material may be dumped over the LoM if found to dilute the grade during the mining process (as mentioned in Section 4.1.3). In addition, Marginal Zone Norite and Hornfels are likely to be fractured during mining and will remain in situ at the base of the open pit, exposed to the atmosphere over extended time periods.

The low risk acid producing rock types include one Platreef ore rock type (Pyroxenite) and three intrusion rock types (Dolerite, Quartz Feldspar and Aplite). Although it is likely that the Pyroxenite will be sent for beneficiation and will not be sent to a dump, it is possible that Dolerite, Quartz Feldspar and Aplite material may be dumped if these rocks are abundant in certain places, causing a decrease in grade. It is also probable that these intrusion rock types will be exposed in the fractured Footwall. However, as these rock types occur in relatively small volumes in the Platreef, it is thought that any acid producing potential will not make a major impact.

The potentially acid neutralising rock types include rocks of the Hanging-wall (Gabbro-Norite and Mottled Anorthosite) as well as a Platreef rock (Serpentinite) and a Footwall rock (Dolomite). The mean static ABA results indicated that the Gabbro-Norite material was non-acid generating and potentially acid neutralizing, although some samples did have the potential to generate acid and their kinetic results showed a steady slightly acidic pH for the duration of the test period. These acid generating samples are dispersed within a much larger volume of potentially acid-neutralizing Gabbro-Norite.

The Serpentinite and Dolomite materials are able to buffer acid potential to varying degrees. The laboratory results revealed, however, that Dolomite has the ability to generate acid in certain instances. Weathered Dolomite (Calcsilicate Hornfels) material containing a high percentage of sulphide minerals may generate acid during oxidation owing to a reduced buffering ability. Depending on pit design, this rock type may be fractured and exposed to the atmosphere for an extended period of time at the base of the open pit.

The high acid producing status and contradictory results recorded for the tailings samples are of possible concern, but reveal an uncertainty in the different techniques applied for quantifying AMD. It is suggested that future work be directed to better understand the merits and downfalls of the different analytical methods used to quantify AMD in order to better interpret contradictory results. Metallurgical studies were at a preliminary stage and it is also possible that non-representative samples were selected for bench scale metallurgical testing. It is recommended that once the metallurgical beneficiation process

has been finalized, a new suite of representative tailings samples be generated from representative Platreef rock samples that have been mineralogically and geochemically analysed. These samples should be sent for Static ABA analysis in order to review the acid producing potential of these samples and to highlight which samples should be sent for kinetic tests. It is critical that kinetic tests be carried out on Scavenger Tailings samples as these samples represent the material that will ultimately be sent to the Tailings Dam.

This laboratory based analysis of AMD potential deliberately provides a "worse case scenario" of the rock types to be mined at the Platreef site to ensure all eventualities are considered during pit design and mining to reduce AMD risk. Weighted volume calculations of the mean sulphur content and the mean NNP (Closed) of the Platreef tailings material to be mined initially on Turfspruit and the waste rock piles to be dumped indicate an inconclusive acid producing potential. It is therefore considered unlikely that AMD will be generated from the tailings dams or waste rock piles generated from mining in this region. This study has, however, identified that local zones of potentially acid-producing material may occur within rock volumes dumped over the LoM (Marginal Zone Norite, Hornfels, Gabbro-Norite and Dolomite) or exposed in the pit floor (Marginal Zone Norite, Hornfels, Dolomite) should be managed carefully to ensure that AMD does not result. Additionally, it is of prime importance that the high risk acid producing untreated Platreef Ore rock types are not stockpiled for extended periods of time.

Leuconorite, Quartzite and Pegmatitic Feldspathic Pyroxenite produced contradictory results during this study and it is recommended that these rock types be resampled and sent for further static ABA and kinetic test analyses. The acid producing potential of Quartzite is of particular importance as this rock type occurs in the Footwall of the Platreef and therefore may be dumped or exposed during the process of mining.

This study has identified the potential AMD risks facing the future mine at the Platreef Project and will enable the mine management to minimize these risks during the mine design phase. The so-called "prediction wheel" in drainage chemistry by Morin and Hutt, (1999) in Figure 50 emphasizes that this study should fit into a larger framework of objectives and on-site conditions with time in order to effectively manage AMD risk over the LoM.

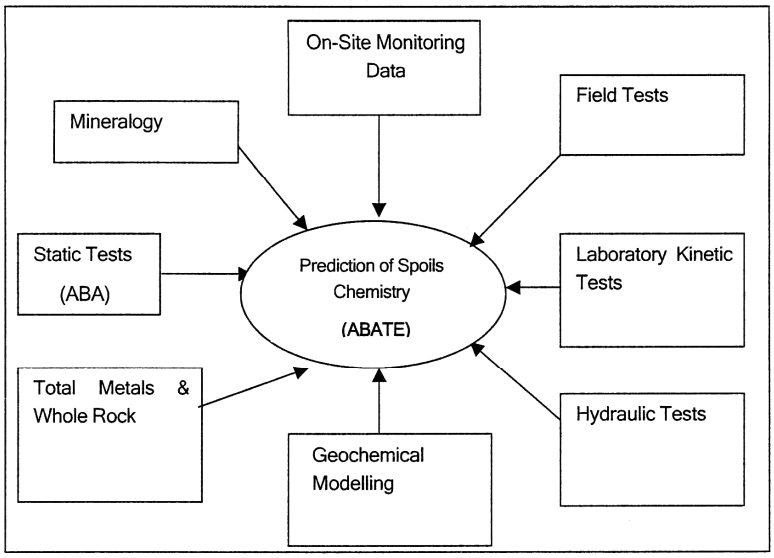

Figure 50: The Prediction Wheel for mine drainage chemistry (After Morin and Hutt (1999).

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APPENDIX 1:

Reference Map Showing the Prospect Area Divided into Blocks 1-4 and the Positions of the Boreholes Sampled

-5000

0

-2660000

-2665000

-2670000

-2675000

Rietfontein 2 KS

1

2

3

4

Turfspruit 241 KR

Macalacaskop 243 KR

Legend

- Prospecting right area
- Drillhole sampled
- Target block
- Urban area
- Farm boundary
- Target area of geochemical analysis

N

1:55,000

0 0.5 1 2 km

APPENDIX 2:

Sample Description Database

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS108	1	3	0.5NQ	37.82	44.58	6.76	GN	HW	M-C	No fabric	30-50%					Grey GN with dark mottles
ATS108	2	3	0.5NQ	64.4	70.9	6.5	GN	HW	M		30-40%	2 QF vns, approx. 2cm wide				Similar to MC1, perhaps slightly darker
ATS108	3	3	0.5NQ	103.6	110.23	6.63	GN	HW	M-C		30-40%	5 Q vns, < 1cm wide		Chloritization of wall rocks <5cm on either side of vnlets		Similar to MC1, but coarser in part
ATS108	4	3	0.25NQ	125.85	132.18	6.33	MN	PR	M		25%					Homogeneous sample, Looks like FPX
ATS108	5	3	0.25NQ	142.695	147.85	5.155	FPX	PR	F-M		5%					A very dark, homogeneous rock, with a spaced fibre at 45°
ATS108	6	3	0.25NQ	167.25	177.22	9.97	NC	PR	M	Equigranular	35%					This sample consists mainly of norite and is olive in colour.
ATS108	7	3	0.25NQ	209.055	219.97	10.915	NC	PR	M		25%	One laminated Q vn, 2cm wide at 45°			Pyrrhotite is concentrated in FPX at the base of the cycles	Dominantly noritic, but with more FPX and less An than MC6
ATS108	8	3	0.5NQ	297.36	304.665	7.305	FPX	PR	F		10%				Considerable pyrrhotite/pentlandite	
ATS108	9	3	0.25NQ	325.08	334.03	8.95	HF	PR	F						Some pyrrhotite/pentlandite	
ATS 039	10	1	0.5NQ	70.045	80.46	10.415	GN	HW	M-C	Equigranular	50-70%	Thin QF lining on fault surfaces	Only one minor fault recorded	Calcite present on fault surface. From 76.6 to 76.75m pegmatitic texture present.	0.5% Very small patches of chalcopyrite	
ATS 039	11	1	0.5NQ	81.92	92.095	10.175	GN	HW	M-C	Equigranular	50%	Three QF vns (vertical dip), 10-15cm length	Minor faults	Slight chlorite alteration on fault/ fracture surfaces Calcite present on fault/fracture surfaces		
ATS 039	12	1	0.5NQ	93.07	100.865	7.795	GN	HW	M-C	Equigranular	60%				0.5% 10cm of pegmatite contains F to M grained interstitial sulphides including chalcopyrite	
ATS 039	13	1	0.5NQ	115.88	121.885	6.005	QF	HW	M	Equigranular				Pink colouration of Fspar Chlorite alteration observed along surface of vertical fractures (approx.1m long). Quartz grains surrounded by amorphous Fspar in places		
ATS 039	14	1	0.25NQ	158	171.78	13.78	FPX	PR	F-M	Equigranular	10%	Q vns present	Minor faults	Calcite and chlorite lining on fault surfaces.	1%	Definite fabric present formed by hairline chlorite /serpentinite "veins"
ATS 039	15	1	0.25NQ	210.853	229.43	18.577	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-30%	QF vns present	Minor faults	Chlorite and Serpentinite on fault surfaces	3% Chalcopyrite, pyrrhotite/pentlandite	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 039	16	1	0.25NQ	247.94	268.075	20.135	PGN	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-30%		Minor faults	Chlorite and serpentinite on fault surfaces	2%	This rock type has been described as MN with PGN patches and as PGN with MN patches. AML geologist advised it should be relogged as MN with variable Fspar content.
ATS 039	17	1	0.25NQ	278.67	298.12	19.45	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-30%	QF vn containing distinctive mafic band	Minor faults	Chlorite and serpentinite on fault surfaces	3-4% Predominantly pyrrhotite/pentlandite, chalcopyrite also present	
ATS068	18	1	0.5NQ	35.03	45.205	10.175	GN	HW	M-C	Equigranular	40%	0.7cm wide QF vn recorded. Chlorite-filled fractures and QF filled fractures present	Minor faults	Chlorite and serpentinite on fault surfaces. Fspar stained yellow/brown in small patches		
ATS068	19	1	0.5NQ	60.46	72.43	11.97	GN	HW	M-C	Equigranular	50%			One chlorite-filled hairline fracture recorded. Bronze drill marks clear on core		.Excellent, homogeneous sample
ATS068	20	1	0.5NQ	114.42	124.27	9.85	GN	HW	M-C	Equigranular	40%					Note that small patches of fine grained pyroxenite occur. These areas appear darker, yet the fspar content is constant
ATS068	21	1	0.5;0.25NQ	138.46	150.48	12.02	GN	HW	M-C	Equigranular	50% Fspar decreases for approx 1m					
ATS068	22	1	0.25NQ	177.5	191.3	13.8	FPX	PR	F-M	Equigranular	15%	QF vns present. Chlorite-filled fractuers present	Several minor faults	Chlorite and Serpentinite on fault surfaces	1% Interstitial chalcopyrite, pyrrhotite/pentlandite	
ATS068	23	1	0.25NQ	238.27	247.64	9.37	FPX	PR	F-M	Equigranular	5-10%. Fspar increases to 30 % in places	Hairline chlorite-filled fractures present	Minor faults	Serpentinite, chlorite and calcite on fault surfaces	2% Pyrite, pyrrhotite/pentlandite, chalcopyrite	
ATS123	24	1	0.5NQ	41.58	52.04	10.46	MN	HW	M	Equigranular	25%	Several thin QF vns occur. The thickest vn was 0.5cm wide				
ATS123	25	1	0.5NQ	54.075	63.87	9.795	MN	HW	F-M	Equigranular	15% (Increases to 25% for 1m)	Several thin QF vns present		Chlorite alteration in and surrounding fractures. Bleaching of rock in and surrounding fractures		
ATS140	26	1	0.25NQ	39.09	60.06	20.97	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	30%			Slight green tinge to Fspar, possibly due to saussiterization	1-2% Pyrite, chalcopyrite	
ATS006	27	2	0.25NQ	63.16	72.97	9.81	HF	PR	F	Equigranular	50% (Decreasing to 0% in places)	Hairline chlorite-filled fractures present		Pale green stringers and patches give the rock a mottled appearance.	0.50%	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS006	28	2	0.25	76.71	86.21	9.5	HF	PR	F	Equigranular	20%			Mottled or patchy in appearance as above, but darker than MC27. Pale green patches are smaller and not as widespread.		
ATS006	29	2	0.25NQ	137.02	149.45	12.43	MZN	FW	F	Equigranular	25%	Several thin QF vns (widest 1cm); and a 2cm wide graphite vn	Minor faults	Serpentinite, talc and chlorite on fault surfaces	0.5% Fine-grained pyrrhotite/pentlandite, chalcopyrite	Note the presence of a 2cm wide graphite band
ATS006	30	2	0.25NQ	149.84	161.08	11.24	MZN	FW	F	Equigranular	25%	QF vns present	Minor faults	Chlorite replacement on some fault surfaces Serpentinite and talc on fault surfaces	1% High concentrations of sulphides in small areas. Pyrrhotite/pentlandite and pyrite present	
ATS006	31	2	0.25NQ	212.59	224.01	11.42	HF	FW	F	Equigranular	15%	Beneath the characteristic green alteration, one can distinguish QF vns, approximately 0.5cm wide and thinner	Minor faults	Serpentinite on fault surfaces. Pale green stringers and patches give the rock a mottled appearance.	3-5% Pyrite, pyrrhotite/pentlandite and chalcopyrite present. Sulphides occur as stringers and as large blotches	
ATS006	32	2	0.25NQ	240	251.93	11.93	HF	FW	F	Equigranular	15%	Beneath the characteristic green alteration, one can distinguish QF vns, approximately 0.5cm wide and thinner. Also noted that zoned vn features occur with QF in the centre, lined with a dark mineral		Pale green stringers and patches give the rock a mottled appearance.	5% Pyrrhotite/pentlandite, chalcopyrite	
ATS127	33	2	0.25NQ	167.825	179.9	12.075	FPX	PR	F-M	Equigranular	10%	Several QF vns (up to 2cm thick)	Minor faults	Serpentinite alteration occurs on either side of quartz fspar vns and on fault/fracture surfaces		Generally much finer grained than other FPX samples
ATS127	34	2	0.25NQ	229.97	255.09	25.12	HF	PR	F	Equigranular		Beneath the characteristic green alteration, one can distinguish QF vns		Pale green stringers and patches give the rock a mottled appearance. However, this rock is generally black in colour with only patches of green alteration. Approximately 1m section of the core is pale green in colour.	2-3% Pyrite identified	Core has a glitter appearance, possibly due to fine grained sulphides or mica.
ATS127	35	2	0.25NQ	271.89	284.95	13.06	FPX	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-50%	Several thin QF vns		Patches of serpentinite and magnetite frequent	3% Pyrrhotite/pentlandite, chalcopyrite. Sulphide grain size increases in areas with pegmatitic texture	
ATS127	36	2	0.25NQ	286.08	296.85	10.77	FPX	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-40%			Some magneite replacement	5% Coarse-grained chalcopyrite, pyrrhotite/pentlandite	This sample is logged as FPX, however,the AML geologist would rather describe it as MN with pegmatitic development and minor fspar. This rock is more heterogeneous that MC 35

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS127	37	2	0.25NQ	296.855	314.94	18.085	FPX	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	10%	Three major QFvns approx. 10cm, 4cm and 1cm in width. Thinner quartz Fspar vns also occur. Also some quartz/fspar vns containing brown mineral		Serpentinite alteration occurs on either side of QFvns	1% Pyrrhotite/pentlandite and chalcopyrite present. Most of the sulphides occur in the medium grained norites and in the PGN	This sample is logged as FPX, however, the AML geologist would now describe it as a Mafic NC with FPX, N and PGN
ATS127	38	2	0.5NQ	45.33	61.49	16.16	GN	HW	M-C	Equigranular	30%	Hairline serpentinite and chlorite-filled fractures present	Minor faults	Calcite on fault surfaces	<1% One vn containing pyrite and chalcopyrite	
ATS127	39	2	0.5NQ	85.51	100.8	15.29	GN	HW	M-C	Equigranular	20-25%	Hairline serpentinite and chlorite-filled fractures present		Chlorite alteration in and surrounding fractures.		
ATS127	40	2	0.5NQ	136.7	148.72	12.02	GN	HW	M	Equigranular	60-70%	Several 3-6cm QF vns	Several minor faults	Calcite on fault surfaces. Pyroxene grains are finer grained than in the average GN sampled. On either side of quartz/fspar vns, fspar crystal laths are evident, possibly due to recrystallization.		Finer grained than MC38 and MC39. This sample is an example of an altered GN.
ATM005	41	3	0.25NQ	30.29	45.49	15.2	GN	HW	M	Equigranular	30%	2 hairline QF vns		Chlorite alteration approx.5cm on either side of the vns		Bronze drill marks present
ATM005	42	3	0.25NQ	46.915	56.19	9.275	GN	HW	M	Equigranular	30% (Fspar increases slightly with depth)	One hairline QF vn				
ATM005	43	3	0.25NQ	95.73	111.03	15.3	GN	HW	M-C (PX grains definitely larger than MC41,42)	Equigranular	35% (Fspar increases slightly with depth)	One 0.5cm QF vn dipping 45°				GN is slightly mottled in places
ATM005	44	3	0.25NQ	114.27	128.2	13.93	GN	HW	M-C	Equigranular	35% (Fspar increases in mottled patches)			In places Fspar has a slight green tinge (saussiterization)		
ATM005	45	3	0.5NQ	229.5	239.62	10.12	GN	HW	M-C	Equigranular	40%	One 0.2cm wide QF vn dipping 70°. Set of 15 parallel hairline serpentinite filled fractures dipping 30°		Chlorite alteration on either side of QF vn. In places Fspar has a slight green tinge (saussiterization)		
ATM005	46	3	0.5NQ	244.4	254.97	10.57	GN	HW	M-C	Equigranular	40%					
ATM005	47	3	0.5NQ	273.77	284.06	10.29	GN	HW	M-C	Equigranular	40-45%	Two hairline QF-filled fractures	Minor faults	Calcite lining on fault surfaces Chlorite alteration on either side of the QF vns		
ARF7	48	3	0.25NQ	107.95	119.8	11.85	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	30%			Described in log as "modified." Fspar filled fractures are pale green, possibly due to saussiterization	4% Pyrrhotite/pentlandite (Fine to coarse grained), chalcopyrite and pyrite present	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ARF7	49	3	0.25NQ	140.27	159.01	18.74	FPX (with MN)	PR	F-M	Equigranular	Variable 0-25%	Few thin QF vei ns Hairline serpentinite-filled fractures present		Sample is very fractured and patches of serpentinite alteration occur	4% Pyrrhotite/pentlandite, chalcopyrite	
ITS011	50	4	0.25NQ	43	63.08	20.08	LN	PR	F-M	Equigranular	40%	Two thin QF vns		Some chlorite alteration evident near the Fspar vns		
ITS011	51	4	0.25NQ	84.78	94	9.22	MN	PR	F-M	Equigranular	Variable 15-30%	5 QF vns dip 90° (widest vn approx, 0.5cm) Hairline serpentinite /chlorite-filled fractures present.	Minor faults	Chlorite replacement of px on fault surfaces	1% Pyrrhotite/pentlandite	AML geologist explained that although the LN and MN occurring in the Platreef may appear similar to the GN in the HW, for nomenclautre reasons, the term GN is not used in the Platreef. This sample is more representative of GN with FPX patches.
ITS011	52	4	0.25NQ	100.37	112.18	11.81	FPX	PR	F-M	Equigranular	Variable 10-50%	Several relatively thick, shallow dipping QF vns. Widest approx. 2.5cm wide. Mica identifed in some vns.	Minor faults	The 2.5cm QF vn is flanked on either side by serpentinite. Chlorite replacement of pyroxene on fault surfaces		
ITS011	53	4	0.25NQ	133.34	152.2	18.86	FPX	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 5-50%	Several 0.5 to 2cm QF vns present	Several faults	The sample is very fractured and serpentinised in places. Fspar is pale green in places. Serpentinite, chlorite and calcite lining on fault surfaces	3% Pyrrhotite/pentlandite , chalcopyrite	FPX with MN and PGN
ITS011	54	4	0.25NQ	185.85	196.04	10.19	FPX	PR	F-M	Equigranular	Variable 0-10%	Several thin QF vns. One 4cm wide QF vn	Minor faults	Serpentinite and chlorite replacement on the fault surfaces	3% Pyrrhotite/pentlandite	FPX with MN
ITS011	55	4	0.25NQ	199.6	208.24	8.64	MZN	PR	F	Equigranular	Variable 30-50%	One 1cm wide QF vn. High number of hariline QF-filled fractures	Minor faults	Chlorite replacement of pyroxene on faults surfaces. QF, chlorite and serpentinite lining on fault surfaces		
ITS011	56	4	0.25NQ	261.22	280.2	18.98	MN	PR	Variable F,M,C	Equigranular	Variable 15-30%		Several minor faults	Serpentinite lining on fault surfaces	2% High concentration of Pyrrhotite/pentlandite	Patches of FPX present
ITS011	57	4	0.25NQ	303.04	313.05	10.01	FPX (with MN and PGN)	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 0-30%		Several minor faults	Serpentinite present in places Talc and serpentinite lining	2% Pyrrhotite/pentlandite some pyrite	Note that this sample spans both the MN and FPX rock types in the log. As the sample was most homogeneous through this interval it was selected and labelled FPX (with MN and PGN)
ATS082B	58	4	0.5NQ	84.84	92.75	7.91	GN	HW	M-C	Equigranular	30%	QF hairline vns present	Minor faults	Minor clacite lining on fault surfaces		
ATS082B	59	4	0.5NQ	103.9	112.49	8.59	GN	HW	M-C	Equigranular	30%	Several very thin QF viens with 90 dip		Chlorite alteration in and surrounding QF vns, giving the sample a pale green tinge		
ATS082B	60	4	0.5NQ	153.23	165.12	11.89	GN	HW	M-C	Equigranular	40%		Minor faults	Fspar has a pale green tinge QF crystals on fault surfaces		

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS082B	61	4	0.5NQ	234.2	242.4	8.2	GN	HW	M-C	Equigranular	40%	Several vns including one 0.5cm chlorite-filled fracture flanked by QF;also several QF vns (1cm & 0.5cm wide)	Minor faults	Chlorite, serpentinite and talc lining on fault surfaces		
ATS082B	62	4	0.5NQ	260.35	268.95	8.6	GN	HW	M-C	Equigranular	40%			In places, the px is fine-grained and the Fspar is pale yellow and green		
ATS034	64	3	0.25NQ	90.29	105.54	15.25	HF	PR	F	Equigranular		1x QF vns 0.5cm wide with 90° dip 2x calcite vns 3.5cm wide	Minor faults	Characteristic pale green stringers present. Also Pale green tinge to vns. Serpentinite flanks the calcite vns. Serpentinite and calcite on fault surfaces	4% Pyrite, pyrrhotite/pentlandite, chalcopyrite. Patches of net like massive sulphides	Core is very fragmented
ATS034	65	3	0.25NQ	107.05	121.66	107.05-121.66	MN	PR	F	Equigranular	20-30%		Several minor faults	Serpentinite on fault surfaces	3-4% Pyrite, pyrrhotite/pentlandite, chalcopyrite	Very good homogeneous sample. Q/Fspar "grains" appear scattered for 1m. Several hairline serpentinite-filled fractures present
ATS034	66	3	0.25NQ	180.53	191.55	11.02	FPX	PR	M	Equigranular	10	Several hairline serpentinite-filled fractures present	Several minor faults	Up to 5cm wide patches of serpentinite serpentinite lining on fault/fracture surfaces	3-4% Pyrite, pyrrhotite/pentlandite, some chalcopyrite	1x 4cm wide QF grain present
ATS34	67	3	0.25NQ	257.97	268.58	10.61	FPX	PR	Variable F,M,C	Equigranular	Varies 10-20%	Few hairline serpentinite vns	Several minor faults	Serpentinite, chlorite, calcite and quartz lining on fault surfaces	5% Pyrite, pyrrhotite/pentlandite, chalcopyrite	
ATS34	68	3	0.25 and 0.5NQ	333.97	342.15	8.18	DM	FW	F			1x0.5cm pyrite vn	Minor faults	QF present on fault surfaces	1% Pyrite	Sample has is very distinctive texture and is yellow-green-grey-black and white in colour. According to M. Le Grange, this sample represents an algal stromaotlite/oolitic sandstone sequence which has been heated and altered. The texture makes it difficult to determine the presence of vns
ATS49	69	3	0.25NQ	191.86	201.92	10.06	HF	PR	F	Equigranular			Several minor faults	Characteristic pale green stringers and patches of serpentinite present. QF, chlorite and sulphides observed on fault surfaces	<1% Pyrite, chalcopyrite, pyrrhotite/pentlandite	Good sample
ATS049	70	3	0.25NQ	225.71	238.65	12.94	HF	PR	F	Equigranular		2x0.5-1cm wide QF vns (0º dip)	Several minor faults	Characteristic pale green/yellow stringers Calcite, chlorite, talc and serpentinite present on the fault surfaces	0.5% Pyrite, chalcopyrite, pyrrhotite/pentlandite	Good sample
ATS049	71	3	0.25NQ	246.75	257.58	10.83	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	35%	Several hairline serpentinite vns	Several minor faults	Patches of serpentinite present Talc and serpentinite on fault surfaces	1% Pyrite, pyrrhotite, chalcopyrite. One patch of massive sulphide present	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS049	72	3	0.25NQ	277	286.8	9.8	FPX	PR	F (Coarse grained patches also occur)	Equigranular (Pegmatitic in places)	Variable (20-35%)	1 x 1cm wide QF vn with 10º dip 1 x 0.5cm wide QF vn with chlorite, serpentinite alteration with 75º dip Several hairline serpentinite vns	Minor faults	Patches of serpentinite present Serpentinite, talc and chlorite on fault surfaces	0.5-1% Pyrite, pyrrhotite/pentlandite, chalcopyrite	
ATS049	73	3	0.25NQ	287	300.25	13.25	PGN	PR	C	Pegmatitic	Variable 25-40%	One hairline QFvn	One fault	Serpentinite and talc on fault surface	2% Pyrite, pyrrhotite/pentlandite, chalcopyrite	
ATS049	74	3	0.25NQ	321.17	332.51	11.34	MZN	PR	F	Equigranular	30%	3 thin QF vns dipping70º	Minor faults	Serpentinite flanks either side of the q/fspar vns. Serpentinite, talc and chlorite on the fault surfaces	<0.5% Pyrrhotite/pentlandite, pyrite	
ATS049	75	3	0.25NQ	309	317.64	8.64	HF	PR	F	Equigranular		Several thin QF vns with shallow dis		Characteristic pale green/yellow stringers	1% Pyrite, chalcopyrite, pyrrhotite/pentlandite	
ATS061	76	3	0.25NQ	101.66	111.24	9.58	MN	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 20-50%	One thin QF vn	Minor faults	Chlorite alteration Calcite lining on fault surfaces	<0.5% Pyrite, pyrrhotite/pentlandite	
ATS061	77	3	0.25NQ	213.79	226.84	13.05	MZN	PR	F	Equigranular		2 x 0.5cm wide QF vns with vertical dips 1 X thin chlorite vn	Minor faults	Serpentinite and chlorite replacement on fault surfaces	5% Chalcopyrite, pyrrhotite/pentlandite, pyrite Patches of massive sulphides up to 13cm wide	
ATS061	78	3	0.25NQ	276.85	286	9.15	MN	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 60-80%	Several thin QF vns with shallow dips	Several faults	Chlorite alteration Serpentinite replacement on fault surfaces	2% Pyrite, pyrrhotite/pentlandite	
ATS061	79	3	0.25NQ	289.03	300.53	11.5	SP	PR	Variable F,M,C	Equigranular; Pegmatitic in places	Variable 0-5%	2cm wide pyrrhotite, pyrite vn	Minor faults	In patches, the entire rock has been serpentinized and is pitch black Serpentinite and chlorite replacement on fault surfaces	4% Pyrite, chalcopyrite, pyrrhotite/pentlandite	Previous pegmatitic texture discernable
ATS022	80	3	0.5NQ	43.1	46	2.9	HF	HW	F	Equigranular		Thin QF vns present Thin chlorite-filled fractures with shallow dips		Chlorite alteration weathering/oxidation causing a brown colour to sample. Patches of serpentinite present	0.5% Chalcopyrite, pyrrhotite/pentlandite	
ATS022	81	3	0.25NQ	199.04	206	6.96	SP	PR	M-C	Coarse grained pyroxene grains surrounded by fine grained serpentinite and Fspar grains	25%	1 x 0.5cm QFr vn with vertical dip		Serpentinization	1% Chalcopyrite, pyrrhotite/pentlandite	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS022	82	3	0.25HQ	252.53	258.5	5.97	SP	PR	M-C	Coarse grained pyroxene grains surrounded by fine grained serpentinite/magnetite and Fspar grains. Fabric exists in the serpentinitep/magnetite	20%	Chlorite -serpentinite filled hairline vns		Serpentinization	<0.5% Pyrite, chalcopyrite, pyrrhotite/pentlandite	
ATS022	83	3	0.25NQ	306.58	315	8.42	MN	PR	M-C (Some fine grains present)	Equigranular	Variable 0-35%	1x0.5cm wide QF vn with 0º dip	Minor faults	Serpentinite present on fault surfaces	8% Pyrite, pyrrhotite/pentlandite, pyrite, chalcopyrite (Massive pyrrhotite/pentlandite)	Generally the sample is a medium to coarse grained MN with 35% Fspar. However, approx. 1m of the sample has 0% Fspar (appears pitch black) and is fine grained
ATS022	84	3	0.25NQ	66.02	77.14	11.12	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 25 - 50%	Frequent thin QF vns with shallow dips Several serpentinite and chlorite vns with vertical dips	Several minor faults	Chlorite alteration adjacent to fractures calcite, chlorite and serpentinite on the fault surfaces	1-2% Pyrite, pyrrhotite/pentlandite	
ATS014	85	2	0.25NQ	87.09	100.87	13.78	HF	PR	F	Equigranular					5-20% Chalcopyrite, pyrrhotite/pentlandite, pyrite	Sample is inundated with sulphides. Colour is gold, grey and black with occassional patches (up to 5cm wide) of QF
ATS014	86	2	0.25NQ	125.9	136.47	10.57	HF	PR	F	Equigranular			Minor faults	QF, calcite and chlorite on fault surfaces	2% Chalcopyrite, pyrrhotite/pentlandite, pyrite Finely disseminated	Good, homogeneous sample, a fine grained black rock with patches of pale green
ATS014	87	2	0.25NQ	187	197.88	10.88	MN	PR	F-M	Equigranular	30	Several very thin QF vns with shallow dips Several hairline chlorite vns	Two faults occur	Fspar has a pale green tinge Calcite lining on fault surfaces	2% Pyrite, chalcopyrite	One pegmatite patch, approximately 3cm wide
ATS014	88	2	0.25NQ	256.08	267	10.92	MA	HW	C	Mottled	40%	4cm wide QF vn dipping 30º	Several Faults	Serpentinite on either side of the QF vn Sp and talc on fault surfaces	<0.5% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous MA sample. Approximately 3m of MN (medium grained, equigranular, 20% fspar) occurs, also approx. 50cm of FPX, and a 14cm wide patch of PGN is present
ATS014	89	2	0.25NQ	278	286.12	8.12	MA	HW	C	Mottled	60%	1x3cm wide QFr vn (Slightly green chloritized) 1x1cm QF vn (0º dip) Chlorite hairline vns		Chlorite alteration		Patches of FPX present
ATS014	90	2	0.25NQ	290	302	12	LN	PR	M-C	Equigranular mottled	15% (FPX) - 50% (LN)	Set of parallel thin chlorite vns with shallow dip Many thin sp/chlorite vns	Minor faults	Serpentinite and talc on fault surfaces	1% Chalcopyrite, pyrrhotite/pentlandite Possible chlorite	Sample more representative of NC with LN and patches of FPX. LN has a mottled texture in places

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS041	91	2	0.25NQ	22	31	9	DM	PR	F	Very distinctive texture described as modifed stromatolite and oolitic sandstone		1x QF vn dipping 75º		Rock is very fractured	<0.5% Chalcopyrite, pyrrhotite/pentlandite	Sample is altered and grey, black, pale green and pink in colour
ATS168	92	1	0.25NQ	50	61.97	11.97	MN	PR	F	Equigranular	15%-25%	Chlorite hairline vns present	Minor faults	Serpentinite and talc on fault surfaces	1% Pyrrhotite/pentlandite	
ATS169	93	1	0.25NQ	113.26	123.06	9.8	HF	PR	F	Equigranular		4 x thin QF vns with 0ºdip Hairline serpentinite and chlorite vns occur			Sulphides scarce, except for one patch of pyrrhotite	Sample generally black and grey except for white QF patches
ATS168	94	1	0.25NQ	166.6	177.06	10.46	HF	PR	F	Equigranular		1 x 3cm QF vn Hairline serpentinite and chlorite vns occur	Frequent faults	Sample is extensively fractured Calcite present on fault surfaces	0.5% Pyrite, pyrrhotite/pentlandite Mainly disseminated , also as stringers.	Sample is homogeneous, generally grey, (with no green stringers)
ATS168	95	1	0.25NQ	179.02	189.03	10.01	DM	PR	F	Equigranular		2 x 0.5cm QFr vns with 45º dip	Many faults	Sample has pale yellow/grey patches and areas of serpentinite alteration Chlorite alteration on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite Pyrite possibly present, disseminated and as vns	
STT93	96	2	0.25NQ	185.52	197.07	11.55	SP	PR	M-C	Coarse pyroxene grains surrounded by medium grained sp/mgt grains and Fspar	15-20%	1 x 1cm QF vn with 0º dip Hariline sp and chlorite vns		Highly serpentinised	2-3% Pyrite, Chalcopyrite, pyrrhotite/pentlandite	
STT3	97	2	0.25NQ	244.05	255.92	11.87	NC	PR	M	Equigranular	Variable 10 - 30%	4 x thin QF vns with 30º dip	Minor faults	Low serpentinization Chlorite alteration Serpentinite and calcite present on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	Generally GN with patches of FPX and one thin PGN section. A thin (15cm) ductile shear zone occurs
STT3	98	2	0.25NQ	287.8	299.64	11.84	NC	PR	Variable F,M,C	Variable, Equigranular; Pegmatitic	Variable 10-30%	Several QF vns Several thin chlorite and serpentinite vns with shallow dip	Minor faults	Low serpentinization Serpentinite, talc and chlorite on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	Sample consists of FPX, LN cycles with thin sections of PGN and MA
STT3	99	2	0.25NQ	336.12	347.53	11.41	FPX	PR	F	Equigranular	Variable 10-30%	3 x 0.5cm to 2cm thick QF vns with 45º dip	Several faults	Serpentinite and talc on fault surfaces	0.5% Fine grained pyrrhotite/pentlandite, chalcopyrite	
ATS003	109	2	0.25NQ	65.36	77.6	12.24	PGN	PR	C	Pegmatitic	60%	1 × 8cm QF vn with 45º dip 1 × 12cm QF vn with 25º dip 1 × 4cm QF vn with 10º dip Two thinner QF vns occurred at dips of 45ºand 70º	Minor faults	Rock stained yellow, brown, orange near the fracture. Calcite on fracture surface	2% Chalcopyrite, pyrrhotite/pentlandite	
ATS003	110	2	0.25NQ	166.55	179.65	13.1	SP	PR	M	Medium to coarse grained px grains surrounded by medium grained Mg, Sp and Fspar	10%	Hairline Sp vns		Sp patches ±3 cm wide in places	1% Chalcopyrite, pyrrhotite/pentlandite	
ATS063	111	4	0.25NQ	63.28	75.16	11.88	LN	PR	M	Equigranular	30%		Minor faults	Chlorite replacement on fault surfaces		
ATS063	112	4	0.25NQ	101.96	112.24	10.28	MN	PR	M	Equigranular	15%	1 × 1cm QF vn dipping 45º 5 × (1 - 5cm) FPX vns with 0-45º dips Hairline chlorite vns with 80º dips	2 minor faults	Fault surfaces show chlorite and Sp replacement		

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS063	113	4	0.25NQ	125	135.85	10.85	FPX	PR	M	Equigranular		1 × 3cm wide QF vn dipping 0º 1 × 1cm QF vn dipping 30º Few hairline Sp vns	Several minor faults	Chlorite alteration Fault surfaces generally pitch black, crumbly Calcite and chlorite on fault surfaces	< 0.5% Pyrrhotite/pentlandite	
ATS070	114	4	0.25NQ	267.3	277.4	10.1	MN	PR	M	Equigranular	10%	Several thin QF, chlorite and Sp vns	Several minor faults	Sp and chlorite on fault surfaces	1 -2% Chalcopyrite, pyrrhotite/pentlandite	Possibly relog as FPX?
ATS070	115	4	0.25NQ	42.72	53.25	10.53	NC	PR	M-C	Equigranular; pegmatitic	35%				3% Chalcopyrite, pyrrhotite/pentlandite	Sample consists of FPX, MN and PGN
ATS070	116	4	0.25NQ	332.97	343.08	10.11	NC	PR	F-M	Equigranular; Pegmatitic	30%		Several minor faults	Low serpentinization Sp and chlorite on fault surfaces	2% Chalcopyrite, pyrrhotite/pentlandite, pyrite	Sample consists of FPX, MN and PGN
ATS070	117	4	0.25NQ	163.85	172.25	9.11	HF	PR	F	Equigranular		1 × 0.5cm wide QF vn with 0º dip	Several minor faults	Chlorite and calcite on fault surfaces	1% Chalcopyrite, pyrrhotite/pentlandite Fine grained	Heterogeneous sample with many green stringers or bands. 15cm of Sp alteration with lath - like (possibly aragonite) crystals approx. 2cm in length. Mica concentrated in patch of QF
ATS018	118	2	0.25HQ	46.14	51.98	5.84	SP	PR	M - C	Equigranular	0.50%	1 × 0.5cm Sp vn dipping 45º	Minor faults	Fspar pale green tinge Calcite and Sp on fault surfaces	1% Chalcopyrite, pyrrhotite/pentlandite, pyrite	Hairline Sp vns. Intial rock FPX.
ATS018	119	2	0.25HQ	157	162.26	3.46	MN	PR	F - M	Equigranular	20%	1 x thin QF vn dipping 60º			2% Chalcopyrite, pyrrhotite/pentlandite	
ATS 018	120	2	0.5NQ	171.84	175.3	3.46	NC	PR	F-M	Equigranular; Pegmatitic	20 -80%	2 x 3 to 4cm QF vns Hairline chlorite/Sp vn.	Minor faults	Sp alteration Chlorite alteration on fault surfaces	2% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample. FPX, LGN, PGN (20cm) present
ATS 018	121	2	0.25NQ	226.1	232.11	6.01	MN	PR	M	Equigranular; Pegmatitic	20 -80%	Hairline Sp vns (parallel set)			1% Chalcopyrite, pyrrhotite/pentlandite	
ITS24	122	4	0.25NQ	153.01	163.07	10.06	NC	PR	M-C	Equigranular	25%	Several thin sp and chlorite vns with 80º dips	Minor Faults	Chlorite alteration associated with sp/chlorite vning Chlorite replacement on fault surfaces	<05% Chalcopyrite, pyrrhotite/pentlandite	MN, GN, PGN present
ATS146	123	1	0.25NQ	33.66	44.45	10.79	PX	PR	F - M	Equigranular		1 x 2cm wide QFvn dipping 75º 1 x 2cm vn composed of QF, dark green acicular mineral and px dipping at 80º dip	Several Faults	1 x 15cm long, 2cm wide Sp and QF patch. Sp, calcite and chlorite on fault surface. Fault surface frequently brown and muddy.	0.5% Chalcopyrite, pyrrhotite/pentlandite, pyrite (Fine grained)	
ATS146	124	1	0.25NQ	53.82	64	10.18	SP	PR	M - C	Coarse Px grains surrounded by discrete, medium grained Mgt/ Sp		1 x 13cm wide QFvn (with coarse Fspar crystals, myrmekitic texture and sp and chlorite alteration). 1 x 3cm QFvn with 45º dip 1 x 1cm wide QF vn and 1 x 5cm wide vn of pegmatitic QF, pyrite, Sp & sulphides dipping 10º	Several faults	High Sp alteration in places Sp, chlorite and calcite on fault surfaces	1.5% Chalcopyrite, pyrrhotite/pentlandite, pyrite	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS146	125	1	0.25NQ	77.97	89	11.03	NC	PR	Variable F (FPX) M (MN) C (LN)	Variable Equigranular; mottled; leopard spot	Variable 20 - 80%	Thin QF and Sp/ chlorite vns with 70 - 90º dips 1 x <0.5cm wide QF vn dipping < 10º	One fault	Chlorite alteration on fracture surface and the adjacent Fspar and calcite lining	0.5% Chalcopyrite, pyrrhotite/pentlandite, possibly pyrite	Excellent NC sample, consisting of LN, MN and FPX
ATS 146	126	1	0.25NQ	92	102	10	FPX	PR	F - M	Equigranular	0 - 10% (up to 50% in LN patches)	1 x 0.5cm QF vn dipping 70º dip 2 x thin QF vns with 45 - 70º dips			2% Chalcopyrite, pyrrhotite/pentlandite	Sample generally a fine to medium grained FPX with 3 patches of LN (2 - 40cm wide) with coarse Px grains
ATS 164	127	4	0.5NQ	72.82	79.6	6.78	HF	PR	F	Equigranular		1 thin QF vn dipping 45º 1 x 0.5cm QF vn dipping 30º Hairline px vn	Several minor faults	Minor calcite lining on fault surfaces		Pale green stringers present
ATS 85	128	4	0.25NQ	221.95	231.93	9.98	MZN	PR	F	Equigranular	25%	Many thin vns (45 - 80º dip). 1 x 4cm wide chalcopyrite, pyrrhotite/pentlandite vn dipping 5º			0.5% Chalcopyrite, pyrrhotite/pentlandite Concentrated in vn	Sample is pale dirty brown in colour with unusual black streaks
ATS85	129	4	0.25NQ	239.3	250.48	11.18	HF	PR	F	Equigranular		0.5cm wide shiny grey/pink graphite vn	Many minor faults		0.5% Chalcopyrite, pyrrhotite/pentlandite	Frequent green stringers Possible replacement of QF vns possibly epidote. Also Irregular shaped QF patches present
ATS83	130	4	0.25NQ	132.04	142.8	10.76	FPX	PR	M	Equigranular	15 - 20%	Few QF vns (1cm wide and thinner) with 45º dip Thin sp/talc vns		Serpentinization	0.5% Chalcopyrite, pyrrhotite/pentlandite	8cm wide patches of QF 1 x 2cm patch of coarse grained QF. Disseminated graphite present
ATS 83	131	4	0.25NQ	169.56	180.32	10.66	MN	PR	F	Equigranular	30%	Thin QF vns with 45 to 60º dip	Minor faults	QF and chlorite on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	
ATS115	132	1	0.25NQ	35.82	46.49	10.67	PFPX	PR	M -C	Equigranular	25%	High number of hairline Sp vns. 1 x 0.5cm QF vn dipping 5º	Several faults	Fspar has pale green/yellow tinge (especially near Sp/chlorite hairline vns) Calcite and Sp present on fracture surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite possible pyrite	Fspar increases to 80% in a 20cm LN patch
ATS 083	133	4	0.25NQ	244.04	255.02	11	HF	PR	F	Equigranular					0.5% Pyrrhotite disseminated and concentrated as a bands parallel to layering	Sample is predominantly pale green with grey, irregularly shaped patches. Mica present .
ATS66	134	2	0.25NQ	76.92	88.02	11.1	LN	PR	M - C	Equigranular	40%	Approx. 7 thin QF vns with 0 - 90º dips 1 x 2cm wide QF zoned vn (qtz in the center and Fspar on either side)		Chlorite alteration	2% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample consisting of equigranular, medium to coarse grained LN. An 8cm wide MZN patch occurs
ATS66	135	2	0.25NQ	89	99.73	10.73	NC	PR	F (MN) M -C (LN)	Equigranular	15% (MN) 45% (LN)	3 thin QF vns (0 - 45º dip)	Few minor faults.	Saussiterization and chloritzation of Fspar Sp on surfaces and thin QF lining	3% Chalcopyrite, pyrrhotite/pentlandite	Half of this sample consists of MN and the other half LN
ATS032	137	2	0.25NQ	115.18	123.41	8.23	MZN	PR	F	Equigranular	25%	Several thin QF vns		Chlorite alteration	<0.5% Chalcopyrite	High frequency of unusual grey veins or stains
STT006	138	2	0.25NQ	32.5	42	9.5	PGN	PR	M - C	Equigranular; Pegmatitic	5% (FPX) - 75% (PGN)	2 x thin QF vns			3% Chalcopyrite, pyrrhotite/pentlandite	Sample is generally medium to coarse grained with some coarse grain patches and a 0.75m patch of fine grained FPX
ATS 009	139	2	0.25NQ	65	75.23	10.23	PX	PR	M	Equigranular	5 - 10%	Thin QF vns 1 x 1cm QF vn dipping 75º Hairline Sp vn dipping 30º	2 faults	Calcite lining and chlorite alteration on fault surface	<0.5% Pyrrhotite/pentlandite	

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS009	140	2	0.25NQ	100.62	108.93	8.31	PX	PR	Variable (Medium to coarse grained pale green mineral occurs as porphyries within a fine grained matrix)	Porphyritic	20-30%	1 x0.5cm wide QF vn dipping 30 - 35º dip) Hairline sp/chlorite and QF vns			<0.5% Pyrite (small amount) and chalcopyrite	Sample is not representative of Px, but is best described as a porphyritic MZN. Many unusual pale green veins or stains similar to MC137
STT008	141	2	0.25NQ	280.2	287.4	7.2	LN	PR	F	Mottled	50%	1 x 5cm wide QF vn containing one coarse px grain 1 x thin <0.5cm QF vn Hairline sp/chlorite vn		Chlorite alteration	<0.5% Chalcopyrite, pyrrhotite/pentlandite	Mottles are medium to coarse grained
STT008	142	2	0.25NQ	162.1	172.38	10.28	DM	PR	Variable F,M,C	Altered		1 x 0.5cm vn dipping 10º 0.5cm wide pyrite vn dipping 25º	Few minor faults	Extensive Sp alteration in places	0.5% Chalcopyrite, pyrrhotite/pentlandite, pyrite	Sample is a pale green/yellow, altered dolomite. A coarse grained to pegmatitic yellow mineral occurs. Patches of QF are present
ATS134	143	2	0.5NQ	216.4	218.64	2.24	QF	PR	F	Equigranular		Pyrite vns prolific in first 20cm of sample		Pale pink colouration, probably K-spar	0.5 - 1% Mainly Pyrite, also chalcopyrite, pyrrhotite/pentlandite	
ATS036	144	2	0.25NQ	218.64	225.82	7.18	MN	PR	M	Equigranular	25%	Thin vertical calcite vn		Low sp alteration Chlorite alteration	1% Chalcopyrite, pyrrhotite/pentlandite	3 x 3 to 16cm pegmatitic patches
ATS032	145	2	0.25NQ	68.91	78.77	9.86	MN	PR	F (Also 10 - 60cm medium grained LN patches and 1x 10cm coarse grained pegmatitic patch)	Equigranular	Varies 25% to 40% (pegmatitic patch)	Many thin QF vns. 2 x 0.5cm wide QF with 30º dip Thin Sp/chlorite vns Thin chalcopyrite and pyrrhotite vn with 0º dip.			1% Chalcopyrite, pyrrhotite/pentlandite	Sample looks like NC. Not a good MN sample.
ATS77	146	3	0.25NQ	376	386	10	MZN	PR	F	Equigranular	20%	Hairline QF and sp/chlorite vns.	Minor faults	Talc and chlorite replacement and thin calcite lining on fault surfaces	4% Chalcopyrite, pyrrhotite/pentlandite	
ATS 77	147	3	0.25NQ	147.6	159.52	11.92	PGN	PR	C (Some medium grained and some pegmatitic patches)	Equigranular - pegmatitic	50%	1 x 2cm wide QF vn dipping 45º 1 x 0.5cm wide QF vn dipping 45º		Chlorite alteration	0.5% Chalcopyrite, pyrrhotite/pentlandite	
ATS069	148	3	0.25NQ	152.73	160.3	7.57	PFPX	PR	M - C	Pegmatitic	50%	Thin QF and sp/chlorite vns	Two faults present		2% Chalcopyrite, pyrrhotite/pentlandite	
ATS5	149	3	0.25NQ	298.82	305.69	6.87	MA	HW	F - M	Mottled	60%	4 x 0.5 - 1cm wide QF vn with 0 - 20º dips Thin chlorite vns		Patch of Sp ± 5cm wide	0.5% Chalcopyrite, pyrrhotite/pentlandite	Rock has light brown and black mottles. Patches of medium grained PX occur. Patch of disseminated Graphite, approx 7cm wide

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS5	150	3	0.25NQ	166-95	177.04	10.09	PGN	PR	M-C	Pegmatitic	55% (LN) 70% (PGN)	Several thin QF vns. 1 x 0.5cm QF vn dipping 35º Thin chlorite/Sp vns			1% Chalcopyrite and pyrite	Approx. half of the sample is a medium grained LN. The other half of the sample is a coarse grained PGN.
ATS018	151	2	0.25 and 0.5NQ	211.37	216.55	5.18	PGN	PR	M - C	Pegmatitic	25 -30	Thin Sp vn	Minor faults	Sp on fault surfaces	5% Chalcopyrite, pyrrhotite/pentlandite	Good, homogeneous sample
ATS093	152	3	0.25NQ	90.97	96.55	5.58	DM	PR	F	Evidence of previous layering		Thin calcite vns present. 1x 7cm wide pale green QF vn	Several faults Sample is quite broken.	Extensive serpentinization Calcite lining on fault surfaces	<0.5% Few pyrite grains	In general the rock is grey and black with yellow - green patches. 25cm patch of coarse grained Px crystals present (possibly representing a previous vn). The Px grains have partially altered to chlorite.
ITS019	153	4	0.25NQ	135.25	141.61	6.36	DM	PR	F	Equigranular		Difficult to detect due to texture. Possible thin sp vns	Few minor faults	Low- medium serpentinization Thin calcite lining on fault surfaces	<0.5% Chalcopyrite, pyrrhotite/pentlandite	Altered sample, generally pale white/yellow with grey/black patches
ITS018	154	4	0.25NQ	106.21	114.06	7.85	DM	PR	F			Difficult to detect due to texture. Possible thin sp vns		±10 -30cm patches of serpentinite	<0.5% Chalcopyrite, pyrrhotite/pentlandite	General apperance light grey with light yellow/white/grey patches
ITS028	155	4	0.25NQ	83.36	93.77	10.4	NC	PR	M (With patches of fine grained FPX and coarse grained PGN)	Equigranular - pegmatitic	5 -10% (MN) - 50% (PGN)	2 x 1 cm QF and Sp/chlorite vn. (merges and seperates) with 70º dip. Several thin (<0.5cm) QF and chlorite vns with 45 - 90º dip		Medium serpentinization	2% Chalcopyrite, pyrrhotite/pentlandite	Mainly medium grained MN with patches of PGN and FPX
ITS024	157	4	0.25NQ	123.84	129.85	6.01	QF	PR	F	Equigranular		Many hairline px vns	Minor faults		<0.5% Small amount of pyrite	Sample is white with many of fine - medium black specks (Px?) Coarse fspar crystals present
ATS 054	158	4	0.25NQ	168.08	177.97	9.89	NC	PR	F-M (With a 3.5m pegmatitic patch)	Equigranular - pegmatitic	Variable 15% (MN) 30% (FPX) 50% (PGN)	1 x 0.5cm QF vn dipping 25º, displaced by Sp/chlorite vn dipping 70º Several thin (<0.5cm), undulating chlorite/Sp vns 1 x 0.5cm wide Sp vn dipping 75º	Minor faults	Chlorite alteration on fracture surfaces.	2% Chalcopyrite, pyrrhotite/pentlandite	Sample is heterogeneous consisting of MN, FPX and PGN
ATS054	159	4	0.25NQ	202.88	209.55	6.67	PGN	PR	C (With some medium and some pegmatitic grains).	Pegmatitic	50 -70%	1 x 0.5 - 4cm wide QF vn dipping 75º 1 x 10cm QF vn (contains sulphides and Px/Sp)		Calcite lining present on fracture surfaces.	3% Chalcopyrite, pyrrhotite/pentlandite	Good PGN sample
ATS 044C	160	3	0.25NQ	389.05	395.26	6.21	DM	PR	F	Equigranular		Several thin QF vns. 1 x 0.5cm wide QF vn dippingt 75º	Minor faults	Low Serpentinization QF lining on fault surfaces Possblie quartz and carbonate	<0.5% Chalcopyrite, pyrrhotite/pentlandite	Rock is pale green and yellow with grey patches. Core is fairly fragmented. Approx. 3m of relatively unaltered DM
ITS028	161	4	0.25NQ	289.83	299.78	9.95	PFPX	PR	Variable M,C,Pegmatitic	Variable (Equigranular-pegmatitic)	20% (M - grained GN) 30% (pegmatitic GN)			chlorite alteration on fracture surfaces	2 - 3% Chalcopyrite, pyrrhotite/pentlandite	Sample is coarse grained to pegmatitic with patches of medium grained GN
ITS026	162	4	0.25NQ	68.92	75.55	6.63	PGN	PR	C	Pegmatitic	30%	Hairline to thin chlorite/sp vns 1 x 0.5cm chlorite/sp vn dipping 70º	Few minor faults	Chlorite replacement on fault surfaces	2% Pyrite and chalcopyrite	Graphite in patches

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS021	163	1	0.25HQ	116.15	122.11	6.63	SP	PR	M-C	Equigranular	<1%	Several thin QF vns (shallow and steep dips) 1 x 0.3mm wide calcite/chlorite vn dipping 5 - 10º 1 X 3cm wide QF vn dipping 45º	4 subvertical faults	High serpentinization thin calcite lining and talc on fault surfaces	3% Chalcopyrite; pentlandite/ pyrrhotite (Pyrite mentioned in the log not seen)	Highly serpentinized sample. Can see previous equigranular texture, but net-like texture of sp alteration dominates
ATS021	164	1	0.25HQ	85.14	90.6	5.46	PX	PR	M	Equigranluar		Thin (0.2cm wide) vns dipping 30 to 40º Thin Sp vns dipping 45 to 80º	Minor faults	Minor chlorite alteration	<0.5% Chalcopyrite, pyrrhotite/pentlandite (Fine - grained)	Homogeneous sample with several thin sp vns
ATS 021	165	1	0.25HQ	234.5	240.03	5.53	MN	PR	M-C The sample is generally a medium to coarse grained GN with patches of fine grained MN	Equigranular	50-60% (GN) and 10% (MN)	Thin cholrite vn dipping 85º thin QF vn dipping 56º	2× faults (± 75-80º dips)	Minor chlorite alteration Sp on fracture surfaces	1% Chalcopyrite and pentlandite/ pyrrhotite Sulphides occur in concentrated patches	Sample is a medium grained GN. However patches of finer grained MN occur (approx. 1.5m of the sample) Within the MN sections, GN patches (sometimes vein-like) occur
ATS 033	166	1	0.25NQ	40.02	45.45	5.43	MN	PR	M (coarse grained in pegmatitic patches)	Equigranular (with pegmatitic patches)	15-20%	1 × 6cm wide QF vn dipping 50º flanked on either side with chlorite mineralisation 4 × thin QF vns with shallow dips		Chlorite alteration associated with vning	1% Chalcopyrite, pyrrhotite/pentlandite	Fairly homogeneous sample of medium grained MN with pegmatitic patches (approx.12cm and 6cm wide)
ATS 068	167	1	0.25NQ	282.83	288.2	5.37	LN	PR	M	Equigranular (with pegmatitic patches)	40%	High number of thin Sp vns	Several faults	Minor chlorite alteration Sp and chlorite alteration on surfaces. Sample is fairly fractured/broken in places	1% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample, a medium grained LN with approx. 3 × 6-10cm pegmatitc patches. Also approx. 1m of fine -medium grained MN
ATS 068	168	1	0.25NQ	325.5	331.1	5.6	HF	PR	F	Equigranular		1 × 22cm wide QF vn. Px mottles occur in the vn		Medium serpentinization. Chlorite alteration of QF vns in places and on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample, generally black and grey with few white-green stringers (60-70º dip). Grey and black alternating bands indicate previous layering.
ATS 086	169	1	0.5NQ	68.9	74.84	5.94	HF	PR	F	Equigranular		Thin sp and chlorite vning with 15º and 90º dips. Thin pyrite vns occur at 69,6m	Many discrete faults (rock is generally competent - no shear zones). Calcite (pale pink) and QF line fault surfaces. Sp and chlorite alteration on fault surfaces	SP alteration	2% Chalcopyrite, pyrrhotite/pentlandite pyrite	Homogeneous, dark grey sample
ATS 067	170	1	0.25NQ	132.05	142.98	10.93	FPX	PR	F - M	Equigranular	10%	Several thin QF vns dipping 60º Thin chlorite vns with shallow dips		Chlorite alteration noted in thin QF vn. Minor serpentinization Calcite lining on fracture surfaces	1% Chalcopyrite, pyrrhotite/pentlandite Medium to fine grained.	Excellent homogeneous sample. Generally light grey in colour
ATS001	171	1	0.25NQ	87.3	98.05	10.75	PGN	PR	M - C	Pegmatitic	40-60%	Thin QF, chlorite and sp vns	Minor faults	Pale green Fspar (Chloritization) QF and chlorite on fault surfaces	2% Chalcopyrite, pyrrhotite/pentlandite	Homogeneous sample, coarse grained with patches of medium grained GN
ATS 002	172	1	0.25NQ	117.23	126.78	9.55	PX	PR	Variable F,M,C	Equigranular	0-5% (30% fspar for 0.75m)	Thin calcite vn (with associated px)	Minor faults	Minor serpentinization Calcite lining on fault surfaces	1% Chalcopyrite, pyrrhotite/pentlandite Fine -medium grained	Fairly homogeneous sample, varying only in grain and Fspar content

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 002	173	1	0.25NQ	194.13	202.34	8.21	MZN	PR	F	Equigranular	5% (But 20% in GN patches)	Pyrite vn dipping 45º Thin sp vns	Minor faults	Moderate serpentinization	3% Chalcopyrite, pyrrhotite/pentlandite & pyrite Sulphides are concentrated in Hf section of the core	Sample is heterogeneous, fine grained, brown/grey MZN with a high concentration of pentlandite/pyrrhotite. Small patches of GN occur. Approx. 3m of HF present. According to AML Geologist, MZN is often mixed with HF
ATS 002	174	1	0.25NQ	211.47	215.1	3.63	DM	PR	F			Hairline Sp vn dipping 85-90º (Coarse pyrite crystals concentrated adjacent to this vn) 1× 2cm wide GN vn dipping 45º	Minor faults	Moderate-high serpentinization Sp on fault surfaces Chlorite replacement on fracture surfaces.	20-30% Chalcopyrite, pyrrhotite/pentlandite pyrite (high amount of pyrite)	Sample is heterogeneous being extenisively altered and interlayered with HF. Colour is generally black-grey with patches of light yellow staining. A 16cm white QF vein is present.
ATS 002	175	1	0.25NQ	215.23	218.5	3.27	DM	PR	F			1 × 0.5cm pyrite vn dipping 60º	Minor faults	Moderate-high serpentinization Sp on fault surfaces	20% Chalcopyrite, pyrrhotite/pentlandite pyrite, Less sulphides than MC174	Sample is heterogeneous, being extensively altered and interlayered with HF. Colour is generally grey. Forced to take MC 174 separate to MC 175 as the Platreef staff has sampled 12cm of core between the samples
ATS 002	176	1	0.5NQ	60.22	62.1	1.88	QF	PR	F-M	Equigranular			Shear zone extends into first 10cm of the sample	Potassium rich QF vn, pink in colour		Generally sample is pale pink with pale grey (qtz) and black (px) grains. There are also very coarse grey white qtz grains. This sample occurs just below a shear zone where the core is broken/gravelly. The first 10cm are grey-white in colour and fractured
ATS 143B	177	1	0.25NQ	37.04	47.71	10.67	NC	PR	Variable F-M	Equigranular	Variable 15-20% (N) 50% (LN) 5% (FPX)	Thin chlorite vn dipping 75º Several hairline chlorite vns with 45-90º dip	Minor faults	Frequent 5-10cm patches of serpentinization occur. Minor chlorite alteration. chlorite alteration on fracture surfaces	1-2% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample with Norite, LN and FPX present
ATS 112	178	1	0.25NQ	60.57	69.09	8.52	PX	PR	M	Equigranular		Hairline chlorite vns Very thin calcite vn dipping 10º	Several minor faults	Calcite lning to fracture/fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	Excellent Homogeneous sample. At 68.7m, a vein like accumulation of pale yellow, soft platy material (?)
ATS 002	179	1	0.25NQ	88.68	94.35	5.67	MA	HW	C to Pegmatitic Mottles	Mottled	Variable 20-30% (to 92m) - 40-50% (from 92-94.35m)	2 × thin QF vns (0 and 75ºdip) 1 × 0.3cm px vn dipping 70º	Minor faults	Chlorite alteration; saussiterization of Fspar Calcite/chlorite on fracture surface	0.5% Chalcopyrite, pentlandite/pyrrhotite	Sample is pale green and black. From 89.65-92m, the mottles are defined. From 92-94.35m, the mottles have been replaced by Fspar laths

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 139	180	1	0.25NQ	187.96	194.36	6.4	HF	PR	F - C	Equigranular	Variable 0 (HF) - 20% (FPX)	1 × 2-4cm QF vn dipping 90º Thin pyrite, chalcopyrite and pentlandite vns with 85-90º dips Thin chlorite vn dipping 75º	Frequent faults	Moderate-high sp Chlorite/calcite alteration on fault surfaces	2% Chalcopyrite; pentlandite/pyrrhotite, pyrite	Very heterogeneous sample. Sample varies from fine grained back-grey material that shows moderate-high serpentinization to a distinctive coarse grained mottled pale green/yellow-grey texture. Pale green/yellow caronas have formed around grey centres??? Approx. 2m of fine grained FPX material also occur with pegmatitic patches. The AML geologist commented that this sample occurs within a contact zone and is a hybrid of HF, "digested pyroxenite" and fine grained FPX
ATS 002	182	1	0.25NQ	221.65	230.47	8.82	HF	PR	F	Equigranular	Variable 0% (Hfls) - 70% (Fspar rich patches)	Thin QF vns. Thin sulphide vns (chalcopyrite, pyrrhotite and pentlandite)		Moderate-highly serpentinized	30% Chalcopyrite, pyrrhotite/pentlandite, pyrite (less than MC180)	Heterogeneous sample. Rock is fine grained, grey-black with numerous sulphide patches. Fspar rich patches occur
ATS 001	183	1	0.25NQ	123.12	131.85	8.73	PX	PR	M	Equigranular	Variable 0-5%	1 x 0.5cm px/chlorite dipping 75º	Minor faults	Low sp QF lining and chlorite replacement on fault surfaces	1-2% Chalcopyrite, pyrrhotite/pentlandite Pale yellow sulphide tarnished to bronze-yellow in places. Possibly pyrite and/or chalcopyrite	Excellent, homogeneous sample. 1 x 5cm patch of pegmatitic texture associated with coarse grained sulphides
STT 021	184	2	0.25NQ	92.85	99.33	6.48	PFPX	PR	Variable C-pegmatitic	Equigranular - pegmatitic	Variable 20-80%	1 x 1cm wide QF vn dipping 5º 1 x 3cm QF dipping 5º 1 x 4cm wide QF vn dipping 45º	Few faults	Low-high Sp alteration. 20cm patch of high Sp with coarse Sp grains. Talc/chlorite alteration on fault surfaces	3-4% Chalcopyrite, pyrrhotite/pentlandite	Heterogeneous sample Approx. 4m of coarse grained FPX increases in grain size and Fspar content and grades into PFPX . Long needle-like black-brown crystals occur in veins
ATS 017	185	2	0.25NQ	156.98	162.65	5.67	PFPX	PR	C	Equigranular - pegmatitic	Variable 10-30%	Thin sp vns	Several faults	Chlorite alteration Low-moderate Sp alteration chlorite, Sp and talc on fault surfaces	1-2% Chalcopyrite, pyrrhotite/pentlandite	Excellent homogeneous sample, generally pale grey with white patches
ATS 015	186	2	0.25NQ	98.75	106.66	7.91	PFPX	PR	M-C	Equigranular to pegmatitic	40%	Thin QF vns Thin chlorite vns	Few faults	Minor Serpentinization & chlorite alteration Calcite lining and chlorite replacement on fault surfaces	1% Chalcopyrite, pyrrhotite/pentlandite	Sample is a fairly homogeneous black and white, medium to coarse grained FPX with patches of coarse grained FPX

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 017	187	2	0.25HQ	337.41	341.65	4.24	PFPX	PR	M	Equigranular	1-50%	Many thin Sp and chlorite vns dipping 90º		Chlorite alteration Moderate-high Serpentinization	3% Chalcopyrite, pyrrhotite/pentlandite	Fairly homogeneous, light grey and white appearance. Generally medium grained FPX with an 80cm section of Fspar rich FPX and a 30 cm patch of PFPX
ATS 010	188	2	0.25NQ	58.05	67.91	9.86	PX	PR	M	Equigranular	5-20%	Many thin Sp vns 1 x 0.5cm Sp vn dipping 60º	Minor faults	Chlorite lining on fault surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite Fine grained	Excellent homogeneous sample
ATS 011	189	2	0.25NQ	251.69	257.5	5.81	PFPX	PR	M	Equigranular	Variable (20-40%)			Minor serpentinization	1% Chalcopyrite, pyrrhotite/pentlandite	Fairly homogeneous grey, white and black rock. Generally medium grained sample with 1 x 20-30cm coarse grained patch. Also smaller 5-10cm coarse grained patches.
ATS 003	190	2	0.25NQ	252.02	258.1	6.08	PX	PR	M (with 1 x 8cm Fspar rich patch with medium - coarse grained Px crystals)	Equigranular	Generally 20% In places 40%	1 x 0.3mm QF vn dipping 15º Set of thin 75º dip grey/blue vns (Very hard). Hairline vertical chlorite vn. Very thin sulphide vn (pyrrhotite/pentlandite)	Minor faults	Moderate-high Sp alteration (for 60cm only) Sp on surfaces	1% Chalcopyrite, pyrrhotite/pentlandite	This sample is fairly homogeneous and is grey, brown and white in colour. 3 x 8-32cm wide Fspar rich patches occur
ATS 013A	191	2	0.25NQ	231.8	241.6	9.8	PX	PR	F-M	Equigranular		2 x 0.5cm QF vns with 5º dip Frequent hairline QF vns Hairline Sp/chlorite vns	Minor faults	Minor chlorite alteration Chlorite/Sp alteration on fault surfaces	2% Chalcopyrite, pentlandite/pyrrhotite	Fairly homogeneous sample; dark grey with occasional flecks of QF grains. Main feature is a 10cm wide vein of coarse grained GN, richly concentrated with pentlandite and pyrrhotite and some chalcopyrite. Translucent blue medium grained crystals present?
ATS 130	192	2	0.25NQ	210.36	214.06	3.7	DM	PR	F	Equigranular		Thin calcite vns. Hairline Sp vns. QF vns Thin sulphide vns (Pyrite and pyrrhotite/pentlandite vns)	Minor faults	Low-moderate serpentinization Minor Sp and chlorite alteration	1-2% Pyrrhotite/pentlandite. Some chalcopyrite, possibly some pyrite	Generally consists of fine grained, dark grey material with 20-50cm wide QF rich patches Pale green tinge possibly chlorite alteration
ATS 012B	193	4 (South)	0.5NQ	179	183.22	4.22	QF	HW	M	Variable (Equigranular-amorphorus)		Thin Px vns	Few minor faults	Pale pink and yellow colouration to Fspar	0.5% Minor pyrite	Generally sample is dirty white with a tinge of pale pink. Black and white patches occur where Px is present (Px is concentrated along vertical fractures)

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
AMK 089	194	4 (South)	0.5NQ	477.06	480.02	2.96	Q	PR	F	Equigranular		Thin Fspar (microcline) vns. Abundant Px vns, generally 0.5cm wide with 0-30º dips Minor pyrite associated with these vns in places	Frequent minor faults	Chlorite alteration with Px, chlorite and microcline on surfaces.	0.5% Fine grained pyrite	Heterogeneous sample. Colour is dirty white with extensive dark veining (probably Px) Green tinge to rock may be Px alteration/replacement by chorite. Note that magnetite is recorded on the log and occurs in dark patches/veins
AMK 52	195	4 (South)	0.25NQ	312.04	321.94	9.9	DO	PR	F	Equigranular	25%	Frequent thin Sp vns 2 x 0.5cm Sp vns dipping 60º	Frequent faults	Minor Sp Sp on fracture surfaces		Homogeneous sample, dark grey in colour
AMK 034	196	4 (South)	0.5NQ	407	411.4	4.4	Q	PR	F			Several Sp and chlorite hairline vns	Several faults	Minor Sp alteration and chlorite alteration Chlorite alteration and calcite lining on surfaces	<0.5% Fine grained chalcopyrite	Fairly heterogeneous sample Dark grey/ pale green in colour, Can see previous layering
AMK 008	197	4 (South)	0.5NQ	184	187.45	3.45	DO	PR	F	Equigranular	10%	Hairline Sp vns	Several minor faults	Minor chlorite alteration and Sp alteration Sp alteration on surfaces	<0.5% Fine grained pyrite	Homogeneous sample
AMK 008	198	4 (South)	0.5NQ	389.49	394.12	4.63	DO	PR	F	Equigranular	15%	Hairine Sp chlorite vns	Several faults	Moderate Sp alteration Sp and chlorite on fault surfaces	<0.5% Fine grained pyrite	
AMK 049	199	4 (South)	0.5NQ	388.45	393.33	4.88	DO	PR	F (But coarser grained than MC198)	Equigranular	20%	1cm wide QF vn dipping 65º	Many faults	Chlorite alteration and moderate Sp alteration. Sp on fault surfaces	<0.5% Fine grained pyrite	Homogeneous sample
AMK 073	200	4 (South)	0.5NQ	381.02	385.62	4.6	Q	PR	F	Equigranular		Hairline chlorite and Sp vns	Several faults	Chlorite alteration and moderate-high Sp alteration Sp and calcite on fault surfaces	1% Pyrite Fine-grained; occurs throughout the sample	Heterogeneous sample.Grey, black, green in colour Alternate green, grey, white and black bands possibly representing previous bedding
AMK 083	209	4 (South)	0.25NQ	480.01	488.06	8.05	Q	PR	F			Extensive thin QF vns. Frequent thin Sp/Chlorite vns	Highly faulted	Chlorite alteration Fractured surfaces generally clean apart from QF lining and chlorite alteration in places	0.5% Pyrite (fine grained)	Heterogeneous sample; light grey, white and pink in colour. Black and white and dark pink banding present (possibly previous layering).
AMK 048	210	4 (South)	0.5NQ	231.9	236.05	4.15	DO	PR	F	Equigranular		Hairline Sp vns	Frequent faults	Chlorite alteration and moderate-high Sp alteration. Sp and chlorite alteration on surfaces	<0.5% Minor Fine grained sulphides	Homogeneous sample. Fine grained, dark grey with a greenish tinge
ATS 004	211	2	0.25NQ	183.58	190.3	6.72	PGN	PR	C	Variable (Equigranular to pegmatitic)	Variable from 80% (PGN) to 50% (coarse grained PGN) to 5% (FPX)	1 x 0.5cm QF vn dipping 45º 1 x 7cm QF vn dipping 20º	1 x major fault zone (55cm) 1 x minor fault	Chlorite alteration Major chlorite alteration on fault surfaces	2% Chalcopyrite, pyrrhotite/pentlandite (Medium to coarse grained sulphides)	Heterogeneous sample, black and white in colour with . patches of coarse grained GN alternating with patches of pegmatitic GN. Approx. 1m of medium grained FPX occurs

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 008	212	2	0.25NQ	61.57	72.08	10.51	PX	PR	F	Equigranular (Amorphorus in altered areas)	Variable (0-35%)	High frequency of hairline chlorite vns dipping 0-90º 1 x 4cm wide QF vn dipping 45º	Sample has many clean fractures and one 10cm section of broken core	Chlorite alteration	1% Chalcopyrite, pyrrhotite/pentlandite	Colour green-grey with white-grey-green Fspar rich patches (approx. 30cm).
ITS 046	214	3	0.25NQ	415.91	426.33	10.42	PX	PR	M-C	Equigranular	5%	High frequency of hairline sp/chlorite vns. 1 x 1cm QF vn dipping 45º	Frequent faults	Half the sample shows moderate-high serpentinization. Chlorite alteration of Px Sp and talc on surfaces	4-5% Chalcopyrite, pyrrhotite/pentlandite. Medium-coarse grained sulphides throughout	Medium to coarse grained, equigranular grey, white, green sample. 1 x 23cm patch with "speckled egg" texture. This patch is rich in Fspar (approx. 60%), medium grained and white, grey, brown in colour
ITS 007	215	4	0.25NQ	123	132.02	9.02	SP	PR	M-C	Equigranular (where not altered)	5-10%	Approx. 8cm of QF vns (with pale green tinge) with 20ºdip Several hairline Sp/Chlorite vns with 75º dip	Several faults	Moderate to major serpentinization. Minor talc Chlorite, sp and talc on surfaces.	1% Chalcopyrite, pyrrhotite/pentlandite	Sample is generally grey and black in colour with occassional white patches of coarse grains of QF
ATS 045	216	3	0.25NQ	160.81	164.25	3.44	QF	PR	M (Some coarse grains)	Equigranular (Speckled)		Few thin Px/chlorite vns	Several faults	Minor chlorite alteration Some chlorite and calcite lining on on surfaces		The sample is homogeneous and is white with grey and black specks
AMK 092	217	4 (South)	0.25NQ	482.96	490.07	7.11	Q	PR	F	Texture variable with alternating bands of white, black and grey. Also a variety of patterns		Numerous hairline chlorite/Sp vns	Numerous faults	Bright yellow patches/vns?	<0.5% Pyrite	Sample is black and grey and white in colour. Pale green tinge where alteration to chlorite has occurred.
AMK 089	218	4 (South)	0.25NQ	349.16	359.18	10.02	AP	PR	M		60-70%	1 x 1cm QF vn Many hairline Px/Sp/Chlorite vns	Only minor faults	Moderate alteration of Px to Sp Px and chlorite on fault surfaces		Homogeneous sample pink, grey and black in colour
AMK 089	219	4 (South)	0.25NQ	368.2	377.93	9.73	AP	PR	M-C		60-70%	1 x 2cm band or vn of PX material dipping 45º dip Sp/chlorite hairline vns			<0.5% Small amount of pyrite on surface of fracture	Sample is generally pink,grey, black and white. with a 16cm patch of white/grey QF
ATS 015	220	2	0.25NQ	164.35	172.29	7.94	MA	HW	F-M (Mottles are coarse grained)	Mottled	50-60%	1 x 0.5 LN vn dipping 45º Hairline QF vns frequent	Only minor fractures with broken QF on surfaces	Pale green tinge to fspar	<<0.5% Chalcopyrite, pyrrhotite/pentlandite	Excellent homogeneous MA sample. The sample is grey and white with a pale green tinge. Mottles 2-3cm in radius. 1 x 25cm patch of medium-grained LN. Mottles are fairly diffuse with fine to medium grained Px grains speckled in QF.
AMK 054	221	4 (South)	0.25NQ	255.5	261.65	6.15	AP	PR	F-M (Finer grained than MC218 and MC219)	Equigranular	60-70%	Many hairline sp/chlorite vns	Core very faulted and broken	Px, sp and chlorite on fault surfaces		Sample is pink, black and grey with medium-grained, white euhedral plagioclase crystals in places. Not a good sample as the core is very broken.

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 008	222	2	0.25NQ	43.54	49.6	6.06	PGN	PR	M (With some coarse grained patches)	Texturally this sample is very heterogeneous ranging from coarse grained patches where minerals have defined boundaries to medium grained altered textures where mineral boundaries are diffuse and ill defined.	Variable (10-30%)	High number of thin Px and chlorite vns. Approx. 35cm of sub-parallel Px-chlorite vns with 70º dip Few thin QF vns	Fault associated with sub parallel vn set	Major chlorite alteration Chlorite and broken QF on fault surface	0.5% Chalcopyrite	Heterogeneous sample; Grey, green and white in colour. Not pegmatitic
ATS 096	225	4	0.25NQ	27.32	35.15	7.83	QF	PR	M to C (Coarse grained Fspar and Q grains in a medium grained matrix)	Porphyritic		Several QF vns varying from 0.2mm to 4cm in width. Flanked on either side by bands of a dark mineral (probably Px)	Minor faulting	Pale green mineral on weathered surfaces. Pink staining?		The sample is pink ,white, grey and black. Core is fairly broken due to poor drilling . The dark mineral is feather- like in form, probably tremolite/actinolite
ITS 013	226	4	0.25NQ	140.89	146.9	6.01	PFPX	PR	C	Equigranular	30%	1 x 1cm QF vn dipping 45º dip High number of thin cholrite vns and QF vns with 0-45º dips	Several minor faults	Chlorite alteration gives sample a green tinge. In altered core, a non-magnetic coppery-brown mineral (very fine grained) present - probably phlogopite Chlorite alteration on fault surfaces	4% Chalcopyrite, pyrrhotite/pentlandite	Sample is fairly homogeneous and grey and white in colour. It consists of equigranular coarse grained plagioclase and Px grains. A 10cm wide, medium to coarse grained px patch with diffuse contacts occurs A 0.78m section of alteration is present (serpentinization, saussiterization)
ITS 007	227	4	0.25NQ	208.28	215.92	7.64	HF	PR	F			Thin chlorite stringers, some thin sulphide vns (pyrrhotite and chalcopyrite.)		Chlorite alteration gives rock green ting (saussiterization).	2% Chalcopyrite, pyrrhotite/pentlandite	Homogeneous sample. Sample is black with many pale green stringers (<0.5cm wide) and bands (up to 2-5cm wide) Many of these bands dip at 45º. Fine grained black material glitters with sulphides (pyrrhotite; pentlandite) Did not see graphite reported in log.
ATS 084	228	4	0.25NQ	285.68	295.96	10.28	PGN	PR	M - Pegmatitc	Pegmatitic	Variable (25-80%)	Several px/chlorite/sp vns		In Fspar rich patches px has altered to chlorite (the altered grains are more tubular than the px grains)	2% Chalcopyrite, pyrrhotite/pentlandite	Sample is chemically homogeneous, however grain size and fspar content vary. Colour is generally grey and white, with white patches (up to 80% fspar). Patches of graphite occur

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATM 005	229	3	0.25NQ	142.5	146.13	3.63	GN	HW	M	Equigranular	40% (25% for small section)			Minor chlorite alteration		Sample is homogeneous (with slight variation in Fspar content) Colour is black and white. Px grains appear to be M-C (approx. 5mm in size). Texture is almost mottled. Sample is restricted in size due to sampling of core by Platreef from 146.13 to 146.23m
ATM 005	230	3	0.25NQ	155.17	163.06	7.89	GN	HW	M	Equigranular	30%	Several thin (<0.5cm wide) QF vns dipping 45-90º 1 x 1cm wide QF vn dipping 70º. 1 x 4cm QF vn dipping 45º 1 x 5cm QF vn dipping 90º, but only present for some of the core. 2 x 0.5cm sub-parallel dark mineral bands (25º dip), rich in fine grained mica and sulphides	Minor faults	Minor chlorite and sp alteration Chlorite alteration on surfaces	<0.5%	Px grains are medium sized but not as large as MC 229
ATM 005	231	3	0.25NQ	163.11	168.06	4.95	GN	HW	M	Equigranular	30%	Several thin QF vns (dip 70º) Several thin Px/chlorite vns	Minor faults	Minor chlorite and sp alteration		Px grains are medium sized (not as large and defined as MC229) Forced to take this sample separate to MC 230 due to the removal of core @ 163.05-163.11.
ATM 005	232	3	0.25NQ	179.25	182.84	3.59	GN	HW	M	Equigranular	30%	1 X 3.5cm QF vn dipping 5º Below this QF vn is a 1cm wide Px-chlorite band. Several thin QF vns dipping 0-90º	Minor faults	Minor chlorite and sp alteration Chlorite alteration on surfaces		Px grains medium in size, but finer than MC229-231.
ATM 005	233	3	0.25NQ	187.62	194.8	7.18	GN	HW	M	Equigranular	40%	Several thin QF vns dipping 45º. 1 x 0.5cm QF vn dipping 45º	Minor faults associated with vning.	Minor chlorite alteration Chlorite and minor calcite on surfaces		Homogeneous sample. Px grains also finer as in MC232
ATM 005	235	3	0.25NQ	196.08	207.05	10.97	GN	HW	M	Equigranular	30%	1 X 10cm QF vn dipping 20º Few thin QF vns dipping 45-70º				Homogeneous sample, black and white in colour. Px grains still finer as in MC233
ATM 005	236	3	0.25NQ	208	218.2	10.2	GN	HW	M	Equigranular	30%	2 x thin QF vns with 60-70º dip		Minor chlorite alteration		Homogeneous sample
ATM 005	237	3	0.25NQ	218.2	225.73	7.53	GN	HW	M	Equigranular	30%	Several hairline QF and chlorite vns. 1 x 0.5cm chlorite-px-sp vn dipping 45º		Minor sp and chlorite alteration		Px grains very dispersed
ITS 027	238	4	0.25NQ	78	84.17	6.17	SP	PR	F-M	Altered/Serpentinitzed	0-5% (But 40% in coarse grained GN patch)	High frequency of Sp vns	Few faults	High Sp alteration; minor chlorite alteration Sp and chlorite alteration on surfaces	2% Chalcopyrite, pyrrhotite/pentlandite. Possibly minor pyrite?	The sample is light grey with black streaks. A 30cm patch of coarse grained present. Minor graphite observed
ATM 005	239	3	0.25NQ	59.59	65.6	6.01	GN	HW	M	Equigranular	25%	1 x 1cm Px/chlorite vn. Several other thin chlorite vns dipping 45º. Also few thin QF vns dipping 0-90º		Minor Sp and chlorite alteration		Excellent homogeneous sample, light grey in colour

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATM 005	240	3	0.25NQ	74.14	82.24	8.1	GN	HW	M	Equigranular	40-60%	Several hairline chlorite and QF vns dipping 45º to 90º 1 x 0.5cm Q vn dipping 45º Several 0.5cm QF- chlorite vns dipping 70º		Minor chlorite alteration		Sample is homogeneous, black and white. Px grains form mottles in places.
ATM 005	241	3	0.25NQ	90.08	95.71	5.63	GN	HW	M	Equigranular	30-40%	Few hairline QF vns		Minor chlorite alteration		Sample is black and white. Generally Px grains are dispersed, but mottled patches do occur
ATS 082B	242	4	0.25HQ	10.49	16.98	6.49	GN	HW	M	Weathered	30%	2 X 1cm QF vns dipping 30-60º	Rock highly fractured	Sample is very weathered		Sample is weathered and white, green, brown and grey in colour.
ATS 072	244	3	0.25HQ	7.2	12.41	5.21	GN	HW	M	Weathered	30%		Rock is highly fractured with deep red soil on fracture surfaces	sample is very weathered to deep red soil		Sample is black and white with sections weathered to deep red soil. Rock is highly fractured and 10cm section of gravel occurs.
ATS 005	245	3	0.5HQ	4.03	5.64	1.61	GN	HW	M	Weathered	30%		Highly fractured	Highly weathered to deep red soil		Sample is highly weathered to deep red soil. Rock is very fractured except for 10cm of gravel. Sample is very dirty and dusty. It is difficult in places to see orginal texture. No marker boxes available, so depth of sample estimated.
ITS 040	247	3	0.25NQ	70.89	81.11	10.22	MA	HW	M	Mottled	30-50% (fspar increases in sample with depth and appears to break up mottles)	1 x 1.5cm zoned vn with thin chlorite centre flanked by thicker QF dipping 70º Fequent thin QF vns dipping 45-70º		Chlorite alteration, particulary near the vns. Alteration of Px to yellow mineral (looks like clay), probably a fine- grained matrix		Mottles are large (up to 10cm) and blotchy (ill-defined). One can see individual px and fspar grains. A shiny, yellow-brown mineral and a silver mineral (possibly mica-only shiny on clearage?) occurs commonly throughout the sample between Px and Fspar grains.AML Geologist has seen it occuring at a larger scale.
ITS 031	248	3	0.25NQ	203.32	207.44	4.12	LN	PR	M	Equigranular	40%	Occassional thin QF vns dipping 45º 2 x thin px-chlorite vns dipping 45º Also a diffuse QF vn approx. 0.5cm wide dipping 10º	2 Minor faults dipping 30º	Chlorite alteration adjacent to vning Chlorite alteration present of fracture surfaces	0.5% Chalcopyrite, pyrrhotite/pentlandite	Sample is bottle green, grey and white. A patch of FPX occurs.
ATS 057	249	3	0.5NQ	30.65	33.31	2.66	MA	HW	M	Mottled	35%	Frequent thin dark (sp, px. chlorite?) vns; <0.5cm wide dipping 45º Several chlorite vns occur in sub-parallel sets dipping 45º-70º		Chlorite alteration. Alteration of Px to yellow, brown material. Possibly fine grained matrix of Fspar and Px?		Sample is black and white. The mottles are approx 1-3cm (long axis). One can see Fspar and Px crystals
ITS 035	250	3	0.25NQ	316.64	323.3	6.66	PFPX	PR	M-C	Pegmatitic	30% (PFPX), 10%(FPX)	Several thin QF vns dipping 45º-60º and several hairline chlorite vns	Several faults	Chlorite alteration Chlorite alteration and talc on surfaces	3% Chalcopyrite, pyrrhotite/pentlandite	The sample is fairly homogeneous, consisting of medium to coarse grained, grey and white PFPX wirh patches of grey FPX. Graphite is also present.

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 007	251	3	0.25NQ	138.93	144.28	5.35	PX	PR	F	Equigranular	5-10% (Fspar rich banding occassionally)	Thin, sub-parallel Sp and QF vns dipping 35º High frequency of Sp-chlorite vns dipping at 45-90º	Rock has high number of faults	Fine-grained Px has altered to yellow brown mineral, giving sample dirty brown colour?	2% Chalcopyrite, pyrrhotite/pentlandite	First impression suggests this sample is more representative of HF than PX. The sample is dirty brown/black with thin sulphide (pyrrhotite, pentlandite) banding and QF banding.
ARF 034	252	3	0.25HQ	10.84	12.83	1.99	PX	PR	F-M (Approx 1m fine grained and 1m medium grained)	Equigranular	15%				0.5% Chalcopyrite, pyrrhotite/pentlandite	Sample is homogeneous and light grey in colour.
ARF 003	253	3	0.25NQ	150.87	155.86	4.99	PX	PR	F	Equigranualr	5%		Few minor faults with dirty dark surfaces (non-magnetic)		2% Chalcopyrite, pyrrhotite/pentlandite	Excellent homogeneous sample. Grey in colour with shiny fine-grained sulphide specks.
ATS 038	254	3	0.25NQ	133.37	145.07	11.7	PGN	PR	M-C	Pegmatitic	30-45%	Several thin QF vns dipping 60-90º Several thin px vns dipping 0-30º			4% Chalcopyrite, pyrrhotite/pentlandite. Sulphides occur richly throughout the sample and are concentrated in fine grained patches	The sampe is a medium-coarse grained PGN with patches of sulphide rich, finer grained material. It is possible that the 5-26cm fine grained sulphide rich patches are veins however, the contacts are not sharp.
ATS 090	255	3	0.25NQ	455.69	463	7.31	LN	PR	F	Texture is unusual, with patches of fine grained px surrounded by QF halos. Also patches of fine grained brown and white material?	20%	Few thin QF vns dipping 45° to 60° Few thin Px and chlorite vns dipping 45°	Few minor faults with chlorite alteration on surfaces	Minor chlorite alteration	5% Chalcopyrite, pyrrhotite/pentlandite	Sample is light grey with fine grained white specks. I would not call this Leuconorite, in places Fspar is only 5%. High amount of sulphides (including a 10cm patch).
ATS 111	256	3	0.25NQ	79.67	87.27	7.6	HF	HW	F		x	Few thin px, chlorite and sulphide veins (45° to 70° dip)	Few faults present. Generally the sample is competent.		2% Chalcopyrite, pentlandite/pyrrhotite. Fine grained sulphides throughout. Few coarse grained sulphides.	Graphite present. Overall black with green mottles (fine grained) with occassional coarse grained sulphide grains or "blotches".
ARF 006	257	3	0.25NQ	55.38	60.4	5.02	QF	PR	F-M	Speckled		Extensive Px, chlorite and QFveining (hairline to 3mm width) dipping 45° to 70°	Sample is highly fractured. Orange, brown weathering and slight chlorite alteration observed on fracture surfaces.	Weathering		Sample is white (fine and medium grained fspar) with black specks (fine grained px)
ITS 046	258	3	0.25NQ	118	121.88	3.88	PGN	PR	C	Pegmatitic	35%	Few 0.5cm diffuse (ill-defined) QF veins dipping 25°. Several hairline px-chlorite veins	One fault with chlorite on the fault surface	Minor chlorite alteration	3% Chalcopyrite, pentlandite/pyrrhotite	Sample is homogeneous; and light grey and white in colour A 20cm fpx patch occurs

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ATS 038	260	3	0.25NQ	145.68	153.02	7.34	LN	PR	M	Equigranular; pegmatitic	25% (ranges from 5-50%)	Several hairline px-sp veins dipping 70°. Few minor QF veins	Few faults with dirty, dark surfaces (non-magnetic)		Pyrrhotite is concentrated in FPX at the base of the cycles	Sample is grey and white, medium grained and homogeneous (except for variations in Fspar content and texture and the occurrence of pegmatitic patches or zones). Sulphides fine grained with occassional coarse grained sulphides.
ITS 044	261	3	0.25NQ	99	104	5	PX	HW	F-M	Equigranular	<5%	Several thin QF veins dipping 30° Several hairline sp-px-chlorite vns dipping 30° - 90°	Sp and calcite present on fault surfaces.	Minor Chlorite alteration		A homogeneous light grey sample
ATS 111	262	3	0.25NQ	407.87	417.88	10.01	PFPX	PR	F-M (Medium grained higher up in sample, to fine grained lower down)	Equigranular	10% (Except in Ln patches where 50% Fspar was noted)	Few hairline px vns 2 x 0.5cm 20° dipping LN vns	Frequent faults with dirty black, non-magnetic surfaces. Chlorite alteration also present on fault surfaces	Chlorite alteration	10% Chalcopyrite, pyrrhotite/pentlandite	Definitely not PFPX!!! Best described as a heterogeneous Px sample with patches of LN, and massive sulphide. Sample is fractured/faulted.
ITS 018	264	4	0.25NQ	24.01	34.14	10.13	MN	PR	M-C	Weathered	30%		Sample is extensively fractured	Rock is extensively weathered to deep red soil	0.5% Pentlandite/pyrrhotite.	Sample is a medium to coarse grained LN (not MN) that is very fractured and weathered to a rich red soil. Sections of gravel occur between broken pieces of competent core. A 10cm wide section of fine grained material occurs. (possibly a vein?). The first 5m of the sample are more broken and weathered than the next 5m, which although fractured and broken, do contain 30cm sections of competent core.
ATS 168	266	1	0.25NQ	21.48	29.48	8	MN	PR	M	Weathered	25%	Many 0.5cm wide QF veins dipping 30° to 90°	Sample is highly fractured/weathered	Pyroxene grains are much darker and defined than usual, (possibly replaced?) Sample has weathered to deep red soil. Chlorite replacement of pyroxene evident	0.5% Pyrrhotite/pentlandite (Although log states 3%, sulphides, only 0.5% observed, possibly due to weathering)	Sample is generally light grey-green and black (Px grains) in colour with white patches (high Fspar content) and looks like a mosaic on plaster. Sample is highly fractured and broken. Patches (up to 30cm) of gravel material occur. Rich red soil is present on fracture surfaces
ARF 037	267	3	0.5HQ	4.41	8.15	3.74	NC	PR	M	Weathered	30%	Few thin QF veins diping 70° to 90°	Sample is highly fractured/weathered	Sample has weathered to a deep red soil	Although the log states 2% sulphides, none were noted owing to the weathered state of the sample	Homogeneous LN has been extensively fractured and weathered to a deep red soil. The sample mainly consists of triangular fragments and 10-20cm sections of competent core

SAMPLE DESCRIPTION DATABASE

BH	MC Sample Number	Block	Sz	From Depth	To Depth	Thick (m)	Lith	Strat	Grain Sz	Texture	% Fspar	vns	Faults	Alteration	Sulphides	Comments
ARF 037	268	3	0.25HQ	9.66	14.26	4.6	NC	PR	F-M	Weathered	20 - 50%		Weathered	Weathered to red soil.	3% Chalcopyrite, pentladite/pyrrhotite (observed in fresh material)	This is a weathered heterogeneous, medium-grained LN sample (with up to 50% Fspar) . A 15cm patch of fine to medium grained MN (20% Fspar) occurs. Texture varies from an altered, fine grained amorphous texture to an equigranular medium-grained texture. Coarse sulphide grains occur in this fresher material. The sample is a mixture of gravel, fragments (angular) and segments of whole core.
ATS 154	271	2	0.25HQ	8	16.8	8.8	GN/MA/GN	PR	M	Equigranular; mottled	35%		Sample is very weathered and broken	Sample is weathered to a deep red soil.		Medium grained, black and white, fairly homogeneous sample. Texture varies from equigranular to almost mottled. First 5m of sample is fairly fractured with a 20cm section of gravel. Next 5m of sample is very weathered and broken into fragments.
ATS 154	272	2	0.25HQ	20.3	24.5	4.2	GN	PR	M	Weathered	10-15%		Weathered	Weathered		The sample depths are estimated as the core is broken into fractured segments and gravel. There is approx 1m of reasonably competent core that is homogeneous and light grey in colour. Most of the sample is weathered to brown soil.
STT 011	273	2	0.25HQ	15.39	17.64	2.25	FPX	PR	F	Equigranular	20%		2m vertical fracture has split the core in half. The fracture surface shows weathering to deep red soil	Weathered to red soil	3% Chalcopyrite, pentlandite/pyrrhotite. Visible throughout the sample	Homogeneous sample, light grey with white specks
ATS 086	274	1	0.5HQ	9.5	13.25	3.75	GN	HW	M	Weathered	35%	Several weathered remants of QF vns 0.5cm wide with shallow dips.	Rock is very fractured	Weathered to red soil.		Sample consists of patches of approx 10cm segments of competent core between very broken and gravelly core. Rich red soil occurs on fracture surfaces. This soil is also mixed in with the gravelly core. Before weathering, this sample must have been fairly homogeneous GN

APPENDIX 3:

Selection of Samples for Kinetic Test Analysis

Selection of Samples for Kinetic Test Analysis

Sample Number	Rock Type	Estimated Tonnes ($x10^6$) for Processing	Estimated Tonnage ($x10^6$) to be Dumped	Geog. Block	Strat Position	Percent Sulphide	Pyrite	Comments from Sample Description Log
MC174	DM		39.2	1	PR	20-30	Yes	20-30% chalcopyrite, pyrrhotite/pentlandite and pyrite (high amount of pyrite)
MC95	DM		39.2	1	PR	0.5		0.5% chalcopyrite, pyrrhotite/pentlandite
MC08	FPX	259		3	PR	Yes. (See Comments)		Considerable pyrrhotite/pentlandite present
MC117	HF	75.4		4	PR	1		1% fine grained chalcopyrite, pyrrhotite/pentlandite
MC182	HF	75.4		1	PR	30	Yes	30% chalcopyrite, pyrrhotite/pentlandite, pyrite. Heterogeneous sample. Rock is fine grained, grey-black with numerous sulphide patches.
MC64	HF	75.4		3	PR	4	Yes	4% pyrite, pyrrhotite/pentlandite, chalcopyrite. Patches of net like massive sulphides
MC85	HF	75.4		2	PR	5-20	Yes	5-20% chalcopyrite, pyrrhotite/pentlandite, pyrite
MC18	GN	68.8	2000	1	HW			
MC02	GN	68.8	2000	3	HW			
MC38	GN	68.8	2000	2	HW	<1	Yes	<1% One vn containing pyrite and chalcopyrite
MC44	GN	68.8	2000	3	HW			
MC58	GN	68.8	2000	4	HW			
MC83	MN	99.9		3	PR	8	Yes	8% pyrite, pyrrhotite/pentlandite, pyrite, chalcopyrite (Massive pyrrhotite/pentlandite)
MC194	Q		45.8	South	FW	0.5	Yes	0.5% fine-grained pyrite
MC209	Q		45.8	South	FW	0.5	Yes	0.5% fine-grained pyrite
MC276	Tailing	1004.5		Tailings Dam				
MC277	Tailing	1004.5		Tailings Dam				
MC278	Tailing	1004.5		Tailings Dam				
MC279	Tailing	1004.5		Tailings Dam				

Sample Number	Rock Type	Estimated Tonnes ($x10^6$) for Processing	Estimated Tonnage ($x10^6$) to be Dumped	Geog. Block	Strat Position	Percent Sulphide	Pyrite	Comments from Sample Description Log
MC281	Tailing	1004.5		Tailings Dam				

As can be seen above, it is estimated that approximately 2000 x 10^6 tonnes of GN will be dumped over the LoM. For this reason, a quarter of the samples submitted for kinetic tests were GN samples. As shown in Section 4.1.2, only 9.52% of all the GN samples collected contained sulphides at an average content of 0.34%. The GN samples submitted for kinetic test analysis are regionally representative and generally do not contain sulphides, except for MC38 which contains a single vein containing pyrite and chalcopyrite.

As shown in Section 4.1.2 above, on average 92% of the HF samples collected contained sulphides at an average content of 3.52%. Approximately half the HF samples collected contained pyrite. Although it is not anticipated that substantial tonnages of HF will be dumped over the LoM, it is conceivable that relatively large HF xenoliths in the Platreef may be dumped if they prove to dilute the grade during the mining process. For this reason, four HF samples were submitted for Kinetic test analysis. As can be seen in the Table above, the four HF samples collected were present in the Platreef as xenoliths, were regionally representative and varied in sulphide content from 1 to 30%.

It is estimated that approximately 39.2 x 10^6 tonnes of DM will be dumped over the LoM. As shown in Section 4.1.2 above, all of the DM samples collected contained sulphides at an average content of 4.52%. Approximately half the DM samples collected contained pyrite. For this reason, two DM samples were submitted for kinetic test analysis. As shown in Table above, both DM samples were taken from Block 1 (owing to the limited amount of DM sample material available). The one sample was sulphide rich and contained pyrite (MC174), while the other contained a relatively low amount of sulphides (MC95).

The Table above shows that all the Q samples contained sulphides at an average content of 0.5% per sample. Approximately 80% of the samples taken contained pyrite. It is estimated that 45.8 x 10^6 tonnes of Q rocks will be dumped over the LoM. For this reason, two Q samples were submitted for kinetic test analysis. Both Q samples were taken to the south of the project area on Macalacaskop 243KR where shales and quartzites of the Duitschland Formation and Timeball Hill Formation occur in the footwall to the Platreef. Both Q samples contained 0.5% fine-grained pyrite.

Although it is unlikely that any well-mineralized Platreef ore will be dumped over the LoM, one FPX and one MN sample were sent for kinetic tests. These samples were chosen because, of the rock-types to be processed, it is estimated that the largest tonnage will be FPX (259 x 10^6 tonnes), followed by MN (99.9 x

10^6 tonnes). The FPX sample selected was noted to contain “considerable pyrrhotite/pentlandite” and was taken from Block 3. No pyrite was present in this sample. The MN sample was taken from Block 3 and contained 8% sulphides and pyrite was recorded present

APPENDIX 4:

The Executive Summaries of Whole Rock Geochemistry and Static ABA Quality Control Reports

GEOLOGICAL AND GEOCHEMICAL ENVIRONMENTAL BASELINE STUDY OF THE PLATREEF PROJECT–

QUALITY CONTROL REPORT OF THE GEOCHEMICAL RESULTS

By Kate Lishman

(The Mineral Corporation Report No. C-AML-PRE(2)-183/154 Sandton, June 2004)

EXECUTIVE SUMMARY

During June to October 2003, 242 samples of borehole core were selected by The Mineral Corporation for geochemical analysis as part of a Geological and Geochemical Environmental Baseline Study of the Platreef Project situated just north of Mokopane in the Limpopo Province of South Africa. *Set Point Laboratories ("Set Point")* was awarded the contract by African Minerals Limited to undertake all the geochemical analyses.

A series of quality control tests has been carried out on the geochemical results to assess the level of accuracy and precision attained by Set Point. This study has shown that the following determinands can be used with confidence: Al_2O_3, CaO, Fe_2O_3, MgO, SiO_2 and TiO_2 and the analytical data are generally considered acceptable for use in an environmental baseline study. However, concerns do exist in subsets of data and the following caveats need to be borne in mind:

- The accuracy of the Set Point analyses of the following determinands was assessed by examination of the external standards and found to be uncertain for Co; Cr; Cu; FeO; MnO; Na_2O; Ni; P_2O_5; S; V_2O_5 and Zn; and poor for K_2O. Duplicate samples were sent to a referee laboratory, *Ultra Trace Laboratories* (*"Ultra Trace*") in order to provide an additional check on the accuracy of the results obtained by Set Point.

- The analysis of the duplicate samples sent to Ultra Trace also provided a method of assessing accuracy of analyses for determinands for which no certified or accepted values were provided by the external standards. Examination of the Ultra Trace results revealed that As, Ba, Cl and Pb are such determinands analysed with po or accuracy. The results of these determinands should therefore be regarded with caution.

- The results from both the standards and the reference laboratory suggest that the Set Point results have a tendency to be under-reported for the determinands: Co; Cu; MgO; MnO; Ni; S; SiO_2; TiO_2 and Zn. In this regard, it is important to note that for an environmental baseline study, under-reporting can have more severe long-term consequences than over-reporting.

- The precision was assessed by studying the results of duplicate samples submitted to Set Point as unknowns. The precision of the Set Point analyses is considered uncertain for As; Ba; Co; Cu; Cl; H_2O^+; H_2O^-; K_2O; MnO; Na_2O, Ni; P_2O_5; Pb; S; V_2O_5 and Zn; and poor for $H2O^-$. The analyses for the majority of these determinands have no significant bias. Indications are that the precision may be worse for sulphide-rich samples.

- A synthesis of the quality of the total data was created using information obtained from standards, duplicates and the referee laboratory. This assessment of both the accuracy and precision of the total data set revealed that the determinands for which there is some doubt about both the accuracy and precision are: As; Ba; Cl; Co; Cu; H_2O^-, K_2O; MnO; Na_2O; Ni; Pb; P_2O_5; S; V_2O_5 and Zn. The results for these elements should be used with circumspection.

- A change in analytical bias from earlier to later batches was detected during the quality control tests in the analyses of the following determinands: P_2O_5, Ba, Cl, Zn and K_2O. The change in bias detected compromises the comparability of these results and hence they should be dealt with circumspectly. None of the sample batches are rejected in their entirety but batches 3/2014, and 3/2013 are likely to prove the least reliable, particularly for P_2O_5, K_2O, Cu, Cl, Ba and Ni.

As a result of these concerns, it may be necessary to call for the re-analysis of a subset of data as work progresses.

GEOLOGICAL AND GEOCHEMICAL ENVIRONMENTAL BASELINE STUDY OF
THE PLATREEF PROJECT–
QUALITY CONTROL REPORT OF THE STATIC ACID BASE ACCOUNTING RESULTS

By Kate Lishman

(The Mineral Corporation Report No. C-AML-PRE(2)-183/162 Sandton, August 2004)

EXECUTIVE SUMMARY

During June to October 2003, 242 samples of borehole core were selected by The Mineral Corporation for Static ABA Analysis as part of a Geological and Geochemical Environmental Baseline Study of the Platreef Project situated just north of Mokopane in the Limpopo Province of South Africa. The Institute for Groundwater Studies (IGS) was awarded the contract by African Minerals Limited to undertake all the Static ABA Analyses.

A series of quality control tests have been carried out on the Static ABA results to assess the level of accuracy and precision obtained by IGS. This study has shown that the analytical data are generally considered acceptable for use in an environmental baseline study. However, concerns do exist in subsets of data and the following caveats need to be borne in mind:

- A synthesis of the total dataset revealed that the determinands for which there is some doubt about both the accuracy and precision are: Cr, Na, Se, Pb, Zn, Ba, Li, V and NP. The results of these determinands should be dealt with circumspectly.

- The results from the standards suggest that the IGS results have a tendency to be under-reported for the determinands Ba and Li and over-reported for Fe and Na. Although no overall significant analytical bias was recorded for the analyses of SO_4, a tendency to under-report the results in later batches was noted. In this regard, it is important to note that for an environmental baseline study, under-reporting can have more severe long-term consequences than over-reporting.

- A change of bias with time was detected in the analyses for the following determinands: Ca, Co, Cu, K, Mg, Mn, Sr, Pb, Zn, NP and Final pH. As the comparability of these results for the sample suite may have been compromised, these results may be inconsistent and should be used with caution.

- None of the sample batches are rejected in their entirety, however, Batch 6 is likely to prove the least reliable, particularly for Ca, K, Mg, Ba, Cr, Mo, Pb and V. The results from Batch 2 should also be dealt with circumspectly as this batch contributed significantly to the first sample of the majority of outliers and produced a relatively high number of outliers in the standard analysis. It should be borne in mind that MC134, a sulphide rich sample, was present in Batch 2. Indications are that precision may be worse for sulphide-rich samples.

- With respect to the reliability of determinands, the greatest number of outliers in the quality control dataset were recorded for Cr, K, Li, Mo and V.

- As most values were near or below the laboratory detection limit, no quantitative assessment of the accuracy of the analytical data was possible for: Ag, As, Be, Cd, Sb and Sn. Similarly, no quantitative assessment of the precision of the analytical data was possible for Ag, Be and Sn.

APPENDIX 5:

Summary of the Determinands and Calculations Performed by the Laboratories During the Whole Rock Geochemistry Analysis (Set Point Laboratory), Static ABA and Kinetic tests (IGS Laboratory)

Determinands Analysed and Calculations Reported by Set Point (Whole Rock Geochemistry) and IGS (Static ABA and Kinetic Test Results)

Whole Rock Geochemistry Results (Wt percent)	Static ABA Results (kg/t)	Kinetic Test Results (mg/l)
Determinands Analysed		
	Ag	
Al_2O_3	Al	Al
As	As	
Ba	Ba	
CaO	Ca	Ca
	Cd	
Cl		Cl
Co	Co	
CO_2		
Cr	Cr	
Cu	Cu	Cu*
Fe_2O_3	Fe	Fe*
FeO		
$H2O^-$		
H_2O^+		
K_2O	K	K
	Li	
LOI		
MgO	Mg	Mg
MnO	Mn	Mn*
	Mo	
Na_2O	Na	Na
Ni	Ni	Ni*
P_2O_5		
Pb	Pb	
S	SO_4	SO_4
SiO_2	Sb	
	Se	
	Sn	
	Sr	
Te		
TiO_2		
Tl		
V_2O_5	V	
Zn	Zn	Zn*
		EC
	Final pH	pH

Whole Rock Geochemistry Results (Wt percent)	**Static ABA Results (kg/t)**	**Kinetic Test Results (mg/l)**
	Initial pH	
		Malk
		NO3-N
		Volume
Calculations Performed		
	Acid –Open (kg/tonne $CaCO_{3)}$	Al_rate (mg/kg/wk)
	Acid – Closed (kg/tonne $CaCO_3$)	Ca_rate (mg/kg/wk)
	NP (kg/tonne $CaCO_3$)	Cl_rate (mg/kg/wk)
	NNP – Open (kg/tonne $CaCO_3$)	Cu_rate (mg/kg/wk)
	NNP – Closed (kg/tonne $CaCO_3$)	Fe_rate (mg/kg/wk)
		K_rate (mg/kg/wk)
		Malk_rate (mg/kg/wk)
		Mg_rate (mg/kg/wk)
		Mn_rate (mg/kg/wk)
		Na_rate (mg/kg/wk)
		Ni_rate (mg/kg/wk)
		Zn_rate (mg/kg/wk)
		Carbonate molar ratio
		Carbonate Ratio NP Consumption (mg $CaCO_3$/kg/wk)
		Feldspar molar ratio
		Feldspar Ratio NP Consumption (mg $CaCO_3$/kg/wk)
		Cumulative SO_4

Whole Rock Geochemistry Results (Wt percent)	**Static ABA Results (kg/t)**	**Kinetic Test Results (mg/l)**
		NAGpH_ratio
		Overall_NP Consumption
		Remaining_NP_%
		Remaining _%S
**During the kinetic test analyses, these determinands were measured in the leachate on a bi-weekly basis as recommended by IGS.*		

APPENDIX 6:

The IGS Adopted ASTM “Standardised Methodology” for Humidity Cell Kinetic Tests

The IGS Adopted ASTM "standardised Methodology" for Humidity Cell Kinetic Tests

1.1. Humidity cells

Humidity cells typically consist of a cylinder fitted with a base plate equipped with a drain hole and tubing nipple. Approximately 2 - 3cm from the bottom of the base plate is a removable perforated plate or screen which supports the sample. Materials such as inert geofabrics or landscape fabric may be used to prevent particularly fine samples from passing through the perforated plate.
The dimensions of the humidity cells used at IGS during this study are shown in Figure 1. Figure 2 provides photographs of a typical humidity cell used as well as the configuration of an array of humidity cells. Figure 3 shows photographs of the interior of the humidity cell both with and without a sample.

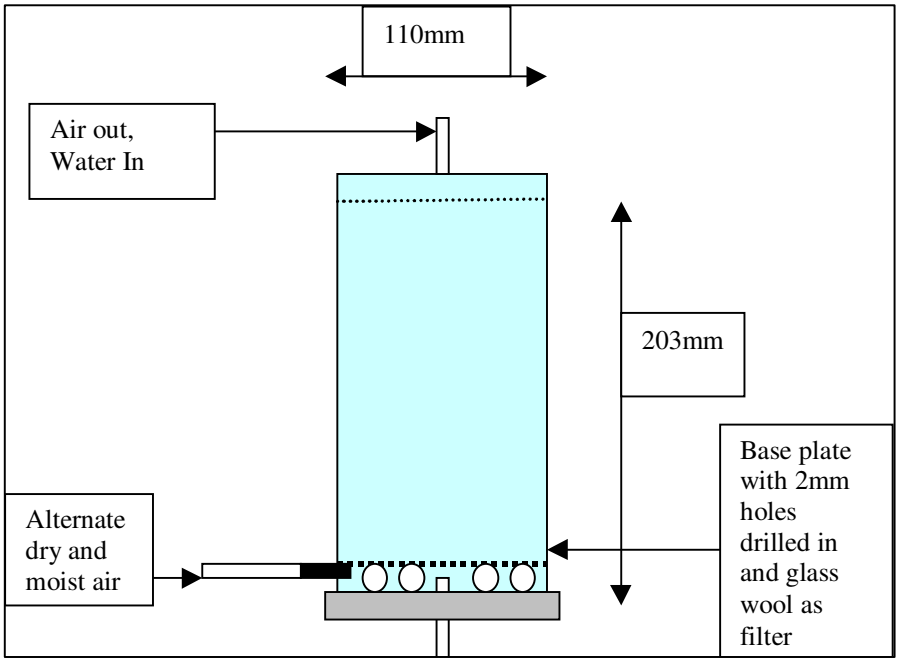


Figure 1: Dimensions of the humidity cells used at the IGS

Figure 2: An IGS humidity cell *(left)* and an array of cells set up at the IGS *(right)*

Figure 3: Interior of cell shown without and with sample in cell.

1.2. Overview of Procedure

Approximately 1kg (dry weight) of sample was placed in a humidity cell, forming a relatively flat surface. Air was continuously pumped into the cell according to a cyclic pattern. Air was introduced below the sample in a waste rock cell so that it could circulate more freely through it. One testing "cycle" took place over 7 days. The first 3 days of the cycle was the "dry" portion during which background laboratory air was passed through a waste-rock sample. The next 3-day period was the "wet" portion of the testing cycle, when laboratory air was first pumped through a humidifier unit and then into a cell. On the final day of the testing cycle, a sample "rinse/leach" was done.

Deionised water (500ml) was added to the top of the cell, allowing the sample to soak overnight (for the coarse rock samples) or for a period of 5 minutes to 1.5

hours (fine tailings material), and then drained for analysis. The purpose of the weekly rinse/leaching was to wash out any weathering reaction products that had accumulated in the cell during the week.

Initial Procedure

- Samples were collected from borehole core;
- Samples were bagged and labeled under the supervision of the author with marking pen on the bags and on aluminium tickets around the necks of the bags. Each sample batch was delivered for preparation to the Set Point Laboratory in Mokopane;
- The samples were weighed on arrival;
- The samples were crushed to - 2.5cm;
- Each crushed sample was split by cone and quartering and a 1kg split was sent to IGS for Kinetic test analysis.
- On arrival at the IGS, each sample was allowed to air-dry before being accurately weighed. The masses were as close to 1kg as possible. Each sample was then carefully placed in the cell. It was ensured that each sample had a relatively level surface in the cell.
- The humidity cells were operated on a weekly cycle. The beginning of the humidity cell test program was recorded as Week 0.
- The first readings were recorded on the first day of the kinetic testing. The outlet of the cylinder was clamped and approximately 500ml deionised water was added to the top of the cell. Enough water was added to the sample to completely saturate the sample and allow for the collection of at least 300 - 500ml of leachate.
- The amount of water added was recorded on a weekly data sheet.
- A collection flask was placed under the cell with a hose draining into it.
- The coarse rock samples were left to soak overnight. The hose clamp was disconnected and the leachate was drained off into the collection flask. If the cell would not drain in a reasonable time (i.e. about an hour), the drainage hose was checked to ensure that it was not blocked.
- The volume of leachate collected was recorded.
- The concentration of the determinands was recorded using the following apparatus:

1. PERKIN ELMER OPTIMA 3000DV ICP (Determination of all cations)
2. DIONEX 2000i/SP Ion Chromatograph (Determination of all anions)
3. SCHOTT TITRONIC T200 automated titrator (Determination of pH and Alkalinity)
4. ZEISS CON 602 (Conductivity Meter)

Weekly Procedure

- For the first three days after each rinse episode, dry air was passed through the humidity cell. Recommended flow rates are from 1 to 10L/s. The humidity cell was connected to a dry air source to allow a gentle flow

rate through the sample. As several cells were running, splits were taken from the main air line leading to each humidity cell. Hose clamps or in-line airflow control taps were used to ensure that each cell received roughly the same air flow rate;

- On the morning of the fourth day, a 3-day wet air cycle began. The air supply was switched from a dry source to a humid one. Each humidity cell was disconnected from the main dry air supply line. The air from the main dry air supply was switched to pass through the humidifier unit. This air passed through the humidifier and exited from an aquarium type diffuser. The air pressure was adjusted to provide an adequate air flow without causing rolling waves in the humidifier. Again, as more than one humidity cell was running, hose clamps associated with each humidity cell were used to ensure that each cell received roughly the same air flow rate.
- On the seventh day, sampling procedures began. The main air supply was shut off. The air supply hose was disconnected from each of the waste rock humidity cells and clamped shut (waste rock cells have the air inlet at the bottom and will allow leach water to drain back into the humidifier if not clamped).
- It was ensured that the drain hose at the bottom of each cell was clamped. A clean 500 ml beaker was placed under each cell with the hose draining into it. 500 ml of deionised water was carefully added. The amount of water added was recorded. The coarse rock samples were allowed to soak overnight. The hose clamp was then disconnected and the leachate drained off into the collection flask.
  If the cell did not begin to drain in a reasonable time (i.e. about 1-2h), the drainage hose was checked for blockage. Draining was allowed to continue overnight to remove as much rinsing water as possible.
- The volume of leachate collected was recorded.
- The concentration of the determinands was recorded using the following apparatus:

5. PERKIN ELMER OPTIMA 3000DV ICP (Determination of all cations)
6. DIONEX 2000i/SP Ion Chromatograph (Determination of all anions)
7. SCHOTT TITRONIC T200 automated titrator (Determination of pH and Alkalinity)
8. ZEISS CON 602 (Conductivity Meter)

Duration

The standard ASTM methodology suggests a minimum period of 20 weeks for testing and this was adhered to during this study.

As well as reporting the concentration of the weathering products in the leachate per week, IGS reported a series of calculations. These calculations and their relevance have been included as Appendix Z.

APPENDIX 7:

Geological Map of the Platreef Project

-5000 0

Bultongfontein 239 KR

Holmesleigh 1 KS

1 KS

5 KS

Knapdaar 234 KR

Tweefontein 238 KR

4 KS

Rietfontein 2 KS

Rietfontein 240 KR

Uitloop 3 KS

Turfspruit 241 KR

41 KS

Macalacaskop 243 KR

Blinkwater 244 KR

44 KS

Lisbon 288 KR

Kromdraai 265 KR

Zandspruit 287 KR

Maribashoek 50 KS

-2660000 -2665000 -2670000 -2675000

0

Legend

Prospecting right area

Lithology		Stratigraphy	
Dolerite			Rashoop Granophyre Suite
Quartzo-Feldspathic Dykes			
Granite and Granophyre			
Magnetite-Gabbro		Upper Zone	
Gabbro-Norite			
Troctolite		Main Zone	Rustenburg Layered Suite
Norite and Gabbro-Norite			
Platreef Pyroxenite		Critical Zone?	
Troctolite (LZ)		Lower Zone	
Quartzite			Transvaal Supergroup (undifferentiated)
Interbedded Limestone and Tuff			
Shale and Hornfels			
Quartzite		Duitschland Formation	Chuniespoort Group
Shale and Hornfels			
Dolomite			
Banded Iron Formation		Penge Formation	
Dolomite		Malmani Subgroup	
Archean Granite-Gneiss			
Faults			

N

1:55,000

0 0.5 1 2 km

APPENDIX 8:

The Whole Rock Geochemistry Results Provided by Set Point Laboratory

PLATREEF DATABASE (RAW)																																							
									TOTAL Fe																													
Sample	From Depth	To Depth	Litho Code	Date	Laboratory	Batch	Sample	Corresponding	as Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
						No	Type	Sample No.	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
1	37.82	44.58	GN	2003/10/21	Set Point	3/2013	**Original (O)**	**Duplicate No**	7.51	0.11	0.02	0.28	10.7	0.55	0.04	51.9	18.3	6.6	2.1	0.48	0.12	<10	138	38	383	36	134	<10	20	<10	53	0.016	6.1	<0.5	<0.5		<0.1	<0.5
2	64.4	70.9	GN	2003/10/21	Set Point	3/2013	**Duplicate (D)**	**Original No**	7.35	0.10	0.02	0.38	10.9	0.65	0.05	51.9	18.8	5.9	1.9	0.80	0.15	<10	174	31	327	44	123	<10	<20	<10	53	0.018	6.1	1.27	<0.5		<0.1	<0.5
3	103.6	110.23	GN	2003/10/21	Set Point	3/2013	**Standard (S)**	**Standard Name**	6.71	0.09	0.02	0.41	10.8	0.87	0.07	52.9	19.0	4.8	2.1	1.16	0.16	<10	191	31	252	41	101	<10	<20	<10	55	0.023	5.4	0.86	<0.5		<0.1	<0.5
4	125.85	132.18	MN	2003/10/21	Set Point	3/2013	**Mettalurgical (M)**		8.52	0.14	0.02	0.19	7.94	0.48	0.02	51.5	13.9	14.2	1.4	0.35	0.12	<10	118	49	1396	43	317	<10	<20	<10	57	0.019	6.9	0.97	<0.5		<0.1	<0.5
5	142.695	147.85	FPX	2003/10/21	Set Point	3/2013			11.5	0.20	0.03	0.19	6.28	0.16	0.01	51.6	7.7	19.2	0.8	1.22	0.08	<10	48	90	2175	203	607	10	<20	<10	74	0.082	9.6	1.00	<0.5		<0.1	<0.5
6	167.25	177.22	NC	2003/10/21	Set Point	3/2013			11.4	0.16	0.04	0.26	8.25	0.19	0.02	50.8	10.7	15.3	1.0	0.76	0.13	<10	124	87	1606	513	1012	<10	25	<10	61	0.385	9.2	0.63	<0.5		<0.1	<0.5
7	209.055	219.97	NC	2003/10/21	Set Point	3/2013			10.6	0.14	0.05	0.29	8.82	0.31	0.04	49.8	12.6	12.0	1.3	1.62	0.06	<10	109	98	850	729	1668	<10	<20	<10	65	0.727	9	1.29	1.57		<0.1	<0.5
8	297.14	304.66	FPX	2003/10/21	Set Point	3/2013			17.3	0.11	0.05	0.25	6.53	0.29	0.01	42.2	16.7	8.2	0.8	2.99	0.41	10	68	187	663	1360	2734	<10	29	<10	45	3.210	15.3	2.39	0.50		<0.1	<0.5
9	325.08	334.03	HF	2003/10/21	Set Point	3/2013			12.8	0.02	0.06	0.31	1.00	1.05	<0.01	40.7	33.5	2.9	0.7	5.16	0.09	23	69	64	384	321	715	<10	<20	<10	61	0.624	8.4	3.64	0.93		<0.1	<0.5
10	70.05	80.46	GN	2003/10/21	Set Point	3/2013			8.11	0.14	0.02	0.26	10.2	0.39	0.03	51.5	17.8	7.2	1.9	1.33	0.17	<10	143	41	433	60	156	<10	<20	<10	50	0.026	6.3	0.91	<0.5		<0.1	<0.5
11	81.92	92.095	GN	2003/10/21	Set Point	3/2013			8.45	0.12	0.02	0.23	10.3	0.31	0.02	51.1	17.6	7.5	1.9	1.38	0.13	<10	110	35	497	51	161	<10	33	<10	53	0.025	4.1	0.92	<0.5		<0.1	<0.5
12	93.07	100.865	GN	2003/10/21	Set Point	3/2013			8.04	0.12	0.02	0.24	10.1	0.41	0.02	50.9	18.3	7.1	2.1	1.46	0.21	<10	115	35	41	69	142	<10	23	<10	60	0.046	5.8	1.02	<0.5		<0.1	<0.5
13	115.88	121.885	QF	2003/10/21	Set Point	3/2013			0.61	0.01	<0.01	0.06	0.61	0.18	<0.01	77.6	12.6	<0.1	7.6	0.58	0.27	<10	<20	<10	471	<10	<10	<10	<20	<10	17	0.019	0.5	<0.5	<0.5		<0.1	<0.5
14	158.00	171.78	FPX	2003/10/21	Set Point	3/2013			8.94	0.12	0.02	0.27	9.72	0.31	0.04	50.6	15.7	10.9	1.5	0.8	0.35	<10	100	62	1132	484	552	10	34	<10	54	0.175	5.3	0.50	<0.5		<0.1	<0.5
15	210.84	229.43	NC	2003/10/21	Set Point	3/2013			10.2	0.13	0.03	0.15	8.01	0.25	0.01	48.8	11.8	15.2	1.0	2.19	0.08	<10	119	97	1466	1441	2109	14	<20	<10	67	0.729	7.7	2.29	<0.5		<0.1	<0.5
16	247.94	268.075	PGN	2003/10/21	Set Point	3/2013			9.79	0.14	0.05	0.18	9.62	0.16	0.01	49.9	15.1	12.0	1.2	0.61	0.13	<10	80	<10	707	624	87	<10	<20	<10	58	0.419	7.4	1.24	<0.5		<0.1	<0.5
17	278.67	298.12	NC	2003/10/21	Set Point	3/2013			11.1	0.15	0.03	0.32	8.86	0.30	0.03	49.3	16.3	9.8	1.5	1.13	0.07	<10	129	70	610	311	411	13	26	<10	67	0.543	8.9	<0.5	<0.5		<0.1	<0.5
18	35.03	45.205	GN	2003/10/21	Set Point	3/2013			7.74	0.11	0.02	0.22	10.6	0.33	0.02	51.5	17.7	7.9	2.0	0.62	0.08	<10	109	38	521	57	165	<10	<20	<10	53	0.034	6.2	<0.5	<0.5		<0.1	<0.5
19	60.46	72.43	GN	2003/10/21	Set Point	3/2013			7.55	0.12	0.02	0.26	10.8	0.36	0.03	52.4	17.7	7.3	2.1	0.37	0.10	<10	130	34	447	45	146	<10	<20	<10	50	0.032	6.4	<0.5	<0.5		<0.1	<0.5
20	114.42	124.27	GN	2003/10/21	Set Point	3/2013	O	MC101	7.85	0.11	0.02	0.29	10.7	0.35	0.04	51.9	18.1	6.6	2.3	0.48	0.10	<10	140	35	392	39	126	<10	<20	<10	57	0.030	6.1	<0.5	<0.5		<0.1	<0.5
21	138.46	150.48	GN	2003/10/21	Set Point	3/2013			7.46	0.09	0.02	0.27	10.6	0.38	0.05	52.1	18.8	6.1	2.3	0.47	0.08	<10	142	38	393	31	118	<10	<20	<10	59	0.026	5.9	<0.5	<0.5		<0.1	<0.5
22	177.50	191.3	FPX	2003/10/21	Set Point	3/2013			11.4	0.19	0.02	0.16	5.81	0.05	<0.01	52.4	6.5	21.4	0.7	0.74	0.13	<10	86	91	2550	543	1106	<10	<20	<10	67	0.245	9	<0.5	<0.5		<0.1	<0.5
23	238.27	247.64	FPX	2003/10/21	Set Point	3/2013			10.7	0.16	0.02	0.16	7.04	0.09	<0.01	51.6	9.6	17.1	0.9	0.85	0.04	<10	59	77	2015	833	1165	<10	25	<10	67	0.379	8.3	<0.5	<0.5		<0.1	<0.5
24	41.58	52.04	MN	2003/10/21	Set Point	3/2013			7.28	0.12	0.02	0.23	9.98	0.27	0.03	52.7	16.3	9.7	1.9	0.23	0.08	<10	128	39	632	27	208	<10	<20	<10	51	0.020	6.3	<0.5	<0.5		<0.1	<0.5
25	54.08	63.87	MN	2003/10/21	Set Point	3/2013			7.74	0.12	0.02	0.25	10.7	0.34	0.03	52.3	15.9	9.7	2.0	0.22	0.19	<10	111	44	621	26	202	<10	22	<10	51	0.018	5.8	<0.5	<0.5		<0.1	<0.5
26	39.09	60.06	NC	2003/10/21	Set Point	3/2013			8.09	0.11	0.01	0.19	10.3	0.20	0.02	51.6	16.9	8.6	1.9	0.67	0.15	<10	111	50	543	375	421	<10	<20	<10	51	0.300	5.9	<0.5	<0.5		<0.1	<0.5
27	63.16	72.97	HF	2003/10/21	Set Point	3/2013			13.0	0.11	0.05	0.92	1.10	1.79	0.10	50.7	21.4	5.1	0.7	2.83	0.21	<10	250	42	410	154	161	<10	<20	<10	84	0.352	11	2.49	1.06		<0.1	<0.5
28	76.71	86.21	HF	2003/10/21	Set Point	3/2013			15.8	0.12	0.04	1.11	1.20	1.14	0.12	48.1	22.3	6.1	0.7	1.41	0.11	<10	239	47	517	73	172	<10	22	<10	82	0.198	11.1	2.29	<0.5		<0.1	<0.5
29	137.02	149.45	MZN	2003/10/21	Set Point	3/2013			13.1	0.21	0.05	0.30	8.31	0.04	0.02	50.5	11.6	13.4	0.8	0.03	0.13	<10	79	47	1262	59	336	<10	<20	<10	84	0.090	7.7	<0.5	<0.5		<0.1	<0.5
30	149.84	161.08	MZN	2003/10/21	Set Point	3/2013			13.4	0.21	0.05	0.31	8.59	0.08	0.02	49.3	11.8	13.5	0.8	-0.12	0.09	<10	47	64	1162	135	460	<10	23	<10	81	0.110	11.7	<0.5	<0.5		<0.1	<0.5
31	212.59	224.01	HF	2003/10/21	Set Point	3/2013			15.3	0.08	0.06	0.46	0.84	0.58	<0.01	40.7	31.6	3.2	0.5	4.65	0.12	29	84	48	408	275	345	<10	<20	<10	67	0.259	12.5	4.72	<0.5		<0.1	<0.5
32	240	251.93	HF	2003/10/21	Set Point	3/2013			13.7	0.06	0.06	0.33	0.22	0.94	0.01	44.3	30.6	3.1	0.5	4.82	0.07	27	140	40	348	100	213	<10	<20	<10	74	0.175	8.5	5.26	1.01		<0.1	<0.5
33	167.825	179.9	FPX	2003/10/21	Set Point	3/2013			11.9	0.19	0.03	0.28	5.45	0.32	0.04	52.6	7.3	19.1	1.1	0.18	0.07	<10	90	75	2080	95	468	<10	<20	<10	70	0.025	10	<0.5	1.46		<0.1	<0.5
34	229.97	255.09	HF	2003/10/21	Set Point	3/2013			17.8	0.18	0.05	1.27	1.36	0.42	0.05	43.7	24.5	7.4	0.4	1.35	0.05	<10	56	64	608	104	237	<10	<20	<10	93	0.214	13.6	0.88	<0.5		<0.1	<0.5
35	271.89	284.95	FPX	2003/10/21	Set Point	3/2013			10.5	0.14	0.01	0.13	8.93	0.14	0.03	46.1	11.3	16.4	0.6	3.19	0.02	<10	92	95	1712	1648	1818	25	26	<10	62	0.822	7.9	4.92	<0.5		<0.1	<0.5
36	286.08	296.85	FPX	2003/10/21	Set Point	3/2013			9.61	0.13	0.02	0.15	8.99	0.15	0.01	49.7	14.0	12.5	1.5	0.66	0.05	<10	84	85	1240	1599	1468	13	<20	<10	60	0.718	7.4	1.46	<0.5		<0.1	<0.5
37	296.855	314.94	FPX	2003/10/21	Set Point	3/2013			8.06	0.13	0.02	0.15	10.5	0.17	0.01	51.3	14.8	11.2	1.6	0.38	0.03	<10	69	58	769	460	515	14	<20	<10	56	0.204	7	<0.5	<0.5		<0.1	<0.5
38	45.33	61.49	GN	2003/10/21	Set Point	3/2013			7.22	0.10	0.02	0.28	10.5	0.50	0.04	51.7	18.4	6.7	2.2	0.71	0.09	<10	108	41	435	104	146	<10	<20	<10	51	0.055	4.1	1.20	<0.5		<0.1	<0.5
39	85.51	100.8	GN	2003/10/21	Set Point	3/2013			7.12	0.11	0.02	0.28	10.5	0.38	0.04	52.5	19.0	6.5	2.2	0.25	0.09	<10	119	29	398	29	129	<10	<20	<10	55	0.024	4.7	<0.5	<0.5		<0.1	<0.5
40	136.7	148.72	GN	2003/10/21	Set Point	3/2013	O	MC102	6.52	0.08	0.02	0.29	10.8	0.69	0.05	51.7	19.8	4.7	2.3	1.76	0.08	<10	152	25	283	42	94	<10	<20	<10	50	0.020	4.8	2.28	<0.5		<0.1	<0.5
41	30.29	45.49	GN	2003/10/21	Set Point	3/2013			6.88	0.09	0.02	0.33	10.8	0.55	0.06	52.6	18.8	6.3	2.3	0.28	0.09	<10	167	32	354	31	128	<10	<20	<10	50	0.023	5.4	<0.5	<0.5		<0.1	<0.5
42	46.915	56.19	GN	2003/10/21	Set Point	3/2013			7.15	0.11	0.02	0.32	10.4	0.56	0.05	53	17.9	6.7	2.3	0.2	0.06	<10	146	31	402	44	140	<10	<20	<10	48	0.023	5.5	<0.5	<0.5		<0.1	<0.5
43	95.73	111.03	GN	2003/10/21	Set Point	3/2013			5.63	0.07	0.01	0.28	11.3	0.51	0.05	52.6	21.2	4.7	2.2	0.32	0.06	<10	178	18	290	37	97	<10	<20	<10	49	0.027	4.7	<0.5	<0.5		<0.1	<0.5
44	114.27	128.2	GN	2003/10/21	Set Point	3/2013			5.91	0.08	0.02	0.32	11.5	0.53	0.05	51.8	21.2	4.7	2.1	0.32	0.14	<10	149	21	257	48	91	<10	<20	<10	49	0.027	4.7	<0.5	<0.5		<0.1	<0.5
45	229.5	239.62	GN	2003/10/21	Set Point	3/2013			7.23	0.09	0.02	0.32	10.4	0.47	0.05	52.5	18.4	6.8	2.2	0.32	0.07	<10	176	34	460	42	145	11	<20	<10	53	0.031	5.6	<0.5	<0.5		<0.1	<0.5
46	244.4	254.97	GN	2003/10/21	Set Point	3/2013			7.72	0.11	0.02	0.34	10.2	0.50	0.06	52.3	18.1	7.0	2.1	0.22	0.07	<10	168	35	497	40	146	<10	<20	<10	54	0.029	6	<0.5	<0.5		<0.1	<0.5
47	273.77	284.06	GN	2003/10/21	Set Point	3/2013			7.29	0.10	0.02	0.41	10.2	0.61	0.08	52.9	18.2	6.6	2.3	0.31	0.09	<10	173	31	435	35	132	16	<20	<10	54	0.023	5.8	<0.5	<0.5		<0.1	<0.5
48	107.95	119.8	NC	2003/10/21	Set Point	3/2013			11.0	0.13	0.03	0.27	10.3	0.49	0.03	47.3	13.6	11.6	1.1	2.01	0.06	<10	180	99	830	1215	1432	11	25	<10	51	1.070	7.8	3.94	<0.5		<0.1	<0.5
49	140.27	159.01	FPX	2003/10/21	Set Point	3/2013			7.35	0.10	0.01	0.18	10.8	0.10	0.02	50.6	18.1	10.2	1.7	0.34	0.09	<10	92	34	1067	91	258	<10	<20	<10	49	0.054	5.9	<0.5	<0.5		<0.1	<0.5
50	43	63.08	LN	2003/10/21	Set Point	3/2013			15.8	0.16	0.03	0.24	6.30	0.17	0.03	46.3	8.3	16.6	0.8	2.21	0.06	<10	78	144	1449	2584	2628	12	<20	<10	65	2.030	9.7	2.28	<0.5		<0.1	<0.5
51	84.78	94	MN	2003/10/21	Set Point	3/2013			11.5	0.17	0.03	0.23	7.45	0.17	0.02	51	10.5	15.6	1.0	0.41	0.23	<10	66	65	1629	199	620	<10	31	<10	65	0.147	9.1	<0.5	<0.5		<0.1	<0.5
52	100.37	112.18	FPX	2003/10/21	Set Point	3/2013			11.9	0.19	0.03	0.21	6.00	0.10	0.02	52.9	7.4	19.0	0.7	0.26	0.10	<10	50	65	2314	227	676	<10	<20	<10	74	0.125	7.2	<0.5	<0.5		<0.1	<0.5
53	133.34	152.2	FPX	2003/10/21	Set Point	3/2013			13.0	0.19	0.02	0.19	5.08	0.03	<0.01	50	6.0	21.7	0.6	0.94	0.06	<10	55	103	2822	1387	2090	14	<20	<10	71	0.627	9.9	1.87	<0.5		<0.1	<0.5
54	185.85	196.04	FPX	2003/10/21	Set Point	3/2013			13.0	0.17	0.03	0.26	8.24	0.04	0.03	50.6	10.0	13.9	1.3	0.35	0.14	<10	90	93	1279	1370	1638	<10	<20	<10	62	0.665	10.2	<0.5	<0.5		<0.1	<0.5
55	199.6	208.24	MZN	2003/10/21	Set Point	3/2013			12.5	0.12	0.05	0.23	9.95	0.15	0.01	48.7	14.0	10.4	1.3	0.32	0.24	<10	67	71	649	525	622	<10	22	<10	50	0.329	10.4	<0.5	<0.5		<0.1	<0.5
56	261.22	280.2	MN	2003/10/21	Set Point	3/2013			12.1	0.16	0.05	0.13	8.02	0.13	0.01	48.6	14.5	12.8	0.8	0.51	0.04	<10	79	104	997	1052	1400	11	22	<10	51	0.762	9.5	<0.5	<0.5		<0.1	<0.5
57	303.04	313.05	FPX	2003/10/21	Set Point	3/2013			12.8	0.16	0.06	0.17	8.68	0.05	0.04	47.8	10.8	14.8	0.6	1.45	0.06	<10	62	118	1505	1372	1855	<10	26	<10	53	1.000	9.9	3.31	<0.5		<0.1	<0.5
58	84.84	92.75	GN	2003/10/21	Set Point	3/2013			6.88	0.09	0.02	0.25	10.6	0.36	0.03	52.1	18.9	6.2	2.4	0.31	0.11	<10	149	34	405	29	140	15	<20	<10	48	0.025	5.7	<0.5	<0.5		<0.1	<0.5
59	103.9	112.49	GN	2003/10/21	Set Point	3/2013			6.96	0.10	0.02	0.27	10.8	0.44	0.04	51.9	19.1	6.2	2.3	0.29	0.07	<10	176	32	378	32	126	<10	<20	<10	56	0.024	5.6	<0.5	<0.5		<0.1	<0.5
60	153.23	165.12	GN	2003/10/21	Set Point	3/2013	D	MC104	5.97	0.07	0.02	0.30	11.4	0.54	0.05	52.3	19.9	5.2	2.3	0.32	0.03	<10	134	27	300	30	105	10	<20	<10	43	0.014	4.7	<0.5	<0.5		<0.1	<0.5
61	234.2	242.4	GN	2003/10/21	Set Point	3/2013			7.63	0.11	0.02	0.32	10.9	0.44	0.04	52.5	17.7	7.8	2.0	0.23	0.05	<10	123	31	537	24	154	<10	<20	<10	55	0.017	6.4	<0.5	<0.5		<0.1	<0.5
62	260.35	268.95	GN	2003/10/21	Set Point	3/2013			7.00	0.10	0.02	0.29	11.5	0.34	0.04	51.6	18.7	6.6	2.1	0.21	0.04	<10	140	30	350	34	127	11	<20	<10	51	0.015	5.9	<0.5	<0.5		<0.1	<0.5
63				2003/10/21	Set Point	3/2013	S	SARM4	8.94	0.16	0.04	0.20	11.7	0.15	<0.01	52.5	16.3	7.3	2.4	0.01	0.06	<10	81	51	18	12	108	<10	<20	<10	51	0.012	6.9	<0.5	<0.5		<0.1	<0.5
64	90.29	105.54	HF	2003/10/21	Set Point	3/2013			18.5	0.07	0.08	0.11	1.13	0.55	<0.01	36.7	29.0	5.5	0.5	5.2	0.07	<10	173	165	1006	1024	1766	<10	<20	<10	133	2.950	8.8	3.95	1.58		<0.1	<0.5
65	107.05	121.66	MN	2003/10/21	Set Point	3/2013			15.9	0.17	0.03	0.30	6.19	0.01	0.02	49.0	9.0	15.3	1.1	1.19	0.03	<10	82	130	1716	1697	1970	16	<20	<10	63	1.860	11.4	1.72	<0.5		<0.1	<0.5
66	180.53	191.55	FPX	2003/10/21	Set Point	3/2013			16.5	0.17	0.02	0.17	3.26	0.06	0.01	42.4	5.3	23.3	0.3	5.16	0.02	<10	72	167	3477	1948	2609	12	<20	<10	65	2.000	12.2	5.27	<0.5		<0.1	<0.5
67	257.97	268.58	FPX	2003/10/21	Set Point	3/2013			16.2	0.12	0.03	0.32	7.80	0.29	0.04	45.1	15.5	8.7	1.1	1.84	0.06	<10	124	188	653	2587	3447	15	44	<10	52	2.990	12.8	0.83	<0.5		<0.1	<0.5

Sample	From Depth	To Depth	Litho Code	Date	Laboratory	Batch	Sample	Corresponding	TOTAL Fe as Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
						No	Type	Sample No.	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
68	333.97	342.15	DM	2003/10/21	Set Point	3/2013			5.35	0.21	<0.01	0.12	29.3	<0.01	0.03	25.5	0.4	19.2	0.1	17.6	0.06	<10	38	19	17	170	31	<10	<20	<10	21	1.550	0.7	5.10	15.7		<0.1	<0.5
69	191.86	201.92	HF	2003/10/21	Set Point	3/2013			14.6	0.05	0.07	0.66	0.35	0.42	<0.01	40.9	33.5	3.7	0.5	3.97	0.07	23	50	48	488	122	215	<10	<20	<10	62	0.116	8.9	3.72	<0.5		<0.1	<0.5
70	225.71	238.65	HF	2003/10/21	Set Point	3/2013			11.9	0.03	0.09	0.14	0.31	0.63	<0.01	37.0	40.5	3.4	0.5	3.53	0.06	39	53	56	661	138	284	<10	<20	<10	81	0.156	6.7	4.12	0.63		<0.1	<0.5
71	246.75	257.58	NC	2003/10/21	Set Point	3/2013			9.80	0.12	0.05	0.19	11.4	0.23	0.01	47.3	16.8	10.6	0.8	1.26	0.16	<10	111	63	807	410	410	<10	<20	<10	47	0.277	8.2	1.87	<0.5		<0.1	<0.5
72	277	286.8	FPX	2003/10/21	Set Point	3/2013			13.4	0.19	0.05	0.24	7.41	0.15	0.01	49.3	12.0	14.2	0.8	0.38	0.04	<10	80	<10	1192	649	831	<10	35	<10	66	0.345	11.2	<0.5	<0.5		<0.1	<0.5
73	287	300.25	PGN	2003/10/21	Set Point	3/2013			11.2	0.14	0.04	0.23	9.44	0.24	0.07	49.2	18.3	7.6	1.2	0.66	0.05	10	101	56	445	829	860	10	34	<10	50	0.493	9.5	<0.5	<0.5		<0.1	<0.5
74	321.17	332.51	MZN	2003/10/21	Set Point	3/2013			14.0	0.22	0.05	0.30	9.54	<0.01	0.01	50.0	12.5	12.7	0.7	-0.02	0.06	<10	75	71	823	320	495	<10	34	<10	73	0.128	11.1	<0.5	<0.5		<0.1	<0.5
75	309	317.64	HF	2003/10/21	Set Point	3/2013			14.8	0.03	0.07	0.67	0.10	0.32	<0.01	42.6	35.0	3.0	0.2	1.39	0.06	22	64	59	559	184	299	<10	<20	<10	59	0.062	12.4	1.50	<0.5		<0.1	<0.5
76	101.66	111.24	MN	2003/10/21	Set Point	3/2013			8.42	0.12	0.04	0.22	10.7	0.49	0.02	50.7	16.5	8.8	1.5	0.84	0.18	<10	165	48	630	143	20	<10	<20	<10	54	0.121	7.1	1.23	<0.5		<0.1	<0.5
77	213.79	226.84	MZN	2003/10/21	Set Point	3/2013			23.3	0.09	0.03	0.17	8.02	<0.01	0.02	41.2	11.6	6.2	1.7	2.75	0.06	<10	96	325	425	3001	5696	<10	41	<10	36	7.640	18.8	1.39	<0.5		<0.1	<0.5
78	276.85	286	MN	2003/10/21	Set Point	3/2013			11.3	0.11	0.02	0.19	8.26	0.18	0.03	47.3	14.4	11.8	1.3	1.29	0.06	<10	121	129	1294	2043	2526	<10	<20	<10	46	1.670	9.5	0.80	<0.5		<0.1	<0.5
79	289.03	300.53	SP	2003/10/21	Set Point	3/2013			18.0	0.13	0.02	0.18	3.22	0.07	0.01	38.1	5.5	24.4	0.3	6.52	0.07	<10	76	182	1624	2146	3118	<10	37	<10	61	2.400	13.2	6.33	<0.5		<0.1	<0.5
80	43.1	46	HF	2003/10/21	Set Point	3/2013	O	MC105	17.4	0.31	0.04	1.04	4.62	0.55	0.15	44.4	20.9	7.1	0.7	1.35	0.06	<10	164	49	461	97	185	<10	34	<10	76	0.250	12	1.38	<0.5		<0.1	<0.5
81	199.04	206	SP	2003/10/21	Set Point	3/2013			12.9	0.18	0.02	0.17	4.83	0.12	0.01	45.7	6.3	24.5	0.5	3.4	0.02	<10	80	114	2771	29	997	<10	<20	<10	70	0.163	8	4.30	<0.5		<0.1	<0.5
82	252.53	258.5	SP	2003/10/21	Set Point	3/2013			13.8	0.18	0.02	0.16	4.33	0.08	0.02	43.4	6.2	24.3	0.7	4.03	0.05	<10	78	123	3672	424	1305	<10	<20	<10	80	0.216	8.4	3.70	<0.5		<0.1	<0.5
83	306.58	315	MN	2003/10/21	Set Point	3/2013			34.1	0.12	0.06	0.40	5.50	0.25	0.02	29.3	16.7	3.8	0.8	3.92	0.04	<10	183	522	477	5396	12440	16	74	<10	91	10.70	24.4	1.83	<0.5		<0.1	<0.5
84	66.02	77.14	NC	2003/10/21	Set Point	3/2013			9.59	0.12	0.02	0.29	9.98	0.06	0.1	49.6	13.8	11.4	1.5	1.45	0.04	<10	61	76	734	975	1010	<10	<20	<10	51	0.868	4.7	2.18	<0.5		<0.1	<0.5
85	87.09	100.87	HF	2003/10/21	Set Point	3/2013			26.6	0.16	0.03	0.27	4.80	0.13	0.12	45.0	11.4	5.8	0.2	4.95	0.02	56	161	98	361	1114	580	<10	54	<10	49	7.850	21.3	3.22	0.8		<0.1	<0.5
86	125.9	136.47	HF	2003/10/21	Set Point	3/2013			16.8	0.17	0.05	1.12	1.88	0.39	0.04	44.6	23.2	6.8	0.5	2.38	0.03	<10	99	66	605	162	192	<10	28	<10	84	0.377	12.5	3.34	1.05		<0.1	<0.5
87	187	197.88	MN	2003/10/21	Set Point	3/2013			6.81	0.08	0.02	0.18	12.0	0.14	0.02	50.7	18.3	7.2	2.0	0.58	0.04	<10	106	37	500	429	452	<10	<20	<10	45	0.225	5.2	2.64	<0.5		<0.1	<0.5
88	256.08	267	MA	2003/10/21	Set Point	3/2013			5.75	0.07	0.01	0.16	11.2	0.19	0.01	50.3	19.9	8.2	1.8	0.77	0.07	<10	126	33	964	337	423	<10	<20	<10	45	0.122	4.4	<0.5	<0.5		<0.1	<0.5
89	278	286.12	MA	2003/10/21	Set Point	3/2013			5.84	0.07	0.01	0.18	12.8	0.29	0.02	50.1	21.8	6.2	1.9	0.73	0.03	<10	94	29	517	267	286	<10	<20	<10	42	0.117	4.4	0.88	<0.5		<0.1	<0.5
90	290	302	LN	2003/10/21	Set Point	3/2013			11.1	0.18	0.03	0.19	5.00	0.05	0.02	51.6	7.1	20.6	0.7	1.46	0.05	<10	67	71	2371	117	777	<10	<20	<10	67	0.052	8.7	1.31	<0.5		<0.1	<0.5
91	22	31	DM	2003/10/21	Set Point	3/2013			6.86	0.09	<0.01	0.32	18.4	<0.01	0.01	39.7	8.6	18.6	0.2	4.81	0.03	<10	25	38	155	1019	1103	18	<20	<10	52	0.715	2.7	4.37	0.88		<0.1	<0.5
92	50.00	61.97	MN	2003/10/21	Set Point	3/2013			12.9	0.14	0.04	0.24	8.22	0.14	0.03	49.5	12.4	12.5	1.1	1.17	0.06	<10	141	105	691	24	297	<10	<20	<10	66	1.570	10.3	1.84	<0.5		<0.1	<0.5
93	113.26	123.06	HF	2003/10/21	Set Point	3/2013			16.6	0.04	0.08	0.26	1.11	0.20	<0.01	36.3	36.7	3.6	0.4	2.27	0.06	16	88	97	751	261	549	<10	23	<10	87	0.639	11.9	2.76	<0.5		<0.1	<0.5
94	166.60	177.06	HF	2003/10/21	Set Point	3/2013			13.7	0.07	0.03	0.18	7.32	0.45	0.08	44.9	16.9	7.7	0.8	6.16	0.02	<10	268	42	346	679	205	13	22	<10	63	4.470	3.9	2.30	0.75		<0.1	<0.5
95	179.02	189.03	DM	2003/10/21	Set Point	3/2013			6.98	0.25	<0.01	0.40	20.7	0.14	0.05	34.9	8.8	9.7	0.3	4.61	0.01	<10	183	14	186	66	70	<10	<20	<10	38	5.900	1.7	7.01	<0.5		<0.1	<0.5
96	185.52	197.07	SP	2003/10/21	Set Point	3/2013			17.3	0.19	0.02	0.15	3.00	0.03	0.01	39.1	4.4	26.4	0.4	6.38	0.01	<10	86	166	2352	1858	3532	15	<20	<10	79	0.941	5.5	6.32	<0.5		<0.1	<0.5
97	244.05	255.92	NC	2003/10/21	Set Point	3/2013			8.22	0.10	0.01	0.15	10.8	0.34	<0.01	49.1	18.4	7.9	1.8	1.36	0.04	<10	109	67	514	1049	1068	<10	<20	<10	59	0.642	5.8	2.10	<0.5		<0.1	<0.5
98	287.8	299.64	NC	2003/10/21	Set Point	3/2013			9.65	0.12	0.02	0.17	9.20	0.13	0.01	48.9	14.4	14.2	1.2	0.92	0.03	<10	100	71	1344	737	1104	<10	20	<10	56	0.349	7.3	<0.5	<0.5		<0.1	<0.5
99	336.12	347.53	FPX	2003/10/21	Set Point	3/2013	O	MC107	11.8	0.18	0.02	0.25	7.83	0.19	0.02	51.7	10.2	15.4	1.3	0.38	0.04	<10	101	73	1567	723	850	<10	<20	<10	66	0.344	9.4	<0.5	<0.5		<0.1	<0.5
100				2003/10/21	Set Point	3/2013	S	SARM4	8.98	0.15	0.03	0.18	11.5	0.12	<0.01	51.6	16.1	7.1	2.4	0.02	0.04	<10	119	51	14	<10	103	<10	<20	<10	51	0.014	6.7	<0.5	<0.5		<0.1	<0.5
101				2003/10/21	Set Point	3/2014	D	MC20	7.93	0.11	0.02	0.29	10.7	0.45	0.04	51.7	18.0	6.8	2.3	0.45	0.02	<10	192	29	386	44	129	<10	<20	<10	43	0.028	6.0	<0.5	<0.5	0.06		
102				2003/10/21	Set Point	3/2014	D	MC40	6.25	0.07	0.02	0.30	10.9	0.64	0.05	51.2	20.3	4.9	2.3	1.67	0.02	<10	201	24	282	44	97	12	<20	<10	36	0.019	5.0	1.72	<0.5	0.09		
104				2003/10/21	Set Point	3/2014	D	MC60	6.04	0.07	0.02	0.28	11.5	0.52	0.05	51.9	20.3	5.5	2.3	0.35	0.01	<10	212	29	286	39	107	<10	<20	<10	32	0.019	4.7	<0.5	<0.5	0.04		
105				2003/10/21	Set Point	3/2014	D	MC80	17.4	0.30	0.04	0.95	4.49	0.59	0.09	44.5	20.6	7.2	0.8	1.36	0.01	<10	170	54	487	122	217	17	<20	<10	65	0.150	11.8	1.55	<0.5	0.05		
107				2003/10/21	Set Point	3/2014	D	MC99	11.6	0.17	0.02	0.23	7.65	0.13	0.02	51.8	10.0	15.0	1.3	0.39	0.01	<10	112	77	1585	769	909	<10	<20	<10	52	0.278	9.9	<0.5	<0.5	0.06		
108				29-Oct-03	Setpoint Isando	7840		XPT	14.1	0.19	0.03	0.26	5.95	0.19	0.03	49.1	7.8	19.3	0.6	0.98	0.01	<10	109	136	6377	2774	3708	14	<20	<10	78	1.34	9.9	1.23	<0.5	0.18		
109	65.36	77.6	PGN	2003/10/21	Set Point	3/2014			7.83	0.08	0.02	0.22	8.90	0.48	0.04	51.1	16.8	9.9	1.5	0.93	0.01	<10	148	82	986	218	2774	19	<20	<10	38	0.608	6.2	1.30	<0.5	0.07		
110	166.55	179.65	SP	2003/10/21	Set Point	3/2014			14.7	0.18	0.02	0.14	4.23	0.19	0.01	42.5	5.9	24.7	0.5	5.17	0.04	<10	66	148	2711	1030	2192	<10	<20	<10	65	0.333	8.6	5.23	<0.5	0.16		
111	63.28	75.16	LN	2003/10/21	Set Point	3/2014			7.14	0.10	0.01	0.16	10.9	0.21	0.01	50.4	18.7	10.3	1.5	0.25	<0.01	<10	99	41	950	111	263	<10	<20	<10	33	0.041	5.3	<0.5	<0.5	0.04		
112	101.96	112.24	MN	2003/10/21	Set Point	3/2014			11.6	0.16	0.03	0.21	8.22	0.30	0.02	51.0	11.7	15.0	1.1	0.23	0.01	<10	125	64	1617	137	433	10	<20	<10	55	0.072	9.2	<0.5	<0.5	0.04		
113	125	135.85	FPX	2003/10/21	Set Point	3/2014			13.7	0.21	0.04	0.23	6.50	0.15	0.02	51.0	6.7	19.5	0.5	0.63	0.01	<10	57	88	2151	180	608	13	<20	<10	63	0.113	10.9	0.81	<0.5	0.05		
114	267.3	277.4	MN	2003/10/21	Set Point	3/2014			12.8	0.18	0.03	0.16	5.19	0.12	0.01	50.5	7.7	20.1	0.9	0.37	<0.01	<10	92	99	2590	1099	1708	<10	<20	<10	56	0.447	9.4	<0.5	<0.5	0.04		
115	42.72	53.25	NC	2003/10/21	Set Point	3/2014			8.70	0.11	0.04	0.26	11.9	0.43	0.03	50.0	15.7	8.7	1.7	0.86	0.02	<10	146	78	651	1295	1534	<10	<20	<10	41	0.421	6.2	1.13	<0.5	0.06		
116	332.97	343.08	NC	2003/10/21	Set Point	3/2014			12.9	0.18	0.02	0.21	5.27	0.24	0.02	48.0	7.2	19.3	0.8	2.78	0.01	<10	93	127	2688	2501	2993	11	<20	<10	48	0.978	10.4	<0.5	<0.5	0.19		
117	163.85	172.25	HF	2003/10/21	Set Point	3/2014			13.6	0.04	0.10	0.30	1.43	0.49	<0.01	37.1	38.7	4.0	0.6	2.35	0.01	38	100	55	661	153	360	<10	<20	<10	86	0.104	9.7	1.11	<0.5	0.08		
118	46.14	51.98	SP	2003/10/21	Set Point	3/2014			14.9	0.19	0.02	0.12	4.02	0.08	<0.01	45.0	5.4	24.7	0.4	2.80	0.01	<10	87	159	3597	1788	2940	<10	<20	<10	57	0.617	10.3	3.15	<0.5	0.13		
119	157	162.26	MN	2003/10/21	Set Point	3/2014			7.52	0.11	0.01	0.12	10.9	0.20	<0.01	50.3	17.6	8.9	1.8	0.70	0.01	<10	133	63	647	1376	1028	<10	<20	<10	38	0.555	5.9	0.72	<0.5	0.01		
120	171.84	175.3	NC	2003/10/21	Set Point	3/2014			9.47	0.12	0.02	0.16	10.0	0.36	0.04	49.0	15.3	11.3	1.4	1.54	0.01	<10	138	78	1227	1172	1362	21	<20	<10	39	0.547	7.3	1.83	<0.5	0.05		
121	226.1	232.11	MN	2003/10/21	Set Point	3/2014			10.2	0.12	0.02	0.15	9.70	0.44	0.01	49.0	17.3	9.3	1.4	0.85	0.01	<10	139	84	663	989	1172	<10	<20	<10	46	0.505	8.2	1.29	<0.5	0.02		
122	153.01	163.07	NC	2003/10/21	Set Point	3/2014			7.77	0.11	0.03	0.26	10.3	0.40	0.04	52.0	17.5	8.9	2.0	0.30	0.01	<10	123	39	532	245	353	<10	<20	<10	32	0.058	6.4	<0.5	<0.5	0.05		
123	33.66	44.45	PX	2003/10/21	Set Point	3/2014			13.4	0.16	0.02	0.18	5.78	0.14	<0.01	50.3	5.7	19.9	0.4	3.03	0.01	<10	53	81	2606	674	1230	10	<20	<10	47	0.294	9.7	2.15	<0.5	0.08		
124	53.82	64	SP	2003/10/21	Set Point	3/2014			12.2	0.13	0.01	0.10	6.82	0.12	0.01	41.5	8.9	20.8	0.5	5.73	0.02	<10	77	136	1879	2108	3189	17	<20	<10	54	0.751	9.2	5.42	<0.5	0.21		
125	77.97	89	NC	2003/10/21	Set Point	3/2014			7.50	0.11	0.01	0.12	10.3	0.28	0.01	50.2	16.4	12.6	1.3	0.65	<0.01	<10	114	54	1156	475	676	<10	<20	<10	32	0.179	5.9	0.80	<0.5	0.05		
126	92	102	FPX	2003/10/21	Set Point	3/2014			15.2	0.19	0.03	0.25	4.31	0.47	0.10	50.6	7.4	18.0	0.7	0.94	0.02	<10	98	99	1806	757	1078	10	<20	<10	57	0.570	11.6	0.96	<0.5	0.09		
127	72.82	79.6	HF	2003/10/21	Set Point	3/2014	O	MC203	14.3	0.04	0.05	0.92	0.06	0.32	0.01	43.1	34.5	2.8	0.2	2.99	<0.01	24	92	36	442	28	144	<10	<20	<10	81	0.020	11.6	3.55	<0.5	0.10		
128	221.95	231.93	MZN	2003/10/21	Set Point	3/2014			14.0	0.18	0.05	0.29	8.63	0.10	0.02	48.9	13.5	12.1	0.8	0.13	0.01	13	98	62	891	329	563	<10	<20	<10	57	0.272	12.2	<0.5	<0.5	0.03		
129	239.3	250.48	HF	2003/10/21	Set Point	3/2014			12.9	0.02	0.07	0.23	0.07	0.26	<0.01	41.9	37.6	3.2	0.2	2.83	<0.01	25	45	37	590	28	164	<10	<20	<10	47	0.012	10.7	2.03	0.95	0.11		
130	132.04	142.8	FPX	2003/10/21	Set Point	3/2014			13.7	0.19	0.07	0.24	6.21	0.15	0.02	49.0	5.7	21.2	0.6	1.87	<0.01	<10	77	82	1857	288	724	12	<20	<10	52	0.174	10.3	1.83	<0.5	0.06		
131	169.66	180.32	MN	2003/10/21	Set Point	3/2014			13.1	0.18	0.06	0.28	11.8	0.09	<0.01	48.4	15.4	9.2	1.1	-0.06	<0.01	13	88	56	305	157	240	11	<20	<10	43	0.183	11.0	<0.5	<0.5	0.02		
132	35.82	46.49	PFPX	2003/10/21	Set Point	3/2014			13.9	0.17	0.02	0.34	5.06	0.20	0.03	49.5	9.5	17.7	0.9	1.11	0.01	<10	57	78	2050	148	1049	<10	<20	<10	61	0.175	12.3	1.34	<0.5	0.07		
133	244.04	255.02	HF	2003/10/21	Set Point	3/2014			9.99	0.03	0.03	0.72	0.57	3.27	0.08	57.1	20.7	1.9	0.6	4.23	0.01	13	554	31	386	76	63	16	<20	<10	50	0.164	8.3	4.06	<0.5	0.23		
134	76.92	88.02	LN	2003/10/21	Set Point	3/2014			9.86	0.08	0.05	0.23	9.71	0.78	0.04	47.3	20.0	6.3	1.2	1.89	0.02	<10	180	47	518	315	240	<10	<20	<10	41	0.964	8.2	2.05	<0.5	0.09		
135	89	99.73	NC	2003/10/21	Set Point	3/2014			13.5	0.10	0.05	0.28	7.63	0.65	0.05	47.4	16.4	9.1	1.1	1.85	0.02	<10	160	64	721	348	230	<10	<20	<10	60	1.27	10.6	2.10	<0.5	0.08		
136				2003/10/21	Set Point	3/2014	S	XPT	15.0	0.19	0.03	0.22	5.80	0.18	0.02	47.0	7.7	18.7	0.6	1.36	0.01	<10	111	135	6603	2718	3528	10	<20	<10	65	1.06	10.8	1.63	<0.5	0.05		
137	115.18	123.41	MZN	2003/10/21	Set Point	3/2014			13.0	0.19	0.05	0.22	9.65	0.07	0.03	50.0	12.8	13.0	0.7	0.02	0.01	<10	88	60	875	66	291	<10	<20	<10	64	0.023	11.2	<0.5	<0.5	0.03		
138	32.5	42	PGN	2003/10/21	Set Point	3/2014			12.7	0.12	0.06	0.29	9.41	0.41	0.02	46.9	19.3	7.5	0.9	0.83	0.02	16	187	72	639	1055	1204	13	<20	<10	64	0.694	10.0	1.26	<0.5	0.04		
139	65	75.23	PX	2003/10/21	Set Point	3/2014			11.1	0.19	0.02	0.16	5.31	0.19	0.01	52.1	6.4	21.3	0.5	0.62	0.01	<10	78	86	2625	267	880	<10	<20	<10	53	0.137	9.1	0.98	<0.5	0.06		

Sample	From Depth	To Depth	Litho Code	Date	Laboratory	Batch	Sample	Corresponding	TOTAL Fe as Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
						No	Type	Sample No.	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%		
140	100.62	108.93	PX	2003/10/21	Set Point	3/2014			11.3	0.18	0.03	0.19	7.87	0.27	0.01	51.6	8.8	17.7	0.8	0.21	0.01	<10	129	65	2438	160	562	<10	<20	<10	52	0.103	9.0	<0.5	<0.5	0.03		
141	280.2	287.4	LN	2003/10/21	Set Point	3/2014			5.22	0.05	0.01	0.14	12.9	0.54	0.01	49.7	22.0	6.4	1.8	0.98	0.01	<10	111	29	798	290	330	13	<20	<10	26	0.093	4.0	1.04	<0.5	0.03		
142	162.1	172.38	DM	2003/10/21	Set Point	3/2014			8.00	0.11	<0.01	0.24	11.0	0.03	<0.01	29.1	4.7	30.8	0.2	14.1	0.09	<10	32	56	185	353	674	33	<20	<10	114	0.396	3.2	<0.5	3.51	0.16		
143	216.4	218.64	QF	2003/10/21	Set Point	3/2014			1.12	0.01	<0.01	0.03	0.57	2.84	0.02	76.3	12.6	0.3	4.9	0.43	0.01	<10	159	<10	17	1697	77	14	<20	<10	11	0.162	0.6	<0.5	<0.5	0.03		
144	218.64	225.82	MN	2003/10/21	Set Point	3/2014			9.39	0.11	0.02	0.20	14.1	0.70	<0.01	48.0	14.0	9.9	1.0	1.32	0.01	<10	158	87	754	527	680	10	<20	<10	31	0.762	7.0	1.38	<0.5	0.11		
145	68.91	78.77	MN	2003/10/21	Set Point	3/2014			11.0	0.14	0.03	0.20	10.6	0.32	0.09	50.3	16.0	8.8	1.5	0.42	0.01	<10	172	61	405	781	884	<10	<20	<10	49	0.339	9.3	<0.5	<0.5	0.06		
146	376	386	MZN	2003/10/21	Set Point	3/2014			17.0	0.16	0.03	0.42	6.77	0.30	0.06	46.1	9.3	13.0	0.8	1.07	0.01	21	147	167	1313	7305	4681	25	<20	<10	46	1.94	13.1	1.29	<0.5	0.06		
147	147.6	159.52	PGN	2003/10/21	Set Point	3/2014	O	MC204	7.49	0.12	0.03	0.29	11.8	0.54	0.04	51.5	15.4	8.4	1.9	0.70	0.02	<10	188	39	468	119	198	<10	<20	<10	43	0.053	6.4	0.67	<0.5	0.07		
148	152.73	160.3	PFPX	2003/10/21	Set Point	3/2014			13.1	0.19	0.02	0.16	4.83	0.10	0.01	50.3	6.3	21.4	0.7	0.74	<0.01	<10	107	119	2406	1767	3019	10	<20	<10	51	0.623	9.8	1.20	<0.5	0.10		
149	298.82	305.69	MA	2003/10/21	Set Point	3/2014			6.77	0.07	0.02	0.12	13.1	0.43	0.01	47.3	21.5	7.5	1.2	1.31	<0.01	<10	133	46	702	380	415	<10	<20	<10	28	0.126	5.4	<0.5	1.76	0.11		
150	166.95	177.04	PGN	2003/10/21	Set Point	3/2014			10.3	0.11	0.03	0.17	10.7	0.41	0.02	47.0	19.7	7.9	1.1	1.10	0.01	<10	142	75	537	1433	1362	<10	<20	<10	39	0.617	6.5	<0.5	0.95	0.06		
151	211.37	216.55	PGN	2003/10/21	Set Point	3/2014			20.1	0.13	0.05	0.68	10.5	0.47	0.03	38.0	13.8	6.5	1.3	2.11	0.03	<10	180	218	266	3758	5263	16	<20	<10	41	3.31	12.9	2.75	<0.5	0.04		
152	90.97	96.55	DM	2003/10/21	Set Point	3/2014			7.48	0.16	0.01	0.24	2.70	0.02	<0.01	30.2	7.7	34.9	0.3	14.5	0.20	<10	<20	40	83	839	748	<10	<20	<10	67	0.490	2.6	13.7	2.55	0.45		
153	135.25	141.61	DM	2003/10/21	Set Point	3/2014			5.48	0.08	<0.01	0.28	11.5	0.01	0.01	38.1	6.1	27.6	0.2	9.05	0.07	<10	26	22	97	436	291	14	<20	<10	92	0.233	0.4	9.85	<0.5	0.28		
154	106.21	114.06	DM	2003/10/21	Set Point	3/2014			6.20	0.06	<0.01	0.19	20.3	0.00	<0.01	32.7	4.1	26.5	0.2	7.55	0.10	<10	43	67	31	1402	1486	<10	<20	<10	35	0.278	0.5	7.36	1.81	0.17		
155	83.37	93.77	NC	2003/10/21	Set Point	3/2014			10.4	0.13	0.04	0.36	7.94	0.45	0.05	50.2	12.7	13.7	1.4	0.87	0.01	<10	141	91	1130	1212	2409	<10	<20	<10	48	0.349	8.5	0.92	<0.5	0.07		
156				2003/10/21	Set Point	3/2014	S	SARM5	13.3	0.22	0.05	0.19	2.66	0.10	0.01	50.6	4.2	24.7	0.6	-0.28	<0.01	<10	114	89	19500	25	543	<10	<20	<10	70	0.019	9.1	<0.5	<0.5	0.05		
157	123.84	129.85	QF	2003/10/21	Set Point	3/2014			0.98	0.01	0.00	0.11	0.79	4.11	0.06	75.1	13.0	0.3	4.0	0.52	0.01	<10	486	<10	376	21	25	<10	<20	<10	16	0.045	0.9	<0.5	1.07	0.17		
158	168.08	177.97	NC	2003/10/21	Set Point	3/2014			11.8	0.17	0.05	0.26	8.67	0.32	0.03	50.3	11.4	13.4	1.2	0.65	0.01	<10	120	94	961	1014	1381	11	<20	<10	51	0.630	10.0	1.57	<0.5	0.05		
159	202.88	209.55	PGN	2003/10/21	Set Point	3/2014			10.3	0.11	0.04	0.24	9.25	0.46	0.05	48.5	16.1	9.6	1.2	1.14	0.01	<10	146	94	806	1600	2000	<10	<20	<10	46	0.692	8.5	1.52	<0.5	0.04		
160	389.05	395.26	DM	2003/10/21	Set Point	3/2014			7.63	0.09	<0.01	0.31	17.0	0.00	0.04	41.5	7.6	19.4	0.2	5.41	0.01	<10	64	64	184	1415	1221	12	<20	<10	53	0.319	4.0	5.18	1.05	0.20		
161	289.83	299.78	PFPX	2003/10/21	Set Point	3/2014			9.16	0.12	0.02	0.21	8.98	0.34	0.04	50.1	15.0	12.1	1.4	0.59	0.02	<10	120	69	1233	1134	1301	14	<20	<10	50	0.424	8.0	<0.5	1.21	0.40		
162	68.92	75.55	PGN	2003/10/21	Set Point	3/2014			9.58	0.12	0.04	0.34	10.6	0.50	0.06	51.9	14.4	7.7	1.9	0.83	0.03	<10	234	78	374	735	1206	<10	<20	<10	47	0.403	8.2	1.14	<0.5	0.05		
163	116.15	122.11	SP	2003/10/21	Set Point	3/2486			15.3	0.14	0.01	0.10	2.54	0.17	<0.01	42.2	2.9	26.4	0.3	5.82	0.02	<10	57	177	3635	2762	4500	<10	<20	<10	98	1.30	8.6	6.04	<0.5	0.31		
164	85.14	90.6	PX	2003/10/21	Set Point	3/2486			11.1	0.18	0.03	0.18	4.57	0.22	<0.01	53.0	6.1	21.5	0.7	0.57	0.01	<10	103	87	2586	305	896	<10	<20	<10	67	0.059	9.6	0.83	<0.5	0.16		
165	234.5	240.03	MN	2003/10/21	Set Point	3/2486			10.5	0.15	0.02	0.21	9.23	0.39	<0.01	52.0	12.8	10.5	1.7	0.73	0.02	<10	122	67	630	1128	1166	<10	<20	<10	56	0.695	7.9	0.88	<0.5	0.13		
166	40.02	45.45	MN	2003/10/21	Set Point	3/2486			9.11	0.12	0.02	0.12	7.83	0.50	0.04	51.0	13.2	14.1	1.1	0.59	<0.01	<10	118	85	1400	1094	1510	<10	<20	<10	57	0.416	7.8	0.63	<0.5	0.14		
167	282.83	288.2	LN	2003/10/21	Set Point	3/2486	O	MC206	14.6	0.22	0.04	1.05	3.73	1.03	0.06	50.7	19.1	6.1	1.0	1.70	<0.01	5	217	50	578	193	204	<10	<20	<10	102	0.218	10.5	1.76	<0.5	0.12		
168	325.5	331.1	HF	2003/10/21	Set Point	3/2486			14.8	0.05	0.10	0.13	1.75	0.38	<0.01	36.8	37.4	4.7	0.6	2.05	0.02	20	100	89	755	132	369	<10	<20	<10	106	0.120	11.3	1.78	<0.5	0.10		
169	68.9	74.84	HF	2003/10/21	Set Point	3/2486			7.97	0.11	0.20	0.22	10.2	0.34	<0.01	52.4	14.3	10.0	1.8	1.00	0.02	<10	153	64	851	839	818	<10	<20	<10	47	0.436	6.5	1.25	<0.5	0.10		
170	132.05	142.98	FPX	2003/10/21	Set Point	3/2486			13.2	0.18	0.03	0.17	8.16	0.18	<0.01	51.9	10.1	13.6	1.3	-0.1	0.01	<10	110	68	1383	447	679	<10	<20	<10	68	0.323	11.9	<0.5	<0.5	0.03		
171	87.38	98.05	PGN	2003/10/21	Set Point	3/2486			6.85	0.08	0.01	0.24	13.1	0.60	0.01	49.9	16.5	8.6	1.3	1.04	0.02	<10	145	63	1014	1422	1680	12	<20	<10	49	0.558	5.2	0.60	<0.5	0.09		
172	117.23	126.78	PX	2003/10/21	Set Point	3/2486			11.6	0.15	0.02	0.19	8.29	0.23	<0.01	49.5	12.8	14.5	1.2	0.33	0.01	<10	116	87	1167	621	1039	<10	<20	<10	62	0.352	9.7	<0.5	<0.5	0.08		
173	194.13	202.34	MZN	2003/10/21	Set Point	3/2486			17.5	0.09	0.02	0.15	6.33	0.26	0.01	44.0	13.9	13.8	0.8	2.61	0.01	<10	117	76	863	541	480	<10	<20	<10	50	5.11	14.2	2.13	<0.5	0.07		
174	211.47	215.1	DM	2003/10/21	Set Point	3/2486			24.1	0.10	<0.01	0.16	12.4	0.24	<0.01	31.8	7.3	10.5	0.4	7.50	0.02	<10	268	145	452	1063	619	14	29	<10	71	14.9	14.3	3.15	<0.5	0.13		
175	215.23	218.5	DM	2003/10/21	Set Point	3/2486			19.7	0.07	<0.01	0.14	15.6	0.05	<0.01	33.7	7.0	13.0	0.3	5.90	0.02	<10	188	59	463	914	717	11	27	<10	87	12.0	8.3	6.25	<0.5	0.10		
176	60.22	62.1	QF	2003/10/21	Set Point	3/2486			1.46	<0.01	<0.01	0.07	4.04	0.06	0.01	74.1	12.8	0.7	5.3	1.26	0.01	<10	<20	13	511	37	42	<10	<20	<10	17	0.021	1.1	0.82	<0.5	0.11		
177	37.04	47.71	NC	2003/10/21	Set Point	3/2486			13.6	0.09	0.11	0.18	4.40	1.72	<0.01	44.2	17.8	10.9	0.6	5.10	0.01	36	253	103	981	714	854	<10	<20	<10	51	1.50	9.9	4.46	<0.5	0.18		
178	60.57	69.09	PX	2003/10/21	Set Point	3/2486			11.2	0.19	0.03	0.21	4.64	0.17	<0.01	53.0	6.4	22.1	0.7	0.43	0.01	<10	103	81	2655	294	920	<10	<20	<10	66	0.060	8.8	0.58	<0.5	0.10		
179	89.65	94.35	MA	2003/10/21	Set Point	3/2486			5.35	0.06	0.02	0.17	12.7	0.53	<0.01	49.7	22.8	4.9	2.0	0.47	<0.01	<10	137	28	270	41	104	<10	<20	<10	43	0.039	3.9	<0.5	<0.5	0.04		
180	187.96	194.36	HF	2003/10/21	Set Point	3/2486			11.9	0.19	0.02	0.17	4.71	0.27	<0.01	51.2	6.6	20.9	0.6	0.62	0.01	<10	41	102	2395	520	1127	<10	<20	<10	74	0.423	8.1	<0.5	<0.5	0.10		
181				2003/10/21	Set Point	3/2486	S	NMZ	26.8	0.14	0.04	0.25	4.92	0.25	<0.01	37.9	9.5	10.6	0.6	3.69	<0.01	13	86	360	973	3422	6500	12	28	<10	58	7.42	21.5	2.73	<0.5	0.19		
182	221.65	230.47	HF	2003/10/21	Set Point	3/2486			15.1	0.02	0.04	0.23	4.60	1.21	0.01	45.5	20.9	5.9	0.6	5.33	0.01	<10	79	66	469	854	448	15	<20	<10	44	6.57	3.8	4.90	<0.5	0.17		
183	123.12	131.85	PX	2003/10/21	Set Point	3/2486			11	0.19	0.02	0.18	9.05	0.16	<0.01	50.8	10.6	15.8	1.1	0.46	<0.01	<10	112	83	1395	1084	1175	<10	<20	<10	54	0.468	8.4	<0.5	<0.5	0.05		
184	92.85	99.33	PFPX	2003/10/21	Set Point	3/2486			12.2	0.16	0.02	0.22	5.70	0.27	<0.01	51.0	9.4	18.7	0.8	0.71	0.01	<10	320	141	2064	2711	4000	<10	<20	<10	60	0.980	9.1	<0.5	<0.5	0.03		
185	156.98	162.65	PFPX	2003/10/21	Set Point	3/2486			12.1	0.17	0.03	0.14	4.97	0.10	<0.01	50.7	8.0	20.9	0.7	0.74	0.01	<10	61	127	2767	2237	3300	11	<20	<10	63	0.657	9.3	<0.5	<0.5	0.07		
186	98.75	106.66	PFPX	2003/10/21	Set Point	3/2486			8.17	0.11	0.02	0.20	11.6	0.36	<0.01	50.3	17.1	7.6	2.0	0.66	0.01	<10	64	69	401	1065	830	<10	<20	<10	53	0.513	7.2	<0.5	<0.5	0.07		
187	337.41	341.65	PFPX	2003/10/21	Set Point	3/2486	O	MC207	19.3	0.21	0.04	0.18	7.42	0.16	<0.01	43.3	7.6	19.5	0.7	0.21	0.01	<10	98	155	542	1325	2415	<10	<20	<10	73	0.786	16.6	<0.5	<0.5	0.09		
188	58.05	67.91	PX	2003/10/21	Set Point	3/2486			10.8	0.18	0.03	0.23	4.43	0.43	<0.01	53.4	6.4	21.5	0.7	0.74	0.02	<10	187	82	2522	336	857	<10	<20	<10	80	0.087	9.1	0.55	<0.5	0.08		
189	251.69	257.5	PFPX	2003/10/21	Set Point	3/2567			7.35	0.10	0.04	0.17	13.6	0.33	<0.01	48.8	16.8	9.6	1.1	1.31	0.02	<10	124	65	713	734	861	22	<20	<10	50	0.393	6.1	0.72	0.53	0.10		
190	252.02	258.1	PX	2003/10/21	Set Point	3/2567			10.3	0.16	0.03	0.16	7.69	0.21	<0.01	50.5	11.8	17.0	1.2	0.31	0.01	<10	84	72	1674	312	681	16	<20	<10	62	0.143	9.1	<0.5	<0.5	0.13		
191	231.8	241.6	PX	2003/10/21	Set Point	3/2567			14.4	0.21	0.05	0.26	7.18	0.34	0.01	49.3	9.4	16.0	1.2	0.28	0.01	<10	120	107	1639	935	1104	16	<20	<10	63	0.808	12.1	<0.5	<0.5	0.12		
192	210.36	214.06	DM	2003/10/21	Set Point	3/2567			14.1	0.31	0.02	0.09	9.89	0.07	1.00	68.0	1.4	3.2	0.2	0.25	0.04	<10	109	17	240	39	64	16	<20	<10	<10	0.781	12.3	<0.5	<0.5	0.12		
193	179	183.22	QF	2003/10/21	Set Point	3/2567			1.06	<0.01	0.02	0.03	0.45	1.76	<0.01	77.0	12.4	0.4	6.1	0.38	0.01	<10	67	<10	319	25	59	22	<20	<10	<10	0.093	0.8	<0.5	<0.5	0.18		
194	477.06	480.02	Q	2003/10/21	Set Point	3/2567			1.70	<0.01	0.02	0.05	0.15	0.14	<0.01	96.2	0.9	0.1	0.2	0.03	0.01	<10	<20	<10	565	139	15	<10	<20	<10	<10	0.086	1.1	<0.5	<0.5	0.07		
195	312.04	321.94	DO	2003/10/21	Set Point	3/2567			17.5	0.21	0.10	2.35	9.91	0.84	0.24	48.2	12.0	4.9	2.0	0.55	0.01	<10	242	43	115	335	56	16	<20	<10	78	0.068	14.0	0.70	<0.5	0.16		
196	407	411.4	Q	2003/10/21	Set Point	3/2567			8.04	0.02	0.04	0.58	0.71	0.68	0.01	77.0	8.9	1.5	0.3	1.55	0.01	<10	58	30	120	69	41	<10	<20	<10	59	0.306	6.6	1.72	<0.5	0.18		
197	184	187.45	DO	2003/10/21	Set Point	3/2567			16.7	0.21	0.09	2.39	9.87	0.46	0.22	49.4	12.0	4.7	2.1	0.62	0.01	<10	190	48	31	338	59	11	<20	<10	68	0.060	12.9	0.50	<0.5	0.16		
198	389.49	394.12	DO	2003/10/21	Set Point	3/2567			17.2	0.20	0.08	2.30	9.53	0.67	0.26	49.9	11.7	4.5	2.1	0.34	0.01	<10	214	48	30	352	58	11	<20	<10	86	0.068	13.3	0.75	<0.5	0.13		
199	388.45	393.33	DO	2003/10/21	Set Point	3/2567			17.3	0.22	0.09	2.36	9.09	0.79	0.23	49.3	11.9	4.7	2.0	0.70	0.01	<10	267	39	22	336	58	11	<20	<10	86	0.128	12.9	1.35	<0.5	0.11		
200	381.02	385.62	Q	2003/10/21	Set Point	3/2567			7.76	0.06	0.07	0.65	2.04	0.68	0.02	75.0	9.6	1.6	0.6	1.42	0.01	<10	145	15	326	47	33	<10	<20	<10	40	0.289	5.5	1.21	<0.5	0.19		
203				2003/10/21	Set Point	3/2567	O	MC127	15.1	0.04	0.08	0.91	0.19	0.55	<0.01	42.2	34.0	2.9	0.2	3.32	<0.01	17	76	43	403	23	113	10	<20	<10	85	0.018	11.6	3.68	<0.5	0.27		
204				2003/10/21	Set Point	3/2567	O	MC147	7.58	0.12	0.04	0.31	12.1	0.71	0.02	51.7	15.7	8.5	1.9	0.64	0.02	5	188	43	456	112	186	<10	<20	<10	44	0.060	6.7	0.78	<0.5	0.13		
206				2003/10/21	Set Point	3/2567	O	MC167	14.8	0.22	0.06	1.07	3.74	1.17	0.07	50.1	19.2	6.0	1.0	1.40	0.01	5	240	55	553	157	175	14	<20	<10	91	0.026	10.7	1.95	<0.5	0.18		
207				2003/10/21	Set Point	3/2567	O	MC187	19.5	0.22	0.06	0.19	7.43	0.14	0.01	43.0	7.6	19.2	0.8	0.23	0.01	5	92	153	529	1285	2357	<10	<20	<10	59	0.881	15.8	<0.5	<0.5	0.08		
209	480.01	488.06	Q	2003/10/21	Set Point	3/2567			4.51	0.01	0.04	0.43	0.56	0.55	<0.01	85.4	5.0	1.1	0.7	0.46	0.01	<10	75	10	394	73	43	<10	<20	<10	16	0.313	3.2	<0.5	<0.5	0.8		
210	231.9	236.05	DO	2003/10/21	Set Point	3/2567			17.5	0.23	0.10	2.49	9.54	0.55	0.25	48.8	12.2	4.7	2.2	0.82	0.01	<10	177	40	3	341	61	12	<20	<10	87	0.085	12.6	1.31	<0.5	0.17		
211	183.58	190.3	PGN	2003/10/21	Set Point	3/2567			9.67	0.12	0.03	0.19	10.1	0.45	0.01	49.4	14.0	11.2	1.4	1.20	0.01	<10	126	100	1324	2328	3022	10	<20	<10	43	1.01	7.3	1.67	<0.5	0.16		
212	61.57	72.08	PX	2003/10/21	Set Point	3/2567			12.9	0.16	0.04	0.26	8.23	0.28	0.02	48.7	10.7	14.9	0.8	0.95	0.02	<10	101	86	1214	467	877	11	<20	<10	57	0.344	10.5	0.85	<0.5	0.19		
213				2003/10/21	Set Point	3/2567	S	SARM5	13.2	0.22	0.08	0.2	2.76	0.14	<0.01	50.7	4.1	24.7	0.5	-0.63	0.01	<10	86	83	24700	26	538	11	<20	<10	83	0.016	8.8	<0.5	<0.5	0.12		

Sample	From Depth	To Depth	Litho Code	Date	Laboratory	Batch	Sample	Corresponding	TOTAL Fe as Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
						No	Type	Sample No.	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%		
214	415.91	426.33	PX	2003/10/21	Set Point	3/2567			16.4	0.16	0.05	0.26	3.89	0.59	0.02	42.1	8.3	21.3	0.5	2.84	0.02	13	139	223	1430	3606	4966	16	<20	<10	50	1.77	11.6	3.20	<0.5	0.22		
215	123	132.02	SP	2003/10/21	Set Point	3/2567	O	MC305	14.6	0.20	0.07	0.21	6.49	0.13	<0.01	48.8	6.0	20.5	0.4	1.01	0.01	5	87	123	2032	1202	2280	11	<20	<10	58	0.595	12.0	1.33	<0.5	0.12		
216	160.81	164.25	QF	2003/10/21	Set Point	3/2567			2.20	<0.01	0.02	0.15	1.07	2.28	0.04	73.8	13.1	0.7	5.3	0.56	0.01	11	259	<10	203	43	79	16	<20	<10	14	0.034	1.8	0.80	<0.5	0.11		
217	482.96	490.07	Q	2003/10/21	Set Point	3/2567			10.7	0.06	0.04	0.47	3.78	0.40	0.04	70.4	8.2	3.8	1.0	0.43	0.01	<10	158	21	602	85	119	10	<20	<10	39	0.106	5.15	<0.5	<0.5	0.08		
218	349.16	359.18	AP	2003/10/21	Set Point	3/2567			2.66	<0.01	0.01	0.16	1.10	5.12	<0.01	75.8	11.5	0.1	2.9	0.27	0.03	<10	942	10	283	13	<10	14	<20	<10	17	0.040	1.8	0.55	<0.5	0.08		
219	368.2	377.93	AP	2003/10/21	Set Point	3/2567			2.77	0.01	0.02	0.19	1.16	4.88	<0.01	75.2	11.5	0.1	3.1	0.14	0.03	<10	932	<10	318	24	16	17	<20	<10	29	0.080	2.1	<0.5	<0.5	0.05		
220	164.35	172.29	MA	2003/10/21	Set Point	3/2567			5.40	0.07	0.02	0.15	13.0	0.56	<0.01	49.6	22.1	6.6	2.0	0.34	0.01	<10	146	29	433	148	173	<10	<20	<10	27	0.064	4.8	<0.5	<0.5	0.06		
221	254.5	261.65	AP	2003/10/21	Set Point	3/2567			2.98	0.01	0.02	0.24	1.11	5.26	<0.01	75.3	11.8	0.1	2.8	0.19	0.02	<10	907	<10	224	37	16	18	<20	<10	26	0.111	2.2	<0.5	<0.5	0.08		
222	43.54	49.76	PGN	2003/10/21	Set Point	3/2567			7.62	0.10	0.03	0.31	10.0	0.63	0.03	50.4	18.2	8.4	1.8	1.77	0.02	<10	179	40	706	196	348	<10	<20	<10	43	0.106	6.1	1.89	<0.5	0.23		
225	27.32	35.15	QF	09-Oct-03	Setpoint Isando	7131			6.75	0.09	0.02	0.32	9.96	0.60	0.05	53.7	18.0	7.2	2.1	0.35	0.01	<10	178	26	509	46	155	<10	<20	<10	51	0.028	5.8	<0.5	<0.5	0.13		
226	140.89	146.9	PFPX	09-Oct-03	Setpoint Isando	7131			13.0	0.14	0.05	0.33	7.39	0.88	0.09	49.0	14.4	11.3	0.7	0.76	0.01	19	179	95	1064	1463	1919	12	<20	<10	69	0.800	11.8	0.85	<0.5	0.21		
227	208.28	215.92	HF	09-Oct-03	Setpoint Isando	7131			13.7	0.04	0.07	0.29	0.15	0.82	<0.01	42.8	32.1	3.8	0.3	4.36	<0.01	30	64	50	46	70	148	<10	<20	<10	79	0.137	12.1	4.76	<0.5	0.37		
228	285.68	295.96	PGN	09-Oct-03	Setpoint Isando	7131			11.7	0.14	0.06	0.29	7.21	0.40	0.04	50.2	13.0	12.5	1.1	0.95	0.01	<10	111	115	916	882	1246	<10	<20	<10	72	0.492	10.5	0.95	<0.5	0.16		
229	142.5	146.13	GN	09-Oct-03	Setpoint Isando	7131			6.96	0.09	0.01	0.31	11.9	0.50	0.03	51.1	21.3	5.1	2.2	0.14	<0.01	<10	217	31	273	48	96	<10	<20	<10	51	0.037	5.5	<0.5	<0.5	0.14		
230	155.17	163.06	GN	09-Oct-03	Setpoint Isando	7131			6.61	0.08	0.02	0.36	10.7	0.61	0.05	50.4	19.9	5.6	2.0	1.42	0.01	<10	186	29	340	61	125	<10	<20	<10	57	0.054	4.9	1.38	<0.5	0.19		
231	163.11	168.06	GN	09-Oct-03	Setpoint Isando	7131			6.49	0.08	0.02	0.33	10.1	0.74	0.05	52.0	19.4	5.9	2.0	1.48	0.01	<10	180	35	376	40	130	<10	<20	<10	52	0.036	5.7	1.48	<0.5	0.18		
232	179.25	182.84	GN	09-Oct-03	Setpoint Isando	7131			7.25	0.10	0.02	0.30	9.70	0.45	0.04	50.9	17.8	7.9	1.7	1.96	<0.01	<10	162	39	581	39	187	13	<20	<10	62	0.030	6.8	2.00	<0.5	0.22		
233	187.62	194.8	GN	09-Oct-03	Setpoint Isando	7131			7.16	0.10	0.02	0.28	9.72	0.52	0.04	52.0	17.3	8.0	2.0	0.87	0.01	<10	158	37	578	50	179	<10	<20	<10	56	0.030	5.5	0.62	<0.5	0.15		
235	196.08	207.05	GN	09-Oct-03	Setpoint Isando	7131	O	MC306	1.20	0.01	<0.01	0.14	1.05	2.03	0.06	75.4	13.1	0.4	5.7	0.62	0.01	<10	235	<10	331	12	18	12	<20	<10	23	0.013	0.6	0.58	<0.5	0.11		
236	208	218.2	GN	09-Oct-03	Setpoint Isando	7131			17.3	0.20	0.03	0.18	3.99	0.18	0.01	42.2	6.6	22.3	0.5	3.84	0.02	<10	93	180	750	1154	2098	14	<20	<10	84	0.731	13.4	3.01	<0.5	0.28		
237	218.2	225.73	GN	09-Oct-03	Setpoint Isando	7131			6.31	0.08	0.02	0.31	10.5	0.57	0.05	52.6	19.2	6.4	2.2	0.40	0.01	<10	169	32	423	45	135	<10	<20	<10	48	0.046	4.1	<0.5	<0.5	0.11		
238	78	84.17	SP	09-Oct-03	Setpoint Isando	7131			5.96	0.08	0.02	0.31	11.0	0.59	0.05	51.6	20.1	6.0	2.3	0.48	0.01	<10	161	34	372	42	120	<10	<20	<10	49	0.038	5.6	<0.5	<0.5	0.10		
239	59.59	65.6	GN	09-Oct-03	Setpoint Isando	7131			8.52	0.14	0.02	0.36	9.00	0.46	0.06	53.2	14.6	10.4	1.8	0.13	0.01	<10	170	42	637	41	235	<10	<20	<10	62	0.027	7.6	<0.5	<0.5	0.07		
240	74.14	82.24	GN	09-Oct-03	Setpoint Isando	7131			5.46	0.07	0.01	0.31	11.9	0.61	0.04	51.4	22.0	4.8	2.2	0.69	0.01	<10	172	24	241	42	92	<10	<20	<10	49	0.028	4.2	0.68	<0.5	0.11		
241	90.08	95.71	GN	09-Oct-03	Setpoint Isando	7131			6.05	0.08	0.01	0.31	11.3	0.53	0.05	51.5	21.0	5.5	2.1	0.22	0.01	<10	128	25	292	38	104	<10	<20	<10	56	0.026	5.0	<0.5	<0.5	0.06		
242	10.49	16.98	GN	09-Oct-03	Setpoint Isando	7131			6.90	0.11	0.02	0.33	10.5	0.33	0.03	51.1	17.5	6.9	1.8	2.48	<0.01	<10	135	36	558	<10	190	<10	<20	<10	54	0.020	3.8	2.62	0.55	1.13		
243				09-Oct-03	Setpoint Isando	7131	S	XPT	14.0	0.18	0.03	0.22	5.70	0.16	0.02	47.1	7.5	18.3	0.7	0.96	0.01	<10	61	130	6455	2653	3588	10	<20	<10	78	1.34	6.3	0.6	<0.5	0.13		
244	7.2	12.41	GN	09-Oct-03	Setpoint Isando	7131			7.56	0.11	0.02	0.29	9.79	0.50	0.04	52.0	17.5	7.4	2.1	0.46	<0.01	<10	178	45	504	40	167	<10	<20	<10	59	0.035	5.5	0.79	<0.5	0.26		
245	4.03	5.64	GN	09-Oct-03	Setpoint Isando	7131			7.35	0.11	0.02	0.29	10.8	0.43	0.02	52.0	18.4	6.5	2.2	0.70	<0.01	<10	174	34	425	47	132	<10	<20	<10	60	0.021	5.5	<0.5	<0.5	0.30		
247	70.89	81.11	MA	09-Oct-03	Setpoint Isando	7131			3.87	0.03	0.01	0.38	12.9	0.87	0.07	50.9	24.2	1.9	2.8	1.07	0.01	<10	221	12	146	42	37	<10	<20	<10	43	0.028	2.5	1.02	<0.5	0.08		
248	203.32	207.44	LN	09-Oct-03	Setpoint Isando	7131			7.71	0.11	0.02	0.15	8.57	0.42	0.01	50.7	15.0	14.1	1.2	0.54	<0.01	<10	128	56	1552	292	587	<10	<20	<10	56	0.117	6.9	<0.5	<0.5	0.10		
249	30.65	33.31	MA	09-Oct-03	Setpoint Isando	7138			6.08	0.08	0.02	0.34	11.7	0.83	0.04	51.5	21.3	4.5	2.7	0.50	<0.01	<10	146	21	220	43	79	14	<20	<10	48	0.034	4.3	<0.5	<0.5	0.09		
250	316.64	323.3	PFPX	09-Oct-03	Setpoint Isando	7138			11.3	0.14	0.08	0.27	12.6	0.32	0.03	47.5	11.3	12.3	0.7	1.08	0.01	<10	119	107	1315	1174	1468	14	<20	<10	52	0.918	9.4	0.84	<0.5	0.12		
251	138.93	144.28	PX	09-Oct-03	Setpoint Isando	7131			24.4	0.76	0.02	0.11	9.50	0.11	1.00	53.0	2.1	5.1	0.1	0.79	0.02	33	122	49	174	212	131	<10	<20	<10	40	1.56	20.2	0.55	<0.5	0.07		
252	10.84	12.83	PX	09-Oct-03	Setpoint Isando	7138			13.1	0.21	0.03	0.21	5.66	0.18	0.02	51.7	6.8	19.7	1.0	-0.08	<0.01	<10	64	96	2335	804	1514	<10	<20	<10	77	0.368	10.7	<0.5	<0.5	0.05		
253	150.87	155.86	PX	09-Oct-03	Setpoint Isando	7131			14.7	0.17	0.03	0.31	5.11	0.21	0.05	49.0	7.7	17.9	1.0	0.46	<0.01	<10	128	147	2141	2865	2948	20	<20	<10	65	1.61	11.5	<0.5	<0.5	0.07		
254	133.37	145.07	PGN	09-Oct-03	Setpoint Isando	7131			17.2	0.13	0.04	0.22	7.48	0.42	0.03	44.3	14.5	8.9	1.1	1.63	0.01	<10	175	181	588	1902	2856	<10	<20	<10	54	3.26	13.6	1.38	<0.5	0.09		
255	455.69	463	LN	09-Oct-03	Setpoint Isando	7131	O	MC308	16.0	0.09	0.03	0.18	9.98	0.38	0.02	39.1	19.4	6.1	1.1	1.92	0.01	13	151	257	516	5535	6255	31	<20	<10	77	6.09	11.6	2.35	<0.5	0.08		
256	79.67	87.27	HF	09-Oct-03	Setpoint Isando	7138			10.3	0.03	0.03	0.72	0.89	2.81	0.12	55.6	20.6	2.0	0.7	4.83	0.01	53	767	22	256	119	109	<10	<20	<10	52	0.475	8.2	2.8	2.3	0.30		
257	55.38	60.4	QF	09-Oct-03	Setpoint Isando	7138			1.94	0.01	<0.01	0.14	0.89	3.15	0.05	75.3	12.9	0.4	4.4	0.44	<0.01	<10	341	<10	416	<10	45	24	<20	<10	26	0.036	1.5	<0.5	<0.5	0.06		
258	118	121.88	PGN	09-Oct-03	Setpoint Isando	7138			11.9	0.16	0.05	0.36	7.82	0.41	0.06	50.6	13.6	11.5	1.4	1.01	0.02	<10	93	121	525	878	1042	<10	<20	<10	63	0.872	10.2	0.51	<0.5	0.12		
260	145.68	153.02	LN	09-Oct-03	Setpoint Isando	7138			13.2	0.12	0.05	0.22	8.88	0.45	0.04	46.1	16.4	8.1	1.3	1.17	0.01	<10	104	147	445	1358	2474	13	24	<10	55	2.24	11.0	0.61	<0.5	0.09		
261	99	104	PX	09-Oct-03	Setpoint Isando	7138			12.1	0.20	0.03	0.27	4.43	0.27	0.04	52.8	5.6	21.1	0.8	0.27	<0.01	<10	87	90	2495	476	1098	<10	<20	<10	76	0.149	10.2	<0.5	<0.5	0.10		
262	407.87	417.88	PFPX	09-Oct-03	Setpoint Isando	7138			24.1	0.15	0.03	0.24	4.86	0.18	0.03	40.6	7.3	15.0	0.6	2.97	0.01	<10	118	349	1393	2894	7540	13	27	<10	56	6.67	17.6	3.21	<0.5	0.11		
263				09-Oct-03	Setpoint Isando	7138	S	SARM4	8.98	0.16	0.04	0.20	11.6	0.24	0.02	52.5	16.4	7.4	2.4	-0.07	<0.01	<10	118	50	11	19	115	<10	<20	<10	56	0.010	6.8	<0.5	<0.5	0.05		
264	24.01	34.14	MN	09-Oct-03	Setpoint Isando	7138			10.6	0.13	0.04	0.23	8.65	0.33	0.03	48.5	16.7	10.3	1.2	1.10	0.01	<10	105	90	632	622	807	<10	<20	<10	70	0.221	7.0	<0.5	0.89	0.22		
266	21.48	29.48	MN	09-Oct-03	Setpoint Isando	7138			9.09	0.13	0.02	0.24	8.81	0.40	0.03	47.9	15.2	11.3	1.1	3.61	0.01	<10	126	81	1192	540	992	12	28	<10	66	0.426	6.0	2.66	1.21	0.42		
267	4.41	8.15	NC	09-Oct-03	Setpoint Isando	7138			8.76	0.12	0.04	0.29	8.42	0.73	0.04	50.9	16.4	9.6	1.4	1.46	0.01	11	251	107	656	1629	3013	<10	<20	<10	62	0.074	5.5	1.38	<0.5	0.19		
268	9.66	14.26	NC	09-Oct-03	Setpoint Isando	7138			7.88	0.10	0.03	0.25	8.95	0.64	0.04	50.7	17.4	9.1	1.7	1.23	<0.01	<10	129	112	813	2272	5040	10	<20	<10	57	0.391	5.0	1.59	<0.5	0.16		
271	8	16.8	GN	09-Oct-03	Setpoint Isando	7138			6.10	0.07	0.01	0.16	11.0	0.54	0.03	50.5	20.4	6.9	1.8	1.48	<0.01	<10	219	54	725	678	1067	<10	<20	<10	44	0.046	3.5	1.35	<0.5	0.20		
272	20.3	24.5	GN	09-Oct-03	Setpoint Isando	7138			10.1	0.11	0.01	0.21	8.38	0.40	0.04	47.2	13.5	13.7	0.9	2.91	0.01	<10	173	87	1681	1023	1372	10	<20	<10	57	0.109	5.6	2.05	0.76	0.40		
273	15.39	17.64	FPX	09-Oct-03	Setpoint Isando	7138			16.8	0.21	0.03	0.27	5.48	0.18	0.03	49.1	9.5	14.2	0.8	0.68	<0.01	<10	84	110	1464	1560	1861	<10	<20	<10	83	0.767	13.8	0.52	<0.5	0.12		
274	9.5	13.25	GN	09-Oct-03	Setpoint Isando	7138			6.34	0.10	0.01	0.19	12.0	0.58	0.04	49.7	17.8	6.7	1.4	3.56	<0.01	<10	121	34	505	90	209	13	<20	<10	50	0.020	4.0	0.9	2.59	0.46		
285				29-Oct-03	Setpoint Isando	2840	M	Scavenger tail Low grade ore	14.8	0.18	0.03	0.23	5.60	0.20	0.03	47.3	7.2	18.9	0.5	2.21	0.01	<10	84	102	1988	895	1617	11	<20	<10	86	1.25	11.5	1	0.74	0.36		
286				29-Oct-03	Setpoint Isando	2840	M	Scavenger tails Oxidised ore	13.0	0.16	0.04	0.19	6.80	0.19	0.02	48.2	8.3	15.6	0.6	3.40	0.01	<10	148	137	1604	1569	2868	13	<20	<10	94	0.097	7	2.02	1.58	1.35		
287				29-Oct-03	Setpoint Isando	2840	M	Scavenger tail High grade ore	17.6	0.16	0.04	0.21	5.77	0.25	0.04	43.6	8.5	16.3	0.6	2.90	0.01	22	60	113	1836	1167	2524	15	<20	<10	84	2.99	13.7	<0.5	0.78	0.38		
300				29-Oct-03	Setpoint Isando	2840		NMZ	27.0	0.15	0.04	0.26	4.93	0.26	0.03	37.4	9.4	10.5	0.5	3.65	<0.01	16	133	352	988	3318	6635	17	<20	<10	60	7.38	20.9	4.04	<0.5	0.33		
305				29-Oct-03	Setpoint Isando	2840	D	MC215	14.0	0.20	0.05	0.21	6.33	0.16	0.02	48.4	6.0	20.6	0.3	0.81	0.01	<10	83	114	2024	1142	2222	14	<20	<10	75	0.67	11.6	<0.5	0.82	0.20		
306				29-Oct-03	Setpoint Isando	2840	D	MC235	0.83	0.01	0.005	0.13	1.00	2.08	0.06	75.9	13.0	0.3	5.3	0.39	0.01	<10	275	5	306	30	41	15	<20	<10	22	0.032	0.4	<0.5	<0.5	0.14		
308				29-Oct-03	Setpoint Isando	2840	D	MC255	16.2	0.09	0.03	0.18	10.1	0.34	0.03	39.5	19.6	6.2	1.0	2.07	0.01	14	155	274	509	5658	6442	23	<20	<10	78	4.33	12	2.05	<0.5	0.16		
315				29-Oct-03	Setpoint Isando	2840		SARM5	12.5	0.22	0.05	0.20	2.67	0.09	0.02	49.9	4.1	25.0	0.5	-0.36	<0.01	<10	61	81	23600	25	552	<10	<20	<10	87	0.025	8.5	<0.5	<0.5	0.08		

APPENDIX 9:

The Whole Rock Geochemistry Results Provided by Ultra Trace Laboratory

ULTRA TRACE RESULTS

Sample	Al2O3	CaO	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SiO2	TiO2	V2O5	Cl	LOI1000	As	Ba	Co	Cr	Cu	Ni	Pb	S	Te	Tl	Zn	CO2
UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%
MC18 A	17.6	10.44	7.91	0.372	8.14	0.14	2.11	0.024	52.15	0.22	0.027	0.01	0.55	1	113	50	290	95	270	4	0.04	-0.2	-0.1	90	0.73
MC18 B	17.69	10.51	7.95	0.372	8.2	0.14	2.17	0.025	52.16	0.23	0.028	0.011	0.62	-1	119	45	310	90	200	4	0.03	-0.2	-0.1	85	0.73
MC49	18.19	10.55	6.95	0.214	10.3	0.13	1.67	0.021	51.15	0.17	0.02	0.008	0.35	2	81	50	590	100	300	3	0.06	-0.2	-0.1	75	0.73
MC90	7.2	4.89	10.9	0.156	20.7	0.2	0.68	0.023	53.01	0.19	0.029	0.014	1.4	3	38	75	1300	105	685	5	0.04	-0.2	-0.1	85	0.84
MC109	17.23	8.94	8.01	0.511	10.2	0.12	1.53	0.039	51.19	0.25	0.022	0.019	0.79	4	114	95	580	1840	3220	13	0.86	0.8	0.2	75	0.84
MC137	12.72	9.35	13	0.109	13.1	0.21	0.64	0.028	50.46	0.22	0.055	0.019	0.03	2	40	70	620	75	355	4	0.04	-0.2	-0.1	120	0.84
MC161	15.22	8.91	9.05	0.363	12.3	0.15	1.48	0.039	51.08	0.23	0.022	0.032	0.86	3	97	85	700	1000	1470	14	0.58	0.2	0.1	80	0.84
MC182 A	20.72	4.4	15.1	1.146	5.84	0.04	0.6	0.036	45.77	0.23	0.045	0.02	5.56	12	297	95	280	845	630	16	6.44	-0.2	0.6	85	0.88
MC182 B	20.65	4.36	14.9	1.129	5.79	0.04	0.6	0.036	45.6	0.22	0.045	0.018	5.53	14	322	100	310	865	645	17	6.84	-0.2	0.6	75	0.77
MC199	12.1	8.85	18	0.675	4.89	0.25	2.29	0.264	48.83	2.45	0.084	0.009	0.99	4	191	55	60	400	75	8	0.14	-0.2	0.2	150	0.84
MC218	11.51	1.05	2.63	4.807	0.03	0.02	2.93	0.013	76.31	0.19	0.002	0.056	0.09	-1	958	-5	140	30	15	14	0.06	-0.2	0.5	40	1.61
MC244	17.87	9.71	8.05	0.501	7.57	0.14	2.31	0.043	52.94	0.3	0.026	0.009	0.53	-1	165	45	330	45	165	5	-0.01	-0.2	-0.1	90	0.73
MC256	20.73	0.84	10.1	2.749	2.01	0.05	0.77	0.126	56.86	0.73	0.03	0.017	4.9	104	779	40	330	120	135	11	0.58	-0.2	0.7	85	2.31
MC255	20.02	9.87	16.5	0.32	6.41	0.11	1.18	0.023	40.98	0.18	0.036	0.033	2.27	48	125	320	360	6060	7330	36	4.61	1	0.1	120	0.88
MC173	13.8	6	17.4	0.251	13.7	0.11	0.71	0.034	44.7	0.14	0.02	0.019	2.62	11	110	100	590	600	660	11	5.13	0.2	0.1	75	0.92
MC83	16.33	5.54	31.5	0.281	4.16	0.13	0.87	0.03	29.82	0.43	0.067	0.015	4.63	55	115	715	330	8430	17500	27	11.4	1.4	-0.1	170	0.95

APPENDIX 10:

The Static ABA Results Provided by The Institute for Groundwater Studies

Constituents released during complete oxidation in kg/t																								
					Batch	Sample	Corresponding																	
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na	Ni	Sb
1	37.82	44.58	GN	2003/08/19	1A	Original (O)	Duplicate No.	<0.00002	0.01934	0.00010	0.00020	<0.00002	0.31800	<0.00002	0.00286	0.00008	0.00079	0.02608	0.21400	0.00024	0.37467	0.00093	0.00021	0.28400	0.00126	<0.00002
2	64.40	70.90	GN	2003/08/19	1A	Duplicate (D)	Original No.	<0.00002	0.01038	<0.0001	0.00010	<0.00002	0.30000	0.00003	0.00124	0.00034	0.00108	0.00523	0.09940	0.00018	0.20467	0.00318	0.00020	0.20700	0.00273	<0.00002
3	103.60	110.23	GN	2003/08/19	1A	Standard (S)	Standard Ref .	<0.00002	0.01576	0.00011	0.00008	<0.00002	0.63200	<0.00002	0.00174	0.00008	0.00038	0.01717	0.15740	0.00014	0.32400	0.00115	0.00024	0.25200	0.00085	0.00001
4	125.85	132.18	MN	2003/08/19	1A	Metalurgical (M)		0.00002	0.01946	<0.0001	0.00016	<0.00002	0.28000	<0.00002	0.00428	0.00009	0.00043	0.03276	0.11720	0.00016	0.38200	0.00099	0.00011	0.19470	0.00171	0.00002
5	142.70	147.85	FPX	2003/08/19	1A			<0.00002	0.00164	<0.0001	<0.00006	<0.00002	0.47800	<0.00002	0.00513	<0.00004	0.00015	0.00263	0.07060	0.00016	1.12400	0.00063	0.00007	0.25100	0.00033	0.00002
6	167.25	177.22	NC	2003/08/19	1A			0.00002	0.27972	<0.0001	0.00252	<0.00002	1.40600	<0.00002	0.00646	0.01374	0.47772	0.01737	0.16980	0.00030	1.21000	0.01938	0.00086	0.31300	0.40476	<0.00002
7	209.06	219.97	NC	2003/08/19	1A			0.00003	0.68400	<0.000125	0.00278	<0.000025	2.07250	<0.000025	0.00593	0.03543	0.63549	0.01165	0.27000	0.00065	2.26500	0.02976	0.00127	0.52000	1.37146	<0.000025
8	297.14	304.66	FPX	2003/08/19	1A			<0.000025	5.11500	<0.000125	0.00283	0.00016	2.14000	<0.000025	0.00414	0.14398	1.81590	6.45000	0.35250	0.00135	2.28417	0.04731	<0.00005	0.79625	3.71035	<0.000025
9	325.08	334.03	HF	2003/08/19	1A			0.00017	1.87250	<0.000125	0.00213	0.00022	0.51000	<0.000025	0.00223	0.04291	0.28950	0.02220	0.45750	0.00205	0.78500	0.02362	0.00320	0.83500	0.73713	<0.000025
10	70.05	80.46	GN	2003/08/19	1A			<0.00002	0.01023	<0.0001	0.00006	<0.00002	0.51000	<0.00002	0.00188	0.00007	0.00038	0.01433	0.08900	0.00008	0.30333	0.00092	0.00012	0.20070	0.00131	<0.00002
11	81.92	92.10	GN	2003/08/19	1A			<0.00002	0.01199	<0.0001	0.00008	<0.00002	0.53400	<0.00002	0.00300	0.00005	0.00025	0.01793	0.09920	0.00010	0.39733	0.00114	0.00012	0.21900	0.00111	0.00001
12	93.07	100.87	GN	2003/08/19	1A			<0.00002	0.21588	<0.0001	0.00058	<0.00002	0.88200	<0.00002	0.00005	<0.00004	0.00003	0.10084	0.16140	0.00018	0.49000	0.00003	<0.00004	0.32600	0.00007	<0.00002
13	115.88	121.89	QF	2003/08/19	1A			<0.00002	0.05053	<0.0001	0.00018	0.00002	1.10400	<0.00002	0.00266	0.00020	0.00060	0.01432	0.03580	0.00004	0.02653	0.00137	0.00005	0.63500	0.00065	<0.00002
14	158.00	171.78	FPX	2003/08/19	1A			<0.000025	0.03509	<0.000125	0.00068	<0.000025	1.22250	0.00003	0.00322	0.00269	0.11968	0.00716	0.20250	0.00043	0.65917	0.01228	0.00024	0.46500	0.04188	<0.000025
15	210.84	229.43	NC	2003/08/19	1A			<0.00002	0.18561	<0.0001	0.00278	<0.00002	2.58000	<0.00002	0.00580	0.01630	1.20437	0.00401	0.25800	0.00090	2.11333	0.03057	0.00018	0.36900	0.77045	<0.00002
16	247.94	268.08	PGN	2003/08/19	1A	O	MC301	<0.00002	0.04070	<0.0001	0.00110	<0.00002	2.72000	<0.00002	0.00364	0.01164	0.25726	0.00511	0.16480	0.00050	1.16000	0.02704	0.00034	0.34800	0.26750	<0.00002
17	278.67	298.12	NC	2003/08/19	1A			<0.00002	0.40340	<0.0001	0.00216	<0.00002	3.34000	<0.00002	0.00354	0.02612	0.23900	0.00491	0.26400	0.00064	0.93533	0.02802	0.00032	0.37600	0.26360	<0.00002
18	35.03	45.21	GN	2003/08/19	1A			<0.00002	0.00598	<0.0001	0.00008	<0.00002	0.46000	<0.00002	0.00272	0.00022	0.00075	0.00331	0.10900	0.00018	0.27800	0.00138	0.00013	0.22100	0.00624	<0.00002
19	60.46	72.43	GN	2003/08/19	1A			<0.00002	0.01282	<0.0001	0.00008	<0.00002	0.44200	<0.00002	0.00136	0.00031	0.00060	0.00609	0.08660	0.00014	0.19773	0.00152	0.00012	0.19350	0.00546	<0.00002
20	114.42	124.27	GN	2003/08/19	1A	O	MC101	<0.00002	0.01391	<0.0001	0.00016	<0.00002	0.55000	<0.00002	0.00190	0.00015	0.00034	0.01709	0.14720	0.00024	0.25800	0.00094	0.00015	0.23600	0.00320	<0.00002
21	138.46	150.48	GN	2003/08/19	1A			<0.00002	0.01553	<0.0001	0.00022	<0.00002	0.46600	<0.00002	0.00059	0.00009	0.00020	0.00723	0.11840	0.00096	0.18447	0.00054	0.00006	0.23800	0.00163	<0.00002
22	177.50	191.30	FPX	2003/08/19	1A			<0.000025	0.01316	<0.000125	0.00015	<0.000025	1.26250	<0.000025	0.00874	0.00246	0.06585	0.00628	0.06550	0.00088	0.99250	0.01555	0.00018	0.37875	0.05235	0.00003
23	238.27	247.64	FPX	2003/08/19	1A			<0.000025	0.09618	<0.000125	0.00093	<0.000025	2.29750	<0.000025	0.00045	0.00075	0.27628	0.06103	0.19400	0.00085	0.99167	0.00201	<0.00005	0.43875	0.14981	<0.000025
24	41.58	52.04	MN	2003/08/19	1A			<0.00002	0.20551	<0.0001	0.00054	<0.00002	0.71600	<0.00002	0.00002	<0.00004	<0.00002	0.08103	0.10280	0.00044	0.33067	0.00002	<0.00004	0.25900	0.00004	<0.00002
25	54.08	63.87	MN	2003/08/19	1A			<0.00002	0.01188	<0.0001	0.00012	<0.00002	0.45400	<0.00002	0.00127	0.00006	0.00019	0.02204	0.10500	0.00038	0.30133	0.00063	0.00006	0.21100	0.00137	<0.00002
26	39.09	60.06	NC	2003/08/19	1A			<0.00002	0.02287	<0.0001	0.00088	<0.00002	2.28000	<0.00002	0.00148	0.00911	0.13609	0.00182	0.21200	0.00098	0.74333	0.02247	0.00015	0.38000	0.11600	<0.00002
27	63.16	72.97	HF	2003/08/19	1A			<0.000025	0.58625	<0.000125	0.00328	0.00009	0.53750	<0.000025	0.00275	0.01866	0.10131	0.00510	0.91250	0.00128	0.80833	0.03289	0.00262	0.45750	0.12030	<0.000025
28	76.71	86.21	HF	2003/08/19	1A			<0.00002	0.20530	<0.0001	0.00406	0.00002	0.34000	<0.00002	0.00139	0.01591	0.05949	0.00388	0.67000	0.00076	0.53267	0.02129	0.00065	0.24000	0.09621	<0.00002
29	137.02	149.45	MZN	2003/08/19	1A			<0.00002	0.00788	0.00196	0.00006	<0.00002	0.30800	0.00003	0.00258	0.00042	0.00202	0.00343	0.04700	0.00028	0.37800	0.00263	0.00017	0.19110	0.00820	<0.00002
30	149.84	161.08	MZN	2003/08/19	1A			<0.000025	0.02618	0.00114	0.00015	<0.000025	0.52750	<0.000025	0.00254	0.00136	0.02055	0.00332	0.05250	0.00033	0.51083	0.00710	0.00032	0.36625	0.01928	0.00004
31	212.59	224.01	HF	2003/08/19	1A			<0.00002	0.21960	0.00016	0.00156	0.00005	0.67400	<0.00002	0.00088	0.00784	0.14554	0.00285	0.24200	0.00128	0.51333	0.02797	0.00372	0.63000	0.09511	<0.00002
32	240.00	251.93	HF	2003/08/19	1A			<0.00002	0.12393	0.00074	0.00110	0.00003	0.29800	<0.00002	0.00041	0.00643	0.03645	0.00208	0.30000	0.00074	0.26067	0.01212	0.00323	0.47200	0.06437	0.00022
33	167.83	179.90	FPX	2003/08/19	1A			<0.00002	0.00460	0.00012	0.00008	<0.00002	0.25600	<0.00002	0.00648	0.00014	0.00071	0.00288	0.21600	0.00024	0.40800	0.00162	0.00025	0.18290	0.00321	0.00003
34	229.97	255.09	HF	2003/08/19	1A			<0.00002	0.23620	<0.0001	0.00108	<0.00002	0.60400	<0.00002	0.00154	0.01891	0.07721	0.00228	0.28800	0.00056	0.61400	0.02660	0.00080	0.26500	0.11164	<0.00002
35	271.89	284.95	FPX	2003/08/19	1A			<0.000025	0.37133	<0.000125	0.00225	<0.000025	2.04250	0.00024	0.00632	0.02533	1.43750	0.00241	0.14150	0.00093	2.85833	0.05768	0.00018	0.42375	0.83805	<0.000025
36	286.08	296.85	FPX	2003/08/19	1A			<0.00002	1.13239	<0.0001	0.00210	<0.00002	1.98600	<0.00002	0.00803	0.03872	1.75000	0.00590	0.15320	0.00046	1.25267	0.03016	0.00014	0.39000	1.57138	<0.00002
37	296.86	314.94	FPX	2003/08/19	1A			<0.00002	0.01842	<0.0001	0.00034	<0.00002	1.23600	0.00002	0.00230	0.00281	0.14682	0.00289	0.08160	0.00028	0.55467	0.01622	0.00034	0.26900	0.06453	<0.00002
38	45.33	61.49	GN	2003/08/19	1A			<0.00002	0.00754	0.00017	0.00006	<0.00002	0.60400	<0.00002	0.00243	0.00027	0.00546	0.00361	0.15260	0.00026	0.38200	0.00102	0.00111	0.24300	0.00716	<0.00002
39	85.51	100.80	GN	2003/08/19	1A			<0.00002	0.01947	<0.0001	0.00010	<0.00002	0.42000	<0.00002	0.00089	0.00031	0.00044	0.00731	0.09660	0.00020	0.16620	0.00103	0.00011	0.21900	0.00404	<0.00002
40	136.70	148.72	GN	2003/08/19	1A			<0.00002	0.01522	0.00046	0.00034	<0.00002	0.60600	<0.00002	0.00138	0.00008	0.00029	0.02121	0.10680	0.00012	0.21200	0.00078	0.00014	0.21500	0.00073	<0.00002
41	30.29	45.49	GN	2003/08/19	1A	O	MC103	<0.00002	0.18307	<0.0001	0.00040	<0.00002	0.47600	<0.00002	0.00015	0.00005	0.00009	0.05930	0.11580	0.00040	0.19327	0.00018	<0.00004	0.24600	0.00048	<0.00002
42	46.92	56.19	GN	2003/08/19	1A			<0.00002	0.01044	<0.0001	0.00014	<0.00002	0.32400	<0.00002	0.00187	0.00023	0.00047	0.00348	0.16080	0.00038	0.23667	0.00095	0.00029	0.36800	0.00358	<0.00002
43	95.73	111.03	GN	2003/08/19	1A			0.00013	0.01241	<0.0001	0.00010	<0.00002	0.48600	<0.00002	0.00082	0.00045	0.00172	0.00268	0.34000	0.00032	0.14280	0.00153	0.00026	0.41200	0.00626	<0.00002
44	114.27	128.20	GN	2003/08/19	1A			<0.00002	0.01234	<0.0001	0.00008	<0.00002	0.49400	<0.00002	0.00095	0.00045	0.00192	0.00362	0.09900	0.00030	0.13567	0.00159	0.00026	0.38800	0.00648	<0.00002
45	229.50	239.62	GN	2003/08/19	1A			<0.00002	0.00836	<0.0001	0.00010	<0.00002	0.36800	<0.00002	0.00174	0.00026	0.00062	0.00273	0.13120	0.00028	0.23067	0.00151	0.00029	0.38700	0.00672	<0.00002
46	244.40	254.97	GN	2003/08/19	1A			<0.00002	0.00945	<0.0001	0.00006	<0.00002	0.38400	<0.00002	0.00156	0.00038	0.00141	0.00223	0.11860	0.00026	0.21733	0.00174	0.00033	0.39100	0.00666	<0.00002
47	273.77	284.06	GN	2003/08/19	1A			0.00030	0.00758	<0.0001	0.00032	<0.00002	0.34600	0.00064	0.00197	0.00070	0.00132	0.00243	0.14120	0.00052	0.23667	0.00177	0.00035	0.39100	0.00437	<0.00002
48	107.95	119.80	NC	2003/08/19	1A			<0.000025	2.38824	<0.000125	0.00218	<0.000025	1.86250	<0.000025	0.00671	0.10131	1.62981	0.10328	0.42500	0.00083	2.20667	0.05826	0.00049	0.67375	2.11454	<0.000025
49	140.27	159.01	FPX	2003/08/19	1A			<0.00002	0.01104	<0.0001	<0.00006	<0.00002	0.42200	<0.00002	0.00282	0.00033	0.00524	0.00228	0.06640	0.00022	0.33000	0.00172	0.00021	0.38900	0.00739	<0.00002
50	43.00	63.08	LN	2003/08/19	1A			0.00016	2.67204	<0.000125	0.00245	<0.000025	1.69750	<0.000025	0.01099	0.12286	3.41625	2.27673	0.29000	0.00098	3.50000	0.08115	<0.00005	0.59125	3.41313	<0.000025
51	84.78	94.00	MN	2003/08/19	1B			<0.00002	0.02327	0.00062	0.00028	<0.00002	0.88600	<0.00002	0.00432	0.00167	0.05041	0.00274	0.10360	0.00024	0.57667	0.00968	0.00044	0.50100	0.04500	0.00004
52	100.37	112.18	FPX	2003/08/19	1B			<0.00002	0.00204	0.00027	<0.00006	<0.00002	0.60600	<0.00002	0.00639	0.00024	0.00594	0.00184	0.15160	0.00028	0.77267	0.00343	0.00024	0.46300	0.01246	0.00005
53	133.34	152.20	FPX	2003/08/19	1B			<0.00002	0.03103	<0.0001	0.00180	<0.00002	1.25200	0.00009	0.00739	0.00728	0.92300	0.00109	0.18440	0.00066	2.76000	0.03591	0.00020	0.56500	0.19420	0.00003
54	185.85	196.04	FPX	2003/08/19	1B			<0.000025	1.03500	<0.000125	0.00185	<0.000025	1.33750	0.00013	0.00704	0.05622	1.58250	0.00842	0.12175	0.00055	1.36333	0.02295	0.00033	0.67250	1.85250	<0.000025
55	199.60	208.24	MZN	2003/08/19	1B			<0.000025	0.02116	0.00031	0.00025	<0.000025	1.62750	<0.000025	0.00339	0.00518	0.18428	0.00171	0.08150	0.00060	1.27250	0.01603	0.00085	0.62875	0.07013	0.00003
56	261.22	280.20	MN	2003/08/19	1B			<0.00002	1.68000	<0.0001	0.00154	<0.00002	2.16000	0.00011	0.00547	0.07349	1.16520	0.00501	0.16700	0.00032	1.27133	0.01969	0.00152	0.63700	1.59600	<0.00002
57	303.04	313.05	FPX	2003/08/19	1B			<0.00002	1.56000	<0.0001	0.00140	<0.00002	2.08000	0.00017	0.00586	0.08861	1.52400	0.00768	0.16340	0.00048	2.60667	0.04181	0.00139	0.60000	1.96200	<0.00002
58	84.84	92.75	GN	2003/08/19	1B			<0.00002	0.00687	<0.0001	0.00012	<0.00002	0.41000	<0.00002	0.00129	0.00024	0.00273	0.00248	0.15860	0.00026	0.27133	0.00110	0.00020	0.49500	0.00562	<0.00002
59	103.90	112.49	GN	2003/08/19	1B			<0.00002	0.01023	<0.0001	0.00008	<0.00002	0.38400	<0.00002	0.00104	0.00016	0.00080	0.00420	0.13340	0.00026	0.27533	0.00098	0.00019	0.48000	0.00285	<0.00002
60	153.23	165.12	GN	2003/08/19	1B			0.00004	0.00979	<0.0001	0.00006	<0.00002	0.31600	<0.00002	0.00068	0.00022	0.00099	0.00265	0.10260	0.00026	0.18633	0.00122	0.00021	0.37200	0.00241	<0.00002
61	234.20	242.40	GN	2003/08/19	1B			<0.00002	0.00817	0.00010	0.00008	<0.00002	0.32000	<0.00002	0.00151	0.00018	0.00073	0.00409	0.11500	0.00084	0.25200	0.00142	0.00023	0.41900	0.00185	<0.00002
62	260.35	268.95	GN	2003/08/19	1B			<0.00002	0.00989	0.00015	0.00010	<0.00002	0.36600	<0.00002	0.00089	0.00026	0.00134	0.00418	0.08760	0.00068	0.19753	0.00157	0.00022	0.43400	0.00197	<0.00002
64	90.29	105.54	HF	2003/08/19	1B			<0.000025	4.25000	<0.000125	0.00235	0.00014	1.05750	0.00014	0.00507	0.17025	1.10500	4.66250	0.59500	0.00243	2.75000	0.05366	<0.00005	0.85125	2.03125	<0.000025
65	107.05	121.66	MN	2003/08/19	1B			<0.000025	2.70000	<0.000125	0.00210	<0.000025	1.65750	0.00023	0.01023	0.12957	2.00125	2.18750	0.32250	0.00088	2.54250	0.05355	<0.00005	0.72000	2.27625	<0.000025
66	180.53	191.55	FPX	2003/08/19	1B	O	MC302	<0.000025	1.11000	<0.000125	0.00433	<0.000025	1.05750	0.00026	0.01570	0.15360	1.80500	0.69750	0.28250	0.00090	6.20000	0.10519	<0.00005	0.54875	2.58750	0.00003
67	257.97	268.58	FPX	2003/08/19	1B			<0.000025	4.55000	<0.000125	0.00233	<0.000025	3.35000	0.00030	0.00393	0.19748	3.28750	3.75000	0.39000	0.00098	1.67333	0.02826	<0.00005	0.89250	4.21250	<0.000025
68	333.97	342.15	DM	2003/08/19	1B			<0.00003	0.00945	0.00077	0.00015	<0.00003	0.82500	<0.00003	0.00149	0.00038	0.00828	0.01078	0.07950	0.00051	7.92000	0.00158	0.00016	0.50400	0.00922	<0.00003
69	191.86	201.92	HF	2003/08/19	1B			<0.00002	0.02582	0.00674	0.00016	<0.00002	0.42200	0.00004	0.00110	0.00269	0.01457	0.00256	0.16320	0.00072	0.24200	0.00721	0.00473	0.66700	0.02338	0.00013

Constituents released during complete oxidation in kg/t																				
					Batch	Sample	Corresponding													
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Se	Sn	Sr	Pb	V	Zn	SO4	Initial pH	Final pH	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)
1	37.82	44.58	GN	2003/08/19	1A	Original (O)	Duplicate No.	<0.00006	0.00036	0.00054	<0.0002	0.00115	0.00590	0.22600	11.02000	5.47000	0.23542	0.47083	11.69856	11.46314	11.22773
2	64.40	70.90	GN	2003/08/19	1A	Duplicate (D)	Original No.	<0.00006	0.00024	0.00056	<0.0002	0.00064	0.00525	0.28600	10.40000	4.70000	0.29792	0.59583	3.61854	3.32062	3.02271
3	103.60	110.23	GN	2003/08/19	1A	Standard (S)	Standard Ref .	<0.00006	0.00024	0.00050	<0.0002	0.00109	0.00461	0.31200	10.51000	5.84000	0.32500	0.65000	10.39499	10.06999	9.74499
4	125.85	132.18	MN	2003/08/19	1A	Metalurgical (M)		<0.00006	0.00073	0.00044	<0.0002	0.00047	0.00164	0.28200	10.46000	5.20000	0.29375	0.58750	8.18638	7.89263	7.59888
5	142.70	147.85	FPX	2003/08/19	1A			0.00006	<0.0002	0.00028	<0.0002	0.00047	0.00085	1.73200	10.50000	6.71000	1.80417	3.60833	16.40004	14.59587	12.79171
6	167.25	177.22	NC	2003/08/19	1A			0.00070	0.00032	0.00304	0.00058	0.00162	0.01942	10.69000	10.49000	3.62000	11.13542	22.27083	7.69046	-3.44496	-14.58037
7	209.06	219.97	NC	2003/08/19	1A			0.00100	<0.00025	0.00313	0.00061	0.00280	0.01998	20.46250	10.45000	3.62000	21.31510	42.63021	14.37312	-6.94199	-28.25709
8	297.14	304.66	FPX	2003/08/19	1A			0.00076	<0.00025	0.00943	0.00227	0.00122	0.02538	65.00000	9.75000	2.60000	67.70833	135.41667	7.79594	-59.91240	-127.62073
9	325.08	334.03	HF	2003/08/19	1A			0.00080	<0.00025	0.00518	0.00044	0.00207	0.02252	17.55000	9.90000	3.51000	18.28125	36.56250	-0.90612	-19.18738	-37.46863
10	70.05	80.46	GN	2003/08/19	1A			<0.00006	<0.0002	0.00046	<0.0002	0.00060	0.00258	0.32400	10.21000	5.79000	0.33750	0.67500	7.73290	7.39540	7.05790
11	81.92	92.10	GN	2003/08/19	1A			<0.00006	0.00022	0.00050	<0.0002	0.00094	0.00594	0.31000	10.24000	6.08000	0.32292	0.64583	10.93476	10.61184	10.28893
12	93.07	100.87	GN	2003/08/19	1A			<0.00006	<0.0002	0.00134	<0.0002	0.00001	0.00003	0.66200	10.44000	5.80000	0.68958	1.37917	9.93960	9.25001	8.56043
13	115.88	121.89	QF	2003/08/19	1A			<0.00006	0.00120	0.00062	<0.0002	0.00008	0.00223	0.19760	10.78000	5.73000	0.20583	0.41167	-0.43460	-0.64044	-0.84627
14	158.00	171.78	FPX	2003/08/19	1A			0.00030	0.00065	0.00198	0.00029	0.00068	0.01551	5.16250	10.31000	4.03000	5.37760	10.75521	12.69867	7.32107	1.94346
15	210.84	229.43	NC	2003/08/19	1A			0.00133	<0.0002	0.00294	0.00105	0.00175	0.01707	18.86000	10.57000	3.96000	19.64583	39.29167	19.78956	0.14372	-19.50211
16	247.94	268.08	PGN	2003/08/19	1A	O	MC301	0.00089	0.00042	0.00234	0.00037	0.00247	0.01458	12.34000	10.54000	4.34000	12.85417	25.70833	16.19817	3.34400	-9.51016
17	278.67	298.12	NC	2003/08/19	1A			0.00055	<0.0002	0.00314	0.00040	0.00225	0.01165	15.68000	10.39000	3.51000	16.33333	32.66667	13.73552	-2.59782	-18.93115
18	35.03	45.21	GN	2003/08/19	1A			<0.00006	<0.0002	0.00048	<0.0002	0.00081	0.00387	0.53200	10.54000	5.50000	0.55417	1.10833	9.03114	8.47697	7.92281
19	60.46	72.43	GN	2003/08/19	1A			<0.00006	0.00027	0.00052	<0.0002	0.00054	0.00259	0.44600	10.45000	5.04000	0.46458	0.92917	6.62088	6.15629	5.69171
20	114.42	124.27	GN	2003/08/19	1A	O	MC101	<0.00006	0.00023	0.00056	<0.0002	0.00099	0.00161	0.41600	10.38000	5.61000	0.43333	0.86667	9.15738	8.72405	8.29071
21	138.46	150.48	GN	2003/08/19	1A			<0.00006	0.00026	0.00064	<0.0002	0.00031	0.00024	0.30600	10.50000	5.17000	0.31875	0.63750	7.89240	7.57365	7.25490
22	177.50	191.30	FPX	2003/08/19	1A			0.00059	0.00081	0.00085	<0.00025	0.00079	0.00878	5.41250	10.55000	5.29000	5.63802	11.27604	9.85228	4.21426	-1.42376
23	238.27	247.64	FPX	2003/08/19	1A			<0.000075	<0.00025	0.00220	<0.00025	0.00007	0.00090	9.67500	10.37000	4.08000	10.07813	20.15625	11.95034	1.87222	-8.20591
24	41.58	52.04	MN	2003/08/19	1A			<0.00006	<0.0002	0.00118	<0.0002	0.00001	0.00000	0.27200	10.53000	5.19000	0.28333	0.56667	8.48482	8.20149	7.91815
25	54.08	63.87	MN	2003/08/19	1A			<0.00006	0.00041	0.00050	<0.0002	0.00032	0.00158	0.23200	10.71000	5.48000	0.24167	0.48333	10.21242	9.97075	9.72909
26	39.09	60.06	NC	2003/08/19	1A			0.00039	<0.0002	0.00304	<0.0002	0.00077	0.00543	9.15000	10.41000	4.21000	9.53125	19.06250	12.61100	3.07975	-6.45150
27	63.16	72.97	HF	2003/08/19	1A			0.00066	<0.00025	0.00288	<0.00025	0.00387	0.01680	10.15000	9.98000	3.35000	10.57292	21.14583	6.86486	-3.70806	-14.28097
28	76.71	86.21	HF	2003/08/19	1A			0.00031	<0.0002	0.00156	<0.0002	0.00177	0.01006	5.46000	10.18000	3.34000	5.68750	11.37500	4.09090	-1.59660	-7.28410
29	137.02	149.45	MZN	2003/08/19	1A			0.00012	<0.0002	0.00042	<0.0002	0.00141	0.00099	1.07400	10.98000	5.22000	1.11875	2.23750	-17.16238	-18.28113	-19.39988
30	149.84	161.08	MZN	2003/08/19	1A			0.00014	0.00055	0.00095	<0.00025	0.00131	0.02377	2.40000	10.55000	4.63000	2.50000	5.00000	11.86976	9.36976	6.86976
31	212.59	224.01	HF	2003/08/19	1A			0.00056	<0.0002	0.00440	0.00023	0.00142	0.01279	6.54000	9.87000	3.78000	6.81250	13.62500	1.05446	-5.75804	-12.57054
32	240.00	251.93	HF	2003/08/19	1A			0.00026	<0.0002	0.00198	<0.0002	0.00056	0.00066	3.50000	9.78000	3.58000	3.64583	7.29167	-0.93062	-4.57645	-8.22229
33	167.83	179.90	FPX	2003/08/19	1A			<0.00006	<0.0002	0.00030	<0.0002	0.00087	0.00820	0.43800	10.64000	5.32000	0.45625	0.91250	5.26103	4.80478	4.34853
34	229.97	255.09	HF	2003/08/19	1A			0.00047	<0.0002	0.00184	0.00022	0.00159	0.02024	6.03000	9.79000	3.50000	6.28125	12.56250	7.50058	1.21933	-5.06192
35	271.89	284.95	FPX	2003/08/19	1A			0.00147	<0.00025	0.00353	0.00150	0.00084	0.02064	20.82500	10.74000	3.78000	21.69271	43.38542	26.71748	5.02477	-16.66794
36	286.08	296.85	FPX	2003/08/19	1A			0.00143	<0.0002	0.00448	0.00169	0.00106	0.00936	20.01000	10.47000	3.76000	20.84375	41.68750	11.77880	-9.06495	-29.90870
37	296.86	314.94	FPX	2003/08/19	1A			0.00037	<0.0002	0.00194	0.00027	0.00069	0.00278	5.25000	10.94000	4.41000	5.46875	10.93750	10.21582	4.74707	-0.72168
38	45.33	61.49	GN	2003/08/19	1A			<0.00006	<0.0002	0.00140	<0.0002	0.00094	0.00384	0.89400	10.84000	5.74000	0.93125	1.86250	8.94574	8.01449	7.08324
39	85.51	100.80	GN	2003/08/19	1A			<0.00006	0.00031	0.00062	<0.0002	0.00046	0.00023	0.39200	10.65000	4.88000	0.40833	0.81667	5.65434	5.24601	4.83767
40	136.70	148.72	GN	2003/08/19	1A			<0.00006	<0.0002	0.00052	<0.0002	0.00065	0.00025	0.27800	10.38000	5.67000	0.28958	0.57917	9.78596	9.49638	9.20679
41	30.29	45.49	GN	2003/08/19	1A	O	MC103	<0.00006	<0.0002	0.00102	<0.0002	0.00008	0.00005	0.33000	10.69000	4.87000	0.34375	0.68750	3.17744	2.83369	2.48994
42	46.92	56.19	GN	2003/08/19	1A			<0.00006	0.00024	0.00046	<0.0002	0.00098	0.00085	0.35000	10.55000	5.22000	0.36458	0.72917	8.75450	8.38992	8.02533
43	95.73	111.03	GN	2003/08/19	1A			<0.00006	0.00087	0.00068	<0.0002	0.00055	0.00071	0.37200	10.86000	4.82000	0.38750	0.77500	9.90970	9.52220	9.13470
44	114.27	128.20	GN	2003/08/19	1A			<0.00006	0.00065	0.00068	<0.0002	0.00052	0.00358	0.41400	10.78000	4.76000	0.43125	0.86250	-48.90558	-49.33683	-49.76808
45	229.50	239.62	GN	2003/08/19	1A			<0.00006	0.00041	0.00052	<0.0002	0.00099	0.00072	0.39800	10.86000	5.19000	0.41458	0.82917	10.30335	9.88876	9.47418
46	244.40	254.97	GN	2003/08/19	1A			<0.00006	0.00084	0.00054	<0.0002	0.00101	0.00061	0.41600	10.54000	5.02000	0.43333	0.86667	9.13309	8.69976	8.26642
47	273.77	284.06	GN	2003/08/19	1A			<0.00006	0.00071	0.00080	<0.0002	0.00100	0.00110	0.29800	10.92000	5.21000	0.31042	0.62083	9.07598	8.76556	8.45515
48	107.95	119.80	NC	2003/08/19	1A			0.00188	<0.00025	0.00485	0.00180	0.00327	0.02436	31.12500	10.39000	3.25000	32.42188	64.84375	14.27199	-18.14989	-50.57177
49	140.27	159.01	FPX	2003/08/19	1A			0.00009	0.00049	0.00058	<0.0002	0.00055	0.00053	1.17200	10.72000	5.16000	1.22083	2.44167	9.05698	7.83614	6.61531
50	43.00	63.08	LN	2003/08/19	1A			0.00220	0.00029	0.00350	0.00593	0.00182	0.04460	47.25000	10.27000	2.62000	49.21875	98.43750	22.85474	-26.36402	-75.58277
51	84.78	94.00	MN	2003/08/19	1B			0.00021	<0.0002	0.00092	<0.0002	0.00080	0.00261	3.68500	10.31000	4.63000	3.83854	7.67708	9.03144	5.19289	1.35435
52	100.37	112.18	FPX	2003/08/19	1B			0.00022	<0.0002	0.00038	<0.0002	0.00085	0.00066	2.83667	10.85000	5.88000	2.95486	5.90972	12.26899	9.31412	6.35926
53	133.34	152.20	FPX	2003/08/19	1B			0.00112	<0.0002	0.00170	0.00086	0.00093	0.00853	14.14667	10.78000	4.49000	14.73611	29.47222	19.85214	5.11602	-9.62009
54	185.85	196.04	FPX	2003/08/19	1B			0.00145	<0.00025	0.00335	0.00141	0.00112	0.01292	17.42500	10.53000	3.51000	18.15104	36.30208	9.04498	-9.10607	-27.25711
55	199.60	208.24	MZN	2003/08/19	1B			0.00049	<0.00025	0.00265	0.00025	0.00226	0.00360	8.64792	10.51000	4.79000	9.00825	18.01649	14.25603	5.24778	-3.76047
56	261.22	280.20	MN	2003/08/19	1B			0.00117	<0.0002	0.00382	0.00104	0.00256	0.01011	19.49000	10.30000	3.84000	20.30208	40.60417	14.46544	-5.83665	-26.13873
57	303.04	313.05	FPX	2003/08/19	1B			0.00136	<0.0002	0.00318	0.00125	0.00269	0.01389	23.76667	10.28000	3.77000	24.75694	49.51389	17.45774	-7.29920	-32.05615
58	84.84	92.75	GN	2003/08/19	1B			<0.00006	0.00022	0.00056	<0.0002	0.00068	0.00067	0.38600	10.93000	5.36000	0.40208	0.80417	7.95364	7.55156	7.14947
59	103.90	112.49	GN	2003/08/19	1B			<0.00006	0.00045	0.00050	<0.0002	0.00062	0.00030	0.29400	10.57000	5.21000	0.30625	0.61250	7.60790	7.30165	6.99540
60	153.23	165.12	GN	2003/08/19	1B			<0.00006	0.00057	0.00052	<0.0002	0.00047	0.00039	0.18800	10.56000	4.87000	0.19583	0.39167	5.74116	5.54533	5.34949
61	234.20	242.40	GN	2003/08/19	1B			<0.00006	0.00043	0.00048	<0.0002	0.00067	0.00433	0.22600	10.41000	5.09000	0.23542	0.47083	6.81452	6.57910	6.34369
62	260.35	268.95	GN	2003/08/19	1B			<0.00006	0.00063	0.00054	<0.0002	0.00047	0.00333	0.23600	10.39000	4.83000	0.24583	0.49167	7.49098	7.24515	6.99931
64	90.29	105.54	HF	2003/08/19	1B			0.00083	<0.00025	0.00835	0.00128	0.00010	0.06048	46.37500	9.55000	3.09000	48.30729	96.61458	-1.55854	-49.86583	-98.17312
65	107.05	121.66	MN	2003/08/19	1B			0.00100	<0.00025	0.00438	0.00310	0.00024	0.01889	39.75000	10.03000	2.64000	41.40625	82.81250	12.57207	-28.83419	-70.24044
66	180.53	191.55	FPX	2003/08/19	1B	O	MC302	0.00130	<0.00025	0.00198	0.00219	0.00004	0.02790	39.12500	10.71000	3.14000	40.75521	81.51042	42.57596	1.82075	-38.93446
67	257.97	268.58	FPX	2003/08/19	1B			0.00113	<0.00025	0.00860	0.00285	0.00025	0.02765	54.62500	9.99000	2.77000	56.90104	113.80208	10.50630	-46.39475	-103.29579
68	333.97	342.15	DM	2003/08/19	1B			0.00009	<0.0003	0.00036	<0.0003	0.00023	0.00060	21.90750	11.06000	8.75000	22.82031	45.64063	422.06170	399.24139	376.42108
69	191.86	201.92	HF	2003/08/19	1B			0.00012	<0.0002	0.00136	<0.0002	0.00102	0.00518	2.50333	9.92000	4.40000	2.60764	5.21528	0.36319	-2.24444	-4.85208

Constituents released during complete oxidation in kg/t																								
					Batch	Sample	Corresponding																	
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na	Ni	Sb
70	225.71	238.65	HF	2003/08/19	1B			<0.00002	0.04698	0.00437	0.00036	<0.00002	0.27000	0.00003	0.00061	0.00697	0.03043	0.00186	0.33400	0.00100	0.28733	0.00697	0.00734	0.65600	0.04259	0.00010
71	246.75	257.58	NC	2003/08/19	1B			<0.00002	0.09120	0.00063	0.00066	<0.00002	1.13800	0.00004	0.00194	0.00686	0.25900	0.00181	0.15700	0.00046	0.86667	0.01565	0.00058	0.52900	0.03910	0.00003
72	277.00	286.80	FPX	2003/08/19	1B			<0.000025	0.18000	0.00018	0.00178	<0.000025	1.49500	0.00006	0.00533	0.00802	0.58125	0.00218	0.19950	0.00078	1.25333	0.02045	0.00080	0.64500	0.17888	<0.000025
73	287.00	300.25	PGN	2003/08/19	1B			<0.000025	0.72250	<0.000125	0.00243	<0.000025	2.01500	0.00008	0.00421	0.01728	0.89625	0.00959	0.27750	0.00078	0.86167	0.01919	0.00120	0.69625	0.38500	<0.000025
74	321.17	332.51	MZN	2003/08/19	1B			<0.00002	0.00640	0.00062	0.00020	<0.00002	0.86200	<0.00002	0.00178	0.00139	0.04450	0.00096	0.05740	0.00050	0.56133	0.00802	0.00025	0.22800	0.02425	0.00003
75	309.00	317.64	HF	2003/08/19	1B			<0.00002	0.01963	0.01005	0.00024	<0.00002	0.10760	0.00006	0.00057	0.00128	0.03090	0.00300	0.32600	0.00064	0.16533	0.00186	0.00173	0.50200	0.05530	0.00016
76	101.66	111.24	MN	2003/08/19	1B			<0.00002	0.01129	0.00084	0.00012	<0.00002	0.90200	<0.00002	0.00169	0.00196	0.02455	0.00097	0.12720	0.00034	0.49000	0.00593	0.00039	0.53400	0.02109	0.00003
77	213.79	226.84	MZN	2003/08/19	1B			<0.000025	2.25775	<0.000125	0.00205	<0.000025	1.24250	0.00022	0.00413	0.28793	4.27625	27.29375	0.04625	0.00068	1.31500	0.02684	<0.00005	0.74250	5.65125	0.00021
78	276.85	286.00	MN	2003/08/19	1B			<0.00002	2.98000	0.00012	0.00174	<0.00002	2.28000	0.00020	0.00396	0.12956	2.34000	0.25861	0.41200	0.00072	1.93667	0.02318	<0.00004	0.78100	3.24000	<0.00002
79	289.03	300.53	SP	2003/08/19	1B			<0.000025	0.94500	<0.000125	0.00450	<0.000025	2.97500	0.00025	0.00932	0.19125	2.35250	1.72125	0.18825	0.00043	6.50000	0.07348	<0.00005	0.58125	3.80000	<0.000025
80	43.10	46.00	HF	2003/08/19	1B			<0.00002	0.02603	0.00017	0.00024	<0.00002	1.67200	<0.00002	0.00073	0.00870	0.03862	0.00385	0.25800	0.00038	0.37133	0.04057	0.00148	0.51100	0.03711	<0.00002
81	199.04	206.00	SP	2003/08/19	1B	O	MC106	<0.000025	0.00068	<0.000125	0.00013	<0.000025	0.18250	<0.000025	0.01189	0.00006	0.00145	0.00145	0.18675	0.00028	2.55750	0.00104	0.00021	0.51000	0.00045	0.00006
82	252.53	258.50	SP	2003/08/19	1B			<0.000025	0.00040	<0.000125	0.00013	<0.000025	0.11425	<0.000025	0.01182	0.00000	0.00094	0.00077	0.17500	0.00023	2.28167	0.00050	0.00024	0.56750	0.00126	0.00006
83	306.58	315.00	MN	2003/08/19	1B			<0.000025	3.41825	<0.000125	0.00280	<0.000025	3.05000	0.00044	0.00076	0.46228	6.77600	20.37338	0.16900	0.00080	0.82833	0.02569	<0.00005	0.85750	11.35888	0.00007
84	66.02	77.14	NC	2003/08/19	1B			<0.000025	1.43500	<0.000125	0.00180	<0.000025	2.55000	0.00011	0.00802	0.05828	0.90300	0.01434	0.13700	0.00058	2.32000	0.04125	0.00021	0.74375	1.05000	<0.000025
85	87.09	100.87	HF	2003/08/19	1B			<0.00003	9.55800	<0.00015	0.00312	0.00006	6.72000	0.00014	0.00270	0.10331	1.29600	22.18500	0.11760	0.00045	1.14100	0.04388	<0.00006	0.39300	0.73980	0.00032
86	125.90	136.47	HF	2003/08/19	1B			<0.00002	0.99600	<0.0001	0.00236	0.00009	1.18200	0.00009	0.00173	0.02991	0.14607	0.01299	0.53400	0.00112	1.19267	0.04087	0.00313	0.39800	0.17450	<0.00002
87	187.00	197.88	MN	2003/08/19	1B			<0.00002	0.03113	<0.0001	0.00100	<0.00002	1.57600	0.00003	0.00163	0.00465	0.16876	0.00190	0.10400	0.00036	0.74267	0.01458	0.00011	0.32100	0.12090	<0.00002
88	256.08	267.00	MA	2003/08/19	1B			<0.00002	0.00231	<0.0001	0.00008	<0.00002	0.95800	<0.00002	0.00427	0.00014	0.00207	0.00089	0.12380	0.00036	0.54600	0.00141	0.00008	0.24100	0.00573	<0.00002
89	278.00	286.12	MA	2003/08/19	1B			<0.00002	0.00185	<0.0001	0.00008	<0.00002	1.03800	<0.00002	0.00232	0.00022	0.00172	0.00077	0.15140	0.00040	0.45467	0.00209	0.00010	0.25200	0.00818	<0.00002
90	290.00	302.00	LN	2003/08/19	1B			<0.00002	0.00222	0.00025	0.00008	<0.00002	0.65200	<0.00002	0.00757	0.00008	0.00059	0.00246	0.10820	0.00018	0.75400	0.00090	0.00014	0.19230	0.00111	0.00003
91	22.00	31.00	DM	2003/08/19	1B			<0.00002	0.00071	<0.0001	0.00010	<0.00002	1.92200	<0.00002	0.00070	0.00004	0.00100	0.00254	0.03060	0.00014	3.03333	0.00093	0.00020	0.17090	0.00198	<0.00002
92	50.00	61.97	MN	2003/08/19	1B			<0.000025	4.00000	<0.000125	0.00193	<0.000025	4.90000	0.00017	0.00168	0.07169	0.25139	0.03769	0.21750	0.00073	1.54417	0.03189	0.00100	0.57500	0.33875	0.00004
93	113.26	123.06	HF	2003/08/19	1B			<0.000025	2.17500	<0.000125	0.00245	0.00006	1.00250	0.00005	0.00861	0.04350	0.24631	0.03415	0.19175	0.00150	0.78583	0.02783	0.00078	0.31000	0.42750	<0.000025
94	166.60	177.06	HF	2003/08/19	1B			<0.00003	7.50000	0.00029	0.00255	0.00009	16.50000	0.00016	0.00223	0.03486	0.73650	2.96550	0.25530	0.00150	1.78600	0.06333	<0.00006	0.66300	0.25905	0.00005
95	179.02	189.03	DM	2003/08/19	1B			0.00003	0.00223	<0.0001	0.00098	<0.00002	11.38000	<0.00002	0.00082	0.00022	0.00053	0.00143	0.10400	0.00018	0.86467	0.00317	0.00028	0.17180	0.00229	<0.00002
96	185.52	197.07	SP	2003/08/19	1B			<0.00003	0.02023	0.00018	0.00021	<0.00003	0.23340	<0.00003	0.00887	0.00046	0.00742	0.05625	0.24420	0.00036	4.17000	0.00449	0.00025	0.27420	0.01075	0.00003
97	244.05	255.92	NC	2003/08/19	1B			<0.000025	0.95000	<0.000125	0.00255	<0.000025	2.45750	0.00012	0.00427	0.03223	0.93975	0.00718	0.19250	0.00073	1.37250	0.02728	0.00015	0.43375	1.05825	<0.000025
98	287.80	299.64	NC	2003/08/19	1B			<0.000025	0.01203	<0.000125	0.00135	<0.000025	2.03000	0.00004	0.00438	0.00242	0.08084	0.00159	0.29500	0.00078	1.93833	0.01882	0.00015	0.35500	0.05054	<0.000025
99	336.12	347.53	FPX	2003/08/19	1B			<0.000025	0.14400	<0.000125	0.00148	<0.000025	1.56000	0.00006	0.00590	0.01814	0.63750	0.00286	0.11075	0.00048	1.21333	0.02610	0.00031	0.31500	0.48500	<0.000025
101				2003/08/19	2	D	MC20	<0.00002	0.01521	<0.0001	0.00028	<0.0001	0.61000	<0.00002	0.00133	0.00008	0.00055	0.01750	0.19720	0.00036	0.32200	0.00071	0.00014	0.23000	0.00178	<0.00002
103				2003/08/19	2	D	MC41	0.00002	0.01147	<0.0001	0.00016	<0.0001	0.42800	<0.00002	0.00075	0.00018	0.00055	0.00551	0.31600	0.00033	0.21600	0.00070	0.00013	0.19510	0.00226	<0.00002
106				2003/08/19	2	D	MC81	<0.00002	0.00201	<0.0001	0.00012	<0.0001	0.14640	<0.00002	0.01180	<0.00004	0.00025	0.00103	0.52000	0.00097	1.93933	0.00082	0.00010	0.18110	0.00011	0.00003
108				2003/10/29	6	S	XPT	<0.000025	0.83454	<0.000125	0.00163	<0.000025	1.60486	<0.000025	0.00948	0.10045	2.75908	0.81321	0.11260	0.00024	0.90406	0.03913	0.00031	0.86295	3.66035	<0.000025
109	65.36	77.60	PGN	2003/08/19	2			0.00004	1.05875	<0.000125	0.00183	<0.000125	1.85250	0.00017	0.00546	0.04029	1.86738	0.00380	0.27750	0.00150	0.76833	0.01405	0.00028	0.34500	2.57500	<0.000025
110	166.55	179.65	SP	2003/08/19	2			<0.000025	0.00160	<0.000125	0.00015	<0.000125	0.16400	<0.000025	0.00934	0.00009	0.00144	0.00174	0.15175	0.00100	1.94667	0.00105	0.00012	0.18538	0.00291	0.00005
111	63.28	75.16	LN	2003/08/19	2			<0.00002	0.00495	<0.0001	0.00012	<0.0001	0.38600	<0.00002	0.00188	0.00032	0.00146	0.00217	0.06840	0.00084	0.36600	0.00128	0.00010	0.16390	0.01183	<0.00002
112	101.96	112.24	MN	2003/08/19	2			<0.00002	0.00344	0.00023	0.00010	<0.0001	0.39800	<0.00002	0.00389	0.00041	0.00166	0.00198	0.14200	0.00080	0.53133	0.00151	0.00025	0.16930	0.01656	<0.00002
113	125.00	135.85	FPX	2003/08/19	2			<0.00002	0.00219	0.00123	0.00010	<0.0001	0.49600	<0.00002	0.00485	0.00092	0.00290	0.00156	0.25200	0.00076	0.86400	0.00629	0.00036	0.15860	0.02886	0.00005
114	267.30	277.40	MN	2003/08/19	2			<0.000025	0.67500	<0.000125	0.00228	<0.000125	1.29250	0.00011	0.01338	0.03576	0.90553	0.00375	0.15150	0.00079	1.34000	0.02363	0.00013	0.29250	1.47000	<0.000025
115	42.72	53.25	NC	2003/08/19	2			<0.000025	0.45000	<0.000125	0.00185	<0.000125	1.25500	0.00012	0.00395	0.03460	0.98000	0.00260	0.17675	0.00094	1.10583	0.02319	0.00028	0.33000	1.27000	<0.000025
116	332.97	343.08	NC	2003/08/19	2			<0.00003	1.55700	<0.00015	0.00246	<0.00015	1.61700	0.00029	0.01424	0.08016	2.39100	0.35550	0.35700	0.00084	1.72800	0.03537	0.00014	0.38100	3.42000	<0.00003
117	163.85	172.25	HF	2003/08/19	2			0.00005	0.04163	0.00181	0.00112	<0.0001	0.31400	0.00003	0.00045	0.00730	0.03574	0.00130	0.30000	0.00086	0.29667	0.00756	0.00179	0.27000	0.07039	0.00015
118	46.14	51.98	SP	2003/08/19	2			<0.000025	0.00234	<0.000125	0.00018	<0.000125	1.05000	<0.000025	0.00751	0.00155	0.07098	0.00152	0.12375	0.00075	3.70000	0.03034	0.00008	0.23500	0.04348	0.00004
119	157.00	162.26	MN	2003/08/19	2			<0.000025	1.15750	<0.000125	0.00143	<0.000125	2.52500	0.00015	0.00369	0.03911	1.32225	0.01021	0.15050	0.00116	1.03667	0.03100	<0.00005	0.41000	1.22500	<0.000025
120	171.84	175.30	NC	2003/08/19	2	O	MC202	<0.00002	0.57600	<0.0001	0.00232	<0.0001	2.36000	0.00007	0.00542	0.01500	0.98952	0.00266	0.24800	0.00221	1.37933	0.02542	0.00012	0.31500	0.53800	<0.00002
121	226.10	232.11	MN	2003/08/19	2			0.00003	0.88500	<0.000125	0.00200	<0.000125	2.90000	0.00011	0.00357	0.03956	0.90500	0.00584	0.28250	0.00149	0.99000	0.02640	0.00011	0.40625	1.16500	<0.000025
122	153.01	163.07	NC	2003/08/19	2			<0.00002	0.00745	0.00031	0.00008	<0.0001	0.43800	<0.00002	0.00298	0.00019	0.00132	0.00181	0.10220	0.00049	0.41533	0.00096	0.00022	0.23800	0.00300	0.00002
123	33.66	44.45	PX	2003/08/19	2			<0.00003	0.00123	0.00022	0.00030	<0.00015	1.97700	<0.00003	0.02338	0.00048	0.00194	0.00180	0.21660	0.00081	1.71500	0.00696	0.00027	0.27540	0.01882	0.00006
124	53.82	64.00	SP	2003/08/19	2			<0.000025	0.00362	<0.000125	0.00165	<0.000125	1.58000	0.00012	0.00367	0.03675	0.51625	0.00135	0.24375	0.00085	4.45000	0.07921	0.00010	0.22700	0.82500	<0.000025
125	77.97	89.00	NC	2003/08/19	2			0.00004	0.00150	<0.0001	0.00010	<0.0001	1.20000	<0.00002	0.00576	0.00062	0.00275	0.00063	0.34200	0.00051	0.59200	0.00396	0.00007	0.19740	0.01602	0.00002
126	92.00	102.00	FPX	2003/08/19	2			<0.000025	0.00316	<0.000125	0.00085	<0.000125	3.32500	0.00003	0.00653	0.00933	0.01015	0.00407	0.92750	0.00118	2.88333	0.04754	0.00032	0.26625	0.06426	0.00003
127	72.82	79.60	HF	2003/08/19	2			<0.00002	0.00903	0.00253	0.00010	<0.0001	0.07380	<0.00002	0.00033	0.00012	0.00023	0.00624	0.27200	0.00099	0.14553	0.00052	0.00188	0.29800	0.00537	0.00027
128	221.95	231.93	MZN	2003/08/19	2			<0.00003	0.02468	0.00027	0.00129	<0.00015	1.35900	0.00003	0.00490	0.01401	0.09425	0.00261	0.18060	0.00101	1.98700	0.02674	0.00207	0.39600	0.19764	0.00006
129	239.30	250.48	HF	2003/08/19	2			<0.00002	0.00861	0.00316	0.00006	<0.0001	0.08900	<0.00002	0.00031	0.00010	0.00031	0.00667	0.18520	0.00073	0.14107	0.00041	0.00025	0.29200	0.00626	0.00014
130	132.04	142.80	FPX	2003/08/19	2			<0.00003	0.00118	0.00064	0.00018	<0.00015	0.36000	<0.00003	0.01054	0.00008	0.00040	0.00119	0.32700	0.00051	1.90200	0.00116	0.00038	0.29880	0.00214	0.00004
131	169.66	180.32	MN	2003/08/19	2			<0.00002	0.13457	<0.0001	0.00072	<0.0001	0.99600	<0.00002	0.00109	0.01472	0.08663	0.00179	0.05460	0.00116	0.67000	0.01506	0.00097	0.25900	0.10828	<0.00002
132	35.82	46.49	PFPX	2003/08/19	2			<0.00002	0.00053	<0.0001	0.00008	<0.0001	0.68800	<0.00002	0.01085	0.00011	0.00022	0.00067	0.18860	0.00089	1.21333	0.00058	0.00012	0.19720	0.01529	0.00004
133	244.04	255.02	HF	2003/08/19	2			<0.00002	0.01716	0.00022	0.00232	<0.0001	0.42200	<0.00002	0.00075	0.00414	0.00362	0.00114	1.60800	0.00297	0.24067	0.00430	0.00113	0.54700	0.01642	0.00017
134	76.92	88.02	LN	2003/08/19	2	O	MC 303	<0.000025	2.70000	0.00019	0.00165	<0.000125	3.80000	0.00007	0.00684	0.03254	0.25613	0.01603	0.91750	0.00150	2.10167	0.03306	0.00097	0.50125	0.21493	0.00004
135	89.00	99.73	NC	2003/08/19	2			<0.000025	3.25000	0.00023	0.00120	<0.000125	3.92500	0.00011	0.00443	0.03621	0.26388	0.01596	0.98500	0.00168	2.82500	0.04053	0.00079	0.58250	0.18764	0.00008
136				2003/08/19	2	S	XPT	<0.000025	1.14000	<0.000125	0.00150	<0.000125	2.04500	0.00032	0.00659	0.08434	3.10000	0.60500	0.22550	0.00079	1.23417	0.03496	<0.00005	0.29375	4.36250	<0.000025
137	115.18	123.41	MZN	2003/08/19	2			<0.00002	0.00403	0.00046	0.00008	<0.0001	0.60600	<0.00002	0.00330	0.00013	0.00331	0.00100	0.06580	0.00051	0.45600	0.00094	0.00010	0.16840	0.00431	0.00003
138	32.50	42.00	PGN	2003/08/19	2			<0.00002	1.89420	0.00013	0.00114	<0.0001	3.18000	0.00014	0.00211	0.03928	1.16600	0.01466	0.38400	0.00097	0.87333	0.02630	0.00017	0.35000	1.21594	<0.00002
139	65.00	75.23	PX	2003/08/19	2			<0.00002	0.00129	0.00015	0.00012	<0.0001	0.87200	<0.00002	0.01165	0.00010	0.00279	0.00193	0.31800	0.00059	0.89667	0.00320	0.00011	0.17160	0.00741	0.00004
140	100.62	108.93	PX	2003/08/19	2			<0.00002	0.00384	<0.0001	0.00010	<0.0001	0.79000	<0.00002	0.01059	0.00022	0.00712	0.00065	0.18560	0.00046	0.81000	0.00258	0.00008	0.17720	0.01087	0.00003
141	280.20	287.40	LN	2003/08/19	2			0.00004	0.00041	0.00027	0.00008	<0.0001	0.94200	<0.00002	0.00507	0.00010	0.00062	0.00048	0.52800	0.00040	0.44467	0.00099	0.00009	0.25500	0.00658	0.00004
142	162.10	172.38	DM	2003/08/19	2			<0.000025	0.00208	<0.000125	0.00018	<0.000125	0.15775	<0.000025	0.00125	<0.00005	0.00019	0.00250	0.03025	0.00009	2.84167	0.00032	0.00007	0.17275	0.00006	<0.000025

Constituents released during complete oxidation in kg/t																				
					Batch	Sample	Corresponding													
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Se	Sn	Sr	Pb	V	Zn	SO4	Initial pH	Final pH	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)
70	225.71	238.65	HF	2003/08/19	1B			0.00018	<0.0002	0.00170	<0.0002	0.00106	0.00873	3.22667	10.12000	3.76000	3.36111	6.72222	0.03863	-3.32248	-6.68359
71	246.75	257.58	NC	2003/08/19	1B			0.00026	<0.0002	0.00214	0.00024	0.00143	0.00737	6.67556	10.62000	3.97000	6.95370	13.90741	4.22784	-2.72586	-9.67957
72	277.00	286.80	FPX	2003/08/19	1B			0.00048	<0.00025	0.00263	0.00046	0.00193	0.00799	9.81111	10.56000	3.92000	10.21991	20.43981	11.16938	0.94947	-9.27044
73	287.00	300.25	PGN	2003/08/19	1B			0.00068	0.00044	0.00388	0.00083	0.00263	0.01999	13.41389	10.26000	3.73000	13.97280	27.94560	10.52303	-3.44977	-17.42257
74	321.17	332.51	MZN	2003/08/19	1B			0.00019	<0.0002	0.00128	<0.0002	0.00116	0.00178	3.68000	10.47000	4.90000	3.83333	7.66667	15.04610	11.21277	7.37943
75	309.00	317.64	HF	2003/08/19	1B			0.00008	<0.0002	0.00048	<0.0002	0.00037	0.00478	1.10000	9.55000	4.03000	1.14583	2.29167	-4.48695	-5.63278	-6.77862
76	101.66	111.24	MN	2003/08/19	1B			0.00014	<0.0002	0.00116	<0.0002	0.00101	0.00169	3.35111	10.81000	4.94000	3.49074	6.98148	9.62196	6.13122	2.64048
77	213.79	226.84	MZN	2003/08/19	1B			<0.000075	<0.00025	0.00520	0.00364	0.00040	0.02382	78.87500	9.56000	2.47000	82.16146	164.32292	-2.79121	-84.95267	-167.11413
78	276.85	286.00	MN	2003/08/19	1B			0.00116	<0.0002	0.00536	0.00162	0.00034	0.01605	28.00000	10.15000	3.16000	29.16667	58.33333	9.92308	-19.24359	-48.41026
79	289.03	300.53	SP	2003/08/19	1B			0.00106	<0.00025	0.00183	0.00204	0.00004	0.03288	36.25000	10.33000	3.09000	37.76042	75.52083	56.16696	18.40654	-19.35387
80	43.10	46.00	HF	2003/08/19	1B			0.00084	<0.0002	0.00086	<0.0002	0.00057	0.00342	5.22444	10.29000	4.36000	5.44213	10.88426	12.53220	7.09007	1.64794
81	199.04	206.00	SP	2003/08/19	1B	O	MC106	0.00014	<0.00025	0.00043	<0.00025	0.00080	0.00035	1.79250	11.32000	7.81000	1.86719	3.73438	64.65980	62.79261	60.92543
82	252.53	258.50	SP	2003/08/19	1B			0.00015	<0.00025	0.00038	<0.00025	0.00080	0.00021	1.55250	10.74000	8.07000	1.61719	3.23438	55.01526	53.39807	51.78089
83	306.58	315.00	MN	2003/08/19	1B			<0.000075	<0.00025	0.00848	0.00544	0.00027	0.04475	92.00000	8.68000	2.77000	95.83333	191.66667	29.33740	-66.49593	-162.32927
84	66.02	77.14	NC	2003/08/19	1B			0.00090	<0.00025	0.00388	0.00092	0.00137	0.01309	25.01250	10.36000	3.66000	26.05469	52.10938	20.85600	-5.19869	-31.25338
85	87.09	100.87	HF	2003/08/19	1B			0.00009	<0.0003	0.00768	0.00200	0.00026	0.02006	105.75000	9.33000	2.59000	110.15625	220.31250	-19.15470	-129.31095	-239.46720
86	125.90	136.47	HF	2003/08/19	1B			0.00072	<0.0002	0.00514	<0.0002	0.00248	0.01165	12.02000	9.76000	3.87000	12.52083	25.04167	4.06014	-8.46069	-20.98153
87	187.00	197.88	MN	2003/08/19	1B			0.00032	<0.0002	0.00272	0.00022	0.00060	0.00603	6.90000	10.48000	4.08000	7.18750	14.37500	9.66194	2.47444	-4.71306
88	256.08	267.00	MA	2003/08/19	1B			0.00017	<0.0002	0.00072	<0.0002	0.00052	0.00021	3.23000	10.53000	5.90000	3.36458	6.72917	13.29621	9.93162	6.56704
89	278.00	286.12	MA	2003/08/19	1B			0.00014	<0.0002	0.00092	<0.0002	0.00053	0.00023	3.48667	10.27000	5.74000	3.63194	7.26389	8.65447	5.02252	1.39058
90	290.00	302.00	LN	2003/08/19	1B			0.00006	<0.0002	0.00050	<0.0002	0.00068	0.00007	1.01933	10.72000	6.12000	1.06181	2.12361	12.17095	11.10914	10.04734
91	22.00	31.00	DM	2003/08/19	1B			0.00059	<0.0002	0.00190	<0.0002	0.00021	0.00362	11.00000	11.30000	7.75000	11.45833	22.91667	65.84104	54.38270	42.92437
92	50.00	61.97	MN	2003/08/19	1B			0.00076	<0.00025	0.00813	0.00028	0.00216	0.01603	37.12500	10.23000	3.31000	38.67188	77.34375	11.92245	-26.74943	-65.42130
93	113.26	123.06	HF	2003/08/19	1B			0.00067	<0.00025	0.00558	<0.00025	0.00244	0.01762	16.17500	9.55000	3.36000	16.84896	33.69792	0.48463	-16.36433	-33.21329
94	166.60	177.06	HF	2003/08/19	1B			0.00182	<0.0003	0.03120	0.00479	0.00007	0.03564	85.95000	9.15000	2.77000	89.53125	179.06250	16.85815	-72.67310	-162.20435
95	179.02	189.03	DM	2003/08/19	1B			0.00006	<0.0002	0.01112	<0.0002	0.00032	0.00036	27.00000	9.68000	5.42000	28.12500	56.25000	15.25965	-12.86536	-40.99036
96	185.52	197.07	SP	2003/08/19	1B			0.00096	<0.0003	0.00072	<0.0003	0.00074	0.00069	12.36000	10.56000	6.96000	12.87500	25.75000	86.08088	73.20588	60.33088
97	244.05	255.92	NC	2003/08/19	1B			0.00091	<0.00025	0.00440	0.00086	0.00088	0.02229	17.25000	10.39000	3.68000	17.96875	35.93750	12.56385	-5.40490	-23.37366
98	287.80	299.64	NC	2003/08/19	1B			0.00065	<0.00025	0.00285	<0.00025	0.00059	0.00424	11.88750	11.13000	4.69000	12.38281	24.76563	32.05505	19.67223	7.28942
99	336.12	347.53	FPX	2003/08/19	1B			0.00049	<0.00025	0.00228	0.00059	0.00094	0.00910	10.62083	10.53000	3.67000	11.06337	22.12674	8.15278	-2.91059	-13.97396
101				2003/08/19	2	D	MC20	<0.00002	<0.0002	0.00062	<0.0002	0.00078	0.00045	0.51200	10.67000	5.78000	0.53333	1.06667	7.26052	6.72719	6.19385
103				2003/08/19	2	D	MC41	<0.00002	<0.0002	0.00064	<0.0002	0.00041	0.00019	0.37000	10.90000	5.03000	0.38542	0.77083	10.00325	9.61783	9.23242
106				2003/08/19	2	D	MC81	0.00013	<0.0002	0.00038	<0.0002	0.00083	0.00016	2.01700	11.36000	8.69000	2.10104	4.20208	80.45674	78.35569	76.25465
108				2003/10/29	6	S	XPT	0.00363	<0.00025	0.00220	0.00481	0.00058	0.06202	26.58881	10.13000	2.88000	27.69668	55.39335	27.44215	-0.25453	-27.95121
109	65.36	77.60	PGN	2003/08/19	2			0.00202	<0.00025	0.00443	0.00113	0.00104	0.02159	21.58125	10.21000	3.70000	22.48047	44.96094	24.20650	1.72603	-20.75444
110	166.55	179.65	SP	2003/08/19	2			0.00042	<0.00025	0.00050	<0.00025	0.00069	0.00038	5.28125	10.96000	7.51000	5.50130	11.00260	60.36410	54.86280	49.36150
111	63.28	75.16	LN	2003/08/19	2			0.00006	<0.0002	0.00060	<0.0002	0.00031	0.00034	1.23500	11.02000	5.07000	1.28646	2.57292	19.24695	17.96049	16.67403
112	101.96	112.24	MN	2003/08/19	2			0.00010	<0.0002	0.00054	<0.0002	0.00073	0.00044	2.38000	10.71000	5.10000	2.47917	4.95833	18.56834	16.08917	13.61001
113	125.00	135.85	FPX	2003/08/19	2			0.00018	<0.0002	0.00044	<0.0002	0.00116	0.00068	4.02500	11.05000	5.53000	4.19271	8.38542	26.22275	22.03004	17.83733
114	267.30	277.40	MN	2003/08/19	2			0.00121	<0.00025	0.00233	0.00053	0.00135	0.01109	17.20000	10.76000	3.62000	17.91667	35.83333	14.48395	-3.43272	-21.34938
115	42.72	53.25	NC	2003/08/19	2			0.00116	<0.00025	0.00290	0.00063	0.00214	0.01890	14.80000	10.38000	3.72000	15.41667	30.83333	13.57210	-1.84457	-17.26123
116	332.97	343.08	NC	2003/08/19	2			0.00196	<0.0003	0.00330	0.00192	0.00157	0.02274	32.84250	10.74000	2.73000	34.21094	68.42188	16.06614	-18.14480	-52.35574
117	163.85	172.25	HF	2003/08/19	2			0.00014	<0.0002	0.00158	<0.0002	0.00111	0.01066	3.19000	9.94000	3.53000	3.32292	6.64583	-0.32340	-3.64632	-6.96923
118	46.14	51.98	SP	2003/08/19	2			0.00096	<0.00025	0.00085	<0.00025	0.00063	0.00182	15.77500	11.32000	5.46000	16.43229	32.86458	55.70995	39.27766	22.84537
119	157.00	162.26	MN	2003/08/19	2			0.00095	<0.00025	0.00688	0.00080	0.00077	0.01894	22.49375	10.72000	3.69000	23.43099	46.86198	17.26123	-6.16976	-29.60075
120	171.84	175.30	NC	2003/08/19	2	O	MC202	0.00088	<0.0002	0.00422	0.00045	0.00090	0.01337	16.72000	10.87000	3.89000	17.41667	34.83333	12.17385	-5.24282	-22.65948
121	226.10	232.11	MN	2003/08/19	2			0.00123	<0.00025	0.00590	0.00054	0.00130	0.01779	20.58750	10.46000	3.74000	21.44531	42.89063	9.02361	-12.42170	-33.86702
122	153.01	163.07	NC	2003/08/19	2			0.00014	<0.0002	0.00042	<0.0002	0.00098	0.00047	1.53800	10.68000	5.96000	1.60208	3.20417	7.14444	5.54236	3.94027
123	33.66	44.45	PX	2003/08/19	2			0.00074	<0.0003	0.00087	<0.0003	0.00157	0.00128	10.50000	10.37000	6.26000	10.93750	21.87500	16.16766	5.23016	-5.70734
124	53.82	64.00	SP	2003/08/19	2			0.00179	<0.00025	0.00205	0.00034	0.00056	0.02009	22.98750	10.93000	4.87000	23.94531	47.89063	58.35176	34.40644	10.46113
125	77.97	89.00	NC	2003/08/19	2			0.00019	<0.0002	0.00074	<0.0002	0.00047	0.00026	4.16500	10.54000	5.61000	4.33854	8.67708	18.99403	14.65548	10.31694
126	92.00	102.00	FPX	2003/08/19	2			0.00076	<0.00025	0.00208	<0.00025	0.00252	0.00121	20.10625	10.85000	5.49000	20.94401	41.88802	-53.82252	-74.76653	-95.71054
127	72.82	79.60	HF	2003/08/19	2			0.00006	<0.0002	0.00028	<0.0002	0.00024	0.00039	0.53800	9.04000	5.42000	0.56042	1.12083	81.61500	81.05458	80.49417
128	221.95	231.93	MZN	2003/08/19	2			0.00045	<0.0003	0.00303	<0.0003	0.00350	0.00756	12.17250	10.53000	4.44000	12.67969	25.35938	-46.39400	-59.07369	-71.75338
129	239.30	250.48	HF	2003/08/19	2			<0.00002	<0.0002	0.00022	<0.0002	0.00030	0.00020	0.58600	9.30000	5.30000	0.61042	1.22083	70.85136	70.24094	69.63053
130	132.04	142.80	FPX	2003/08/19	2			0.00024	<0.0003	0.00039	<0.0003	0.00270	0.00087	6.02250	11.08000	6.83000	6.27344	12.54688	46.63990	40.36646	34.09303
131	169.66	180.32	MN	2003/08/19	2			0.00021	<0.0002	0.00224	<0.0002	0.00159	0.00536	6.55000	10.94000	3.93000	6.82292	13.64583	7.79190	0.96898	-5.85393
132	35.82	46.49	PFPX	2003/08/19	2			0.00024	<0.0002	0.00052	<0.0002	0.00131	0.00046	4.45500	10.67000	6.87000	4.64063	9.28125	28.93510	24.29448	19.65385
133	244.04	255.02	HF	2003/08/19	2			0.00050	<0.0002	0.00474	<0.0002	0.00164	0.00182	4.61500	10.29000	5.07000	4.80729	9.61458	-1.28770	-6.09499	-10.90228
134	76.92	88.02	LN	2003/08/19	2	O	MC 303	0.00085	<0.00025	0.00790	<0.00025	0.00627	0.01746	32.37500	10.61000	3.78000	33.72396	67.44792	24.96210	-8.76186	-42.48582
135	89.00	99.73	NC	2003/08/19	2			0.00080	<0.00025	0.00745	<0.00025	0.00980	0.02508	38.18750	10.45000	3.57000	39.77865	79.55729	20.77940	-18.99925	-58.77789
136				2003/08/19	2	S	XPT	0.00220	<0.00025	0.00298	0.00312	0.00051	0.03293	30.00000	9.99000	2.94000	31.25000	62.50000	8.46301	-22.78700	-54.03700
137	115.18	123.41	MZN	2003/08/19	2			<0.00002	<0.0002	0.00032	<0.0002	0.00122	0.00032	0.77900	10.46000	6.02000	0.81146	1.62292	19.21550	18.40404	17.59258
138	32.50	42.00	PGN	2003/08/19	2			0.00128	<0.0002	0.00622	0.00055	0.00303	0.02348	24.75000	10.13000	3.78000	25.78125	51.56250	18.57090	-7.21035	-32.99160
139	65.00	75.23	PX	2003/08/19	2			0.00028	<0.0002	0.00044	<0.0002	0.00085	0.00029	4.49500	11.19000	6.34000	4.68229	9.36458	10.17304	5.49075	0.80846
140	100.62	108.93	PX	2003/08/19	2			0.00018	<0.0002	0.00052	<0.0002	0.00087	0.00054	3.78000	10.46000	6.44000	3.93750	7.87500	9.92138	5.98388	2.04638
141	280.20	287.40	LN	2003/08/19	2			0.00019	<0.0002	0.00080	<0.0002	0.00076	0.00039	3.45000	10.40000	6.33000	3.59375	7.18750	34.42180	30.82805	27.23430
142	162.10	172.38	DM	2003/08/19	2			0.00013	<0.00025	0.00038	<0.00025	0.00040	0.00073	2.90000	10.88000	10.47000	3.02083	6.04167	300.39550	297.37467	294.35383

Constituents released during complete oxidation in kg/t																								
					Batch	Sample	Corresponding																	
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na	Ni	Sb
143	216.40	218.64	QF	2003/08/19	2			0.00005	0.04704	<0.0001	0.00166	0.00002	1.28200	0.00002	0.00124	0.00327	1.00600	0.00119	0.39000	0.00023	0.15787	0.00491	0.00014	0.61500	0.05548	<0.00002
144	218.64	225.82	MN	2003/08/19	2			<0.000025	2.23750	0.00013	0.00210	<0.000125	3.52500	0.00010	0.00319	0.04964	0.50875	0.05663	0.42000	0.00070	0.99167	0.02186	<0.00005	0.46000	0.46325	0.00004
145	68.91	78.77	MN	2003/08/19	2			0.00004	0.28000	<0.000125	0.00200	<0.000125	2.00500	0.00009	0.00162	0.01327	0.66250	0.00385	0.16325	0.00065	0.89667	0.02442	0.00057	0.36500	0.25636	<0.000025
146	376.00	386.00	MZN	2003/08/19	2			<0.00003	2.47200	0.00018	0.00291	<0.00015	1.91700	0.00082	0.00369	0.11508	9.05850	1.60875	0.54600	0.00071	1.54300	0.02802	<0.00006	0.48000	1.80060	<0.00003
147	147.60	159.52	PGN	2003/08/19	2			<0.000025	0.00877	0.00024	0.00028	<0.000125	0.86500	<0.000025	0.00208	0.00012	0.00227	0.00547	0.14225	0.00018	0.55167	0.00141	0.00023	0.74875	0.00397	<0.000025
148	152.73	160.30	PFPX	2003/08/19	2	O	MC223	<0.000025	0.83000	<0.000125	0.00178	<0.000125	1.56250	0.00020	0.01259	0.05470	1.87375	0.02129	0.14150	0.00033	1.89917	0.03756	0.00012	0.81375	1.29063	<0.000025
149	298.82	305.69	MA	2003/08/19	2			<0.000025	0.01316	0.00139	0.00013	<0.000125	0.92500	<0.000025	0.00170	0.00149	0.02250	0.00406	0.15400	0.00018	0.64583	0.00615	0.00042	0.71125	0.02535	0.00006
150	166.95	177.04	PGN	2003/08/19	2			<0.000025	1.61500	<0.000125	0.00205	<0.000125	2.15750	0.00014	0.00535	0.04194	1.08750	0.00664	0.20850	0.00023	0.77750	0.01313	0.00100	0.84750	0.74325	<0.000025
151	211.37	216.55	PGN	2003/08/19	2			<0.00003	3.05400	0.00015	0.00255	<0.00015	3.66000	0.00029	0.00513	0.10776	3.99000	10.64250	0.34200	0.00177	0.89800	0.02835	<0.00006	1.14600	1.52985	0.00006
152	90.97	96.55	DM	2003/08/19	2			<0.000025	0.00268	<0.000125	0.00018	<0.000125	2.06750	<0.000025	0.00065	0.00014	0.00391	0.00534	0.00810	0.00070	2.68333	0.00037	0.00012	0.62125	0.00779	<0.000025
153	135.25	141.61	DM	2003/08/19	2			<0.000025	0.00032	<0.000125	0.00015	<0.000125	1.63750	<0.000025	0.00120	0.00006	0.00054	0.00073	0.00730	0.00060	2.49500	0.00100	0.00010	0.61500	0.00070	<0.000025
154	106.21	114.06	DM	2003/08/19	2			<0.000025	0.00035	<0.000125	0.00020	<0.000125	5.40000	<0.000025	0.00044	<0.00005	0.00014	0.00064	0.01610	0.00049	0.05675	0.00007	0.00008	0.67375	0.00007	<0.000025
155	83.37	93.77	NC	2003/08/19	2			<0.000025	0.04146	<0.000125	0.00035	<0.000125	1.25500	0.00003	0.00496	0.00317	0.37500	0.00461	0.16900	0.00070	1.25167	0.01007	0.00036	0.76250	0.12258	<0.000025
157	123.84	129.85	QF	2003/08/19	2			<0.000025	0.05471	0.00126	0.00058	<0.000125	1.19000	<0.000025	0.00110	0.00042	0.00241	0.01464	0.35250	0.00038	0.13708	0.00172	0.00050	0.73875	0.00414	0.00004
158	168.08	177.97	NC	2003/08/19	2			<0.000025	0.74750	<0.000125	0.00215	<0.000125	1.72750	0.00010	0.00612	0.02362	0.76250	0.01175	0.20250	0.00069	1.52833	0.01968	0.00033	0.85000	0.85500	<0.000025
159	202.88	209.55	PGN	2003/08/19	2			<0.000025	1.60000	<0.000125	0.00185	<0.000125	2.12500	0.00016	0.00642	0.05943	1.22650	0.01692	0.37000	0.00053	1.26833	0.01830	0.00053	0.89125	2.41500	<0.000025
160	389.05	395.26	DM	2003/08/19	2	O	MC205	<0.000025	0.00778	0.00043	0.00013	<0.000125	1.19250	<0.000025	0.00164	0.00035	0.01360	0.00152	0.03200	0.00055	2.14333	0.00113	0.00017	0.69125	0.01349	<0.000025
161	289.83	299.78	PFPX	2003/08/19	2			<0.000025	0.38750	<0.000125	0.00225	<0.000125	2.52500	0.00010	0.00778	0.01367	0.73075	0.00834	0.22475	0.00044	1.20250	0.02078	0.00027	0.82000	0.56000	<0.000025
162	68.92	75.55	PGN	2003/08/19	2			<0.000025	0.25000	0.00022	0.00143	<0.000125	1.58000	0.00010	0.00238	0.00637	0.52200	0.00896	0.21025	0.00050	1.12750	0.02269	0.00088	0.92000	0.11484	<0.000025
163	116.15	122.11	SP	2003/09/17	3			<0.00003	0.08547	<0.00015	0.00369	<0.00015	4.11000	<0.00003	0.01791	0.04310	2.21400	0.01237	0.47400	0.00078	4.72000	0.10776	<0.00006	1.04700	1.46250	<0.00003
164	85.14	90.60	PX	2003/09/17	3			<0.00002	0.00700	<0.0001	0.00018	<0.0001	0.54000	<0.00002	0.00820	0.00012	0.00421	0.01413	0.10240	0.00073	0.64333	0.00417	0.00014	0.67800	0.00594	0.00004
165	234.50	240.03	MN	2003/09/17	3			0.00003	0.03765	<0.00015	0.00093	<0.00015	5.79000	<0.00003	0.00231	0.00988	0.60300	0.00681	0.20250	0.00105	0.92600	0.02872	0.00015	1.13400	0.09191	<0.00003
166	40.02	45.45	MN	2003/09/17	3			<0.000025	0.90000	<0.000125	0.00263	<0.000125	2.09250	<0.000025	0.00943	0.02452	0.89500	0.03031	0.18350	0.00082	0.94667	0.01877	0.00015	0.96750	1.16250	<0.000025
167	282.83	288.20	LN	2003/09/17	3			<0.000025	0.16715	0.00013	0.00135	<0.000125	1.85000	<0.000025	0.00123	0.00992	0.07007	0.02014	0.36250	0.00098	0.53250	0.03170	0.00066	0.86000	0.04956	<0.000025
168	325.50	331.10	HF	2003/09/17	3			<0.00002	0.13112	0.00070	0.00074	<0.0001	1.00600	<0.00002	0.00119	0.01127	0.03781	0.01378	0.24400	0.00074	0.29800	0.01226	0.00387	0.66800	0.05213	<0.00002
169	68.90	74.84	HF	2003/09/17	3			<0.000025	0.01141	<0.000125	0.00045	<0.0001	2.80000	<0.000025	0.00229	0.00644	0.09844	0.00424	0.14350	0.00074	0.76250	0.01580	0.00018	0.86250	0.09638	<0.000025
170	132.05	142.98	FPX	2003/09/17	3			<0.000025	0.17428	<0.000125	0.00110	<0.0001	1.85500	<0.000025	0.00704	0.00702	0.32750	0.01607	0.04675	0.00054	0.93750	0.02371	0.00015	0.92000	0.12904	0.00003
171	87.38	98.05	PGN	2003/09/17	3			<0.000025	0.04143	<0.000125	0.00108	<0.0001	4.22500	<0.000025	0.00444	0.00846	0.62000	0.00374	0.22500	0.00073	0.87417	0.01554	0.00015	0.90250	0.11616	<0.000025
172	117.23	126.78	PX	2003/09/17	3			<0.000025	0.52250	<0.000125	0.00258	<0.0001	1.90500	<0.000025	0.00560	0.01577	0.47000	0.01848	0.16350	0.00076	1.22167	0.02278	0.00048	0.89750	0.41750	0.00003
173	194.13	202.34	MZN	2003/09/17	3			<0.00003	7.16232	<0.00015	0.00387	0.00004	6.87000	<0.00003	0.00419	0.04197	0.52050	6.71468	0.39000	0.00070	1.58400	0.03546	<0.00006	1.42500	0.41631	0.00028
174	211.47	215.10	DM	2003/09/17	3			<0.00003	1.66500	<0.00015	0.00375	<0.00015	9.87000	<0.00003	0.00774	0.02757	1.14600	17.58918	0.26820	0.00091	2.95100	0.04311	<0.00006	0.94800	0.37777	0.00044
175	215.23	218.50	DM	2003/09/17	3			<0.00003	1.17000	<0.00015	0.00357	<0.00015	11.79000	<0.00003	0.00623	0.01107	0.95250	15.11267	0.02387	0.00110	2.53400	0.03251	<0.00006	0.98100	0.47475	0.00038
176	60.22	62.10	QF	2003/09/17	3			<0.00002	0.04834	<0.0001	0.00032	<0.0001	1.28000	<0.00002	0.00165	0.00035	0.00249	0.02645	0.01738	0.00051	0.13993	0.00121	0.00020	0.82800	0.00267	<0.00002
177	37.04	47.71	NC	2003/09/17	3			<0.00003	1.86000	<0.00015	0.00465	0.00006	7.56000	<0.00003	0.01056	0.06042	0.61350	1.21650	0.46200	0.00137	1.55300	0.04340	0.00076	0.98100	0.78750	<0.00003
178	60.57	69.09	PX	2003/09/17	3			<0.00002	0.00779	0.00012	0.00026	<0.0001	0.50200	<0.00002	0.00899	0.00017	0.00362	0.01719	0.14220	0.00082	0.65667	0.00473	0.00014	0.68600	0.00597	0.00004
179	89.65	94.35	MA	2003/09/17	3			<0.00002	0.01263	<0.0001	0.00014	<0.0001	0.80000	<0.00002	0.00059	0.00017	0.00049	0.00364	0.15880	0.00084	0.31067	0.00072	0.00007	0.73400	0.00280	<0.00002
180	187.96	194.36	HF	2003/09/17	3			<0.00003	0.07113	<0.00015	0.00231	<0.00015	2.64600	<0.00003	0.01530	0.00700	0.19723	0.01102	0.62100	0.00102	1.77200	0.06572	0.00023	1.01100	0.13449	0.00003
181				2003/09/17	3	S	NMZ	<0.00003	6.18191	0.00021	0.00345	<0.00015	4.92000	<0.00003	0.00368	0.19655	4.41000	9.40980	0.24240	0.00108	3.40000	0.05822	<0.00006	1.34400	5.65371	<0.00003
182	221.65	230.47	HF	2003/09/17	3			<0.00003	8.65135	0.00022	0.00375	0.00008	7.71000	<0.00003	0.00296	0.03366	0.76950	6.84833	0.54300	0.00145	1.92200	0.03062	<0.00006	1.41000	0.56400	0.00037
183	123.12	131.85	PX	2003/09/17	3			<0.00003	0.02994	<0.00015	0.00045	<0.00015	2.90100	<0.00003	0.00526	0.00781	0.36300	0.00823	0.05430	0.00058	0.95900	0.02908	0.00015	1.05300	0.04511	<0.00003
184	92.85	99.33	PFPX	2003/09/17	3			<0.00003	1.66500	0.00029	0.00324	<0.00015	1.69200	<0.00003	0.00846	0.08466	2.78400	0.15267	0.35100	0.00068	1.77100	0.03079	<0.00006	1.16700	3.50330	<0.00003
185	156.98	162.65	PFPX	2003/09/17	3			<0.000025	1.82500	0.00018	0.00380	<0.000125	2.95500	<0.000025	0.01237	0.07064	3.91250	0.03446	0.22975	0.00036	2.90500	0.03758	<0.00005	1.73250	3.11080	<0.000025
186	98.75	106.66	PFPX	2003/09/17	3			<0.000025	2.30000	<0.000125	0.00445	<0.0001	4.03750	<0.000025	0.00635	0.03383	1.76000	0.03875	0.45050	0.00059	2.01750	0.03030	0.00010	2.02750	1.43125	<0.000025
187	337.41	341.65	PFPX	2003/09/17	3			<0.00003	0.12717	0.00033	0.00162	<0.00015	1.32900	0.00006	0.00355	0.00701	0.71100	0.00914	0.18660	0.00032	1.92900	0.03680	0.00075	1.00800	0.08036	0.00004
188	58.05	67.91	PX	2003/09/17	3			<0.00003	0.02257	0.00102	0.00024	<0.00015	0.61500	0.00004	0.00954	0.00033	0.01308	0.08247	0.46200	0.00027	0.59000	0.01409	0.00029	0.93300	0.01145	0.00006
189	251.69	257.50	PFPX	2003/09/25	4			<0.000025	0.06655	0.00014	0.00058	<0.000125	2.85000	<0.000025	0.00309	0.00722	0.33500	0.00397	0.14100	0.00051	0.80917	0.01862	0.00027	0.87250	0.10241	<0.000025
190	252.02	258.10	PX	2003/09/25	4			<0.000025	0.02858	0.00015	0.00015	<0.000125	0.58500	<0.000025	0.00661	0.00041	0.01390	0.01800	0.12950	0.00043	0.84167	0.00365	0.00013	0.81500	0.01749	0.00005
191	231.80	241.60	PX	2003/09/25	4			<0.000025	1.37250	<0.000125	0.00185	<0.000125	1.91250	<0.000025	0.01153	0.04455	0.83250	0.09664	0.21300	0.00073	1.15667	0.04279	0.00018	0.96750	0.70513	<0.000025
192	210.36	214.06	DM	2003/09/25	4			<0.000025	0.52750	<0.000125	0.00245	<0.000125	2.41500	<0.000025	0.01444	0.01241	0.02991	1.12000	0.08000	0.00024	0.32417	0.07780	0.00050	0.85750	0.04350	0.00010
193	179.00	183.22	QF	2003/09/25	4			<0.00002	0.08886	0.00013	0.00038	<0.0001	0.91200	<0.00002	0.00162	0.00172	0.00356	0.02209	0.20000	0.00013	0.07100	0.00181	0.00034	0.93800	0.00580	0.00004
194	477.06	480.02	Q	2003/09/25	4			<0.00002	0.09732	<0.0001	0.00110	<0.0001	0.20600	<0.00002	0.00348	0.00295	0.06637	0.06752	0.06520	0.00031	0.05873	0.00315	0.00007	0.59400	0.00539	<0.00002
195	312.04	321.94	DO	2003/09/25	4			<0.00002	0.08842	<0.0001	0.00072	<0.0001	0.56600	<0.00002	0.00064	0.00286	0.15555	0.05022	0.19080	0.00025	0.14773	0.01450	0.00040	0.78400	0.00330	<0.00002
196	407.00	411.40	Q	2003/09/25	4			<0.000025	1.01750	<0.000125	0.00228	<0.000125	0.55750	0.00017	0.00379	0.01197	0.03562	0.07106	0.26500	0.00129	0.36667	0.02191	0.00109	0.88750	0.01992	0.00003
197	184.00	187.45	DO	2003/09/25	4			<0.00002	0.09618	<0.0001	0.00088	<0.0001	0.53400	<0.00002	0.00052	0.00174	0.16083	0.06108	0.06980	0.00028	0.19687	0.01618	0.00041	0.73000	0.00105	<0.00002
198	389.49	394.12	DO	2003/09/25	4	O	MC208	<0.00002	0.07176	<0.0001	0.00074	<0.0001	0.45000	0.00003	0.00046	0.00181	0.19493	0.04771	0.09660	0.00016	0.13040	0.01330	0.00034	0.66400	0.00135	<0.00002
199	388.45	393.33	DO	2003/09/25	4			<0.000025	0.09315	<0.000125	0.00050	<0.000125	1.18250	<0.000025	0.00060	0.00114	0.15723	0.04441	0.13675	0.00043	0.24358	0.02053	0.00040	0.84250	0.00114	<0.000025
200	381.02	385.62	Q	2003/09/25	4			<0.00002	0.53400	<0.0001	0.00386	<0.0001	1.57200	<0.00002	0.00235	0.00828	0.01992	0.02007	0.34200	0.00104	0.31133	0.02172	0.00069	0.73200	0.01637	0.00002
202				2003/09/25	4	D	MC120	<0.000025	0.64500	<0.000125	0.00248	<0.000125	2.52500	<0.000025	0.00912	0.01129	0.88250	0.02429	0.22025	0.00075	0.99833	0.02638	0.00013	0.96000	0.25813	<0.000025
205				2003/09/25	4	D	MC160	<0.00002	0.00226	0.00025	0.00010	<0.0001	0.98200	<0.00002	0.00147	0.00004	0.00481	0.00091	0.01896	0.00030	1.39200	0.00084	0.00011	0.64200	0.00165	<0.00002
208				2003/09/25	4	D	MC198	<0.00002	0.07120	<0.0001	0.00078	<0.0001	0.47400	0.00004	0.00053	0.00228	0.19644	0.02916	0.07480	0.00016	0.12433	0.01251	0.00032	0.69000	0.00138	<0.00002
209	480.01	488.06	Q	2003/09/25	4			<0.000025	0.96250	<0.000125	0.00185	<0.000125	0.28250	<0.000025	0.00509	0.00970	0.03603	0.17408	0.20700	0.00115	0.43250	0.02573	0.00084	0.92750	0.00666	0.00005
210	231.90	236.05	DO	2003/09/25	4			<0.000025	0.11328	<0.000125	0.00053	<0.000125	0.52750	<0.000025	0.00062	0.00189	0.15698	0.04803	0.06075	0.00030	0.27950	0.02415	0.00031	0.84750	0.00090	<0.000025
211	183.58	190.30	PGN	2003/09/25	4			<0.00003	1.48800	0.00017	0.00186	<0.00015	2.78700	<0.000025	0.00761	0.08093	2.43000	0.07163	0.19140	0.00045	1.22800	0.03900	<0.00006	1.17600	3.30092	<0.000025
212	61.57	72.08	PX	2003/09/25	4			<0.00003	0.15645	<0.00015	0.00126	<0.00015	1.77600	<0.000025	0.00656	0.01214	0.22477	0.01532	0.15390	0.00042	0.95000	0.02629	0.00022	0.94800	0.16749	<0.000025
214	415.91	426.33	PX	2003/09/25	4			<0.00003	1.23900	0.00017	0.00213	<0.00015	0.99900	<0.000025	0.00451	0.15942	2.98950	0.34418	0.73800	0.00045	2.90300	0.06980	<0.00006	1.08300	4.05134	<0.000025
215	123.00	132.02	SP	2003/09/25	4			<0.00003	0.07827	<0.00015	0.00120	<0.00015	2.60100	<0.000025	0.00857	0.01629	0.49650	0.01400	0.14670	0.00033	1.16300	0.02774	0.00058	0.97500	0.34950	<0.000025
216	160.81	164.25	QF	2003/09/25	4	O	MC312	<0.00002	0.08250	0.00263	0.00014	<0.0001	0.80400	0.00003	0.00096	0.00051	0.00256	0.04203	0.12980	0.00010	0.05787	0.00192	0.00011	0.69600	0.00906	0.00013
217	482.96	490.07	Q	2003/09/25	4			<0.00002	0.04956	<0.0001	0.00010	<0.0001	0.90600	<0.00002	0.00195	0.00207	0.01117	0.01312	0.09740	0.00028	0.28667	0.00686	0.00016	0.68600	0.01218	<0.00002
218	349.16	359.18	AP	2003/09/25	4			<0.00002	0.08932	<0.0001	0.00090	<0.0001	1.11200	<0.00002	0.00404	0.00050	0.00327	0.05046	0.31000	0.00010	0.01005	0.00633	0.00039	0.66000	0.00077	0.00003
219	368.20	377.93	AP	2003/09/25	4			<0.00002	0.09128	<0.0001	0.00154	<0.0001	1.13000	<0.00002	0.00162	0.00080	0.00539	0.03461	0.46200	0.00012	0.01455	0.00678	0.00050	0.74800	0.00229	0.00003
220	164.35	172.29	MA	2003/09/25	4			<0.00002	0.07734	<0.0001	0.00018	<0.0001	0.68400	<0.00002	0.00182	0.00088	0.03453	0.01320	0.07980	0.00020	0.19573	0.00362	0.00008	0.62200	0.01472	0.00002

Constituents released during complete oxidation in kg/t																				
					Batch	Sample	Corresponding													
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Se	Sn	Sr	Pb	V	Zn	SO4	Initial pH	Final pH	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)
143	216.40	218.64	QF	2003/08/19	2			0.00014	<0.0002	0.00144	0.00060	0.00012	0.00881	7.08500	10.74000	3.51000	7.38021	14.76042	-4.49333	-11.87354	-19.25375
144	218.64	225.82	MN	2003/08/19	2			0.00056	<0.00025	0.00775	0.00034	0.00011	0.01389	27.87500	10.74000	3.30000	29.03646	58.07292	12.67360	-16.36286	-45.39932
145	68.91	78.77	MN	2003/08/19	2			0.00074	<0.00025	0.00470	0.00035	0.00150	0.01421	12.81250	10.69000	3.88000	13.34635	26.69271	15.51436	2.16801	-11.17835
146	376.00	386.00	MZN	2003/08/19	2			0.00189	<0.0003	0.00654	0.00732	0.00083	0.04557	54.30000	10.08000	2.64000	56.56250	113.12500	6.35200	-50.21050	-106.77300
147	147.60	159.52	PGN	2003/08/19	2			0.00010	<0.00025	0.00385	<0.00025	0.00092	0.00029	1.74000	10.71000	6.12000	1.81250	3.62500	8.79570	6.98320	5.17070
148	152.73	160.30	PFPX	2003/08/19	2	O	MC223	0.00197	<0.00025	0.00593	0.00107	0.00079	0.01905	24.74375	10.69000	3.30000	25.77474	51.54948	15.10130	-10.67344	-36.44818
149	298.82	305.69	MA	2003/08/19	2			0.00019	<0.00025	0.00543	<0.00025	0.00090	0.00062	4.33125	10.97000	5.80000	4.51172	9.02344	26.03860	21.52688	17.01516
150	166.95	177.04	PGN	2003/08/19	2			0.00122	<0.00025	0.00823	0.00059	0.00167	0.01765	21.46875	10.26000	3.68000	22.36328	44.72656	17.43160	-4.93168	-27.29496
151	211.37	216.55	PGN	2003/08/19	2			0.00013	<0.0003	0.01275	0.00347	0.00069	0.04014	65.77500	9.70000	2.53000	68.51563	137.03125	1.96340	-66.55223	-135.06785
152	90.97	96.55	DM	2003/08/19	2			0.00031	<0.00025	0.00450	<0.00025	0.00069	0.00031	9.36250	9.79000	6.63000	9.75260	19.50521	162.56774	152.81514	143.06253
153	135.25	141.61	DM	2003/08/19	2			0.00021	<0.00025	0.00338	<0.00025	0.00011	0.00016	6.63750	10.28000	7.35000	6.91406	13.82813	69.53058	62.61652	55.70246
154	106.21	114.06	DM	2003/08/19	2			0.00035	<0.00025	0.00353	<0.00025	0.00003	0.00020	6.65625	12.93000	11.64000	6.93359	13.86719	325.56420	318.63061	311.69701
155	83.37	93.77	NC	2003/08/19	2			0.00052	<0.00025	0.00498	<0.00025	0.00120	0.00564	8.59375	10.86000	4.74000	8.95182	17.90365	10.38906	1.43723	-7.51459
157	123.84	129.85	QF	2003/08/19	2			<0.000025	<0.00025	0.00355	<0.00025	0.00008	0.00125	0.81000	11.16000	4.94000	0.84375	1.68750	0.15095	-0.69280	-1.53655
158	168.08	177.97	NC	2003/08/19	2			0.00085	<0.00025	0.00563	0.00039	0.00188	0.01226	16.98125	11.09000	3.57000	17.68880	35.37760	17.17036	-0.51845	-18.20725
159	202.88	209.55	PGN	2003/08/19	2			0.00141	<0.00025	0.00705	0.00072	0.00221	0.02249	26.11875	10.63000	3.56000	27.20703	54.41406	14.81053	-12.39651	-39.60354
160	389.05	395.26	DM	2003/08/19	2	O	MC205	0.00037	<0.00025	0.00348	<0.00025	0.00033	0.00042	7.59375	11.33000	6.89000	7.91016	15.82031	46.56962	38.65946	30.74930
161	289.83	299.78	PFPX	2003/08/19	2			0.00089	<0.00025	0.00563	0.00040	0.00099	0.01545	15.65000	10.70000	3.71000	16.30208	32.60417	15.83900	-0.46309	-16.76517
162	68.92	75.55	PGN	2003/08/19	2			0.00071	<0.00025	0.00525	0.00029	0.00261	0.01659	11.59375	10.80000	3.83000	12.07682	24.15365	13.13578	1.05896	-11.01787
163	116.15	122.11	SP	2003/09/17	3			0.00268	<0.0003	0.00270	0.00210	0.00102	0.03378	39.00000	10.25000	3.74000	40.62500	81.25000	51.57287	10.94787	-29.67714
164	85.14	90.60	PX	2003/09/17	3			0.00020	<0.0002	0.00044	<0.0002	0.00096	0.00033	1.41400	10.35000	6.47000	1.47292	2.94583	24.25177	22.77885	21.30593
165	234.50	240.03	MN	2003/09/17	3			0.00061	<0.0003	0.00720	0.00055	0.00114	0.00850	19.20000	9.94000	4.61000	20.00000	40.00000	25.06559	5.06559	-14.93442
166	40.02	45.45	MN	2003/09/17	3			0.00152	<0.00025	0.00385	0.00111	0.00069	0.01276	17.47500	10.16000	3.55000	18.20313	36.40625	23.84486	5.64173	-12.56140
167	282.83	288.20	LN	2003/09/17	3			0.00031	<0.00025	0.00250	<0.00025	0.00107	0.00775	7.65000	9.87000	4.01000	7.96875	15.93750	24.01925	16.05050	8.08175
168	325.50	331.10	HF	2003/09/17	3			0.00025	<0.0002	0.00136	<0.0002	0.00160	0.00554	3.82000	9.43000	4.02000	3.97917	7.95833	18.14812	14.16895	10.18978
169	68.90	74.84	HF	2003/09/17	3			0.00051	<0.00025	0.00190	<0.00025	0.00097	0.00160	10.52500	9.89000	5.62000	10.96354	21.92708	28.14648	17.18293	6.21939
170	132.05	142.98	FPX	2003/09/17	3			0.00049	<0.00025	0.00285	0.00039	0.00119	0.00626	9.96250	10.26000	3.89000	10.37760	20.75521	22.76945	12.39185	2.01424
171	87.38	98.05	PGN	2003/09/17	3			0.00110	<0.00025	0.00235	0.00050	0.00077	0.00933	15.66250	10.25000	4.72000	16.31510	32.63021	29.83225	13.51714	-2.79796
172	117.23	126.78	PX	2003/09/17	3			0.00084	<0.00025	0.00360	0.00104	0.00081	0.01006	14.03750	10.37000	3.66000	14.62240	29.24479	32.27371	17.65131	3.02891
173	194.13	202.34	MZN	2003/09/17	3			0.00140	<0.0003	0.01236	0.00197	0.00010	0.02195	89.25000	10.12000	2.56000	92.96875	185.93750	22.18815	-70.78060	-163.74935
174	211.47	215.10	DM	2003/09/17	3			<0.00003	<0.0003	0.02361	0.00529	0.00022	0.04437	104.55000	9.94000	2.39000	108.90625	217.81250	25.12372	-83.78254	-192.68879
175	215.23	218.50	DM	2003/09/17	3			<0.00003	<0.0003	0.03420	0.00451	0.00014	0.04263	100.20000	9.95000	2.36000	104.37500	208.75000	25.96660	-78.40840	-182.78340
176	60.22	62.10	QF	2003/09/17	3			0.00007	<0.0002	0.00102	<0.0002	0.00066	0.00059	1.34500	10.07000	5.15000	1.40104	2.80208	32.09932	30.69827	29.29723
177	37.04	47.71	NC	2003/09/17	3			0.00223	<0.0003	0.00513	0.00110	0.00377	0.01924	44.85000	9.77000	2.94000	46.71875	93.43750	36.57533	-10.14343	-56.86218
178	60.57	69.09	PX	2003/09/17	3			0.00024	<0.0002	0.00058	<0.0002	0.00116	0.00036	1.62000	10.34000	6.46000	1.68750	3.37500	24.06129	22.37379	20.68629
179	89.65	94.35	MA	2003/09/17	3			<0.00002	<0.0002	0.00098	<0.0002	0.00040	0.00015	1.09500	10.20000	5.33000	1.14063	2.28125	28.32087	27.18024	26.03962
180	187.96	194.36	HF	2003/09/17	3			0.00091	<0.0003	0.00189	<0.0003	0.00151	0.00646	15.97500	10.48000	4.57000	16.64063	33.28125	33.11659	16.47597	-0.16466
181				2003/09/17	3	S	NMZ	0.00064	<0.0003	0.01299	0.00416	0.00003	0.04203	109.05000	8.00000	2.63000	113.59375	227.18750	17.42149	-96.17226	-209.76601
182	221.65	230.47	HF	2003/09/17	3			0.00263	<0.0003	0.01827	0.00190	0.00038	0.03207	104.10000	9.47000	2.67000	108.43750	216.87500	21.02555	-87.41195	-195.84945
183	123.12	131.85	PX	2003/09/17	3			0.00065	<0.0003	0.00195	0.00038	0.00083	0.00431	11.71500	10.28000	4.92000	12.20313	24.40625	28.96030	16.75717	4.55405
184	92.85	99.33	PFPX	2003/09/17	3			0.00348	<0.0003	0.00486	0.00311	0.00064	0.03024	37.80000	10.00000	3.23000	39.37500	78.75000	32.53529	-6.83971	-46.21471
185	156.98	162.65	PFPX	2003/09/17	3			0.00269	<0.00025	0.00523	0.00218	0.00059	0.02695	49.78750	10.11000	3.45000	51.86198	103.72396	26.51884	-25.34314	-77.20512
186	98.75	106.66	PFPX	2003/09/17	3			0.00123	<0.00025	0.01048	0.00119	0.00188	0.01952	37.87500	10.25000	3.44000	39.45313	78.90625	24.45522	-14.99791	-54.45103
187	337.41	341.65	PFPX	2003/09/17	3			0.00110	<0.0003	0.00252	0.00084	0.00207	0.01207	30.60000	10.82000	4.21000	31.87500	63.75000	89.31079	57.43579	25.56079
188	58.05	67.91	PX	2003/09/17	3			0.00026	<0.0003	0.00042	0.00030	0.00144	0.00119	1.90900	10.48000	6.39000	1.98854	3.97708	29.07656	27.08801	25.09947
189	251.69	257.50	PFPX	2003/09/25	4			0.00079	<0.00025	0.00198	0.00046	0.00170	0.01525	9.97500	10.20000	4.67000	10.39063	20.78125	19.89202	9.50139	-0.88924
190	252.02	258.10	PX	2003/09/25	4			0.00023	<0.00025	0.00060	<0.00025	0.00092	0.00083	2.67375	10.52000	5.95000	2.78516	5.57031	33.11659	30.33143	27.54628
191	231.80	241.60	PX	2003/09/25	4			0.00127	<0.00025	0.00430	0.00109	0.00176	0.01591	20.97500	10.17000	3.17000	21.84896	43.69792	25.06559	3.21663	-18.63233
192	210.36	214.06	DM	2003/09/25	4			<0.000025	<0.00025	0.00143	0.00058	0.00048	0.00355	17.45000	10.01000	2.49000	18.17708	36.35417	31.37269	13.19561	-4.98148
193	179.00	183.22	QF	2003/09/25	4			0.00007	<0.0002	0.00066	<0.0002	0.00041	0.00089	1.56200	10.38000	4.81000	1.62708	3.25417	12.56764	10.94055	9.31347
194	477.06	480.02	Q	2003/09/25	4			<0.00002	<0.0002	0.00044	0.00027	0.00236	0.00240	1.93000	9.51000	2.36000	2.01042	4.02083	7.77191	5.76149	3.75108
195	312.04	321.94	DO	2003/09/25	4			0.00038	<0.0002	0.00090	0.00026	0.00517	0.02648	1.44100	9.76000	4.40000	1.50104	3.00208	19.39791	17.89687	16.39583
196	407.00	411.40	Q	2003/09/25	4			0.00011	<0.00025	0.00283	<0.00025	0.00405	0.03178	7.72500	9.45000	2.98000	8.04688	16.09375	19.39791	11.35104	3.30416
197	184.00	187.45	DO	2003/09/25	4			0.00042	<0.0002	0.00108	0.00025	0.00508	0.01793	1.62000	9.78000	4.37000	1.68750	3.37500	17.82840	16.14090	14.45340
198	389.49	394.12	DO	2003/09/25	4	O	MC208	0.00035	<0.0002	0.00090	0.00031	0.00453	0.04122	1.61800	9.81000	3.78000	1.68542	3.37083	17.53775	15.85233	14.16692
199	388.45	393.33	DO	2003/09/25	4			0.00041	<0.00025	0.00120	<0.00025	0.00466	0.02137	2.87500	9.73000	4.49000	2.99479	5.98958	22.79852	19.80372	16.80893
200	381.02	385.62	Q	2003/09/25	4			0.00012	<0.0002	0.00286	<0.0002	0.00378	0.00652	7.50000	9.54000	3.56000	7.81250	15.62500	19.25259	11.44009	3.62759
202				2003/09/25	4	D	MC120	0.00118	<0.00025	0.00345	0.00101	0.00114	0.01479	15.46250	10.12000	3.92000	16.10677	32.21354	33.29775	17.19098	1.08421
205				2003/09/25	4	D	MC160	0.00042	<0.0002	0.00094	<0.0002	0.00042	0.00058	5.48000	10.50000	7.27000	5.70833	11.41667	72.01910	66.31077	60.60243
208				2003/09/25	4	D	MC198	0.00035	<0.0002	0.00088	0.00037	0.00438	0.04222	1.55600	9.75000	3.59000	1.62083	3.24167	16.57861	14.95777	13.33694
209	480.01	488.06	Q	2003/09/25	4			0.00011	<0.00025	0.00098	0.00027	0.00616	0.00363	8.98750	9.11000	2.81000	9.36198	18.72396	16.25889	6.89691	-2.46507
210	231.90	236.05	DO	2003/09/25	4			0.00038	<0.00025	0.00105	<0.00025	0.00585	0.01756	1.74250	9.77000	4.54000	1.81510	3.63021	21.46153	19.64642	17.83132
211	183.58	190.30	PGN	2003/09/25	4			0.00338	<0.0003	0.00435	0.00333	0.00068	0.03654	31.12500	9.92000	3.46000	32.42188	64.84375	29.97757	-2.44431	-34.86618
212	61.57	72.08	PX	2003/09/25	4			0.00044	<0.0003	0.00198	0.00041	0.00132	0.01186	8.43000	10.26000	4.51000	8.78125	17.56250	44.63987	35.85862	27.07737
214	415.91	426.33	PX	2003/09/25	4			0.00276	<0.0003	0.00180	0.00425	<0.00003	0.04389	38.40000	9.96000	3.06000	40.00000	80.00000	37.30195	-2.69805	-42.69805
215	123.00	132.02	SP	2003/09/25	4			0.00110	<0.0003	0.00165	0.00067	0.00162	0.01065	12.18000	10.44000	4.65000	12.68750	25.37500	47.15989	34.47239	21.78489
216	160.81	164.25	QF	2003/09/25	4	O	MC312	<0.00002	<0.0002	0.00036	<0.0002	0.00037	0.00093	0.47100	10.07000	5.04000	0.49063	0.98125	15.53227	15.04164	14.55102
217	482.96	490.07	Q	2003/09/25	4			0.00011	<0.0002	0.00114	<0.0002	0.00130	0.00115	1.99000	9.82000	4.91000	2.07292	4.14583	27.65237	25.57945	23.50654
218	349.16	359.18	AP	2003/09/25	4			<0.00002	<0.0002	0.00154	<0.0002	0.00029	0.00139	0.95600	10.06000	4.93000	0.99583	1.99167	13.67211	12.67627	11.68044
219	368.20	377.93	AP	2003/09/25	4			<0.00002	<0.0002	0.00150	<0.0002	0.00034	0.00291	1.76000	10.18000	4.54000	1.83333	3.66667	12.65483	10.82150	8.98816
220	164.35	172.29	MA	2003/09/25	4			0.00011	<0.0002	0.00098	<0.0002	0.00055	0.00162	1.31700	10.34000	5.05000	1.37188	2.74375	29.59973	28.22785	26.85598

Constituents released during complete oxidation in kg/t																								
					Batch	Sample	Corresponding																	
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na	Ni	Sb
221	254.50	261.65	AP	2003/09/25	4			<0.00002	0.08432	<0.0001	0.00168	<0.0001	1.23400	<0.00002	0.00129	0.00118	0.01270	0.04782	0.26000	0.00014	0.02927	0.00959	0.00166	0.62600	0.00327	0.00003
222	43.54	49.76	PGN	2003/09/25	4			<0.000025	0.02197	0.00025	0.00003	<0.000125	0.82250	<0.000025	0.00781	0.00016	0.00138	0.01126	0.09650	0.00023	0.53083	0.00256	0.00023	0.78500	0.00948	0.00005
223				2003/09/25		D	MC148	<0.00002	0.84767	<0.0001	0.00114	<0.00002	1.30689	<0.00002	0.00656	0.05800	1.84812	0.03503	0.19462	0.00046	1.85622	0.03803	0.00022	0.81130	3.25592	<0.00002
224				2003/09/25		S	NMZ	<0.00003	8.50665	<0.00015	0.00275	<0.00003	5.20807	<0.00003	0.00197	0.23586	5.80310	11.04069	0.27307	0.00128	3.84341	0.06644	<0.00006	1.44646	9.23427	<0.00003
225	27.32	35.15	QF	2003/09/25	5			<0.00002	0.00588	<0.0001	0.00007	<0.00002	0.45757	<0.00002	0.00258	0.00010	0.00122	0.00402	0.20031	0.00022	0.36791	0.00088	0.00052	0.68045	0.00724	0.00007
226	140.89	146.90	PFPX	2003/09/25	5			<0.00002	0.72787	<0.0001	0.00127	<0.00002	1.51294	<0.00002	0.00721	0.02667	1.41350	0.00963	0.65255	0.00086	1.42008	0.02561	0.00049	0.82246	0.76217	0.00002
227	208.28	215.92	HF	2003/09/25	5			<0.00002	0.02258	0.00017	0.00025	<0.00002	0.15795	<0.00002	0.00073	0.00412	0.00962	0.00219	0.42345	0.00108	0.36498	0.01010	0.00308	0.88646	0.04629	0.00024
228	285.68	295.96	PGN	2003/09/25	5			<0.00002	0.17521	<0.0001	0.00279	<0.00002	1.56457	0.00003	0.00925	0.00952	0.56243	0.00622	0.43076	0.00027	1.45706	0.02579	0.00152	0.77207	0.16580	0.00007
229	142.50	146.13	GN	2003/09/25	5			<0.00002	0.00375	0.00012	0.00010	<0.00002	0.52510	0.00002	0.00150	0.00008	0.00077	0.00388	0.16090	0.00026	0.27607	0.00102	0.00052	0.72627	0.00263	0.00008
230	155.17	163.06	GN	2003/09/25	5	O	MC299	<0.00002	0.00287	0.00052	0.00011	<0.00002	0.55801	0.00002	0.00535	0.00005	0.00071	0.00227	0.27928	0.00026	0.66209	0.00095	0.00065	0.75172	0.00212	0.00009
231	163.11	168.06	GN	2003/09/25	5			<0.00002	0.00979	0.00224	0.00004	<0.00002	0.45489	0.00004	0.00469	0.00033	0.00419	0.01038	0.23358	0.00022	0.58866	0.00116	0.00056	0.76479	0.00825	0.00010
232	179.25	182.84	GN	2003/09/25	5			<0.00002	0.00355	<0.0001	0.00005	<0.00002	0.40221	<0.00002	0.00868	0.00009	0.00069	0.00221	0.15812	0.00018	0.84885	0.00076	0.00057	0.71618	0.00199	0.00009
233	187.62	194.80	GN	2003/09/25	5			<0.00002	0.00386	<0.0001	0.00008	<0.00002	0.45880	0.00002	0.00425	0.00005	0.00047	0.00206	0.14025	0.00017	0.44955	0.00102	0.00053	0.67019	0.00292	0.00008
234						S	XPT	<0.00002	0.95005	<0.0001	0.00111	<0.00002	2.00946	<0.00002	0.00336	0.08679	3.42737	0.97516	0.20344	0.00031	1.21297	0.03771	0.00012	0.79311	4.32669	<0.00002
235	196.08	207.05	GN	2003/09/25	5			<0.00002	0.05415	<0.0001	0.00011	<0.00002	0.77592	0.00002	0.00296	0.00004	0.00181	0.01388	0.19135	0.00005	0.07661	0.00137	0.00042	0.83388	0.00237	0.00007
236	208.00	218.20	GN	2003/09/25	5			<0.000025	0.06630	<0.000125	0.00168	<0.000025	0.47451	<0.000025	0.00495	0.04507	0.48114	0.00510	0.38913	0.00059	4.31342	0.08786	0.00197	0.86956	0.38574	0.00008
237	218.20	225.73	GN	2003/09/25	5			<0.00002	0.00377	<0.0001	0.00006	<0.00002	0.38500	0.00002	0.00436	0.00005	0.00056	0.00266	0.31254	0.00029	0.54262	0.00076	0.00052	0.75155	0.00412	0.00008
238	78.00	84.17	SP	2003/09/25	5			0.00002	0.01266	<0.0001	0.00006	<0.00002	0.41482	<0.00002	0.00231	0.00007	0.00159	0.00411	0.22052	0.00020	0.40776	0.00068	0.00048	0.74695	0.00612	0.00007
239	59.59	65.60	GN	2003/09/25	5			<0.00002	0.01206	<0.0001	0.00003	<0.00002	0.38016	<0.00002	0.00223	0.00026	0.00143	0.00407	0.14307	0.00028	0.41727	0.00118	0.00048	0.66840	0.00829	0.00007
240	74.14	82.24	GN	2003/09/25	5	O	MC307	<0.00002	0.00358	<0.0001	0.00000	<0.00002	0.39427	<0.00002	0.00186	<0.00004	0.00066	0.00229	0.19426	0.00028	0.36924	0.00076	0.00049	0.72775	0.00309	0.00007
241	90.08	95.71	GN	2003/09/25	5			<0.00002	0.01326	<0.0001	0.00003	<0.00002	0.52828	<0.00002	0.00136	0.00050	0.01067	0.00511	0.14252	0.00019	0.22415	0.00115	0.00048	0.73705	0.02066	0.00006
242	10.49	16.98	GN	2003/09/25	5			<0.000025	0.00648	<0.000125	0.00016	<0.000025	0.82326	<0.000025	0.00759	0.00015	0.00168	0.00423	0.12040	0.00025	0.59049	0.00848	0.00050	0.85610	0.00188	0.00010
243						S	XPT	<0.00002	0.94924	<0.0001	0.00105	<0.00002	2.03059	<0.00002	0.00288	0.09585	3.08961	1.00173	0.19705	0.00033	1.23465	0.04061	0.00012	0.80327	4.55727	<0.00002
244	7.20	12.41	GN	2003/09/25	5			0.00002	0.07094	<0.0001	0.00020	<0.00002	0.25443	0.00002	0.00254	0.00026	0.00175	0.02109	0.10062	0.00033	0.21822	0.00981	0.00040	0.78475	0.00344	0.00006
245	4.03	5.64	GN	2003/09/25	5			0.00004	0.00969	<0.0001	0.00016	<0.00002	0.53218	0.00002	0.00325	0.00009	0.00145	0.00423	0.14171	0.00023	0.41241	0.00846	0.00042	0.71595	0.00193	0.00007
247	70.89	81.11	MA	2003/09/25	5			<0.00002	0.00344	<0.0001	0.00006	<0.00002	0.76449	0.00002	0.00103	0.00015	0.00133	0.00224	0.18742	0.00019	0.14685	0.00098	0.00053	0.76810	0.00257	0.00008
248	203.32	207.44	LN	2003/09/25	5			<0.00002	0.00270	0.00017	0.00006	<0.00002	0.45471	0.00002	0.00872	0.00007	0.00273	0.00467	0.13213	0.00020	0.64910	0.00120	0.00045	0.69091	0.01096	0.00009
249	30.65	33.31	MA	2003/09/25	5			<0.00002	0.00459	<0.0001	0.00006	<0.00002	0.37706	<0.00002	0.00184	0.00009	0.00241	0.00263	0.22972	0.00018	0.31343	0.00069	0.00046	0.78114	0.00489	0.00007
250	316.64	323.30	PFPX	2003/09/25	5			<0.00002	0.38476	<0.0001	0.00227	<0.00002	1.85059	0.00002	0.01380	0.01111	0.65010	0.01065	0.24152	0.00065	2.67888	0.03788	0.00131	0.74991	0.18403	0.00009
251	138.93	144.28	PX	2003/09/25	5			<0.00003	0.62790	0.00046	0.00218	<0.00003	9.16700	<0.00003	0.01130	0.03193	0.28559	2.82446	0.07921	0.00029	0.79169	0.13418	0.00058	1.04918	0.15430	0.00018
252	10.84	12.83	PX	2003/09/25	5			<0.000025	0.02917	<0.000125	0.00032	<0.000025	0.89402	<0.000025	0.01349	0.00412	0.26918	0.01019	0.17339	0.00036	1.45822	0.01474	0.00056	0.88323	0.16419	0.00010
253	150.87	155.86	PX	2003/09/25	5			<0.00003	2.32391	<0.00015	0.00218	<0.00003	1.67881	<0.00003	0.01088	0.10237	3.28220	0.92936	0.28459	0.00059	1.66177	0.03792	0.00023	1.22008	3.20430	<0.00003
254	133.37	145.07	PGN	2003/09/25	5			<0.00003	4.03095	<0.00015	0.00228	<0.00003	3.03656	<0.00003	0.00354	0.16810	2.05835	6.73568	0.28132	0.00034	1.07184	0.03646	<0.00006	1.39901	2.99385	<0.00003
255	455.69	463.00	LN	2003/09/25	5			<0.00003	3.74201	<0.00015	0.00197	<0.00003	3.60599	<0.00003	0.00089	0.25018	6.99631	3.83884	0.26387	0.00094	1.39705	0.03937	<0.00006	1.34708	6.72789	<0.00003
256	79.67	87.27	HF	2003/09/25	5			<0.00002	1.25037	0.00040	0.00115	0.00015	0.78849	<0.00002	0.00147	0.03094	0.07039	0.05866	1.23910	0.00285	0.71047	0.04608	0.00039	1.08143	0.14472	0.00006
257	55.38	60.40	QF	2003/09/25	5			<0.00002	0.08727	0.00011	0.00031	<0.00002	0.45831	0.00003	0.00211	0.00076	0.00519	0.03141	0.33742	0.00007	0.10849	0.00359	0.00047	0.84352	0.01193	0.00009
258	118.00	121.88	PGN	2003/09/25	5			<0.00002	1.16691	<0.0001	0.00234	<0.00002	1.51254	<0.00002	0.00666	0.07176	0.84752	0.47035	0.34442	0.00049	1.74296	0.04191	0.00016	0.90686	0.89151	<0.00002
259						S	XPT	<0.00002	0.98009	<0.0001	0.00101	<0.00002	2.05374	<0.00002	0.00472	0.10712	3.14971	1.48428	0.20432	0.00033	1.22468	0.04654	0.00004	0.81222	4.40542	<0.00002
260	145.68	153.02	LN	2003/09/25	5			0.00134	4.16960	<0.0001	0.00112	<0.00002	4.13952	<0.00002	0.00187	0.13618	1.39312	1.04983	0.64373	0.00072	2.70172	0.06005	<0.00004	1.23968	3.01162	<0.00002
261	99.00	104.00	PX	2003/09/25	5			<0.00002	0.01038	<0.0001	0.00006	<0.00002	0.34599	0.00003	0.02636	0.00031	0.00483	0.00322	0.15509	0.00021	1.22024	0.00094	0.00059	0.71816	0.01010	0.00013
262	407.87	417.88	PFPX	2003/09/25	5			<0.00003	2.66526	<0.00015	0.00181	<0.00003	1.67096	<0.00003	0.00431	0.23471	3.25864	16.44146	0.22963	0.00066	2.85706	0.06543	<0.00006	1.16309	6.17232	<0.00003
264	24.01	34.14	MN	2003/09/25	5	O	MC313	0.00004	0.02047	<0.0001	0.00048	<0.00002	1.10345	<0.00002	0.00750	0.02374	0.20099	0.00324	0.17315	0.00046	0.73574	0.04481	0.00107	0.78418	0.31745	0.00006
266	21.48	29.48	MN	2003/09/25	5			0.00003	0.00317	0.00124	0.00032	<0.00002	2.97650	<0.00002	0.00708	0.00219	0.00921	0.00191	0.09539	0.00042	0.82493	0.01384	0.00048	0.69431	0.10572	0.00009
267	4.41	8.15	NC	2003/09/25	5			<0.00002	0.01204	0.00154	0.00012	<0.00002	0.20817	<0.00002	0.00237	0.00176	0.00557	0.01045	0.19279	0.00012	0.30542	0.00727	0.00062	0.71472	0.10312	0.00007
268	9.66	14.26	NC	2003/09/25	5			<0.00002	0.17596	<0.0001	0.00074	<0.00002	0.71149	<0.00002	0.00622	0.05109	0.94615	0.00258	0.18915	0.00015	0.52570	0.02437	0.00052	0.76300	2.56850	<0.00002
269						S	NMZ	<0.00003	6.41467	<0.00015	0.00299	<0.00003	4.28375	<0.00003	0.00391	0.24724	4.05814	10.82505	0.23644	0.00109	3.16931	0.07038	<0.00006	1.39203	6.63472	<0.00003
271	8.00	16.80	GN	2003/09/25	5			<0.00002	0.01854	<0.0001	0.00009	<0.00002	0.37106	0.00002	0.00311	0.00066	0.00369	0.01115	0.11328	0.00020	0.30690	0.00370	0.00042	0.68453	0.02918	0.00008
272	20.30	24.50	GN	2003/09/25	5			<0.00002	0.00180	<0.0001	0.00012	<0.00002	0.70440	<0.00002	0.00655	0.00042	0.00208	0.00243	0.12777	0.00036	0.68037	0.00320	0.00042	0.66788	0.03948	0.00008
273	15.39	17.64	FPX	2003/09/25	5			<0.00002	1.07562	<0.0001	0.00107	<0.00002	1.44182	<0.00002	0.01210	0.05759	1.21053	0.04384	0.13582	0.00049	1.24957	0.06785	0.00053	0.77215	1.11049	<0.00002
274	9.50	13.25	GN	2003/09/25	5			<0.00002	0.01779	<0.0001	0.00031	<0.00002	0.64463	<0.00002	0.00262	0.00012	0.00392	0.00893	0.11217	0.00021	0.33471	0.01021	0.00041	0.60575	0.00286	0.00006
282				2003/10/29	6	M		<0.00003	0.47348	<0.00015	0.00171	<0.00003	1.13798	<0.00003	0.00672	0.06906	0.53517	47.50211	0.03271	0.00008	0.64409	0.21796	<0.00006	1.03268	2.91095	0.00081
283				2003/10/29	6	M		<0.00003	0.41966	<0.00015	0.00174	<0.00003	1.27343	<0.00003	0.00759	0.06920	0.58017	43.80736	0.04432	0.00011	0.49920	0.21962	<0.00006	1.07457	2.53628	0.00078
284				2003/10/29	6	M		<0.000025	0.30996	<0.000125	0.00187	<0.000025	2.18512	<0.000025	0.02208	0.06540	0.38850	0.88502	0.08272	0.00017	0.63381	0.17047	0.00146	0.86462	1.03366	<0.000025
285				2003/10/29	6	M		<0.00002	0.74447	<0.0001	0.00294	<0.00002	2.83607	<0.00002	0.00810	0.05462	0.86981	1.51310	0.09250	0.00027	1.52001	0.09706	0.00008	0.78749	1.01731	0.00003
286				2003/10/29	6	M		<0.00002	0.00113	0.00039	0.00055	<0.00002	0.98938	0.00002	0.01023	0.00034	0.00066	0.00294	0.08414	0.00007	0.39474	0.00606	0.00071	0.64338	0.02664	0.00012
287				2003/10/29	6	M		<0.00003	1.74546	<0.00015	0.00304	<0.00003	3.14177	<0.00003	0.00624	0.10050	1.08243	3.93100	0.08062	0.00028	2.21211	0.10952	<0.00006	1.12105	2.31482	<0.00003
299				2003/10/29	6	D	MC230	<0.000025	0.01946	0.00084	0.00007	<0.000025	0.79364	0.00003	0.00563	0.00042	0.01142	0.01078	0.22909	0.00032	0.68731	0.00390	0.00089	0.90300	0.01973	0.00011
300				2003/10/29	6	S	NMZ	<0.00003	6.23665	<0.00015	0.00296	<0.00003	4.27142	<0.00003	0.00441	0.26690	4.19720	10.92522	0.23527	0.00113	3.17923	0.07390	<0.00006	1.38435	6.62572	<0.00003
301				2003/10/29	6	D	MC16	<0.000025	0.10286	0.00019	0.00038	<0.000025	2.99851	0.00004	0.00750	0.00772	0.44310	0.00530	0.15576	0.00045	1.16028	0.03283	0.00080	0.91352	0.12690	0.00008
302				2003/10/29	6	D	MC66	<0.000025	0.82231	<0.000125	0.00328	<0.000025	0.85296	<0.000025	0.02776	0.12432	1.52433	0.26644	0.19645	0.00038	4.85363	0.13078	0.00024	0.85748	1.82316	<0.000025
303				2003/10/29	6	D	MC134	<0.00002	1.95258	<0.0001	0.00204	<0.00002	3.89044	<0.00002	0.01473	0.05134	0.36519	1.53668	1.06816	0.00114	2.58846	0.06007	0.00012	1.04000	0.29552	0.00019
307				2003/10/29	6	D	MC240	0.00002	0.04805	<0.0001	0.00006	<0.00002	0.50035	<0.00002	0.00204	0.00051	0.01287	0.01878	0.18143	0.00027	0.32623	0.00374	0.00052	0.69318	0.02063	0.00008
312				2003/10/29	6	D	MC216	<0.00002	0.09043	0.00377	0.00015	<0.00002	1.02795	0.00005	0.00147	0.00064	0.00529	0.05968	0.16422	0.00007	0.08266	0.00428	0.00043	0.79133	0.01284	0.00021
313				2003/10/29	6	D	MC264	<0.00002	0.12685	<0.0001	0.00042	<0.00002	1.01675	<0.00002	0.00540	0.01450	0.22729	0.00340	0.17429	0.00039	0.60748	0.03800	0.00079	0.74402	0.22131	0.00006

Constituents released during complete oxidation in kg/t																				
					Batch	Sample	Corresponding													
Samples	From Depth	To Depth	Lithology	Date	No	Type	Sample No.	Se	Sn	Sr	Pb	V	Zn	SO4	Initial pH	Final pH	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)
221	254.50	261.65	AP	2003/09/25	4			<0.00002	<0.0002	0.00094	<0.0002	0.00027	0.00571	2.19000	10.17000	3.90000	2.28125	4.56250	12.24792	9.96667	7.68542
222	43.54	49.76	PGN	2003/09/25	4			0.00019	<0.00025	0.00063	<0.00025	0.00172	0.00035	2.12750	10.16000	6.17000	2.21615	4.43229	42.31467	40.09852	37.88238
223				2003/09/25		D	MC148	0.00272	<0.0002	0.00262	0.00165	<0.00002	0.02985	23.89166	10.67000	3.54000	24.88715	49.77430	27.99438	3.10723	-21.77992
224				2003/09/25		S	NMZ	0.00031	<0.0003	0.01440	0.00438	0.00048	0.06387	100.05679	10.90000	2.77000	104.22582	208.45165	10.66965	-93.55617	-197.78200
225	27.32	35.15	QF	2003/09/25	5			0.00012	<0.0002	0.00037	<0.0002	0.00124	0.00044	0.81764	11.36000	6.52000	0.85171	1.70342	27.91396	27.06225	26.21054
226	140.89	146.90	PFPX	2003/09/25	5			0.00214	<0.0002	0.00416	0.00152	0.00193	0.03399	18.01605	10.21000	4.09000	18.76672	37.53343	30.91442	12.14770	-6.61901
227	208.28	215.92	HF	2003/09/25	5			0.00038	<0.0002	0.00105	<0.0002	0.00089	0.00184	3.37941	10.96000	5.65000	3.52022	7.04044	16.78883	13.26861	9.74839
228	285.68	295.96	PGN	2003/09/25	5			0.00129	<0.0002	0.00231	0.00082	0.00492	0.01913	11.93681	11.02000	4.68000	12.43418	24.86836	33.53027	21.09609	8.66191
229	142.50	146.13	GN	2003/09/25	5			0.00012	<0.0002	0.00042	<0.0002	0.00106	0.00057	0.45932	10.71000	6.58000	0.47846	0.95692	28.67642	28.19795	27.71949
230	155.17	163.06	GN	2003/09/25	5	O	MC299	0.00017	<0.0002	0.00037	<0.0002	0.00230	0.00090	1.16373	11.05000	6.98000	1.21222	2.42444	35.47763	34.26540	33.05318
231	163.11	168.06	GN	2003/09/25	5			0.00011	<0.0002	0.00036	<0.0002	0.00210	0.00060	0.92262	10.76000	6.74000	0.96107	1.92213	35.36137	34.40030	33.43923
232	179.25	182.84	GN	2003/09/25	5			0.00021	<0.0002	0.00033	<0.0002	0.00242	0.00039	0.68976	10.38000	6.90000	0.71850	1.43699	38.58758	37.86908	37.15059
233	187.62	194.80	GN	2003/09/25	5			0.00012	<0.0002	0.00033	<0.0002	0.00132	0.00045	0.44903	10.74000	6.62000	0.46774	0.93548	28.78591	28.31816	27.85042
234						S	XPT	0.00304	<0.0002	0.00288	0.00360	<0.00002	0.05816	28.84359	9.94000	3.36000	30.04541	60.09082	27.79093	-2.25448	-32.29989
235	196.08	207.05	GN	2003/09/25	5			0.00006	<0.0002	0.00080	<0.0002	0.00029	0.00062	0.38436	11.32000	5.28000	0.40038	0.80076	16.51371	16.11333	15.71295
236	208.00	218.20	GN	2003/09/25	5			0.00169	<0.00025	0.00162	0.00068	0.00263	0.03182	21.11386	10.72000	4.45000	21.99361	43.98722	136.86225	114.86864	92.87503
237	218.20	225.73	GN	2003/09/25	5			0.00011	<0.0002	0.00035	<0.0002	0.00158	0.00054	0.84679	10.87000	6.50000	0.88207	1.76414	31.07527	30.19320	29.31113
238	78.00	84.17	SP	2003/09/25	5			0.00010	<0.0002	0.00039	<0.0002	0.00116	0.00043	1.00163	10.46000	6.43000	1.04336	2.08672	30.01341	28.97005	27.92669
239	59.59	65.60	GN	2003/09/25	5			0.00007	<0.0002	0.00030	<0.0002	0.00121	0.00034	1.30659	10.68000	6.16000	1.36103	2.72206	-55.45124	-56.81226	-58.17329
240	74.14	82.24	GN	2003/09/25	5	O	MC307	0.00007	<0.0002	0.00037	<0.0002	0.00113	0.00043	0.38983	10.37000	6.56000	0.40607	0.81215	29.69369	29.28762	28.88154
241	90.08	95.71	GN	2003/09/25	5			<0.00006	<0.0002	0.00050	<0.0002	0.00073	0.00070	0.65910	10.93000	6.46000	0.68656	1.37312	22.99520	22.30864	21.62208
242	10.49	16.98	GN	2003/09/25	5			0.00013	<0.00025	0.00122	<0.00025	0.00167	0.00054	0.21877	10.54000	6.23000	0.22789	0.45577	40.47681	40.24892	40.02103
243						S	XPT	0.00323	<0.0002	0.00290	0.00323	<0.00002	0.06205	30.43188	10.85000	3.46000	31.69987	63.39974	28.51755	-3.18232	-34.88219
244	7.20	12.41	GN	2003/09/25	5			0.00007	<0.0002	0.00086	<0.0002	0.00099	0.00062	0.35545	9.04000	4.63000	0.37026	0.74052	20.90252	20.53226	20.16200
245	4.03	5.64	GN	2003/09/25	5			0.00010	<0.0002	0.00092	<0.0002	0.00155	0.00027	0.23130	10.53000	5.94000	0.24094	0.48188	26.92575	26.68481	26.44387
247	70.89	81.11	MA	2003/09/25	5			0.00007	<0.0002	0.00055	<0.0002	0.00113	0.00048	0.52079	11.08000	6.53000	0.54249	1.08498	23.98341	23.44092	22.89843
248	203.32	207.44	LN	2003/09/25	5			0.00030	<0.0002	0.00031	0.00020	0.00097	0.00067	2.44709	10.94000	6.94000	2.54906	5.09811	31.08881	28.53975	25.99070
249	30.65	33.31	MA	2003/09/25	5			0.00006	<0.0002	0.00037	<0.0002	0.00127	0.00045	0.31896	10.67000	6.64000	0.33225	0.66449	29.69369	29.36144	29.02920
250	316.64	323.30	PFPX	2003/09/25	5			0.00147	<0.0002	0.00286	0.00076	0.00435	0.01777	17.68820	10.29000	4.29000	18.42521	36.85042	19.94139	1.51618	-16.90903
251	138.93	144.28	PX	2003/09/25	5			<0.00009	<0.0003	0.00231	0.00094	0.00022	0.02646	39.97102	10.61000	2.68000	41.63648	83.27296	45.57672	3.94024	-37.69624
252	10.84	12.83	PX	2003/09/25	5			0.00116	<0.00025	0.00124	0.00050	0.00155	0.04298	8.74170	10.45000	5.31000	9.10594	18.21188	27.23869	18.13275	9.02681
253	150.87	155.86	PX	2003/09/25	5			0.00179	<0.0003	0.00512	0.00425	0.00027	0.04722	40.07547	9.99000	2.79000	41.74528	83.49057	22.12325	-19.62203	-61.36732
254	133.37	145.07	PGN	2003/09/25	5			<0.00009	<0.0003	0.00887	0.00340	0.00075	0.04676	56.47363	10.46000	2.71000	58.82670	117.65339	27.52059	-31.30611	-90.13281
255	455.69	463.00	LN	2003/09/25	5			0.00245	<0.0003	0.01298	0.00734	0.00013	0.13182	64.50136	10.13000	2.97000	67.18891	134.37783	38.44027	-28.74864	-95.93756
256	79.67	87.27	HF	2003/09/25	5			0.00154	<0.0002	0.00690	0.00022	0.00008	0.01923	12.75148	11.19000	4.00000	13.28279	26.56558	23.66171	10.37892	-2.90387
257	55.38	60.40	QF	2003/09/25	5			0.00014	<0.0002	0.00109	<0.0002	0.00018	0.00285	1.37464	10.46000	4.36000	1.43191	2.86382	10.26473	8.83282	7.40091
258	118.00	121.88	PGN	2003/09/25	5			0.00109	<0.0002	0.00330	0.00117	<0.00002	0.03150	21.38072	10.40000	3.78000	22.27158	44.54316	25.71179	3.44020	-18.83138
259						S	XPT	0.00344	<0.0002	0.00289	0.00407	0.00003	0.07062	31.29123	10.88000	3.42000	32.59503	65.19006	32.70291	0.10788	-32.48715
260	145.68	153.02	LN	2003/09/25	5			0.00210	<0.0002	0.01137	0.00166	0.00004	0.03709	51.50696	10.74000	3.55000	53.65309	107.30617	57.77527	4.12218	-49.53091
261	99.00	104.00	PX	2003/09/25	5			0.00058	<0.0002	0.00024	<0.0002	0.00281	0.00149	2.72735	10.74000	7.81000	2.84098	5.68197	32.55759	29.71660	26.87562
262	407.87	417.88	PFPX	2003/09/25	5			<0.00009	<0.0003	0.00465	0.00602	0.00077	0.06841	76.96823	10.69000	2.49000	80.17523	160.35047	32.78135	-47.39388	-127.56912
264	24.01	34.14	MN	2003/09/25	5	O	MC313	0.00081	<0.0002	0.00270	0.00035	0.00403	0.00675	7.29465	10.71000	5.55000	7.59860	15.19720	29.96120	22.36260	14.76400
266	21.48	29.48	MN	2003/09/25	5			0.00089	<0.0002	0.00249	<0.0002	0.00160	0.00101	9.21474	10.71000	6.08000	9.59868	19.19737	42.77294	33.17426	23.57557
267	4.41	8.15	NC	2003/09/25	5			0.00044	<0.0002	0.00076	0.00021	0.00334	0.00046	1.06644	10.26000	6.42000	1.11087	2.22174	22.00699	20.89612	19.78525
268	9.66	14.26	NC	2003/09/25	5			0.00226	<0.0002	0.00272	0.00121	0.00250	0.02756	10.22860	9.70000	3.85000	10.65479	21.30959	21.14181	10.48702	-0.16778
269						S	NMZ	<0.00009	<0.0003	0.01188	0.00503	0.00105	0.07235	96.39212	9.79000	2.52000	100.40845	200.81691	41.14133	-59.26712	-159.67558
271	8.00	16.80	GN	2003/09/25	5			0.00017	<0.0002	0.00091	<0.0002	0.00120	0.00061	1.07192	9.79000	6.32000	1.11658	2.23317	28.79268	27.67609	26.55951
272	20.30	24.50	GN	2003/09/25	5			0.00036	<0.0002	0.00127	<0.0002	0.00159	0.00048	2.27097	10.86000	6.75000	2.36559	4.73118	67.25921	64.89362	62.52803
273	15.39	17.64	FPX	2003/09/25	5			0.00128	<0.0002	0.00383	0.00171	0.00257	0.03667	18.10609	11.16000	3.54000	18.86051	37.72102	28.91571	10.05519	-8.80532
274	9.50	13.25	GN	2003/09/25	5			0.00008	<0.0002	0.00104	<0.0002	0.00118	0.00048	0.24180	11.09000	6.09000	0.25188	0.50375	63.42263	63.17075	62.91888
282				2003/10/29	6	M		<0.00009	<0.0003	0.00260	0.00557	0.00154	0.03546	108.15330	10.31000	2.37000	112.65969	225.31937	18.53075	-94.12894	-206.78863
283				2003/10/29	6	M		<0.00009	<0.0003	0.00241	0.00530	0.00144	0.03596	102.33000	10.90000	2.22000	106.59375	213.18749	26.09442	-80.49933	-187.09308
284				2003/10/29	6	M		0.00140	<0.00025	0.00517	0.00124	0.00403	0.03409	15.89239	11.36000	2.77000	16.55457	33.10915	20.97898	4.42440	-12.13017
285				2003/10/29	6	M		0.00145	<0.0002	0.00513	0.00143	0.00004	0.06149	23.47273	10.21000	3.76000	24.45076	48.90151	38.97220	14.52144	-9.92932
286				2003/10/29	6	M		0.00049	<0.0002	0.00182	<0.0002	0.00278	0.00079	2.30065	10.96000	7.52000	2.39651	4.79301	38.46455	36.06804	33.67154
287				2003/10/29	6	M		0.00161	<0.0003	0.00558	0.00410	0.00106	0.06932	42.57515	11.02000	2.62000	44.34912	88.69823	50.69216	6.34304	-38.00607
299				2003/10/29	6	D	MC230	0.00025	<0.00025	0.00054	0.00027	0.00273	0.00112	1.82255	10.37000	6.23000	1.89849	3.79698	47.73430	45.83581	43.93732
300				2003/10/29	6	S	NMZ	<0.00009	<0.0003	0.01191	0.00542	0.00120	0.07883	100.08420	10.93000	2.50000	104.25438	208.50875	39.46432	-64.79006	-169.04444
301				2003/10/29	6	D	MC16	0.00132	<0.00025	0.00255	0.00053	0.00360	0.01797	13.10016	10.54000	4.61000	13.64600	27.29200	46.31012	32.66411	19.01811
302				2003/10/29	6	D	MC66	0.00204	<0.00025	0.00166	0.00270	0.00123	0.05497	32.94995	10.45000	3.19000	34.32286	68.64573	85.40931	51.08645	16.76358
303				2003/10/29	6	D	MC134	0.00093	<0.0002	0.00773	0.00048	0.00005	0.03136	34.22491	9.04000	3.92000	35.65095	71.30190	48.77301	13.12206	-22.52889
307				2003/10/29	6	D	MC240	0.00011	<0.0002	0.00060	<0.0002	0.00117	0.00075	0.57293	10.94000	5.37000	0.59680	1.19360	32.22912	31.63232	31.03552
312				2003/10/29	6	D	MC216	0.00007	<0.0002	0.00051	<0.0002	0.00019	0.00146	1.01637	9.99000	4.90000	1.05872	2.11743	14.74751	13.68879	12.63008
313				2003/10/29	6	D	MC264	0.00055	<0.0002	0.00263	0.00033	0.00272	0.00951	6.08110	10.46000	4.39000	6.33447	12.66895	33.65330	27.31883	20.98435

APPENDIX 11:

The Kinetic Test Results Provided by The Institute for Groundwater Studies

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 02	GN	24-Feb-04	6.91	2.97	1.89	0.24	3.25	0.62	11.10	1.61	0.19	0.79	0.0077	0.1320	0.0425	0.0018	0.0099	0.0099	458.11	0.86	0.11	1.49	0.28	0.74	0.09
MC 02	GN	02-Mar-04	6.58	6.6	4.59	0.41	5.12	1.30	19.90	2.37	0.18	4.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	455.43	2.10	0.19	2.34	0.59	1.08	0.08
MC 02	GN	09-Mar-04	7.21	3.1	4.61	1.07	3.11	0.86	17.00	1.81	0.06	3.67	0.0075	0.4191	0.0866	0.0023	0.0106	0.0106	426.08	2.11	0.49	1.42	0.39	0.83	0.03
MC 02	GN	16-Mar-04	6.73	2.4	3.43	0.61	1.95	0.62	11.00	1.17	0.06	1.96	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	445.06	1.57	0.28	0.89	0.28	0.54	0.03
MC 02	GN	23-Mar-04	5.96	1.41	2.65	0.63	2.14	0.69	8.10	2.19	0.05	2.25	0.0169	0.1096	0.0407	0.0015	0.0093	0.0093	461.93	1.21	0.29	0.98	0.31	1.00	0.02
MC 02	GN	30-Mar-04	5.64	1.2	1.76	0.68	1.30	0.43	3.10	2.47	0.05	2.73	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	444.67	0.80	0.31	0.59	0.20	1.13	0.02
MC 02	GN	06-Apr-04	6.21	2.46	1.40	0.18	1.59	0.58	5.87	1.50	0.00	0.90	0.0200	0.0553	0.0307	0.0013	0.0140	0.0140	430.02	0.64	0.08	0.73	0.27	0.69	0.00
MC 02	GN	13-Apr-04	6.69	2.13	1.14	0.21	2.03	0.47	6.90	1.50	0.00	0.28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	443.75	0.52	0.09	0.93	0.22	0.69	0.00
MC 02	GN	20-Apr-04	5.8	1.3	0.73	0.11	1.41	0.41	5.78	0.42	0.01	0.29	0.0112	0.1627	0.0828	0.0019	0.0094	0.0094	455.57	0.33	0.05	0.65	0.19	0.19	0.00
MC 02	GN	27-Apr-04	5.98	0.6	0.51	0.11	1.24	0.15	2.40	0.58	0.03	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	446.04	0.23	0.05	0.57	0.07	0.27	0.01
MC 02	GN	04-May-04	7.01	2.3	1.70	0.35	1.45	0.52	7.30	1.80	0.12	0.19	0.0125	0.0649	0.0742	0.0034	0.0184	0.0184	403.92	0.78	0.16	0.66	0.24	0.82	0.05
MC 02	GN	11-May-04	6.7	1.44	3.45	0.88	1.58	0.41	6.60	3.17	0.06	4.09	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	416.78	1.58	0.40	0.72	0.19	1.45	0.03
MC 02	GN	18-May-04	7.52	1.34	3.19	0.75	1.81	0.48	6.80	3.68	0.13	4.20	0.0067	0.1590	0.1358	0.0029	0.0127	0.0127	403.59	1.46	0.34	0.83	0.22	1.68	0.06
MC 02	GN	25-May-04	6.14	1.1	3.08	0.81	1.37	0.13	5.75	2.73	0.04	3.64	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	429.17	1.41	0.37	0.63	0.06	1.25	0.02
MC 02	GN	01-Jun-04	6.09	1.45	3.16	0.81	1.72	0.55	8.04	3.38	0.09	3.74	0.0063	0.0775	0.0552	0.0011	0.0120	0.0120	454.48	1.44	0.37	0.79	0.25	1.55	0.04
MC 02	GN	08-Jun-04	5.1	1.58	0.66	0.07	1.18	0.46	3.28	1.01	0.06	0.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	457.11	0.30	0.03	0.54	0.21	0.46	0.03
MC 02	GN	15-Jun-04	6.06	1.21	0.41	0.06	1.26	0.32	3.10	0.72	0.06	0.42	0.0068	0.0501	0.0558	0.0036	0.0114	0.0114	391.4	0.19	0.03	0.58	0.15	0.33	0.03
MC 02	GN	22-Jun-04	5.68	1.36	0.70	0.11	1.87	0.41	2.31	2.74	0.10	0.51	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	510.4	0.32	0.05	0.86	0.19	1.25	0.05
MC 02	GN	29-Jun-04	5.95	1.21	0.76	0.05	1.43	0.37	2.32	1.87	0.09	0.31	0.0089	0.0729	0.0443	0.0032	0.0188	0.0188	474.14	0.35	0.02	0.66	0.17	0.86	0.04
MC 02	GN	06-Jul-04	6.44	1.67	0.84	0.06	1.54	0.48	2.96	1.75	0.10	0.70	0.0108	0.1100	0.0972	0.0033	0.0117	0.0117	491.7	0.39	0.03	0.70	0.22	0.80	0.05
MC 08	FPX	24-Feb-04	7.03	3.24	2.75	0.34	3.55	0.31	10.40	1.25	0.33	4.12	0.0186	0.0410	0.0082	0.0004	0.0093	0.0093	439.31	1.21	0.15	1.56	0.14	0.55	0.14
MC 08	FPX	02-Mar-04	6.81	6.9	4.30	0.47	7.07	0.58	18.50	2.26	0.21	6.72	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	439.05	1.89	0.21	3.10	0.25	0.99	0.09
MC 08	FPX	09-Mar-04	7.04	3.9	4.84	1.07	4.10	0.23	18.00	1.23	0.09	3.97	0.0068	0.2238	0.0334	0.0003	0.0235	0.0235	434.22	2.10	0.46	1.78	0.10	0.53	0.04
MC 08	FPX	16-Mar-04	6.68	2.9	3.46	0.64	2.97	0.25	11.00	1.31	0.18	2.76	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	451.99	1.56	0.29	1.34	0.11	0.59	0.08
MC 08	FPX	23-Mar-04	6.26	1.76	2.79	0.78	2.90	0.46	7.90	2.74	0.07	3.29	0.0300	0.0420	0.0301	0.0011	0.0104	0.0104	470.07	1.31	0.37	1.36	0.21	1.29	0.03
MC 08	FPX	30-Mar-04	5.97	1.4	1.80	0.64	1.22	0.12	2.80	2.35	0.02	2.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	470.39	0.85	0.30	0.57	0.06	1.11	0.01
MC 08	FPX	06-Apr-04	6.54	3.09	2.33	0.25	2.32	0.22	7.98	1.80	-1.00	2.40	0.0267	0.0380	0.0553	0.0028	0.1271	0.1271	448.88	1.05	0.11	1.04	0.10	0.81	0.00
MC 08	FPX	13-Apr-04	7.46	2.82	1.52	0.27	2.73	0.18	9.10	1.23	0.06	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	448.44	0.68	0.12	1.22	0.08	0.55	0.03
MC 08	FPX	20-Apr-04	5.45	2.2	1.06	0.14	2.25	0.20	5.63	0.64	0.02	1.58	0.0122	0.0791	0.0666	0.0013	0.0093	0.0093	459.88	0.49	0.07	1.04	0.09	0.29	0.01
MC 08	FPX	27-Apr-04	5.93	0.8	0.17	0.01	0.79	0.08	1.20	0.43	0.02	0.76	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	450.99	0.08	0.00	0.36	0.04	0.19	0.01
MC 08	FPX	04-May-04	6.79	3.2	3.83	0.60	2.32	0.17	10.50	1.95	0.06	2.80	0.0178	0.0189	0.0895	0.0051	0.0170	0.0170	408.74	1.56	0.25	0.95	0.07	0.80	0.02
MC 08	FPX	11-May-04	6.22	2.18	3.52	0.90	1.90	0.12	5.90	2.09	0.08	6.35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	428.52	1.51	0.39	0.81	0.05	0.90	0.03
MC 08	FPX	18-May-04	6.09	1.89	2.93	0.76	1.73	0.03	4.24	2.45	0.13	5.76	0.0072	0.0327	0.1134	0.0024	0.0144	0.0144	437.98	1.28	0.33	0.76	0.01	1.07	0.06
MC 08	FPX	25-May-04	6.39	1.85	3.20	0.79	1.08	0.36	2.86	2.19	0.15	6.35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	411.87	1.32	0.32	0.44	0.15	0.90	0.06
MC 08	FPX	01-Jun-04	6.35	2.08	3.42	0.88	1.87	0.25	4.36	2.94	0.04	6.81	0.0079	0.0465	0.0907	0.0006	0.0118	0.0118	438.04	1.50	0.39	0.82	0.11	1.29	0.02
MC 08	FPX	08-Jun-04	5.75	2.01	0.91	0.15	1.86	0.16	1.89	1.44	0.04	3.78	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	438.33	0.40	0.07	0.82	0.07	0.63	0.02
MC 08	FPX	15-Jun-04	5.98	2.3	1.05	0.28	1.38	0.10	1.80	0.39	0.03	5.20	0.0076	0.0306	0.2160	0.0064	0.0145	0.0145	396.48	0.42	0.11	0.55	0.04	0.15	0.01
MC 08	FPX	22-Jun-04	5.04	2.24	1.42	0.28	1.86	0.07	1.10	2.10	0.08	5.96	0.0000	0.0470	0.1330	0.0080	0.0000	0.0000	442.69	0.63	0.13	0.82	0.03	0.93	0.04
MC 08	FPX	29-Jun-04	5.46	2.35	1.48	0.26	1.59	0.26	1.06	1.90	0.07	5.65	0.0134	0.0253	0.0826	0.0065	0.0262	0.0262	432.7	0.64	0.11	0.69	0.11	0.82	0.03
MC 08	FPX	06-Jul-04	6.17	2.45	1.58	0.25	2.41	0.40	1.80	1.48	0.08	6.79	0.0109	0.0271	0.1180	0.0075	0.0269	0.0269	454.53	0.72	0.11	1.09	0.18	0.67	0.04
MC 117	HF	24-Feb-04	6.87	4.53	3.95	0.58	4.52	0.14	9.10	1.50	0.75	10.68	0.0254	0.0145	0.0143	0.0011	0.0105	0.0105	438.94	1.73	0.25	1.98	0.06	0.66	0.33
MC 117	HF	02-Mar-04	6.9	95.5	220.65	2.91	12.96	0.89	10.30	2.28	0.20	512.11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	440.54	97.20	1.28	5.71	0.39	1.00	0.09
MC 117	HF	09-Mar-04	6.85	24.3	40.65	1.14	5.11	0.25	5.00	1.47	0.08	97.36	0.0074	0.0680	0.0314	0.0071	0.0154	0.0154	477.52	19.41	0.55	2.44	0.12	0.70	0.04
MC 117	HF	16-Mar-04	6.7	15.5	26.80	0.93	3.77	0.23	6.00	1.35	0.04	75.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	451.37	12.10	0.42	1.70	0.10	0.61	0.02
MC 117	HF	23-Mar-04	6.31	17.1	28.89	1.05	2.58	0.43	2.30	2.26	0.20	71.02	0.0149	0.0129	0.0274	0.0088	0.0130	0.0130	476.28	13.76	0.50	1.23	0.20	1.08	0.10
MC 117	HF	30-Mar-04	6.57	5.8	9.43	1.23	2.20	0.20	3.40	3.33	0.08	24.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	472.49	4.45	0.58	1.04	0.09	1.57	0.04

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumulative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*		*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg/kg*		*mg $CaCO_3$/kg*		
MC 02	GN	0.36	0.0035	0.0604	0.0194	0.0008	0.0045	0.0003	6.91	2.60	0.38	15.29	5.76	0.36	1.47	5.46	99.34	99.87
MC 02	GN	1.89	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.06	6.02	1.97	5.64	11.12	2.25	1.40	16.53	99.03	99.21
MC 02	GN	1.68	0.0034	0.1918	0.0396	0.0011	0.0048	0.0001	4.16	7.27	1.75	5.07	8.87	3.93	1.53	26.06	98.77	98.63
MC 02	GN	0.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.44	5.08	0.93	6.66	6.23	4.83	1.43	32.03	98.61	98.31
MC 02	GN	1.03	0.0077	0.0502	0.0186	0.0007	0.0042	0.0000	3.92	4.21	1.07	5.19	5.57	5.86	1.27	36.81	98.47	97.95
MC 02	GN	1.25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.53	3.29	1.30	2.73	3.55	7.11	1.20	39.53	98.40	97.51
MC 02	GN	0.41	0.0092	0.0253	0.0141	0.0006	0.0064	0.0003	4.49	1.93	0.43	8.21	3.52	7.52	1.32	42.65	98.31	97.37
MC 02	GN	0.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	12.63	1.69	0.13	26.93	3.60	7.65	1.42	45.94	98.22	97.33
MC 02	GN	0.13	0.0051	0.0745	0.0379	0.0009	0.0043	0.0011	7.47	1.03	0.14	17.93	2.48	7.78	1.23	48.72	98.14	97.28
MC 02	GN	0.46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.67	0.80	0.48	4.00	1.91	8.24	1.27	50.30	98.10	97.12
MC 02	GN	0.09	0.0057	0.0297	0.0340	0.0015	0.0084	0.0014	28.77	2.61	0.09	40.73	3.69	8.32	1.49	53.73	98.01	97.09
MC 02	GN	1.87	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.87	5.59	1.95	2.96	5.76	10.20	1.43	58.70	97.87	96.43
MC 02	GN	1.92	0.0031	0.0728	0.0622	0.0013	0.0058	0.0006	2.52	5.06	2.00	2.86	5.73	12.12	1.60	63.82	97.73	95.76
MC 02	GN	1.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.90	5.04	1.74	2.86	4.96	13.78	1.31	68.18	97.61	95.18
MC 02	GN	1.71	0.0029	0.0355	0.0253	0.0005	0.0055	0.0007	2.87	5.13	1.78	3.16	5.64	15.50	1.30	73.65	97.46	94.58
MC 02	GN	0.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.13	0.90	0.29	7.72	2.21	15.77	1.09	75.43	97.41	94.49
MC 02	GN	0.19	0.0031	0.0229	0.0255	0.0017	0.0052	0.0004	2.86	0.57	0.20	9.55	1.91	15.96	1.29	77.05	97.36	94.42
MC 02	GN	0.23	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.15	1.01	0.24	11.95	2.91	16.20	1.21	78.35	97.33	94.34
MC 02	GN	0.14	0.0041	0.0334	0.0203	0.0015	0.0086	0.0123	6.45	0.95	0.15	17.00	2.51	16.34	1.27	79.56	97.29	94.29
MC 02	GN	0.32	0.0050	0.0503	0.0445	0.0015	0.0053	0.0017	3.20	1.07	0.33	8.32	2.78	16.66	1.37	81.25	97.25	94.18
MC 08	FPX	1.81	0.0082	0.0180	0.0036	0.0002	0.0041	0.0007	1.93	3.64	1.89	3.49	6.59	1.81	2.70	6.45	99.92	100.00
MC 08	FPX	2.95	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.81	5.57	3.07	3.84	11.80	4.76	2.62	17.65	99.77	99.99
MC 08	FPX	1.72	0.0030	0.0972	0.0145	0.0001	0.0102	0.0002	3.98	7.16	1.80	5.15	9.25	6.48	2.71	27.26	99.65	99.99
MC 08	FPX	1.25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.92	5.09	1.30	5.36	6.97	7.73	2.57	33.54	99.57	99.99
MC 08	FPX	1.55	0.0141	0.0197	0.0141	0.0005	0.0049	0.0005	2.97	4.78	1.61	4.04	6.52	9.28	2.41	38.86	99.50	99.99
MC 08	FPX	1.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.34	3.34	1.43	2.40	3.44	10.65	2.30	41.61	99.47	99.98
MC 08	FPX	1.08	0.0120	0.0171	0.0248	0.0012	0.0571	0.0017	2.73	3.07	1.12	4.46	5.01	11.73	2.52	46.31	99.41	99.98
MC 08	FPX	0.45	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.73	2.21	0.47	9.57	4.47	12.18	2.87	50.86	99.35	99.98
MC 08	FPX	0.73	0.0056	0.0364	0.0306	0.0006	0.0043	0.0020	1.96	1.49	0.76	4.74	3.59	12.90	2.10	54.21	99.30	99.98
MC 08	FPX	0.34	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.57	0.20	0.36	2.85	1.02	13.25	2.28	55.11	99.29	99.98
MC 08	FPX	1.14	0.0073	0.0077	0.0366	0.0021	0.0070	0.0040	4.13	4.92	1.19	5.09	6.06	14.39	2.61	60.59	99.22	99.98
MC 08	FPX	2.72	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.89	5.36	2.84	1.98	5.61	17.11	2.39	65.95	99.15	99.97
MC 08	FPX	2.52	0.0032	0.0143	0.0496	0.0011	0.0063	0.0030	1.74	4.58	2.63	1.85	4.87	19.64	2.34	70.44	99.10	99.97
MC 08	FPX	2.62	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.70	4.62	2.73	1.63	4.44	22.25	2.46	74.34	99.05	99.97
MC 08	FPX	2.98	0.0035	0.0204	0.0397	0.0003	0.0052	0.0048	1.71	5.33	3.11	1.82	5.66	25.23	2.44	79.36	98.98	99.96
MC 08	FPX	1.66	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.74	1.28	1.73	1.66	2.87	26.89	2.21	81.91	98.95	99.96
MC 08	FPX	2.06	0.0030	0.0122	0.0856	0.0025	0.0058	0.0108	0.70	1.49	2.15	1.06	2.29	28.95	2.30	84.78	98.91	99.96
MC 08	FPX	2.64	0.0000	0.0208	0.0589	0.0035	0.0000	0.0000	0.76	2.08	2.75	1.24	3.40	31.59	1.94	88.01	98.87	99.95
MC 08	FPX	2.44	0.0058	0.0109	0.0358	0.0028	0.0114	0.0219	0.81	2.07	2.55	1.27	3.25	34.04	2.10	91.02	98.83	99.95
MC 08	FPX	3.09	0.0049	0.0123	0.0536	0.0034	0.0122	0.0216	0.70	2.26	3.22	1.37	4.41	37.12	2.37	95.05	98.78	99.94
MC 117	HF	4.69	0.0111	0.0064	0.0063	0.0005	0.0046	0.0003	1.10	5.37	4.88	1.79	8.72	4.69	1.95	8.88	0.00	99.85
MC 117	HF	225.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.06	248.01	235.07	1.09	255.75	230.29	1.95	248.48	0.00	92.78
MC 117	HF	46.49	0.0035	0.0325	0.0150	0.0034	0.0074	0.0016	1.05	50.72	48.44	1.11	53.96	276.78	1.94	299.31	0.00	91.32
MC 117	HF	33.85	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.91	31.94	35.27	0.97	34.06	310.63	1.90	337.29	0.00	90.26
MC 117	HF	33.83	0.0071	0.0062	0.0131	0.0042	0.0062	0.0013	1.03	36.41	35.25	1.06	37.31	344.46	1.79	373.64	0.00	89.20
MC 117	HF	11.43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.13	13.51	11.91	1.13	13.51	355.90	1.86	387.16	0.00	88.84

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 117	HF	06-Apr-04	6.8	10.4	15.57	0.79	3.72	0.23	4.29	2.17	0.10	43.70	0.0150	0.0170	0.0278	0.0052	0.0111	0.0111	475.05	7.40	0.38	1.77	0.11	1.03	0.05
MC 117	HF	13-Apr-04	6.67	10.31	13.05	0.66	4.45	0.17	4.40	1.36	0.72	33.43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	449.01	5.86	0.29	2.00	0.08	0.61	0.32
MC 117	HF	20-Apr-04	5.5	15.5	25.38	0.43	3.05	0.18	1.14	0.49	0.11	73.99	0.0236	0.0164	0.0344	0.0096	0.0170	0.0170	468.1	11.88	0.20	1.43	0.08	0.23	0.05
MC 117	HF	27-Apr-04	6.21	3.2	5.25	0.77	1.60	0.16	1.10	2.54	0.07	13.79	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	452.39	2.38	0.35	0.72	0.07	1.15	0.03
MC 117	HF	04-May-04	6.13	4.4	9.45	0.85	3.18	0.18	2.05	2.54	0.06	31.72	0.0111	0.0248	0.0840	0.0054	0.0143	0.0143	428.71	4.05	0.36	1.36	0.08	1.09	0.03
MC 117	HF	11-May-04	6.54	9.4	12.90	0.86	3.64	0.19	3.52	1.23	0.03	33.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	456.06	5.88	0.39	1.66	0.09	0.56	0.01
MC 117	HF	18-May-04	6.15	9.2	10.57	0.27	3.24	0.13	4.24	0.27	0.01	30.25	0.0114	0.0262	0.0861	0.0077	0.0144	0.0144	436.75	4.62	0.12	1.42	0.06	0.12	0.00
MC 117	HF	25-May-04	6.28	5.7	8.20	0.94	2.61	0.18	3.77	0.49	0.02	26.50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	440.17	3.61	0.41	1.15	0.08	0.22	0.01
MC 117	HF	01-Jun-04	6.22	4.1	6.10	0.95	2.32	0.20	4.32	1.20	0.04	17.13	0.0078	0.0184	0.0380	0.0023	0.0099	0.0099	441.56	2.69	0.42	1.02	0.09	0.53	0.02
MC 117	HF	08-Jun-04	5.57	3.23	4.13	0.29	2.43	0.20	1.20	0.60	0.27	12.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	438.88	1.81	0.13	1.07	0.09	0.26	0.12
MC 117	HF	15-Jun-04	5.26	4.66	4.92	0.15	1.79	0.00	0.90	0.41	0.03	15.80	0.0114	0.0181	0.0672	0.0094	0.0138	0.0138	428.15	2.11	0.06	0.77	0.00	0.18	0.01
MC 117	HF	22-Jun-04	6.24	3.65	2.99	0.16	2.84	0.20	1.10	0.73	-1.00	12.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	443.8	1.33	0.07	1.26	0.09	0.32	0.00
MC 117	HF	29-Jun-04	6.09	3.8	3.21	0.18	2.00	0.14	1.21	0.89	0.10	11.96	0.0134	0.0109	0.0649	0.0067	0.0150	0.0150	443.41	1.42	0.08	0.89	0.06	0.39	0.04
MC 117	HF	06-Jul-04	5.76	4.36	3.41	0.20	2.71	0.27	1.04	0.92	0.05	13.84	0.0184	0.0143	0.0227	0.0072	0.0202	0.0202	447.26	1.52	0.09	1.21	0.12	0.41	0.02
MC 174	DM	24-Feb-04	6.92	86.5	190.96	9.02	3.14	1.25	15.10	2.41	0.37	467.07	0.0567	-0.0040	0.0100	0.2914	0.2694	0.2694	437.9	83.54	3.95	1.37	0.55	1.05	0.16
MC 174	DM	02-Mar-04	7.1	161	418.24	9.19	2.91	2.79	15.50	3.39	0.19	1032.69	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	421.63	176.17	3.87	1.23	1.18	1.43	0.08
MC 174	DM	09-Mar-04	7.08	118.7	289.68	5.56	1.55	1.49	13.00	1.88	0.07	693.32	0.0096	-0.0040	0.0205	0.1901	0.0719	0.0719	463.21	134.05	2.57	0.72	0.69	0.87	0.03
MC 174	DM	16-Mar-04	6.78	98.2	222.80	3.64	0.96	1.08	11.00	1.34	0.02	495.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	443.97	98.82	1.61	0.42	0.48	0.59	0.01
MC 174	DM	23-Mar-04	6.29	46.5	90.42	2.09	1.64	0.80	1.10	1.89	0.04	206.70	0.0259	0.0198	0.0641	0.0983	0.1220	0.1220	444.06	40.11	0.93	0.73	0.35	0.84	0.02
MC 174	DM	30-Mar-04	6.41	45.7	90.95	3.77	1.62	0.70	4.10	3.70	0.09	218.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	438.57	39.85	1.65	0.71	0.31	1.62	0.04
MC 174	DM	06-Apr-04	6.07	99.9	247.04	4.02	2.31	1.33	5.49	1.23	0.18	552.66	0.0287	0.0006	0.0396	0.3136	0.3443	0.3443	442.22	109.14	1.78	1.02	0.59	0.54	0.08
MC 174	DM	13-Apr-04	6.4	111.6	243.79	3.93	1.72	1.36	9.30	1.83	0.44	542.39	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	376.83	91.77	1.48	0.65	0.51	0.69	0.17
MC 174	DM	20-Apr-04	5.45	92.2	201.22	4.16	2.22	1.34	1.07	0.58	0.02	463.87	0.0280	-0.0040	0.6852	0.3788	0.5325	0.5325	404.56	81.33	1.68	0.90	0.54	0.23	0.01
MC 174	DM	27-Apr-04	4.39	30.4	51.13	2.24	0.90	0.41	0.00	0.51	0.03	129.65	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	442.98	22.63	0.99	0.40	0.18	0.23	0.01
MC 174	DM	04-May-04	6.12	97.8	207.61	4.32	2.28	0.97	5.95	0.76	0.02	562.88	0.0412	-0.0040	1.2810	0.4967	0.5318	0.5318	381.25	79.07	1.65	0.87	0.37	0.29	0.01
MC 174	DM	11-May-04	6.06	94.3	215.57	4.39	0.65	0.92	5.89	1.82	0.02	498.36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	390.85	84.17	1.71	0.25	0.36	0.71	0.01
MC 174	DM	18-May-04	4.87	80.8	157.85	4.24	1.26	0.87	1.14	1.05	0.06	416.22	0.0226	0.0023	2.6636	0.2873	0.4097	0.4097	412.61	65.07	1.75	0.52	0.36	0.43	0.02
MC 174	DM	25-May-04	5.49	70	152.93	4.31	0.66	0.74	2.16	1.74	0.07	382.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	413.93	63.24	1.78	0.27	0.31	0.72	0.03
MC 174	DM	01-Jun-04	4.51	74.6	156.95	4.31	0.86	0.96	0.93	1.70	0.08	380.72	0.0520	0.0077	4.1407	0.2986	0.3336	0.3336	420.63	65.95	1.81	0.36	0.40	0.71	0.03
MC 174	DM	08-Jun-04	4.22	77.7	139.03	4.75	4.09	1.29	-1.00	3.81	0.11	384.21	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	436.91	60.68	2.07	1.79	0.56	1.66	0.05
MC 174	DM	15-Jun-04	4.17	84.5	181.13	4.59	1.81	0.98	0.00	1.76	0.02	461.35	0.0426	0.0060	5.7545	0.3021	0.3450	0.3450	414.97	75.09	1.90	0.75	0.41	0.73	0.01
MC 174	DM	22-Jun-04	4.54	73.4	144.03	4.91	1.01	0.90	1.15	1.77	0.02	401.80	0.0000	0.0070	0.0000	0.1970	0.0000	0.0000	460.39	66.24	2.26	0.46	0.41	0.81	0.01
MC 174	DM	29-Jun-04	4.07	69.4	130.06	5.01	2.17	0.94	0.00	3.44	0.08	353.28	0.0400	0.0305	4.7593	0.2509	0.1780	0.1780	471.22	61.23	2.36	1.02	0.44	1.62	0.04
MC 174	DM	06-Jul-04	4.57	74	153.03	4.96	1.86	0.97	0.94	2.56	0.05	391.56	0.0404	0.0142	5.1825	0.2445	0.1194	0.1194	448.55	68.57	2.22	0.84	0.44	1.15	0.02
MC 18	GN	24-Feb-04	6.9	3.53	3.25	0.16	2.55	0.41	12.90	1.35	0.11	1.50	0.0119	0.0278	0.0033	0.0013	0.0065	0.0065	432.98	1.41	0.07	1.10	0.18	0.58	0.05
MC 18	GN	02-Mar-04	6.2	5.4	4.66	0.29	4.24	0.80	16.20	1.63	0.05	2.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	435.57	2.03	0.13	1.85	0.35	0.71	0.02
MC 18	GN	09-Mar-04	7.11	3.2	3.94	1.02	1.95	0.49	15.00	1.08	0.03	1.84	0.0069	0.1526	0.0430	0.0008	0.0280	0.0280	440.57	1.73	0.45	0.86	0.22	0.48	0.01
MC 18	GN	16-Mar-04	6.7	2.3	3.18	0.60	1.47	0.42	9.00	1.23	0.04	1.99	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	446.69	1.42	0.27	0.66	0.19	0.55	0.02
MC 18	GN	23-Mar-04	6.07	1.81	2.68	0.58	1.91	0.57	6.20	2.37	0.18	2.10	0.0182	0.0347	0.0136	0.0011	0.0101	0.0101	471.7	1.26	0.27	0.90	0.27	1.12	0.08
MC 18	GN	30-Mar-04	5.95	1.1	2.83	0.78	1.46	0.30	3.80	3.46	0.08	3.57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	470.83	1.33	0.37	0.69	0.14	1.63	0.04
MC 18	GN	06-Apr-04	6.41	2.68	2.12	0.17	1.13	0.38	5.98	1.94	0.17	0.90	0.0185	0.0257	0.0277	0.0015	0.0283	0.0283	420.34	0.89	0.07	0.47	0.16	0.81	0.07
MC 18	GN	13-Apr-04	6.57	2.4	1.45	0.15	1.53	0.32	6.90	1.42	0.10	0.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	446.32	0.64	0.07	0.68	0.14	0.63	0.04
MC 18	GN	20-Apr-04	5.95	1.6	0.80	0.05	1.94	0.31	5.60	0.50	0.03	0.23	0.0103	0.0289	0.0344	0.0018	0.0127	0.0127	463.09	0.37	0.02	0.90	0.15	0.23	0.01
MC 18	GN	27-Apr-04	6.34	1	2.16	0.56	0.79	0.21	3.20	2.04	0.06	3.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	447.64	0.97	0.25	0.36	0.09	0.91	0.03
MC 18	GN	04-May-04	6.53	2.5	4.35	0.76	1.30	0.45	10.60	3.37	0.05	3.25	0.0132	0.0350	0.0563	0.0023	0.0199	0.0199	422.21	1.83	0.32	0.55	0.19	1.42	0.02
MC 18	GN	11-May-04	6.3	1.73	4.11	0.83	1.23	0.30	9.20	2.20	0.05	3.73	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	415.2	1.70	0.34	0.51	0.13	0.91	0.02

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumulative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week		mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg/kg		mg $CaCO_3$/kg		
MC 117	HF	20.76	0.0071	0.0081	0.0132	0.0025	0.0053	0.0027	0.93	20.02	21.63	1.04	22.47	376.65	1.93	410.82	0.00	88.19
MC 117	HF	15.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.01	15.85	15.64	1.22	19.08	391.67	1.89	428.44	0.00	87.72
MC 117	HF	34.63	0.0111	0.0077	0.0161	0.0045	0.0079	0.0041	0.85	30.50	36.09	0.91	32.90	426.30	1.56	465.06	0.00	86.64
MC 117	HF	6.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.13	7.36	6.50	1.17	7.60	432.54	1.76	472.06	0.00	86.44
MC 117	HF	13.60	0.0048	0.0106	0.0360	0.0023	0.0061	0.0024	0.82	11.62	14.17	0.93	13.19	446.14	1.74	487.11	0.00	86.01
MC 117	HF	15.19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.03	16.32	15.82	1.16	18.42	461.33	1.85	504.54	0.00	85.54
MC 117	HF	13.21	0.0050	0.0114	0.0376	0.0034	0.0063	0.0025	0.87	12.02	13.76	1.07	14.69	474.54	1.74	520.15	0.00	85.12
MC 117	HF	11.66	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.88	10.71	12.15	0.96	11.62	486.20	1.78	533.97	0.00	84.76
MC 117	HF	7.56	0.0035	0.0081	0.0168	0.0010	0.0044	0.0014	1.07	8.45	7.88	1.15	9.07	493.76	1.76	543.76	0.00	84.52
MC 117	HF	5.43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.89	5.04	5.66	1.23	6.96	499.19	1.58	549.94	0.00	84.35
MC 117	HF	6.76	0.0049	0.0077	0.0288	0.0040	0.0059	0.0027	0.78	5.52	7.05	0.98	6.93	505.96	1.49	557.37	0.00	84.14
MC 117	HF	5.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.62	3.60	5.83	1.06	6.17	511.55	1.77	563.69	0.00	83.96
MC 117	HF	5.30	0.0059	0.0048	0.0288	0.0030	0.0066	0.0048	0.70	3.88	5.53	1.01	5.56	516.85	1.73	569.75	0.00	83.80
MC 117	HF	6.19	0.0082	0.0064	0.0102	0.0032	0.0090	0.0041	0.65	4.17	6.45	1.02	6.60	523.04	1.63	576.67	0.00	83.60
MC 174	DM	204.33	0.0248	0.0000	0.0044	0.1275	0.1178	0.1312	1.06	224.86	212.90	1.00	212.37	204.33	2.90	219.51	99.13	99.80
MC 174	DM	434.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.01	455.86	453.23	0.98	444.25	639.31	2.97	679.26	97.30	99.39
MC 174	DM	320.83	0.0044	0.0000	0.0095	0.0880	0.0333	0.0727	1.03	345.35	334.29	1.01	337.31	960.14	2.96	1019.57	95.94	99.08
MC 174	DM	219.74	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.11	253.43	228.96	1.08	248.39	1179.88	2.84	1253.41	95.01	98.87
MC 174	DM	91.70	0.0115	0.0088	0.0284	0.0436	0.0541	0.0585	1.09	103.99	95.54	1.07	102.24	1271.57	2.63	1349.44	94.63	98.78
MC 174	DM	95.51	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.07	106.32	99.52	1.02	101.49	1367.09	2.68	1450.75	94.22	98.69
MC 174	DM	244.16	0.0127	0.0003	0.0175	0.1385	0.1521	0.2144	1.10	279.86	254.40	1.08	275.60	1611.24	2.54	1707.58	93.20	98.45
MC 174	DM	204.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.11	235.28	212.75	1.09	231.32	1815.43	2.68	1923.83	92.34	98.25
MC 174	DM	187.48	0.0113	0.0000	0.2769	0.1531	0.2152	0.3562	1.08	210.02	195.34	1.05	205.80	2002.90	2.28	2119.60	91.56	98.07
MC 174	DM	57.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.01	60.59	59.78	0.96	57.63	2060.28	1.84	2179.38	91.32	98.02
MC 174	DM	214.38	0.0157	0.0000	0.4879	0.1892	0.2025	0.5032	0.91	204.24	223.38	0.89	199.89	2274.66	2.56	2405.03	90.43	97.81
MC 174	DM	194.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.07	217.25	202.75	1.04	211.27	2469.25	2.54	2610.08	89.61	97.63
MC 174	DM	171.57	0.0093	0.0009	1.0979	0.1184	0.1689	0.4878	0.95	169.67	178.76	0.92	164.12	2640.82	2.04	2789.32	88.90	97.46
MC 174	DM	158.05	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.00	165.26	164.68	0.97	158.96	2798.87	2.30	2954.89	88.24	97.31
MC 174	DM	159.98	0.0218	0.0032	1.7399	0.1255	0.1402	0.4824	1.03	172.16	166.69	1.00	166.06	2958.85	1.89	3121.98	87.57	97.15
MC 174	DM	167.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.92	160.09	174.73	0.89	156.20	3126.55	1.77	3296.27	86.88	96.99
MC 174	DM	191.26	0.0177	0.0025	2.3856	0.1252	0.1430	0.6025	0.98	195.35	199.28	0.95	189.73	3317.80	1.74	3495.55	86.08	96.81
MC 174	DM	184.80	0.0000	0.0032	0.0000	0.0906	0.0000	0.0000	0.91	174.72	192.55	0.87	167.02	3502.60	1.90	3688.63	85.32	96.63
MC 174	DM	166.31	0.0188	0.0144	2.2404	0.1181	0.0838	0.5085	0.94	162.60	173.28	0.90	155.73	3668.91	1.70	3861.92	84.63	96.47
MC 174	DM	175.46	0.0181	0.0064	2.3223	0.1096	0.0535	0.3651	0.99	180.40	182.82	0.95	173.68	3844.37	1.91	4045.16	83.90	96.30
MC 18	GN	0.65	0.0052	0.0120	0.0014	0.0006	0.0028	0.0004	5.62	3.80	0.68	9.08	6.14	0.65	1.25	6.26	99.93	99.88
MC 18	GN	1.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.40	5.59	1.27	7.51	9.54	1.87	1.13	14.58	99.84	99.65
MC 18	GN	0.81	0.0031	0.0672	0.0189	0.0003	0.0123	0.0003	7.31	6.17	0.84	7.67	6.47	2.68	1.29	22.02	99.76	99.49
MC 18	GN	0.89	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.02	4.64	0.93	5.64	5.22	3.57	1.22	26.97	99.70	99.33
MC 18	GN	0.99	0.0086	0.0164	0.0064	0.0005	0.0048	0.0000	4.16	4.29	1.03	5.29	5.46	4.56	1.10	30.92	99.66	99.14
MC 18	GN	1.68	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.76	4.83	1.75	2.86	5.00	6.24	1.08	34.46	99.62	98.82
MC 18	GN	0.38	0.0077	0.0108	0.0116	0.0006	0.0119	0.0005	6.39	2.52	0.39	8.78	3.46	6.61	1.17	37.36	99.59	98.75
MC 18	GN	0.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	22.50	1.88	0.08	39.19	3.28	6.69	1.19	40.52	99.55	98.74
MC 18	GN	0.11	0.0048	0.0134	0.0159	0.0008	0.0059	0.0016	9.08	1.01	0.11	27.60	3.06	6.80	1.08	43.23	99.52	98.72
MC 18	GN	1.46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.26	3.44	1.52	2.17	3.31	8.26	1.15	46.18	99.49	98.44
MC 18	GN	1.37	0.0056	0.0147	0.0238	0.0010	0.0084	0.0008	4.13	5.90	1.43	4.21	6.01	9.63	1.19	52.08	99.42	98.18
MC 18	GN	1.55	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.51	5.67	1.61	3.43	5.54	11.18	1.15	57.51	99.36	97.89

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 18	GN	18-May-04	6.03	1.41	2.82	0.63	1.20	0.20	3.18	4.34	0.11	4.14	0.0080	0.0166	0.0411	0.0017	0.0085	0.0085	433.39	1.22	0.27	0.52	0.09	1.88	0.05
MC 18	GN	25-May-04	6.73	2.92	3.31	1.03	2.13	0.49	7.87	3.59	0.06	4.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	412.01	1.36	0.42	0.88	0.20	1.48	0.02
MC 18	GN	01-Jun-04	6.47	1.49	3.41	0.82	1.16	0.34	7.05	3.16	0.17	3.65	0.0082	0.0498	0.0573	0.0004	0.0092	0.0092	434.63	1.48	0.36	0.51	0.15	1.37	0.07
MC 18	GN	08-Jun-04	5.9	1.37	0.85	0.05	1.05	0.25	2.28	1.52	0.09	0.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	431.96	0.36	0.02	0.45	0.11	0.66	0.04
MC 18	GN	15-Jun-04	6.47	1.7	0.64	0.02	0.83	0.17	2.80	0.51	0.03	0.08	0.0066	0.0206	0.0629	0.0027	0.0122	0.0122	391.08	0.25	0.01	0.32	0.07	0.20	0.01
MC 18	GN	22-Jun-04	6.22	2.44	1.57	0.19	1.56	0.34	3.10	3.13	0.13	0.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	450.8	0.71	0.09	0.70	0.15	1.41	0.06
MC 18	GN	29-Jun-04	8.57	2.44	1.45	0.14	1.58	0.36	2.98	2.60	0.12	1.17	0.0138	0.0488	0.0639	0.0036	0.0197	0.0197	444.52	0.64	0.06	0.70	0.16	1.15	0.05
MC 18	GN	06-Jul-04	6.55	2	1.06	0.10	1.60	0.48	2.78	2.10	0.09	1.03	0.0113	0.0670	0.0546	0.0028	0.0191	0.0191	447.21	0.47	0.04	0.71	0.21	0.94	0.04
MC 182	HF	24-Feb-04	7.17	15.9	17.83	2.38	9.74	1.02	17.10	4.52	0.18	51.20	0.0306	0.0340	0.0109	0.0258	0.0141	0.0141	415.98	7.42	0.99	4.05	0.42	1.88	0.07
MC 182	HF	02-Mar-04	7.01	67	124.29	7.24	15.43	1.59	16.70	5.38	0.13	322.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	413.95	51.45	3.00	6.39	0.66	2.23	0.05
MC 182	HF	09-Mar-04	7.16	36.1	62.22	3.57	7.92	0.95	11.00	2.11	0.06	154.07	0.0069	0.1221	0.0225	0.0574	0.0089	0.0089	468.1	29.12	1.67	3.71	0.44	0.99	0.03
MC 182	HF	16-Mar-04	6.82	24.6	34.74	2.47	4.72	0.94	14.00	1.36	0.05	81.43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	425.42	14.78	1.05	2.01	0.40	0.58	0.02
MC 182	HF	23-Mar-04	6.42	12.35	19.78	1.72	3.05	0.92	2.10	2.16	0.87	55.80	0.0328	0.1889	0.1219	0.0385	0.0208	0.0208	447.65	8.85	0.77	1.37	0.41	0.97	0.39
MC 182	HF	30-Mar-04	6.38	13.2	20.75	2.08	2.83	0.57	2.70	2.81	0.08	56.38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	431.45	8.95	0.90	1.22	0.25	1.21	0.03
MC 182	HF	06-Apr-04	6.18	20.4	33.86	2.21	3.94	0.71	2.26	1.40	0.06	101.00	0.0227	0.0795	0.1487	0.1328	0.0775	0.0775	435.62	14.75	0.96	1.71	0.31	0.61	0.03
MC 182	HF	13-Apr-04	6.66	23.28	25.36	2.39	3.55	0.49	7.30	2.06	0.49	73.63	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	427.23	10.83	1.02	1.52	0.21	0.88	0.21
MC 182	HF	20-Apr-04	5.38	24.8	35.93	4.21	6.21	0.87	2.28	0.81	0.04	127.00	0.0267	0.1017	0.9011	0.4917	0.0953	0.0953	429.34	15.43	1.81	2.67	0.37	0.35	0.02
MC 182	HF	27-Apr-04	4.91	11.6	15.78	1.52	2.88	0.51	1.10	0.68	0.04	53.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	424.43	6.70	0.65	1.22	0.22	0.29	0.02
MC 182	HF	04-May-04	5.31	22.3	29.92	3.78	3.44	0.74	1.86	3.17	0.08	99.88	0.0142	0.0152	1.5120	0.6819	0.1813	0.1813	393.3	11.77	1.49	1.35	0.29	1.25	0.03
MC 182	HF	11-May-04	5.68	23	35.09	3.39	2.86	0.66	1.07	1.77	0.06	112.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	399.34	14.01	1.35	1.14	0.26	0.71	0.02
MC 182	HF	18-May-04	4.86	25.1	38.65	2.53	3.72	0.60	1.01	3.53	0.11	109.09	0.0163	0.0586	3.4191	0.3723	0.2051	0.2051	405.88	15.69	1.03	1.51	0.25	1.43	0.04
MC 182	HF	25-May-04	5.05	56.6	117.83	2.96	2.17	0.67	0.94	1.71	0.09	307.88	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	408.09	48.08	1.21	0.89	0.28	0.70	0.04
MC 182	HF	01-Jun-04	5.41	20.5	30.34	3.01	2.96	0.60	2.96	4.68	0.11	103.85	0.0108	0.0256	6.5008	0.2511	0.1723	0.1723	412.98	12.53	1.24	1.22	0.25	1.93	0.05
MC 182	HF	08-Jun-04	4.36	18.03	26.67	2.78	2.67	0.58	-1.00	1.34	0.05	88.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	415.03	11.07	1.16	1.11	0.24	0.56	0.02
MC 182	HF	15-Jun-04	4.2	21.9	31.26	2.29	1.89	0.46	0.00	0.51	0.04	130.08	0.0237	0.0749	15.9289	0.2691	0.2692	0.2692	387.54	12.12	0.89	0.73	0.18	0.20	0.02
MC 182	HF	22-Jun-04	4.58	28.1	42.29	1.86	2.79	0.54	1.09	0.71	0.04	153.00	0.0000	0.0600	14.5000	0.1860	0.0000	0.0000	415.21	17.56	0.77	1.16	0.22	0.29	0.02
MC 182	HF	29-Jun-04	4.39	23.1	32.80	1.77	3.38	0.54	0.00	0.76	0.17	132.46	0.0252	0.0393	14.9280	0.2024	0.1844	0.1844	416.95	13.67	0.74	1.41	0.23	0.32	0.07
MC 182	HF	06-Jul-04	4.29	22.6	31.15	1.77	3.94	0.63	0.00	0.97	0.07	123.60	0.0361	0.0570	12.6462	0.2109	0.1539	0.1539	424.12	13.21	0.75	1.67	0.27	0.41	0.03
MC 194	Q	24-Feb-04	6.82	4.22	3.64	0.39	3.33	0.46	9.10	4.51	0.19	4.43	0.0228	0.0162	0.0148	0.0196	0.0104	0.0104	402.42	1.47	0.16	1.34	0.19	1.81	0.08
MC 194	Q	02-Mar-04	6.7	21.4	35.06	2.75	4.48	1.19	13.90	4.12	0.10	95.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	412.82	14.47	1.14	1.85	0.49	1.70	0.04
MC 194	Q	09-Mar-04	7.1	8.9	14.14	1.11	1.86	0.71	12.00	1.46	0.03	27.58	0.0063	0.0991	0.0645	0.1705	0.0080	0.0080	427.66	6.05	0.47	0.80	0.30	0.62	0.01
MC 194	Q	16-Mar-04	6.98	4.8	7.13	1.00	1.16	0.52	9.00	1.66	0.05	10.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	396.41	2.83	0.40	0.46	0.20	0.66	0.02
MC 194	Q	23-Mar-04	6.67	2.78	4.70	0.83	1.83	0.69	8.10	2.46	0.07	6.54	0.0216	0.0589	0.0605	0.0341	0.0091	0.0091	436.41	2.05	0.36	0.80	0.30	1.07	0.03
MC 194	Q	30-Mar-04	6.89	2.4	4.49	0.90	1.14	0.29	6.10	2.62	0.07	6.10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	427.79	1.92	0.38	0.49	0.12	1.12	0.03
MC 194	Q	06-Apr-04	6.85	3.97	4.67	0.25	1.51	0.35	10.20	1.17	0.07	4.36	0.0238	0.0670	0.0422	0.0505	0.0902	0.0902	423.89	1.98	0.11	0.64	0.15	0.50	0.03
MC 194	Q	13-Apr-04	6.99	3.78	4.13	0.51	1.96	0.45	10.40	1.97	0.26	4.26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	404.58	1.67	0.21	0.79	0.18	0.80	0.11
MC 194	Q	20-Apr-04	6.91	2.8	1.79	0.18	2.87	0.32	7.11	0.71	0.02	2.78	0.0122	0.0870	0.0574	0.0117	0.0120	0.0120	406.27	0.73	0.07	1.17	0.13	0.29	0.01
MC 194	Q	27-Apr-04	6.56	1.41	3.59	0.81	1.52	0.32	5.20	3.41	0.31	5.03	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	395.42	1.42	0.32	0.60	0.13	1.35	0.12
MC 194	Q	04-May-04	7.08	4	5.29	0.48	1.18	0.34	13.30	1.64	0.02	4.88	0.0175	0.1018	0.0438	0.0343	0.0171	0.0171	389.4	2.06	0.19	0.46	0.13	0.64	0.01
MC 194	Q	11-May-04	6.88	3.6	6.48	1.16	1.75	0.25	12.38	2.44	0.05	8.47	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	422.91	2.74	0.49	0.74	0.11	1.03	0.02
MC 194	Q	18-May-04	6.62	2.6	5.28	0.50	1.58	0.16	8.16	2.59	0.11	8.59	0.0080	0.0582	0.0451	0.0101	0.0091	0.0091	404.4	2.14	0.20	0.64	0.07	1.05	0.04
MC 194	Q	25-May-04	6.9	2.3	4.10	0.78	1.34	0.26	8.37	1.60	0.09	4.04	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	400.1	1.64	0.31	0.54	0.10	0.64	0.04
MC 194	Q	01-Jun-04	4.63	2.98	5.33	1.03	1.75	0.36	9.73	2.13	0.05	7.01	0.0103	0.0483	0.0355	0.0109	0.0092	0.0092	411.84	2.20	0.42	0.72	0.15	0.88	0.02
MC 194	Q	08-Jun-04	6.47	2.39	1.50	0.07	1.55	0.20	4.59	0.88	0.06	2.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	401.44	0.60	0.03	0.62	0.08	0.35	0.02
MC 194	Q	15-Jun-04	6.57	2.4	2.21	0.10	1.12	0.13	4.50	0.29	0.01	3.10	0.0091	0.0505	0.0400	0.0108	0.0133	0.0133	386.76	0.86	0.04	0.43	0.05	0.11	0.00
MC 194	Q	22-Jun-04	6.68	2.21	2.43	0.12	1.18	0.13	4.48	0.47	0.05	4.09	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	404.3	0.98	0.05	0.48	0.05	0.19	0.02

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week		mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg/kg		mg $CaCO_3$/kg		
MC 18	GN	1.79	0.0035	0.0072	0.0178	0.0007	0.0037	0.0006	2.23	4.17	1.87	2.29	4.29	12.97	1.10	60.76	99.33	97.55
MC 18	GN	1.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.91	5.15	1.77	3.15	5.57	14.67	1.22	65.77	99.27	97.23
MC 18	GN	1.59	0.0035	0.0216	0.0249	0.0002	0.0040	0.0004	3.12	5.16	1.65	3.02	4.99	16.26	1.18	70.48	99.22	96.93
MC 18	GN	0.12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.30	1.01	0.12	16.78	2.04	16.38	1.07	71.59	99.21	96.91
MC 18	GN	0.03	0.0026	0.0081	0.0246	0.0011	0.0048	0.0005	20.24	0.66	0.03	43.38	1.41	16.41	1.18	72.71	99.19	96.90
MC 18	GN	0.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	7.68	2.13	0.28	12.62	3.50	16.67	1.13	74.39	99.18	96.85
MC 18	GN	0.52	0.0061	0.0217	0.0284	0.0016	0.0088	0.0042	3.44	1.86	0.54	6.18	3.35	17.19	1.56	76.25	99.16	96.76
MC 18	GN	0.46	0.0051	0.0299	0.0244	0.0013	0.0085	0.0028	2.84	1.36	0.48	6.27	3.01	17.65	1.19	77.97	99.14	96.67
MC 182	HF	21.30	0.0127	0.0142	0.0045	0.0107	0.0059	0.0005	1.02	22.60	22.19	1.26	27.90	21.30	2.69	29.30	99.86	99.98
MC 182	HF	133.29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.01	140.83	138.88	1.03	143.28	154.59	2.63	175.10	99.17	99.85
MC 182	HF	72.12	0.0032	0.0571	0.0105	0.0269	0.0042	0.0007	1.06	79.61	75.14	1.08	81.40	226.71	2.68	255.40	98.79	99.78
MC 182	HF	34.64	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.14	41.24	36.10	1.16	41.81	261.35	2.55	297.45	98.59	99.75
MC 182	HF	24.98	0.0147	0.0846	0.0546	0.0172	0.0093	0.0035	0.97	25.28	26.03	0.98	25.62	286.33	2.40	324.42	98.46	99.72
MC 182	HF	24.33	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.03	26.04	25.35	1.00	25.34	310.66	2.39	350.93	98.33	99.70
MC 182	HF	44.00	0.0099	0.0346	0.0648	0.0579	0.0337	0.0108	0.89	40.80	45.84	0.89	40.97	354.65	2.31	397.75	98.11	99.66
MC 182	HF	31.46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.95	31.26	32.78	0.93	30.63	386.11	2.49	433.65	97.94	99.63
MC 182	HF	54.53	0.0115	0.0437	0.3869	0.2111	0.0409	0.0633	0.81	45.97	56.81	0.79	44.82	440.64	2.01	491.44	97.66	99.58
MC 182	HF	22.62	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.82	19.39	23.57	0.83	19.67	463.26	1.84	515.48	97.55	99.55
MC 182	HF	39.28	0.0056	0.0060	0.5947	0.2682	0.0713	0.1352	0.87	35.50	40.93	0.80	32.71	502.54	1.99	557.14	97.35	99.52
MC 182	HF	44.73	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.87	40.56	46.60	0.81	37.83	547.27	2.13	604.17	97.13	99.47
MC 182	HF	44.28	0.0066	0.0238	1.3878	0.1511	0.0832	0.2063	0.94	43.41	46.14	0.93	42.79	591.55	1.82	650.72	96.90	99.43
MC 182	HF	125.64	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.96	125.05	130.92	0.93	122.40	717.19	1.89	782.02	96.28	99.31
MC 182	HF	42.89	0.0045	0.0106	2.6847	0.1037	0.0712	0.2230	0.81	36.41	44.69	0.77	34.28	760.08	2.03	827.92	96.06	99.27
MC 182	HF	36.69	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.85	32.40	38.23	0.79	30.38	796.77	1.63	865.74	95.88	99.23
MC 182	HF	50.41	0.0092	0.0290	6.1731	0.1043	0.1043	0.3968	0.65	33.91	52.53	0.61	32.09	847.18	1.57	918.26	95.63	99.19
MC 182	HF	63.53	0.0000	0.0249	6.0205	0.0772	0.0000	0.0000	0.71	47.03	66.19	0.71	46.67	910.71	1.72	984.91	95.32	99.12
MC 182	HF	55.23	0.0105	0.0164	6.2242	0.0844	0.0769	0.4470	0.65	37.18	57.54	0.65	37.51	965.93	1.64	1042.45	95.04	99.07
MC 182	HF	52.42	0.0153	0.0242	5.3635	0.0894	0.0653	0.5244	0.66	36.09	54.62	0.68	36.98	1018.36	1.61	1097.08	94.78	99.02
MC 194	Q	1.78	0.0092	0.0065	0.0059	0.0079	0.0042	0.0010	2.32	4.30	1.86	3.67	6.82	1.78	2.89	5.52	99.93	99.91
MC 194	Q	39.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.00	40.82	40.86	1.00	40.81	41.00	2.84	52.12	99.33	97.88
MC 194	Q	11.79	0.0027	0.0424	0.0276	0.0729	0.0034	0.0005	1.39	17.05	12.29	1.40	17.23	52.80	3.01	69.54	99.11	97.26
MC 194	Q	4.32	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.93	8.69	4.50	1.85	8.33	57.12	2.96	77.61	99.00	97.04
MC 194	Q	2.85	0.0094	0.0257	0.0264	0.0149	0.0040	0.0001	2.23	6.62	2.97	2.44	7.25	59.97	2.83	84.12	98.92	96.89
MC 194	Q	2.61	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.35	6.38	2.72	2.21	6.02	62.58	2.92	89.45	98.85	96.76
MC 194	Q	1.85	0.0101	0.0284	0.0179	0.0214	0.0382	0.0011	2.80	5.39	1.93	3.39	6.53	64.43	2.90	95.70	98.77	96.66
MC 194	Q	1.72	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.80	5.03	1.80	3.41	6.13	66.15	2.96	101.70	98.69	96.57
MC 194	Q	1.13	0.0049	0.0354	0.0233	0.0048	0.0049	0.0013	1.80	2.12	1.18	3.84	4.52	67.28	2.93	105.77	98.64	96.51
MC 194	Q	1.99	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.35	4.87	2.07	2.42	5.02	69.27	2.78	109.90	98.59	96.41
MC 194	Q	1.90	0.0068	0.0396	0.0170	0.0134	0.0066	0.0012	2.98	5.91	1.98	3.19	6.31	71.17	3.00	117.06	98.49	96.31
MC 194	Q	3.58	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.37	8.86	3.73	2.30	8.59	74.75	2.92	126.02	98.38	96.13
MC 194	Q	3.47	0.0032	0.0235	0.0182	0.0041	0.0037	0.0007	1.70	6.16	3.62	1.88	6.81	78.23	2.81	132.94	98.29	95.95
MC 194	Q	1.62	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.19	5.37	1.68	3.20	5.40	79.84	2.92	137.98	98.22	95.86
MC 194	Q	2.89	0.0042	0.0199	0.0146	0.0045	0.0038	0.0005	2.40	7.22	3.01	2.41	7.24	82.73	1.96	144.99	98.13	95.71
MC 194	Q	0.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.69	1.62	0.96	3.08	2.97	83.65	2.74	147.80	98.10	95.67
MC 194	Q	1.20	0.0035	0.0195	0.0155	0.0042	0.0052	0.0003	1.84	2.29	1.25	2.51	3.14	84.85	2.78	150.79	98.06	95.60
MC 194	Q	1.65	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.55	2.66	1.72	2.06	3.56	86.51	2.83	154.32	98.01	95.52

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 194	Q	29-Jun-04	6.86	2.78	1.97	0.19	2.10	0.24	5.70	1.06	0.06	4.33	0.0116	0.0490	0.0569	0.0108	0.0159	0.0159	406.74	0.80	0.08	0.85	0.10	0.43	0.02
MC 194	Q	06-Jul-04	6.49	2.61	2.04	0.09	1.62	0.27	3.94	1.29	0.09	4.28	0.0133	0.0502	0.0463	0.0104	0.0171	0.0171	419.51	0.85	0.04	0.68	0.12	0.54	0.04
MC 209	Q	24-Feb-04	6.63	5.02	3.05	0.39	5.51	0.57	8.60	3.12	0.13	10.23	0.0121	0.0517	0.0477	0.0063	0.0276	0.0276	442.64	1.70	0.22	3.07	0.32	1.74	0.07
MC 209	Q	02-Mar-04	6.65	15.5	20.85	2.34	7.36	0.74	11.80	4.64	0.15	60.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	491.77	12.92	1.45	4.56	0.46	2.87	0.09
MC 209	Q	09-Mar-04	6.59	5.2	7.05	1.10	2.56	0.37	7.00	2.09	0.06	18.40	0.0048	0.0729	0.1138	0.0100	0.0119	0.0119	484.17	4.30	0.67	1.56	0.22	1.27	0.04
MC 209	Q	16-Mar-04	6.55	3.6	5.15	0.89	1.62	0.41	4.00	1.56	0.06	11.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	449.93	2.92	0.51	0.92	0.23	0.88	0.03
MC 209	Q	23-Mar-04	5.9	1.92	3.29	0.72	2.14	0.47	2.10	2.55	0.08	7.67	0.0106	0.0303	0.0553	0.0067	0.0094	0.0094	442.59	1.83	0.40	1.19	0.26	1.42	0.04
MC 209	Q	30-Mar-04	6.26	2.2	3.60	0.74	1.05	0.22	1.90	2.15	0.06	8.53	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	466.74	2.12	0.43	0.62	0.13	1.26	0.04
MC 209	Q	06-Apr-04	6.43	4	6.82	1.36	1.82	0.33	3.40	4.10	0.05	15.80	0.0109	0.0161	0.0412	0.0172	0.0222	0.0222	474.74	4.08	0.81	1.09	0.20	2.45	0.03
MC 209	Q	13-Apr-04	6.26	4.04	2.73	0.38	1.84	0.24	2.20	2.15	0.33	7.65	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	453.74	1.56	0.21	1.05	0.13	1.23	0.19
MC 209	Q	20-Apr-04	5.63	2.9	2.30	0.33	1.28	0.21	2.16	0.51	0.05	8.57	0.0129	0.0601	0.1031	0.0104	0.0136	0.0136	455.23	1.32	0.19	0.73	0.12	0.29	0.03
MC 209	Q	27-Apr-04	5.82	1.34	3.00	0.77	1.22	0.16	1.10	2.49	0.06	7.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	450.97	1.70	0.44	0.69	0.09	1.41	0.03
MC 209	Q	04-May-04	6.19	4.8	4.34	0.47	2.20	0.31	2.90	1.77	0.04	14.13	0.0132	0.0130	0.0338	0.0423	0.0198	0.0198	187.44	1.02	0.11	0.52	0.07	0.42	0.01
MC 209	Q	11-May-04	6.24	4.1	6.05	0.95	0.63	0.06	2.17	1.37	0.04	15.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	256.34	1.95	0.31	0.20	0.02	0.44	0.01
MC 209	Q	18-May-04	5.97	2.8	4.83	1.00	1.07	0.12	1.08	3.55	0.09	12.56	0.0056	0.0237	0.0653	0.0123	0.0100	0.0100	439.15	2.67	0.55	0.59	0.06	1.96	0.05
MC 209	Q	25-May-04	5.6	2.58	4.47	0.92	0.87	0.15	0.88	3.19	0.10	10.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	449.61	2.53	0.52	0.49	0.08	1.81	0.06
MC 209	Q	01-Jun-04	5.82	2.81	4.86	1.03	0.85	0.24	2.81	3.70	0.08	10.96	0.0074	0.0289	0.0487	0.0150	0.0073	0.0073	490.74	3.00	0.64	0.53	0.15	2.29	0.05
MC 209	Q	08-Jun-04	4.83	2.39	3.28	0.75	0.73	0.18	1.00	0.84	0.09	11.66	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	464.66	1.92	0.44	0.43	0.11	0.49	0.05
MC 209	Q	15-Jun-04	4.7	2.12	3.23	0.56	0.52	0.11	0.20	0.36	0.02	12.10	0.0093	0.0124	0.0362	0.0167	0.0142	0.0142	418.15	1.70	0.30	0.27	0.06	0.19	0.01
MC 209	Q	22-Jun-04	3.84	2.7	2.37	0.28	0.64	0.20	0.00	0.57	0.11	15.97	0.0000	0.0250	0.0950	0.0180	0.0000	0.0000	448.91	1.34	0.16	0.36	0.11	0.32	0.06
MC 209	Q	29-Jun-04	4.22	3.02	3.14	0.28	0.69	0.26	0.00	0.74	0.12	16.01	0.0137	0.0140	0.0518	0.0256	0.0220	0.0220	496.85	1.97	0.17	0.43	0.16	0.46	0.08
MC 209	Q	06-Jul-04	4.56	3.02	3.28	0.27	0.98	0.22	0.50	0.78	0.04	13.10	0.0153	0.0174	0.0686	0.0308	0.0237	0.0237	437.64	1.81	0.15	0.54	0.12	0.43	0.02
MC 276	Tailings	24-Feb-04	8.09	39.9	42.34	14.05	17.50	9.64	84.00	16.75	0.59	112.75	0.0245	0.0161	0.0064	0.0324	0.0235	0.0235	237.6	10.23	3.40	4.23	2.33	4.05	0.14
MC 276	Tailings	02-Mar-04	7.4	34.3	29.35	16.34	14.34	10.70	49.00	11.45	0.37	98.69	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	251.2	7.50	4.18	3.66	2.73	2.93	0.09
MC 276	Tailings	09-Mar-04	7.58	20.2	14.48	9.83	6.66	6.79	32.00	3.64	0.43	63.40	0.0073	0.0447	0.0321	0.0025	0.0046	0.0046	245.03	3.61	2.45	1.66	1.69	0.91	0.11
MC 276	Tailings	16-Mar-04	7.67	11.5	9.79	5.07	3.07	4.31	24.00	3.53	0.33	22.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	186.48	1.86	0.96	0.58	0.82	0.67	0.06
MC 276	Tailings	23-Mar-04	8.79	10.6	9.14	4.74	5.18	3.96	22.00	5.61	0.46	21.70	0.0393	0.0467	0.0605	0.0271	0.1174	0.1174	227.77	2.12	1.10	1.20	0.92	1.30	0.11
MC 276	Tailings	30-Mar-04	7.93	18	14.07	8.78	4.96	6.46	36.90	4.44	0.15	38.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	196.99	2.82	1.76	0.99	1.29	0.89	0.03
MC 276	Tailings	06-Apr-04	8.9	25.2	20.06	11.57	10.60	9.86	51.00	7.02	0.21	90.10	0.0365	0.1121	0.2389	0.0180	0.1892	0.1892	230.05	4.70	2.71	2.48	2.31	1.64	0.05
MC 276	Tailings	13-Apr-04	9.35	10.6	7.36	4.04	3.34	3.99	28.70	2.95	0.10	17.23	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	284.05	2.13	1.17	0.96	1.15	0.85	0.03
MC 276	Tailings	20-Apr-04	7.6	13.4	11.07	7.12	5.09	5.18	29.00	4.72	0.41	32.10	0.0101	0.0726	0.1072	0.0096	0.0207	0.0207	407.22	4.59	2.95	2.11	2.15	1.96	0.17
MC 276	Tailings	27-Apr-04	7.53	11.7	9.94	6.33	2.71	4.14	31.00	3.96	0.36	20.41	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	185.5	1.88	1.19	0.51	0.78	0.75	0.07
MC 276	Tailings	04-May-04	6.93	20.7	12.75	10.46	5.46	8.37	36.00	6.91	0.52	59.95	0.0300	0.0311	0.0344	0.0093	0.0191	0.0191	237.12	3.08	2.52	1.32	2.02	1.67	0.13
MC 276	Tailings	11-May-04	7.59	11.7	9.91	6.74	2.28	5.13	35.00	3.08	0.33	22.50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	247.74	2.50	1.70	0.57	1.29	0.78	0.08
MC 276	Tailings	18-May-04	8.36	16.8	11.56	8.96	3.76	6.44	38.00	4.33	0.30	35.69	0.0082	0.0369	0.0377	0.0045	0.0087	0.0087	235.55	2.77	2.15	0.90	1.54	1.04	0.07
MC 276	Tailings	25-May-04	7.51	9.2	9.78	4.71	1.51	2.96	32.22	3.56	0.40	14.73	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	224.01	2.23	1.07	0.34	0.67	0.81	0.09
MC 276	Tailings	01-Jun-04	7.18	15.9	14.17	7.85	3.51	6.42	33.16	6.23	0.24	39.78	0.0100	0.0527	0.0489	0.0091	0.0131	0.0131	250.21	3.61	2.00	0.89	1.64	1.59	0.06
MC 276	Tailings	08-Jun-04	7.79	20.08	14.33	11.84	4.10	8.39	31.42	5.23	0.38	57.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	237.59	3.46	2.86	0.99	2.03	1.26	0.09
MC 276	Tailings	15-Jun-04	8.24	20.3	11.68	12.02	5.38	8.26	31.90	7.44	0.57	48.97	0.0085	0.0536	0.0621	0.0106	0.0114	0.0114	201.53	2.40	2.47	1.10	1.69	1.53	0.12
MC 276	Tailings	22-Jun-04	8.15	19.32	15.29	10.27	4.10	7.12	39.66	6.28	0.49	51.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	266.1	4.14	2.78	1.11	1.93	1.70	0.13
MC 276	Tailings	29-Jun-04	7.44	14.1	12.19	6.34	2.86	4.82	27.50	8.85	0.47	29.00	0.0153	0.0748	0.1457	0.0161	0.0408	0.0408	262.72	3.26	1.69	0.76	1.29	2.37	0.13
MC 276	Tailings	06-Jul-04	7.77	17.44	14.44	8.77	3.20	6.42	31.80	7.37	0.45	38.94	0.0142	0.0554	0.0968	0.0067	0.0100	0.0100	258.88	3.80	2.31	0.84	1.69	1.94	0.12
MC 277	Tailings	24-Feb-04	8.09	36.8	40.20	14.37	16.94	12.76	125.00	6.29	0.51	92.61	0.0216	0.0149	0.0045	0.0129	0.0153	0.0153	247.7	10.13	3.62	4.27	3.21	1.58	0.13
MC 277	Tailings	02-Mar-04	7.21	32.5	33.27	11.98	13.50	11.26	48.90	6.73	0.51	95.95	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	263.86	8.93	3.21	3.62	3.02	1.81	0.14
MC 277	Tailings	09-Mar-04	7.48	17.5	16.19	5.30	7.81	7.09	26.00	3.90	0.37	55.80	0.0110	0.0780	0.0745	0.0076	0.0181	0.0181	293.19	4.83	1.58	2.33	2.11	1.16	0.11
MC 277	Tailings	16-Mar-04	7.7	13.8	14.23	4.48	4.56	6.02	27.00	1.25	0.32	33.50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	196.41	2.84	0.89	0.91	1.20	0.25	0.06

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week		mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg/kg		mg $CaCO_3$/kg		
MC 194	Q	1.76	0.0047	0.0199	0.0231	0.0044	0.0065	0.0033	1.27	2.32	1.84	2.17	3.98	88.27	2.91	158.47	97.96	95.43
MC 194	Q	1.80	0.0056	0.0211	0.0194	0.0044	0.0072	0.0021	1.22	2.28	1.87	2.01	3.76	90.06	2.75	162.00	97.92	95.33
MC 209	Q	5.70	0.0054	0.0229	0.0211	0.0028	0.0122	0.0013	0.86	5.13	5.94	1.91	11.35	5.70	2.36	10.74	99.93	99.94
MC 209	Q	37.16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.99	38.23	38.72	1.10	42.78	42.86	2.37	56.77	99.65	99.52
MC 209	Q	11.22	0.0023	0.0353	0.0550	0.0048	0.0057	0.0004	1.15	13.49	11.69	1.23	14.42	54.08	2.35	72.72	99.55	99.40
MC 209	Q	6.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.40	9.37	6.67	1.44	9.58	60.49	2.33	81.66	99.50	99.33
MC 209	Q	4.28	0.0047	0.0134	0.0245	0.0030	0.0042	0.0000	1.40	6.22	4.45	1.69	7.51	64.76	2.10	87.29	99.46	99.28
MC 209	Q	5.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.35	7.07	5.22	1.30	6.79	69.78	2.23	93.63	99.42	99.22
MC 209	Q	9.45	0.0052	0.0076	0.0195	0.0082	0.0105	0.0006	1.37	13.53	9.84	1.30	12.81	79.22	2.29	105.51	99.35	99.12
MC 209	Q	4.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.05	4.78	4.56	1.40	6.36	83.60	2.23	111.32	99.32	99.07
MC 209	Q	4.91	0.0059	0.0274	0.0469	0.0047	0.0062	0.0023	0.80	4.09	5.12	0.99	5.05	88.51	2.00	117.68	99.28	99.02
MC 209	Q	4.11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.41	6.05	4.28	1.37	5.88	92.62	2.07	122.59	99.25	98.97
MC 209	Q	3.34	0.0025	0.0024	0.0063	0.0079	0.0037	0.0018	0.87	3.01	3.48	1.09	3.78	95.96	2.20	126.75	99.22	98.93
MC 209	Q	5.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.15	6.14	5.35	1.00	5.34	101.09	2.22	132.80	99.18	98.88
MC 209	Q	6.95	0.0024	0.0104	0.0286	0.0054	0.0044	0.0006	1.24	8.95	7.24	1.11	8.05	108.04	2.12	140.63	99.14	98.80
MC 209	Q	5.76	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.41	8.46	6.01	1.25	7.50	113.80	1.99	147.14	99.10	98.73
MC 209	Q	6.77	0.0036	0.0142	0.0239	0.0074	0.0036	0.0008	1.43	10.12	7.06	1.25	8.84	120.58	2.07	155.93	99.04	98.66
MC 209	Q	6.82	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.93	6.59	7.11	0.82	5.85	127.40	1.72	163.63	98.99	98.58
MC 209	Q	6.37	0.0039	0.0052	0.0151	0.0070	0.0059	0.0009	0.82	5.48	6.64	0.74	4.93	133.77	1.67	170.37	98.95	98.51
MC 209	Q	9.03	0.0000	0.0112	0.0426	0.0081	0.0000	0.0000	0.43	4.01	9.41	0.46	4.29	142.80	1.37	179.78	98.89	98.41
MC 209	Q	10.02	0.0068	0.0070	0.0257	0.0127	0.0109	0.0054	0.54	5.63	10.44	0.58	6.06	152.82	1.50	190.22	98.83	98.30
MC 209	Q	7.22	0.0067	0.0076	0.0300	0.0135	0.0104	0.0034	0.68	5.13	7.52	0.78	5.85	160.04	1.62	198.02	98.78	98.22
MC 276	Tailings	27.26	0.0059	0.0039	0.0016	0.0078	0.0057	0.0039	1.39	39.54	28.40	1.33	37.76	27.26	2.26	48.71	99.85	99.76
MC 276	Tailings	25.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.37	35.93	26.28	1.15	30.22	52.48	2.07	87.51	99.74	99.55
MC 276	Tailings	15.81	0.0018	0.0111	0.0080	0.0006	0.0011	0.0010	1.16	19.10	16.47	0.90	14.80	68.29	2.12	111.96	99.66	99.41
MC 276	Tailings	4.33	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.91	8.60	4.51	1.54	6.95	72.61	2.14	121.02	99.63	99.37
MC 276	Tailings	5.03	0.0091	0.0108	0.0140	0.0063	0.0272	0.0025	1.87	9.81	5.24	1.73	9.08	77.64	2.46	131.36	99.60	99.33
MC 276	Tailings	7.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.76	14.29	8.12	1.34	10.87	85.44	2.22	146.88	99.56	99.26
MC 276	Tailings	21.09	0.0085	0.0262	0.0559	0.0042	0.0443	0.0049	1.04	22.88	21.97	0.91	20.09	106.52	2.49	180.79	99.45	99.08
MC 276	Tailings	4.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.95	10.12	5.19	1.71	8.89	111.50	2.61	194.27	99.41	99.04
MC 276	Tailings	13.30	0.0042	0.0301	0.0444	0.0040	0.0086	0.0019	1.70	23.60	13.86	1.36	18.80	124.80	2.12	220.14	99.34	98.92
MC 276	Tailings	3.85	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.39	9.60	4.01	1.69	6.80	128.66	2.10	230.01	99.31	98.89
MC 276	Tailings	14.46	0.0072	0.0075	0.0083	0.0022	0.0046	0.0025	1.20	18.07	15.07	0.87	13.14	143.12	1.94	253.76	99.23	98.76
MC 276	Tailings	5.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.24	13.23	5.91	1.55	9.15	148.79	2.12	268.49	99.19	98.71
MC 276	Tailings	8.55	0.0020	0.0088	0.0090	0.0011	0.0021	0.0013	1.77	15.76	8.91	1.22	10.86	157.34	2.34	286.51	99.13	98.64
MC 276	Tailings	3.36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.85	9.98	3.50	2.05	7.18	160.70	2.10	297.35	99.10	98.61
MC 276	Tailings	10.13	0.0025	0.0134	0.0125	0.0023	0.0033	0.0010	1.63	17.23	10.55	1.24	13.05	170.83	2.01	316.35	99.04	98.52
MC 276	Tailings	13.97	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.40	20.43	14.56	0.92	13.40	184.80	2.18	338.50	98.98	98.40
MC 276	Tailings	10.04	0.0017	0.0110	0.0127	0.0022	0.0023	0.0014	1.54	16.13	10.46	1.01	10.55	194.84	2.30	355.50	98.93	98.31
MC 276	Tailings	13.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.50	21.78	14.49	1.05	15.23	208.75	2.28	380.73	98.85	98.19
MC 276	Tailings	7.75	0.0041	0.0200	0.0389	0.0043	0.0109	0.0064	1.87	15.11	8.08	1.42	11.46	216.50	2.08	396.16	98.80	98.13
MC 276	Tailings	10.26	0.0037	0.0146	0.0255	0.0018	0.0026	0.0028	1.78	19.01	10.69	1.26	13.50	226.75	2.17	415.22	98.75	98.04
MC 277	Tailings	23.33	0.0054	0.0038	0.0011	0.0032	0.0039	0.0021	1.65	40.19	24.31	1.59	38.70	23.33	2.39	55.80	99.83	99.80
MC 277	Tailings	25.75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.32	35.53	26.83	1.27	34.06	49.08	2.13	95.74	99.64	99.29
MC 277	Tailings	16.64	0.0033	0.0233	0.0222	0.0023	0.0054	0.0023	1.07	18.56	17.34	1.14	19.84	65.71	2.21	120.83	99.55	99.09
MC 277	Tailings	6.69	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.55	10.78	6.97	1.52	10.63	72.41	2.28	133.20	99.50	99.01

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 277	Tailings	23-Mar-04	8.63	8.68	8.13	2.83	4.71	3.70	21.00	2.31	0.33	18.80	0.0411	0.0765	0.1501	0.0176	0.0229	0.0229	205.45	1.70	0.59	0.98	0.77	0.48	0.07
MC 277	Tailings	30-Mar-04	7.52	11.6	10.73	3.70	3.45	4.38	22.00	2.19	0.09	23.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	169.96	1.85	0.64	0.60	0.76	0.38	0.02
MC 277	Tailings	06-Apr-04	8.79	18.3	15.92	5.27	9.45	8.05	48.00	4.93	0.75	38.10	0.0167	0.0620	0.0814	0.0089	0.0276	0.0276	225.52	3.65	1.21	2.17	1.85	1.13	0.17
MC 277	Tailings	13-Apr-04	9	10	11.93	3.23	4.51	4.31	30.70	6.04	0.72	19.34	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	276.83	3.36	0.91	1.27	1.21	1.70	0.20
MC 277	Tailings	20-Apr-04	7.12	11	11.98	3.36	4.62	5.29	27.70	4.15	0.41	19.51	0.0092	0.1132	0.2055	0.0087	0.0083	0.0083	405.32	4.94	1.39	1.90	2.18	1.71	0.17
MC 277	Tailings	27-Apr-04	7.34	9.1	10.24	2.78	2.26	3.71	27.00	2.67	0.30	11.26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	195.4	2.03	0.55	0.45	0.74	0.53	0.06
MC 277	Tailings	04-May-04	7.46	9.8	10.17	2.82	2.37	5.33	26.00	3.69	0.28	14.52	0.0219	0.0938	0.1489	0.0075	0.0113	0.0113	232.49	2.40	0.67	0.56	1.26	0.87	0.07
MC 277	Tailings	11-May-04	7.34	10.8	12.83	3.27	2.19	5.06	34.00	2.43	0.26	15.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	223.21	2.91	0.74	0.50	1.15	0.55	0.06
MC 277	Tailings	18-May-04	7.81	11.7	12.57	3.80	2.78	4.97	30.70	2.95	0.49	23.43	0.0086	0.1096	0.1964	0.0071	0.0069	0.0069	233.76	2.99	0.90	0.66	1.18	0.70	0.12
MC 277	Tailings	25-May-04	7.14	7.88	9.84	2.71	2.13	3.19	21.29	3.74	0.37	12.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	216.96	2.17	0.60	0.47	0.70	0.83	0.08
MC 277	Tailings	01-Jun-04	7.13	16.7	18.45	5.11	5.95	7.41	26.99	10.95	0.26	44.22	0.0129	0.0436	0.0625	0.0086	0.0032	0.0032	262.98	4.93	1.37	1.59	1.98	2.93	0.07
MC 277	Tailings	08-Jun-04	7.2	11.04	12.11	3.00	2.61	5.52	25.28	3.06	0.32	22.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	247.71	3.05	0.75	0.66	1.39	0.77	0.08
MC 277	Tailings	15-Jun-04	7.45	15	11.43	4.82	5.21	7.31	21.00	4.32	0.60	36.00	0.0060	0.0729	0.0898	0.0061	0.0093	0.0093	245.91	2.86	1.21	1.30	1.83	1.08	0.15
MC 277	Tailings	22-Jun-04	7.29	13.08	14.20	3.40	3.11	5.99	27.35	4.29	0.60	26.82	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	267.94	3.87	0.93	0.85	1.63	1.17	0.16
MC 277	Tailings	29-Jun-04	7.48	11.4	11.49	2.54	2.54	5.04	20.60	6.23	0.46	19.70	0.0132	0.0767	0.1832	0.0114	0.0108	0.0108	259.6	3.03	0.67	0.67	1.33	1.64	0.12
MC 277	Tailings	06-Jul-04	6.91	12.1	13.64	3.09	2.39	5.36	19.92	4.94	0.83	23.38	0.0117	0.0920	0.2197	0.0075	0.0102	0.0102	221.6	3.07	0.70	0.54	1.21	1.11	0.19
MC 278	Tailings	24-Feb-04	7.72	32.3	35.45	10.09	15.21	8.85	73.00	10.39	0.44	87.90	0.0221	0.0179	0.0046	0.0117	0.0214	0.0214	206.75	7.46	2.12	3.20	1.86	2.19	0.09
MC 278	Tailings	02-Mar-04	7.42	25.4	25.46	11.08	11.29	7.75	51.20	6.55	0.37	92.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	257.04	6.66	2.90	2.95	2.03	1.71	0.10
MC 278	Tailings	09-Mar-04	7.63	20.6	16.09	9.90	7.62	7.42	35.00	4.07	0.31	68.20	0.0064	0.0396	0.0155	0.0026	0.0054	0.0054	188.02	3.08	1.89	1.46	1.42	0.78	0.06
MC 278	Tailings	16-Mar-04	7.74	11.9	9.91	4.87	3.85	3.97	23.00	1.47	0.27	25.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	210.62	2.12	1.04	0.82	0.85	0.32	0.06
MC 278	Tailings	23-Mar-04	8.48	33.2	23.75	15.98	15.85	9.29	34.00	12.80	0.35	109.14	0.0408	0.0213	0.0058	0.0155	0.0259	0.0259	238.42	5.76	3.88	3.84	2.25	3.11	0.08
MC 278	Tailings	30-Mar-04	7.75	17.9	15.77	7.76	5.66	5.60	27.00	4.62	0.13	54.05	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	151.72	2.43	1.20	0.87	0.86	0.71	0.02
MC 278	Tailings	06-Apr-04	8.77	28	19.29	12.37	12.68	11.43	45.00	8.30	0.53	72.91	0.0181	0.0245	0.0158	0.0110	0.0160	0.0160	235.02	4.61	2.96	3.03	2.73	1.98	0.13
MC 278	Tailings	13-Apr-04	9.2	11.33	8.50	4.35	3.36	3.17	27.00	5.60	0.75	18.05	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	326.12	2.82	1.44	1.12	1.05	1.86	0.25
MC 278	Tailings	20-Apr-04	6.99	15.9	12.81	8.16	5.90	7.54	33.98	5.91	0.38	37.81	0.0093	0.0454	0.0512	0.0081	0.0078	0.0078	444.98	5.80	3.70	2.67	3.42	2.68	0.17
MC 278	Tailings	27-Apr-04	7.71	11.01	10.00	5.13	2.35	4.15	36.00	3.18	0.22	14.77	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	209.65	2.13	1.09	0.50	0.88	0.68	0.05
MC 278	Tailings	04-May-04	7.63	14.6	9.30	6.71	3.48	6.71	36.00	4.92	0.30	25.99	0.0243	0.0500	0.0718	0.0084	0.0130	0.0130	207.95	1.97	1.42	0.74	1.42	1.04	0.06
MC 278	Tailings	11-May-04	7.88	10.3	9.34	5.18	1.67	4.94	37.00	1.72	0.20	9.65	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	243.92	2.32	1.29	0.41	1.23	0.43	0.05
MC 278	Tailings	18-May-04	7.13	10.4	9.47	4.29	2.16	4.34	31.60	3.17	0.75	13.17	0.0074	0.0865	0.1269	0.0078	0.0072	0.0072	256.7	2.47	1.12	0.56	1.13	0.83	0.20
MC 278	Tailings	25-May-04	7.12	7.1	8.80	3.39	1.68	2.33	25.57	3.89	0.37	9.53	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.53	1.89	0.73	0.36	0.50	0.84	0.08
MC 278	Tailings	01-Jun-04	6.99	14.1	13.05	6.06	2.68	6.21	37.87	4.36	0.27	22.58	0.0094	0.0817	0.1146	0.0070	0.0033	0.0033	256.07	3.40	1.58	0.70	1.62	1.14	0.07
MC 278	Tailings	08-Jun-04	8.06	13.52	12.20	6.02	2.78	6.07	37.37	3.10	0.31	25.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	205.77	2.55	1.26	0.58	1.27	0.65	0.06
MC 278	Tailings	15-Jun-04	7.89	14.8	11.00	7.34	3.08	7.10	35.50	3.90	0.48	26.90	0.0080	0.0653	0.0918	0.0058	0.0094	0.0094	208.51	2.33	1.56	0.65	1.51	0.83	0.10
MC 278	Tailings	22-Jun-04	7.83	13.3	11.87	6.12	2.63	5.59	39.61	4.70	0.42	20.25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	242.47	2.93	1.51	0.65	1.38	1.16	0.10
MC 278	Tailings	29-Jun-04	7.26	12.7	10.67	5.45	2.26	5.18	30.60	6.08	0.86	18.20	0.0135	0.0718	0.1329	0.0098	0.0130	0.0130	247.49	2.69	1.37	0.57	1.30	1.53	0.22
MC 278	Tailings	06-Jul-04	7.17	15.65	13.27	7.34	3.16	7.06	40.20	5.63	0.57	27.76	0.0116	0.0898	0.1766	0.0074	0.0086	0.0086	219.4	2.96	1.64	0.71	1.58	1.26	0.13
MC 279	Tailings	24-Feb-04	6.96	32.8	37.10	12.81	14.84	12.82	107.00	5.12	0.35	76.59	0.0199	0.0218	0.0020	0.0126	0.0192	0.0192	222.58	8.52	2.94	3.41	2.94	1.18	0.08
MC 279	Tailings	02-Mar-04	7.34	27.17	28.89	9.80	11.30	10.66	41.40	4.73	0.42	100.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	250.6	7.47	2.53	2.92	2.76	1.22	0.11
MC 279	Tailings	09-Mar-04	7.53	16.8	15.32	5.10	6.55	7.14	29.00	3.07	0.23	48.10	0.0049	0.0651	0.0502	0.0029	0.0070	0.0070	288.32	4.56	1.52	1.95	2.12	0.91	0.07
MC 279	Tailings	16-Mar-04	7.63	18.8	19.09	5.45	7.45	6.11	16.00	1.98	0.33	72.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	233.18	4.59	1.31	1.79	1.47	0.48	0.08
MC 279	Tailings	23-Mar-04	8.66	11.3	11.75	3.75	6.00	5.53	30.40	4.07	0.42	23.20	0.0474	0.0594	0.0729	0.0092	0.0134	0.0134	238.22	2.89	0.92	1.47	1.36	1.00	0.10
MC 279	Tailings	30-Mar-04	7.11	9.9	10.57	3.41	2.15	4.30	29.00	1.66	0.09	14.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	200.29	2.18	0.71	0.44	0.89	0.34	0.02
MC 279	Tailings	06-Apr-04	8.59	14.7	12.82	4.27	7.40	7.23	41.00	3.66	0.60	32.60	0.0144	0.0886	0.1430	0.0081	0.0247	0.0247	217.22	2.87	0.96	1.66	1.62	0.82	0.13
MC 279	Tailings	13-Apr-04	8.5	8.3	8.73	2.93	3.78	3.08	31.00	4.61	0.56	9.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	292.66	2.64	0.88	1.14	0.93	1.39	0.17
MC 279	Tailings	20-Apr-04	7.33	8.9	10.28	2.62	3.61	3.98	25.56	3.62	0.43	14.09	0.0098	0.1105	0.2357	0.0076	0.0115	0.0115	426.86	4.53	1.15	1.59	1.75	1.59	0.19
MC 279	Tailings	27-Apr-04	7.12	8.02	8.02	2.12	2.20	3.68	22.00	2.73	0.22	10.15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	232.2	1.92	0.51	0.53	0.88	0.65	0.05

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*		*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg/kg*		*mg $CaCO_3$/kg*		
MC 277	Tailings	3.93	0.0086	0.0160	0.0314	0.0037	0.0048	0.0020	1.63	6.68	4.09	1.80	7.38	76.33	2.55	141.68	99.47	98.96
MC 277	Tailings	4.10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.70	7.27	4.27	1.62	6.90	80.43	2.22	149.75	99.44	98.91
MC 277	Tailings	8.74	0.0038	0.0142	0.0187	0.0020	0.0063	0.0026	1.55	14.09	9.10	1.78	16.21	89.17	2.60	169.86	99.36	98.81
MC 277	Tailings	5.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.14	12.13	5.67	2.24	12.71	94.61	2.66	184.18	99.31	98.74
MC 277	Tailings	8.04	0.0038	0.0466	0.0847	0.0036	0.0034	0.0019	2.15	18.04	8.38	2.30	19.27	102.65	2.11	203.98	99.23	98.65
MC 277	Tailings	2.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.15	7.35	2.33	3.00	7.00	104.89	2.17	211.67	99.20	98.62
MC 277	Tailings	3.43	0.0052	0.0222	0.0352	0.0018	0.0027	0.0018	2.45	8.75	3.58	2.47	8.84	108.32	2.21	221.40	99.17	98.58
MC 277	Tailings	3.61	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.75	10.33	3.76	2.61	9.83	111.94	2.17	232.88	99.12	98.54
MC 277	Tailings	5.57	0.0020	0.0261	0.0467	0.0017	0.0016	0.0020	1.93	11.18	5.80	1.79	10.42	117.51	2.31	245.98	99.07	98.47
MC 277	Tailings	2.66	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.84	7.88	2.77	2.65	7.35	120.17	2.11	253.45	99.05	98.44
MC 277	Tailings	11.83	0.0034	0.0117	0.0167	0.0023	0.0009	0.0016	1.46	17.95	12.32	1.49	18.33	131.99	2.11	272.99	98.97	98.30
MC 277	Tailings	5.74	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.79	10.72	5.98	1.81	10.83	137.74	2.13	285.35	98.93	98.23
MC 277	Tailings	9.00	0.0015	0.0182	0.0225	0.0015	0.0023	0.0011	1.29	12.10	9.38	1.31	12.32	146.74	2.20	299.98	98.87	98.12
MC 277	Tailings	7.31	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.77	13.48	7.61	1.79	13.60	154.05	2.16	315.05	98.81	98.03
MC 277	Tailings	5.20	0.0035	0.0203	0.0484	0.0030	0.0028	0.0049	1.91	10.34	5.42	1.98	10.74	159.25	2.21	325.90	98.77	97.97
MC 277	Tailings	5.27	0.0026	0.0207	0.0495	0.0017	0.0023	0.0034	1.92	10.54	5.49	1.89	10.40	164.52	2.04	335.88	98.74	97.90
MC 278	Tailings	18.49	0.0047	0.0038	0.0010	0.0025	0.0045	0.0023	1.42	27.36	19.27	1.45	27.98	18.49	1.59	34.62	99.90	99.63
MC 278	Tailings	24.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.14	28.55	25.07	1.02	25.66	42.55	1.52	73.09	99.78	99.26
MC 278	Tailings	13.05	0.0012	0.0076	0.0030	0.0005	0.0010	0.0005	1.14	15.49	13.59	0.93	12.68	55.60	1.57	93.38	99.72	99.06
MC 278	Tailings	5.42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.70	9.60	5.65	1.45	8.19	61.02	1.59	103.96	99.69	98.97
MC 278	Tailings	26.48	0.0099	0.0052	0.0014	0.0038	0.0063	0.0021	1.10	30.35	27.59	0.93	25.65	87.50	1.74	139.79	99.58	98.56
MC 278	Tailings	8.34	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.27	11.01	8.69	1.05	9.09	95.84	1.59	152.65	99.54	98.43
MC 278	Tailings	17.44	0.0043	0.0059	0.0038	0.0026	0.0038	0.0022	1.30	23.69	18.17	1.19	21.63	113.28	1.80	181.58	99.46	98.16
MC 278	Tailings	5.99	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.08	12.99	6.24	1.73	10.82	119.27	1.89	196.78	99.41	98.07
MC 278	Tailings	17.12	0.0042	0.0206	0.0232	0.0037	0.0035	0.0016	1.67	29.70	17.84	1.38	24.68	136.39	1.44	230.00	99.31	97.80
MC 278	Tailings	3.15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.00	9.84	3.28	2.30	7.56	139.54	1.58	240.97	99.28	97.75
MC 278	Tailings	5.50	0.0051	0.0106	0.0152	0.0018	0.0027	0.0020	1.88	10.76	5.73	1.45	8.34	145.04	1.57	254.31	99.24	97.67
MC 278	Tailings	2.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.44	11.08	2.50	3.31	8.26	147.43	1.62	265.99	99.21	97.63
MC 278	Tailings	3.44	0.0019	0.0226	0.0332	0.0020	0.0019	0.0017	3.01	10.79	3.58	2.47	8.86	150.87	1.46	277.83	99.17	97.58
MC 278	Tailings	2.05	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.62	7.74	2.14	2.88	6.16	152.92	1.46	285.47	99.15	97.55
MC 278	Tailings	5.88	0.0024	0.0213	0.0299	0.0018	0.0009	0.0011	2.45	14.99	6.13	1.97	12.09	158.81	1.44	301.47	99.10	97.45
MC 278	Tailings	5.28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.10	11.57	5.50	1.69	9.28	164.08	1.66	314.79	99.06	97.37
MC 278	Tailings	5.71	0.0017	0.0139	0.0195	0.0012	0.0020	0.0010	2.06	12.24	5.95	1.54	9.18	169.79	1.62	328.27	99.02	97.28
MC 278	Tailings	5.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.60	13.53	5.21	2.02	10.49	174.79	1.61	343.24	98.98	97.21
MC 278	Tailings	4.58	0.0034	0.0181	0.0335	0.0025	0.0033	0.0034	2.59	12.36	4.78	2.01	9.62	179.37	1.49	355.73	98.94	97.13
MC 278	Tailings	6.20	0.0026	0.0200	0.0394	0.0016	0.0019	0.0027	2.19	14.14	6.46	1.70	10.95	185.57	1.47	371.16	98.89	97.04
MC 279	Tailings	17.59	0.0046	0.0050	0.0005	0.0029	0.0044	0.0023	1.82	33.38	18.33	1.77	32.47	17.59	1.43	42.90	99.71	99.58
MC 279	Tailings	26.03	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.07	29.08	27.13	1.05	28.55	43.62	1.98	80.73	99.45	98.96
MC 279	Tailings	14.31	0.0015	0.0194	0.0149	0.0009	0.0021	0.0004	1.18	17.62	14.91	1.23	18.35	57.93	2.03	104.26	99.29	98.61
MC 279	Tailings	17.32	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.93	16.86	18.05	0.96	17.25	75.25	2.06	126.16	99.14	98.20
MC 279	Tailings	5.70	0.0116	0.0146	0.0179	0.0023	0.0033	0.0009	1.85	11.01	5.94	2.05	12.16	80.95	2.33	139.57	99.05	98.06
MC 279	Tailings	2.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.70	8.36	3.10	2.44	7.56	83.93	1.92	148.66	98.99	97.99
MC 279	Tailings	7.31	0.0032	0.0198	0.0320	0.0018	0.0055	0.0012	1.46	11.11	7.61	1.69	12.86	91.23	2.32	165.46	98.87	97.82
MC 279	Tailings	3.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.28	10.22	3.12	3.29	10.26	94.23	2.29	177.94	98.79	97.74
MC 279	Tailings	6.20	0.0043	0.0487	0.1038	0.0034	0.0051	0.0018	2.48	16.05	6.47	2.63	17.02	100.43	1.98	195.66	98.66	97.60
MC 279	Tailings	2.43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.72	6.89	2.53	2.79	7.08	102.87	1.92	203.47	98.61	97.54

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 279	Tailings	04-May-04	6.75	10.1	9.57	2.62	2.98	5.03	19.10	4.07	0.30	16.45	0.0222	0.1097	0.2153	0.0095	0.0141	0.0141	233.48	2.31	0.63	0.72	1.21	0.98	0.07
MC 279	Tailings	11-May-04	7.76	9.6	11.50	2.82	1.64	4.57	33.00	3.62	0.26	8.87	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	281.53	3.34	0.82	0.48	1.33	1.05	0.08
MC 279	Tailings	18-May-04	7.28	7.2	8.14	1.81	1.46	3.38	22.70	2.33	0.23	8.01	0.0067	0.0903	0.1617	0.0062	0.0078	0.0078	231.16	1.94	0.43	0.35	0.81	0.56	0.05
MC 279	Tailings	25-May-04	7.18	6.48	7.85	2.30	1.70	3.00	18.23	4.52	0.35	9.77	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	238.87	1.94	0.57	0.42	0.74	1.11	0.09
MC 279	Tailings	01-Jun-04	7.14	9.37	11.11	2.99	2.47	4.27	24.11	5.21	0.73	14.11	0.0090	0.1341	0.2536	0.0060	0.0016	0.0016	250.56	2.87	0.77	0.64	1.11	1.35	0.19
MC 279	Tailings	08-Jun-04	7.55	8.51	9.03	2.11	2.02	4.58	20.29	2.99	0.31	13.86	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	220.62	2.06	0.48	0.46	1.04	0.68	0.07
MC 279	Tailings	15-Jun-04	7.64	12.5	10.10	3.38	2.65	7.01	24.00	4.14	0.39	18.10	0.0043	0.0705	0.0895	0.0091	0.0092	0.0092	219.99	2.29	0.77	0.60	1.59	0.94	0.09
MC 279	Tailings	22-Jun-04	7.08	10.35	10.84	2.77	2.22	5.03	22.36	7.65	0.65	14.72	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	252.08	2.82	0.72	0.58	1.31	1.99	0.17
MC 279	Tailings	29-Jun-04	7.27	9.1	10.10	2.16	1.82	4.28	20.40	7.43	0.51	10.67	0.0109	0.0776	0.1794	0.0109	0.0120	0.0120	242.52	2.53	0.54	0.45	1.07	1.86	0.13
MC 279	Tailings	06-Jul-04	6.89	9.5	10.58	2.23	1.63	3.77	25.21	3.93	0.35	10.82	0.0129	0.1308	0.3676	0.0089	0.0101	0.0101	250.09	2.73	0.58	0.42	0.97	1.01	0.09
MC 281	Tailings	24-Feb-04	7.57	36.4	35.47	18.39	17.70	6.44	118.00	6.09	1.21	91.78	0.0222	0.0115	0.0064	0.0224	0.0161	0.0161	242.55	8.74	4.53	4.36	1.59	1.50	0.30
MC 281	Tailings	02-Mar-04	7.79	17.74	17.01	7.51	6.90	3.40	43.00	2.30	0.47	42.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	236.34	4.08	1.80	1.66	0.82	0.55	0.11
MC 281	Tailings	09-Mar-04	8.16	15.4	14.11	6.02	6.62	3.48	48.00	2.63	0.29	30.70	0.0100	0.0452	0.0960	0.0048	0.0064	0.0064	265.39	3.80	1.62	1.78	0.94	0.71	0.08
MC 281	Tailings	16-Mar-04	8.29	12.5	12.90	5.20	6.56	3.18	43.00	1.86	0.41	19.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	176.88	2.32	0.93	1.18	0.57	0.33	0.07
MC 281	Tailings	23-Mar-04	8.66	10.7	11.05	4.31	6.74	3.17	36.00	4.72	0.61	14.79	0.0519	0.0663	0.2277	0.0109	0.0130	0.0130	210.44	2.36	0.92	1.44	0.68	1.01	0.13
MC 281	Tailings	30-Mar-04	7.71	16.5	15.53	6.60	6.68	3.85	39.00	3.08	0.21	34.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	201.45	3.18	1.35	1.37	0.79	0.63	0.04
MC 281	Tailings	06-Apr-04	8.01	15.3	15.54	5.66	11.45	4.16	36.00	5.13	0.99	29.50	0.0263	0.1179	0.3436	0.0114	0.0149	0.0149	202.82	3.20	1.17	2.36	0.86	1.06	0.20
MC 281	Tailings	13-Apr-04	9.1	8.82	9.19	3.01	4.26	2.12	33.00	4.91	0.85	7.31	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	323.49	3.02	0.99	1.40	0.70	1.61	0.28
MC 281	Tailings	20-Apr-04	8.5	13.7	14.50	5.70	7.29	3.33	45.50	5.15	0.33	22.46	0.0112	0.0432	0.1070	0.0043	0.0109	0.0109	401.24	5.91	2.33	2.97	1.36	2.10	0.13
MC 281	Tailings	27-Apr-04	8.08	9.95	10.22	3.67	3.56	2.41	40.00	4.01	0.29	9.50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	175.88	1.83	0.66	0.64	0.43	0.72	0.05
MC 281	Tailings	04-May-04	8.15	16.5	13.73	5.07	6.81	3.51	56.00	6.67	0.33	20.19	0.0252	0.0596	0.1344	0.0060	0.0115	0.0115	207.91	2.90	1.07	1.44	0.74	1.41	0.07
MC 281	Tailings	11-May-04	7.55	11.2	12.64	4.99	5.41	3.26	41.00	5.27	0.31	11.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	288.05	3.70	1.46	1.58	0.95	1.54	0.09
MC 281	Tailings	18-May-04	8.08	12.6	13.74	4.55	5.36	2.92	43.60	7.89	0.32	14.30	0.0123	0.0653	0.1710	0.0076	0.0047	0.0047	271.36	3.79	1.26	1.48	0.80	2.18	0.09
MC 281	Tailings	25-May-04	8.25	8.74	12.02	3.82	3.02	2.09	32.65	5.38	0.43	11.79	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	216.18	2.64	0.84	0.66	0.46	1.18	0.09
MC 281	Tailings	01-Jun-04	7.48	11.3	12.34	4.25	4.42	2.55	38.94	5.04	0.70	11.08	0.0099	0.0547	0.1528	0.0050	0.0021	0.0021	235.36	2.95	1.02	1.06	0.61	1.21	0.17
MC 281	Tailings	08-Jun-04	7.85	11.14	12.01	4.28	4.38	2.77	37.10	3.85	0.34	13.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	242.53	2.96	1.05	1.08	0.68	0.95	0.08
MC 281	Tailings	15-Jun-04	8.12	12.95	12.51	4.88	4.41	3.30	43.00	3.71	0.44	14.03	0.0100	0.0869	0.2122	0.0072	0.0080	0.0080	216.02	2.75	1.07	0.97	0.72	0.81	0.10
MC 281	Tailings	22-Jun-04	8.35	13.7	16.47	5.62	4.84	3.29	47.00	6.71	3.25	15.86	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	258.2	4.32	1.47	1.27	0.86	1.76	0.85
MC 281	Tailings	29-Jun-04	7.94	11.7	12.26	4.25	3.52	2.79	40.60	5.36	0.39	8.44	0.0142	0.0711	0.2497	0.0114	0.0091	0.0091	234.91	2.93	1.01	0.84	0.67	1.28	0.09
MC 281	Tailings	06-Jul-04	8.11	12.6	14.35	5.17	3.08	2.76	52.00	5.72	0.31	11.69	0.0152	0.0738	0.2276	0.0057	0.0082	0.0082	240.73	3.51	1.26	0.75	0.67	1.40	0.08
MC 38	GN	24-Feb-04	7.12	3.84	2.69	0.14	3.55	0.46	12.50	2.53	0.05	1.39	0.0129	0.1117	0.0189	0.0016	0.0091	0.0091	408.96	1.10	0.06	1.45	0.19	1.03	0.02
MC 38	GN	02-Mar-04	6.68	7.1	9.28	1.71	5.86	1.51	25.90	5.04	0.25	7.26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	404.16	3.75	0.69	2.36	0.61	2.03	0.10
MC 38	GN	09-Mar-04	7.31	5	6.07	1.07	4.08	1.25	19.00	3.18	0.14	4.26	0.0060	0.3066	0.0225	0.0034	0.0132	0.0132	424.27	2.57	0.45	1.73	0.53	1.35	0.06
MC 38	GN	16-Mar-04	7.12	4.4	6.02	0.95	2.96	1.40	19.00	1.43	0.05	2.55	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	408.88	2.46	0.39	1.21	0.57	0.58	0.02
MC 38	GN	23-Mar-04	6.97	2.84	4.64	0.85	2.76	1.30	14.00	2.49	0.09	2.67	0.0300	0.2176	0.0468	0.0021	0.0101	0.0101	435.29	2.02	0.37	1.20	0.57	1.08	0.04
MC 38	GN	30-Mar-04	6.41	2.4	3.67	1.15	2.35	0.82	7.60	3.65	0.07	5.15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	441.41	1.62	0.51	1.04	0.36	1.61	0.03
MC 38	GN	06-Apr-04	6.69	3.94	3.06	0.30	2.03	0.99	12.00	2.04	0.11	0.90	0.0234	0.2421	0.0490	0.0020	0.0134	0.0134	439.48	1.34	0.13	0.89	0.43	0.90	0.05
MC 38	GN	13-Apr-04	8.18	5.72	5.59	0.51	4.30	1.15	25.60	1.53	0.00	1.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	472.1	2.64	0.24	2.03	0.54	0.72	0.00
MC 38	GN	20-Apr-04	6.18	3.4	3.10	0.25	2.89	0.80	13.54	0.53	0.04	0.61	0.0141	0.2524	0.0590	0.0038	0.0125	0.0125	416	1.29	0.10	1.20	0.33	0.22	0.02
MC 38	GN	27-Apr-04	6.54	1.05	3.01	0.74	1.41	0.51	5.50	2.33	0.05	3.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	407.78	1.23	0.30	0.58	0.21	0.95	0.02
MC 38	GN	04-May-04	8.33	4.4	4.75	0.27	2.26	1.00	17.10	1.54	0.02	0.62	0.0242	0.1023	0.0124	0.0053	0.0165	0.0165	389.75	1.85	0.11	0.88	0.39	0.60	0.01
MC 38	GN	11-May-04	6.76	3.64	6.61	1.15	1.53	0.94	16.00	2.23	0.07	4.03	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	396.87	2.62	0.46	0.61	0.37	0.88	0.03
MC 38	GN	18-May-04	6.87	2.82	5.06	0.88	1.37	0.65	11.00	3.45	0.10	5.60	0.0076	0.1378	0.0219	0.0023	0.0053	0.0053	401.83	2.03	0.35	0.55	0.26	1.38	0.04
MC 38	GN	25-May-04	6.85	2.64	4.64	0.87	1.43	0.71	10.18	2.85	0.04	3.29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	405.6	1.88	0.35	0.58	0.29	1.15	0.02
MC 38	GN	01-Jun-04	7.33	2.67	4.69	0.88	1.28	0.80	12.00	2.45	0.05	3.31	0.0099	0.1624	0.0359	0.0018	0.0060	0.0060	403.17	1.89	0.35	0.52	0.32	0.99	0.02
MC 38	GN	08-Jun-04	6.5	2.5	3.58	0.11	1.15	0.63	10.49	0.68	0.03	0.39	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	409.998	1.46	0.05	0.47	0.26	0.28	0.01

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week		mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg/kg		mg $CaCO_3$/kg		
MC 279	Tailings	3.96	0.0054	0.0264	0.0519	0.0023	0.0034	0.0009	2.02	8.36	4.13	2.15	8.87	106.83	1.82	212.20	98.55	97.44
MC 279	Tailings	2.58	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.36	11.71	2.68	4.13	11.08	109.40	2.09	224.47	98.47	97.38
MC 279	Tailings	1.91	0.0016	0.0215	0.0386	0.0015	0.0019	0.0007	3.33	6.63	1.99	3.34	6.64	111.31	1.96	231.87	98.42	97.34
MC 279	Tailings	2.41	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.86	7.16	2.51	2.67	6.69	113.72	1.94	238.87	98.37	97.28
MC 279	Tailings	3.65	0.0023	0.0347	0.0655	0.0016	0.0004	0.0007	2.73	10.36	3.80	2.63	9.98	117.37	1.92	248.90	98.30	97.19
MC 279	Tailings	3.15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.16	7.11	3.29	2.27	7.47	120.52	2.04	256.81	98.25	97.12
MC 279	Tailings	4.11	0.0010	0.0160	0.0203	0.0021	0.0021	0.0003	2.08	8.89	4.28	2.12	9.07	124.63	2.06	266.54	98.18	97.02
MC 279	Tailings	3.83	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.51	10.00	3.99	2.50	9.97	128.46	1.91	276.34	98.11	96.93
MC 279	Tailings	2.67	0.0027	0.0194	0.0449	0.0027	0.0030	0.0018	3.07	8.54	2.78	3.12	8.67	131.13	1.96	284.23	98.06	96.86
MC 279	Tailings	2.79	0.0033	0.0337	0.0948	0.0023	0.0026	0.0016	3.16	9.19	2.91	3.09	8.98	133.92	1.86	293.64	98.00	96.79
MC 281	Tailings	22.62	0.0055	0.0028	0.0016	0.0055	0.0040	0.0021	1.72	40.49	23.57	1.42	33.36	22.62	1.34	52.65	99.79	89.18
MC 281	Tailings	10.28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.65	17.62	10.71	1.39	14.86	32.90	1.38	73.68	99.71	84.26
MC 281	Tailings	8.28	0.0027	0.0122	0.0259	0.0013	0.0017	0.0015	1.88	16.18	8.63	1.69	14.59	41.17	1.44	95.25	99.63	80.30
MC 281	Tailings	3.56	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.60	9.64	3.71	2.45	9.09	44.73	1.46	106.69	99.58	78.60
MC 281	Tailings	3.16	0.0111	0.0142	0.0487	0.0023	0.0028	0.0021	2.94	9.69	3.30	3.01	9.91	47.90	1.53	117.68	99.54	77.08
MC 281	Tailings	7.02	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.85	13.50	7.32	1.63	11.93	54.92	1.36	132.98	99.48	73.72
MC 281	Tailings	6.08	0.0054	0.0243	0.0708	0.0024	0.0031	0.0026	2.02	12.80	6.33	2.25	14.24	61.00	1.42	146.73	99.43	70.82
MC 281	Tailings	2.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.64	11.61	2.50	4.59	11.49	63.40	1.61	160.08	99.37	69.67
MC 281	Tailings	9.16	0.0046	0.0176	0.0436	0.0018	0.0045	0.0028	2.55	24.34	9.54	2.41	22.98	72.55	1.50	188.17	99.26	65.29
MC 281	Tailings	1.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.11	7.26	1.77	3.67	6.50	74.25	1.43	197.09	99.23	64.47
MC 281	Tailings	4.27	0.0053	0.0126	0.0284	0.0013	0.0024	0.0016	2.62	11.65	4.44	2.55	11.33	78.52	1.44	213.36	99.16	62.43
MC 281	Tailings	3.51	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.17	15.25	3.65	3.81	13.91	82.02	1.33	229.01	99.10	60.75
MC 281	Tailings	3.94	0.0034	0.0180	0.0471	0.0021	0.0013	0.0025	3.56	14.63	4.11	3.34	13.71	85.97	1.43	245.14	99.04	58.87
MC 281	Tailings	2.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.73	10.05	2.70	3.20	8.63	88.56	1.46	255.01	99.00	57.63
MC 281	Tailings	2.65	0.0024	0.0131	0.0365	0.0012	0.0005	0.0012	4.18	11.55	2.76	3.79	10.46	91.20	1.32	267.09	98.95	56.36
MC 281	Tailings	3.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.50	11.73	3.35	3.17	10.62	94.42	1.39	279.58	98.91	54.82
MC 281	Tailings	3.08	0.0022	0.0191	0.0466	0.0016	0.0018	0.0018	3.51	11.27	3.21	3.08	9.89	97.50	1.43	292.23	98.86	53.35
MC 281	Tailings	4.16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.89	16.85	4.34	3.38	14.66	101.66	1.48	308.89	98.79	51.36
MC 281	Tailings	2.01	0.0034	0.0170	0.0596	0.0027	0.0022	0.0034	5.47	11.48	2.10	4.76	9.99	103.68	1.40	320.68	98.74	50.39
MC 281	Tailings	2.86	0.0037	0.0181	0.0557	0.0014	0.0020	0.0027	4.69	13.97	2.98	3.78	11.27	106.54	1.43	336.38	98.68	49.03
MC 38	GN	0.57	0.0053	0.0456	0.0077	0.0007	0.0037	0.0004	5.03	2.97	0.59	10.38	6.14	0.57	1.24	5.70	99.94	99.94
MC 38	GN	2.93	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.99	12.20	3.05	5.01	15.30	3.50	1.16	19.21	99.78	99.61
MC 38	GN	1.81	0.0026	0.1299	0.0095	0.0015	0.0056	0.0006	4.41	8.29	1.88	5.78	10.87	5.30	1.27	29.14	99.67	99.41
MC 38	GN	1.04	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	7.12	7.73	1.09	8.76	9.51	6.35	1.24	37.99	99.57	99.29
MC 38	GN	1.16	0.0130	0.0946	0.0203	0.0009	0.0044	0.0002	5.42	6.56	1.21	6.93	8.39	7.51	1.21	45.29	99.49	99.16
MC 38	GN	2.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.59	6.14	2.37	2.86	6.76	9.78	1.12	51.01	99.43	98.91
MC 38	GN	0.40	0.0103	0.1063	0.0215	0.0009	0.0059	0.0005	9.46	3.90	0.41	14.23	5.86	10.17	1.17	56.69	99.36	98.86
MC 38	GN	0.53	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	13.64	7.57	0.56	21.06	11.70	10.71	1.43	69.32	99.22	98.80
MC 38	GN	0.25	0.0059	0.1049	0.0245	0.0016	0.0052	0.0016	13.80	3.64	0.26	23.70	6.26	10.96	1.08	75.21	99.15	98.77
MC 38	GN	1.46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.82	4.30	1.52	3.01	4.59	12.42	1.14	78.97	99.11	98.61
MC 38	GN	0.24	0.0094	0.0399	0.0048	0.0021	0.0064	0.0013	20.09	5.05	0.25	27.94	7.03	12.66	1.45	85.88	99.04	98.58
MC 38	GN	1.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.06	8.42	1.66	5.01	8.34	14.26	1.18	93.89	98.95	98.40
MC 38	GN	2.25	0.0030	0.0553	0.0088	0.0009	0.0021	0.0003	2.79	6.53	2.34	2.82	6.60	16.51	1.20	100.65	98.87	98.15
MC 38	GN	1.33	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.42	6.15	1.39	4.56	6.33	17.84	1.19	106.16	98.81	98.00
MC 38	GN	1.33	0.0040	0.0654	0.0145	0.0007	0.0024	0.0005	4.44	6.17	1.39	4.50	6.25	19.18	1.28	112.38	98.74	97.86
MC 38	GN	0.16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	23.09	3.84	0.17	30.10	5.01	19.34	1.13	116.85	98.69	97.84

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 38	GN	15-Jun-04	7.25	2.8	3.84	0.14	0.95	0.59	11.80	0.72	0.03	0.26	0.0053	0.1348	0.0210	0.0040	0.0139	0.0139	386.72	1.48	0.06	0.37	0.23	0.28	0.01
MC 38	GN	22-Jun-04	6.55	1.97	2.43	0.11	1.52	0.43	7.10	1.28	0.04	0.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	406.52	0.99	0.05	0.62	0.17	0.52	0.02
MC 38	GN	29-Jun-04	6.87	2.8	2.23	0.13	1.18	0.60	7.70	1.23	0.20	0.52	0.0145	0.1589	0.0555	0.0070	0.0257	0.0257	277.38	0.62	0.04	0.33	0.17	0.34	0.06
MC 38	GN	06-Jul-04	6.53	2.45	1.83	0.11	1.32	0.52	8.18	0.83	0.04	0.36	0.0125	0.1997	0.0736	0.0085	0.0183	0.0183	415.65	0.76	0.05	0.55	0.22	0.34	0.02
MC 44	GN	24-Feb-04	7.3	4.08	4.40	0.67	2.88	0.59	11.90	4.83	1.27	0.87	0.0254	0.0600	0.0038	0.0009	0.0098	0.0098	440.04	1.94	0.29	1.27	0.26	2.13	0.56
MC 44	GN	02-Mar-04	6.67	7.3	8.48	0.93	4.54	1.12	18.50	9.07	0.49	4.36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	440.54	3.74	0.41	2.00	0.49	4.00	0.22
MC 44	GN	09-Mar-04	7.4	3.4	4.06	0.94	2.65	0.81	14.00	2.82	0.07	1.97	0.0062	0.3634	0.0465	0.0016	0.0114	0.0114	459.13	1.87	0.43	1.21	0.37	1.29	0.03
MC 44	GN	16-Mar-04	6.84	2.3	3.30	0.63	1.49	0.62	8.00	2.14	0.08	2.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	448.09	1.48	0.28	0.67	0.28	0.96	0.04
MC 44	GN	23-Mar-04	6.13	1.23	2.49	0.56	1.98	0.59	6.10	2.56	0.06	2.20	0.0148	0.0210	0.0069	0.0012	0.0115	0.0115	469.18	1.17	0.26	0.93	0.28	1.20	0.03
MC 44	GN	30-Mar-04	5.78	1.1	2.24	0.83	1.00	0.49	2.50	3.79	0.10	3.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	456.1	1.02	0.38	0.46	0.22	1.73	0.05
MC 44	GN	06-Apr-04	6.53	2.07	1.16	0.13	1.76	0.62	5.92	2.30	0.00	0.30	0.0171	0.0168	0.0272	0.0026	0.0133	0.0133	457.41	0.53	0.06	0.81	0.28	1.05	0.00
MC 44	GN	13-Apr-04	6.62	1.85	1.02	0.16	1.58	0.54	4.20	1.82	0.17	0.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	452.07	0.46	0.07	0.71	0.24	0.82	0.08
MC 44	GN	20-Apr-04	5.66	1.1	0.33	0.02	1.36	0.35	2.32	1.00	0.02	0.40	0.0099	0.0777	0.0412	0.0009	0.0097	0.0097	468.68	0.15	0.01	0.64	0.17	0.47	0.01
MC 44	GN	27-Apr-04	5.74	0.98	2.33	0.62	1.04	0.26	2.20	3.00	0.07	3.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	449.06	1.05	0.28	0.47	0.12	1.35	0.03
MC 44	GN	04-May-04	7.03	2	3.64	0.73	1.27	0.68	4.61	4.18	0.07	3.25	0.0116	0.0258	0.0623	0.0041	0.0181	0.0181	425.08	1.55	0.31	0.54	0.29	1.78	0.03
MC 44	GN	11-May-04	6.31	1.29	2.57	0.50	0.86	0.38	6.36	1.56	0.06	2.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	430.19	1.11	0.21	0.37	0.16	0.67	0.03
MC 44	GN	18-May-04	6.32	1.01	0.21	0.00	1.55	0.27	2.01	0.76	0.04	0.81	0.0062	0.1067	0.0424	0.0012	0.0085	0.0085	436.43	0.09	0.00	0.68	0.12	0.33	0.02
MC 44	GN	25-May-04	6.31	0.89	2.58	0.63	1.03	0.36	4.48	2.91	0.03	2.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	414.58	1.07	0.26	0.43	0.15	1.21	0.01
MC 44	GN	01-Jun-04	6.26	1.29	0.88	0.12	1.00	0.53	3.38	1.41	0.04	0.33	0.0256	0.0850	0.0330	0.0010	0.0100	0.0100	439.56	0.39	0.05	0.44	0.23	0.62	0.02
MC 44	GN	08-Jun-04	6.02	0.91	0.35	0.01	1.49	0.30	2.08	1.38	0.15	0.14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	440.04	0.15	0.00	0.65	0.13	0.61	0.07
MC 44	GN	15-Jun-04	6.34	0.96	0.32	0.01	1.01	0.41	3.60	0.37	0.01	0.07	0.0050	0.0725	0.0307	0.0021	0.0138	0.0138	421.76	0.13	0.00	0.43	0.17	0.16	0.00
MC 44	GN	22-Jun-04	6.4	1.03	0.43	0.04	1.78	0.27	3.30	1.02	0.05	0.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	448.64	0.19	0.02	0.80	0.12	0.46	0.02
MC 44	GN	29-Jun-04	6.11	1.14	0.54	0.02	1.23	0.29	3.40	0.91	0.03	0.15	0.0100	0.0569	0.0207	0.0028	0.0156	0.0156	439.88	0.24	0.01	0.54	0.13	0.40	0.01
MC 44	GN	06-Jul-04	6.22	1.1	0.41	0.02	0.95	0.33	2.17	1.13	0.05	0.30	0.0091	0.0715	0.0288	0.0022	0.0121	0.0121	451.91	0.18	0.01	0.43	0.15	0.51	0.02
MC 58	GN	24-Feb-04	6.98	4.46	4.38	0.40	3.12	0.73	11.70	2.43	0.12	6.40	0.0249	0.1324	0.0200	0.0011	0.0091	0.0091	417.4	1.83	0.17	1.30	0.30	1.01	0.05
MC 58	GN	02-Mar-04	6.97	13.1	14.93	2.17	7.55	3.68	34.10	14.20	0.42	11.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	412.81	6.16	0.90	3.12	1.52	5.86	0.17
MC 58	GN	09-Mar-04	7.33	13.8	18.61	2.53	6.50	2.49	51.00	6.06	0.02	11.18	0.0146	0.0877	0.0111	0.0390	0.0178	0.0178	410.02	7.63	1.04	2.66	1.02	2.48	0.01
MC 58	GN	16-Mar-04	6.34	2.4	3.22	0.69	1.50	0.56	8.20	1.36	0.02	3.31	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	429.27	1.38	0.30	0.64	0.24	0.58	0.01
MC 58	GN	23-Mar-04	6.34	1.84	3.28	0.82	1.64	0.85	6.80	2.65	0.06	3.44	0.0209	0.0363	0.0058	0.0039	0.0102	0.0102	455.62	1.50	0.38	0.75	0.39	1.21	0.03
MC 58	GN	30-Mar-04	6.07	1.4	2.02	0.59	1.21	0.45	3.50	2.26	0.05	2.62	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	447.51	0.90	0.27	0.54	0.20	1.01	0.02
MC 58	GN	06-Apr-04	6.57	2.55	1.83	0.23	1.41	0.78	5.89	2.16	-1.00	1.30	0.0184	0.0209	0.0087	0.0056	0.0123	0.0123	438.26	0.80	0.10	0.62	0.34	0.95	0.00
MC 58	GN	13-Apr-04	6.42	2.12	1.39	0.16	1.83	0.58	5.80	1.77	0.06	0.55	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	429.31	0.60	0.07	0.79	0.25	0.76	0.03
MC 58	GN	20-Apr-04	5.73	1.3	0.38	0.04	1.76	0.47	4.61	0.48	0.03	0.64	0.0102	0.0140	0.0047	0.0011	0.0077	0.0077	443.47	0.17	0.02	0.78	0.21	0.21	0.01
MC 58	GN	27-Apr-04	6.51	1.01	2.27	0.58	0.87	0.33	3.20	2.00	0.06	3.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	430.22	0.98	0.25	0.37	0.14	0.86	0.03
MC 58	GN	04-May-04	6.99	1.8	3.16	0.73	1.56	0.62	6.65	2.98	0.08	4.01	0.0105	0.0339	0.0077	0.0024	0.0278	0.0278	396.32	1.25	0.29	0.62	0.25	1.18	0.03
MC 58	GN	11-May-04	6.45	1.66	2.87	0.54	0.84	0.47	7.64	1.22	0.05	3.13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	410.07	1.18	0.22	0.34	0.19	0.50	0.02
MC 58	GN	18-May-04	6.1	1.19	2.19	0.56	0.81	0.33	3.80	1.90	0.17	2.20	0.0066	0.0091	0.0084	0.0014	0.0060	0.0060	410.76	0.90	0.23	0.33	0.13	0.78	0.07
MC 58	GN	25-May-04	6.42	1.01	2.39	0.59	0.92	0.37	4.29	1.99	0.03	3.07	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	415.09	0.99	0.24	0.38	0.15	0.83	0.01
MC 58	GN	01-Jun-04	6.64	1.39	3.08	0.78	1.26	0.59	6.59	2.82	0.04	3.93	0.0093	0.0325	0.0098	0.0009	0.0081	0.0081	411.83	1.27	0.32	0.52	0.24	1.16	0.02
MC 58	GN	08-Jun-04	6.04	1.1	0.39	0.02	1.00	0.40	2.04	0.81	0.04	0.63	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	417.45	0.16	0.01	0.42	0.17	0.34	0.02
MC 58	GN	15-Jun-04	6.18	1.08	0.29	0.03	0.54	0.42	0.90	0.79	0.02	0.46	0.0068	0.0098	0.0084	0.0028	0.0173	0.0173	406.91	0.12	0.01	0.22	0.17	0.32	0.01
MC 58	GN	22-Jun-04	6.16	1.02	0.35	0.02	0.95	0.36	1.08	1.25	0.08	0.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	419.03	0.15	0.01	0.40	0.15	0.52	0.03
MC 58	GN	29-Jun-04	5.46	1.18	0.59	0.05	0.85	0.29	1.78	1.20	0.17	0.60	0.0111	0.0563	0.0186	0.0027	0.0153	0.0153	414.29	0.24	0.02	0.35	0.12	0.50	0.07
MC 58	GN	06-Jul-04	6.07	1.19	0.48	0.03	0.92	0.55	1.99	1.12	0.12	0.80	0.0106	0.1023	0.0279	0.0033	0.0233	0.0233	419.19	0.20	0.01	0.38	0.23	0.47	0.05
MC 64	HF	24-Feb-04	6.62	6.2	1.35	0.21	9.17	0.26	9.40	1.01	0.04	16.60	0.0130	0.1117	0.0885	0.0036	0.0114	0.0114	432.74	0.59	0.09	3.97	0.11	0.44	0.02
MC 64	HF	02-Mar-04	6.44	12.1	8.29	1.60	14.59	0.45	10.70	3.01	0.11	48.32	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	433.86	3.60	0.69	6.33	0.19	1.31	0.05

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*		*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg/kg*		*mg $CaCO_3$/kg*		
MC 38	GN	0.10	0.0021	0.0521	0.0081	0.0016	0.0054	0.0003	37.57	3.93	0.10	45.85	4.80	19.44	1.26	121.51	98.63	97.83
MC 38	GN	0.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	14.22	2.65	0.19	21.61	4.02	19.61	1.14	124.58	98.60	97.81
MC 38	GN	0.14	0.0040	0.0440	0.0154	0.0019	0.0071	0.0030	11.30	1.70	0.15	16.47	2.47	19.76	1.20	126.86	98.57	97.79
MC 38	GN	0.15	0.0052	0.0829	0.0306	0.0035	0.0076	0.0017	13.44	2.09	0.16	21.64	3.37	19.91	1.14	130.42	98.53	97.77
MC 44	GN	0.38	0.0112	0.0264	0.0017	0.0004	0.0043	0.0002	15.18	6.05	0.40	19.90	7.94	0.38	1.53	5.64	99.94	99.91
MC 44	GN	1.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.51	11.03	2.00	7.15	14.32	2.30	1.40	15.79	99.82	99.44
MC 44	GN	0.90	0.0028	0.1668	0.0214	0.0007	0.0053	0.0002	6.83	6.44	0.94	8.26	7.78	3.21	1.55	23.16	99.74	99.23
MC 44	GN	0.99	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.72	4.85	1.03	5.36	5.50	4.19	1.44	27.77	99.69	98.99
MC 44	GN	1.03	0.0069	0.0098	0.0032	0.0006	0.0054	0.0000	3.73	4.01	1.08	4.93	5.30	5.23	1.29	31.71	99.64	98.74
MC 44	GN	1.64	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.41	4.11	1.71	2.25	3.83	6.86	1.21	34.55	99.61	98.34
MC 44	GN	0.14	0.0078	0.0077	0.0125	0.0012	0.0061	0.0001	10.90	1.56	0.14	24.06	3.44	7.00	1.37	37.40	99.58	98.31
MC 44	GN	0.04	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	38.48	1.45	0.04	80.22	3.02	7.04	1.39	39.34	99.56	98.30
MC 44	GN	0.19	0.0046	0.0364	0.0193	0.0004	0.0046	0.0008	2.16	0.42	0.20	10.16	1.99	7.22	1.19	40.62	99.54	98.25
MC 44	GN	1.45	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.50	3.76	1.51	2.51	3.79	8.67	1.21	43.12	99.52	97.91
MC 44	GN	1.38	0.0049	0.0110	0.0265	0.0017	0.0077	0.0011	3.57	5.14	1.44	3.76	5.41	10.05	1.48	46.52	99.48	97.57
MC 44	GN	1.15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.05	3.64	1.20	3.15	3.77	11.20	1.33	50.45	99.43	97.29
MC 44	GN	0.35	0.0027	0.0466	0.0185	0.0005	0.0037	0.0006	0.62	0.23	0.37	5.03	1.85	11.55	1.33	51.69	99.42	97.21
MC 44	GN	1.21	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.97	3.75	1.26	3.01	3.80	12.76	1.33	54.81	99.38	96.92
MC 44	GN	0.15	0.0113	0.0374	0.0145	0.0004	0.0044	0.0017	7.82	1.18	0.15	14.69	2.22	12.91	1.32	56.45	99.37	96.88
MC 44	GN	0.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	6.21	0.40	0.06	30.79	1.98	12.97	1.26	57.43	99.35	96.87
MC 44	GN	0.03	0.0021	0.0306	0.0129	0.0009	0.0058	0.0003	11.38	0.35	0.03	48.45	1.49	13.00	1.33	58.98	99.34	96.86
MC 44	GN	0.12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.33	0.55	0.13	18.82	2.38	13.12	1.34	60.59	99.32	96.83
MC 44	GN	0.07	0.0044	0.0250	0.0091	0.0012	0.0069	0.0034	9.31	0.64	0.07	28.19	1.94	13.19	1.28	62.15	99.30	96.81
MC 44	GN	0.14	0.0041	0.0323	0.0130	0.0010	0.0055	0.0017	3.50	0.49	0.14	11.24	1.59	13.32	1.31	63.27	99.29	96.78
MC 58	GN	2.67	0.0104	0.0553	0.0083	0.0005	0.0038	0.0002	1.89	5.26	2.78	2.80	7.79	2.67	1.30	7.67	99.90	99.04
MC 58	GN	4.83	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.79	19.08	5.03	4.79	24.13	7.50	1.30	26.78	99.66	97.77
MC 58	GN	4.58	0.0060	0.0360	0.0045	0.0160	0.0073	0.0024	4.88	23.32	4.78	5.48	26.17	12.09	1.37	52.46	99.34	96.57
MC 58	GN	1.42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.16	4.68	1.48	3.49	5.16	13.51	1.18	57.46	99.28	96.19
MC 58	GN	1.57	0.0095	0.0166	0.0026	0.0018	0.0047	0.0000	3.23	5.28	1.63	3.59	5.86	15.07	1.18	62.20	99.22	95.78
MC 58	GN	1.17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.74	3.35	1.22	3.02	3.69	16.25	1.13	64.98	99.18	95.47
MC 58	GN	0.57	0.0081	0.0091	0.0038	0.0024	0.0054	0.0008	4.08	2.42	0.59	6.38	3.79	16.82	1.23	68.16	99.14	95.32
MC 58	GN	0.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	7.21	1.77	0.25	14.32	3.52	17.05	1.20	70.89	99.11	95.26
MC 58	GN	0.28	0.0045	0.0062	0.0021	0.0005	0.0034	0.0007	1.69	0.50	0.30	8.07	2.39	17.34	1.07	73.23	99.08	95.19
MC 58	GN	1.37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.43	3.47	1.43	2.41	3.44	18.70	1.21	76.04	99.04	94.83
MC 58	GN	1.59	0.0042	0.0134	0.0031	0.0009	0.0110	0.0008	2.61	4.32	1.66	2.89	4.79	20.29	1.30	80.33	98.99	94.41
MC 58	GN	1.28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.88	3.85	1.34	2.95	3.94	21.58	1.20	84.80	98.93	94.07
MC 58	GN	0.90	0.0027	0.0038	0.0035	0.0006	0.0025	0.0005	3.38	3.19	0.94	3.33	3.13	22.48	1.14	87.30	98.90	93.84
MC 58	GN	1.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.63	3.49	1.33	2.64	3.51	23.75	1.20	90.41	98.86	93.50
MC 58	GN	1.62	0.0038	0.0134	0.0040	0.0004	0.0033	0.0005	2.67	4.50	1.69	2.74	4.61	25.37	1.24	94.81	98.80	93.08
MC 58	GN	0.26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.60	0.44	0.27	5.56	1.52	25.64	1.13	95.94	98.79	93.01
MC 58	GN	0.19	0.0028	0.0040	0.0034	0.0011	0.0070	0.0003	1.72	0.34	0.20	5.06	0.99	25.82	1.15	96.50	98.78	92.96
MC 58	GN	0.28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.40	0.41	0.29	4.90	1.43	26.10	1.15	97.24	98.77	92.89
MC 58	GN	0.25	0.0046	0.0233	0.0077	0.0011	0.0063	0.0029	2.68	0.69	0.26	5.92	1.53	26.35	1.02	98.24	98.76	92.82
MC 58	GN	0.34	0.0044	0.0429	0.0117	0.0014	0.0097	0.0021	1.62	0.56	0.35	4.69	1.64	26.69	1.13	99.42	98.75	92.73
MC 64	HF	7.18	0.0056	0.0483	0.0383	0.0016	0.0050	0.0150	0.24	1.83	7.48	1.37	10.25	7.18	2.14	11.55	76.89	97.85
MC 64	HF	20.96	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.54	11.83	21.84	1.05	23.01	28.15	2.08	38.04	23.92	92.35

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 64	HF	09-Mar-04	7.69	17.3	17.14	2.90	15.47	0.56	42.00	6.33	0.28	44.40	0.0092	0.0455	0.0254	0.0148	0.0169	0.0169	466.88	8.00	1.35	7.22	0.26	2.96	0.13
MC 64	HF	16-Mar-04	6.88	7.1	6.89	1.24	6.95	0.40	6.00	1.58	0.06	24.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	446.55	3.08	0.55	3.10	0.18	0.71	0.03
MC 64	HF	23-Mar-04	6.22	4.32	4.17	0.92	4.13	0.45	5.20	1.91	0.16	13.10	0.0290	0.0345	0.0747	0.0107	0.0128	0.0128	476.64	1.99	0.44	1.97	0.22	0.91	0.08
MC 64	HF	30-Mar-04	6.59	6.2	6.48	1.29	3.38	0.29	1.90	1.88	0.05	25.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	461.42	2.99	0.59	1.56	0.13	0.87	0.02
MC 64	HF	06-Apr-04	6.24	10.5	7.33	1.18	7.41	0.34	1.15	1.95	0.00	40.20	0.0194	0.0210	0.1591	0.0487	0.0310	0.0310	447.97	3.29	0.53	3.32	0.15	0.87	0.00
MC 64	HF	13-Apr-04	6.35	10.26	7.09	1.26	10.00	0.45	7.20	1.34	0.07	35.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	447.78	3.17	0.56	4.48	0.20	0.60	0.03
MC 64	HF	20-Apr-04	5.47	9.4	6.82	1.19	8.86	0.45	1.09	0.61	0.02	39.44	0.0167	0.0201	0.0782	0.0471	0.0283	0.0283	475.49	3.24	0.56	4.21	0.22	0.29	0.01
MC 64	HF	27-Apr-04	5.88	8.04	7.09	1.53	2.98	0.37	2.10	1.92	0.07	29.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	447.5	3.17	0.69	1.33	0.16	0.86	0.03
MC 64	HF	04-May-04	5.95	13.5	9.88	1.74	7.43	0.40	2.51	0.39	0.02	50.32	0.0248	0.0092	0.2489	0.1451	0.0770	0.0770	448.41	4.43	0.78	3.33	0.18	0.17	0.01
MC 64	HF	11-May-04	5.93	12.3	10.85	2.26	7.13	0.37	3.21	1.24	0.03	48.14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	443.11	4.81	1.00	3.16	0.16	0.55	0.01
MC 64	HF	18-May-04	5.68	12.8	11.60	2.67	6.48	0.31	2.10	0.81	0.04	51.06	0.0087	0.0102	0.5497	0.1103	0.0567	0.0567	431.52	5.01	1.15	2.80	0.14	0.35	0.02
MC 64	HF	25-May-04	5.4	12.4	11.22	2.74	5.09	0.41	0.96	2.03	0.09	48.29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	431.35	4.84	1.18	2.20	0.18	0.88	0.04
MC 64	HF	01-Jun-04	5.17	13.4	11.38	2.68	5.01	0.41	1.10	1.85	0.02	59.64	0.0109	0.0146	1.2812	0.1484	0.0964	0.0964	434.88	4.95	1.17	2.18	0.18	0.80	0.01
MC 64	HF	08-Jun-04	4.48	12.85	8.68	2.26	5.80	0.43	-1.00	1.64	0.09	56.89	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	432.59	3.76	0.98	2.51	0.18	0.71	0.04
MC 64	HF	15-Jun-04	4.14	15.9	9.59	2.71	4.62	0.31	0.00	0.32	0.03	64.99	0.0186	0.0215	3.6590	0.2479	0.1762	0.1762	421.43	4.04	1.14	1.95	0.13	0.13	0.01
MC 64	HF	22-Jun-04	4.39	13.7	8.26	2.47	5.96	0.38	-1.00	0.59	0.04	66.35	0.0000	0.0030	4.3100	0.1400	0.0000	0.0000	448.35	3.70	1.11	2.67	0.17	0.26	0.02
MC 64	HF	29-Jun-04	4.19	16.8	9.76	3.14	5.48	0.51	0.00	0.97	0.16	74.19	0.0289	0.0344	4.2095	0.2309	0.1539	0.1539	431.32	4.21	1.36	2.36	0.22	0.42	0.07
MC 64	HF	06-Jul-04	4.2	17.9	10.10	3.42	5.55	0.61	0.00	1.07	0.04	79.70	0.0387	0.0414	6.5553	0.2644	0.1765	0.1765	434.83	4.39	1.49	2.41	0.27	0.47	0.02
MC 83	MN	24-Feb-04	6.59	5.99	4.29	0.71	4.83	0.61	4.20	1.54	0.07	20.42	0.0276	0.0043	0.0089	0.0241	0.0203	0.0203	437.6	1.88	0.31	2.11	0.27	0.67	0.03
MC 83	MN	02-Mar-04	5.67	10.6	22.56	3.84	14.41	2.65	35.00	4.76	0.24	49.23	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	444.13	10.02	1.71	6.40	1.18	2.11	0.11
MC 83	MN	09-Mar-04	7.28	5.7	6.27	1.26	3.81	0.78	6.00	2.29	0.02	18.50	0.0081	0.0732	0.0626	0.0033	0.0293	0.0293	460.44	2.89	0.58	1.75	0.36	1.05	0.01
MC 83	MN	16-Mar-04	6.58	5.2	6.61	1.11	2.66	0.83	4.00	1.34	0.06	19.18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	451.89	2.99	0.50	1.20	0.37	0.61	0.03
MC 83	MN	23-Mar-04	5.76	3.58	4.47	0.83	1.74	0.74	3.20	1.74	0.04	11.20	0.0281	0.0268	0.1633	0.0199	0.0238	0.0238	475.19	2.13	0.39	0.83	0.35	0.83	0.02
MC 83	MN	30-Mar-04	6.26	4.3	6.67	1.48	1.61	0.54	2.27	3.73	0.08	19.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	472.24	3.15	0.70	0.76	0.26	1.76	0.04
MC 83	MN	06-Apr-04	5.5	5.31	4.88	0.62	1.82	0.64	1.17	2.24	0.05	17.20	0.0164	0.0111	0.1147	0.0592	0.0429	0.0429	459.62	2.24	0.29	0.84	0.29	1.03	0.02
MC 83	MN	13-Apr-04	6.12	4.7	3.10	0.53	1.87	0.51	1.20	1.21	0.10	10.53	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	451.52	1.40	0.24	0.84	0.23	0.55	0.05
MC 83	MN	20-Apr-04	5.29	4.1	2.81	0.48	2.53	0.56	1.14	0.54	0.02	13.10	0.0122	0.0148	0.0595	0.0438	0.0262	0.0262	460.1	1.29	0.22	1.17	0.26	0.25	0.01
MC 83	MN	27-Apr-04	5.24	2.66	1.61	0.24	1.75	0.30	0.50	0.59	0.02	8.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	450.92	0.73	0.11	0.79	0.14	0.27	0.01
MC 83	MN	04-May-04	5.94	5.9	3.71	0.67	1.66	0.64	0.81	0.42	0.01	21.20	0.0148	0.0019	0.1668	0.1029	0.0641	0.0641	422.5	1.57	0.29	0.70	0.27	0.18	0.00
MC 83	MN	11-May-04	6.01	5.8	5.71	1.12	1.17	0.57	1.20	1.17	0.04	22.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	432.12	2.47	0.48	0.51	0.24	0.51	0.02
MC 83	MN	18-May-04	5.05	6.1	4.35	0.62	1.74	0.52	1.10	0.88	0.06	20.30	0.0142	0.0072	0.4365	0.0805	0.0655	0.0655	435.93	1.90	0.27	0.76	0.22	0.38	0.03
MC 83	MN	25-May-04	5.49	6.7	6.50	1.45	1.29	0.55	0.85	2.69	0.09	31.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	437.73	2.84	0.63	0.56	0.24	1.18	0.04
MC 83	MN	01-Jun-04	5.06	8.39	6.15	1.35	1.58	0.76	1.01	2.94	0.09	33.98	0.0120	0.0141	1.4088	0.1139	0.1222	0.1222	443.11	2.72	0.60	0.70	0.34	1.30	0.04
MC 83	MN	08-Jun-04	4.17	8.31	5.52	1.21	1.80	0.54	-1.00	1.03	0.07	49.71	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	437.61	2.41	0.53	0.79	0.24	0.45	0.03
MC 83	MN	15-Jun-04	4.13	10.8	7.28	1.40	1.83	0.50	0.00	0.33	0.03	66.75	0.0222	0.0153	6.6682	0.1638	0.2362	0.2362	419.09	3.05	0.59	0.77	0.21	0.14	0.01
MC 83	MN	22-Jun-04	4.11	12.2	7.46	1.26	2.63	0.51	-1.00	0.87	0.54	58.35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	438.24	3.27	0.55	1.15	0.22	0.38	0.24
MC 83	MN	29-Jun-04	4.25	12.6	6.84	0.93	1.54	0.55	0.00	1.16	0.04	65.20	0.0270	0.0297	4.4559	0.1561	0.1897	0.1897	440.08	3.01	0.41	0.68	0.24	0.51	0.02
MC 83	MN	06-Jul-04	4.24	14.4	6.02	1.03	1.74	0.68	0.00	1.11	0.03	75.92	0.0442	0.0407	7.2036	0.1743	0.2170	0.2170	441.69	2.66	0.46	0.77	0.30	0.49	0.01
MC 85	HF	24-Feb-04	4.44	8.9	6.71	2.49	2.40	0.20	0.00	1.54	0.14	33.00	0.0292	0.0328	0.1962	0.1069	0.3745	0.3745	436	2.93	1.09	1.05	0.09	0.67	0.06
MC 85	HF	02-Mar-04	4.46	22.1	19.01	7.13	5.46	1.15	0.00	6.01	0.52	84.92	0.0000	0.0000	10.2557	0.0000	0.0000	0.0000	461.35	8.77	3.29	2.52	0.53	2.77	0.24
MC 85	HF	09-Mar-04	5.21	28.9	17.95	5.91	2.10	0.50	1.00	2.09	0.48	156.13	0.0048	0.0771	44.7946	0.4931	0.6117	0.6117	470.83	8.45	2.78	0.99	0.23	0.98	0.23
MC 85	HF	16-Mar-04	5.06	19.5	9.19	2.97	0.97	0.28	1.00	0.94	0.02	95.90	0.0000	0.0000	30.9200	0.0000	0.0000	0.0000	449.67	4.13	1.34	0.43	0.13	0.42	0.01
MC 85	HF	23-Mar-04	4.86	12.2	5.94	1.89	1.79	0.51	1.10	2.15	0.13	56.60	0.0084	0.0342	20.0035	0.1131	0.1282	0.1282	483.44	2.87	0.92	0.87	0.25	1.04	0.06
MC 85	HF	30-Mar-04	5.3	12.7	8.17	2.70	1.39	0.27	1.10	3.09	0.04	59.80	0.0000	0.0000	15.0400	0.0000	0.0000	0.0000	473.55	3.87	1.28	0.66	0.13	1.46	0.02
MC 85	HF	06-Apr-04	5.21	23.2	8.01	2.94	0.76	0.25	1.27	2.21	0.06	94.44	0.0113	0.0511	37.1741	0.2826	0.1582	0.1582	466.22	3.73	1.37	0.36	0.12	1.03	0.03
MC 85	HF	13-Apr-04	4.68	19.43	6.11	2.26	1.77	0.22	1.10	2.03	0.23	77.40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	425.23	2.60	0.96	0.75	0.09	0.86	0.10

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week		mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg $CaCO_3$/kg/wk	mg/kg		mg $CaCO_3$/kg		
MC 64	HF	20.73	0.0043	0.0213	0.0119	0.0069	0.0079	0.0815	1.18	25.56	21.60	1.67	36.05	48.88	2.49	79.25	0.00	99.89
MC 64	HF	10.99	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.87	9.97	11.45	1.28	14.67	59.86	2.23	93.37	0.00	99.87
MC 64	HF	6.24	0.0138	0.0165	0.0356	0.0051	0.0061	0.1224	1.04	6.76	6.51	1.47	9.53	66.11	2.01	102.36	0.00	99.86
MC 64	HF	11.63	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.82	9.92	12.12	0.91	11.04	77.73	2.13	115.35	0.00	99.83
MC 64	HF	18.01	0.0087	0.0094	0.0713	0.0218	0.0139	0.4132	0.55	10.38	18.76	0.83	15.62	95.74	2.02	134.63	0.00	99.79
MC 64	HF	16.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.61	10.24	16.75	1.07	17.94	111.82	2.06	154.61	0.00	99.76
MC 64	HF	18.75	0.0079	0.0095	0.0372	0.0224	0.0134	0.3831	0.53	10.43	19.54	0.90	17.55	130.58	1.77	174.66	0.00	99.72
MC 64	HF	13.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.79	10.75	13.62	0.81	11.04	143.65	1.90	189.23	0.00	99.69
MC 64	HF	22.56	0.0111	0.0041	0.1116	0.0651	0.0345	1.4910	0.61	14.27	23.51	0.79	18.55	166.22	1.93	213.86	0.00	99.64
MC 64	HF	21.33	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.73	16.12	22.23	0.86	19.09	187.55	1.92	237.52	0.00	99.60
MC 64	HF	22.03	0.0037	0.0044	0.2372	0.0476	0.0245	1.1772	0.75	17.25	22.96	0.82	18.77	209.58	1.84	261.38	0.00	99.55
MC 64	HF	20.83	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.78	16.96	21.71	0.79	17.10	230.41	1.75	283.50	0.00	99.50
MC 64	HF	25.94	0.0047	0.0064	0.5572	0.0646	0.0419	1.7733	0.64	17.16	27.02	0.64	17.33	256.35	1.67	311.00	0.00	99.45
MC 64	HF	24.61	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.52	13.40	25.64	0.59	15.08	280.96	1.45	336.21	0.00	99.39
MC 64	HF	27.39	0.0079	0.0091	1.5420	0.1045	0.0743	3.2244	0.52	14.79	28.54	0.51	14.50	308.35	1.34	364.75	0.00	99.34
MC 64	HF	29.75	0.0000	0.0013	1.9324	0.0628	0.0000	0.0000	0.45	13.81	31.00	0.49	15.29	338.10	1.42	395.30	0.00	99.27
MC 64	HF	32.00	0.0125	0.0148	1.8156	0.0996	0.0664	3.1533	0.48	16.09	33.34	0.48	15.94	370.10	1.36	428.64	0.00	99.20
MC 64	HF	34.66	0.0168	0.0180	2.8504	0.1150	0.0768	3.7091	0.47	17.10	36.11	0.46	16.57	404.75	1.36	464.75	0.00	99.13
MC 83	MN	8.94	0.0121	0.0019	0.0039	0.0106	0.0089	0.1440	0.64	5.98	9.31	1.03	9.63	8.94	2.38	11.15	99.95	100.00
MC 83	MN	21.86	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.41	32.05	22.78	1.78	40.48	30.80	2.05	49.47	99.78	99.98
MC 83	MN	8.52	0.0037	0.0337	0.0288	0.0015	0.0135	0.0150	1.08	9.61	8.88	1.29	11.49	39.32	2.63	61.11	99.73	99.97
MC 83	MN	8.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.06	9.53	9.03	1.17	10.56	47.98	2.38	71.95	99.69	99.96
MC 83	MN	5.32	0.0134	0.0127	0.0776	0.0094	0.0113	0.2122	1.25	6.93	5.55	1.36	7.56	53.31	2.08	79.02	99.66	99.95
MC 83	MN	9.30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.11	10.75	9.69	1.02	9.85	62.61	2.26	89.78	99.61	99.94
MC 83	MN	7.91	0.0075	0.0051	0.0527	0.0272	0.0197	0.6871	0.82	6.78	8.24	0.95	7.79	70.51	1.99	98.56	99.57	99.93
MC 83	MN	4.75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.91	4.49	4.95	1.14	5.63	75.27	2.21	104.05	99.55	99.93
MC 83	MN	6.03	0.0056	0.0068	0.0274	0.0201	0.0121	0.5408	0.66	4.13	6.28	0.97	6.09	81.30	1.91	110.86	99.52	99.92
MC 83	MN	3.79	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.57	2.26	3.95	0.94	3.70	85.08	1.89	115.03	99.50	99.92
MC 83	MN	8.96	0.0063	0.0008	0.0705	0.0435	0.0271	1.2741	0.55	5.09	9.33	0.62	5.79	94.04	2.14	124.70	99.46	99.91
MC 83	MN	9.68	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.81	8.16	10.09	0.75	7.58	103.72	2.17	135.31	99.41	99.90
MC 83	MN	8.85	0.0062	0.0031	0.1903	0.0351	0.0286	1.5634	0.63	5.85	9.22	0.72	6.68	112.57	1.82	145.01	99.37	99.89
MC 83	MN	13.66	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.68	9.71	14.24	0.61	8.64	126.23	1.98	159.62	99.31	99.87
MC 83	MN	15.06	0.0053	0.0062	0.6242	0.0505	0.0541	2.9120	0.59	9.27	15.69	0.56	8.76	141.29	1.83	175.75	99.24	99.86
MC 83	MN	21.75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.36	8.22	22.67	0.36	8.05	163.04	1.51	197.98	99.14	99.83
MC 83	MN	27.97	0.0093	0.0064	2.7946	0.0687	0.0990	5.5071	0.34	10.04	29.15	0.33	9.56	191.02	1.49	227.13	99.01	99.80
MC 83	MN	25.57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.39	10.44	26.64	0.41	10.97	216.59	1.48	253.34	98.90	99.78
MC 83	MN	28.69	0.0119	0.0131	1.9609	0.0687	0.0835	7.0685	0.31	9.20	29.90	0.31	9.31	245.28	1.53	283.23	98.77	99.74
MC 83	MN	33.53	0.0195	0.0180	3.1818	0.0770	0.0959	8.9563	0.24	8.52	34.94	0.25	8.70	278.81	1.53	318.17	98.62	99.71
MC 85	HF	14.39	0.0127	0.0143	0.0856	0.0466	0.1633	0.1727	0.79	11.78	14.99	0.65	9.70	14.39	1.71	14.99	70.02	100.00
MC 85	HF	39.18	0.0000	0.0000	4.7315	0.0000	0.0000	0.0000	0.87	35.44	40.82	0.69	28.08	53.56	1.72	55.81	0.00	99.95
MC 85	HF	73.51	0.0023	0.0363	21.0906	0.2322	0.2880	0.6213	0.43	32.56	76.59	0.31	23.55	127.07	2.01	132.88	0.00	99.87
MC 85	HF	43.12	0.0000	0.0000	13.9038	0.0000	0.0000	0.0000	0.35	15.82	44.93	0.25	11.43	170.20	1.95	178.26	0.00	99.83
MC 85	HF	27.36	0.0041	0.0166	9.6705	0.0547	0.0620	0.1789	0.38	10.94	28.51	0.33	9.37	197.56	1.88	207.30	0.00	99.80
MC 85	HF	28.32	0.0000	0.0000	7.1222	0.0000	0.0000	0.0000	0.51	14.93	29.51	0.38	11.26	225.88	2.05	237.33	0.00	99.77
MC 85	HF	44.03	0.0053	0.0238	17.3313	0.1317	0.0738	0.3192	0.33	14.96	45.88	0.22	10.25	269.91	2.01	283.80	0.00	99.72
MC 85	HF	32.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.30	10.44	34.29	0.24	8.25	302.82	1.81	318.56	0.00	99.68

Sample No	Lithology	Date	pH	EC	Ca	Mg	Na	K	Malk	Cl	NO3-N	SO4	Cu	Al	Fe	Mn	Zn	Ni	Volume	Ca_rate	MG_rate	NA_rate	K_rate	Malk_rate	Cl_rate
				mS/m	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*ml*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*	*mg/kg/ week*
MC 85	HF	20-Apr-04	4.3	9.9	4.75	1.60	1.78	0.33	0.00	0.30	0.02	35.52	0.0262	0.0222	8.8569	0.1531	0.0515	0.0515	448.26	2.13	0.72	0.80	0.15	0.13	0.01
MC 85	HF	27-Apr-04	4.86	12.5	7.81	2.07	0.91	0.11	1.10	2.48	0.03	63.19	0.0000	0.0000	18.7005	0.0000	0.0000	0.0000	448.63	3.50	0.93	0.41	0.05	1.11	0.01
MC 85	HF	04-May-04	4.46	44	4.92	2.21	0.84	0.21	0.00	0.39	0.01	237.02	0.0183	0.2046	118.4021	0.3768	0.1527	0.1527	422.13	2.08	0.93	0.35	0.09	0.16	0.00
MC 85	HF	11-May-04	5.26	49.4	9.40	2.59	0.91	0.15	2.20	1.89	0.05	281.15	0.0000	0.0000	132.0000	0.0000	0.0000	0.0000	432.44	4.06	1.12	0.39	0.07	0.82	0.02
MC 85	HF	18-May-04	4.4	45.8	3.40	1.34	1.37	0.09	0.00	5.23	0.07	258.46	0.0208	0.1101	133.0000	0.1253	0.0734	0.0734	435.84	1.48	0.58	0.60	0.04	2.28	0.03
MC 85	HF	25-May-04	4.74	37.1	6.86	2.25	0.72	0.13	0.99	2.31	0.05	184.19	0.0000	0.0000	92.4000	0.0000	0.0000	0.0000	437.93	3.01	0.99	0.32	0.06	1.01	0.02
MC 85	HF	01-Jun-04	4.92	30	7.09	2.30	0.68	0.30	1.18	2.16	0.06	165.91	0.0086	0.1065	73.4397	0.1902	0.0518	0.0518	460.34	3.26	1.06	0.31	0.14	0.99	0.03
MC 85	HF	08-Jun-04	4.3	38.8	7.96	2.64	0.92	0.27	-1.00	0.81	0.06	205.17	0.0000	0.0000	88.9222	0.0000	0.0000	0.0000	434.96	3.46	1.15	0.40	0.12	0.35	0.03
MC 85	HF	15-Jun-04	4.28	46.3	3.47	1.62	0.69	0.09	0.00	0.14	0.12	270.14	0.0153	0.1698	140.2459	0.2056	0.0948	0.0948	426.61	1.48	0.69	0.29	0.04	0.06	0.05
MC 85	HF	22-Jun-04	3.95	36.05	6.00	1.94	1.66	0.23	-1.00	3.59	0.09	191.16	0.0000	0.0000	87.5000	0.0000	0.0000	0.0000	470.45	2.82	0.91	0.78	0.11	1.69	0.04
MC 85	HF	29-Jun-04	4.41	47.3	6.34	2.02	1.99	0.28	0.00	2.58	0.08	264.03	0.0235	0.1224	127.3988	0.2323	0.0872	0.0872	460	2.92	0.93	0.91	0.13	1.19	0.04
MC 85	HF	06-Jul-04	4.24	16	4.62	1.47	1.84	0.36	0.00	2.14	0.05	72.56	0.0380	0.0648	26.5137	0.1880	0.0542	0.0542	450.79	2.08	0.66	0.83	0.16	0.96	0.02
MC 95	DM	24-Feb-04	7.16	144	383.84	2.47	5.24	1.07	10.80	0.99	0.06	900.93	0.0587	-0.0040	0.0078	0.0172	0.0259	0.0259	477.97	183.28	1.18	2.50	0.51	0.47	0.03
MC 95	DM	02-Mar-04	6.89	219	685.40	4.00	6.05	1.88	18.30	2.31	0.11	1497.88	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	441.99	302.64	1.77	2.67	0.83	1.02	0.05
MC 95	DM	09-Mar-04	7.07	206	639.58	2.32	3.46	0.90	11.00	1.18	0.02	1550.92	0.0136	0.0059	0.0085	0.0076	0.0122	0.0122	474.76	303.34	1.10	1.64	0.43	0.56	0.01
MC 95	DM	16-Mar-04	7.2	204	616.13	1.86	2.33	0.78	11.00	0.80	0.06	1308.61	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	451.25	277.75	0.84	1.05	0.35	0.36	0.03
MC 95	DM	23-Mar-04	6.65	142	406.70	1.55	2.40	0.62	7.30	1.71	0.07	880.00	0.0272	0.0129	0.0129	0.0128	0.0110	0.0110	489.43	198.85	0.76	1.17	0.30	0.84	0.03
MC 95	DM	30-Mar-04	6.58	154	432.47	1.94	1.32	0.42	6.20	1.97	0.02	950.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	456.15	197.07	0.88	0.60	0.19	0.90	0.01
MC 95	DM	06-Apr-04	6.78	209	601.23	1.95	1.97	0.85	14.70	1.31	0.00	1281.74	0.0297	0.0031	0.0197	0.0129	0.0152	0.0152	468.19	281.21	0.91	0.92	0.40	0.61	0.00
MC 95	DM	13-Apr-04	7	200	629.49	1.94	4.58	0.80	12.80	1.64	0.17	1383.84	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	459.11	288.71	0.89	2.10	0.37	0.75	0.08
MC 95	DM	20-Apr-04	6.13	177	457.85	1.28	2.99	0.60	4.28	0.62	0.00	998.36	0.0378	0.0061	0.0159	0.0156	0.0260	0.0260	479.23	219.20	0.61	1.43	0.29	0.30	0.00
MC 95	DM	27-Apr-04	6.3	94.6	224.63	1.68	1.38	0.33	3.10	2.96	0.06	519.04	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	452.22	101.48	0.76	0.62	0.15	1.34	0.03
MC 95	DM	04-May-04	6.94	210	557.04	1.08	1.72	0.71	10.80	0.13	0.01	1345.41	0.0479	-0.0040	0.0667	0.0131	0.0220	0.0220	435.66	242.44	0.47	0.75	0.31	0.06	0.00
MC 95	DM	11-May-04	6.53	210	617.89	1.50	1.30	0.69	11.35	0.94	0.10	1330.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	439.5	271.29	0.66	0.57	0.30	0.41	0.04
MC 95	DM	18-May-04	6.96	192	502.38	1.93	1.73	0.66	10.40	0.72	0.04	1200.51	0.0153	0.0033	0.2573	0.0067	0.0095	0.0095	461.11	231.42	0.89	0.80	0.30	0.33	0.02
MC 95	DM	25-May-04	6.26	195	529.59	1.98	1.71	0.51	4.20	2.55	0.04	1227.63	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	439.24	232.38	0.87	0.75	0.22	1.12	0.02
MC 95	DM	01-Jun-04	6.75	187	529.28	1.91	1.34	0.56	5.45	2.59	0.04	1212.93	0.0177	-0.0040	0.0208	0.0062	0.0121	0.0121	441	233.18	0.84	0.59	0.25	1.14	0.02
MC 95	DM	08-Jun-04	5.56	179.4	488.86	0.91	1.85	0.59	2.24	0.55	0.32	1147.87	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	477.01	232.96	0.43	0.88	0.28	0.26	0.15
MC 95	DM	15-Jun-04	5.39	187.6	530.40	0.72	0.83	0.47	1.80	0.26	0.03	1256.40	0.0327	0.0054	0.0348	0.0156	0.0204	0.0204	432.92	229.39	0.31	0.36	0.20	0.11	0.01
MC 95	DM	22-Jun-04	6.33	203.6	614.37	1.07	2.42	0.54	3.22	1.15	0.09	1397.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	453.45	278.31	0.48	1.10	0.24	0.52	0.04
MC 95	DM	29-Jun-04	6.32	189	530.89	0.88	1.34	0.51	2.00	1.74	0.23	1319.91	0.0545	0.0037	0.0521	0.0157	0.0326	0.0326	440.44	233.59	0.39	0.59	0.22	0.77	0.10
MC 95	DM	06-Jul-04	6.17	198.3	565.89	0.89	1.58	0.59	4.17	0.90	0.10	1498.29	0.0592	0.0045	0.0413	0.0173	0.0307	0.0307	477.79	270.11	0.42	0.76	0.28	0.43	0.05

Sample No	Lithology	SO4_rate	Cu_rate	Al_rate	Fe_rate	Mn_rate	Zn_rate	Ni_rate	Carbonate Molar Ratio	Carbonate Ratio NP Consumption	NP Consumption	Feldspar Molar Ratio	Feldspar Total NP Consumption	Cumalative SO4	NAGpH_ratio	Overal_NP Consumption	Remaining_NP_%	Remaining_%S
		mg/kg/week	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*	*mg/kg/week*		*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg $CaCO_3$/kg/wk*	*mg/kg*		*mg $CaCO_3$/kg*		
MC 85	HF	15.92	0.0118	0.0100	3.9702	0.0686	0.0231	0.0677	0.50	8.28	16.59	0.44	7.24	318.74	1.66	335.15	0.00	99.66
MC 85	HF	28.35	0.0000	0.0000	8.3896	0.0000	0.0000	0.0000	0.43	12.56	29.54	0.33	9.71	347.09	1.88	365.18	0.00	99.63
MC 85	HF	100.05	0.0077	0.0864	49.9811	0.1591	0.0645	0.0986	0.09	9.03	104.25	0.06	6.08	447.15	1.72	469.43	0.00	99.52
MC 85	HF	121.58	0.0000	0.0000	57.0821	0.0000	0.0000	0.0000	0.12	14.77	126.68	0.09	11.09	568.73	2.03	597.06	0.00	99.39
MC 85	HF	112.65	0.0091	0.0480	57.9667	0.0546	0.0320	0.1143	0.05	6.11	117.37	0.04	5.05	681.38	1.70	714.44	0.00	99.27
MC 85	HF	80.66	0.0000	0.0000	40.4647	0.0000	0.0000	0.0000	0.14	11.57	84.04	0.10	8.27	762.04	1.83	798.92	0.00	99.18
MC 85	HF	76.38	0.0040	0.0490	33.8072	0.0876	0.0238	0.0918	0.16	12.52	79.58	0.11	9.01	838.41	1.90	879.04	0.00	99.10
MC 85	HF	89.24	0.0000	0.0000	38.6776	0.0000	0.0000	0.0688	0.14	13.38	92.98	0.10	9.67	927.65	1.66	971.59	0.00	99.00
MC 85	HF	115.24	0.0065	0.0724	59.8303	0.0877	0.0404	0.2492	0.05	6.54	120.08	0.04	4.38	1042.89	1.65	1091.67	0.00	98.88
MC 85	HF	89.93	0.0000	0.0000	41.1644	0.0000	0.0000	0.0000	0.12	10.81	93.70	0.09	8.90	1132.82	1.53	1184.90	0.00	98.78
MC 85	HF	121.45	0.0108	0.0563	58.6035	0.1069	0.0401	0.0880	0.09	11.11	126.55	0.07	9.44	1254.28	1.70	1311.45	0.00	98.65
MC 85	HF	32.71	0.0171	0.0292	11.9521	0.0847	0.0244	0.0598	0.23	7.93	34.08	0.21	7.22	1286.98	1.64	1345.53	0.00	98.61
MC 95	DM	430.19	0.0280	0.0000	0.0037	0.0082	0.0124	0.0022	1.03	462.55	448.24	1.04	463.95	430.19	1.32	453.39	0.00	98.44
MC 95	DM	661.39	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.11	763.04	689.13	1.11	762.88	1091.58	1.27	1150.61	0.00	95.99
MC 95	DM	735.58	0.0065	0.0028	0.0040	0.0036	0.0058	0.0008	0.99	762.06	766.44	0.99	761.89	1827.16	1.30	1922.26	0.00	93.27
MC 95	DM	589.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.13	697.06	614.67	1.13	696.57	2417.07	1.33	2541.89	0.00	91.08
MC 95	DM	430.27	0.0133	0.0063	0.0063	0.0063	0.0054	0.0003	1.11	499.70	448.32	1.11	499.68	2847.34	1.23	2993.78	0.00	89.49
MC 95	DM	432.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.10	495.79	451.07	1.09	493.85	3280.25	1.21	3447.68	0.00	87.89
MC 95	DM	599.50	0.0139	0.0015	0.0092	0.0060	0.0071	0.0010	1.13	706.00	624.65	1.13	704.99	3879.75	1.25	4079.20	0.00	85.67
MC 95	DM	634.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.10	724.66	661.33	1.10	726.26	4514.45	1.29	4746.40	0.00	83.32
MC 95	DM	477.97	0.0181	0.0029	0.0076	0.0075	0.0124	0.0028	1.10	549.91	498.02	1.11	551.04	4992.42	1.13	5246.47	0.00	81.55
MC 95	DM	234.49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.05	256.54	244.32	1.04	255.05	5226.90	1.16	5492.19	0.00	80.68
MC 95	DM	585.56	0.0208	0.0000	0.0290	0.0057	0.0096	0.0023	1.00	607.35	610.12	1.00	607.64	5812.46	1.28	6107.01	0.00	78.51
MC 95	DM	584.07	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.12	680.20	608.57	1.12	679.33	6396.53	1.20	6720.57	0.00	76.35
MC 95	DM	553.02	0.0070	0.0015	0.1185	0.0031	0.0044	0.0013	1.01	581.57	576.22	1.01	580.22	6949.54	1.28	7301.57	0.00	74.30
MC 95	DM	538.69	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.04	583.90	561.29	1.04	582.42	7488.23	1.15	7864.70	0.00	72.30
MC 95	DM	534.37	0.0078	0.0000	0.0091	0.0027	0.0053	0.0008	1.05	585.77	556.79	1.05	584.09	8022.60	1.25	8423.89	0.00	70.32
MC 95	DM	547.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.02	583.53	569.95	1.03	584.21	8569.59	1.03	8994.90	0.00	68.30
MC 95	DM	543.38	0.0142	0.0023	0.0151	0.0068	0.0088	0.0009	1.01	574.13	566.17	1.01	574.07	9112.97	0.99	9561.86	0.00	66.29
MC 95	DM	632.95	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.06	697.00	659.50	1.06	697.92	9745.92	1.17	10222.82	0.00	63.94
MC 95	DM	580.76	0.0240	0.0016	0.0229	0.0069	0.0143	0.0043	0.97	584.93	605.12	0.97	585.09	10326.68	1.17	10828.82	0.00	61.79
MC 95	DM	715.15	0.0283	0.0022	0.0197	0.0083	0.0146	0.0027	0.91	676.27	745.16	0.91	676.74	11041.83	1.14	11575.97	0.00	59.14

APPENDIX 12:

Geochemical Database of Statistical Parameters of the Whole Rock Geochemistry Results

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
68	333.97	342.15	DM	2003/10/21	Set Point	3/2013	4.57	0.21	0.005	0.12	29.3	0.005	0.03	25.5	0.4	19.2	0.1	17.6	0.0567	5	38	19	17
91	22	31	DM	2003/10/21	Set Point	3/2013	3.86	0.09	0.005	0.32	18.4	0.005	0.01	39.7	8.6	18.6	0.2	4.81	0.0284	5	25	38	155
95	179.02	189.03	DM	2003/10/21	Set Point	3/2013	5.09	0.25	0.005	0.4	20.7	0.14	0.05	34.9	8.8	9.7	0.3	4.61	0.0106	5	183	14	186
142	162.1	172.38	DM	2003/10/21	Set Point	3/2014	4.44	0.11	0.005	0.24	11	0.03	0.005	29.1	4.7	30.8	0.2	14.1	0.09	5	32	56	185
152	90.97	96.55	DM	2003/10/21	Set Point	3/2014	4.59	0.16	0.01	0.24	2.7	0.02	0.005	30.2	7.7	34.9	0.3	14.5	0.2	5	10	40	83
153	135.25	141.61	DM	2003/10/21	Set Point	3/2014	5.04	0.08	0.005	0.28	11.5	0.01	0.01	38.1	6.1	27.6	0.2	9.05	0.07	5	26	22	97
154	106.21	114.06	DM	2003/10/21	Set Point	3/2014	5.65	0.06	0.005	0.19	20.3	0	0.005	32.7	4.1	26.5	0.2	7.55	0.1	5	43	67	31
160	389.05	395.26	DM	2003/10/21	Set Point	3/2014	3.18	0.09	0.005	0.31	17	0	0.04	41.5	7.6	19.4	0.2	5.41	0.01	5	64	64	184
174	211.47	215.1	DM	2003/10/21	Set Point	3/2486	8.21	0.1	0.005	0.16	12.4	0.24	0.005	31.8	7.3	10.5	0.4	7.5	0.02	5	268	145	452
175	215.23	218.5	DM	2003/10/21	Set Point	3/2486	10.48	0.07	0.005	0.14	15.6	0.05	0.005	33.7	7	13	0.3	5.9	0.02	5	188	59	463
192	210.36	214.06	DM	2003/10/21	Set Point	3/2567	0.43	0.31	0.02	0.09	9.89	0.07	1	68	1.4	3.2	0.2	0.25	0.04	5	109	17	240
			DM		**MEAN**		5.05	0.14	0.01	0.23	15.34	0.05	0.11	36.84	5.79	19.40	0.24	8.30	0.06	5.00	89.64	49.18	190.27
			DM		**STDEV**		2.59	0.08	0.00	0.10	7.01	0.08	0.30	11.36	2.83	9.82	0.08	5.15	0.06	0.00	86.01	37.41	149.09
			DM		**MODE**		#N/A	0.09	0.005	0.24	#N/A	0.005	0.005	#N/A	#N/A	#N/A	0.2	#N/A	0.02	5	#N/A	#N/A	#N/A
			DM		**MAX**		10.48	0.31	0.02	0.4	29.3	0.24	1	68	8.8	34.9	0.4	17.6	0.2	5	268	145	463
			DM		**MIN**		0.43	0.06	0.005	0.09	2.7	0	0.005	25.5	0.4	3.2	0.1	0.25	0.01	5	10	14	17
195	312.04	321.94	DO	2003/10/21	Set Point	3/2567	1.94	0.21	0.1	2.35	9.91	0.84	0.24	48.2	12	4.9	2	0.55	0.01	5	242	43	115
197	184	187.45	DO	2003/10/21	Set Point	3/2567	2.36	0.21	0.09	2.39	9.87	0.46	0.22	49.4	12	4.7	2.1	0.62	0.01	5	190	48	31
198	389.49	394.12	DO	2003/10/21	Set Point	3/2567	2.42	0.2	0.08	2.3	9.53	0.67	0.26	49.9	11.7	4.5	2.1	0.34	0.01	5	214	48	30
199	388.45	393.33	DO	2003/10/21	Set Point	3/2567	2.96	0.22	0.09	2.36	9.09	0.79	0.23	49.3	11.9	4.7	2	0.7	0.01	5	267	39	22
210	231.9	236.05	DO	2003/10/21	Set Point	3/2567	3.50	0.23	0.1	2.49	9.54	0.55	0.25	48.8	12.2	4.7	2.2	0.82	0.01	5	177	40	3
			DO		**MEAN**		2.64	0.21	0.09	2.38	9.59	0.66	0.24	49.12	11.96	4.70	2.08	0.61	0.01	5.00	218.00	43.60	40.20
			DO		**STDEV**		0.60	0.01	0.01	0.07	0.33	0.16	0.02	0.65	0.18	0.14	0.08	0.18	0.00	0.00	36.94	4.28	43.30
			DO		**MODE**		#N/A	0.21	0.1	#N/A	#N/A	#N/A	#N/A	#N/A	12	4.7	2	#N/A	0.01	5	#N/A	48	#N/A
			DO		**MAX**		3.50	0.23	0.1	2.49	9.91	0.84	0.26	49.9	12.2	4.9	2.2	0.82	0.01	5	267	48	115
			DO		**MIN**		1.94	0.2	0.08	2.3	9.09	0.46	0.22	48.2	11.7	4.5	2	0.34	0.01	5	177	39	3
5	142.695	147.85	FPX	2003/10/21	Set Point	3/2013	0.83	0.2	0.03	0.19	6.28	0.16	0.01	51.6	7.7	19.2	0.8	1.22	0.0815	5	48	90	2175
8	297.14	304.66	FPX	2003/10/21	Set Point	3/2013	0.30	0.11	0.05	0.25	6.53	0.29	0.01	42.2	16.7	8.2	0.8	2.99	0.4112	10	68	187	663
14	158	171.78	FPX	2003/10/21	Set Point	3/2013	3.05	0.12	0.02	0.27	9.72	0.31	0.04	50.6	15.7	10.9	1.5	0.8	0.3474	5	100	62	1132
22	177.5	191.3	FPX	2003/10/21	Set Point	3/2013	1.40	0.19	0.02	0.16	5.81	0.05	0.005	52.4	6.5	21.4	0.7	0.74	0.1276	5	86	91	2550
23	238.27	247.64	FPX	2003/10/21	Set Point	3/2013	1.48	0.16	0.02	0.16	7.04	0.09	0.005	51.6	9.6	17.1	0.9	0.85	0.0425	5	59	77	2015
33	167.825	179.9	FPX	2003/10/21	Set Point	3/2013	0.79	0.19	0.03	0.28	5.45	0.32	0.04	52.6	7.3	19.1	1.1	0.18	0.0709	5	90	75	2080
35	271.89	284.95	FPX	2003/10/21	Set Point	3/2013	1.72	0.14	0.01	0.13	8.93	0.14	0.03	46.1	11.3	16.4	0.6	3.19	0.0177	5	92	95	1712
36	286.08	296.85	FPX	2003/10/21	Set Point	3/2013	1.39	0.13	0.02	0.15	8.99	0.15	0.01	49.7	14	12.5	1.5	0.66	0.0496	5	84	85	1240
37	296.855	314.94	FPX	2003/10/21	Set Point	3/2013	0.28	0.13	0.02	0.15	10.5	0.17	0.01	51.3	14.8	11.2	1.6	0.38	0.0284	5	69	58	769
52	100.37	112.18	FPX	2003/10/21	Set Point	3/2013	3.90	0.19	0.03	0.21	6	0.1	0.02	52.9	7.4	19	0.7	0.26	0.0993	5	50	65	2314
54	185.85	196.04	FPX	2003/10/21	Set Point	3/2013	1.66	0.17	0.03	0.26	8.24	0.04	0.03	50.6	10	13.9	1.3	0.35	0.1418	5	90	93	1279
66	180.53	191.55	FPX	2003/10/21	Set Point	3/2013	2.94	0.17	0.02	0.17	3.26	0.06	0.01	42.4	5.3	23.3	0.3	5.16	0.0213	5	72	167	3477
67	257.97	268.58	FPX	2003/10/21	Set Point	3/2013	1.97	0.12	0.03	0.32	7.8	0.29	0.04	45.1	15.5	8.7	1.1	1.84	0.0567	5	124	188	653
72	277	286.8	FPX	2003/10/21	Set Point	3/2013	0.95	0.19	0.05	0.24	7.41	0.15	0.01	49.3	12	14.2	0.8	0.38	0.0354	5	80	5	1192
99	336.12	347.53	FPX	2003/10/21	Set Point	3/2013	0.98	0.175	0.02	0.24	7.74	0.16	0.02	51.75	10.1	15.2	1.3	0.385	0.0212505	5	106.5	75	1576
113	125	135.85	FPX	2003/10/21	Set Point	3/2014	1.59	0.21	0.04	0.23	6.5	0.15	0.02	51	6.7	19.5	0.5	0.63	0.01	5	57	88	2151
126	92	102	FPX	2003/10/21	Set Point	3/2014	2.31	0.19	0.03	0.25	4.31	0.47	0.1	50.6	7.4	18	0.7	0.94	0.02	5	98	99	1806
130	132.04	142.8	FPX	2003/10/21	Set Point	3/2014	2.25	0.19	0.07	0.24	6.21	0.15	0.02	49	5.7	21.2	0.6	1.87	0.005	5	77	82	1857
170	132.05	142.98	FPX	2003/10/21	Set Point	3/2486	0.00	0.18	0.03	0.17	8.16	0.18	0.005	51.9	10.1	13.6	1.3	-0.1	0.01	5	110	68	1383
273	15.39	17.64	FPX	2003/10/09	Setpoint Isando	7138	1.46	0.21	0.03	0.27	5.48	0.18	0.03	49.1	9.5	14.2	0.8	0.68	0.005	5	84	110	1464
49	140.27	159.01	FPX	2003/10/21	Set Point	3/2013	0.79	0.1	0.01	0.18	10.8	0.1	0.02	50.6	18.1	10.2	1.7	0.34	0.0851	5	92	34	1067

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
68	333.97	342.15	DM	2003/10/21	Set Point	3/2013	170	31	5	10	5	21	1.55	0.7	5.1	15.7		0.05	0.25
91	22	31	DM	2003/10/21	Set Point	3/2013	1019	1103	18	10	5	52	0.715	2.7	4.37	0.88		0.05	0.25
95	179.02	189.03	DM	2003/10/21	Set Point	3/2013	66	70	5	10	5	38	5.9	1.7	7.01	0.25		0.05	0.25
142	162.1	172.38	DM	2003/10/21	Set Point	3/2014	353	674	33	10	5	114	0.396	3.2	0.25	3.51	0.16		
152	90.97	96.55	DM	2003/10/21	Set Point	3/2014	839	748	5	10	5	67	0.49	2.6	13.7	2.55	0.45		
153	135.25	141.61	DM	2003/10/21	Set Point	3/2014	436	291	14	10	5	92	0.233	0.4	9.85	0.25	0.28		
154	106.21	114.06	DM	2003/10/21	Set Point	3/2014	1402	1486	5	10	5	35	0.278	0.5	7.36	1.81	0.17		
160	389.05	395.26	DM	2003/10/21	Set Point	3/2014	1415	1221	12	10	5	53	0.319	4	5.18	1.05	0.2		
174	211.47	215.1	DM	2003/10/21	Set Point	3/2486	1063	619	14	29	5	71	14.9	14.3	3.15	0.25	0.13		
175	215.23	218.5	DM	2003/10/21	Set Point	3/2486	914	717	11	27	5	87	12	8.3	6.25	0.25	0.1		
192	210.36	214.06	DM	2003/10/21	Set Point	3/2567	39	64	16	10	5	5	0.781	12.3	0.25	0.25	0.12		
			DM		**MEAN**		701.45	638.55	12.55	13.27	5.00	57.73	3.41	4.61	5.68	2.43			
			DM		**STDEV**		511.13	493.58	8.34	7.30	0.00	32.48	5.26	4.85	3.93	4.54			
			DM		**MODE**		#N/A	#N/A	5	10	5	#N/A	#N/A	#N/A	0.25	0.25			
			DM		**MAX**		1415	1486	33	29	5	114	14.9	14.3	13.7	15.7			
			DM		**MIN**		39	31	5	10	5	5	0.233	0.4	0.25	0.25			
195	312.04	321.94	DO	2003/10/21	Set Point	3/2567	335	56	16	10	5	78	0.068	14	0.7	0.25	0.16		
197	184	187.45	DO	2003/10/21	Set Point	3/2567	338	59	11	10	5	68	0.06	12.9	0.5	0.25	0.16		
198	389.49	394.12	DO	2003/10/21	Set Point	3/2567	352	58	11	10	5	86	0.068	13.3	0.75	0.25	0.13		
199	388.45	393.33	DO	2003/10/21	Set Point	3/2567	336	58	11	10	5	86	0.128	12.9	1.35	0.25	0.11		
210	231.9	236.05	DO	2003/10/21	Set Point	3/2567	341	61	12	10	5	87	0.085	12.6	1.31	0.25	0.17		
			DO		**MEAN**		340.40	58.40	12.20	10.00	5.00	81.00	0.08	13.14	0.92	0.25			
			DO		**STDEV**		6.88	1.82	2.17	0.00	0.00	8.12	0.03	0.54	0.38	0.00			
			DO		**MODE**		#N/A	58	11	10	5	86	0.068	12.9	#N/A	0.25			
			DO		**MAX**		352	61	16	10	5	87	0.128	14	1.35	0.25			
			DO		**MIN**		335	56	11	10	5	68	0.06	12.6	0.5	0.25			
5	142.695	147.85	FPX	2003/10/21	Set Point	3/2013	203	607	10	10	5	74	0.082	9.6	1	0.25		0.05	0.25
8	297.14	304.66	FPX	2003/10/21	Set Point	3/2013	1360	2734	5	29	5	45	3.21	15.3	2.39	0.5		0.05	0.25
14	158	171.78	FPX	2003/10/21	Set Point	3/2013	484	552	10	34	5	54	0.175	5.3	0.5	0.25		0.05	0.25
22	177.5	191.3	FPX	2003/10/21	Set Point	3/2013	543	1106	5	10	5	67	0.245	9	0.25	0.25		0.05	0.25
23	238.27	247.64	FPX	2003/10/21	Set Point	3/2013	833	1165	5	25	5	67	0.379	8.3	0.25	0.25		0.05	0.25
33	167.825	179.9	FPX	2003/10/21	Set Point	3/2013	95	468	5	10	5	70	0.025	10	0.25	1.46		0.05	0.25
35	271.89	284.95	FPX	2003/10/21	Set Point	3/2013	1648	1818	25	26	5	62	0.822	7.9	4.92	0.25		0.05	0.25
36	286.08	296.85	FPX	2003/10/21	Set Point	3/2013	1599	1468	13	10	5	60	0.718	7.4	1.46	0.25		0.05	0.25
37	296.855	314.94	FPX	2003/10/21	Set Point	3/2013	460	515	14	10	5	56	0.204	7	0.25	0.25		0.05	0.25
52	100.37	112.18	FPX	2003/10/21	Set Point	3/2013	227	676	5	10	5	74	0.125	7.2	0.25	0.25		0.05	0.25
54	185.85	196.04	FPX	2003/10/21	Set Point	3/2013	1370	1638	5	10	5	62	0.665	10.2	0.25	0.25		0.05	0.25
66	180.53	191.55	FPX	2003/10/21	Set Point	3/2013	1948	2609	12	10	5	65	2	12.2	5.27	0.25		0.05	0.25
67	257.97	268.58	FPX	2003/10/21	Set Point	3/2013	2587	3447	15	44	5	52	2.99	12.8	0.83	0.25		0.05	0.25
72	277	286.8	FPX	2003/10/21	Set Point	3/2013	649	831	5	35	5	66	0.345	11.2	0.25	0.25		0.05	0.25
99	336.12	347.53	FPX	2003/10/21	Set Point	3/2013	746	879.5	5	10	5	59	0.311	9.65	0.25	0.25	0.06	0.05	0.25
113	125	135.85	FPX	2003/10/21	Set Point	3/2014	180	608	13	10	5	63	0.113	10.9	0.81	0.25	0.05		
126	92	102	FPX	2003/10/21	Set Point	3/2014	757	1078	10	10	5	57	0.57	11.6	0.96	0.25	0.09		
130	132.04	142.8	FPX	2003/10/21	Set Point	3/2014	288	724	12	10	5	52	0.174	10.3	1.83	0.25	0.06		
170	132.05	142.98	FPX	2003/10/21	Set Point	3/2486	447	679	5	10	5	68	0.323	11.9	0.25	0.25	0.03		
273	15.39	17.64	FPX	2003/10/09	Setpoint Isando	7138	1560	1861	5	10	5	83	0.767	13.8	0.52	0.25	0.12		
49	140.27	159.01	FPX	2003/10/21	Set Point	3/2013	91	258	5	10	5	49	0.054	5.9	0.25	0.25		0.05	0.25

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
53	133.34	152.2	FPX	2003/10/21	Set Point	3/2013	2.00	0.19	0.02	0.19	5.08	0.03	0.005	50	6	21.7	0.6	0.94	0.0567	5	55	103	2822
57	303.04	313.05	FPX	2003/10/21	Set Point	3/2013	1.80	0.16	0.06	0.17	8.68	0.05	0.04	47.8	10.8	14.8	0.6	1.45	0.0567	5	62	118	1505
			FPX		**MEAN**		1.56	0.17	0.03	0.21	7.17	0.16	0.02	49.57	10.36	15.80	0.95	1.14	0.08	5.22	80.59	91.96	1690.52
			FPX		**STDEV**		0.94	0.03	0.02	0.05	1.93	0.11	0.02	3.00	3.83	4.35	0.39	1.21	0.10	1.04	20.22	42.81	701.97
			FPX		**MODE**		#N/A	0.19	0.03	0.17	#N/A	0.15	0.01	50.6	7.4	14.2	0.8	0.38	0.0567	5	90	75	#N/A
			FPX		**MAX**		3.90	0.21	0.07	0.32	10.8	0.47	0.1	52.9	18.1	23.3	1.7	5.16	0.4112	10	124	188	3477
			FPX		**MIN**		0.00	0.1	0.01	0.13	3.26	0.03	0.005	42.2	5.3	8.2	0.3	-0.1	0.005	5	48	5	653
1	37.82	44.58	GN	2003/10/21	Set Point	3/2013	0.73	0.11	0.02	0.28	10.7	0.55	0.04	51.9	18.3	6.6	2.1	0.48	0.1241	5	138	38	383
2	64.4	70.9	GN	2003/10/21	Set Point	3/2013	0.57	0.1	0.02	0.38	10.9	0.65	0.05	51.9	18.8	5.9	1.9	0.8	0.1489	5	174	31	327
3	103.6	110.23	GN	2003/10/21	Set Point	3/2013	0.71	0.09	0.02	0.41	10.8	0.87	0.07	52.9	19	4.8	2.1	1.16	0.156	5	191	31	252
10	70.045	80.46	GN	2003/10/21	Set Point	3/2013	1.11	0.14	0.02	0.26	10.2	0.39	0.03	51.5	17.8	7.2	1.9	1.33	0.1702	5	143	41	433
11	81.92	92.095	GN	2003/10/21	Set Point	3/2013	3.89	0.12	0.02	0.23	10.3	0.31	0.02	51.1	17.6	7.5	1.9	1.38	0.1276	5	110	35	497
12	93.07	100.865	GN	2003/10/21	Set Point	3/2013	1.59	0.12	0.02	0.24	10.1	0.41	0.02	50.9	18.3	7.1	2.1	1.46	0.2056	5	115	35	41
18	35.03	45.205	GN	2003/10/21	Set Point	3/2013	0.85	0.11	0.02	0.22	10.6	0.33	0.02	51.5	17.7	7.9	2	0.62	0.078	5	109	38	521
19	60.46	72.43	GN	2003/10/21	Set Point	3/2013	0.44	0.12	0.02	0.26	10.8	0.36	0.03	52.4	17.7	7.3	2.1	0.37	0.0993	5	130	34	447
20	114.42	124.27	GN	2003/10/21	Set Point	3/2013	1.17	0.11	0.02	0.29	10.7	0.4	0.04	51.8	18.05	6.7	2.3	0.465	0.049651	5	166	32	389
21	138.46	150.48	GN	2003/10/21	Set Point	3/2013	0.90	0.09	0.02	0.27	10.6	0.38	0.05	52.1	18.8	6.1	2.3	0.47	0.078	5	142	38	393
38	45.33	61.49	GN	2003/10/21	Set Point	3/2013	2.66	0.1	0.02	0.28	10.5	0.5	0.04	51.7	18.4	6.7	2.2	0.71	0.0922	5	108	41	435
39	85.51	100.8	GN	2003/10/21	Set Point	3/2013	1.90	0.11	0.02	0.28	10.5	0.38	0.04	52.5	19	6.5	2.2	0.25	0.0851	5	119	29	398
40	136.7	148.72	GN	2003/10/21	Set Point	3/2013	0.94	0.075	0.02	0.295	10.85	0.665	0.05	51.45	20.05	4.8	2.3	1.715	0.039001	5	176.5	24.5	282.5
41	30.29	45.49	GN	2003/10/21	Set Point	3/2013	0.88	0.09	0.02	0.33	10.8	0.55	0.06	52.6	18.8	6.3	2.3	0.28	0.0922	5	167	32	354
42	46.915	56.19	GN	2003/10/21	Set Point	3/2013	1.04	0.11	0.02	0.32	10.4	0.56	0.05	53	17.9	6.7	2.3	0.2	0.0638	5	146	31	402
43	95.73	111.03	GN	2003/10/21	Set Point	3/2013	0.41	0.07	0.01	0.28	11.3	0.51	0.05	52.6	21.2	4.7	2.2	0.32	0.0567	5	178	18	290
44	114.27	128.2	GN	2003/10/21	Set Point	3/2013	0.69	0.08	0.02	0.32	11.5	0.53	0.05	51.8	21.2	4.7	2.1	0.32	0.1418	5	149	21	257
45	229.5	239.62	GN	2003/10/21	Set Point	3/2013	1.01	0.09	0.02	0.32	10.4	0.47	0.05	52.5	18.4	6.8	2.2	0.32	0.0709	5	176	34	460
46	244.4	254.97	GN	2003/10/21	Set Point	3/2013	1.05	0.11	0.02	0.34	10.2	0.5	0.06	52.3	18.1	7	2.1	0.22	0.0709	5	168	35	497
47	273.77	284.06	GN	2003/10/21	Set Point	3/2013	0.84	0.1	0.02	0.41	10.2	0.61	0.08	52.9	18.2	6.6	2.3	0.31	0.0922	5	173	31	435
58	84.84	92.75	GN	2003/10/21	Set Point	3/2013	0.55	0.09	0.02	0.25	10.6	0.36	0.03	52.1	18.9	6.2	2.4	0.31	0.1134	5	149	34	405
59	103.9	112.49	GN	2003/10/21	Set Point	3/2013	0.74	0.1	0.02	0.27	10.8	0.44	0.04	51.9	19.1	6.2	2.3	0.29	0.0709	5	176	32	378
60	153.23	165.12	GN	2003/10/21	Set Point	3/2013	0.78	0.07	0.02	0.29	11.45	0.53	0.05	52.1	20.1	5.35	2.3	0.335	0.0142005	5	173	28	293
61	234.2	242.4	GN	2003/10/21	Set Point	3/2013	0.52	0.11	0.02	0.32	10.9	0.44	0.04	52.5	17.7	7.8	2	0.23	0.0496	5	123	31	537
62	260.35	268.95	GN	2003/10/21	Set Point	3/2013	0.44	0.1	0.02	0.29	11.5	0.34	0.04	51.6	18.7	6.6	2.1	0.21	0.039	5	140	30	350
229	142.5	146.13	GN	2003/10/09	Setpoint Isando	7131	0.85	0.09	0.01	0.31	11.9	0.5	0.03	51.1	21.3	5.1	2.2	0.14	0.005	5	217	31	273
230	155.17	163.06	GN	2003/10/09	Setpoint Isando	7131	1.16	0.08	0.02	0.36	10.7	0.61	0.05	50.4	19.9	5.6	2	1.42	0.01	5	186	29	340
231	163.11	168.06	GN	2003/10/09	Setpoint Isando	7131	0.16	0.08	0.02	0.33	10.1	0.74	0.05	52	19.4	5.9	2	1.48	0.01	5	180	35	376
232	179.25	182.84	GN	2003/10/09	Setpoint Isando	7131	0.00	0.1	0.02	0.3	9.7	0.45	0.04	50.9	17.8	7.9	1.7	1.96	0.005	5	162	39	581
233	187.62	194.8	GN	2003/10/09	Setpoint Isando	7131	1.05	0.1	0.02	0.28	9.72	0.52	0.04	52	17.3	8	2	0.87	0.01	5	158	37	578
235	196.08	207.05	GN	2003/10/09	Setpoint Isando	7131	0.46	0.01	0.005	0.135	1.025	2.055	0.06	75.65	13.05	0.35	5.5	0.505	0.01	5	255	5	318.5
236	208	218.2	GN	2003/10/09	Setpoint Isando	7131	2.41	0.2	0.03	0.18	3.99	0.18	0.01	42.2	6.6	22.3	0.5	3.84	0.02	5	93	180	750
237	218.2	225.73	GN	2003/10/09	Setpoint Isando	7131	1.75	0.08	0.02	0.31	10.5	0.57	0.05	52.6	19.2	6.4	2.2	0.4	0.01	5	169	32	423
239	59.59	65.6	GN	2003/10/09	Setpoint Isando	7131	0.07	0.14	0.02	0.36	9	0.46	0.06	53.2	14.6	10.4	1.8	0.13	0.01	5	170	42	637
240	74.14	82.24	GN	2003/10/09	Setpoint Isando	7131	0.79	0.07	0.01	0.31	11.9	0.61	0.04	51.4	22	4.8	2.2	0.69	0.01	5	172	24	241
241	90.08	95.71	GN	2003/10/09	Setpoint Isando	7131	0.49	0.08	0.01	0.31	11.3	0.53	0.05	51.5	21	5.5	2.1	0.22	0.01	5	128	25	292
242	10.49	16.98	GN	2003/10/09	Setpoint Isando	7131	2.68	0.11	0.02	0.33	10.5	0.33	0.03	51.1	17.5	6.9	1.8	2.48	0.005	5	135	36	558
244	7.2	12.41	GN	2003/10/09	Setpoint Isando	7131	1.45	0.11	0.02	0.29	9.79	0.5	0.04	52	17.5	7.4	2.1	0.46	0.005	5	178	45	504
245	4.03	5.64	GN	2003/10/09	Setpoint Isando	7131	1.24	0.11	0.02	0.29	10.8	0.43	0.02	52	18.4	6.5	2.2	0.7	0.005	5	174	34	425
271	8	16.8	GN	2003/10/09	Setpoint Isando	7138	2.21	0.07	0.01	0.16	11	0.54	0.03	50.5	20.4	6.9	1.8	1.48	0.005	5	219	54	725
272	20.3	24.5	GN	2003/10/09	Setpoint Isando	7138	3.88	0.11	0.01	0.21	8.38	0.4	0.04	47.2	13.5	13.7	0.9	2.91	0.01	5	173	87	1681
274	9.5	13.25	GN	2003/10/09	Setpoint Isando	7138	1.89	0.1	0.01	0.19	12	0.58	0.04	49.7	17.8	6.7	1.4	3.56	0.005	5	121	34	505

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
53	133.34	152.2	FPX	2003/10/21	Set Point	3/2013	1387	2090	14	10	5	71	0.627	9.9	1.87	0.25		0.05	0.25
57	303.04	313.05	FPX	2003/10/21	Set Point	3/2013	1372	1855	5	26	5	53	1	9.9	3.31	0.25		0.05	0.25
			FPX		**MEAN**		905.83	1289.85	9.04	16.48	5.00	62.13	0.69	9.88	1.22	0.31			
			FPX		**STDEV**		683.07	840.89	5.17	10.64	0.00	9.20	0.87	2.47	1.47	0.26			
			FPX		**MODE**		#N/A	#N/A	5	10	5	74	#N/A	9.9	0.25	0.25			
			FPX		**MAX**		2587	3447	25	44	5	83	3.21	15.3	5.27	1.46			
			FPX		**MIN**		91	258	5	10	5	45	0.025	5.3	0.25	0.25			
1	37.82	44.58	GN	2003/10/21	Set Point	3/2013	36	134	5	20	5	53	0.016	6.1	0.25	0.25		0.05	0.25
2	64.4	70.9	GN	2003/10/21	Set Point	3/2013	44	123	5	10	5	53	0.018	6.1	1.27	0.25		0.05	0.25
3	103.6	110.23	GN	2003/10/21	Set Point	3/2013	41	101	5	10	5	55	0.023	5.4	0.86	0.25		0.05	0.25
10	70.045	80.46	GN	2003/10/21	Set Point	3/2013	60	156	5	10	5	50	0.026	6.3	0.91	0.25		0.05	0.25
11	81.92	92.095	GN	2003/10/21	Set Point	3/2013	51	161	5	33	5	53	0.025	4.1	0.92	0.25		0.05	0.25
12	93.07	100.865	GN	2003/10/21	Set Point	3/2013	69	142	5	23	5	60	0.046	5.8	1.02	0.25		0.05	0.25
18	35.03	45.205	GN	2003/10/21	Set Point	3/2013	57	165	5	10	5	53	0.034	6.2	0.25	0.25		0.05	0.25
19	60.46	72.43	GN	2003/10/21	Set Point	3/2013	45	146	5	10	5	50	0.032	6.4	0.25	0.25		0.05	0.25
20	114.42	124.27	GN	2003/10/21	Set Point	3/2013	41.5	127.5	5	10	5	50	0.029	6.05	0.25	0.25	0.06	0.05	0.25
21	138.46	150.48	GN	2003/10/21	Set Point	3/2013	31	118	5	10	5	59	0.026	5.9	0.25	0.25		0.05	0.25
38	45.33	61.49	GN	2003/10/21	Set Point	3/2013	104	146	5	10	5	51	0.055	4.1	1.2	0.25		0.05	0.25
39	85.51	100.8	GN	2003/10/21	Set Point	3/2013	29	129	5	10	5	55	0.024	4.7	0.25	0.25		0.05	0.25
40	136.7	148.72	GN	2003/10/21	Set Point	3/2013	43	95.5	8.5	10	5	43	0.0195	4.9	2	0.25	0.09	0.05	0.25
41	30.29	45.49	GN	2003/10/21	Set Point	3/2013	31	128	5	10	5	50	0.023	5.4	0.25	0.25		0.05	0.25
42	46.915	56.19	GN	2003/10/21	Set Point	3/2013	44	140	5	10	5	48	0.023	5.5	0.25	0.25		0.05	0.25
43	95.73	111.03	GN	2003/10/21	Set Point	3/2013	37	97	5	10	5	49	0.027	4.7	0.25	0.25		0.05	0.25
44	114.27	128.2	GN	2003/10/21	Set Point	3/2013	48	91	5	10	5	49	0.027	4.7	0.25	0.25		0.05	0.25
45	229.5	239.62	GN	2003/10/21	Set Point	3/2013	42	145	11	10	5	53	0.031	5.6	0.25	0.25		0.05	0.25
46	244.4	254.97	GN	2003/10/21	Set Point	3/2013	40	146	5	10	5	54	0.029	6	0.25	0.25		0.05	0.25
47	273.77	284.06	GN	2003/10/21	Set Point	3/2013	35	132	16	10	5	54	0.023	5.8	0.25	0.25		0.05	0.25
58	84.84	92.75	GN	2003/10/21	Set Point	3/2013	29	140	15	10	5	48	0.025	5.7	0.25	0.25		0.05	0.25
59	103.9	112.49	GN	2003/10/21	Set Point	3/2013	32	126	5	10	5	56	0.024	5.6	0.25	0.25		0.05	0.25
60	153.23	165.12	GN	2003/10/21	Set Point	3/2013	34.5	106	7.5	10	5	37.5	0.0165	4.7	0.25	0.25	0.04	0.05	0.25
61	234.2	242.4	GN	2003/10/21	Set Point	3/2013	24	154	5	10	5	55	0.017	6.4	0.25	0.25		0.05	0.25
62	260.35	268.95	GN	2003/10/21	Set Point	3/2013	34	127	11	10	5	51	0.015	5.9	0.25	0.25		0.05	0.25
229	142.5	146.13	GN	2003/10/09	Setpoint Isando	7131	48	96	5	10	5	51	0.037	5.5	0.25	0.25	0.14		
230	155.17	163.06	GN	2003/10/09	Setpoint Isando	7131	61	125	5	10	5	57	0.054	4.9	1.38	0.25	0.19		
231	163.11	168.06	GN	2003/10/09	Setpoint Isando	7131	40	130	5	10	5	52	0.036	5.7	1.48	0.25	0.18		
232	179.25	182.84	GN	2003/10/09	Setpoint Isando	7131	39	187	13	10	5	62	0.03	6.8	2	0.25	0.22		
233	187.62	194.8	GN	2003/10/09	Setpoint Isando	7131	50	179	5	10	5	56	0.03	5.5	0.62	0.25	0.15		
235	196.08	207.05	GN	2003/10/09	Setpoint Isando	7131	21	29.5	13.5	10	5	22.5	0.0225	0.5	0.415	0.25	0.125		
236	208	218.2	GN	2003/10/09	Setpoint Isando	7131	1154	2098	14	10	5	84	0.731	13.4	3.01	0.25	0.28		
237	218.2	225.73	GN	2003/10/09	Setpoint Isando	7131	45	135	5	10	5	48	0.046	4.1	0.25	0.25	0.11		
239	59.59	65.6	GN	2003/10/09	Setpoint Isando	7131	41	235	5	10	5	62	0.027	7.6	0.25	0.25	0.07		
240	74.14	82.24	GN	2003/10/09	Setpoint Isando	7131	42	92	5	10	5	49	0.028	4.2	0.68	0.25	0.11		
241	90.08	95.71	GN	2003/10/09	Setpoint Isando	7131	38	104	5	10	5	56	0.026	5	0.25	0.25	0.06		
242	10.49	16.98	GN	2003/10/09	Setpoint Isando	7131	5	190	5	10	5	54	0.02	3.8	2.62	0.55	1.13		
244	7.2	12.41	GN	2003/10/09	Setpoint Isando	7131	40	167	5	10	5	59	0.035	5.5	0.79	0.25	0.26		
245	4.03	5.64	GN	2003/10/09	Setpoint Isando	7131	47	132	5	10	5	60	0.021	5.5	0.25	0.25	0.3		
271	8	16.8	GN	2003/10/09	Setpoint Isando	7138	678	1067	5	10	5	44	0.046	3.5	1.35	0.25	0.2		
272	20.3	24.5	GN	2003/10/09	Setpoint Isando	7138	1023	1372	10	10	5	57	0.109	5.6	2.05	0.76	0.4		
274	9.5	13.25	GN	2003/10/09	Setpoint Isando	7138	90	209	13	10	5	50	0.02	4	0.9	2.59	0.46		

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
			GN		MEAN		1.17	0.10	0.02	0.29	10.24	0.52	0.04	52.07	18.22	6.91	2.10	0.90	0.06	5.00	157.85	37.46	444.38
			GN		STDEV		0.89	0.03	0.00	0.06	1.91	0.27	0.01	4.14	2.57	3.05	0.65	0.91	0.05	0.00	32.68	25.23	236.84
			GN		MODE		#N/A	0.11	0.02	0.28	10.8	0.5	0.04	52	18.8	6.7	2.1	0.32	0.01	5	173	31	497
			GN		MAX		3.89	0.2	0.03	0.41	12	2.055	0.08	75.65	22	22.3	5.5	3.84	0.2056	5	255	180	1681
			GN		MIN		0.00	0.01	0.005	0.135	1.025	0.18	0.01	42.2	6.6	0.35	0.5	0.13	0.005	5	93	5	41
221	254.5	261.65	AP	2003/10/21	Set Point	3/2567	0.54	0.01	0.02	0.24	1.11	5.26	0.005	75.3	11.8	0.1	2.8	0.19	0.02	5	907	5	224
218	349.16	359.18	AP	2003/10/21	Set Point	3/2567	0.66	0.005	0.01	0.16	1.1	5.12	0.005	75.8	11.5	0.1	2.9	0.27	0.03	5	942	10	283
219	368.2	377.93	AP	2003/10/21	Set Point	3/2567	0.44	0.01	0.02	0.19	1.16	4.88	0.005	75.2	11.5	0.1	3.1	0.14	0.03	5	932	5	318
			AP		MEAN		0.54	0.01	0.02	0.20	1.12	5.09	0.01	75.43	11.60	0.10	2.93	0.20	0.03	5.00	927.00	6.67	275.00
			AP		STDEV		0.11	0.00	0.01	0.04	0.03	0.19	0.00	0.32	0.17	0.00	0.15	0.07	0.01	0.00	18.03	2.89	47.51
			AP		MODE		#N/A	0.01	0.02	#N/A	#N/A	#N/A	0.005	#N/A	11.5	0.1	#N/A	#N/A	0.03	5	#N/A	5	#N/A
			AP		MAX		0.66	0.01	0.02	0.24	1.16	5.26	0.005	75.8	11.8	0.1	3.1	0.27	0.03	5	942	10	318
			AP		MIN		0.44	0.005	0.01	0.16	1.1	4.88	0.005	75.2	11.5	0.1	2.8	0.14	0.02	5	907	5	224
9	325.08	334.03	HF	2003/10/21	Set Point	3/2013	3.46	0.02	0.06	0.31	1	1.05	0.005	40.7	33.5	2.9	0.7	5.16	0.0851	23	69	64	384
27	63.16	72.97	HF	2003/10/21	Set Point	3/2013	0.77	0.11	0.05	0.92	1.1	1.79	0.1	50.7	21.4	5.1	0.7	2.83	0.2127	5	250	42	410
28	76.71	86.21	HF	2003/10/21	Set Point	3/2013	3.46	0.12	0.04	1.11	1.2	1.14	0.12	48.1	22.3	6.1	0.7	1.41	0.1063	5	239	47	517
31	212.59	224.01	HF	2003/10/21	Set Point	3/2013	1.41	0.08	0.06	0.46	0.84	0.58	0.005	40.7	31.6	3.2	0.5	4.65	0.1205	29	84	48	408
32	240	251.93	HF	2003/10/21	Set Point	3/2013	4.25	0.06	0.06	0.33	0.22	0.94	0.01	44.3	30.6	3.1	0.5	4.82	0.0709	27	140	40	348
34	229.97	255.09	HF	2003/10/21	Set Point	3/2013	2.69	0.18	0.05	1.27	1.36	0.42	0.05	43.7	24.5	7.4	0.4	1.35	0.0496	5	56	64	608
64	90.29	105.54	HF	2003/10/21	Set Point	3/2013	8.72	0.07	0.08	0.11	1.13	0.55	0.005	36.7	29	5.5	0.5	5.2	0.0709	5	173	165	1006
69	191.86	201.92	HF	2003/10/21	Set Point	3/2013	4.71	0.05	0.07	0.66	0.35	0.42	0.005	40.9	33.5	3.7	0.5	3.97	0.0709	23	50	48	488
70	225.71	238.65	HF	2003/10/21	Set Point	3/2013	4.45	0.03	0.09	0.14	0.31	0.63	0.005	37	40.5	3.4	0.5	3.53	0.0567	39	53	56	661
75	309	317.64	HF	2003/10/21	Set Point	3/2013	1.02	0.03	0.07	0.67	0.1	0.32	0.005	42.6	35	3	0.2	1.39	0.0567	22	64	59	559
80	43.1	46	HF	2003/10/21	Set Point	3/2013	4.18	0.305	0.04	0.995	4.555	0.57	0.12	44.45	20.75	7.15	0.75	1.355	0.0283505	5	167	51.5	474
85	87.09	100.87	HF	2003/10/21	Set Point	3/2013	2.93	0.16	0.03	0.27	4.8	0.13	0.12	45	11.4	5.8	0.2	4.95	0.0213	56	161	98	361
86	125.9	136.47	HF	2003/10/21	Set Point	3/2013	2.91	0.17	0.05	1.12	1.88	0.39	0.04	44.6	23.2	6.8	0.5	2.38	0.0284	5	99	66	605
93	113.26	123.06	HF	2003/10/21	Set Point	3/2013	3.38	0.04	0.08	0.26	1.11	0.2	0.005	36.3	36.7	3.6	0.4	2.27	0.0638	16	88	97	751
94	166.6	177.06	HF	2003/10/21	Set Point	3/2013	9.37	0.07	0.03	0.18	7.32	0.45	0.08	44.9	16.9	7.7	0.8	6.16	0.0213	5	268	42	346
117	163.85	172.25	HF	2003/10/21	Set Point	3/2014	2.82	0.04	0.1	0.3	1.43	0.49	0.005	37.1	38.7	4	0.6	2.35	0.01	38	100	55	661
127	72.82	79.6	HF	2003/10/21	Set Point	3/2014	1.81	0.04	0.065	0.915	0.125	0.435	0.0075	42.65	34.25	2.85	0.2	3.155	0.005	20.5	84	39.5	422.5
129	239.3	250.48	HF	2003/10/21	Set Point	3/2014	1.01	0.02	0.07	0.23	0.07	0.26	0.005	41.9	37.6	3.2	0.2	2.83	0.005	25	45	37	590
133	244.04	255.02	HF	2003/10/21	Set Point	3/2014	0.77	0.03	0.03	0.72	0.57	3.27	0.08	57.1	20.7	1.9	0.6	4.23	0.01	13	554	31	386
168	325.5	331.1	HF	2003/10/21	Set Point	3/2486	2.24	0.05	0.1	0.13	1.75	0.38	0.005	36.8	37.4	4.7	0.6	2.05	0.02	20	100	89	755
169	68.9	74.84	HF	2003/10/21	Set Point	3/2486	0.75	0.11	0.2	0.22	10.2	0.34	0.005	52.4	14.3	10	1.8	1	0.02	5	153	64	851
180	187.96	194.36	HF	2003/10/21	Set Point	3/2486	2.90	0.19	0.02	0.17	4.71	0.27	0.005	51.2	6.6	20.9	0.6	0.62	0.01	5	41	102	2395
182	221.65	230.47	HF	2003/10/21	Set Point	3/2486	10.88	0.02	0.04	0.23	4.6	1.21	0.01	45.5	20.9	5.9	0.6	5.33	0.01	5	79	66	469
227	208.28	215.92	HF	2003/10/09	Setpoint Isando	7131	0.25	0.04	0.07	0.29	0.15	0.82	0.005	42.8	32.1	3.8	0.3	4.36	0.005	30	64	50	46
256	79.67	87.27	HF	2003/10/09	Setpoint Isando	7138	1.19	0.03	0.03	0.72	0.89	2.81	0.12	55.6	20.6	2	0.7	4.83	0.01	53	767	22	256
			HF		MEAN		3.29	0.08	0.06	0.51	2.07	0.79	0.04	44.15	26.96	5.35	0.56	3.29	0.05	19.38	157.92	61.72	590.30
			HF		STDEV		2.74	0.07	0.04	0.37	2.55	0.78	0.05	5.76	9.25	3.81	0.31	1.62	0.05	15.35	167.45	29.89	426.39
			HF		MODE		#N/A	0.03	0.07	0.23	#N/A	0.42	0.01	40.70	33.50	3.20	0.50	2.83	0.01	5.00	84.00	64.00	661.00
			HF		MAX		10.88	0.305	0.2	1.27	10.2	3.27	0.12	57.1	40.5	20.9	1.8	6.16	0.2127	56	767	165	2395
			HF		MIN		0.25	0.02	0.02	0.11	0.07	0.13	0.005	36.3	6.6	1.9	0.2	0.62	0.005	5	41	22	46
50	43	63.08	LN	2003/10/21	Set Point	3/2013	5.02	0.16	0.03	0.24	6.3	0.17	0.03	46.3	8.3	16.6	0.8	2.21	0.0638	5	78	144	1449
90	290	302	LN	2003/10/21	Set Point	3/2013	1.43	0.18	0.03	0.19	5	0.05	0.02	51.6	7.1	20.6	0.7	1.46	0.0496	5	67	71	2371
111	63.28	75.16	LN	2003/10/21	Set Point	3/2014	1.25	0.1	0.01	0.16	10.9	0.21	0.01	50.4	18.7	10.3	1.5	0.25	0.005	5	99	41	950
134	76.92	88.02	LN	2003/10/21	Set Point	3/2014	0.75	0.08	0.05	0.23	9.71	0.78	0.04	47.3	20	6.3	1.2	1.89	0.02	5	180	47	518
141	280.2	287.4	LN	2003/10/21	Set Point	3/2014	0.77	0.05	0.01	0.14	12.9	0.54	0.01	49.7	22	6.4	1.8	0.98	0.01	5	111	29	798

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
			GN		MEAN		108.19	233.89	6.85	11.10	5.00	52.69	0.05	5.46	0.74	0.33			
			GN		STDEV		243.48	379.08	3.40	4.27	0.00	8.40	0.11	1.70	0.72	0.37			
			GN		MODE		40	146	5	10	5	53	0.023	5.5	0.25	0.25			
			GN		MAX		1154	2098	16	33	5	84	0.731	13.4	3.01	2.59			
			GN		MIN		5	29.5	5	10	5	22.5	0.015	0.5	0.25	0.25			
221	254.5	261.65	AP	2003/10/21	Set Point	3/2567	37	16	18	10	5	26	0.111	2.2	0.25	0.25	0.08		
218	349.16	359.18	AP	2003/10/21	Set Point	3/2567	13	5	14	10	5	17	0.04	1.8	0.55	0.25	0.08		
219	368.2	377.93	AP	2003/10/21	Set Point	3/2567	24	16	17	10	5	29	0.08	2.1	0.25	0.25	0.05		
			AP		MEAN		24.67	12.33	16.33	10.00	5.00	24.00	0.08	2.03	0.35	0.25			
			AP		STDEV		12.01	6.35	2.08	0.00	0.00	6.24	0.04	0.21	0.17	0.00			
			AP		MODE		#N/A	16	#N/A	10	5	#N/A	#N/A	#N/A	0.25	0.25			
			AP		MAX		37	16	18	10	5	29	0.111	2.2	0.55	0.25			
			AP		MIN		13	5	14	10	5	17	0.04	1.8	0.25	0.25			
9	325.08	334.03	HF	2003/10/21	Set Point	3/2013	321	715	5	10	5	61	0.624	8.4	3.64	0.93		0.05	0.25
27	63.16	72.97	HF	2003/10/21	Set Point	3/2013	154	161	5	10	5	84	0.352	11	2.49	1.06		0.05	0.25
28	76.71	86.21	HF	2003/10/21	Set Point	3/2013	73	172	5	22	5	82	0.198	11.1	2.29	0.25		0.05	0.25
31	212.59	224.01	HF	2003/10/21	Set Point	3/2013	275	345	5	10	5	67	0.259	12.5	4.72	0.25		0.05	0.25
32	240	251.93	HF	2003/10/21	Set Point	3/2013	100	213	5	10	5	74	0.175	8.5	5.26	1.01		0.05	0.25
34	229.97	255.09	HF	2003/10/21	Set Point	3/2013	104	237	5	10	5	93	0.214	13.6	0.88	0.25		0.05	0.25
64	90.29	105.54	HF	2003/10/21	Set Point	3/2013	1024	1766	5	10	5	133	2.95	8.8	3.95	1.58		0.05	0.25
69	191.86	201.92	HF	2003/10/21	Set Point	3/2013	122	215	5	10	5	62	0.116	8.9	3.72	0.25		0.05	0.25
70	225.71	238.65	HF	2003/10/21	Set Point	3/2013	138	284	5	10	5	81	0.156	6.7	4.12	0.63		0.05	0.25
75	309	317.64	HF	2003/10/21	Set Point	3/2013	184	299	5	10	5	59	0.062	12.4	1.5	0.25		0.05	0.25
80	43.1	46	HF	2003/10/21	Set Point	3/2013	109.5	201	11	22	5	70.5	0.2	11.9	1.465	0.25	0.05	0.05	0.25
85	87.09	100.87	HF	2003/10/21	Set Point	3/2013	1114	580	5	54	5	49	7.85	21.3	3.22	0.8		0.05	0.25
86	125.9	136.47	HF	2003/10/21	Set Point	3/2013	162	192	5	28	5	84	0.377	12.5	3.34	1.05		0.05	0.25
93	113.26	123.06	HF	2003/10/21	Set Point	3/2013	261	549	5	23	5	87	0.639	11.9	2.76	0.25		0.05	0.25
94	166.6	177.06	HF	2003/10/21	Set Point	3/2013	679	205	13	22	5	63	4.47	3.9	2.3	0.75		0.05	0.25
117	163.85	172.25	HF	2003/10/21	Set Point	3/2014	153	360	5	10	5	86	0.104	9.7	1.11	0.25	0.08		
127	72.82	79.6	HF	2003/10/21	Set Point	3/2014	25.5	128.5	7.5	10	5	83	0.019	11.6	3.615	0.25	0.185	#DIV/0!	#DIV/0!
129	239.3	250.48	HF	2003/10/21	Set Point	3/2014	28	164	5	10	5	47	0.012	10.7	2.03	0.95	0.11		
133	244.04	255.02	HF	2003/10/21	Set Point	3/2014	76	63	16	10	5	50	0.164	8.3	4.06	0.25	0.23		
168	325.5	331.1	HF	2003/10/21	Set Point	3/2486	132	369	5	10	5	106	0.12	11.3	1.78	0.25	0.1		
169	68.9	74.84	HF	2003/10/21	Set Point	3/2486	839	818	5	10	5	47	0.436	6.5	1.25	0.25	0.1		
180	187.96	194.36	HF	2003/10/21	Set Point	3/2486	520	1127	5	10	5	74	0.423	8.1	0.25	0.25	0.1		
182	221.65	230.47	HF	2003/10/21	Set Point	3/2486	854	448	15	10	5	44	6.57	3.8	4.9	0.25	0.17		
227	208.28	215.92	HF	2003/10/09	Setpoint Isando	7131	70	148	5	10	5	79	0.137	12.1	4.76	0.25	0.37		
256	79.67	87.27	HF	2003/10/09	Setpoint Isando	7138	119	109	5	10	5	52	0.475	8.2	2.8	2.3	0.3		
			HF		MEAN		305.48	394.74	6.50	14.44	5.00	72.70	1.08	10.15	2.89	0.59			
			HF		STDEV		328.57	380.29	3.36	9.93	0.00	20.74	2.10	3.49	1.39	0.52			
			HF		MODE		#N/A	#N/A	5.00	10.00	5.00	84.00	#N/A	12.50	#N/A	0.25			
			HF		MAX		1114	1766	16	54	5	133	7.85	21.3	5.26	2.3			
			HF		MIN		25.5	63	5	10	5	44	0.012	3.8	0.25	0.25			
50	43	63.08	LN	2003/10/21	Set Point	3/2013	2584	2628	12	10	5	65	2.03	9.7	2.28	0.25		0.05	0.25
90	290	302	LN	2003/10/21	Set Point	3/2013	117	777	5	10	5	67	0.052	8.7	1.31	0.25		0.05	0.25
111	63.28	75.16	LN	2003/10/21	Set Point	3/2014	111	263	5	10	5	33	0.041	5.3	0.25	0.25	0.04		
134	76.92	88.02	LN	2003/10/21	Set Point	3/2014	315	240	5	10	5	41	0.964	8.2	2.05	0.25	0.09		
141	280.2	287.4	LN	2003/10/21	Set Point	3/2014	290	330	13	10	5	26	0.093	4	1.04	0.25	0.03		

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
167	282.83	288.2	LN	2003/10/21	Set Point	3/2486	2.92	0.22	0.05	1.06	3.735	1.1	0.065	50.4	19.15	6.05	1	1.55	0.0075	5	228.5	52.5	565.5
248	203.32	207.44	LN	2003/10/09	Setpoint Isando	7131	0.04	0.11	0.02	0.15	8.57	0.42	0.01	50.7	15	14.1	1.2	0.54	0.005	5	128	56	1552
255	455.69	463	LN	2003/10/09	Setpoint Isando	7131	2.99	0.09	0.03	0.18	10.04	0.36	0.025	39.3	19.5	6.15	1.05	1.995	0.01	13.5	153	265.5	512.5
260	145.68	153.02	LN	2003/10/09	Setpoint Isando	7138	0.97	0.12	0.05	0.22	8.88	0.45	0.04	46.1	16.4	8.1	1.3	1.17	0.01	5	104	147	445
			LN		**MEAN**		1.79	0.12	0.03	0.29	8.45	0.45	0.03	47.98	16.24	10.51	1.17	1.34	0.02	5.94	127.61	94.78	1017.89
			LN		**STDEV**		1.56	0.05	0.02	0.29	2.93	0.32	0.02	3.83	5.25	5.38	0.34	0.66	0.02	2.83	51.67	77.18	651.26
			LN		**MODE**		#N/A	#N/A	0.03	#N/A	#N/A	#N/A	0.01	50.4	#N/A	#N/A	1.2	#N/A	0.01	5	#N/A	#N/A	#N/A
			LN		**MAX**		5.02	0.22	0.05	1.06	12.9	1.1	0.065	51.6	22	20.6	1.8	2.21	0.0638	13.5	228.5	265.5	2371
			LN		**MIN**		0.04	0.05	0.01	0.14	3.735	0.05	0.01	39.3	7.1	6.05	0.7	0.25	0.005	5	67	29	445
88	256.08	267	MA	2003/10/21	Set Point	3/2013	0.86	0.07	0.01	0.16	11.2	0.19	0.01	50.3	19.9	8.2	1.8	0.77	0.0709	5	126	33	964
89	278	286.12	MA	2003/10/21	Set Point	3/2013	0.95	0.07	0.01	0.18	12.8	0.29	0.02	50.1	21.8	6.2	1.9	0.73	0.0284	5	94	29	517
149	298.82	305.69	MA	2003/10/21	Set Point	3/2014	0.77	0.07	0.02	0.12	13.1	0.43	0.01	47.3	21.5	7.5	1.2	1.31	0.005	5	133	46	702
179	89.65	94.35	MA	2003/10/21	Set Point	3/2486	1.02	0.06	0.02	0.17	12.7	0.53	0.005	49.7	22.8	4.9	2	0.47	0.005	5	137	28	270
220	164.35	172.29	MA	2003/10/21	Set Point	3/2567	0.07	0.07	0.02	0.15	13	0.56	0.005	49.6	22.1	6.6	2	0.34	0.01	5	146	29	433
247	70.89	81.11	MA	2003/10/09	Setpoint Isando	7131	1.09	0.03	0.01	0.38	12.9	0.87	0.07	50.9	24.2	1.9	2.8	1.07	0.01	5	221	12	146
249	30.65	33.31	MA	2003/10/09	Setpoint Isando	7138	1.30	0.08	0.02	0.34	11.7	0.83	0.04	51.5	21.3	4.5	2.7	0.5	0.005	5	146	21	220
			MA		**MEAN**		0.86	0.06	0.02	0.21	12.49	0.53	0.02	49.91	21.94	5.69	2.06	0.74	0.02	5.00	143.29	28.29	464.57
			MA		**STDEV**		0.39	0.02	0.01	0.10	0.73	0.25	0.02	1.33	1.33	2.12	0.55	0.35	0.02	0.00	38.57	10.45	291.18
			MA		**MODE**		#N/A	0.07	0.02	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	2	#N/A	0.005	5	146	29	#N/A
			MA		**MAX**		1.30	0.08	0.02	0.38	13.1	0.87	0.07	51.5	24.2	8.2	2.8	1.31	0.0709	5	221	46	964
			MA		**MIN**		0.07	0.03	0.01	0.12	11.2	0.19	0.005	47.3	19.9	1.9	1.2	0.34	0.005	5	94	12	146
4	125.85	132.18	MN	2003/10/21	Set Point	3/2013	0.85	0.14	0.02	0.19	7.94	0.48	0.02	51.5	13.9	14.2	1.4	0.35	0.1205	5	118	49	1396
24	41.58	52.04	MN	2003/10/21	Set Point	3/2013	0.28	0.12	0.02	0.23	9.98	0.27	0.03	52.7	16.3	9.7	1.9	0.23	0.078	5	128	39	632
25	54.075	63.87	MN	2003/10/21	Set Point	3/2013	1.29	0.12	0.02	0.25	10.7	0.34	0.03	52.3	15.9	9.7	2	0.22	0.1914	5	111	44	621
56	261.22	280.2	MN	2003/10/21	Set Point	3/2013	1.54	0.16	0.05	0.13	8.02	0.13	0.01	48.6	14.5	12.8	0.8	0.51	0.0425	5	79	104	997
65	107.05	121.66	MN	2003/10/21	Set Point	3/2013	3.23	0.17	0.03	0.3	6.19	0.01	0.02	49	9	15.3	1.1	1.19	0.0284	5	82	130	1716
76	101.66	111.24	MN	2003/10/21	Set Point	3/2013	0.53	0.12	0.04	0.22	10.7	0.49	0.02	50.7	16.5	8.8	1.5	0.84	0.1772	5	165	48	630
78	276.85	286	MN	2003/10/21	Set Point	3/2013	0.74	0.11	0.02	0.19	8.26	0.18	0.03	47.3	14.4	11.8	1.3	1.29	0.0567	5	121	129	1294
83	306.58	315	MN	2003/10/21	Set Point	3/2013	6.98	0.12	0.06	0.4	5.5	0.25	0.02	29.3	16.7	3.8	0.8	3.92	0.0354	5	183	522	477
87	187	197.88	MN	2003/10/21	Set Point	3/2013	1.03	0.08	0.02	0.18	12	0.14	0.02	50.7	18.3	7.2	2	0.58	0.0354	5	106	37	500
92	50	61.97	MN	2003/10/21	Set Point	3/2013	1.45	0.14	0.04	0.24	8.22	0.14	0.03	49.5	12.4	12.5	1.1	1.17	0.0567	5	141	105	691
112	101.96	112.24	MN	2003/10/21	Set Point	3/2014	1.38	0.16	0.03	0.21	8.22	0.3	0.02	51	11.7	15	1.1	0.23	0.01	5	125	64	1617
114	267.3	277.4	MN	2003/10/21	Set Point	3/2014	2.35	0.18	0.03	0.16	5.19	0.12	0.01	50.5	7.7	20.1	0.9	0.37	0.005	5	92	99	2590
119	157	162.26	MN	2003/10/21	Set Point	3/2014	0.96	0.11	0.01	0.12	10.9	0.2	0.005	50.3	17.6	8.9	1.8	0.7	0.01	5	133	63	647
121	226.1	232.11	MN	2003/10/21	Set Point	3/2014	1.09	0.12	0.02	0.15	9.7	0.44	0.01	49	17.3	9.3	1.4	0.85	0.01	5	139	84	663
131	169.66	180.32	MN	2003/10/21	Set Point	3/2014	0.87	0.18	0.06	0.28	11.8	0.09	0.005	48.4	15.4	9.2	1.1	-0.06	0.005	13	88	56	305
144	218.64	225.82	MN	2003/10/21	Set Point	3/2014	1.61	0.11	0.02	0.2	14.1	0.7	0.005	48	14	9.9	1	1.32	0.01	5	158	87	754
145	68.91	78.77	MN	2003/10/21	Set Point	3/2014	0.66	0.14	0.03	0.2	10.6	0.32	0.09	50.3	16	8.8	1.5	0.42	0.01	5	172	61	405
165	234.5	240.03	MN	2003/10/21	Set Point	3/2486	1.72	0.15	0.02	0.21	9.23	0.39	0.005	52	12.8	10.5	1.7	0.73	0.02	5	122	67	630
166	40.02	45.45	MN	2003/10/21	Set Point	3/2486	0.44	0.12	0.02	0.12	7.83	0.5	0.04	51	13.2	14.1	1.1	0.59	0.005	5	118	85	1400
264	24.01	34.14	MN	2003/10/09	Setpoint Isando	7138	2.82	0.13	0.04	0.23	8.65	0.33	0.03	48.5	16.7	10.3	1.2	1.1	0.01	5	105	90	632
266	21.48	29.48	MN	2003/10/09	Setpoint Isando	7138	2.42	0.13	0.02	0.24	8.81	0.4	0.03	47.9	15.2	11.3	1.1	3.61	0.01	5	126	81	1192
51	84.78	94	MN	2003/10/21	Set Point	3/2013	1.39	0.17	0.03	0.23	7.45	0.17	0.02	51	10.5	15.6	1	0.41	0.2269	5	66	65	1629
			MN		**MEAN**		1.62	0.14	0.03	0.21	9.09	0.29	0.02	49.07	14.36	11.31	1.31	0.94	0.05	5.36	121.73	95.86	973.55
			MN		**STDEV**		1.42	0.03	0.01	0.06	2.17	0.17	0.02	4.67	2.79	3.48	0.37	0.99	0.07	1.71	30.50	98.84	564.20
			MN		**MODE**		#N/A	0.12	0.02	0.23	10.7	0.14	0.02	51	16.7	9.7	1.1	0.23	0.01	5	118	#N/A	632
			MN		**MAX**		6.98	0.18	0.06	0.4	14.1	0.7	0.09	52.7	18.3	20.1	2	3.92	0.2269	13	183	522	2590
			MN		**MIN**		0.28	0.08	0.01	0.12	5.19	0.01	0.005	29.3	7.7	3.8	0.8	-0.06	0.005	5	66	37	305

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
167	282.83	288.2	LN	2003/10/21	Set Point	3/2486	175	189.5	9.5	10	5	96.5	0.122	10.6	1.855	0.25	0.15		
248	203.32	207.44	LN	2003/10/09	Setpoint Isando	7131	292	587	5	10	5	56	0.117	6.9	0.25	0.25	0.1		
255	455.69	463	LN	2003/10/09	Setpoint Isando	7131	5596.5	6348.5	27	10	5	77.5	5.21	11.8	2.2	0.25	0.12		
260	145.68	153.02	LN	2003/10/09	Setpoint Isando	7138	1358	2474	13	24	5	55	2.24	11	0.61	0.25	0.09		
			LN		**MEAN**		1204.28	1537.44	10.50	11.56	5.00	57.44	1.21	8.47	1.32	0.25			
			LN		**STDEV**		1841.02	2039.51	7.15	4.67	0.00	22.19	1.74	2.65	0.82	0.00			
			LN		**MODE**		#N/A	#N/A	5	10	5	#N/A	#N/A	#N/A	0.25	0.25			
			LN		**MAX**		5596.5	6348.5	27	24	5	96.5	5.21	11.8	2.28	0.25			
			LN		**MIN**		111	189.5	5	10	5	26	0.041	4	0.25	0.25			
88	256.08	267	MA	2003/10/21	Set Point	3/2013	337	423	5	10	5	45	0.122	4.4	0.25	0.25		0.05	0.25
89	278	286.12	MA	2003/10/21	Set Point	3/2013	267	286	5	10	5	42	0.117	4.4	0.88	0.25		0.05	0.25
149	298.82	305.69	MA	2003/10/21	Set Point	3/2014	380	415	5	10	5	28	0.126	5.4	0.25	1.76	0.11		
179	89.65	94.35	MA	2003/10/21	Set Point	3/2486	41	104	5	10	5	43	0.039	3.9	0.25	0.25	0.04		
220	164.35	172.29	MA	2003/10/21	Set Point	3/2567	148	173	5	10	5	27	0.064	4.8	0.25	0.25	0.06		
247	70.89	81.11	MA	2003/10/09	Setpoint Isando	7131	42	37	5	10	5	43	0.028	2.5	1.02	0.25	0.08		
249	30.65	33.31	MA	2003/10/09	Setpoint Isando	7138	43	79	14	10	5	48	0.034	4.3	0.25	0.25	0.09		
			MA		**MEAN**		179.71	216.71	6.29	10.00	5.00	39.43	0.08	4.24	0.45	0.47			
			MA		**STDEV**		147.41	159.45	3.40	0.00	0.00	8.38	0.04	0.90	0.34	0.57			
			MA		**MODE**		#N/A	#N/A	5	10	5	43	#N/A	4.4	0.25	0.25			
			MA		**MAX**		380	423	14	10	5	48	0.126	5.4	1.02	1.76			
			MA		**MIN**		41	37	5	10	5	27	0.028	2.5	0.25	0.25			
4	125.85	132.18	MN	2003/10/21	Set Point	3/2013	43	317	5	10	5	57	0.019	6.9	0.97	0.25		0.05	0.25
24	41.58	52.04	MN	2003/10/21	Set Point	3/2013	27	208	5	10	5	51	0.02	6.3	0.25	0.25		0.05	0.25
25	54.075	63.87	MN	2003/10/21	Set Point	3/2013	26	202	5	22	5	51	0.018	5.8	0.25	0.25		0.05	0.25
56	261.22	280.2	MN	2003/10/21	Set Point	3/2013	1052	1400	11	22	5	51	0.762	9.5	0.25	0.25		0.05	0.25
65	107.05	121.66	MN	2003/10/21	Set Point	3/2013	1697	1970	16	10	5	63	1.86	11.4	1.72	0.25		0.05	0.25
76	101.66	111.24	MN	2003/10/21	Set Point	3/2013	143	20	5	10	5	54	0.121	7.1	1.23	0.25		0.05	0.25
78	276.85	286	MN	2003/10/21	Set Point	3/2013	2043	2526	5	10	5	46	1.67	9.5	0.8	0.25		0.05	0.25
83	306.58	315	MN	2003/10/21	Set Point	3/2013	5396	12440	16	74	5	91	10.7	24.4	1.83	0.25		0.05	0.25
87	187	197.88	MN	2003/10/21	Set Point	3/2013	429	452	5	10	5	45	0.225	5.2	2.64	0.25		0.05	0.25
92	50	61.97	MN	2003/10/21	Set Point	3/2013	24	297	5	10	5	66	1.57	10.3	1.84	0.25		0.05	0.25
112	101.96	112.24	MN	2003/10/21	Set Point	3/2014	137	433	10	10	5	55	0.072	9.2	0.25	0.25	0.04		
114	267.3	277.4	MN	2003/10/21	Set Point	3/2014	1099	1708	5	10	5	56	0.447	9.4	0.25	0.25	0.04		
119	157	162.26	MN	2003/10/21	Set Point	3/2014	1376	1028	5	10	5	38	0.555	5.9	0.72	0.25	0.01		
121	226.1	232.11	MN	2003/10/21	Set Point	3/2014	989	1172	5	10	5	46	0.505	8.2	1.29	0.25	0.02		
131	169.66	180.32	MN	2003/10/21	Set Point	3/2014	157	240	11	10	5	43	0.183	11	0.25	0.25	0.02		
144	218.64	225.82	MN	2003/10/21	Set Point	3/2014	527	680	10	10	5	31	0.762	7	1.38	0.25	0.11		
145	68.91	78.77	MN	2003/10/21	Set Point	3/2014	781	884	5	10	5	49	0.339	9.3	0.25	0.25	0.06		
165	234.5	240.03	MN	2003/10/21	Set Point	3/2486	1128	1166	5	10	5	56	0.695	7.9	0.88	0.25	0.13		
166	40.02	45.45	MN	2003/10/21	Set Point	3/2486	1094	1510	5	10	5	57	0.416	7.8	0.63	0.25	0.14		
264	24.01	34.14	MN	2003/10/09	Setpoint Isando	7138	622	807	5	10	5	70	0.221	7	0.25	0.89	0.22		
266	21.48	29.48	MN	2003/10/09	Setpoint Isando	7138	540	992	12	28	5	66	0.426	6	2.66	1.21	0.42		
51	84.78	94	MN	2003/10/21	Set Point	3/2013	199	620	5	31	5	65	0.147	9.1	0.25	0.25		0.05	0.25
			MN		**MEAN**		887.68	1412.36	7.32	15.77	5.00	54.86	0.99	8.83	0.95	0.32			
			MN		**STDEV**		1161.85	2545.43	3.75	14.50	0.00	12.52	2.23	3.90	0.78	0.24			
			MN		**MODE**		#N/A	#N/A	5	10	5	51	0.762	9.5	0.25	0.25			
			MN		**MAX**		5396	12440	16	74	5	91	10.7	24.4	2.66	1.21			
			MN		**MIN**		24	20	5	10	5	31	0.018	5.2	0.25	0.25			

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
29	137.02	149.45	MZN	2003/10/21	Set Point	3/2013	4.54	0.21	0.05	0.3	8.31	0.04	0.02	50.5	11.6	13.4	0.8	0.03	0.1276	5	79	47	1262
30	149.84	161.08	MZN	2003/10/21	Set Point	3/2013	0.40	0.21	0.05	0.31	8.59	0.08	0.02	49.3	11.8	13.5	0.8	-0.12	0.0922	5	47	64	1162
55	199.6	208.24	MZN	2003/10/21	Set Point	3/2013	0.94	0.12	0.05	0.23	9.95	0.15	0.01	48.7	14	10.4	1.3	0.32	0.2411	5	67	71	649
74	321.17	332.51	MZN	2003/10/21	Set Point	3/2013	1.66	0.22	0.05	0.3	9.54	0.005	0.01	50	12.5	12.7	0.7	-0.02	0.0638	5	75	71	823
77	213.79	226.84	MZN	2003/10/21	Set Point	3/2013	2.41	0.09	0.03	0.17	8.02	0.005	0.02	41.2	11.6	6.2	1.7	2.75	0.0567	5	96	325	425
128	221.95	231.93	MZN	2003/10/21	Set Point	3/2014	0.44	0.18	0.05	0.29	8.63	0.1	0.02	48.9	13.5	12.1	0.8	0.13	0.01	13	98	62	891
137	115.18	123.41	MZN	2003/10/21	Set Point	3/2014	0.55	0.19	0.05	0.22	9.65	0.07	0.03	50	12.8	13	0.7	0.02	0.01	5	88	60	875
146	376	386	MZN	2003/10/21	Set Point	3/2014	2.44	0.16	0.03	0.42	6.77	0.3	0.06	46.1	9.3	13	0.8	1.07	0.01	21	147	167	1313
173	194.13	202.34	MZN	2003/10/21	Set Point	3/2486	1.72	0.09	0.02	0.15	6.33	0.26	0.01	44	13.9	13.8	0.8	2.61	0.01	5	117	76	863
			MZN		**MEAN**		1.68	0.16	0.04	0.27	8.42	0.11	0.02	47.63	12.33	12.01	0.93	0.75	0.07	7.67	90.44	104.78	918.11
			MZN		**STDEV**		1.34	0.05	0.01	0.08	1.25	0.11	0.02	3.20	1.47	2.40	0.34	1.15	0.08	5.66	29.16	89.66	288.08
			MZN		**MODE**		#N/A	0.21	0.05	0.3	#N/A	0.005	0.02	50	11.6	13	0.8	#N/A	0.01	5	#N/A	71	#N/A
			MZN		**MAX**		4.54	0.22	0.05	0.42	9.95	0.3	0.06	50.5	14	13.8	1.7	2.75	0.2411	21	147	325	1313
			MZN		**MIN**		0.40	0.09	0.02	0.15	6.33	0.005	0.01	41.2	9.3	6.2	0.7	-0.12	0.01	5	47	47	425
6	167.25	177.22	NC	2003/10/21	Set Point	3/2013	1.18	0.16	0.04	0.26	8.25	0.19	0.02	50.8	10.7	15.3	1	0.76	0.1276	5	124	87	1606
7	209.055	219.97	NC	2003/10/21	Set Point	3/2013	0.60	0.14	0.05	0.29	8.82	0.31	0.04	49.8	12.6	12	1.3	1.62	0.0567	5	109	98	850
15	210.835	229.43	NC	2003/10/21	Set Point	3/2013	1.64	0.13	0.03	0.15	8.01	0.25	0.01	48.8	11.8	15.2	1	2.19	0.078	5	119	97	1466
17	278.67	298.12	NC	2003/10/21	Set Point	3/2013	1.21	0.15	0.03	0.32	8.86	0.3	0.03	49.3	16.3	9.8	1.5	1.13	0.0709	5	129	70	610
26	39.09	60.06	NC	2003/10/21	Set Point	3/2013	1.53	0.11	0.01	0.19	10.3	0.2	0.02	51.6	16.9	8.6	1.9	0.67	0.1489	5	111	50	543
48	107.95	119.8	NC	2003/10/21	Set Point	3/2013	2.33	0.13	0.03	0.27	10.3	0.49	0.03	47.3	13.6	11.6	1.1	2.01	0.0567	5	180	99	830
71	246.75	257.58	NC	2003/10/21	Set Point	3/2013	0.69	0.12	0.05	0.19	11.4	0.23	0.01	47.3	16.8	10.6	0.8	1.26	0.1631	5	111	63	807
84	66.02	77.14	NC	2003/10/21	Set Point	3/2013	4.37	0.12	0.02	0.29	9.98	0.06	0.1	49.6	13.8	11.4	1.5	1.45	0.0425	5	61	76	734
97	244.05	255.92	NC	2003/10/21	Set Point	3/2013	1.77	0.1	0.01	0.15	10.8	0.34	0.005	49.1	18.4	7.9	1.8	1.36	0.0354	5	109	67	514
98	287.8	299.64	NC	2003/10/21	Set Point	3/2013	1.54	0.12	0.02	0.17	9.2	0.13	0.01	48.9	14.4	14.2	1.2	0.92	0.0284	5	100	71	1344
115	42.72	53.25	NC	2003/10/21	Set Point	3/2014	1.81	0.11	0.04	0.26	11.9	0.43	0.03	50	15.7	8.7	1.7	0.86	0.02	5	146	78	651
116	332.97	343.08	NC	2003/10/21	Set Point	3/2014	1.34	0.18	0.02	0.21	5.27	0.24	0.02	48	7.2	19.3	0.8	2.78	0.01	5	93	127	2688
120	171.84	175.3	NC	2003/10/21	Set Point	3/2014	1.36	0.12	0.02	0.16	10	0.36	0.04	49	15.3	11.3	1.4	1.54	0.01	5	138	78	1227
122	153.01	163.07	NC	2003/10/21	Set Point	3/2014	0.66	0.11	0.03	0.26	10.3	0.4	0.04	52	17.5	8.9	2	0.3	0.01	5	123	39	532
125	77.97	89	NC	2003/10/21	Set Point	3/2014	0.94	0.11	0.01	0.12	10.3	0.28	0.01	50.2	16.4	12.6	1.3	0.65	0.005	5	114	54	1156
135	89	99.73	NC	2003/10/21	Set Point	3/2014	1.72	0.1	0.05	0.28	7.63	0.65	0.05	47.4	16.4	9.1	1.1	1.85	0.02	5	160	64	721
155	83.37	93.77	NC	2003/10/21	Set Point	3/2014	0.95	0.13	0.04	0.36	7.94	0.45	0.05	50.2	12.7	13.7	1.4	0.87	0.01	5	141	91	1130
158	168.08	177.97	NC	2003/10/21	Set Point	3/2014	0.69	0.17	0.05	0.26	8.67	0.32	0.03	50.3	11.4	13.4	1.2	0.65	0.01	5	120	94	961
177	37.04	47.71	NC	2003/10/21	Set Point	3/2486	2.60	0.09	0.11	0.18	4.4	1.72	0.005	44.2	17.8	10.9	0.6	5.1	0.01	36	253	103	981
267	4.41	8.15	NC	2003/10/09	Setpoint Isando	7138	2.65	0.12	0.04	0.29	8.42	0.73	0.04	50.9	16.4	9.6	1.4	1.46	0.01	11	251	107	656
268	9.66	14.26	NC	2003/10/09	Setpoint Isando	7138	2.32	0.1	0.03	0.25	8.95	0.64	0.04	50.7	17.4	9.1	1.7	1.23	0.005	5	129	112	813
			NC		**MEAN**		1.61	0.12	0.03	0.23	9.03	0.42	0.03	49.30	14.74	11.58	1.32	1.46	0.04	6.76	134.33	82.14	991.43
			NC		**STDEV**		0.89	0.02	0.02	0.06	1.82	0.34	0.02	1.77	2.85	2.84	0.37	1.02	0.05	6.83	46.05	22.26	498.68
			NC		**MODE**		#N/A	0.12	0.03	0.26	10.30	#N/A	0.04	47.30	16.40	9.10	1.40	0.65	0.01	5.00	109.00	78.00	#N/A
			NC		**MAX**		4.37	0.18	0.11	0.36	11.9	1.72	0.1	52	18.4	19.3	2	5.1	0.1631	36	253	127	2688
			NC		**MIN**		0.60	0.09	0.01	0.12	4.4	0.06	0.005	44.2	7.2	7.9	0.6	0.3	0.005	5	61	39	514
132	35.82	46.49	PFPX	2003/10/21	Set Point	3/2014	0.23	0.17	0.02	0.34	5.06	0.2	0.03	49.5	9.5	17.7	0.9	1.11	0.01	5	57	78	2050
148	152.73	160.3	PFPX	2003/10/21	Set Point	3/2014	2.21	0.19	0.02	0.16	4.83	0.1	0.01	50.3	6.3	21.4	0.7	0.74	0.005	5	107	119	2406
161	289.83	299.78	PFPX	2003/10/21	Set Point	3/2014	0.27	0.12	0.02	0.21	8.98	0.34	0.04	50.1	15	12.1	1.4	0.59	0.02	5	120	69	1233
184	92.85	99.33	PFPX	2003/10/21	Set Point	3/2486	2.09	0.16	0.02	0.22	5.7	0.27	0.005	51	9.4	18.7	0.8	0.71	0.01	5	320	141	2064
185	156.98	162.65	PFPX	2003/10/21	Set Point	3/2486	1.76	0.17	0.03	0.14	4.97	0.1	0.005	50.7	8	20.9	0.7	0.74	0.01	5	61	127	2767
186	98.75	106.66	PFPX	2003/10/21	Set Point	3/2486	0.17	0.11	0.02	0.2	11.6	0.36	0.005	50.3	17.1	7.6	2	0.66	0.01	5	64	69	401
187	337.41	341.65	PFPX	2003/10/21	Set Point	3/2486	1.40	0.215	0.05	0.185	7.425	0.15	0.0075	43.15	7.6	19.35	0.75	0.22	0.01	5	95	154	535.5
189	251.69	257.5	PFPX	2003/10/21	Set Point	3/2567	0.57	0.1	0.04	0.17	13.6	0.33	0.005	48.8	16.8	9.6	1.1	1.31	0.02	5	124	65	713

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
29	137.02	149.45	MZN	2003/10/21	Set Point	3/2013	59	336	5	10	5	84	0.09	7.7	0.25	0.25		0.05	0.25
30	149.84	161.08	MZN	2003/10/21	Set Point	3/2013	135	460	5	23	5	81	0.11	11.7	0.25	0.25		0.05	0.25
55	199.6	208.24	MZN	2003/10/21	Set Point	3/2013	525	622	5	22	5	50	0.329	10.4	0.25	0.25		0.05	0.25
74	321.17	332.51	MZN	2003/10/21	Set Point	3/2013	320	495	5	34	5	73	0.128	11.1	0.25	0.25		0.05	0.25
77	213.79	226.84	MZN	2003/10/21	Set Point	3/2013	3001	5696	5	41	5	36	7.64	18.8	1.39	0.25		0.05	0.25
128	221.95	231.93	MZN	2003/10/21	Set Point	3/2014	329	563	5	10	5	57	0.272	12.2	0.25	0.25	0.03		
137	115.18	123.41	MZN	2003/10/21	Set Point	3/2014	66	291	5	10	5	64	0.023	11.2	0.25	0.25	0.03		
146	376	386	MZN	2003/10/21	Set Point	3/2014	7305	4681	25	10	5	46	1.94	13.1	1.29	0.25	0.06		
173	194.13	202.34	MZN	2003/10/21	Set Point	3/2486	541	480	5	10	5	50	5.11	14.2	2.13	0.25	0.07		
			MZN		**MEAN**		1364.56	1513.78	7.22	18.89	5.00	60.11	1.74	12.27	0.70	0.25			
			MZN		**STDEV**		2408.73	2101.22	6.67	11.93	0.00	16.52	2.77	3.05	0.71	0.00			
			MZN		**MODE**		#N/A	#N/A	5	10	5	50	#N/A	#N/A	0.25	0.25			
			MZN		**MAX**		7305	5696	25	41	5	84	7.64	18.8	2.13	0.25			
			MZN		**MIN**		59	291	5	10	5	36	0.023	7.7	0.25	0.25			
6	167.25	177.22	NC	2003/10/21	Set Point	3/2013	513	1012	5	25	5	61	0.385	9.2	0.63	0.25		0.05	0.25
7	209.055	219.97	NC	2003/10/21	Set Point	3/2013	729	1668	5	10	5	65	0.727	9	1.29	1.57		0.05	0.25
15	210.835	229.43	NC	2003/10/21	Set Point	3/2013	1441	2109	14	10	5	67	0.729	7.7	2.29	0.25		0.05	0.25
17	278.67	298.12	NC	2003/10/21	Set Point	3/2013	311	411	13	26	5	67	0.543	8.9	0.25	0.25		0.05	0.25
26	39.09	60.06	NC	2003/10/21	Set Point	3/2013	375	421	5	10	5	51	0.3	5.9	0.25	0.25		0.05	0.25
48	107.95	119.8	NC	2003/10/21	Set Point	3/2013	1215	1432	11	25	5	51	1.07	7.8	3.94	0.25		0.05	0.25
71	246.75	257.58	NC	2003/10/21	Set Point	3/2013	410	410	5	10	5	47	0.277	8.2	1.87	0.25		0.05	0.25
84	66.02	77.14	NC	2003/10/21	Set Point	3/2013	975	1010	5	10	5	51	0.868	4.7	2.18	0.25		0.05	0.25
97	244.05	255.92	NC	2003/10/21	Set Point	3/2013	1049	1068	5	10	5	59	0.642	5.8	2.1	0.25		0.05	0.25
98	287.8	299.64	NC	2003/10/21	Set Point	3/2013	737	1104	5	20	5	56	0.349	7.3	0.25	0.25		0.05	0.25
115	42.72	53.25	NC	2003/10/21	Set Point	3/2014	1295	1534	5	10	5	41	0.421	6.2	1.13	0.25	0.06		
116	332.97	343.08	NC	2003/10/21	Set Point	3/2014	2501	2993	11	10	5	48	0.978	10.4	0.25	0.25	0.19		
120	171.84	175.3	NC	2003/10/21	Set Point	3/2014	1172	1362	21	10	5	39	0.547	7.3	1.83	0.25	0.05		
122	153.01	163.07	NC	2003/10/21	Set Point	3/2014	245	353	5	10	5	32	0.058	6.4	0.25	0.25	0.05		
125	77.97	89	NC	2003/10/21	Set Point	3/2014	475	676	5	10	5	32	0.179	5.9	0.8	0.25	0.05		
135	89	99.73	NC	2003/10/21	Set Point	3/2014	348	230	5	10	5	60	1.27	10.6	2.1	0.25	0.08		
155	83.37	93.77	NC	2003/10/21	Set Point	3/2014	1212	2409	5	10	5	48	0.349	8.5	0.92	0.25	0.07		
158	168.08	177.97	NC	2003/10/21	Set Point	3/2014	1014	1381	11	10	5	51	0.63	10	1.57	0.25	0.05		
177	37.04	47.71	NC	2003/10/21	Set Point	3/2486	714	854	5	10	5	51	1.5	9.9	4.46	0.25	0.18		
267	4.41	8.15	NC	2003/10/09	Setpoint Isando	7138	1629	3013	5	10	5	62	0.074	5.5	1.38	0.25	0.19		
268	9.66	14.26	NC	2003/10/09	Setpoint Isando	7138	2272	5040	10	10	5	57	0.391	5	1.59	0.25	0.16		
			NC		**MEAN**		982.48	1451.90	7.67	12.67	5.00	52.19	0.59	7.63	1.49	0.31			
			NC		**STDEV**		616.90	1154.35	4.39	5.73	0.00	10.26	0.38	1.84	1.15	0.29			
			NC		**MODE**		#N/A	#N/A	5.00	10.00	5.00	51.00	0.35	5.90	0.25	0.25			
			NC		**MAX**		2501	5040	21	26	5	67	1.5	10.6	4.46	1.57			
			NC		**MIN**		245	230	5	10	5	32	0.058	4.7	0.25	0.25			
132	35.82	46.49	PFPX	2003/10/21	Set Point	3/2014	148	1049	5	10	5	61	0.175	12.3	1.34	0.25	0.07		
148	152.73	160.3	PFPX	2003/10/21	Set Point	3/2014	1767	3019	10	10	5	51	0.623	9.8	1.2	0.25	0.1		
161	289.83	299.78	PFPX	2003/10/21	Set Point	3/2014	1134	1301	14	10	5	50	0.424	8	0.25	1.21	0.4		
184	92.85	99.33	PFPX	2003/10/21	Set Point	3/2486	2711	4000	5	10	5	60	0.98	9.1	0.25	0.25	0.03		
185	156.98	162.65	PFPX	2003/10/21	Set Point	3/2486	2237	3300	11	10	5	63	0.657	9.3	0.25	0.25	0.07		
186	98.75	106.66	PFPX	2003/10/21	Set Point	3/2486	1065	830	5	10	5	53	0.513	7.2	0.25	0.25	0.07		
187	337.41	341.65	PFPX	2003/10/21	Set Point	3/2486	1305	2386	5	10	5	66	0.8335	16.2	0.25	0.25	0.085		
189	251.69	257.5	PFPX	2003/10/21	Set Point	3/2567	734	861	22	10	5	50	0.393	6.1	0.72	0.53	0.1		

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
226	140.89	146.9	PFPX	2003/10/09	Setpoint Isando	7131	0.00	0.14	0.05	0.33	7.39	0.88	0.09	49	14.4	11.3	0.7	0.76	0.01	19	179	95	1064
250	316.64	323.3	PFPX	2003/10/09	Setpoint Isando	7138	0.85	0.14	0.08	0.27	12.6	0.32	0.03	47.5	11.3	12.3	0.7	1.08	0.01	5	119	107	1315
262	407.87	417.88	PFPX	2003/10/09	Setpoint Isando	7138	4.54	0.15	0.03	0.24	4.86	0.18	0.03	40.6	7.3	15	0.6	2.97	0.01	5	118	349	1393
			PFPX		**MEAN**		1.28	0.15	0.03	0.22	7.91	0.29	0.02	48.27	11.15	15.09	0.94	0.99	0.01	6.27	124.00	124.82	1449.23
			PFPX		**STDEV**		1.34	0.03	0.02	0.07	3.32	0.22	0.03	3.36	3.99	4.78	0.42	0.72	0.00	4.22	73.96	80.39	779.93
			PFPX		**MODE**		#N/A	0.17	0.02	#N/A	#N/A	0.1	0.005	50.3	#N/A	#N/A	0.7	0.74	0.01	5	#N/A	69	#N/A
			PFPX		**MAX**		4.54	0.215	0.08	0.34	13.6	0.88	0.09	51	17.1	21.4	2	2.97	0.02	19	320	349	2767
			PFPX		**MIN**		0.00	0.1	0.02	0.14	4.83	0.1	0.005	40.6	6.3	7.6	0.6	0.22	0.005	5	57	65	401
73	287	300.25	PGN	2003/10/21	Set Point	3/2013	0.64	0.14	0.04	0.23	9.44	0.24	0.07	49.2	18.3	7.6	1.2	0.66	0.0496	10	101	56	445
109	65.36	77.6	PGN	2003/10/21	Set Point	3/2014	0.94	0.08	0.02	0.22	8.9	0.48	0.04	51.1	16.8	9.9	1.5	0.93	0.01	5	148	82	986
138	32.5	42	PGN	2003/10/21	Set Point	3/2014	1.59	0.12	0.06	0.29	9.41	0.41	0.02	46.9	19.3	7.5	0.9	0.83	0.02	16	187	72	639
147	147.6	159.52	PGN	2003/10/21	Set Point	3/2014	0.26	0.12	0.035	0.3	11.95	0.625	0.03	51.6	15.55	8.45	1.9	0.67	0.02	5	188	41	462
150	166.95	177.04	PGN	2003/10/21	Set Point	3/2014	3.08	0.11	0.03	0.17	10.7	0.41	0.02	47	19.7	7.9	1.1	1.1	0.01	5	142	75	537
151	211.37	216.55	PGN	2003/10/21	Set Point	3/2014	5.76	0.13	0.05	0.68	10.5	0.47	0.03	38	13.8	6.5	1.3	2.11	0.03	5	180	218	266
159	202.88	209.55	PGN	2003/10/21	Set Point	3/2014	0.85	0.11	0.04	0.24	9.25	0.46	0.05	48.5	16.1	9.6	1.2	1.14	0.01	5	146	94	806
162	68.92	75.55	PGN	2003/10/21	Set Point	3/2014	0.47	0.12	0.04	0.34	10.6	0.5	0.06	51.9	14.4	7.7	1.9	0.83	0.03	5	234	78	374
171	87.38	98.05	PGN	2003/10/21	Set Point	3/2486	1.07	0.08	0.01	0.24	13.1	0.6	0.01	49.9	16.5	8.6	1.3	1.04	0.02	5	145	63	1014
211	183.58	190.3	PGN	2003/10/21	Set Point	3/2567	1.56	0.12	0.03	0.19	10.1	0.45	0.01	49.4	14	11.2	1.4	1.2	0.01	5	126	100	1324
222	43.54	49.76	PGN	2003/10/21	Set Point	3/2567	0.84	0.1	0.03	0.31	10	0.63	0.03	50.4	18.2	8.4	1.8	1.77	0.02	5	179	40	706
228	285.68	295.96	PGN	2003/10/09	Setpoint Isando	7131	0.03	0.14	0.06	0.29	7.21	0.4	0.04	50.2	13	12.5	1.1	0.95	0.01	5	111	115	916
254	133.37	145.07	PGN	2003/10/09	Setpoint Isando	7131	2.09	0.13	0.04	0.22	7.48	0.42	0.03	44.3	14.5	8.9	1.1	1.63	0.01	5	175	181	588
258	118	121.88	PGN	2003/10/09	Setpoint Isando	7138	0.56	0.16	0.05	0.36	7.82	0.41	0.06	50.6	13.6	11.5	1.4	1.01	0.02	5	93	121	525
16	247.94	268.075	PGN	2003/10/21	Set Point	3/2013	1.57	0.14	0.05	0.18	9.62	0.16	0.01	49.9	15.1	12	1.2	0.61	0.1276	5	80	5	707
			PGN		**MEAN**		1.42	0.12	0.04	0.28	9.74	0.44	0.03	48.59	15.92	9.22	1.35	1.10	0.03	6.07	149.00	89.40	686.33
			PGN		**STDEV**		1.43	0.02	0.01	0.12	1.58	0.13	0.02	3.55	2.15	1.83	0.30	0.43	0.03	3.03	42.24	54.20	282.17
			PGN		**MODE**		#N/A	0.12	0.04	0.22	#N/A	0.41	0.03	49.9	#N/A	#N/A	1.2	0.83	0.01	5	#N/A	#N/A	#N/A
			PGN		**MAX**		5.76	0.16	0.06	0.68	13.1	0.63	0.07	51.9	19.7	12.5	1.9	2.11	0.1276	16	234	218	1324
			PGN		**MIN**		0.03	0.08	0.01	0.17	7.21	0.16	0.01	38	13	6.5	0.9	0.61	0.01	5	80	5	266
123	33.66	44.45	PX	2003/10/21	Set Point	3/2014	2.62	0.16	0.02	0.18	5.78	0.14	0.005	50.3	5.7	19.9	0.4	3.03	0.01	5	53	81	2606
139	65	75.23	PX	2003/10/21	Set Point	3/2014	0.99	0.19	0.02	0.16	5.31	0.19	0.01	52.1	6.4	21.3	0.5	0.62	0.01	5	78	86	2625
140	100.62	108.93	PX	2003/10/21	Set Point	3/2014	1.30	0.18	0.03	0.19	7.87	0.27	0.01	51.6	8.8	17.7	0.8	0.21	0.01	5	129	65	2438
164	85.14	90.6	PX	2003/10/21	Set Point	3/2486	0.43	0.18	0.03	0.18	4.57	0.22	0.005	53	6.1	21.5	0.7	0.57	0.01	5	103	87	2586
172	117.23	126.78	PX	2003/10/21	Set Point	3/2486	0.82	0.15	0.02	0.19	8.29	0.23	0.005	49.5	12.8	14.5	1.2	0.33	0.01	5	116	87	1167
178	60.57	69.09	PX	2003/10/21	Set Point	3/2486	1.42	0.19	0.03	0.21	4.64	0.17	0.005	53	6.4	22.1	0.7	0.43	0.01	5	103	81	2655
183	123.12	131.85	PX	2003/10/21	Set Point	3/2486	1.66	0.19	0.02	0.18	9.05	0.16	0.005	50.8	10.6	15.8	1.1	0.46	0.005	5	112	83	1395
188	58.05	67.91	PX	2003/10/21	Set Point	3/2486	0.69	0.18	0.03	0.23	4.43	0.43	0.005	53.4	6.4	21.5	0.7	0.74	0.02	5	187	82	2522
190	252.02	258.1	PX	2003/10/21	Set Point	3/2567	0.19	0.16	0.03	0.16	7.69	0.21	0.005	50.5	11.8	17	1.2	0.31	0.01	5	84	72	1674
191	231.8	241.6	PX	2003/10/21	Set Point	3/2567	0.95	0.21	0.05	0.26	7.18	0.34	0.01	49.3	9.4	16	1.2	0.28	0.01	5	120	107	1639
212	61.57	72.08	PX	2003/10/21	Set Point	3/2567	1.23	0.16	0.04	0.26	8.23	0.28	0.02	48.7	10.7	14.9	0.8	0.95	0.02	5	101	86	1214
214	415.91	426.33	PX	2003/10/21	Set Point	3/2567	3.51	0.16	0.05	0.26	3.89	0.59	0.02	42.1	8.3	21.3	0.5	2.84	0.02	13	139	223	1430
251	138.93	144.28	PX	2003/10/09	Setpoint Isando	7131	1.95	0.76	0.02	0.11	9.5	0.11	1	53	2.1	5.1	0.1	0.79	0.02	33	122	49	174
252	10.84	12.83	PX	2003/10/09	Setpoint Isando	7138	1.21	0.21	0.03	0.21	5.66	0.18	0.02	51.7	6.8	19.7	1	-0.08	0.005	5	64	96	2335
253	150.87	155.86	PX	2003/10/09	Setpoint Isando	7131	1.92	0.17	0.03	0.31	5.11	0.21	0.05	49	7.7	17.9	1	0.46	0.005	5	128	147	2141
261	99	104	PX	2003/10/09	Setpoint Isando	7138	0.76	0.2	0.03	0.27	4.43	0.27	0.04	52.8	5.6	21.1	0.8	0.27	0.005	5	87	90	2495
			PX		**MEAN**		1.35	0.22	0.03	0.21	6.35	0.25	0.08	50.68	7.85	17.96	0.79	0.76	0.01	7.25	107.88	95.13	1943.50
			PX		**STDEV**		0.84	0.15	0.01	0.05	1.87	0.12	0.25	2.78	2.74	4.30	0.32	0.88	0.01	7.15	32.08	39.83	725.45
			PX		**MODE**		#N/A	0.16	0.03	0.18	4.43	0.27	0.005	53	6.4	21.3	0.8	0.46	0.01	5	103	81	#N/A
			PX		**MAX**		3.51	0.76	0.05	0.31	9.5	0.59	1	53.4	12.8	22.1	1.2	3.03	0.02	33	187	223	2655

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
226	140.89	146.9	PFPX	2003/10/09	Setpoint Isando	7131	1463	1919	12	10	5	69	0.8	11.8	0.85	0.25	0.21		
250	316.64	323.3	PFPX	2003/10/09	Setpoint Isando	7138	1174	1468	14	10	5	52	0.918	9.4	0.84	0.25	0.12		
262	407.87	417.88	PFPX	2003/10/09	Setpoint Isando	7138	2894	7540	13	27	5	56	6.67	17.6	3.21	0.25	0.11		
			PFPX		**MEAN**		1512.00	2515.73	10.55	11.55	5.00	57.36	1.18	10.62	0.86	0.36			
			PFPX		**STDEV**		831.03	1974.64	5.35	5.13	0.00	6.79	1.84	3.60	0.88	0.29			
			PFPX		**MODE**		#N/A	#N/A	5	10	5	50	#N/A	#N/A	0.25	0.25			
			PFPX		**MAX**		2894	7540	22	27	5	69	6.67	17.6	3.21	1.21			
			PFPX		**MIN**		148	830	5	10	5	50	0.175	6.1	0.25	0.25			
73	287	300.25	PGN	2003/10/21	Set Point	3/2013	829	860	10	34	5	50	0.493	9.5	0.25	0.25		0.05	0.25
109	65.36	77.6	PGN	2003/10/21	Set Point	3/2014	218	2774	19	10	5	38	0.608	6.2	1.3	0.25	0.07		
138	32.5	42	PGN	2003/10/21	Set Point	3/2014	1055	1204	13	10	5	64	0.694	10	1.26	0.25	0.04		
147	147.6	159.52	PGN	2003/10/21	Set Point	3/2014	115.5	192	5	10	5	43.5	0.0565	6.55	0.725	0.25	0.1		
150	166.95	177.04	PGN	2003/10/21	Set Point	3/2014	1433	1362	5	10	5	39	0.617	6.5	0.25	0.95	0.06		
151	211.37	216.55	PGN	2003/10/21	Set Point	3/2014	3758	5263	16	10	5	41	3.31	12.9	2.75	0.25	0.04		
159	202.88	209.55	PGN	2003/10/21	Set Point	3/2014	1600	2000	5	10	5	46	0.692	8.5	1.52	0.25	0.04		
162	68.92	75.55	PGN	2003/10/21	Set Point	3/2014	735	1206	5	10	5	47	0.403	8.2	1.14	0.25	0.05		
171	87.38	98.05	PGN	2003/10/21	Set Point	3/2486	1422	1680	12	10	5	49	0.558	5.2	0.6	0.25	0.09		
211	183.58	190.3	PGN	2003/10/21	Set Point	3/2567	2328	3022	10	10	5	43	1.01	7.3	1.67	0.25	0.16		
222	43.54	49.76	PGN	2003/10/21	Set Point	3/2567	196	348	5	10	5	43	0.106	6.1	1.89	0.25	0.23		
228	285.68	295.96	PGN	2003/10/09	Setpoint Isando	7131	882	1246	5	10	5	72	0.492	10.5	0.95	0.25	0.16		
254	133.37	145.07	PGN	2003/10/09	Setpoint Isando	7131	1902	2856	5	10	5	54	3.26	13.6	1.38	0.25	0.09		
258	118	121.88	PGN	2003/10/09	Setpoint Isando	7138	878	1042	5	10	5	63	0.872	10.2	0.51	0.25	0.12		
16	247.94	268.075	PGN	2003/10/21	Set Point	3/2013	624	87	5	10	5	58	0.419	7.4	1.24	0.25		0.05	0.25
			PGN		**MEAN**		1198.37	1676.13	8.33	11.60	5.00	50.03	0.91	8.58	1.16	0.30			
			PGN		**STDEV**		949.89	1354.02	4.73	6.20	0.00	10.15	1.00	2.51	0.66	0.18			
			PGN		**MODE**		#N/A	#N/A	5	10	5	43	#N/A	#N/A	0.25	0.25			
			PGN		**MAX**		3758	5263	19	34	5	72	3.31	13.6	2.75	0.95			
			PGN		**MIN**		115.5	87	5	10	5	38	0.0565	5.2	0.25	0.25			
123	33.66	44.45	PX	2003/10/21	Set Point	3/2014	674	1230	10	10	5	47	0.294	9.7	2.15	0.25	0.08		
139	65	75.23	PX	2003/10/21	Set Point	3/2014	267	880	5	10	5	53	0.137	9.1	0.98	0.25	0.06		
140	100.62	108.93	PX	2003/10/21	Set Point	3/2014	160	562	5	10	5	52	0.103	9	0.25	0.25	0.03		
164	85.14	90.6	PX	2003/10/21	Set Point	3/2486	305	896	5	10	5	67	0.059	9.6	0.83	0.25	0.16		
172	117.23	126.78	PX	2003/10/21	Set Point	3/2486	621	1039	5	10	5	62	0.352	9.7	0.25	0.25	0.08		
178	60.57	69.09	PX	2003/10/21	Set Point	3/2486	294	920	5	10	5	66	0.06	8.8	0.58	0.25	0.1		
183	123.12	131.85	PX	2003/10/21	Set Point	3/2486	1084	1175	5	10	5	54	0.468	8.4	0.25	0.25	0.05		
188	58.05	67.91	PX	2003/10/21	Set Point	3/2486	336	857	5	10	5	80	0.087	9.1	0.55	0.25	0.08		
190	252.02	258.1	PX	2003/10/21	Set Point	3/2567	312	681	16	10	5	62	0.143	9.1	0.25	0.25	0.13		
191	231.8	241.6	PX	2003/10/21	Set Point	3/2567	935	1104	16	10	5	63	0.808	12.1	0.25	0.25	0.12		
212	61.57	72.08	PX	2003/10/21	Set Point	3/2567	467	877	11	10	5	57	0.344	10.5	0.85	0.25	0.19		
214	415.91	426.33	PX	2003/10/21	Set Point	3/2567	3606	4966	16	10	5	50	1.77	11.6	3.2	0.25	0.22		
251	138.93	144.28	PX	2003/10/09	Setpoint Isando	7131	212	131	5	10	5	40	1.56	20.2	0.55	0.25	0.07		
252	10.84	12.83	PX	2003/10/09	Setpoint Isando	7138	804	1514	5	10	5	77	0.368	10.7	0.25	0.25	0.05		
253	150.87	155.86	PX	2003/10/09	Setpoint Isando	7131	2865	2948	20	10	5	65	1.61	11.5	0.25	0.25	0.07		
261	99	104	PX	2003/10/09	Setpoint Isando	7138	476	1098	5	10	5	76	0.149	10.2	0.25	0.25	0.1		
			PX		**MEAN**		838.63	1304.88	8.69	10.00	5.00	60.69	0.52	10.58	0.73	0.25			
			PX		**STDEV**		982.19	1140.83	5.36	0.00	0.00	11.23	0.59	2.79	0.82	0.00			
			PX		**MODE**		#N/A	#N/A	5	10	5	62	#N/A	9.1	0.25	0.25			
			PX		**MAX**		3606	4966	20	10	5	80	1.77	20.2	3.2	0.25			

						Batch	Fe2O3	MnO	V2O5	TiO2	CaO	K2O	P2O5	SiO2	AL2O3	MgO	Na2O	L.O.I	Cl	As	Ba	Co	Cr
Sample				Date	Laboratory	No	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm
	From	To	Lithology																				
			PX		MIN		0.19	0.15	0.02	0.11	3.89	0.11	0.005	42.1	2.1	5.1	0.1	-0.08	0.005	5	53	49	174
194	477.06	480.02	Q	2003/10/21	Set Point	3/2567	0.48	0.005	0.02	0.05	0.15	0.14	0.005	96.2	0.9	0.1	0.2	0.03	0.01	5	10	5	565
196	407	411.4	Q	2003/10/21	Set Point	3/2567	0.70	0.02	0.04	0.58	0.71	0.68	0.01	77	8.9	1.5	0.3	1.55	0.01	5	58	30	120
200	381.02	385.62	Q	2003/10/21	Set Point	3/2567	1.65	0.06	0.07	0.65	2.04	0.68	0.02	75	9.6	1.6	0.6	1.42	0.01	5	145	15	326
209	480.01	488.06	Q	2003/10/21	Set Point	3/2567	0.95	0.01	0.04	0.43	0.56	0.55	0.005	85.4	5	1.1	0.7	0.46	0.01	5	75	10	394
217	482.96	490.07	Q	2003/10/21	Set Point	3/2567	4.98	0.06	0.04	0.47	3.78	0.4	0.04	70.4	8.2	3.8	1	0.43	0.01	5	158	21	602
			Q		MEAN		1.75	0.03	0.04	0.44	1.45	0.49	0.02	80.80	6.52	1.62	0.56	0.78	0.01	5.00	89.20	16.20	401.40
			Q		STDEV		1.86	0.03	0.02	0.23	1.48	0.23	0.01	10.18	3.60	1.36	0.32	0.67	0.00	0.00	61.84	9.73	194.89
			Q		MODE		#N/A	0.06	0.04	#N/A	#N/A	0.68	0.005	#N/A	#N/A	#N/A	#N/A	#N/A	0.01	5	#N/A	#N/A	#N/A
			Q		MAX		4.98	0.06	0.07	0.65	3.78	0.68	0.04	96.2	9.6	3.8	1	1.55	0.01	5	158	30	602
			Q		MIN		0.48	0.005	0.02	0.05	0.15	0.14	0.005	70.4	0.9	0.1	0.2	0.03	0.01	5	10	5	120
13	115.88	121.885	QF	2003/10/21	Set Point	3/2013	0.05	0.01	0.005	0.06	0.61	0.18	0.005	77.6	12.6	0.05	7.6	0.58	0.2694	5	10	5	471
143	216.4	218.64	QF	2003/10/21	Set Point	3/2014	0.45	0.01	0.005	0.03	0.57	2.84	0.02	76.3	12.6	0.3	4.9	0.43	0.01	5	159	5	17
157	123.84	129.85	QF	2003/10/21	Set Point	3/2014	0.00	0.01	0	0.11	0.79	4.11	0.06	75.1	13	0.3	4	0.52	0.01	5	486	5	376
176	60.22	62.1	QF	2003/10/21	Set Point	3/2486	0.24	0.005	0.005	0.07	4.04	0.06	0.01	74.1	12.8	0.7	5.3	1.26	0.01	5	10	13	511
193	179	183.22	QF	2003/10/21	Set Point	3/2567	0.17	0.005	0.02	0.03	0.45	1.76	0.005	77	12.4	0.4	6.1	0.38	0.01	5	67	5	319
216	160.81	164.25	QF	2003/10/21	Set Point	3/2567	0.20	0.005	0.02	0.15	1.07	2.28	0.04	73.8	13.1	0.7	5.3	0.56	0.01	11	259	5	203
225	27.32	35.15	QF	2003/10/09	Setpoint Isando	7131	0.30	0.09	0.02	0.32	9.96	0.6	0.05	53.7	18	7.2	2.1	0.35	0.01	5	178	26	509
257	55.38	60.4	QF	2003/10/09	Setpoint Isando	7138	0.27	0.01	0.005	0.14	0.89	3.15	0.05	75.3	12.9	0.4	4.4	0.44	0.005	5	341	5	416
			QF		MEAN		0.21	0.02	0.01	0.11	2.30	1.87	0.03	72.86	13.43	1.26	4.96	0.57	0.04	5.75	188.75	8.63	352.75
			QF		STDEV		0.14	0.03	0.01	0.10	3.31	1.49	0.02	7.86	1.86	2.41	1.60	0.29	0.09	2.12	167.42	7.56	170.83
			QF		MODE		#N/A	0.01	0.005	0.03	#N/A	#N/A	0.005	#N/A	12.6	0.3	5.3	#N/A	0.01	5	10	5	#N/A
			QF		MAX		0.45	0.09	0.02	0.32	9.96	4.11	0.06	77.6	18	7.2	7.6	1.26	0.2694	11	486	26	511
			QF		MIN		0.00	0.005	0	0.03	0.45	0.06	0.005	53.7	12.4	0.05	2.1	0.35	0.005	5	10	5	17
79	289.03	300.53	SP	2003/10/21	Set Point	3/2013	3.33	0.13	0.02	0.18	3.22	0.07	0.01	38.1	5.5	24.4	0.3	6.52	0.0709	5	76	182	1624
81	199.04	206	SP	2003/10/21	Set Point	3/2013	4.01	0.18	0.02	0.17	4.83	0.12	0.01	45.7	6.3	24.5	0.5	3.4	0.0213	5	80	114	2771
82	252.53	258.5	SP	2003/10/21	Set Point	3/2013	4.47	0.18	0.02	0.16	4.33	0.08	0.02	43.4	6.2	24.3	0.7	4.03	0.0496	5	78	123	3672
96	185.52	197.07	SP	2003/10/21	Set Point	3/2013	11.19	0.19	0.02	0.15	3	0.03	0.01	39.1	4.4	26.4	0.4	6.38	0.0142	5	86	166	2352
110	166.55	179.65	SP	2003/10/21	Set Point	3/2014	5.14	0.18	0.02	0.14	4.23	0.19	0.01	42.5	5.9	24.7	0.5	5.17	0.04	5	66	148	2711
118	46.14	51.98	SP	2003/10/21	Set Point	3/2014	3.45	0.19	0.02	0.12	4.02	0.08	0.005	45	5.4	24.7	0.4	2.8	0.01	5	87	159	3597
124	53.82	64	SP	2003/10/21	Set Point	3/2014	1.98	0.13	0.01	0.1	6.82	0.12	0.01	41.5	8.9	20.8	0.5	5.73	0.02	5	77	136	1879
163	116.15	122.11	SP	2003/10/21	Set Point	3/2486	5.74	0.14	0.01	0.1	2.54	0.17	0.005	42.2	2.9	26.4	0.3	5.82	0.02	5	57	177	3635
215	123	132.02	SP	2003/10/21	Set Point	3/2567	0.96	0.2	0.06	0.21	6.41	0.145	0.0125	48.6	6	20.55	0.35	0.91	0.01	5	85	118.5	2028
238	78	84.17	SP	2003/10/09	Setpoint Isando	7131	0.00	0.08	0.02	0.31	11	0.59	0.05	51.6	20.1	6	2.3	0.48	0.01	5	161	34	372
			SP		MEAN		4.03	0.16	0.02	0.16	5.04	0.16	0.01	43.77	7.16	22.28	0.63	4.12	0.03	5.00	85.30	135.75	2464.10
			SP		STDEV		3.10	0.04	0.01	0.06	2.51	0.16	0.01	4.13	4.79	6.05	0.60	2.19	0.02	0.00	28.17	43.12	1048.62
			SP		MODE		#N/A	0.18	0.02	0.1	#N/A	0.12	0.01	#N/A	#N/A	26.4	0.5	#N/A	0.01	5	#N/A	#N/A	#N/A
			SP		MAX		11.19	0.2	0.06	0.31	11	0.59	0.05	51.6	20.1	26.4	2.3	6.52	0.0709	5	161	182	3672
			SP		MIN		0.00	0.08	0.01	0.1	2.54	0.03	0.005	38.1	2.9	6	0.3	0.48	0.01	5	57	34	372
285			Mettalurgical	2003/10/29	Setpoint Isando	2840	2.02	0.18	0.03	0.23	5.6	0.2	0.03	47.3	7.2	18.9	0.5	2.21	0.01	5	84	102	1988
286			Mettalurgical	2003/10/29	Setpoint Isando	2840	5.22	0.16	0.04	0.19	6.8	0.19	0.02	48.2	8.3	15.6	0.6	3.4	0.01	5	148	137	1604
287			Mettalurgical	2003/10/29	Setpoint Isando	2840	2.37	0.16	0.04	0.21	5.77	0.25	0.04	43.6	8.5	16.3	0.6	2.9	0.01	22	60	113	1836
			Mett		MEAN		3.20	0.17	0.04	0.21	6.06	0.21	0.03	46.37	8.00	16.93	0.57	2.84	0.01	10.67	97.33	117.33	1809.33
			Mett		STDEV		1.76	0.01	0.01	0.02	0.65	0.03	0.01	2.44	0.70	1.74	0.06	0.60	0.00	9.81	45.49	17.90	193.38
			Mett		MODE		#N/A	0.16	0.04	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.6	#N/A	0.01	5	#N/A	#N/A	#N/A
			Mett		MAX		5.22	0.18	0.04	0.23	6.8	0.25	0.04	48.2	8.5	18.9	0.6	3.4	0.01	22	148	137	1988
			Mett		MIN		2.02	0.16	0.03	0.19	5.6	0.19	0.02	43.6	7.2	15.6	0.5	2.21	0.01	5	60	102	1604

						Batch	Cu	Ni	Pb	Te	TL	Zn	S	FeO	H2O+	CO2	H2O-	N	F
Sample				Date	Laboratory	No	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
	From	To	Lithology																
			PX		MIN		160	131	5	10	5	40	0.059	8.4	0.25	0.25			
194	477.06	480.02	Q	2003/10/21	Set Point	3/2567	139	15	5	10	5	5	0.086	1.1	0.25	0.25	0.07		
196	407	411.4	Q	2003/10/21	Set Point	3/2567	69	41	5	10	5	59	0.306	6.6	1.72	0.25	0.18		
200	381.02	385.62	Q	2003/10/21	Set Point	3/2567	47	33	5	10	5	40	0.289	5.5	1.21	0.25	0.19		
209	480.01	488.06	Q	2003/10/21	Set Point	3/2567	73	43	5	10	5	16	0.313	3.2	0.25	0.25	0.8		
217	482.96	490.07	Q	2003/10/21	Set Point	3/2567	85	119	10	10	5	39	0.106	5.15	0.25	0.25	0.08		
			Q		MEAN		82.60	50.20	6.00	10.00	5.00	31.80	0.22	4.31	0.74	0.25			
			Q		STDEV		34.39	40.01	2.24	0.00	0.00	21.37	0.11	2.17	0.69	0.00			
			Q		MODE		#N/A	#N/A	5	10	5	#N/A	#N/A	#N/A	0.25	0.25			
			Q		MAX		139	119	10	10	5	59	0.313	6.6	1.72	0.25			
			Q		MIN		47	15	5	10	5	5	0.086	1.1	0.25	0.25			
13	115.88	121.885	QF	2003/10/21	Set Point	3/2013	5	5	5	10	5	17	0.019	0.5	0.25	0.25		0.05	0.25
143	216.4	218.64	QF	2003/10/21	Set Point	3/2014	1697	77	14	10	5	11	0.162	0.6	0.25	0.25	0.03		
157	123.84	129.85	QF	2003/10/21	Set Point	3/2014	21	25	5	10	5	16	0.045	0.9	0.25	1.07	0.17		
176	60.22	62.1	QF	2003/10/21	Set Point	3/2486	37	42	5	10	5	17	0.021	1.1	0.82	0.25	0.11		
193	179	183.22	QF	2003/10/21	Set Point	3/2567	25	59	22	10	5	5	0.093	0.8	0.25	0.25	0.18		
216	160.81	164.25	QF	2003/10/21	Set Point	3/2567	43	79	16	10	5	14	0.034	1.8	0.8	0.25	0.11		
225	27.32	35.15	QF	2003/10/09	Setpoint Isando	7131	46	155	5	10	5	51	0.028	5.8	0.25	0.25	0.13		
257	55.38	60.4	QF	2003/10/09	Setpoint Isando	7138	5	45	24	10	5	26	0.036	1.5	0.25	0.25	0.06		
			QF		MEAN		234.88	60.88	12.00	10.00	5.00	19.63	0.05	1.63	0.39	0.35			
			QF		STDEV		591.00	45.46	8.11	0.00	0.00	14.00	0.05	1.74	0.26	0.29			
			QF		MODE		5	#N/A	5	10	5	17	#N/A	#N/A	0.25	0.25			
			QF		MAX		1697	155	24	10	5	51	0.162	5.8	0.82	1.07			
			QF		MIN		5	5	5	10	5	5	0.019	0.5	0.25	0.25			
79	289.03	300.53	SP	2003/10/21	Set Point	3/2013	2146	3118	5	37	5	61	2.4	13.2	6.33	0.25		0.05	0.25
81	199.04	206	SP	2003/10/21	Set Point	3/2013	29	997	5	10	5	70	0.163	8	4.3	0.25		0.05	0.25
82	252.53	258.5	SP	2003/10/21	Set Point	3/2013	424	1305	5	10	5	80	0.216	8.4	3.7	0.25		0.05	0.25
96	185.52	197.07	SP	2003/10/21	Set Point	3/2013	1858	3532	15	10	5	79	0.941	5.5	6.32	0.25		0.05	0.25
110	166.55	179.65	SP	2003/10/21	Set Point	3/2014	1030	2192	5	10	5	65	0.333	8.6	5.23	0.25	0.16		
118	46.14	51.98	SP	2003/10/21	Set Point	3/2014	1788	2940	5	10	5	57	0.617	10.3	3.15	0.25	0.13		
124	53.82	64	SP	2003/10/21	Set Point	3/2014	2108	3189	17	10	5	54	0.751	9.2	5.42	0.25	0.21		
163	116.15	122.11	SP	2003/10/21	Set Point	3/2486	2762	4500	5	10	5	98	1.3	8.6	6.04	0.25	0.31		
215	123	132.02	SP	2003/10/21	Set Point	3/2567	1172	2251	12.5	10	5	66.5	0.595	12	1.33	0.25	0.16		
238	78	84.17	SP	2003/10/09	Setpoint Isando	7131	42	120	5	10	5	49	0.038	5.6	0.25	0.25	0.1		
			SP		MEAN		1335.90	2414.40	7.95	12.70	5.00	67.95	0.74	8.94	4.21	0.25			
			SP		STDEV		948.53	1314.46	4.87	8.54	0.00	14.56	0.70	2.45	2.11	0.00			
			SP		MODE		#N/A	#N/A	5	10	5	#N/A	#N/A	8.6	#N/A	0.25			
			SP		MAX		2762	4500	17	37	5	98	2.4	13.2	6.33	0.25			
			SP		MIN		29	120	5	10	5	49	0.038	5.5	0.25	0.25			
285			Mettalurgical	2003/10/29	Setpoint Isando	2840	895	1617	11	10	5	86	1.25	11.5	1	0.74	0.36		
286			Mettalurgical	2003/10/29	Setpoint Isando	2840	1569	2868	13	10	5	94	0.097	7	2.02	1.58	1.35		
287			Mettalurgical	2003/10/29	Setpoint Isando	2840	1167	2524	15	10	5	84	2.99	13.7	0.25	0.78	0.38		
			Mett		MEAN		1210.33	2336.33	13.00	10.00	5.00	88.00	1.45	10.73	1.09	1.03	0.70		
			Mett		STDEV		339.08	646.27	2.00	0.00	0.00	5.29	1.46	3.42	0.89	0.47	0.57		
			Mett		MODE		#N/A	#N/A	#N/A	10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
			Mett		MAX		1569	2868	15	10	5	94	2.99	13.7	2.02	1.58	1.35		
			Mett		MIN		895	1617	11	10	5	84	0.097	7	0.25	0.74	0.36		

APPENDIX 13:

Geochemical Database of Statistical Parameters of the Static ABA Results

Constituents released during complete oxidation in kg/t																						
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
68	333.97	342.15	DM	2003/08/19	IGS	0.0000150	0.0094545	0.0007710	0.0001500	0.0000150	0.8250000	0.0000150	0.0014880	0.0003780	0.0082785	0.0107835	0.0795000	0.0005100	7.9200000	0.0015780	0.0001560	0.5040000
91	22	31	DM	2003/08/19	IGS	0.0000100	0.0007120	0.0000500	0.0001000	0.0000100	1.9220000	0.0000100	0.0007020	0.0000410	0.0010010	0.0025390	0.0306000	0.0001400	3.0333333	0.0009300	0.0002000	0.1709000
95	179.02	189.03	DM	2003/08/19	IGS	0.0000270	0.0022250	0.0000500	0.0009800	0.0000100	11.3800000	0.0000100	0.0008200	0.0002210	0.0005310	0.0014310	0.1040000	0.0001800	0.8646667	0.0031700	0.0002820	0.1718000
142	162.1	172.38	DM	2003/08/19	IGS	0.0000125	0.0020775	0.0000625	0.0001750	0.0000625	0.1577500	0.0000125	0.0012463	0.0000250	0.0001938	0.0025038	0.0302500	0.0000875	2.8416667	0.0003150	0.0000725	0.1727500
152	90.97	96.55	DM	2003/08/19	IGS	0.0000125	0.0026813	0.0000625	0.0001750	0.0000625	2.0675000	0.0000125	0.0006475	0.0001350	0.0039125	0.0053400	0.0081000	0.0007000	2.6833333	0.0003738	0.0001225	0.6212500
153	135.25	141.61	DM	2003/08/19	IGS	0.0000125	0.0003225	0.0000625	0.0001500	0.0000625	1.6375000	0.0000125	0.0011963	0.0000638	0.0005375	0.0007275	0.0073000	0.0006000	2.4950000	0.0010025	0.0000963	0.6150000
154	106.21	114.06	DM	2003/08/19	IGS	0.0000125	0.0003488	0.0000625	0.0002000	0.0000625	5.4000000	0.0000125	0.0004375	0.0000250	0.0001400	0.0006363	0.0161000	0.0004875	0.0567500	0.0000663	0.0000750	0.6737500
160	389.05	395.26	DM	2003/08/19	IGS	0.0000113	0.0050175	0.0003378	0.0001125	0.0000563	1.0872500	0.0000113	0.0015544	0.0001931	0.0092025	0.0012148	0.0254800	0.0004250	1.7676667	0.0009810	0.0001381	0.6666250
174	211.47	215.1	DM	2003/09/17	IGS	0.0000150	1.6650000	0.0000750	0.0037500	0.0000750	9.8700000	0.0000150	0.0077415	0.0275730	1.1460000	17.5891830	0.2682000	0.0009100	2.9510000	0.0431100	0.0000300	0.9480000
175	215.23	218.5	DM	2003/09/17	IGS	0.0000150	1.1700000	0.0000750	0.0035700	0.0000750	11.7900000	0.0000150	0.0062340	0.0110745	0.9525000	15.1126665	0.0238650	0.0011000	2.5340000	0.0325050	0.0000300	0.9810000
192	210.36	214.06	DM	2003/09/25	IGS	0.0000125	0.5275000	0.0000625	0.0024500	0.0000625	2.4150000	0.0000125	0.0144400	0.0124138	0.0299083	1.1200000	0.0800000	0.0002375	0.3241667	0.0778000	0.0004950	0.8575000
			DM		**MEAN**	0.0000142	0.3077581	0.0001519	0.0010739	0.0000503	4.4138182	0.0000126	0.0033189	0.0047403	0.1956550	3.0770023	0.0612177	0.0004889	2.4974167	0.0147120	0.0001543	0.5802341
			DM		**STDEV**	0.0000045	0.5811753	0.0002214	0.0014579	0.0000255	4.4626852	0.0000018	0.0044219	0.0088887	0.4243286	6.5945374	0.0759553	0.0003246	2.0959496	0.0256956	0.0001353	0.2996780
			DM		**MODE**	0.0000125	#N/A	0.0000625	0.0001500	0.0000625	#N/A	0.0000125	#N/A	#N/A	0.0000250	#N/A	#N/A	#N/A	#N/A	#N/A	0.0000300	#N/A
			DM		**MAX**	0.0000270	1.6650000	0.0007710	0.0037500	0.0000750	11.7900000	0.0000150	0.0144400	0.0275730	1.1460000	17.5891830	0.2682000	0.0011000	7.9200000	0.0778000	0.0004950	0.9810000
			DM		**MIN**	0.0000100	0.0003225	0.0000500	0.0001000	0.0000100	0.1577500	0.0000100	0.0004375	0.0000250	0.0001400	0.0006363	0.0073000	0.0000875	0.0567500	0.0000663	0.0000300	0.1709000
195	312.04	321.94	DO	2003/09/25	IGS	0.0000100	0.0884200	0.0000500	0.0007200	0.0000500	0.5660000	0.0000100	0.0006390	0.0028640	0.1555467	0.0502200	0.1908000	0.0002500	0.1477333	0.0145040	0.0003980	0.7840000
197	184	187.45	DO	2003/09/25	IGS	0.0000100	0.0961800	0.0000500	0.0008800	0.0000500	0.5340000	0.0000100	0.0005190	0.0017420	0.1608333	0.0610800	0.0698000	0.0002800	0.1968667	0.0161830	0.0004140	0.7300000
198	389.49	394.12	DO	2003/09/25	IGS	0.0000100	0.0714800	0.0000500	0.0007600	0.0000500	0.4620000	0.0000330	0.0004940	0.0020480	0.1956833	0.0384350	0.0857000	0.0001600	0.1273667	0.0129035	0.0003300	0.6770000
199	388.45	393.33	DO	2003/09/25	IGS	0.0000125	0.0931500	0.0000625	0.0005000	0.0000625	1.1825000	0.0000125	0.0005975	0.0011438	0.1572250	0.0444125	0.1367500	0.0004250	0.2435833	0.0205275	0.0003975	0.8425000
210	231.9	236.05	DO	2003/09/25	IGS	0.0000125	0.1132750	0.0000625	0.0005250	0.0000625	0.5275000	0.0000125	0.0006150	0.0018875	0.1569750	0.0480250	0.0607500	0.0003000	0.2795000	0.0241500	0.0003075	0.8475000
			DO		**MEAN**	0.0000110	0.0925010	0.0000550	0.0006770	0.0000550	0.6544000	0.0000156	0.0005729	0.0019371	0.1652527	0.0484345	0.1087600	0.0002830	0.1990100	0.0176536	0.0003694	0.7762000
			DO		**STDEV**	0.0000014	0.0150337	0.0000068	0.0001615	0.0000068	0.2976246	0.0000098	0.0000630	0.0006208	0.0171225	0.0083581	0.0544716	0.0000958	0.0637026	0.0046127	0.0000474	0.0733405
			DO		**MODE**	0.0000100	#N/A	0.0000500	#N/A	0.0000500	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			DO		**MAX**	0.0000125	0.1132750	0.0000625	0.0008800	0.0000625	1.1825000	0.0000330	0.0006390	0.0028640	0.1956833	0.0610800	0.1908000	0.0004250	0.2795000	0.0241500	0.0004140	0.8475000
			DO		**MIN**	0.0000100	0.0714800	0.0000500	0.0005000	0.0000500	0.4620000	0.0000100	0.0004940	0.0011438	0.1555467	0.0384350	0.0607500	0.0001600	0.1273667	0.0129035	0.0003075	0.6770000
5	142.695	147.85	FPX	2003/08/19	IGS	0.0000100	0.0016360	0.0000500	0.0000300	0.0000100	0.4780000	0.0000100	0.0051280	0.0000200	0.0001460	0.0026340	0.0706000	0.0001600	1.1240000	0.0006320	0.0000700	0.2510000
8	297.14	304.66	FPX	2003/08/19	IGS	0.0000125	5.1150000	0.0000625	0.0028250	0.0001600	2.1400000	0.0000125	0.0041363	0.1439750	1.8159000	6.4500000	0.3525000	0.0013500	2.2841667	0.0473125	0.0000250	0.7962500
14	158	171.78	FPX	2003/08/19	IGS	0.0000125	0.0350875	0.0000625	0.0006750	0.0000125	1.2225000	0.0000275	0.0032200	0.0026938	0.1196750	0.0071638	0.2025000	0.0004250	0.6591667	0.0122825	0.0002350	0.4650000
22	177.5	191.3	FPX	2003/08/19	IGS	0.0000125	0.0131638	0.0000625	0.0001500	0.0000125	1.2625000	0.0000125	0.0087388	0.0024588	0.0658500	0.0062788	0.0655000	0.0008750	0.9925000	0.0155500	0.0001750	0.3787500
23	238.27	247.64	FPX	2003/08/19	IGS	0.0000125	0.0961827	0.0000625	0.0009250	0.0000125	2.2975000	0.0000125	0.0004513	0.0007488	0.2762760	0.0610315	0.1940000	0.0008500	0.9916667	0.0020125	0.0000250	0.4387500
33	167.825	179.9	FPX	2003/08/19	IGS	0.0000100	0.0045960	0.0001200	0.0000800	0.0000100	0.2560000	0.0000100	0.0064750	0.0001420	0.0007110	0.0028780	0.2160000	0.0002400	0.4080000	0.0016200	0.0002480	0.1829000
35	271.89	284.95	FPX	2003/08/19	IGS	0.0000125	0.3713250	0.0000625	0.0022500	0.0000125	2.0425000	0.0002425	0.0063200	0.0253250	1.4375000	0.0024075	0.1415000	0.0009250	2.8583333	0.0576750	0.0001775	0.4237500
36	286.08	296.85	FPX	2003/08/19	IGS	0.0000100	1.1323900	0.0000500	0.0021000	0.0000100	1.9860000	0.0000100	0.0080330	0.0387200	1.7500000	0.0058970	0.1532000	0.0004600	1.2526667	0.0301600	0.0001420	0.3900000
37	296.855	314.94	FPX	2003/08/19	IGS	0.0000100	0.0184240	0.0000500	0.0003400	0.0000100	1.2360000	0.0000200	0.0022990	0.0028130	0.1468200	0.0028890	0.0816000	0.0002800	0.5546667	0.0162150	0.0003380	0.2690000
52	100.37	112.18	FPX	2003/08/19	IGS	0.0000100	0.0020420	0.0002680	0.0000300	0.0000100	0.6060000	0.0000100	0.0063850	0.0002420	0.0059360	0.0018370	0.1516000	0.0002800	0.7726667	0.0034300	0.0002400	0.4630000
54	185.85	196.04	FPX	2003/08/19	IGS	0.0000125	1.0350000	0.0000625	0.0018500	0.0000125	1.3375000	0.0001250	0.0070375	0.0562238	1.5825000	0.0084200	0.1217500	0.0005500	1.3633333	0.0229538	0.0003275	0.6725000
66	180.53	191.55	FPX	2003/08/19	IGS	0.0000125	0.9661543	0.0000625	0.0038007	0.0000125	0.9552316	0.0001350	0.0217302	0.1389580	1.6646629	0.4819691	0.2394737	0.0006393	5.5268161	0.1179839	0.0001335	0.7031155
67	257.97	268.58	FPX	2003/08/19	IGS	0.0000125	4.5500000	0.0000625	0.0023250	0.0000125	3.3500000	0.0002950	0.0039250	0.1974750	3.2875000	3.7500000	0.3900000	0.0009750	1.6733333	0.0282625	0.0000250	0.8925000
72	277	286.8	FPX	2003/08/19	IGS	0.0000125	0.1800000	0.0001775	0.0017750	0.0000125	1.4950000	0.0000600	0.0053300	0.0080150	0.5812500	0.0021750	0.1995000	0.0007750	1.2533333	0.0204513	0.0008025	0.6450000
99	336.12	347.53	FPX	2003/08/19	IGS	0.0000125	0.1440000	0.0000625	0.0014750	0.0000125	1.5600000	0.0000550	0.0059000	0.0181413	0.6375000	0.0028563	0.1107500	0.0004750	1.2133333	0.0260950	0.0003100	0.3150000
113	125	135.85	FPX	2003/08/19	IGS	0.0000100	0.0021920	0.0012340	0.0001000	0.0000500	0.4960000	0.0000100	0.0048490	0.0009210	0.0029030	0.0015550	0.2520000	0.0007600	0.8640000	0.0062940	0.0003560	0.1586000
126	92	102	FPX	2003/08/19	IGS	0.0000125	0.0031613	0.0000625	0.0008500	0.0000625	3.3250000	0.0000250	0.0065250	0.0093325	0.0101475	0.0040675	0.9275000	0.0011750	2.8833333	0.0475375	0.0003238	0.2662500
130	132.04	142.8	FPX	2003/08/19	IGS	0.0000150	0.0011775	0.0006360	0.0001800	0.0000750	0.3600000	0.0000150	0.0105360	0.0000795	0.0004020	0.0011910	0.3270000	0.0005100	1.9020000	0.0011565	0.0003765	0.2988000
170	132.05	142.98	FPX	2003/09/17	IGS	0.0000125	0.1742750	0.0000625	0.0011000	0.0000500	1.8550000	0.0000125	0.0070438	0.0070163	0.3275000	0.0160694	0.0467500	0.0005417	0.9375000	0.0237125	0.0001450	0.9200000
273	15.39	17.64	FPX	2003/09/25	IGS	0.0000100	1.0756206	0.0000500	0.0010678	0.0000100	1.4418209	0.0000100	0.0120962	0.0575945	1.2105259	0.0438387	0.1358150	0.0004870	1.2495662	0.0678460	0.0005256	0.7721521
49	140.27	159.01	FPX	2003/08/19	IGS	0.0000100	0.0110390	0.0000500	0.0000300	0.0000100	0.4220000	0.0000100	0.0028190	0.0003300	0.0052400	0.0022800	0.0664000	0.0002200	0.3300000	0.0017160	0.0002060	0.3890000
53	133.34	152.2	FPX	2003/08/19	IGS	0.0000100	0.0310300	0.0000500	0.0018000	0.0000100	1.2520000	0.0000900	0.0073850	0.0072780	0.9230000	0.0010910	0.1844000	0.0006600	2.7600000	0.0359100	0.0001960	0.5650000
57	303.04	313.05	FPX	2003/08/19	IGS	0.0000100	1.5600000	0.0000500	0.0014000	0.0000100	2.0800000	0.0001740	0.0058620	0.0886050	1.5240000	0.0076800	0.1634000	0.0004800	2.6066667	0.0418100	0.0013920	0.6000000
			FPX		**MEAN**	0.0000115	0.7184129	0.0001510	0.0011808	0.0000261	1.4546327	0.0000602	0.0066185	0.0350917	0.7554759	0.4724439	0.2084234	0.0006127	1.5852630	0.0273312	0.0002954	0.4894051
			FPX		**STDEV**	0.0000015	1.3834425	0.0002681	0.0010392	0.0000349	0.8581184	0.0000811	0.0041862	0.0555088	0.8788025	1.5191184	0.1816095	0.0003100	1.1634678	0.0276502	0.0002958	0.2245261
			FPX		**MODE**	0.0000125	#N/A	0.0000625	0.0000300	0.0000100	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	0.0002800	#N/A	#N/A	0.0000250	#N/A
			FPX		**MAX**	0.0000150	5.1150000	0.0012340	0.0038007	0.0001600	3.3500000	0.0002950	0.0217302	0.1974750	3.2875000	6.4500000	0.9275000	0.0013500	5.5268161	0.1179839	0.0013920	0.9200000
			FPX		**MIN**	0.0000100	0.0011775	0.0000500	0.0000300	0.0000100	0.2560000	0.0000100	0.0004513	0.0000200	0.0001460	0.0010910	0.0467500	0.0001600	0.3300000	0.0006320	0.0000250	0.1586000
1	37.82	44.58	GN	2003/08/19	IGS	0.0000100	0.0193390	0.0001000	0.0002000	0.0000100	0.3180000	0.0000100	0.0028640	0.0000800	0.0007880	0.0260800	0.2140000	0.0002400	0.3746667	0.0009300	0.0002120	0.2840000
2	64.4	70.9	GN	2003/08/19	IGS	0.0000100	0.0103780	0.0000500	0.0001000	0.0000100	0.3000000	0.0000340	0.0012370	0.0003360	0.0010790	0.0052300	0.0994000	0.0001800	0.2046667	0.0031800	0.0001960	0.2070000
3	103.6	110.23	GN	2003/08/19	IGS	0.0000100	0.0157590	0.0001140	0.0000800	0.0000100	0.6320000	0.0000100	0.0017440	0.0000820	0.0003790	0.0171710	0.1574000	0.0001400	0.3240000	0.0011520	0.0002400	0.2520000
10	70.045	80.46	GN	2003/08/19	IGS	0.0000100	0.0102280	0.0000500	0.0000600	0.0000100	0.5100000	0.0000100	0.0018750	0.0000680	0.0003780	0.0143270	0.0890000	0.0000800	0.3033333	0.0009180	0.0001240	0.2007000
11	81.92	92.095	GN	2003/08/19	IGS	0.0000100	0.0119860	0.0000500	0.0000800	0.0000100	0.5340000	0.0000100	0.0030040	0.0000520	0.0002530	0.0179260	0.0992000	0.0001000	0.3973333	0.0011380	0.0001240	0.2190000
12	93.07	100.865	GN	2003/08/19	IGS	0.0000100	0.2158754	0.0000500	0.0005800	0.0000100	0.8820000	0.0000100	0.0000450	0.0000200	0.0000270	0.1008392	0.1614000	0.0001800	0.4900000	0.0000280	0.0000200	0.3260000
18	35.03	45.205	GN	2003/08/19	IGS	0.0000100	0.0059810	0.0000500	0.0000800	0.0000100	0.4600000	0.0000100	0.0027170	0.0002200	0.0007510	0.0033060	0.1090000	0.0001800	0.2780000	0.0013840	0.0001300	0.2210000
19	60.46	72.43	GN	2003/08/19	IGS	0.0000100	0.0128160	0.0000500	0.0000800	0.0000100	0.4420000	0.0000100	0.0013570	0.0003120	0.0006040	0.0060910	0.0866000	0.0001400	0.1977333	0.0015160	0.0001240	0.1935000

Constituents released during complete oxidation in kg/t																					
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ni	Sb	Se	Sn	Sr	Pb	V	Zn	SO4	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)	Initial pH	Final pH
68	333.97	342.15	DM	2003/08/19	IGS	0.0092235	0.0000150	0.0000900	0.0001500	0.0003600	0.0001500	0.0002340	0.0006030	21.91	22.82	45.64	422.06	399.24	376.42	11.06	8.75
91	22	31	DM	2003/08/19	IGS	0.0019750	0.0000100	0.0005940	0.0001000	0.0019000	0.0001000	0.0002080	0.0036220	11.00	11.46	22.92	65.84	54.38	42.92	11.30	7.75
95	179.02	189.03	DM	2003/08/19	IGS	0.0022930	0.0000100	0.0000620	0.0001000	0.0111200	0.0001000	0.0003220	0.0003620	27.00	28.13	56.25	15.26	-12.87	-40.99	9.68	5.42
142	162.1	172.38	DM	2003/08/19	IGS	0.0000600	0.0000125	0.0001275	0.0001250	0.0003750	0.0001250	0.0004000	0.0007250	2.90	3.02	6.04	300.40	297.37	294.35	10.88	10.47
152	90.97	96.55	DM	2003/08/19	IGS	0.0077850	0.0000125	0.0003125	0.0001250	0.0045000	0.0001250	0.0006850	0.0003100	9.36	9.75	19.51	162.57	152.82	143.06	9.79	6.63
153	135.25	141.61	DM	2003/08/19	IGS	0.0007025	0.0000125	0.0002125	0.0001250	0.0033750	0.0001250	0.0001100	0.0001550	6.64	6.91	13.83	69.53	62.62	55.70	10.28	7.35
154	106.21	114.06	DM	2003/08/19	IGS	0.0000675	0.0000125	0.0003500	0.0001250	0.0035250	0.0001250	0.0000250	0.0002025	6.66	6.93	13.87	325.56	318.63	311.70	12.93	11.64
160	389.05	395.26	DM	2003/08/19	IGS	0.0075719	0.0000113	0.0003970	0.0001125	0.0022075	0.0001125	0.0003725	0.0004990	6.54	6.81	13.62	59.29	52.49	45.68	10.92	7.08
174	211.47	215.1	DM	2003/09/17	IGS	0.3777739	0.0004350	0.0000150	0.0001500	0.0236100	0.0052890	0.0002205	0.0443700	104.55	108.91	217.81	25.12	-83.78	-192.69	9.94	2.39
175	215.23	218.5	DM	2003/09/17	IGS	0.4747502	0.0003840	0.0000150	0.0001500	0.0342000	0.0045090	0.0001425	0.0426300	100.20	104.38	208.75	25.97	-78.41	-182.78	9.95	2.36
192	210.36	214.06	DM	2003/09/25	IGS	0.0435000	0.0001025	0.0000125	0.0001250	0.0014250	0.0005825	0.0004763	0.0035500	17.45	18.18	36.35	31.37	13.20	-4.98	10.01	2.49
			DM		**MEAN**	0.0841548	0.0000925	0.0001989	0.0001261	0.0078725	0.0010312	0.0002905	0.0088208	28.56	29.75	59.51	136.63	106.88	77.13	10.61	6.58
			DM		**STDEV**	0.1709689	0.0001594	0.0001922	0.0000181	0.0110627	0.0019252	0.0001870	0.0171968	37.23	38.78	77.55	145.14	164.37	189.68	0.95	3.18
			DM		**MODE**	#N/A	0.0000125	0.0000150	0.0001250	#N/A	0.0001250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			DM		**MAX**	0.4747502	0.0004350	0.0005940	0.0001500	0.0342000	0.0052890	0.0006850	0.0443700	104.55	108.91	217.81	422.06	399.24	376.42	12.93	11.64
			DM		**MIN**	0.0000600	0.0000100	0.0000125	0.0001000	0.0003600	0.0001000	0.0000250	0.0001550	2.90	3.02	6.04	15.26	-83.78	-192.69	9.68	2.36
195	312.04	321.94	DO	2003/09/25	IGS	0.0032990	0.0000100	0.0003780	0.0001000	0.0009000	0.0002600	0.0051710	0.0264800	1.44	1.50	3.00	19.40	17.90	16.40	9.76	4.40
197	184	187.45	DO	2003/09/25	IGS	0.0010480	0.0000100	0.0004220	0.0001000	0.0010800	0.0002540	0.0050820	0.0179300	1.62	1.69	3.38	17.83	16.14	14.45	9.78	4.37
198	389.49	394.12	DO	2003/09/25	IGS	0.0013660	0.0000100	0.0003530	0.0001000	0.0008900	0.0003380	0.0044570	0.0417200	1.59	1.65	3.31	17.06	15.41	13.75	9.78	3.69
199	388.45	393.33	DO	2003/09/25	IGS	0.0011363	0.0000125	0.0004075	0.0001250	0.0012000	0.0001250	0.0046625	0.0213725	2.88	2.99	5.99	22.80	19.80	16.81	9.73	4.49
210	231.9	236.05	DO	2003/09/25	IGS	0.0009000	0.0000125	0.0003775	0.0001250	0.0010500	0.0001250	0.0058525	0.0175550	1.74	1.82	3.63	21.46	19.65	17.83	9.77	4.54
			DO		**MEAN**	0.0015499	0.0000110	0.0003876	0.0001100	0.0010240	0.0002204	0.0050450	0.0250115	1.85	1.93	3.86	19.71	17.78	15.85	9.76	4.30
			DO		**STDEV**	0.0009923	0.0000014	0.0000273	0.0000137	0.0001305	0.0000932	0.0005388	0.0100040	0.58	0.61	1.21	2.41	1.99	1.70	0.02	0.35
			DO		**MODE**	#N/A	0.0000100	#N/A	0.0001000	#N/A	0.0001250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	9.78	#N/A
			DO		**MAX**	0.0032990	0.0000125	0.0004220	0.0001250	0.0012000	0.0003380	0.0058525	0.0417200	2.88	2.99	5.99	22.80	19.80	17.83	9.78	4.54
			DO		**MIN**	0.0009000	0.0000100	0.0003530	0.0001000	0.0008900	0.0001250	0.0044570	0.0175550	1.44	1.50	3.00	17.06	15.41	13.75	9.73	3.69
5	142.695	147.85	FPX	2003/08/19	IGS	0.0003260	0.0000200	0.0000620	0.0001000	0.0002800	0.0001000	0.0004700	0.0008480	1.73	1.80	3.61	16.40	14.60	12.79	10.50	6.71
8	297.14	304.66	FPX	2003/08/19	IGS	3.7103500	0.0000125	0.0007575	0.0001250	0.0094250	0.0022650	0.0012175	0.0253750	65.00	67.71	135.42	7.80	-59.91	-127.62	9.75	2.60
14	158	171.78	FPX	2003/08/19	IGS	0.0418750	0.0000125	0.0003000	0.0006450	0.0019750	0.0002925	0.0006825	0.0155050	5.16	5.38	10.76	12.70	7.32	1.94	10.31	4.03
22	177.5	191.3	FPX	2003/08/19	IGS	0.0523500	0.0000300	0.0005850	0.0008050	0.0008500	0.0001250	0.0007925	0.0087825	5.41	5.64	11.28	9.85	4.21	-1.42	10.55	5.29
23	238.27	247.64	FPX	2003/08/19	IGS	0.1498140	0.0000125	0.0000375	0.0001250	0.0022000	0.0001250	0.0000700	0.0008975	9.68	10.08	20.16	11.95	1.87	-8.21	10.37	4.08
33	167.825	179.9	FPX	2003/08/19	IGS	0.0032130	0.0000280	0.0000300	0.0001000	0.0003000	0.0001000	0.0008660	0.0082040	0.44	0.46	0.91	5.26	4.80	4.35	10.64	5.32
35	271.89	284.95	FPX	2003/08/19	IGS	0.8380500	0.0000125	0.0014700	0.0001250	0.0035250	0.0015025	0.0008350	0.0206400	20.83	21.69	43.39	26.72	5.02	-16.67	10.74	3.78
36	286.08	296.85	FPX	2003/08/19	IGS	1.5713800	0.0000100	0.0014340	0.0001000	0.0044800	0.0016920	0.0010560	0.0093560	20.01	20.84	41.69	11.78	-9.06	-29.91	10.47	3.76
37	296.855	314.94	FPX	2003/08/19	IGS	0.0645300	0.0000100	0.0003660	0.0001000	0.0019400	0.0002680	0.0006860	0.0027820	5.25	5.47	10.94	10.22	4.75	-0.72	10.94	4.41
52	100.37	112.18	FPX	2003/08/19	IGS	0.0124620	0.0000460	0.0002180	0.0001000	0.0003800	0.0001000	0.0008460	0.0006560	2.84	2.95	5.91	12.27	9.31	6.36	10.85	5.88
54	185.85	196.04	FPX	2003/08/19	IGS	1.8525000	0.0000125	0.0014525	0.0001250	0.0033500	0.0014075	0.0011150	0.0129150	17.43	18.15	36.30	9.04	-9.11	-27.26	10.53	3.51
66	180.53	191.55	FPX	2003/08/19	IGS	2.2053296	0.0000225	0.0016735	0.0001250	0.0018193	0.0024406	0.0006335	0.0414342	36.04	37.54	75.08	63.99	26.45	-11.09	10.58	3.17
67	257.97	268.58	FPX	2003/08/19	IGS	4.2125000	0.0000125	0.0011275	0.0001250	0.0086000	0.0028525	0.0002500	0.0276500	54.63	56.90	113.80	10.51	-46.39	-103.30	9.99	2.77
72	277	286.8	FPX	2003/08/19	IGS	0.1788750	0.0000125	0.0004750	0.0001250	0.0026250	0.0004625	0.0019325	0.0079850	9.81	10.22	20.44	11.17	0.95	-9.27	10.56	3.92
99	336.12	347.53	FPX	2003/08/19	IGS	0.4850000	0.0000125	0.0004925	0.0001250	0.0022750	0.0005900	0.0009375	0.0090950	10.62	11.06	22.13	8.15	-2.91	-13.97	10.53	3.67
113	125	135.85	FPX	2003/08/19	IGS	0.0288600	0.0000480	0.0001780	0.0001000	0.0004400	0.0001000	0.0011560	0.0006820	4.03	4.19	8.39	26.22	22.03	17.84	11.05	5.53
126	92	102	FPX	2003/08/19	IGS	0.0642625	0.0000300	0.0007600	0.0001250	0.0020750	0.0001250	0.0025200	0.0012125	20.11	20.94	41.89	-53.82	-74.77	-95.71	10.85	5.49
130	132.04	142.8	FPX	2003/08/19	IGS	0.0021405	0.0000390	0.0002430	0.0001500	0.0003900	0.0001500	0.0027000	0.0008670	6.02	6.27	12.55	46.64	40.37	34.09	11.08	6.83
170	132.05	142.98	FPX	2003/09/17	IGS	0.1290375	0.0000250	0.0004900	0.0001250	0.0028500	0.0003900	0.0011888	0.0062550	9.96	10.38	20.76	22.77	12.39	2.01	10.26	3.89
273	15.39	17.64	FPX	2003/09/25	IGS	1.1104947	0.0000100	0.0012809	0.0001000	0.0038269	0.0017138	0.0025678	0.0366715	18.11	18.86	37.72	28.92	10.06	-8.81	11.16	3.54
49	140.27	159.01	FPX	2003/08/19	IGS	0.0073890	0.0000100	0.0000920	0.0004880	0.0005800	0.0001000	0.0005500	0.0005300	1.17	1.22	2.44	9.06	7.84	6.62	10.72	5.16
53	133.34	152.2	FPX	2003/08/19	IGS	0.1942000	0.0000320	0.0011240	0.0001000	0.0017000	0.0008620	0.0009340	0.0085320	14.15	14.74	29.47	19.85	5.12	-9.62	10.78	4.49
57	303.04	313.05	FPX	2003/08/19	IGS	1.9620000	0.0000100	0.0013560	0.0001000	0.0031800	0.0012520	0.0026880	0.0138880	23.77	24.76	49.51	17.46	-7.30	-32.06	10.28	3.77
			FPX		**MEAN**	0.8207365	0.0000205	0.0006959	0.0001843	0.0025681	0.0008268	0.0011606	0.0113375	15.75	16.40	32.81	15.00	-1.41	-17.81	10.59	4.42
			FPX		**STDEV**	1.2233742	0.0000121	0.0005470	0.0001895	0.0023788	0.0008749	0.0007767	0.0117603	16.50	17.19	34.38	20.30	26.21	39.41	0.34	1.16
			FPX		**MODE**	#N/A	0.0000125	#N/A	0.0001250	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.85	#N/A
			FPX		**MAX**	4.2125000	0.0000480	0.0016735	0.0008050	0.0094250	0.0028525	0.0027000	0.0414342	65.00	67.71	135.42	63.99	40.37	34.09	11.16	6.83
			FPX		**MIN**	0.0003260	0.0000100	0.0000300	0.0001000	0.0002800	0.0001000	0.0000700	0.0005300	0.44	0.46	0.91	-53.82	-74.77	-127.62	9.75	2.60
1	37.82	44.58	GN	2003/08/19	IGS	0.0012590	0.0000100	0.0000300	0.0003640	0.0005400	0.0001000	0.0011480	0.0059040	0.23	0.24	0.47	11.70	11.46	11.23	11.02	5.47
2	64.4	70.9	GN	2003/08/19	IGS	0.0027330	0.0000100	0.0000300	0.0002400	0.0005600	0.0001000	0.0006420	0.0052480	0.29	0.30	0.60	3.62	3.32	3.02	10.40	4.70
3	103.6	110.23	GN	2003/08/19	IGS	0.0008510	0.0000100	0.0000300	0.0002360	0.0005000	0.0001000	0.0010940	0.0046080	0.31	0.33	0.65	10.39	10.07	9.74	10.51	5.84
10	70.045	80.46	GN	2003/08/19	IGS	0.0013120	0.0000100	0.0000300	0.0001000	0.0004600	0.0001000	0.0006020	0.0025760	0.32	0.34	0.68	7.73	7.40	7.06	10.21	5.79
11	81.92	92.095	GN	2003/08/19	IGS	0.0011090	0.0000100	0.0000300	0.0002160	0.0005000	0.0001000	0.0009400	0.0059360	0.31	0.32	0.65	10.93	10.61	10.29	10.24	6.08
12	93.07	100.865	GN	2003/08/19	IGS	0.0000650	0.0000100	0.0000300	0.0001000	0.0013400	0.0001000	0.0000140	0.0000320	0.66	0.69	1.38	9.94	9.25	8.56	10.44	5.80
18	35.03	45.205	GN	2003/08/19	IGS	0.0062360	0.0000100	0.0000300	0.0001000	0.0004800	0.0001000	0.0008120	0.0038700	0.53	0.55	1.11	9.03	8.48	7.92	10.54	5.50
19	60.46	72.43	GN	2003/08/19	IGS	0.0054570	0.0000100	0.0000300	0.0002680	0.0005200	0.0001000	0.0005380	0.0025860	0.45	0.46	0.93	6.62	6.16	5.69	10.45	5.04

Constituents released during complete oxidation in kg/t																						
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
20	114.42	124.27	GN	2003/08/19	IGS	0.0000100	0.0145575	0.0000500	0.0002200	0.0000300	0.5800000	0.0000100	0.0016180	0.0001145	0.0004450	0.0172975	0.1722000	0.0003000	0.2900000	0.0008235	0.0001450	0.2330000
21	138.46	150.48	GN	2003/08/19	IGS	0.0000100	0.0155320	0.0000500	0.0002200	0.0000100	0.4660000	0.0000100	0.0005910	0.0000920	0.0001960	0.0072270	0.1184000	0.0009600	0.1844667	0.0005380	0.0000620	0.2380000
38	45.33	61.49	GN	2003/08/19	IGS	0.0000100	0.0075360	0.0001700	0.0000600	0.0000100	0.6040000	0.0000100	0.0024330	0.0002720	0.0054550	0.0036130	0.1526000	0.0002600	0.3820000	0.0010220	0.0011080	0.2430000
39	85.51	100.8	GN	2003/08/19	IGS	0.0000100	0.0194700	0.0000500	0.0001000	0.0000100	0.4200000	0.0000100	0.0008870	0.0003090	0.0004390	0.0073060	0.0966000	0.0002000	0.1662000	0.0010280	0.0001100	0.2190000
40	136.7	148.72	GN	2003/08/19	IGS	0.0000100	0.0152150	0.0004600	0.0003400	0.0000100	0.6060000	0.0000100	0.0013770	0.0000820	0.0002910	0.0212100	0.1068000	0.0001200	0.2120000	0.0007840	0.0001380	0.2150000
41	30.29	45.49	GN	2003/08/19	IGS	0.0000150	0.0972680	0.0000500	0.0002800	0.0000300	0.4520000	0.0000100	0.0004460	0.0001180	0.0003230	0.0324064	0.2159000	0.0003650	0.2046333	0.0004390	0.0000725	0.2205500
42	46.915	56.19	GN	2003/08/19	IGS	0.0000100	0.0104440	0.0000500	0.0001400	0.0000100	0.3240000	0.0000100	0.0018740	0.0002300	0.0004730	0.0034820	0.1608000	0.0003800	0.2366667	0.0009540	0.0002920	0.3680000
43	95.73	111.03	GN	2003/08/19	IGS	0.0001320	0.0124080	0.0000500	0.0001000	0.0000100	0.4860000	0.0000100	0.0008240	0.0004460	0.0017210	0.0026790	0.3400000	0.0003200	0.1428000	0.0015300	0.0002620	0.4120000
44	114.27	128.2	GN	2003/08/19	IGS	0.0000100	0.0123440	0.0000500	0.0000800	0.0000100	0.4940000	0.0000100	0.0009460	0.0004450	0.0019220	0.0036160	0.0990000	0.0003000	0.1356667	0.0015900	0.0002580	0.3880000
45	229.5	239.62	GN	2003/08/19	IGS	0.0000100	0.0083560	0.0000500	0.0001000	0.0000100	0.3680000	0.0000100	0.0017400	0.0002630	0.0006240	0.0027320	0.1312000	0.0002800	0.2306667	0.0015060	0.0002920	0.3870000
46	244.4	254.97	GN	2003/08/19	IGS	0.0000100	0.0094500	0.0000500	0.0000600	0.0000100	0.3840000	0.0000100	0.0015550	0.0003780	0.0014080	0.0022250	0.1186000	0.0002600	0.2173333	0.0017420	0.0003260	0.3910000
47	273.77	284.06	GN	2003/08/19	IGS	0.0002960	0.0075810	0.0000500	0.0003200	0.0000100	0.3460000	0.0006440	0.0019650	0.0006970	0.0013230	0.0024290	0.1412000	0.0005200	0.2366667	0.0017680	0.0003460	0.3910000
58	84.84	92.75	GN	2003/08/19	IGS	0.0000100	0.0068730	0.0000500	0.0001200	0.0000100	0.4100000	0.0000100	0.0012930	0.0002410	0.0027280	0.0024780	0.1586000	0.0002600	0.2713333	0.0011000	0.0001980	0.4950000
59	103.9	112.49	GN	2003/08/19	IGS	0.0000100	0.0102320	0.0000500	0.0000800	0.0000100	0.3840000	0.0000100	0.0010370	0.0001580	0.0008010	0.0041990	0.1334000	0.0002600	0.2753333	0.0009800	0.0001880	0.4800000
60	153.23	165.12	GN	2003/08/19	IGS	0.0000440	0.0097860	0.0000500	0.0000600	0.0000100	0.3160000	0.0000100	0.0006820	0.0002200	0.0009900	0.0026470	0.1026000	0.0002600	0.1863333	0.0012220	0.0002100	0.3720000
61	234.2	242.4	GN	2003/08/19	IGS	0.0000100	0.0081700	0.0001040	0.0000800	0.0000100	0.3200000	0.0000100	0.0015100	0.0001780	0.0007270	0.0040870	0.1150000	0.0008400	0.2520000	0.0014200	0.0002260	0.4190000
62	260.35	268.95	GN	2003/08/19	IGS	0.0000100	0.0098900	0.0001460	0.0001000	0.0000100	0.3660000	0.0000100	0.0008860	0.0002590	0.0013430	0.0041800	0.0876000	0.0006800	0.1975333	0.0015680	0.0002180	0.4340000
229	142.5	146.13	GN	2003/09/25	IGS	0.0000100	0.0037526	0.0001230	0.0001014	0.0000100	0.5250995	0.0000213	0.0014992	0.0000802	0.0007696	0.0038770	0.1608961	0.0002588	0.2760734	0.0010243	0.0005181	0.7262696
230	155.17	163.06	GN	2003/09/25	IGS	0.0000113	0.0111674	0.0006804	0.0000859	0.0000113	0.6758234	0.0000285	0.0054933	0.0002353	0.0060663	0.0065229	0.2541869	0.0002872	0.6747005	0.0024231	0.0007681	0.8273578
231	163.11	168.06	GN	2003/09/25	IGS	0.0000100	0.0097943	0.0022409	0.0000434	0.0000100	0.4548874	0.0000354	0.0046935	0.0003319	0.0041877	0.0103793	0.2335751	0.0002176	0.5886571	0.0011618	0.0005574	0.7647908
232	179.25	182.84	GN	2003/09/25	IGS	0.0000100	0.0035502	0.0000500	0.0000505	0.0000100	0.4022141	0.0000100	0.0086803	0.0000898	0.0006934	0.0022075	0.1581221	0.0001787	0.8488454	0.0007599	0.0005657	0.7161819
233	187.62	194.8	GN	2003/09/25	IGS	0.0000100	0.0038617	0.0000500	0.0000830	0.0000100	0.4587994	0.0000227	0.0042490	0.0000526	0.0004673	0.0020618	0.1402482	0.0001653	0.4495529	0.0010234	0.0005291	0.6701903
235	196.08	207.05	GN	2003/09/25	IGS	0.0000100	0.0541469	0.0000500	0.0001081	0.0000100	0.7759206	0.0000210	0.0029639	0.0000438	0.0018059	0.0138790	0.1913525	0.0000451	0.0766135	0.0013696	0.0004207	0.8338780
236	208	218.2	GN	2003/09/25	IGS	0.0000125	0.0663048	0.0000625	0.0016758	0.0000125	0.4745114	0.0000125	0.0049473	0.0450699	0.4811355	0.0050971	0.3891293	0.0005858	4.3134247	0.0878648	0.0019728	0.8695601
237	218.2	225.73	GN	2003/09/25	IGS	0.0000100	0.0037701	0.0000500	0.0000581	0.0000100	0.3849973	0.0000213	0.0043638	0.0000472	0.0005581	0.0026578	0.3125355	0.0002904	0.5426155	0.0007631	0.0005208	0.7515538
239	59.59	65.6	GN	2003/09/25	IGS	0.0000100	0.0120621	0.0000500	0.0000338	0.0000100	0.3801574	0.0000100	0.0022295	0.0002649	0.0014300	0.0040734	0.1430671	0.0002831	0.4172695	0.0011833	0.0004789	0.6684015
240	74.14	82.24	GN	2003/09/25	IGS	0.0000153	0.0258119	0.0000500	0.0000322	0.0000100	0.4473118	0.0000100	0.0019467	0.0005110	0.0067656	0.0105359	0.1878455	0.0002719	0.3477370	0.0022532	0.0005045	0.7104663
241	90.08	95.71	GN	2003/09/25	IGS	0.0000100	0.0132555	0.0000500	0.0000253	0.0000100	0.5282753	0.0000100	0.0013615	0.0005029	0.0106714	0.0051122	0.1425231	0.0001940	0.2241490	0.0011543	0.0004756	0.7370504
242	10.49	16.98	GN	2003/09/25	IGS	0.0000125	0.0064751	0.0000625	0.0001554	0.0000125	0.8232589	0.0000125	0.0075894	0.0001450	0.0016815	0.0042291	0.1203992	0.0002481	0.5904909	0.0084766	0.0005013	0.8560963
244	7.2	12.41	GN	2003/09/25	IGS	0.0000238	0.0709376	0.0000500	0.0001974	0.0000100	0.2544306	0.0000242	0.0025409	0.0002621	0.0017500	0.0210878	0.1006174	0.0003305	0.2182232	0.0098147	0.0004002	0.7847503
245	4.03	5.64	GN	2003/09/25	IGS	0.0000382	0.0096863	0.0000500	0.0001590	0.0000100	0.5321845	0.0000212	0.0032494	0.0000880	0.0014536	0.0042321	0.1417100	0.0002333	0.4124066	0.0084614	0.0004199	0.7159490
271	8	16.8	GN	2003/09/25	IGS	0.0000100	0.0185374	0.0000500	0.0000859	0.0000100	0.3710634	0.0000235	0.0031091	0.0006643	0.0036865	0.0111483	0.1132838	0.0002046	0.3068967	0.0036953	0.0004216	0.6845316
272	20.3	24.5	GN	2003/09/25	IGS	0.0000100	0.0017981	0.0000500	0.0001213	0.0000100	0.7044011	0.0000100	0.0065460	0.0004156	0.0020826	0.0024279	0.1277736	0.0003640	0.6803650	0.0031999	0.0004223	0.6678776
274	9.5	13.25	GN	2003/09/25	IGS	0.0000100	0.0177884	0.0000500	0.0003052	0.0000100	0.6446326	0.0000100	0.0026180	0.0001234	0.0039194	0.0089255	0.1121660	0.0002119	0.3347099	0.0102138	0.0004102	0.6057542
			GN		**MEAN**	0.0000219	0.0216708	0.0001384	0.0001677	0.0000111	0.4819516	0.0000289	0.0024902	0.0013000	0.0132046	0.0103152	0.1546650	0.0002899	0.4212880	0.0041691	0.0003693	0.4857002
			GN		**STDEV**	0.0000476	0.0363269	0.0003519	0.0002609	0.0000043	0.1445631	0.0000975	0.0019209	0.0069206	0.0739951	0.0160444	0.0677263	0.0001844	0.6371242	0.0134557	0.0003293	0.2302990
			GN		**MODE**	0.0000100	#N/A	0.0000500	0.0000800	0.0000100	0.3840000	0.0000100	#N/A	0.0000820	#N/A	#N/A	#N/A	0.0002600	0.2366667	#N/A	0.0001240	0.2190000
			GN		**MAX**	0.0002960	0.2158754	0.0022409	0.0016758	0.0000300	0.8820000	0.0006440	0.0086803	0.0450699	0.4811355	0.1008392	0.3891293	0.0009600	4.3134247	0.0878648	0.0019728	0.8695601
			GN		**MIN**	0.0000100	0.0017981	0.0000500	0.0000253	0.0000100	0.2544306	0.0000100	0.0000450	0.0000200	0.0000270	0.0020618	0.0866000	0.0000451	0.0766135	0.0000280	0.0000200	0.1935000
221	254.5	261.65	AP	2003/09/25	IGS	0.0000100	0.0843200	0.0000500	0.0016800	0.0000500	1.2340000	0.0000100	0.0012920	0.0011820	0.0127000	0.0478200	0.2600000	0.0001400	0.0292667	0.0095920	0.0016580	0.6260000
218	349.16	359.18	AP	2003/09/25	IGS	0.0000100	0.0893200	0.0000500	0.0009000	0.0000500	1.1120000	0.0000100	0.0040390	0.0005010	0.0032740	0.0504600	0.3100000	0.0001000	0.0100467	0.0063270	0.0003860	0.6600000
219	368.2	377.93	AP	2003/09/25	IGS	0.0000100	0.0912800	0.0000500	0.0015400	0.0000500	1.1300000	0.0000100	0.0016240	0.0008040	0.0053853	0.0346100	0.4620000	0.0001200	0.0145533	0.0067800	0.0005040	0.7480000
			AP		**MEAN**	0.0000100	0.0883067	0.0000500	0.0013733	0.0000500	1.1586667	0.0000100	0.0023183	0.0008290	0.0071198	0.0442967	0.3440000	0.0001200	0.0179556	0.0075663	0.0008493	0.6780000
			AP		**STDEV**	0.0000000	0.0035889	0.0000000	0.0004159	0.0000000	0.0658584	0.0000000	0.0014994	0.0003412	0.0049466	0.0084921	0.1052046	0.0000200	0.0100515	0.0017688	0.0007028	0.0629603
			AP		**MODE**	0.0000100	#N/A	0.0000500	#N/A	0.0000500	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			AP		**MAX**	0.0000100	0.0912800	0.0000500	0.0016800	0.0000500	1.2340000	0.0000100	0.0040390	0.0011820	0.0127000	0.0504600	0.4620000	0.0001400	0.0292667	0.0095920	0.0016580	0.7480000
			AP		**MIN**	0.0000100	0.0843200	0.0000500	0.0009000	0.0000500	1.1120000	0.0000100	0.0012920	0.0005010	0.0032740	0.0346100	0.2600000	0.0001000	0.0100467	0.0063270	0.0003860	0.6260000
9	325.08	334.03	HF	2003/08/19	IGS	0.0001650	1.8725000	0.0000625	0.0021250	0.0002175	0.5100000	0.0000125	0.0022313	0.0429125	0.2895000	0.0221975	0.4575000	0.0020500	0.7850000	0.0236188	0.0031950	0.8350000
27	63.16	72.97	HF	2003/08/19	IGS	0.0000125	0.5862500	0.0000625	0.0032750	0.0000888	0.5375000	0.0000125	0.0027538	0.0186613	0.1013125	0.0050988	0.9125000	0.0012750	0.8083333	0.0328875	0.0026200	0.4575000
28	76.71	86.21	HF	2003/08/19	IGS	0.0000100	0.2053000	0.0000500	0.0040600	0.0000210	0.3400000	0.0000100	0.0013890	0.0159090	0.0594900	0.0038780	0.6700000	0.0007600	0.5326667	0.0212940	0.0006480	0.2400000
31	212.59	224.01	HF	2003/08/19	IGS	0.0000100	0.2196000	0.0001640	0.0015600	0.0000490	0.6740000	0.0000100	0.0008830	0.0078370	0.1455400	0.0028460	0.2420000	0.0012800	0.5133333	0.0279700	0.0037160	0.6300000
32	240	251.93	HF	2003/08/19	IGS	0.0000100	0.1239300	0.0007400	0.0011000	0.0000290	0.2980000	0.0000100	0.0004100	0.0064320	0.0364500	0.0020760	0.3000000	0.0007400	0.2606667	0.0121170	0.0032300	0.4720000
34	229.97	255.09	HF	2003/08/19	IGS	0.0000100	0.2362000	0.0000500	0.0010800	0.0000100	0.6040000	0.0000100	0.0015420	0.0189050	0.0772100	0.0022790	0.2880000	0.0005600	0.6140000	0.0266000	0.0008020	0.2650000
64	90.29	105.54	HF	2003/08/19	IGS	0.0000125	4.2500000	0.0000625	0.0023500	0.0001400	1.0575000	0.0001375	0.0050675	0.1702500	1.1050000	4.6625000	0.5950000	0.0024250	2.7500000	0.0536625	0.0000250	0.8512500
69	191.86	201.92	HF	2003/08/19	IGS	0.0000100	0.0258200	0.0067420	0.0001600	0.0000100	0.4220000	0.0000400	0.0011020	0.0026940	0.0145710	0.0025620	0.1632000	0.0007200	0.2420000	0.0072110	0.0047340	0.6670000
70	225.71	238.65	HF	2003/08/19	IGS	0.0000100	0.0469800	0.0043680	0.0003600	0.0000100	0.2700000	0.0000320	0.0006110	0.0069650	0.0304300	0.0018600	0.3340000	0.0010000	0.2873333	0.0069670	0.0073400	0.6560000
75	309	317.64	HF	2003/08/19	IGS	0.0000100	0.0196280	0.0100540	0.0002400	0.0000100	0.1076000	0.0000560	0.0005700	0.0012800	0.0309000	0.0029950	0.3260000	0.0006400	0.1653333	0.0018620	0.0017340	0.5020000
80	43.1	46	HF	2003/08/19	IGS	0.0000100	0.0260300	0.0001740	0.0002400	0.0000100	1.6720000	0.0000100	0.0007300	0.0087000	0.0386200	0.0038530	0.2580000	0.0003800	0.3713333	0.0405700	0.0014820	0.5110000
85	87.09	100.87	HF	2003/08/19	IGS	0.0000150	9.5580000	0.0000750	0.0031200	0.0000570	6.7200000	0.0001410	0.0027030	0.1033110	1.2960000	22.1850000	0.1176000	0.0004500	1.1410000	0.0438750	0.0000300	0.3930000
86	125.9	136.47	HF	2003/08/19	IGS	0.0000100	0.9960000	0.0000500	0.0023600	0.0000880	1.1820000	0.0000940	0.0017260	0.0299100	0.1460700	0.0129900	0.5340000	0.0011200	1.1926667	0.0408700	0.0031340	0.3980000
93	113.26	123.06	HF	2003/08/19	IGS	0.0000125	2.1750000	0.0000625	0.0024500	0.0000600	1.0025000	0.0000450	0.0086100	0.0435000	0.2463125	0.0341500	0.1917500	0.0015000	0.7858333	0.0278250	0.0007800	0.3100000
94	166.6	177.06	HF	2003/08/19	IGS	0.0000150	7.5000000	0.0002940	0.0025500	0.0000870	16.5000000	0.0001590	0.0022260	0.0348600	0.7365000	2.9655000	0.2553000	0.0015000	1.7860000	0.0633300	0.0000300	0.6630000

Constituents released during complete oxidation in kg/t																					
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ni	Sb	Se	Sn	Sr	Pb	V	Zn	SO4	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)	Initial pH	Final pH
20	114.42	124.27	GN	2003/08/19	IGS	0.0024925	0.0000100	0.0000200	0.0001660	0.0005900	0.0001000	0.0008860	0.0010320	0.46	0.48	0.97	8.21	7.73	7.24	10.53	5.70
21	138.46	150.48	GN	2003/08/19	IGS	0.0016280	0.0000100	0.0000300	0.0002640	0.0006400	0.0001000	0.0003060	0.0002420	0.31	0.32	0.64	7.89	7.57	7.25	10.50	5.17
38	45.33	61.49	GN	2003/08/19	IGS	0.0071560	0.0000100	0.0000300	0.0001000	0.0014000	0.0001000	0.0009360	0.0038420	0.89	0.93	1.86	8.95	8.01	7.08	10.84	5.74
39	85.51	100.8	GN	2003/08/19	IGS	0.0040350	0.0000100	0.0000300	0.0003120	0.0006200	0.0001000	0.0004600	0.0002320	0.39	0.41	0.82	5.65	5.25	4.84	10.65	4.88
40	136.7	148.72	GN	2003/08/19	IGS	0.0007260	0.0000100	0.0000300	0.0001000	0.0005200	0.0001000	0.0006500	0.0002540	0.28	0.29	0.58	9.79	9.50	9.21	10.38	5.67
41	30.29	45.49	GN	2003/08/19	IGS	0.0013675	0.0000100	0.0000200	0.0001000	0.0008300	0.0001000	0.0002450	0.0001210	0.35	0.36	0.73	6.59	6.23	5.86	10.80	4.95
42	46.915	56.19	GN	2003/08/19	IGS	0.0035760	0.0000100	0.0000300	0.0002420	0.0004600	0.0001000	0.0009760	0.0008520	0.35	0.36	0.73	8.75	8.39	8.03	10.55	5.22
43	95.73	111.03	GN	2003/08/19	IGS	0.0062620	0.0000100	0.0000300	0.0008740	0.0006800	0.0001000	0.0005480	0.0007080	0.37	0.39	0.78	9.91	9.52	9.13	10.86	4.82
44	114.27	128.2	GN	2003/08/19	IGS	0.0064810	0.0000100	0.0000300	0.0006480	0.0006800	0.0001000	0.0005240	0.0035780	0.41	0.43	0.86	-48.91	-49.34	-49.77	10.78	4.76
45	229.5	239.62	GN	2003/08/19	IGS	0.0067240	0.0000100	0.0000300	0.0004080	0.0005200	0.0001000	0.0009880	0.0007180	0.40	0.41	0.83	10.30	9.89	9.47	10.86	5.19
46	244.4	254.97	GN	2003/08/19	IGS	0.0066570	0.0000100	0.0000300	0.0008420	0.0005400	0.0001000	0.0010080	0.0006060	0.42	0.43	0.87	9.13	8.70	8.27	10.54	5.02
47	273.77	284.06	GN	2003/08/19	IGS	0.0043690	0.0000100	0.0000300	0.0007140	0.0008000	0.0001000	0.0009960	0.0010960	0.30	0.31	0.62	9.08	8.77	8.46	10.92	5.21
58	84.84	92.75	GN	2003/08/19	IGS	0.0056210	0.0000100	0.0000300	0.0002200	0.0005600	0.0001000	0.0006840	0.0006740	0.39	0.40	0.80	7.95	7.55	7.15	10.93	5.36
59	103.9	112.49	GN	2003/08/19	IGS	0.0028460	0.0000100	0.0000300	0.0004540	0.0005000	0.0001000	0.0006180	0.0003020	0.29	0.31	0.61	7.61	7.30	7.00	10.57	5.21
60	153.23	165.12	GN	2003/08/19	IGS	0.0024080	0.0000100	0.0000300	0.0005660	0.0005200	0.0001000	0.0004700	0.0003900	0.19	0.20	0.39	5.74	5.55	5.35	10.56	4.87
61	234.2	242.4	GN	2003/08/19	IGS	0.0018510	0.0000100	0.0000300	0.0004340	0.0004800	0.0001000	0.0006740	0.0043340	0.23	0.24	0.47	6.81	6.58	6.34	10.41	5.09
62	260.35	268.95	GN	2003/08/19	IGS	0.0019740	0.0000100	0.0000300	0.0006320	0.0005400	0.0001000	0.0004740	0.0033320	0.24	0.25	0.49	7.49	7.25	7.00	10.39	4.83
229	142.5	146.13	GN	2003/09/25	IGS	0.0026321	0.0000774	0.0001171	0.0001000	0.0004165	0.0001000	0.0010568	0.0005653	0.46	0.48	0.96	28.68	28.20	27.72	10.71	6.58
230	155.17	163.06	GN	2003/09/25	IGS	0.0109245	0.0001020	0.0002081	0.0001125	0.0004576	0.0001828	0.0025128	0.0010083	1.49	1.56	3.11	41.61	40.05	38.50	10.71	6.61
231	163.11	168.06	GN	2003/09/25	IGS	0.0082506	0.0001005	0.0001076	0.0001000	0.0003608	0.0001000	0.0020970	0.0005976	0.92	0.96	1.92	35.36	34.40	33.44	10.76	6.74
232	179.25	182.84	GN	2003/09/25	IGS	0.0019882	0.0000911	0.0002091	0.0001000	0.0003329	0.0001000	0.0024166	0.0003909	0.69	0.72	1.44	38.59	37.87	37.15	10.38	6.90
233	187.62	194.8	GN	2003/09/25	IGS	0.0029211	0.0000753	0.0001179	0.0001000	0.0003324	0.0001000	0.0013207	0.0004467	0.45	0.47	0.94	28.79	28.32	27.85	10.74	6.62
235	196.08	207.05	GN	2003/09/25	IGS	0.0023697	0.0000661	0.0000592	0.0001000	0.0008011	0.0001000	0.0002908	0.0006233	0.38	0.40	0.80	16.51	16.11	15.71	11.32	5.28
236	208	218.2	GN	2003/09/25	IGS	0.3857414	0.0000789	0.0016949	0.0001250	0.0016153	0.0006784	0.0026344	0.0318230	21.11	21.99	43.99	136.86	114.87	92.88	10.72	4.45
237	218.2	225.73	GN	2003/09/25	IGS	0.0041217	0.0000754	0.0001143	0.0001000	0.0003528	0.0001000	0.0015845	0.0005427	0.85	0.88	1.76	31.08	30.19	29.31	10.87	6.50
239	59.59	65.6	GN	2003/09/25	IGS	0.0082893	0.0000679	0.0000740	0.0001000	0.0003023	0.0001000	0.0012052	0.0003405	1.31	1.36	2.72	-55.45	-56.81	-58.17	10.68	6.16
240	74.14	82.24	GN	2003/09/25	IGS	0.0118575	0.0000721	0.0000871	0.0001000	0.0004881	0.0001000	0.0011477	0.0005906	0.48	0.50	1.00	30.96	30.46	29.96	10.66	5.97
241	90.08	95.71	GN	2003/09/25	IGS	0.0206588	0.0000633	0.0000300	0.0001000	0.0005013	0.0001000	0.0007328	0.0006956	0.66	0.69	1.37	23.00	22.31	21.62	10.93	6.46
242	10.49	16.98	GN	2003/09/25	IGS	0.0018815	0.0001033	0.0001296	0.0001250	0.0012170	0.0001250	0.0016742	0.0005442	0.22	0.23	0.46	40.48	40.25	40.02	10.54	6.23
244	7.2	12.41	GN	2003/09/25	IGS	0.0034445	0.0000630	0.0000669	0.0001000	0.0008650	0.0001000	0.0009913	0.0006172	0.36	0.37	0.74	20.90	20.53	20.16	9.04	4.63
245	4.03	5.64	GN	2003/09/25	IGS	0.0019304	0.0000719	0.0000990	0.0001000	0.0009220	0.0001000	0.0015504	0.0002668	0.23	0.24	0.48	26.93	26.68	26.44	10.53	5.94
271	8	16.8	GN	2003/09/25	IGS	0.0291779	0.0000774	0.0001715	0.0001000	0.0009127	0.0001000	0.0011962	0.0006124	1.07	1.12	2.23	28.79	27.68	26.56	9.79	6.32
272	20.3	24.5	GN	2003/09/25	IGS	0.0394781	0.0000784	0.0003561	0.0001000	0.0012696	0.0001000	0.0015888	0.0004818	2.27	2.37	4.73	67.26	64.89	62.53	10.86	6.75
274	9.5	13.25	GN	2003/09/25	IGS	0.0028589	0.0000628	0.0000797	0.0001000	0.0010431	0.0001000	0.0011842	0.0004761	0.24	0.25	0.50	63.42	63.17	62.92	11.09	6.09
			GN		**MEAN**	0.0148505	0.0000375	0.0001060	0.0002491	0.0006660	0.0001163	0.0010099	0.0022309	1.01	1.06	2.11	17.97	16.91	15.86	10.60	5.62
			GN		**STDEV**	0.0591097	0.0000348	0.0002601	0.0002201	0.0003141	0.0000898	0.0006007	0.0049849	3.20	3.34	6.67	28.54	26.40	24.52	0.36	0.69
			GN		**MODE**	#N/A	0.0000100	0.0000300	0.0001000	0.0005200	0.0001000	#N/A	#N/A	0.23	0.24	0.47	#N/A	#N/A	#N/A	10.54	5.21
			GN		**MAX**	0.3857414	0.0001033	0.0016949	0.0008740	0.0016153	0.0006784	0.0026344	0.0318230	21.11	21.99	43.99	136.86	114.87	92.88	11.32	6.90
			GN		**MIN**	0.0000650	0.0000100	0.0000200	0.0001000	0.0003023	0.0001000	0.0000140	0.0000320	0.19	0.20	0.39	-55.45	-56.81	-58.17	9.04	4.45
221	254.5	261.65	AP	2003/09/25	IGS	0.0032680	0.0000300	0.0000100	0.0001000	0.0009400	0.0001000	0.0002660	0.0057120	2.19	2.28	4.56	12.25	9.97	7.69	10.17	3.90
218	349.16	359.18	AP	2003/09/25	IGS	0.0007720	0.0000300	0.0000100	0.0001000	0.0015400	0.0001000	0.0002890	0.0013880	0.96	1.00	1.99	13.67	12.68	11.68	10.06	4.93
219	368.2	377.93	AP	2003/09/25	IGS	0.0022930	0.0000320	0.0000100	0.0001000	0.0015000	0.0001000	0.0003440	0.0029140	1.76	1.83	3.67	12.65	10.82	8.99	10.18	4.54
			AP		**MEAN**	0.0021110	0.0000307	0.0000100	0.0001000	0.0013267	0.0001000	0.0002997	0.0033380	1.64	1.70	3.41	12.86	11.15	9.45	10.14	4.46
			AP		**STDEV**	0.0012579	0.0000012	0.0000000	0.0000000	0.0003355	0.0000000	0.0000401	0.0021930	0.63	0.65	1.30	0.73	1.39	2.04	0.07	0.52
			AP		**MODE**	#N/A	0.0000300	0.0000100	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			AP		**MAX**	0.0032680	0.0000320	0.0000100	0.0001000	0.0015400	0.0001000	0.0003440	0.0057120	2.19	2.28	4.56	13.67	12.68	11.68	10.18	4.93
			AP		**MIN**	0.0007720	0.0000300	0.0000100	0.0001000	0.0009400	0.0001000	0.0002660	0.0013880	0.96	1.00	1.99	12.25	9.97	7.69	10.06	3.90
9	325.08	334.03	HF	2003/08/19	IGS	0.7371250	0.0000125	0.0008000	0.0001250	0.0051750	0.0004425	0.0020700	0.0225150	17.55	18.28	36.56	-0.91	-19.19	-37.47	9.90	3.51
27	63.16	72.97	HF	2003/08/19	IGS	0.1203000	0.0000125	0.0006600	0.0001250	0.0028750	0.0001250	0.0038675	0.0168025	10.15	10.57	21.15	6.86	-3.71	-14.28	9.98	3.35
28	76.71	86.21	HF	2003/08/19	IGS	0.0962100	0.0000100	0.0003100	0.0001000	0.0015600	0.0001000	0.0017700	0.0100580	5.46	5.69	11.38	4.09	-1.60	-7.28	10.18	3.34
31	212.59	224.01	HF	2003/08/19	IGS	0.0951100	0.0000100	0.0005600	0.0001000	0.0044000	0.0002260	0.0014200	0.0127860	6.54	6.81	13.63	1.05	-5.76	-12.57	9.87	3.78
32	240	251.93	HF	2003/08/19	IGS	0.0643700	0.0002200	0.0002560	0.0001000	0.0019800	0.0001000	0.0005560	0.0006580	3.50	3.65	7.29	-0.93	-4.58	-8.22	9.78	3.58
34	229.97	255.09	HF	2003/08/19	IGS	0.1116400	0.0000100	0.0004680	0.0001000	0.0018400	0.0002180	0.0015900	0.0202400	6.03	6.28	12.56	7.50	1.22	-5.06	9.79	3.50
64	90.29	105.54	HF	2003/08/19	IGS	2.0312500	0.0000125	0.0008250	0.0001250	0.0083500	0.0012750	0.0000950	0.0604750	46.38	48.31	96.61	-1.56	-49.87	-98.17	9.55	3.09
69	191.86	201.92	HF	2003/08/19	IGS	0.0233800	0.0001260	0.0001240	0.0001000	0.0013600	0.0001000	0.0010220	0.0051760	2.50	2.61	5.22	0.36	-2.24	-4.85	9.92	4.40
70	225.71	238.65	HF	2003/08/19	IGS	0.0425900	0.0001020	0.0001780	0.0001000	0.0017000	0.0001000	0.0010620	0.0087340	3.23	3.36	6.72	0.04	-3.32	-6.68	10.12	3.76
75	309	317.64	HF	2003/08/19	IGS	0.0553000	0.0001640	0.0000800	0.0001000	0.0004800	0.0001000	0.0003740	0.0047760	1.10	1.15	2.29	-4.49	-5.63	-6.78	9.55	4.03
80	43.1	46	HF	2003/08/19	IGS	0.0371100	0.0000100	0.0008400	0.0001000	0.0008600	0.0001000	0.0005660	0.0034200	5.22	5.44	10.88	12.53	7.09	1.65	10.29	4.36
85	87.09	100.87	HF	2003/08/19	IGS	0.7398000	0.0003150	0.0000900	0.0001500	0.0076800	0.0019980	0.0002640	0.0200580	105.75	110.16	220.31	-19.15	-129.31	-239.47	9.33	2.59
86	125.9	136.47	HF	2003/08/19	IGS	0.1745000	0.0000100	0.0007200	0.0001000	0.0051400	0.0001000	0.0024840	0.0116480	12.02	12.52	25.04	4.06	-8.46	-20.98	9.76	3.87
93	113.26	123.06	HF	2003/08/19	IGS	0.4275000	0.0000125	0.0006700	0.0001250	0.0055750	0.0001250	0.0024375	0.0176200	16.18	16.85	33.70	0.48	-16.36	-33.21	9.55	3.36
94	166.6	177.06	HF	2003/08/19	IGS	0.2590500	0.0000480	0.0018210	0.0001500	0.0312000	0.0047940	0.0000720	0.0356400	85.95	89.53	179.06	16.86	-72.67	-162.20	9.15	2.77

Constituents released during complete oxidation in kg/t																						
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
117	163.85	172.25	HF	2003/08/19	IGS	0.0000460	0.0416300	0.0018120	0.0011200	0.0000500	0.3140000	0.0000260	0.0004460	0.0072990	0.0357400	0.0012950	0.3000000	0.0008600	0.2966667	0.0075580	0.0017860	0.2700000
127	72.82	79.6	HF	2003/08/19	IGS	0.0000100	0.0090250	0.0025260	0.0001000	0.0000500	0.0738000	0.0000100	0.0003310	0.0001180	0.0002260	0.0062410	0.2720000	0.0009900	0.1455333	0.0005170	0.0018770	0.2980000
129	239.3	250.48	HF	2003/08/19	IGS	0.0000100	0.0086070	0.0031640	0.0000600	0.0000500	0.0890000	0.0000100	0.0003100	0.0001030	0.0003120	0.0066690	0.1852000	0.0007300	0.1410667	0.0004100	0.0002470	0.2920000
133	244.04	255.02	HF	2003/08/19	IGS	0.0000100	0.0171550	0.0002220	0.0023200	0.0000500	0.4220000	0.0000100	0.0007520	0.0041390	0.0036190	0.0011420	1.6080000	0.0029700	0.2406667	0.0043010	0.0011280	0.5470000
168	325.5	331.1	HF	2003/09/17	IGS	0.0000100	0.1311200	0.0006960	0.0007400	0.0000500	1.0060000	0.0000100	0.0011900	0.0112660	0.0378067	0.0137835	0.2440000	0.0007400	0.2980000	0.0122610	0.0038680	0.6680000
169	68.9	74.84	HF	2003/09/17	IGS	0.0000125	0.0114125	0.0000625	0.0004500	0.0000500	2.8000000	0.0000125	0.0022875	0.0064388	0.0984417	0.0042388	0.1435000	0.0007417	0.7625000	0.0158000	0.0001825	0.8625000
180	187.96	194.36	HF	2003/09/17	IGS	0.0000150	0.0711300	0.0000750	0.0023100	0.0000750	2.6460000	0.0000150	0.0152970	0.0070005	0.1972300	0.0110235	0.6210000	0.0010200	1.7720000	0.0657150	0.0002340	1.0110000
182	221.65	230.47	HF	2003/09/17	IGS	0.0000150	8.6513520	0.0002220	0.0037500	0.0000780	7.7100000	0.0000150	0.0029640	0.0336600	0.7695000	6.8483280	0.5430000	0.0014500	1.9220000	0.0306195	0.0000300	1.4100000
227	208.28	215.92	HF	2003/09/25	IGS	0.0000100	0.0225829	0.0001739	0.0002497	0.0000100	0.1579511	0.0000100	0.0007263	0.0041227	0.0096162	0.0021877	0.4234529	0.0010790	0.3649836	0.0100963	0.0030773	0.8864615
256	79.67	87.27	HF	2003/09/25	IGS	0.0000100	1.2503747	0.0003979	0.0011531	0.0001519	0.7884927	0.0000100	0.0014689	0.0309429	0.0703854	0.0586631	1.2391039	0.0028482	0.7104706	0.0460780	0.0003893	1.0814339
			HF		**MEAN**	0.0000188	1.5222251	0.0012945	0.0015713	0.0000601	1.9161738	0.0000363	0.0023331	0.0246887	0.2230713	1.4745343	0.4489643	0.0011932	0.7555755	0.0249606	0.0018528	0.6070858
			HF		**STDEV**	0.0000313	2.8424687	0.0024571	0.0012349	0.0000503	3.5939800	0.0000458	0.0032424	0.0375574	0.3570257	4.6334671	0.3540475	0.0007016	0.6683076	0.0194944	0.0018394	0.2960540
			HF		**MODE**	0.0000100	#N/A	0.0000625	0.0002400	0.0000100	0.4220000	0.0000100	#N/A	#N/A	#N/A	#N/A	0.3000000	#N/A	#N/A	#N/A	0.0000300	#N/A
			HF		**MAX**	0.0001650	9.5580000	0.0100540	0.0040600	0.0002175	16.5000000	0.0001590	0.0152970	0.1702500	1.2960000	22.1850000	1.6080000	0.0029700	2.7500000	0.0657150	0.0073400	1.4100000
			HF		**MIN**	0.0000100	0.0086070	0.0000500	0.0000600	0.0000100	0.0738000	0.0000100	0.0003100	0.0001030	0.0002260	0.0011420	0.1176000	0.0003800	0.1410667	0.0004100	0.0000250	0.2400000
50	43	63.08	LN	2003/08/19	IGS	0.0001600	2.6720375	0.0000625	0.0024500	0.0000125	1.6975000	0.0000125	0.0109863	0.1228625	3.4162500	2.2767250	0.2900000	0.0009750	3.5000000	0.0811500	0.0000250	0.5912500
90	290	302	LN	2003/08/19	IGS	0.0000100	0.0022180	0.0002540	0.0000800	0.0000100	0.6520000	0.0000100	0.0075720	0.0000780	0.0005860	0.0024610	0.1082000	0.0001800	0.7540000	0.0008960	0.0001360	0.1923000
111	63.28	75.16	LN	2003/08/19	IGS	0.0000100	0.0049480	0.0000500	0.0001200	0.0000500	0.3860000	0.0000100	0.0018840	0.0003170	0.0014640	0.0021710	0.0684000	0.0008400	0.3660000	0.0012780	0.0001010	0.1639000
134	76.92	88.02	LN	2003/08/19	IGS	0.0000113	2.3262902	0.0001200	0.0018463	0.0000363	3.8452201	0.0000400	0.0107883	0.0419409	0.3106578	0.7763546	0.9928313	0.0013177	2.3450645	0.0465673	0.0005444	0.7706269
141	280.2	287.4	LN	2003/08/19	IGS	0.0000410	0.0004130	0.0002720	0.0000800	0.0000500	0.9420000	0.0000100	0.0050660	0.0000970	0.0006170	0.0004790	0.5280000	0.0004000	0.4446667	0.0009870	0.0000890	0.2550000
167	282.83	288.2	LN	2003/09/17	IGS	0.0000125	0.1671500	0.0001275	0.0013500	0.0000625	1.8500000	0.0000125	0.0012338	0.0099188	0.0700667	0.0201444	0.3625000	0.0009833	0.5325000	0.0317000	0.0006550	0.8600000
248	203.32	207.44	LN	2003/09/25	IGS	0.0000100	0.0027002	0.0001723	0.0000556	0.0000100	0.4547148	0.0000237	0.0087247	0.0000716	0.0027298	0.0046668	0.1321272	0.0002009	0.6491035	0.0012000	0.0004488	0.6909052
255	455.69	463	LN	2003/09/25	IGS	0.0000150	3.7420060	0.0000750	0.0019718	0.0000150	3.6059852	0.0000150	0.0008888	0.2501798	6.9963058	3.8388442	0.2638738	0.0009382	1.3970542	0.0393745	0.0000300	1.3470763
260	145.68	153.02	LN	2003/09/25	IGS	0.0013375	4.1695992	0.0000500	0.0011202	0.0000100	4.1395212	0.0000100	0.0018731	0.1361839	1.3931151	1.0498308	0.6437293	0.0007201	2.7017172	0.0600542	0.0000200	1.2396765
			LN		**MEAN**	0.0001786	1.4541513	0.0001315	0.0010082	0.0000285	1.9525490	0.0000160	0.0054463	0.0624055	1.3546436	0.8857419	0.3766291	0.0007284	1.4100118	0.0292452	0.0002277	0.6789705
			LN		**STDEV**	0.0004373	1.7655221	0.0000850	0.0009525	0.0000212	1.5241673	0.0000100	0.0041625	0.0887685	2.4017110	1.3492898	0.3002539	0.0003900	1.1571655	0.0300476	0.0002497	0.4318077
			LN		**MODE**	0.0000100	#N/A	0.0000500	0.0000800	0.0000100	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			LN		**MAX**	0.0013375	4.1695992	0.0002720	0.0024500	0.0000625	4.1395212	0.0000400	0.0109863	0.2501798	6.9963058	3.8388442	0.9928313	0.0013177	3.5000000	0.0811500	0.0006550	1.3470763
			LN		**MIN**	0.0000100	0.0004130	0.0000500	0.0000556	0.0000100	0.3860000	0.0000100	0.0008888	0.0000716	0.0005860	0.0004790	0.0684000	0.0001800	0.3660000	0.0008960	0.0000200	0.1639000
88	256.08	267	MA	2003/08/19	IGS	0.0000100	0.0023090	0.0000500	0.0000800	0.0000100	0.9580000	0.0000100	0.0042740	0.0001400	0.0020650	0.0008940	0.1238000	0.0003600	0.5460000	0.0014140	0.0000780	0.2410000
89	278	286.12	MA	2003/08/19	IGS	0.0000100	0.0018470	0.0000500	0.0000800	0.0000100	1.0380000	0.0000100	0.0023160	0.0002160	0.0017180	0.0007660	0.1514000	0.0004000	0.4546667	0.0020910	0.0000980	0.2520000
149	298.82	305.69	MA	2003/08/19	IGS	0.0000125	0.0131563	0.0013925	0.0001250	0.0000625	0.9250000	0.0000125	0.0016988	0.0014925	0.0225025	0.0040625	0.1540000	0.0001750	0.6458333	0.0061525	0.0004213	0.7112500
179	89.65	94.35	MA	2003/09/17	IGS	0.0000100	0.0126300	0.0000500	0.0001400	0.0000500	0.8000000	0.0000100	0.0005870	0.0001700	0.0004860	0.0036440	0.1588000	0.0008400	0.3106667	0.0007180	0.0000700	0.7340000
220	164.35	172.29	MA	2003/09/25	IGS	0.0000100	0.0773400	0.0000500	0.0001800	0.0000500	0.6840000	0.0000100	0.0018240	0.0008770	0.0345333	0.0132000	0.0798000	0.0002000	0.1957333	0.0036200	0.0000820	0.6220000
247	70.89	81.11	MA	2003/09/25	IGS	0.0000100	0.0034413	0.0000500	0.0000632	0.0000100	0.7644891	0.0000224	0.0010326	0.0001532	0.0013346	0.0022405	0.1874175	0.0001853	0.1468546	0.0009834	0.0005336	0.7681039
249	30.65	33.31	MA	2003/09/25	IGS	0.0000100	0.0045851	0.0000500	0.0000551	0.0000100	0.3770597	0.0000100	0.0018445	0.0000863	0.0024053	0.0026261	0.2297200	0.0001817	0.3134289	0.0006949	0.0004552	0.7811403
			MA		**MEAN**	0.0000104	0.0164727	0.0002418	0.0001033	0.0000289	0.7923641	0.0000121	0.0019395	0.0004479	0.0092921	0.0039190	0.1549911	0.0003346	0.3733119	0.0022391	0.0002483	0.5870706
			MA		**STDEV**	0.0000009	0.0272527	0.0005074	0.0000460	0.0000240	0.2200077	0.0000046	0.0011778	0.0005352	0.0135986	0.0042781	0.0470653	0.0002414	0.1830461	0.0020083	0.0002102	0.2382933
			MA		**MODE**	0.0000100	#N/A	0.0000500	0.0000800	0.0000100	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			MA		**MAX**	0.0000125	0.0773400	0.0013925	0.0001800	0.0000625	1.0380000	0.0000224	0.0042740	0.0014925	0.0345333	0.0132000	0.2297200	0.0008400	0.6458333	0.0061525	0.0005336	0.7811403
			MA		**MIN**	0.0000100	0.0018470	0.0000500	0.0000551	0.0000100	0.3770597	0.0000100	0.0005870	0.0000863	0.0004860	0.0007660	0.0798000	0.0001750	0.1468546	0.0006949	0.0000700	0.2410000
4	125.85	132.18	MN	2003/08/19	IGS	0.0000200	0.0194630	0.0000500	0.0001600	0.0000100	0.2800000	0.0000100	0.0042760	0.0000920	0.0004260	0.0327600	0.1172000	0.0001600	0.3820000	0.0009880	0.0001060	0.1947000
24	41.58	52.04	MN	2003/08/19	IGS	0.0000100	0.2055070	0.0000500	0.0005400	0.0000100	0.7160000	0.0000100	0.0000240	0.0000200	0.0000100	0.0810339	0.1028000	0.0004400	0.3306667	0.0000200	0.0000200	0.2590000
25	54.075	63.87	MN	2003/08/19	IGS	0.0000100	0.0118750	0.0000500	0.0001200	0.0000100	0.4540000	0.0000100	0.0012650	0.0000610	0.0001900	0.0220400	0.1050000	0.0003800	0.3013333	0.0006300	0.0000600	0.2110000
56	261.22	280.2	MN	2003/08/19	IGS	0.0000100	1.6800000	0.0000500	0.0015400	0.0000100	2.1600000	0.0001120	0.0054670	0.0734940	1.1652000	0.0050140	0.1670000	0.0003200	1.2713333	0.0196860	0.0015160	0.6370000
65	107.05	121.66	MN	2003/08/19	IGS	0.0000125	2.7000000	0.0000625	0.0021000	0.0000125	1.6575000	0.0002300	0.0102300	0.1295700	2.0012500	2.1875000	0.3225000	0.0008750	2.5425000	0.0535500	0.0000250	0.7200000
76	101.66	111.24	MN	2003/08/19	IGS	0.0000100	0.0112860	0.0008440	0.0001200	0.0000100	0.9020000	0.0000100	0.0016940	0.0019630	0.0245500	0.0009720	0.1272000	0.0003400	0.4900000	0.0059250	0.0003860	0.5340000
78	276.85	286	MN	2003/08/19	IGS	0.0000100	2.9800000	0.0001220	0.0017400	0.0000100	2.2800000	0.0001980	0.0039640	0.1295580	2.3400000	0.2586100	0.4120000	0.0007200	1.9366667	0.0231800	0.0000200	0.7810000
83	306.58	315	MN	2003/08/19	IGS	0.0000125	3.4182500	0.0000625	0.0028000	0.0000125	3.0500000	0.0004425	0.0007550	0.4622750	6.7760000	20.3733750	0.1690000	0.0008000	0.8283333	0.0256938	0.0000250	0.8575000
87	187	197.88	MN	2003/08/19	IGS	0.0000100	0.0311300	0.0000500	0.0010000	0.0000100	1.5760000	0.0000300	0.0016310	0.0046470	0.1687600	0.0019000	0.1040000	0.0003600	0.7426667	0.0145790	0.0001140	0.3210000
92	50	61.97	MN	2003/08/19	IGS	0.0000125	4.0000000	0.0000625	0.0019250	0.0000125	4.9000000	0.0001675	0.0016750	0.0716875	0.2513875	0.0376875	0.2175000	0.0007250	1.5441667	0.0318875	0.0010000	0.5750000
112	101.96	112.24	MN	2003/08/19	IGS	0.0000100	0.0034350	0.0002280	0.0001000	0.0000500	0.3980000	0.0000100	0.0038900	0.0004110	0.0016570	0.0019830	0.1420000	0.0008000	0.5313333	0.0015140	0.0002510	0.1693000
114	267.3	277.4	MN	2003/08/19	IGS	0.0000125	0.6750000	0.0000625	0.0022750	0.0000625	1.2925000	0.0001125	0.0133763	0.0357625	0.9055250	0.0037525	0.1515000	0.0007875	1.3400000	0.0236325	0.0001313	0.2925000
119	157	162.26	MN	2003/08/19	IGS	0.0000125	1.1575000	0.0000625	0.0014250	0.0000625	2.5250000	0.0001500	0.0036900	0.0391125	1.3222500	0.0102088	0.1505000	0.0011625	1.0366667	0.0310000	0.0000250	0.4100000
121	226.1	232.11	MN	2003/08/19	IGS	0.0000263	0.8850000	0.0000625	0.0020000	0.0000625	2.9000000	0.0001075	0.0035663	0.0395625	0.9050000	0.0058363	0.2825000	0.0014875	0.9900000	0.0264000	0.0001075	0.4062500
131	169.66	180.32	MN	2003/08/19	IGS	0.0000100	0.1345700	0.0000500	0.0007200	0.0000500	0.9960000	0.0000100	0.0010870	0.0147150	0.0866300	0.0017930	0.0546000	0.0011600	0.6700000	0.0150630	0.0009700	0.2590000
144	218.64	225.82	MN	2003/08/19	IGS	0.0000125	2.2375000	0.0001275	0.0021000	0.0000625	3.5250000	0.0000975	0.0031900	0.0496375	0.5087500	0.0566250	0.4200000	0.0007000	0.9916667	0.0218563	0.0000250	0.4600000
145	68.91	78.77	MN	2003/08/19	IGS	0.0000375	0.2800000	0.0000625	0.0020000	0.0000625	2.0050000	0.0000875	0.0016188	0.0132675	0.6625000	0.0038500	0.1632500	0.0006500	0.8966667	0.0244200	0.0005713	0.3650000
165	234.5	240.03	MN	2003/09/17	IGS	0.0000300	0.0376500	0.0000750	0.0009300	0.0000750	5.7900000	0.0000150	0.0023100	0.0098805	0.6030000	0.0068085	0.2025000	0.0010500	0.9260000	0.0287190	0.0001500	1.1340000
166	40.02	45.45	MN	2003/09/17	IGS	0.0000125	0.9000000	0.0000625	0.0026250	0.0000625	2.0925000	0.0000125	0.0094300	0.0245225	0.8950000	0.0303125	0.1835000	0.0008167	0.9466667	0.0187663	0.0001525	0.9675000
264	24.01	34.14	MN	2003/09/25	IGS	0.0000253	0.0736575	0.0000500	0.0004497	0.0000100	1.0600979	0.0000100	0.0064533	0.0191166	0.2141430	0.0033212	0.1737231	0.0004237	0.6716092	0.0414079	0.0009311	0.7641036
266	21.48	29.48	MN	2003/09/25	IGS	0.0000268	0.0031667	0.0012444	0.0003182	0.0000100	2.9764961	0.0000100	0.0070806	0.0021861	0.0092078	0.0019085	0.0953885	0.0004202	0.8249301	0.0138439	0.0004797	0.6943073

Constituents released during complete oxidation in kg/t																					
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ni	Sb	Se	Sn	Sr	Pb	V	Zn	SO4	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)	Initial pH	Final pH
117	163.85	172.25	HF	2003/08/19	IGS	0.0703900	0.0001500	0.0001440	0.0001000	0.0015800	0.0001000	0.0011120	0.0106620	3.19	3.32	6.65	-0.32	-3.65	-6.97	9.94	3.53
127	72.82	79.6	HF	2003/08/19	IGS	0.0053730	0.0002680	0.0000600	0.0001000	0.0002800	0.0001000	0.0002360	0.0003900	0.54	0.56	1.12	81.62	81.05	80.49	9.04	5.42
129	239.3	250.48	HF	2003/08/19	IGS	0.0062580	0.0001420	0.0000100	0.0001000	0.0002200	0.0001000	0.0003020	0.0001960	0.59	0.61	1.22	70.85	70.24	69.63	9.30	5.30
133	244.04	255.02	HF	2003/08/19	IGS	0.0164170	0.0001720	0.0005040	0.0001000	0.0047400	0.0001000	0.0016400	0.0018220	4.62	4.81	9.61	-1.29	-6.09	-10.90	10.29	5.07
168	325.5	331.1	HF	2003/09/17	IGS	0.0521300	0.0000100	0.0002540	0.0001000	0.0013600	0.0001000	0.0015980	0.0055400	3.82	3.98	7.96	18.15	14.17	10.19	9.43	4.02
169	68.9	74.84	HF	2003/09/17	IGS	0.0963750	0.0000125	0.0005075	0.0001250	0.0019000	0.0001250	0.0009663	0.0016000	10.53	10.96	21.93	28.15	17.18	6.22	9.89	5.62
180	187.96	194.36	HF	2003/09/17	IGS	0.1344900	0.0000330	0.0009090	0.0001500	0.0018900	0.0001500	0.0015135	0.0064620	15.98	16.64	33.28	33.12	16.48	-0.16	10.48	4.57
182	221.65	230.47	HF	2003/09/17	IGS	0.5640000	0.0003720	0.0026310	0.0001500	0.0182700	0.0019020	0.0003795	0.0320700	104.10	108.44	216.88	21.03	-87.41	-195.85	9.47	2.67
227	208.28	215.92	HF	2003/09/25	IGS	0.0462916	0.0002414	0.0003794	0.0001000	0.0010540	0.0001000	0.0008868	0.0018402	3.38	3.52	7.04	16.79	13.27	9.75	10.96	5.65
256	79.67	87.27	HF	2003/09/25	IGS	0.1447223	0.0000553	0.0015406	0.0001000	0.0068980	0.0002239	0.0000790	0.0192319	12.75	13.28	26.57	23.66	10.38	-2.90	11.19	4.00
			HF		**MEAN**	0.2460673	0.0001012	0.0006137	0.0001130	0.0047347	0.0005162	0.0011345	0.0132168	19.48	20.29	40.59	12.74	-7.55	-27.84	9.87	3.97
			HF		**STDEV**	0.4289505	0.0001105	0.0006108	0.0000193	0.0067258	0.0010428	0.0009280	0.0138508	31.38	32.69	65.38	22.45	42.91	72.91	0.51	0.89
			HF		**MODE**	#N/A	0.0000100	#N/A	0.0001000	0.0013600	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	9.55	#N/A
			HF		**MAX**	2.0312500	0.0003720	0.0026310	0.0001500	0.0312000	0.0047940	0.0038675	0.0604750	105.75	110.16	220.31	81.62	81.05	80.49	11.19	5.65
			HF		**MIN**	0.0053730	0.0000100	0.0000100	0.0001000	0.0002200	0.0001000	0.0000720	0.0001960	0.54	0.56	1.12	-19.15	-129.31	-239.47	9.04	2.59
50	43	63.08	LN	2003/08/19	IGS	3.4131250	0.0000125	0.0021950	0.0002900	0.0035000	0.0059325	0.0018200	0.0446000	47.25	49.22	98.44	22.85	-26.36	-75.58	10.27	2.62
90	290	302	LN	2003/08/19	IGS	0.0011070	0.0000320	0.0000600	0.0001000	0.0005000	0.0001000	0.0006780	0.0000720	1.02	1.06	2.12	12.17	11.11	10.05	10.72	6.12
111	63.28	75.16	LN	2003/08/19	IGS	0.0118300	0.0000100	0.0000620	0.0001000	0.0006000	0.0001000	0.0003140	0.0003380	1.24	1.29	2.57	19.25	17.96	16.67	11.02	5.07
134	76.92	88.02	LN	2003/08/19	IGS	0.2552222	0.0001149	0.0008919	0.0001125	0.0078149	0.0003024	0.0031591	0.0244105	33.30	34.69	69.37	36.87	2.18	-32.51	9.83	3.85
141	280.2	287.4	LN	2003/08/19	IGS	0.0065820	0.0000440	0.0001860	0.0001000	0.0008000	0.0001000	0.0007560	0.0003940	3.45	3.59	7.19	34.42	30.83	27.23	10.40	6.33
167	282.83	288.2	LN	2003/09/17	IGS	0.0495625	0.0000125	0.0003100	0.0001250	0.0025000	0.0001250	0.0010650	0.0077525	7.65	7.97	15.94	24.02	16.05	8.08	9.87	4.01
248	203.32	207.44	LN	2003/09/25	IGS	0.0109564	0.0000895	0.0003032	0.0001000	0.0003075	0.0001967	0.0009652	0.0006666	2.45	2.55	5.10	31.09	28.54	25.99	10.94	6.94
255	455.69	463	LN	2003/09/25	IGS	6.7278911	0.0000150	0.0024537	0.0001500	0.0129785	0.0073422	0.0001298	0.1318182	64.50	67.19	134.38	38.44	-28.75	-95.94	10.13	2.97
260	145.68	153.02	LN	2003/09/25	IGS	3.0116213	0.0000100	0.0021020	0.0001000	0.0113733	0.0016566	0.0000371	0.0370881	51.51	53.65	107.31	57.78	4.12	-49.53	10.74	3.55
			LN		**MEAN**	1.4986553	0.0000378	0.0009515	0.0001308	0.0044860	0.0017617	0.0009916	0.0274600	23.60	24.58	49.16	30.77	6.19	-18.39	10.44	4.61
			LN		**STDEV**	2.3936895	0.0000388	0.0010083	0.0000621	0.0049698	0.0028304	0.0009783	0.0427361	25.55	26.62	53.23	13.35	21.41	46.43	0.45	1.56
			LN		**MODE**	#N/A	0.0000125	#N/A	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			LN		**MAX**	6.7278911	0.0001149	0.0024537	0.0002900	0.0129785	0.0073422	0.0031591	0.1318182	64.50	67.19	134.38	57.78	30.83	27.23	11.02	6.94
			LN		**MIN**	0.0011070	0.0000100	0.0000600	0.0001000	0.0003075	0.0001000	0.0000371	0.0000720	1.02	1.06	2.12	12.17	-28.75	-95.94	9.83	2.62
88	256.08	267	MA	2003/08/19	IGS	0.0057290	0.0000100	0.0001740	0.0001000	0.0007200	0.0001000	0.0005240	0.0002120	3.23	3.36	6.73	13.30	9.93	6.57	10.53	5.90
89	278	286.12	MA	2003/08/19	IGS	0.0081800	0.0000100	0.0001440	0.0001000	0.0009200	0.0001000	0.0005280	0.0002300	3.49	3.63	7.26	8.65	5.02	1.39	10.27	5.74
149	298.82	305.69	MA	2003/08/19	IGS	0.0253500	0.0000600	0.0001875	0.0001250	0.0054250	0.0001250	0.0008975	0.0006175	4.33	4.51	9.02	26.04	21.53	17.02	10.97	5.80
179	89.65	94.35	MA	2003/09/17	IGS	0.0027960	0.0000100	0.0000100	0.0001000	0.0009800	0.0001000	0.0003950	0.0001540	1.10	1.14	2.28	28.32	27.18	26.04	10.20	5.33
220	164.35	172.29	MA	2003/09/25	IGS	0.0147190	0.0000200	0.0001100	0.0001000	0.0009800	0.0001000	0.0005460	0.0016240	1.32	1.37	2.74	29.60	28.23	26.86	10.34	5.05
247	70.89	81.11	MA	2003/09/25	IGS	0.0025688	0.0000772	0.0000742	0.0001000	0.0005510	0.0001000	0.0011338	0.0004827	0.52	0.54	1.08	23.98	23.44	22.90	11.08	6.53
249	30.65	33.31	MA	2003/09/25	IGS	0.0048861	0.0000685	0.0000610	0.0001000	0.0003697	0.0001000	0.0012747	0.0004549	0.32	0.33	0.66	29.69	29.36	29.03	10.67	6.64
			MA		**MEAN**	0.0091756	0.0000365	0.0001087	0.0001036	0.0014208	0.0001036	0.0007570	0.0005393	2.04	2.13	4.26	22.80	20.67	18.54	10.58	5.86
			MA		**STDEV**	0.0082458	0.0000306	0.0000645	0.0000094	0.0017807	0.0000094	0.0003445	0.0005073	1.60	1.67	3.34	8.43	9.52	10.76	0.34	0.58
			MA		**MODE**	#N/A	0.0000100	#N/A	0.0001000	0.0009800	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			MA		**MAX**	0.0253500	0.0000772	0.0001875	0.0001250	0.0054250	0.0001250	0.0012747	0.0016240	4.33	4.51	9.02	29.69	29.36	29.03	11.08	6.64
			MA		**MIN**	0.0025688	0.0000100	0.0000100	0.0001000	0.0003697	0.0001000	0.0003950	0.0001540	0.32	0.33	0.66	8.65	5.02	1.39	10.20	5.05
4	125.85	132.18	MN	2003/08/19	IGS	0.0017100	0.0000220	0.0000300	0.0007340	0.0004400	0.0001000	0.0004680	0.0016360	0.28	0.29	0.59	8.19	7.89	7.60	10.46	5.20
24	41.58	52.04	MN	2003/08/19	IGS	0.0000400	0.0000100	0.0000300	0.0001000	0.0011800	0.0001000	0.0000060	0.0000000	0.27	0.28	0.57	8.48	8.20	7.92	10.53	5.19
25	54.075	63.87	MN	2003/08/19	IGS	0.0013660	0.0000100	0.0000300	0.0004140	0.0005000	0.0001000	0.0003220	0.0015800	0.23	0.24	0.48	10.21	9.97	9.73	10.71	5.48
56	261.22	280.2	MN	2003/08/19	IGS	1.5960000	0.0000100	0.0011720	0.0001000	0.0038200	0.0010380	0.0025580	0.0101120	19.49	20.30	40.60	14.47	-5.84	-26.14	10.30	3.84
65	107.05	121.66	MN	2003/08/19	IGS	2.2762500	0.0000125	0.0009950	0.0001250	0.0043750	0.0031025	0.0002350	0.0188925	39.75	41.41	82.81	12.57	-28.83	-70.24	10.03	2.64
76	101.66	111.24	MN	2003/08/19	IGS	0.0210900	0.0000300	0.0001360	0.0001000	0.0011600	0.0001000	0.0010060	0.0016900	3.35	3.49	6.98	9.62	6.13	2.64	10.81	4.94
78	276.85	286	MN	2003/08/19	IGS	3.2400000	0.0000100	0.0011580	0.0001000	0.0053600	0.0016220	0.0003400	0.0160460	28.00	29.17	58.33	9.92	-19.24	-48.41	10.15	3.16
83	306.58	315	MN	2003/08/19	IGS	11.3588750	0.0000725	0.0000375	0.0001250	0.0084750	0.0054400	0.0002650	0.0447500	92.00	95.83	191.67	29.34	-66.50	-162.33	8.68	2.77
87	187	197.88	MN	2003/08/19	IGS	0.1209000	0.0000100	0.0003200	0.0001000	0.0027200	0.0002220	0.0006040	0.0060340	6.90	7.19	14.38	9.66	2.47	-4.71	10.48	4.08
92	50	61.97	MN	2003/08/19	IGS	0.3387500	0.0000425	0.0007550	0.0001250	0.0081250	0.0002825	0.0021550	0.0160275	37.13	38.67	77.34	11.92	-26.75	-65.42	10.23	3.31
112	101.96	112.24	MN	2003/08/19	IGS	0.0165620	0.0000100	0.0001000	0.0001000	0.0005400	0.0001000	0.0007300	0.0004440	2.38	2.48	4.96	18.57	16.09	13.61	10.71	5.10
114	267.3	277.4	MN	2003/08/19	IGS	1.4700000	0.0000125	0.0012050	0.0001250	0.0023250	0.0005300	0.0013475	0.0110875	17.20	17.92	35.83	14.48	-3.43	-21.35	10.76	3.62
119	157	162.26	MN	2003/08/19	IGS	1.2250000	0.0000125	0.0009450	0.0001250	0.0068750	0.0007975	0.0007650	0.0189375	22.49	23.43	46.86	17.26	-6.17	-29.60	10.72	3.69
121	226.1	232.11	MN	2003/08/19	IGS	1.1650000	0.0000125	0.0012275	0.0001250	0.0059000	0.0005400	0.0012975	0.0177850	20.59	21.45	42.89	9.02	-12.42	-33.87	10.46	3.74
131	169.66	180.32	MN	2003/08/19	IGS	0.1082800	0.0000100	0.0002140	0.0001000	0.0022400	0.0001000	0.0015900	0.0053560	6.55	6.82	13.65	7.79	0.97	-5.85	10.94	3.93
144	218.64	225.82	MN	2003/08/19	IGS	0.4632500	0.0000350	0.0005575	0.0001250	0.0077500	0.0003438	0.0001050	0.0138850	27.88	29.04	58.07	12.67	-16.36	-45.40	10.74	3.30
145	68.91	78.77	MN	2003/08/19	IGS	0.2563625	0.0000125	0.0007350	0.0001250	0.0047000	0.0003488	0.0015025	0.0142100	12.81	13.35	26.69	15.51	2.17	-11.18	10.69	3.88
165	234.5	240.03	MN	2003/09/17	IGS	0.0919050	0.0000150	0.0006060	0.0001500	0.0072000	0.0005490	0.0011370	0.0084990	19.20	20.00	40.00	25.07	5.07	-14.93	9.94	4.61
166	40.02	45.45	MN	2003/09/17	IGS	1.1625000	0.0000125	0.0015175	0.0001250	0.0038500	0.0011125	0.0006850	0.0127550	17.48	18.20	36.41	23.84	5.64	-12.56	10.16	3.55
264	24.01	34.14	MN	2003/09/25	IGS	0.2693810	0.0000604	0.0006791	0.0001000	0.0026622	0.0003420	0.0033756	0.0081265	6.69	6.97	13.93	31.81	24.84	17.87	10.59	4.97
266	21.48	29.48	MN	2003/09/25	IGS	0.1057206	0.0000878	0.0008858	0.0001000	0.0024918	0.0001000	0.0016030	0.0010134	9.21	9.60	19.20	42.77	33.17	23.58	10.71	6.08

Constituents released during complete oxidation in kg/t																						
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
51	84.78	94	MN	2003/08/19	IGS	0.0000100	0.0232700	0.0006220	0.0002800	0.0000100	0.8860000	0.0000100	0.0043160	0.0016720	0.0504100	0.0027410	0.1036000	0.0002400	0.5766667	0.0096760	0.0004380	0.5010000
			MN		**MEAN**	0.0000156	0.9758300	0.0001869	0.0012394	0.0000313	2.0191861	0.0000842	0.0041359	0.0510552	0.8587203	1.0513651	0.1803301	0.0006736	0.9441760	0.0196563	0.0003411	0.5233255
			MN		**STDEV**	0.0000081	1.2774731	0.0003099	0.0009046	0.0000259	1.4317010	0.0001066	0.0033930	0.0997125	1.4788612	4.3404097	0.0977628	0.0003413	0.5351479	0.0136536	0.0004147	0.2682245
			MN		**MODE**	0.0000100	#N/A	0.0000625	0.0001200	0.0000100	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.0000250	0.2590000
			MN		**MAX**	0.0000375	4.0000000	0.0012444	0.0028000	0.0000750	5.7900000	0.0004425	0.0133763	0.4622750	6.7760000	20.3733750	0.4200000	0.0014875	2.5425000	0.0535500	0.0015160	1.1340000
			MN		**MIN**	0.0000100	0.0031667	0.0000500	0.0001000	0.0000100	0.2800000	0.0000100	0.0000240	0.0000200	0.0000100	0.0009720	0.0546000	0.0001600	0.3013333	0.0000200	0.0000200	0.1693000
29	137.02	149.45	MZN	2003/08/19	IGS	0.0000100	0.0078780	0.0019600	0.0000600	0.0000100	0.3080000	0.0000300	0.0025800	0.0004180	0.0020240	0.0034270	0.0470000	0.0002800	0.3780000	0.0026280	0.0001680	0.1911000
30	149.84	161.08	MZN	2003/08/19	IGS	0.0000125	0.0261750	0.0011350	0.0001500	0.0000125	0.5275000	0.0000125	0.0025413	0.0013575	0.0205450	0.0033200	0.0525000	0.0003250	0.5108333	0.0070963	0.0003200	0.3662500
55	199.6	208.24	MZN	2003/08/19	IGS	0.0000125	0.0211575	0.0003075	0.0002500	0.0000125	1.6275000	0.0000125	0.0033925	0.0051750	0.1842750	0.0017100	0.0815000	0.0006000	1.2725000	0.0160325	0.0008500	0.6287500
74	321.17	332.51	MZN	2003/08/19	IGS	0.0000100	0.0063970	0.0006240	0.0002000	0.0000100	0.8620000	0.0000100	0.0017750	0.0013930	0.0445000	0.0009600	0.0574000	0.0005000	0.5613333	0.0080170	0.0002500	0.2280000
77	213.79	226.84	MZN	2003/08/19	IGS	0.0000125	2.2577500	0.0000625	0.0020500	0.0000125	1.2425000	0.0002200	0.0041275	0.2879250	4.2762500	27.2937500	0.0462500	0.0006750	1.3150000	0.0268375	0.0000250	0.7425000
128	221.95	231.93	MZN	2003/08/19	IGS	0.0000150	0.0246825	0.0002670	0.0012900	0.0000750	1.3590000	0.0000300	0.0049035	0.0140130	0.0942450	0.0026100	0.1806000	0.0010050	1.9870000	0.0267435	0.0020730	0.3960000
137	115.18	123.41	MZN	2003/08/19	IGS	0.0000100	0.0040330	0.0004620	0.0000800	0.0000500	0.6060000	0.0000100	0.0033010	0.0001290	0.0033090	0.0010000	0.0658000	0.0005100	0.4560000	0.0009410	0.0001030	0.1684000
146	376	386	MZN	2003/08/19	IGS	0.0000150	2.4720000	0.0001770	0.0029100	0.0000750	1.9170000	0.0008220	0.0036855	0.1150800	9.0585000	1.6087500	0.5460000	0.0007050	1.5430000	0.0280155	0.0000300	0.4800000
173	194.13	202.34	MZN	2003/09/17	IGS	0.0000150	7.1623200	0.0000750	0.0038700	0.0000390	6.8700000	0.0000150	0.0041910	0.0419700	0.5205000	6.7146750	0.3900000	0.0007000	1.5840000	0.0354600	0.0000300	1.4250000
			MZN		**MEAN**	0.0000125	1.3313770	0.0005633	0.0012067	0.0000329	1.7021667	0.0001291	0.0033886	0.0519401	1.5782387	3.9589113	0.1630056	0.0005889	1.0675185	0.0168635	0.0004277	0.5140000
			MZN		**STDEV**	0.0000022	2.4123595	0.0006208	0.0014293	0.0000278	2.0099220	0.0002685	0.0009719	0.0960813	3.1273267	9.0247365	0.1820254	0.0002196	0.5976055	0.0127368	0.0006689	0.3933368
			MZN		**MODE**	0.0000100	#N/A	#N/A	#N/A	0.0000125	#N/A	0.0000125	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.0000300	#N/A
			MZN		**MAX**	0.0000150	7.1623200	0.0019600	0.0038700	0.0000750	6.8700000	0.0008220	0.0049035	0.2879250	9.0585000	27.2937500	0.5460000	0.0010050	1.9870000	0.0354600	0.0020730	1.4250000
			MZN		**MIN**	0.0000100	0.0040330	0.0000625	0.0000600	0.0000100	0.3080000	0.0000100	0.0017750	0.0001290	0.0020240	0.0009600	0.0462500	0.0002800	0.3780000	0.0009410	0.0000250	0.1684000
6	167.25	177.22	NC	2003/08/19	IGS	0.0000200	0.2797200	0.0000500	0.0025200	0.0000100	1.4060000	0.0000100	0.0064640	0.0137410	0.4777200	0.0173660	0.1698000	0.0003000	1.2100000	0.0193790	0.0008580	0.3130000
7	209.055	219.97	NC	2003/08/19	IGS	0.0000250	0.6840000	0.0000625	0.0027750	0.0000125	2.0725000	0.0000125	0.0059325	0.0354250	0.6354875	0.0116513	0.2700000	0.0006500	2.2650000	0.0297625	0.0012650	0.5200000
15	210.835	229.43	NC	2003/08/19	IGS	0.0000100	0.1856100	0.0000500	0.0027800	0.0000100	2.5800000	0.0000100	0.0058020	0.0162990	1.2043700	0.0040070	0.2580000	0.0009000	2.1133333	0.0305700	0.0001760	0.3690000
17	278.67	298.12	NC	2003/08/19	IGS	0.0000100	0.4034000	0.0000500	0.0021600	0.0000100	3.3400000	0.0000100	0.0035410	0.0261200	0.2390000	0.0049130	0.2640000	0.0006400	0.9353333	0.0280200	0.0003160	0.3760000
26	39.09	60.06	NC	2003/08/19	IGS	0.0000100	0.0228700	0.0000500	0.0008800	0.0000100	2.2800000	0.0000100	0.0014840	0.0091070	0.1360900	0.0018190	0.2120000	0.0009800	0.7433333	0.0224700	0.0001540	0.3800000
48	107.95	119.8	NC	2003/08/19	IGS	0.0000125	2.3882375	0.0000625	0.0021750	0.0000125	1.8625000	0.0000125	0.0067050	0.1013125	1.6298125	0.1032750	0.4250000	0.0008250	2.2066667	0.0582625	0.0004900	0.6737500
71	246.75	257.58	NC	2003/08/19	IGS	0.0000100	0.0912000	0.0006280	0.0006600	0.0000100	1.1380000	0.0000400	0.0019400	0.0068560	0.2590000	0.0018140	0.1570000	0.0004600	0.8666667	0.0156490	0.0005800	0.5290000
84	66.02	77.14	NC	2003/08/19	IGS	0.0000125	1.4350000	0.0000625	0.0018000	0.0000125	2.5500000	0.0001050	0.0080163	0.0582750	0.9030000	0.0143400	0.1370000	0.0005750	2.3200000	0.0412500	0.0002075	0.7437500
97	244.05	255.92	NC	2003/08/19	IGS	0.0000125	0.9500000	0.0000625	0.0025500	0.0000125	2.4575000	0.0001225	0.0042688	0.0322250	0.9397500	0.0071775	0.1925000	0.0007250	1.3725000	0.0272750	0.0001475	0.4337500
98	287.8	299.64	NC	2003/08/19	IGS	0.0000125	0.0120250	0.0000625	0.0013500	0.0000125	2.0300000	0.0000350	0.0043800	0.0024175	0.0808375	0.0015888	0.2950000	0.0007750	1.9383333	0.0188238	0.0001500	0.3550000
115	42.72	53.25	NC	2003/08/19	IGS	0.0000125	0.4500000	0.0000625	0.0018500	0.0000625	1.2550000	0.0001225	0.0039488	0.0346000	0.9800000	0.0025975	0.1767500	0.0009375	1.1058333	0.0231875	0.0002750	0.3300000
116	332.97	343.08	NC	2003/08/19	IGS	0.0000150	1.5570000	0.0000750	0.0024600	0.0000750	1.6170000	0.0002910	0.0142350	0.0801600	2.3910000	0.3555000	0.3570000	0.0008400	1.7280000	0.0353700	0.0001365	0.3810000
120	171.84	175.3	NC	2003/08/19	IGS	0.0000113	0.6105000	0.0000563	0.0023975	0.0000563	2.4425000	0.0000423	0.0072703	0.0131443	0.9360100	0.0134761	0.2341250	0.0014800	1.1888333	0.0258975	0.0001273	0.6375000
122	153.01	163.07	NC	2003/08/19	IGS	0.0000100	0.0074470	0.0003060	0.0000800	0.0000500	0.4380000	0.0000100	0.0029830	0.0001920	0.0013240	0.0018110	0.1022000	0.0004900	0.4153333	0.0009630	0.0002160	0.2380000
125	77.97	89	NC	2003/08/19	IGS	0.0000370	0.0015010	0.0000500	0.0001000	0.0000500	1.2000000	0.0000100	0.0057580	0.0006200	0.0027520	0.0006280	0.3420000	0.0005100	0.5920000	0.0039630	0.0000660	0.1974000
135	89	99.73	NC	2003/08/19	IGS	0.0000125	3.2500000	0.0002300	0.0012000	0.0000625	3.9250000	0.0001075	0.0044288	0.0362125	0.2638750	0.0159563	0.9850000	0.0016750	2.8250000	0.0405250	0.0007900	0.5825000
155	83.37	93.77	NC	2003/08/19	IGS	0.0000125	0.0414625	0.0000625	0.0003500	0.0000625	1.2550000	0.0000275	0.0049600	0.0031725	0.3750000	0.0046063	0.1690000	0.0007000	1.2516667	0.0100738	0.0003575	0.7625000
158	168.08	177.97	NC	2003/08/19	IGS	0.0000125	0.7475000	0.0000625	0.0021500	0.0000625	1.7275000	0.0000950	0.0061213	0.0236213	0.7625000	0.0117538	0.2025000	0.0006875	1.5283333	0.0196825	0.0003263	0.8500000
177	37.04	47.71	NC	2003/09/17	IGS	0.0000150	1.8600000	0.0000750	0.0046500	0.0000630	7.5600000	0.0000150	0.0105630	0.0604200	0.6135000	1.2165000	0.4620000	0.0013700	1.5530000	0.0433950	0.0007560	0.9810000
267	4.41	8.15	NC	2003/09/25	IGS	0.0000100	0.0120420	0.0015436	0.0001211	0.0000100	0.2081705	0.0000100	0.0023690	0.0017628	0.0055732	0.0104507	0.1927931	0.0001235	0.3054247	0.0072667	0.0006167	0.7147190
268	9.66	14.26	NC	2003/09/25	IGS	0.0000100	0.1759577	0.0000500	0.0007424	0.0000100	0.7114938	0.0000100	0.0062177	0.0510899	0.9461463	0.0025773	0.1891485	0.0001511	0.5256982	0.0243658	0.0005158	0.7630006
			NC		**MEAN**	0.0000140	0.7221654	0.0001769	0.0017024	0.0000322	2.0979126	0.0000528	0.0055899	0.0288940	0.6563213	0.0858956	0.2758484	0.0007521	1.3804900	0.0250548	0.0004060	0.5300414
			NC		**STDEV**	0.0000064	0.8966295	0.0003411	0.0011554	0.0000255	1.5449692	0.0000687	0.0029176	0.0279582	0.5982229	0.2705037	0.1871118	0.0003950	0.7042927	0.0139271	0.0003107	0.2175129
			NC		**MODE**	0.0000125	#N/A	0.0000625	#N/A	0.0000100	1.2550000	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			NC		**MAX**	0.0000370	3.2500000	0.0015436	0.0046500	0.0000750	7.5600000	0.0002910	0.0142350	0.1013125	2.3910000	1.2165000	0.9850000	0.0016750	2.8250000	0.0582625	0.0012650	0.9810000
			NC		**MIN**	0.0000100	0.0015010	0.0000500	0.0000800	0.0000100	0.2081705	0.0000100	0.0014840	0.0001920	0.0013240	0.0006280	0.1022000	0.0001235	0.3054247	0.0009630	0.0000660	0.1974000
132	35.82	46.49	PFPX	2003/08/19	IGS	0.0000100	0.0005270	0.0000500	0.0000800	0.0000500	0.6880000	0.0000100	0.0108540	0.0001110	0.0002160	0.0006650	0.1886000	0.0008900	1.2133333	0.0005790	0.0001240	0.1972000
148	152.73	160.3	PFPX	2003/08/19	IGS	0.0000113	0.8388352	0.0000563	0.0014557	0.0000363	1.4346942	0.0001063	0.0095736	0.0563511	1.8609363	0.0281570	0.1680609	0.0003919	1.8776935	0.0377941	0.0001693	0.8125256
161	289.83	299.78	PFPX	2003/08/19	IGS	0.0000125	0.3875000	0.0000625	0.0022500	0.0000625	2.5250000	0.0000950	0.0077763	0.0136700	0.7307500	0.0083400	0.2247500	0.0004375	1.2025000	0.0207788	0.0002650	0.8200000
184	92.85	99.33	PFPX	2003/09/17	IGS	0.0000150	1.6650000	0.0002940	0.0032400	0.0000750	1.6920000	0.0000150	0.0084645	0.0846600	2.7840000	0.1526700	0.3510000	0.0006800	1.7710000	0.0307890	0.0000300	1.1670000
185	156.98	162.65	PFPX	2003/09/17	IGS	0.0000125	1.8250000	0.0001825	0.0038000	0.0000625	2.9550000	0.0000125	0.0123738	0.0706375	3.9125000	0.0344625	0.2297500	0.0003625	2.9050000	0.0375750	0.0000250	1.7325000
186	98.75	106.66	PFPX	2003/09/17	IGS	0.0000125	2.3000000	0.0000625	0.0044500	0.0000500	4.0375000	0.0000125	0.0063525	0.0338250	1.7600000	0.0387500	0.4505000	0.0005938	2.0175000	0.0303000	0.0001000	2.0275000
187	337.41	341.65	PFPX	2003/09/17	IGS	0.0000150	0.1271700	0.0003330	0.0016200	0.0000750	1.3290000	0.0000630	0.0035490	0.0070140	0.7110000	0.0091410	0.1866000	0.0003150	1.9290000	0.0367950	0.0007530	1.0080000
189	251.69	257.5	PFPX	2003/09/25	IGS	0.0000125	0.0665500	0.0001350	0.0005750	0.0000625	2.8500000	0.0000125	0.0030850	0.0072225	0.3350000	0.0039688	0.1410000	0.0005125	0.8091667	0.0186213	0.0002700	0.8725000
226	140.89	146.9	PFPX	2003/09/25	IGS	0.0000100	0.7278731	0.0000500	0.0012693	0.0000100	1.5129350	0.0000100	0.0072120	0.0266740	1.4134974	0.0096292	0.6525519	0.0008649	1.4200776	0.0256086	0.0004895	0.8224635
250	316.64	323.3	PFPX	2003/09/25	IGS	0.0000100	0.3847616	0.0000500	0.0022743	0.0000100	1.8505883	0.0000212	0.0137996	0.0111093	0.6501029	0.0106520	0.2415196	0.0006493	2.6788804	0.0378753	0.0013107	0.7499109
262	407.87	417.88	PFPX	2003/09/25	IGS	0.0000150	2.6652585	0.0000750	0.0018071	0.0000150	1.6709597	0.0000150	0.0043050	0.2347150	3.2586384	16.4414561	0.2296251	0.0006597	2.8570592	0.0654257	0.0000300	1.1630889
			PFPX		**MEAN**	0.0000124	0.9989523	0.0001228	0.0020747	0.0000463	2.0496070	0.0000339	0.0079405	0.0496354	1.5833310	1.5216265	0.2785416	0.0005779	1.8801101	0.0311038	0.0003242	1.0338808
			PFPX		**STDEV**	0.0000020	0.9524564	0.0001035	0.0013261	0.0000249	0.9480680	0.0000363	0.0035295	0.0675207	1.2741179	4.9485334	0.1521209	0.0001940	0.7027330	0.0160250	0.0003960	0.4956401
			PFPX		**MODE**	0.0000125	#N/A	0.0000500	#N/A	0.0000625	#N/A	0.0000125	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.0000300	#N/A
			PFPX		**MAX**	0.0000150	2.6652585	0.0003330	0.0044500	0.0000750	4.0375000	0.0001063	0.0137996	0.2347150	3.9125000	16.4414561	0.6525519	0.0008900	2.9050000	0.0654257	0.0013107	2.0275000
			PFPX		**MIN**	0.0000100	0.0005270	0.0000500	0.0000800	0.0000100	0.6880000	0.0000100	0.0030850	0.0001110	0.0002160	0.0006650	0.1410000	0.0003150	0.8091667	0.0005790	0.0000250	0.1972000

Constituents released during complete oxidation in kg/t																					
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ni	Sb	Se	Sn	Sr	Pb	V	Zn	SO4	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)	Initial pH	Final pH
51	84.78	94	MN	2003/08/19	IGS	0.0450000	0.0000400	0.0002100	0.0001000	0.0009200	0.0001000	0.0007980	0.0026120	3.69	3.84	7.68	9.03	5.19	1.35	10.31	4.63
			MN		**MEAN**	1.1515428	0.0000250	0.0006157	0.0001556	0.0038004	0.0007759	0.0010407	0.0105218	17.89	18.63	37.27	16.01	-2.62	-21.26	10.41	4.17
			MN		**STDEV**	2.4393946	0.0000226	0.0004770	0.0001449	0.0026626	0.0012535	0.0008474	0.0100362	20.28	21.13	42.25	9.19	20.74	40.85	0.47	0.93
			MN		**MODE**	#N/A	0.0000100	0.0000300	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.71	#N/A
			MN		**MAX**	11.3588750	0.0000878	0.0015175	0.0007340	0.0084750	0.0054400	0.0033756	0.0447500	92.00	95.83	191.67	42.77	33.17	23.58	10.94	6.08
			MN		**MIN**	0.0000400	0.0000100	0.0000300	0.0001000	0.0004400	0.0001000	0.0000060	0.0000000	0.23	0.24	0.48	7.79	-66.50	-162.33	8.68	2.64
29	137.02	149.45	MZN	2003/08/19	IGS	0.0082030	0.0000100	0.0001200	0.0001000	0.0004200	0.0001000	0.0014060	0.0009940	1.07	1.12	2.24	-17.16	-18.28	-19.40	10.98	5.22
30	149.84	161.08	MZN	2003/08/19	IGS	0.0192763	0.0000400	0.0001375	0.0005525	0.0009500	0.0001250	0.0013100	0.0237725	2.40	2.50	5.00	11.87	9.37	6.87	10.55	4.63
55	199.6	208.24	MZN	2003/08/19	IGS	0.0701250	0.0000275	0.0004875	0.0001250	0.0026500	0.0002500	0.0022625	0.0036000	8.65	9.01	18.02	14.26	5.25	-3.76	10.51	4.79
74	321.17	332.51	MZN	2003/08/19	IGS	0.0242500	0.0000340	0.0001940	0.0001000	0.0012800	0.0001000	0.0011620	0.0017800	3.68	3.83	7.67	15.05	11.21	7.38	10.47	4.90
77	213.79	226.84	MZN	2003/08/19	IGS	5.6512500	0.0002075	0.0000375	0.0001250	0.0052000	0.0036375	0.0003950	0.0238150	78.88	82.16	164.32	-2.79	-84.95	-167.11	9.56	2.47
128	221.95	231.93	MZN	2003/08/19	IGS	0.1976400	0.0000630	0.0004500	0.0001500	0.0030300	0.0001500	0.0035040	0.0075630	12.17	12.68	25.36	-46.39	-59.07	-71.75	10.53	4.44
137	115.18	123.41	MZN	2003/08/19	IGS	0.0043070	0.0000260	0.0000100	0.0001000	0.0003200	0.0001000	0.0012220	0.0003200	0.78	0.81	1.62	19.22	18.40	17.59	10.46	6.02
146	376	386	MZN	2003/08/19	IGS	1.8006000	0.0000150	0.0018930	0.0001500	0.0065400	0.0073200	0.0008280	0.0455700	54.30	56.56	113.13	6.35	-50.21	-106.77	10.08	2.64
173	194.13	202.34	MZN	2003/09/17	IGS	0.4163099	0.0002820	0.0013950	0.0001500	0.0123600	0.0019740	0.0001020	0.0219540	89.25	92.97	185.94	22.19	-70.78	-163.75	10.12	2.56
			MZN		**MEAN**	0.9102179	0.0000783	0.0005249	0.0001725	0.0036389	0.0015285	0.0013546	0.0143743	27.91	29.07	58.14	2.51	-26.56	-55.63	10.36	4.19
			MZN		**STDEV**	1.8688451	0.0000974	0.0006673	0.0001441	0.0039120	0.0024954	0.0010168	0.0154342	36.00	37.50	75.00	22.00	40.00	74.36	0.40	1.30
			MZN		**MODE**	#N/A	#N/A	#N/A	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			MZN		**MAX**	5.6512500	0.0002820	0.0018930	0.0005525	0.0123600	0.0073200	0.0035040	0.0455700	89.25	92.97	185.94	22.19	18.40	17.59	10.98	6.02
			MZN		**MIN**	0.0043070	0.0000100	0.0000100	0.0001000	0.0003200	0.0001000	0.0001020	0.0003200	0.78	0.81	1.62	-46.39	-84.95	-167.11	9.56	2.47
6	167.25	177.22	NC	2003/08/19	IGS	0.4047600	0.0000100	0.0006960	0.0003240	0.0030400	0.0005760	0.0016220	0.0194220	10.69	11.14	22.27	7.69	-3.44	-14.58	10.49	3.62
7	209.055	219.97	NC	2003/08/19	IGS	1.3714625	0.0000125	0.0009950	0.0001250	0.0031250	0.0006075	0.0027950	0.0199825	20.46	21.32	42.63	14.37	-6.94	-28.26	10.45	3.62
15	210.835	229.43	NC	2003/08/19	IGS	0.7704500	0.0000100	0.0013340	0.0001000	0.0029400	0.0010480	0.0017540	0.0170660	18.86	19.65	39.29	19.79	0.14	-19.50	10.57	3.96
17	278.67	298.12	NC	2003/08/19	IGS	0.2636000	0.0000100	0.0005540	0.0001000	0.0031400	0.0004000	0.0022460	0.0116500	15.68	16.33	32.67	13.74	-2.60	-18.93	10.39	3.51
26	39.09	60.06	NC	2003/08/19	IGS	0.1160000	0.0000100	0.0003940	0.0001000	0.0030400	0.0001000	0.0007740	0.0054340	9.15	9.53	19.06	12.61	3.08	-6.45	10.41	4.21
48	107.95	119.8	NC	2003/08/19	IGS	2.1145375	0.0000125	0.0018775	0.0001250	0.0048500	0.0017975	0.0032650	0.0243625	31.13	32.42	64.84	14.27	-18.15	-50.57	10.39	3.25
71	246.75	257.58	NC	2003/08/19	IGS	0.0391000	0.0000340	0.0002600	0.0001000	0.0021400	0.0002380	0.0014260	0.0073700	6.68	6.95	13.91	4.23	-2.73	-9.68	10.62	3.97
84	66.02	77.14	NC	2003/08/19	IGS	1.0500000	0.0000125	0.0008950	0.0001250	0.0038750	0.0009200	0.0013675	0.0130900	25.01	26.05	52.11	20.86	-5.20	-31.25	10.36	3.66
97	244.05	255.92	NC	2003/08/19	IGS	1.0582500	0.0000125	0.0009075	0.0001250	0.0044000	0.0008600	0.0008825	0.0222925	17.25	17.97	35.94	12.56	-5.40	-23.37	10.39	3.68
98	287.8	299.64	NC	2003/08/19	IGS	0.0505375	0.0000125	0.0006450	0.0001250	0.0028500	0.0001250	0.0005900	0.0042400	11.89	12.38	24.77	32.06	19.67	7.29	11.13	4.69
115	42.72	53.25	NC	2003/08/19	IGS	1.2700000	0.0000125	0.0011550	0.0001250	0.0029000	0.0006288	0.0021425	0.0189000	14.80	15.42	30.83	13.57	-1.84	-17.26	10.38	3.72
116	332.97	343.08	NC	2003/08/19	IGS	3.4200000	0.0000150	0.0019620	0.0001500	0.0033000	0.0019200	0.0015660	0.0227400	32.84	34.21	68.42	16.07	-18.14	-52.36	10.74	2.73
120	171.84	175.3	NC	2003/08/19	IGS	0.3980625	0.0000113	0.0010298	0.0001125	0.0038350	0.0007285	0.0010206	0.0140788	16.09	16.76	33.52	22.74	5.97	-10.79	10.50	3.91
122	153.01	163.07	NC	2003/08/19	IGS	0.0030020	0.0000220	0.0001380	0.0001000	0.0004200	0.0001000	0.0009800	0.0004720	1.54	1.60	3.20	7.14	5.54	3.94	10.68	5.96
125	77.97	89	NC	2003/08/19	IGS	0.0160220	0.0000220	0.0001860	0.0001000	0.0007400	0.0001000	0.0004740	0.0002600	4.17	4.34	8.68	18.99	14.66	10.32	10.54	5.61
135	89	99.73	NC	2003/08/19	IGS	0.1876375	0.0000775	0.0007950	0.0001250	0.0074500	0.0001250	0.0098025	0.0250750	38.19	39.78	79.56	20.78	-19.00	-58.78	10.45	3.57
155	83.37	93.77	NC	2003/08/19	IGS	0.1225750	0.0000125	0.0005225	0.0001250	0.0049750	0.0001250	0.0012000	0.0056400	8.59	8.95	17.90	10.39	1.44	-7.51	10.86	4.74
158	168.08	177.97	NC	2003/08/19	IGS	0.8550000	0.0000125	0.0008525	0.0001250	0.0056250	0.0003863	0.0018825	0.0122625	16.98	17.69	35.38	17.17	-0.52	-18.21	11.09	3.57
177	37.04	47.71	NC	2003/09/17	IGS	0.7875000	0.0000150	0.0022260	0.0001500	0.0051300	0.0011040	0.0037710	0.0192390	44.85	46.72	93.44	36.58	-10.14	-56.86	9.77	2.94
267	4.41	8.15	NC	2003/09/25	IGS	0.1031237	0.0000663	0.0004429	0.0001000	0.0007603	0.0002143	0.0033362	0.0004629	1.07	1.11	2.22	22.01	20.90	19.79	10.26	6.42
268	9.66	14.26	NC	2003/09/25	IGS	2.5684987	0.0000100	0.0022649	0.0001000	0.0027186	0.0012063	0.0024958	0.0275561	10.23	10.65	21.31	21.14	10.49	-0.17	9.70	3.85
			NC		**MEAN**	0.8081009	0.0000197	0.0009587	0.0001267	0.0033930	0.0006338	0.0021616	0.0138855	16.96	17.67	35.33	17.08	-0.58	-18.25	10.48	4.06
			NC		**STDEV**	0.9268955	0.0000183	0.0006426	0.0000479	0.0016807	0.0005457	0.0019831	0.0087511	11.77	12.26	24.52	7.72	11.13	22.10	0.34	0.94
			NC		**MODE**	#N/A	0.0000125	#N/A	0.0001250	0.0030400	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.39	3.62
			NC		**MAX**	3.4200000	0.0000775	0.0022649	0.0003240	0.0074500	0.0019200	0.0098025	0.0275561	44.85	46.72	93.44	36.58	20.90	19.79	11.13	6.42
			NC		**MIN**	0.0030020	0.0000100	0.0001380	0.0001000	0.0004200	0.0001000	0.0004740	0.0002600	1.07	1.11	2.22	4.23	-19.00	-58.78	9.70	2.73
132	35.82	46.49	PFPX	2003/08/19	IGS	0.0152880	0.0000380	0.0002380	0.0001000	0.0005200	0.0001000	0.0013100	0.0004560	4.46	4.64	9.28	28.94	24.29	19.65	10.67	6.87
148	152.73	160.3	PFPX	2003/08/19	IGS	2.2732708	0.0000113	0.0023415	0.0001125	0.0042716	0.0013600	0.0004013	0.0244488	24.32	25.33	50.66	21.55	-3.78	-29.11	10.68	3.42
161	289.83	299.78	PFPX	2003/08/19	IGS	0.5600000	0.0000125	0.0008900	0.0001250	0.0056250	0.0003975	0.0009850	0.0154500	15.65	16.30	32.60	15.84	-0.46	-16.77	10.70	3.71
184	92.85	99.33	PFPX	2003/09/17	IGS	3.5033040	0.0000150	0.0034800	0.0001500	0.0048600	0.0031050	0.0006405	0.0302400	37.80	39.38	78.75	32.54	-6.84	-46.21	10.00	3.23
185	156.98	162.65	PFPX	2003/09/17	IGS	3.1108000	0.0000125	0.0026875	0.0001250	0.0052250	0.0021800	0.0005875	0.0269500	49.79	51.86	103.72	26.52	-25.34	-77.21	10.11	3.45
186	98.75	106.66	PFPX	2003/09/17	IGS	1.4312500	0.0000125	0.0012300	0.0001250	0.0104750	0.0011875	0.0018800	0.0195225	37.88	39.45	78.91	24.46	-15.00	-54.45	10.25	3.44
187	337.41	341.65	PFPX	2003/09/17	IGS	0.0803550	0.0000420	0.0010980	0.0001500	0.0025200	0.0008400	0.0020715	0.0120690	30.60	31.88	63.75	89.31	57.44	25.56	10.82	4.21
189	251.69	257.5	PFPX	2003/09/25	IGS	0.1024125	0.0000125	0.0007925	0.0001250	0.0019750	0.0004600	0.0016950	0.0152450	9.98	10.39	20.78	19.89	9.50	-0.89	10.20	4.67
226	140.89	146.9	PFPX	2003/09/25	IGS	0.7621683	0.0000234	0.0021420	0.0001000	0.0041616	0.0015170	0.0019344	0.0339868	18.02	18.77	37.53	30.91	12.15	-6.62	10.21	4.09
250	316.64	323.3	PFPX	2003/09/25	IGS	0.1840329	0.0000945	0.0014661	0.0001000	0.0028627	0.0007647	0.0043491	0.0177725	17.69	18.43	36.85	19.94	1.52	-16.91	10.29	4.29
262	407.87	417.88	PFPX	2003/09/25	IGS	6.1723168	0.0000150	0.0000450	0.0001500	0.0046527	0.0060202	0.0007705	0.0684127	76.97	80.18	160.35	32.78	-47.39	-127.57	10.69	2.49
			PFPX		**MEAN**	1.6541089	0.0000263	0.0014919	0.0001239	0.0042862	0.0016302	0.0015114	0.0240503	29.38	30.60	61.20	31.15	0.55	-30.05	10.42	3.99
			PFPX		**STDEV**	1.9522463	0.0000251	0.0010615	0.0000197	0.0025715	0.0016922	0.0011147	0.0173934	20.74	21.61	43.22	20.09	27.02	44.61	0.29	1.13
			PFPX		**MODE**	#N/A	0.0000125	#N/A	0.0001250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			PFPX		**MAX**	6.1723168	0.0000945	0.0034800	0.0001500	0.0104750	0.0060202	0.0043491	0.0684127	76.97	80.18	160.35	89.31	57.44	25.56	10.82	6.87
			PFPX		**MIN**	0.0152880	0.0000113	0.0000450	0.0001000	0.0005200	0.0001000	0.0004013	0.0004560	4.46	4.64	9.28	15.84	-47.39	-127.57	10.00	2.49

Constituents released during complete oxidation in kg/t																							
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
73	287	300.25	PGN	2003/08/19	IGS	0.0000125	0.7225000	0.0000625	0.0024250	0.0000125	2.0150000	0.0000775	0.0042063	0.0172813	0.8962500	0.0095850	0.2775000	0.0007750	0.8616667	0.0191938	0.0012000	0.6962500
109	65.36	77.6	PGN	2003/08/19	IGS	0.0000425	1.0587500	0.0000625	0.0018250	0.0000625	1.8525000	0.0001725	0.0054600	0.0402875	1.8673750	0.0037963	0.2775000	0.0015000	0.7683333	0.0140450	0.0002800	0.3450000
138	32.5	42	PGN	2003/08/19	IGS	0.0000100	1.8942000	0.0001260	0.0011400	0.0000500	3.1800000	0.0001400	0.0021100	0.0392800	1.1660000	0.0146550	0.3840000	0.0009700	0.8733333	0.0263000	0.0001700	0.3500000
147	147.6	159.52	PGN	2003/08/19	IGS	0.0000125	0.0087688	0.0002400	0.0002750	0.0000625	0.8650000	0.0000125	0.0020800	0.0001238	0.0022700	0.0054700	0.1422500	0.0001750	0.5516667	0.0014075	0.0002300	0.7487500
150	166.95	177.04	PGN	2003/08/19	IGS	0.0000125	1.6150000	0.0000625	0.0020500	0.0000625	2.1575000	0.0001350	0.0053463	0.0419375	1.0875000	0.0066375	0.2085000	0.0002250	0.7775000	0.0131250	0.0009950	0.8475000
151	211.37	216.55	PGN	2003/08/19	IGS	0.0000150	3.0540000	0.0001500	0.0025500	0.0000750	3.6600000	0.0002850	0.0051330	0.1077600	3.9900000	10.6425000	0.3420000	0.0017700	0.8980000	0.0283455	0.0000300	1.1460000
159	202.88	209.55	PGN	2003/08/19	IGS	0.0000125	1.6000000	0.0000625	0.0018500	0.0000625	2.1250000	0.0001600	0.0064175	0.0594250	1.2265000	0.0169175	0.3700000	0.0005250	1.2683333	0.0182963	0.0005263	0.8912500
162	68.92	75.55	PGN	2003/08/19	IGS	0.0000125	0.2500000	0.0002175	0.0014250	0.0000625	1.5800000	0.0000950	0.0023813	0.0063700	0.5220000	0.0089613	0.2102500	0.0005000	1.1275000	0.0226850	0.0008800	0.9200000
171	87.38	98.05	PGN	2003/09/17	IGS	0.0000125	0.0414250	0.0000625	0.0010750	0.0000500	4.2250000	0.0000125	0.0044438	0.0084563	0.6200000	0.0037388	0.2250000	0.0007333	0.8741667	0.0155375	0.0001475	0.9025000
211	183.58	190.3	PGN	2003/09/25	IGS	0.0000150	1.4880000	0.0001650	0.0018600	0.0000750	2.7870000	0.0000125	0.0076095	0.0809250	2.4300000	0.0716325	0.1914000	0.0004500	1.2280000	0.0390000	0.0000300	1.1760000
222	43.54	49.76	PGN	2003/09/25	IGS	0.0000125	0.0219700	0.0002525	0.0000250	0.0000625	0.8225000	0.0000125	0.0078100	0.0001550	0.0013825	0.0112625	0.0965000	0.0002250	0.5308333	0.0025588	0.0002250	0.7850000
228	285.68	295.96	PGN	2003/09/25	IGS	0.0000100	0.1752148	0.0000500	0.0027865	0.0000100	1.5645707	0.0000274	0.0092473	0.0095156	0.5624293	0.0062236	0.4307615	0.0002683	1.4570584	0.0257862	0.0015229	0.7720686
254	133.37	145.07	PGN	2003/09/25	IGS	0.0000150	4.0309534	0.0000750	0.0022806	0.0000150	3.0365605	0.0000150	0.0035365	0.1681044	2.0583468	6.7356833	0.2813241	0.0003406	1.0718372	0.0364607	0.0000300	1.3990107
258	118	121.88	PGN	2003/09/25	IGS	0.0000100	1.1669099	0.0000500	0.0023383	0.0000100	1.5125376	0.0000100	0.0066573	0.0717552	0.8475189	0.4703509	0.3444237	0.0004925	1.7429641	0.0419083	0.0001632	0.9068618
16	247.94	268.075	PGN	2003/08/19	IGS	0.0000100	0.0407000	0.0000500	0.0011000	0.0000100	2.7200000	0.0000100	0.0036420	0.0116350	0.2572600	0.0051050	0.1648000	0.0005000	1.1600000	0.0270400	0.0003400	0.3480000
			PGN		**MEAN**	0.0000143	1.1445595	0.0001126	0.0016670	0.0000455	2.2735446	0.0000785	0.0050720	0.0442008	1.1689888	1.2008346	0.2630806	0.0006300	1.0127462	0.0221126	0.0004513	0.8156127
			PGN		**STDEV**	0.0000080	1.1951506	0.0000741	0.0008159	0.0000258	0.9830424	0.0000840	0.0021784	0.0473257	1.0575688	3.1308318	0.0971488	0.0004667	0.3289788	0.0119542	0.0004723	0.3037131
			PGN		**MODE**	0.0000125	#N/A	0.0000625	#N/A	0.0000625	#N/A	0.0000125	#N/A	#N/A	#N/A	#N/A	0.2775000	0.0005000	#N/A	#N/A	0.0000300	#N/A
			PGN		**MAX**	0.0000425	4.0309534	0.0002525	0.0027865	0.0000750	4.2250000	0.0002850	0.0092473	0.1681044	3.9900000	10.6425000	0.4307615	0.0017700	1.7429641	0.0419083	0.0015229	1.3990107
			PGN		**MIN**	0.0000100	0.0087688	0.0000500	0.0000250	0.0000100	0.8225000	0.0000100	0.0020800	0.0001238	0.0013825	0.0037388	0.0965000	0.0001750	0.5308333	0.0014075	0.0000300	0.3450000
123	33.66	44.45	PX	2003/08/19	IGS	0.0000150	0.0012330	0.0002160	0.0003000	0.0000750	1.9770000	0.0000150	0.0233790	0.0004755	0.0019350	0.0018000	0.2166000	0.0008100	1.7150000	0.0069585	0.0002700	0.2754000
139	65	75.23	PX	2003/08/19	IGS	0.0000100	0.0012910	0.0001460	0.0001200	0.0000500	0.8720000	0.0000100	0.0116520	0.0000980	0.0027860	0.0019280	0.3180000	0.0005900	0.8966667	0.0031970	0.0001110	0.1716000
140	100.62	108.93	PX	2003/08/19	IGS	0.0000100	0.0038400	0.0000500	0.0001000	0.0000500	0.7900000	0.0000100	0.0105890	0.0002190	0.0071190	0.0006500	0.1856000	0.0004600	0.8100000	0.0025770	0.0000820	0.1772000
164	85.14	90.6	PX	2003/09/17	IGS	0.0000100	0.0069980	0.0000500	0.0001800	0.0000500	0.5400000	0.0000100	0.0082030	0.0001170	0.0042140	0.0141345	0.1024000	0.0007267	0.6433333	0.0041700	0.0001380	0.6780000
172	117.23	126.78	PX	2003/09/17	IGS	0.0000125	0.5225000	0.0000625	0.0025750	0.0000500	1.9050000	0.0000125	0.0055963	0.0157650	0.4700000	0.0184844	0.1635000	0.0007583	1.2216667	0.0227800	0.0004750	0.8975000
178	60.57	69.09	PX	2003/09/17	IGS	0.0000100	0.0077900	0.0001220	0.0002600	0.0000500	0.5020000	0.0000100	0.0089870	0.0001650	0.0036233	0.0171910	0.1422000	0.0008200	0.6566667	0.0047270	0.0001440	0.6860000
183	123.12	131.85	PX	2003/09/17	IGS	0.0000150	0.0299400	0.0000750	0.0004500	0.0000750	2.9010000	0.0000150	0.0052575	0.0078120	0.3630000	0.0082343	0.0543000	0.0005800	0.9590000	0.0290775	0.0001470	1.0530000
188	58.05	67.91	PX	2003/09/17	IGS	0.0000150	0.0225720	0.0010200	0.0002400	0.0000750	0.6150000	0.0000360	0.0095430	0.0003300	0.0130750	0.0824700	0.4620000	0.0002700	0.5900000	0.0140880	0.0002850	0.9330000
190	252.02	258.1	PX	2003/09/25	IGS	0.0000125	0.0285750	0.0001525	0.0001500	0.0000625	0.5850000	0.0000125	0.0066113	0.0004050	0.0138983	0.0180013	0.1295000	0.0004250	0.8416667	0.0036450	0.0001250	0.8150000
191	231.8	241.6	PX	2003/09/25	IGS	0.0000125	1.3725000	0.0000625	0.0018500	0.0000625	1.9125000	0.0000125	0.0115300	0.0445500	0.8325000	0.0966375	0.2130000	0.0007250	1.1566667	0.0427875	0.0001775	0.9675000
212	61.57	72.08	PX	2003/09/25	IGS	0.0000150	0.1564500	0.0000750	0.0012600	0.0000750	1.7760000	0.0000125	0.0065640	0.0121395	0.2247700	0.0153165	0.1539000	0.0004200	0.9500000	0.0262875	0.0002190	0.9480000
214	415.91	426.33	PX	2003/09/25	IGS	0.0000150	1.2390000	0.0001740	0.0021300	0.0000750	0.9990000	0.0000125	0.0045075	0.1594200	2.9895000	0.3441750	0.7380000	0.0004500	2.9030000	0.0697950	0.0000300	1.0830000
251	138.93	144.28	PX	2003/09/25	IGS	0.0000150	0.6278989	0.0004570	0.0021841	0.0000150	9.1669976	0.0000150	0.0113000	0.0319309	0.2855874	2.8244629	0.0792102	0.0002921	0.7916870	0.1341799	0.0005842	1.0491790
252	10.84	12.83	PX	2003/09/25	IGS	0.0000125	0.0291680	0.0000625	0.0003191	0.0000125	0.8940231	0.0000125	0.0134904	0.0041204	0.2691829	0.0101925	0.1733875	0.0003581	1.4582160	0.0147369	0.0005580	0.8832278
253	150.87	155.86	PX	2003/09/25	IGS	0.0000150	2.3239058	0.0000750	0.0021769	0.0000150	1.6788115	0.0000150	0.0108840	0.1023658	3.2822030	0.9293572	0.2845877	0.0005932	1.6617676	0.0379156	0.0002314	1.2200824
261	99	104	PX	2003/09/25	IGS	0.0000100	0.0103837	0.0000500	0.0000574	0.0000100	0.3459864	0.0000287	0.0263607	0.0003142	0.0048328	0.0032214	0.1550903	0.0002093	1.2202441	0.0009410	0.0005926	0.7181567
			PX		**MEAN**	0.0000128	0.3990028	0.0001781	0.0008970	0.0000502	1.7162699	0.0000150	0.0109034	0.0237642	0.5480142	0.2741410	0.2232047	0.0005305	1.1547238	0.0261165	0.0002606	0.7847404
			PX		**STDEV**	0.0000022	0.6815283	0.0002469	0.0009457	0.0000243	2.1142949	0.0000072	0.0060745	0.0449715	1.0378054	0.7199548	0.1695173	0.0001987	0.5803620	0.0344685	0.0001874	0.3220548
			PX		**MODE**	0.0000150	#N/A	0.0000500	#N/A	0.0000750	#N/A	0.0000125	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			PX		**MAX**	0.0000150	2.3239058	0.0010200	0.0025750	0.0000750	9.1669976	0.0000360	0.0263607	0.1594200	3.2822030	2.8244629	0.7380000	0.0008200	2.9030000	0.1341799	0.0005926	1.2200824
			PX		**MIN**	0.0000100	0.0012330	0.0000500	0.0000574	0.0000100	0.3459864	0.0000100	0.0045075	0.0000980	0.0019350	0.0006500	0.0543000	0.0002093	0.5900000	0.0009410	0.0000300	0.1716000
194	477.06	480.02	Q	2003/09/25	IGS	0.0000100	0.0973200	0.0000500	0.0011000	0.0000500	0.2060000	0.0000100	0.0034810	0.0029510	0.0663667	0.0675200	0.0652000	0.0003100	0.0587333	0.0031490	0.0000720	0.5940000
196	407	411.4	Q	2003/09/25	IGS	0.0000125	1.0175000	0.0000625	0.0022750	0.0000625	0.5575000	0.0001675	0.0037863	0.0119713	0.0356167	0.0710625	0.2650000	0.0012875	0.3666667	0.0219075	0.0010900	0.8875000
200	381.02	385.62	Q	2003/09/25	IGS	0.0000100	0.5340000	0.0000500	0.0038600	0.0000500	1.5720000	0.0000100	0.0023520	0.0082810	0.0199173	0.0200700	0.3420000	0.0010400	0.3113333	0.0217200	0.0006860	0.7320000
209	480.01	488.06	Q	2003/09/25	IGS	0.0000125	0.9625000	0.0000625	0.0018500	0.0000625	0.2825000	0.0000125	0.0050850	0.0097013	0.0360333	0.1740750	0.2070000	0.0011500	0.4325000	0.0257288	0.0008400	0.9275000
217	482.96	490.07	Q	2003/09/25	IGS	0.0000100	0.0495600	0.0000500	0.0001000	0.0000500	0.9060000	0.0000100	0.0019450	0.0020710	0.0111660	0.0131210	0.0974000	0.0002800	0.2866667	0.0068620	0.0001580	0.6860000
			Q		**MEAN**	0.0000110	0.5321760	0.0000550	0.0018370	0.0000550	0.7048000	0.0000420	0.0033299	0.0069951	0.0338200	0.0691697	0.1953200	0.0008135	0.2911800	0.0158735	0.0005692	0.7654000
			Q		**STDEV**	0.0000014	0.4590042	0.0000068	0.0014004	0.0000068	0.5570802	0.0000702	0.0012436	0.0043110	0.0210588	0.0643499	0.1151372	0.0004815	0.1415341	0.0101346	0.0004400	0.1396269
			Q		**MODE**	0.0000100	#N/A	0.0000500	#N/A	0.0000500	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			Q		**MAX**	0.0000125	1.0175000	0.0000625	0.0038600	0.0000625	1.5720000	0.0001675	0.0050850	0.0119713	0.0663667	0.1740750	0.3420000	0.0012875	0.4325000	0.0257288	0.0010900	0.9275000
			Q		**MIN**	0.0000100	0.0495600	0.0000500	0.0001000	0.0000500	0.2060000	0.0000100	0.0019450	0.0020710	0.0111660	0.0131210	0.0652000	0.0002800	0.0587333	0.0031490	0.0000720	0.5940000
13	115.88	121.885	QF	2003/08/19	IGS	0.0000100	0.0505300	0.0000500	0.0001800	0.0000240	1.1040000	0.0000100	0.0026600	0.0002000	0.0005980	0.0143240	0.0358000	0.0000400	0.0265333	0.0013660	0.0000520	0.6350000
143	216.4	218.64	QF	2003/08/19	IGS	0.0000540	0.0470400	0.0000500	0.0016600	0.0000220	1.2820000	0.0000240	0.0012420	0.0032740	1.0060000	0.0011860	0.3900000	0.0002300	0.1578667	0.0049130	0.0001390	0.6150000
157	123.84	129.85	QF	2003/08/19	IGS	0.0000125	0.0547125	0.0012625	0.0005750	0.0000625	1.1900000	0.0000125	0.0010963	0.0004188	0.0024063	0.0146438	0.3525000	0.0003750	0.1370833	0.0017175	0.0004988	0.7387500
176	60.22	62.1	QF	2003/09/17	IGS	0.0000100	0.0483400	0.0000500	0.0003200	0.0000500	1.2800000	0.0000100	0.0016530	0.0003540	0.0024860	0.0264450	0.0173800	0.0005067	0.1399333	0.0012140	0.0001960	0.8280000
193	179	183.22	QF	2003/09/25	IGS	0.0000100	0.0888600	0.0001260	0.0003800	0.0000500	0.9120000	0.0000100	0.0016150	0.0017230	0.0035627	0.0220900	0.2000000	0.0001300	0.0710000	0.0018110	0.0003400	0.9380000
216	160.81	164.25	QF	2003/09/25	IGS	0.0000100	0.0864673	0.0032042	0.0001451	0.0000300	0.9159752	0.0000402	0.0012120	0.0005746	0.0039238	0.0508548	0.1470090	0.0000875	0.0702614	0.0031013	0.0002698	0.7436625
225	27.32	35.15	QF	2003/09/25	IGS	0.0000100	0.0058785	0.0000500	0.0000688	0.0000100	0.4575722	0.0000100	0.0025810	0.0001039	0.0012238	0.0040237	0.2003082	0.0002164	0.3679097	0.0008810	0.0005210	0.6804492
257	55.38	60.4	QF	2003/09/25	IGS	0.0000100	0.0872724	0.0001078	0.0003142	0.0000100	0.4583081	0.0000324	0.0021120	0.0007580	0.0051921	0.0314125	0.3374233	0.0000735	0.1084897	0.0035940	0.0004650	0.8435164
			QF		**MEAN**	0.0000158	0.0586376	0.0006126	0.0004554	0.0000323	0.9499819	0.0000186	0.0017714	0.0009258	0.1281741	0.0206225	0.2100526	0.0002074	0.1348847	0.0023247	0.0003102	0.7527973
			QF		**STDEV**	0.0000155	0.0283172	0.0011273	0.0005114	0.0000197	0.3353650	0.0000121	0.0006151	0.0010749	0.3546983	0.0160142	0.1417003	0.0001624	0.1038909	0.0014032	0.0001755	0.1112043
			QF		**MODE**	0.0000100	#N/A	0.0000500	#N/A	0.0000500	#N/A	0.0000100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

Constituents released during complete oxidation in kg/t																					
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ni	Sb	Se	Sn	Sr	Pb	V	Zn	SO4	AP (Open)	AP (Closed)	NP	NNP (Open)	NNP (Closed)	Initial pH	Final pH
73	287	300.25	PGN	2003/08/19	IGS	0.3850000	0.0000125	0.0006800	0.0004425	0.0038750	0.0008275	0.0026325	0.0199875	13.41	13.97	27.95	10.52	-3.45	-17.42	10.26	3.73
109	65.36	77.6	PGN	2003/08/19	IGS	2.5750000	0.0000125	0.0020150	0.0001250	0.0044250	0.0011250	0.0010375	0.0215850	21.58	22.48	44.96	24.21	1.73	-20.75	10.21	3.70
138	32.5	42	PGN	2003/08/19	IGS	1.2159400	0.0000100	0.0012820	0.0001000	0.0062200	0.0005480	0.0030280	0.0234800	24.75	25.78	51.56	18.57	-7.21	-32.99	10.13	3.78
147	147.6	159.52	PGN	2003/08/19	IGS	0.0039725	0.0000125	0.0001025	0.0001250	0.0038500	0.0001250	0.0009200	0.0002900	1.74	1.81	3.63	8.80	6.98	5.17	10.71	6.12
150	166.95	177.04	PGN	2003/08/19	IGS	0.7432500	0.0000125	0.0012200	0.0001250	0.0082250	0.0005938	0.0016725	0.0176475	21.47	22.36	44.73	17.43	-4.93	-27.29	10.26	3.68
151	211.37	216.55	PGN	2003/08/19	IGS	1.5298500	0.0000600	0.0001320	0.0001500	0.0127500	0.0034710	0.0006900	0.0401400	65.78	68.52	137.03	1.96	-66.55	-135.07	9.70	2.53
159	202.88	209.55	PGN	2003/08/19	IGS	2.4150000	0.0000125	0.0014075	0.0001250	0.0070500	0.0007225	0.0022075	0.0224900	26.12	27.21	54.41	14.81	-12.40	-39.60	10.63	3.56
162	68.92	75.55	PGN	2003/08/19	IGS	0.1148375	0.0000125	0.0007075	0.0001250	0.0052500	0.0002925	0.0026100	0.0165850	11.59	12.08	24.15	13.14	1.06	-11.02	10.80	3.83
171	87.38	98.05	PGN	2003/09/17	IGS	0.1161625	0.0000125	0.0011025	0.0001250	0.0023500	0.0005000	0.0007738	0.0093300	15.66	16.32	32.63	29.83	13.52	-2.80	10.25	4.72
211	183.58	190.3	PGN	2003/09/25	IGS	3.3009210	0.0000125	0.0033780	0.0001500	0.0043500	0.0033270	0.0006795	0.0365400	31.13	32.42	64.84	29.98	-2.44	-34.87	9.92	3.46
222	43.54	49.76	PGN	2003/09/25	IGS	0.0094825	0.0000475	0.0001850	0.0001250	0.0006250	0.0001250	0.0017213	0.0003500	2.13	2.22	4.43	42.31	40.10	37.88	10.16	6.17
228	285.68	295.96	PGN	2003/09/25	IGS	0.1657987	0.0000661	0.0012861	0.0001000	0.0023079	0.0008185	0.0049159	0.0191338	11.94	12.43	24.87	33.53	21.10	8.66	11.02	4.68
254	133.37	145.07	PGN	2003/09/25	IGS	2.9938517	0.0000150	0.0000450	0.0001500	0.0088682	0.0034008	0.0007476	0.0467607	56.47	58.83	117.65	27.52	-31.31	-90.13	10.46	2.71
258	118	121.88	PGN	2003/09/25	IGS	0.8915084	0.0000100	0.0010915	0.0001000	0.0033001	0.0011700	0.0000100	0.0315007	21.38	22.27	44.54	25.71	3.44	-18.83	10.40	3.78
16	247.94	268.075	PGN	2003/08/19	IGS	0.2675000	0.0000100	0.0008860	0.0004220	0.0023400	0.0003700	0.0024720	0.0145820	12.34	12.85	25.71	16.20	3.34	-9.51	10.54	4.34
			PGN		**MEAN**	1.1152050	0.0000212	0.0010347	0.0001660	0.0050524	0.0011611	0.0017412	0.0213601	22.50	23.44	46.87	20.97	-2.47	-25.91	10.36	4.05
			PGN		**STDEV**	1.1682423	0.0000193	0.0008618	0.0001094	0.0031380	0.0011990	0.0012639	0.0132461	17.79	18.53	37.07	10.72	23.72	41.20	0.34	1.03
			PGN		**MODE**	#N/A	0.0000125	#N/A	0.0001250	#N/A	0.0001250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.26	3.78
			PGN		**MAX**	3.3009210	0.0000661	0.0033780	0.0004425	0.0127500	0.0034710	0.0049159	0.0467607	65.78	68.52	137.03	42.31	40.10	37.88	11.02	6.17
			PGN		**MIN**	0.0039725	0.0000100	0.0000450	0.0001000	0.0006250	0.0001250	0.0000100	0.0002900	1.74	1.81	3.63	1.96	-66.55	-135.07	9.70	2.53
123	33.66	44.45	PX	2003/08/19	IGS	0.0188175	0.0000600	0.0007440	0.0001500	0.0008700	0.0001500	0.0015660	0.0012840	10.50	10.94	21.88	16.17	5.23	-5.71	10.37	6.26
139	65	75.23	PX	2003/08/19	IGS	0.0074100	0.0000440	0.0002800	0.0001000	0.0004400	0.0001000	0.0008480	0.0002940	4.50	4.68	9.36	10.17	5.49	0.81	11.19	6.34
140	100.62	108.93	PX	2003/08/19	IGS	0.0108740	0.0000320	0.0001800	0.0001000	0.0005200	0.0001000	0.0008680	0.0005420	3.78	3.94	7.88	9.92	5.98	2.05	10.46	6.44
164	85.14	90.6	PX	2003/09/17	IGS	0.0059360	0.0000360	0.0001980	0.0001000	0.0004400	0.0001000	0.0009640	0.0003320	1.41	1.47	2.95	24.25	22.78	21.31	10.35	6.47
172	117.23	126.78	PX	2003/09/17	IGS	0.4175000	0.0000275	0.0008350	0.0001250	0.0036000	0.0010350	0.0008088	0.0100550	14.04	14.62	29.24	32.27	17.65	3.03	10.37	3.66
178	60.57	69.09	PX	2003/09/17	IGS	0.0059680	0.0000380	0.0002380	0.0001000	0.0005800	0.0001000	0.0011590	0.0003560	1.62	1.69	3.38	24.06	22.37	20.69	10.34	6.46
183	123.12	131.85	PX	2003/09/17	IGS	0.0451050	0.0000150	0.0006450	0.0001500	0.0019500	0.0003780	0.0008265	0.0043080	11.72	12.20	24.41	28.96	16.76	4.55	10.28	4.92
188	58.05	67.91	PX	2003/09/17	IGS	0.0114540	0.0000630	0.0002640	0.0001500	0.0004200	0.0003000	0.0014400	0.0011880	1.91	1.99	3.98	29.08	27.09	25.10	10.48	6.39
190	252.02	258.1	PX	2003/09/25	IGS	0.0174863	0.0000450	0.0002275	0.0001250	0.0006000	0.0001250	0.0009200	0.0008250	2.67	2.79	5.57	33.12	30.33	27.55	10.52	5.95
191	231.8	241.6	PX	2003/09/25	IGS	0.7051275	0.0000125	0.0012650	0.0001250	0.0043000	0.0010900	0.0017600	0.0159100	20.98	21.85	43.70	25.07	3.22	-18.63	10.17	3.17
212	61.57	72.08	PX	2003/09/25	IGS	0.1674900	0.0000125	0.0004380	0.0001500	0.0019800	0.0004050	0.0013155	0.0118590	8.43	8.78	17.56	44.64	35.86	27.08	10.26	4.51
214	415.91	426.33	PX	2003/09/25	IGS	4.0513350	0.0000125	0.0027630	0.0001500	0.0018000	0.0042480	0.0000150	0.0438900	38.40	40.00	80.00	37.30	-2.70	-42.70	9.96	3.06
251	138.93	144.28	PX	2003/09/25	IGS	0.1543048	0.0001768	0.0000450	0.0001500	0.0023098	0.0009422	0.0002219	0.0264575	39.97	41.64	83.27	45.58	3.94	-37.70	10.61	2.68
252	10.84	12.83	PX	2003/09/25	IGS	0.1641929	0.0000954	0.0011642	0.0001250	0.0012401	0.0005042	0.0015451	0.0429809	8.74	9.11	18.21	27.24	18.13	9.03	10.45	5.31
253	150.87	155.86	PX	2003/09/25	IGS	3.2043024	0.0000150	0.0017900	0.0001500	0.0051178	0.0042519	0.0002736	0.0472175	40.08	41.75	83.49	22.12	-19.62	-61.37	9.99	2.79
261	99	104	PX	2003/09/25	IGS	0.0101011	0.0001341	0.0005772	0.0001000	0.0002428	0.0001000	0.0028119	0.0014909	2.73	2.84	5.68	32.56	29.72	26.88	10.74	7.81
			PX		**MEAN**	0.5623378	0.0000512	0.0007284	0.0001281	0.0016507	0.0008706	0.0010840	0.0130619	13.22	13.77	27.53	27.66	13.89	0.12	10.41	5.14
			PX		**STDEV**	1.2213324	0.0000472	0.0007224	0.0000221	0.0015106	0.0013634	0.0006783	0.0173078	14.08	14.66	29.33	10.31	14.58	27.36	0.29	1.63
			PX		**MODE**	#N/A	0.0000125	#N/A	0.0001500	0.0004400	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.37	#N/A
			PX		**MAX**	4.0513350	0.0001768	0.0027630	0.0001500	0.0051178	0.0042519	0.0028119	0.0472175	40.08	41.75	83.49	45.58	35.86	27.55	11.19	7.81
			PX		**MIN**	0.0059360	0.0000125	0.0000450	0.0001000	0.0002428	0.0001000	0.0000150	0.0002940	1.41	1.47	2.95	9.92	-19.62	-61.37	9.96	2.68
194	477.06	480.02	Q	2003/09/25	IGS	0.0053890	0.0000100	0.0000100	0.0001000	0.0004400	0.0002720	0.0023640	0.0024020	1.93	2.01	4.02	7.77	5.76	3.75	9.51	2.36
196	407	411.4	Q	2003/09/25	IGS	0.0199163	0.0000275	0.0001125	0.0001250	0.0028250	0.0001250	0.0040500	0.0317750	7.73	8.05	16.09	19.40	11.35	3.30	9.45	2.98
200	381.02	385.62	Q	2003/09/25	IGS	0.0163680	0.0000240	0.0001200	0.0001000	0.0028600	0.0001000	0.0037820	0.0065160	7.50	7.81	15.63	19.25	11.44	3.63	9.54	3.56
209	480.01	488.06	Q	2003/09/25	IGS	0.0066638	0.0000450	0.0001100	0.0001250	0.0009750	0.0002650	0.0061638	0.0036300	8.99	9.36	18.72	16.26	6.90	-2.47	9.11	2.81
217	482.96	490.07	Q	2003/09/25	IGS	0.0121830	0.0000100	0.0001060	0.0001000	0.0011400	0.0001000	0.0013030	0.0011500	1.99	2.07	4.15	27.65	25.58	23.51	9.82	4.91
			Q		**MEAN**	0.0121040	0.0000233	0.0000917	0.0001100	0.0016480	0.0001724	0.0035326	0.0090946	5.63	5.86	11.72	18.07	12.21	6.34	9.49	3.32
			Q		**STDEV**	0.0062030	0.0000145	0.0000460	0.0000137	0.0011208	0.0000884	0.0018432	0.0128337	3.39	3.54	7.07	7.15	7.90	9.94	0.25	0.99
			Q		**MODE**	#N/A	0.0000100	#N/A	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			Q		**MAX**	0.0199163	0.0000450	0.0001200	0.0001250	0.0028600	0.0002720	0.0061638	0.0317750	8.99	9.36	18.72	27.65	25.58	23.51	9.82	4.91
			Q		**MIN**	0.0053890	0.0000100	0.0000100	0.0001000	0.0004400	0.0001000	0.0013030	0.0011500	1.93	2.01	4.02	7.77	5.76	-2.47	9.11	2.36
13	115.88	121.885	QF	2003/08/19	IGS	0.0006470	0.0000100	0.0000300	0.0012000	0.0006200	0.0001000	0.0000820	0.0022300	0.20	0.21	0.41	-0.43	-0.64	-0.85	10.78	5.73
143	216.4	218.64	QF	2003/08/19	IGS	0.0554800	0.0000100	0.0001380	0.0001000	0.0014400	0.0005960	0.0001160	0.0088080	7.09	7.38	14.76	-4.49	-11.87	-19.25	10.74	3.51
157	123.84	129.85	QF	2003/08/19	IGS	0.0041363	0.0000375	0.0000125	0.0001250	0.0035500	0.0001250	0.0000825	0.0012450	0.81	0.84	1.69	0.15	-0.69	-1.54	11.16	4.94
176	60.22	62.1	QF	2003/09/17	IGS	0.0026740	0.0000100	0.0000660	0.0001000	0.0010200	0.0001000	0.0006620	0.0005880	1.35	1.40	2.80	32.10	30.70	29.30	10.07	5.15
193	179	183.22	QF	2003/09/25	IGS	0.0058000	0.0000400	0.0000740	0.0001000	0.0006600	0.0001000	0.0004100	0.0008900	1.56	1.63	3.25	12.57	10.94	9.31	10.38	4.81
216	160.81	164.25	QF	2003/09/25	IGS	0.0109462	0.0001691	0.0000378	0.0001000	0.0004352	0.0001000	0.0002809	0.0011946	0.74	0.77	1.55	15.14	14.37	13.59	10.03	4.97
225	27.32	35.15	QF	2003/09/25	IGS	0.0072392	0.0000661	0.0001165	0.0001000	0.0003675	0.0001000	0.0012389	0.0004364	0.82	0.85	1.70	27.91	27.06	26.21	11.36	6.52
257	55.38	60.4	QF	2003/09/25	IGS	0.0119305	0.0000900	0.0001429	0.0001000	0.0010871	0.0001000	0.0001766	0.0028532	1.37	1.43	2.86	10.26	8.83	7.40	10.46	4.36
			QF		**MEAN**	0.0123566	0.0000541	0.0000772	0.0002406	0.0011475	0.0001651	0.0003811	0.0022807	1.74	1.81	3.63	11.65	9.84	8.02	10.62	5.00
			QF		**STDEV**	0.0178462	0.0000547	0.0000502	0.0003877	0.0010357	0.0001743	0.0003994	0.0027617	2.20	2.29	4.59	13.29	14.38	15.72	0.48	0.89
			QF		**MODE**	#N/A	0.0000100	#N/A	0.0001000	#N/A	0.0001000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

Constituents released during complete oxidation in kg/t																						
Sample	From Depth	To Depth	Lithology	Date	Laboratory	Ag	Al	As	Ba	Be	Ca	Cd	Cr	Co	Cu	Fe	K	Li	Mg	Mn	Mo	Na
			QF		MAX	0.0000540	0.0888600	0.0032042	0.0016600	0.0000625	1.2820000	0.0000402	0.0026600	0.0032740	1.0060000	0.0508548	0.3900000	0.0005067	0.3679097	0.0049130	0.0005210	0.9380000
			QF		MIN	0.0000100	0.0058785	0.0000500	0.0000688	0.0000100	0.4575722	0.0000100	0.0010963	0.0001039	0.0005980	0.0011860	0.0173800	0.0000400	0.0265333	0.0008810	0.0000520	0.6150000
79	289.03	300.53	SP	2003/08/19	IGS	0.0000125	0.9450000	0.0000625	0.0045000	0.0000125	2.9750000	0.0002500	0.0093163	0.1912500	2.3525000	1.7212500	0.1882500	0.0004250	6.5000000	0.0734750	0.0000250	0.5812500
81	199.04	206	SP	2003/08/19	IGS	0.0000113	0.0013459	0.0000563	0.0001225	0.0000313	0.1644500	0.0000113	0.0118430	0.0000406	0.0008484	0.0012356	0.3533750	0.0006225	2.2484167	0.0009308	0.0001550	0.3455500
82	252.53	258.5	SP	2003/08/19	IGS	0.0000125	0.0003988	0.0000625	0.0001250	0.0000125	0.1142500	0.0000125	0.0118150	0.0000000	0.0009438	0.0007688	0.1750000	0.0002250	2.2816667	0.0004975	0.0002400	0.5675000
96	185.52	197.07	SP	2003/08/19	IGS	0.0000150	0.0202335	0.0001830	0.0002100	0.0000150	0.2334000	0.0000150	0.0088725	0.0004575	0.0074160	0.0562500	0.2442000	0.0003600	4.1700000	0.0044850	0.0002490	0.2742000
110	166.55	179.65	SP	2003/08/19	IGS	0.0000125	0.0015950	0.0000625	0.0001500	0.0000625	0.1640000	0.0000125	0.0093388	0.0000888	0.0014425	0.0017350	0.1517500	0.0010000	1.9466667	0.0010488	0.0001188	0.1853750
118	46.14	51.98	SP	2003/08/19	IGS	0.0000125	0.0023413	0.0000625	0.0001750	0.0000625	1.0500000	0.0000125	0.0075050	0.0015488	0.0709750	0.0015200	0.1237500	0.0007500	3.7000000	0.0303375	0.0000813	0.2350000
124	53.82	64	SP	2003/08/19	IGS	0.0000125	0.0036225	0.0000625	0.0016500	0.0000625	1.5800000	0.0001200	0.0036650	0.0367500	0.5162500	0.0013500	0.2437500	0.0008500	4.4500000	0.0792125	0.0001013	0.2270000
163	116.15	122.11	SP	2003/09/17	IGS	0.0000150	0.0854700	0.0000750	0.0036900	0.0000750	4.1100000	0.0000150	0.0179130	0.0430950	2.2140000	0.0123668	0.4740000	0.0007800	4.7200000	0.1077600	0.0000300	1.0470000
215	123	132.02	SP	2003/09/25	IGS	0.0000150	0.0782700	0.0000750	0.0012000	0.0000750	2.6010000	0.0000125	0.0085740	0.0162930	0.4965000	0.0140010	0.1467000	0.0003300	1.1630000	0.0277425	0.0005760	0.9750000
238	78	84.17	SP	2003/09/25	IGS	0.0000227	0.0126553	0.0000500	0.0000617	0.0000100	0.4148180	0.0000100	0.0023085	0.0000667	0.0015936	0.0041078	0.2205246	0.0002000	0.4077622	0.0006775	0.0004840	0.7469470
			SP		MEAN	0.0000141	0.1150932	0.0000752	0.0011884	0.0000419	1.3406918	0.0000471	0.0091151	0.0289590	0.5662469	0.1814585	0.2321300	0.0005542	3.1587512	0.0326167	0.0002060	0.5184822
			SP		STDEV	0.0000033	0.2933683	0.0000386	0.0016342	0.0000280	1.4308437	0.0000789	0.0043615	0.0593166	0.9278303	0.5412915	0.1076577	0.0002826	1.8619714	0.0399440	0.0001879	0.3183538
			SP		MODE	0.0000125	#N/A	0.0000625	#N/A	0.0000625	#N/A	0.0000125	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			SP		MAX	0.0000227	0.9450000	0.0001830	0.0045000	0.0000750	4.1100000	0.0002500	0.0179130	0.1912500	2.3525000	1.7212500	0.4740000	0.0010000	6.5000000	0.1077600	0.0005760	1.0470000
			SP		MIN	0.0000113	0.0003988	0.0000500	0.0000617	0.0000100	0.1142500	0.0000100	0.0023085	0.0000000	0.0008484	0.0007688	0.1237500	0.0002000	0.4077622	0.0004975	0.0000250	0.1853750
282			Mettalurgical	2003/10/29	IGS	0.0000150	0.4734771	0.0000750	0.0017121	0.0000150	1.1379783	0.0000150	0.0067158	0.0690554	0.5351729	47.5021116	0.0327137	0.0000847	0.6440865	0.2179572	0.0000300	1.0326768
283			Mettalurgical	2003/10/29	IGS	0.0000150	0.4196570	0.0000750	0.0017408	0.0000150	1.2734309	0.0000150	0.0075945	0.0691998	0.5801656	43.8073629	0.0443192	0.0001080	0.4992001	0.2196225	0.0000300	1.0745750
284			Mettalurgical	2003/10/29	IGS	0.0000125	0.3099587	0.0000625	0.0018675	0.0000125	2.1851244	0.0000125	0.0220823	0.0653999	0.3884978	0.8850214	0.0827170	0.0001731	0.6338146	0.1704734	0.0014588	0.8646234
285			Mettalurgical	2003/10/29	IGS	0.0000100	0.7444653	0.0000500	0.0029424	0.0000100	2.8360690	0.0000100	0.0080986	0.0546208	0.8698142	1.5130986	0.0924997	0.0002650	1.5200127	0.0970551	0.0000826	0.7874869
286			Mettalurgical	2003/10/29	IGS	0.0000100	0.0011276	0.0003897	0.0005489	0.0000100	0.9893764	0.0000207	0.0102339	0.0003383	0.0006619	0.0029422	0.0841405	0.0000652	0.3947360	0.0060563	0.0007135	0.6433762
287			Mettalurgical	2003/10/29	IGS	0.0000150	1.7454607	0.0000750	0.0030390	0.0000150	3.1417745	0.0000150	0.0062398	0.1004992	1.0824252	3.9309999	0.0806163	0.0002849	2.2121065	0.1095214	0.0000300	1.1210508
			Mett		MEAN	0.0000129	0.6156911	0.0001212	0.0019751	0.0000129	1.9272922	0.0000147	0.0101608	0.0598522	0.5761229	16.2735894	0.0695011	0.0001635	0.9839927	0.1367810	0.0003908	0.9206315
			Mett		STDEV	0.0000025	0.6037842	0.0001319	0.0009206	0.0000025	0.9270984	0.0000036	0.0060034	0.0329372	0.3770009	22.8257875	0.0246126	0.0000939	0.7233242	0.0824593	0.0005883	0.1866309
			Mett		MODE	0.0000150	#N/A	0.0000750	#N/A	0.0000150	#N/A	0.0000150	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.0000300	#N/A
			Mett		MAX	0.0000150	1.7454607	0.0003897	0.0030390	0.0000150	3.1417745	0.0000207	0.0220823	0.1004992	1.0824252	47.5021116	0.0924997	0.0002849	2.2121065	0.2196225	0.0014588	1.1210508
			Mett		MIN	0.0000100	0.0011276	0.0000500	0.0005489	0.0000100	0.9893764	0.0000100	0.0062398	0.0003383	0.0006619	0.0029422	0.0327137	0.0000652	0.3947360	0.0060563	0.0000300	0.6433762

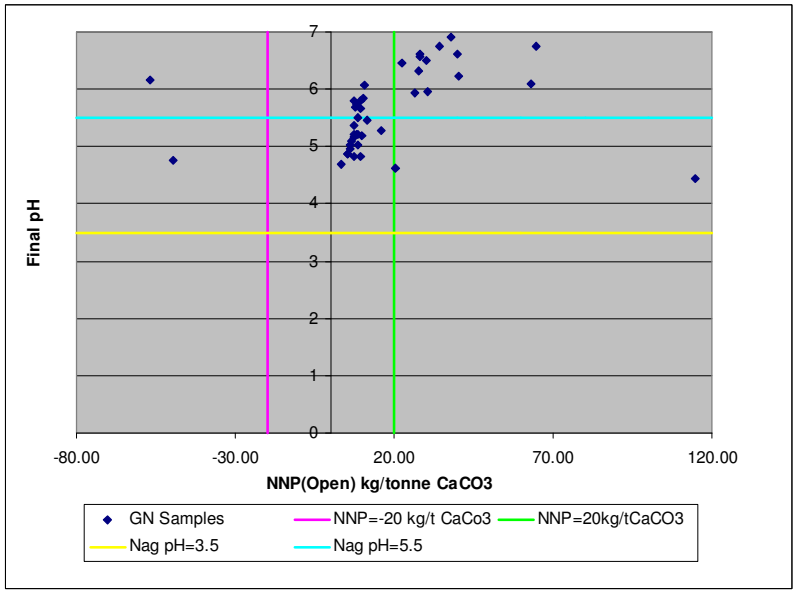
Constituents released during complete oxidation in kg/t																				
Sample	**From Depth**	**To Depth**	**Lithology**	**Date**	**Laboratory**	**Ni**	**Sb**	**Se**	**Sn**	**Sr**	**Pb**	**V**	**Zn**	**SO4**	**AP (Open)**	**AP (Closed)**	**NP**	**NNP (Open)**	**NNP (Closed)**	**Initial pH**	**Final pH**
			QF		**MAX**	0.0554800	0.0001691	0.0001429	0.0012000	0.0035500	0.0005960	0.0012389	0.0088080	7.09	7.38	14.76	32.10	30.70	29.30	11.36	6.52
			QF		**MIN**	0.0006470	0.0000100	0.0000125	0.0001000	0.0003675	0.0001000	0.0000820	0.0004364	0.20	0.21	0.41	-4.49	-11.87	-19.25	10.03	3.51
79	289.03	300.53	SP	2003/08/19	IGS	3.8000000	0.0000125	0.0010575	0.0001250	0.0018250	0.0020350	0.0000425	0.0328750	36.25	37.76	75.52	56.17	18.41	-19.35	10.33	3.09
81	199.04	206	SP	2003/08/19	IGS	0.0002823	0.0000425	0.0001315	0.0001125	0.0004025	0.0001125	0.0008130	0.0002538	1.90	1.98	3.97	72.56	70.57	68.59	11.34	8.25
82	252.53	258.5	SP	2003/08/19	IGS	0.0012550	0.0000575	0.0001450	0.0001250	0.0003750	0.0001250	0.0007950	0.0002125	1.55	1.62	3.23	55.02	53.40	51.78	10.74	8.07
96	185.52	197.07	SP	2003/08/19	IGS	0.0107520	0.0000330	0.0009630	0.0001500	0.0007200	0.0001500	0.0007350	0.0006930	12.36	12.88	25.75	86.08	73.21	60.33	10.56	6.96
110	166.55	179.65	SP	2003/08/19	IGS	0.0029050	0.0000475	0.0004200	0.0001250	0.0005000	0.0001250	0.0006925	0.0003750	5.28	5.50	11.00	60.36	54.86	49.36	10.96	7.51
118	46.14	51.98	SP	2003/08/19	IGS	0.0434750	0.0000400	0.0009550	0.0001250	0.0008500	0.0001250	0.0006325	0.0018200	15.78	16.43	32.86	55.71	39.28	22.85	11.32	5.46
124	53.82	64	SP	2003/08/19	IGS	0.8250000	0.0000125	0.0017875	0.0001250	0.0020500	0.0003363	0.0005600	0.0200925	22.99	23.95	47.89	58.35	34.41	10.46	10.93	4.87
163	116.15	122.11	SP	2003/09/17	IGS	1.4625000	0.0000150	0.0026790	0.0001500	0.0027000	0.0020970	0.0010170	0.0337800	39.00	40.63	81.25	51.57	10.95	-29.68	10.25	3.74
215	123	132.02	SP	2003/09/25	IGS	0.3495000	0.0000125	0.0010980	0.0001500	0.0016500	0.0006720	0.0016170	0.0106500	12.18	12.69	25.38	47.16	34.47	21.78	10.44	4.65
238	78	84.17	SP	2003/09/25	IGS	0.0061248	0.0000651	0.0000984	0.0001000	0.0003911	0.0001000	0.0011604	0.0004309	1.00	1.04	2.09	30.01	28.97	27.93	10.46	6.43
			SP		**MEAN**	0.6501794	0.0000338	0.0009335	0.0001288	0.0011464	0.0005878	0.0008065	0.0101183	14.83	15.45	30.89	57.30	41.85	26.41	10.73	5.90
			SP		**STDEV**	1.2090585	0.0000199	0.0008196	0.0000167	0.0008400	0.0007986	0.0004109	0.0138220	13.94	14.52	29.05	14.76	20.81	32.71	0.39	1.81
			SP		**MODE**	#N/A	0.0000125	#N/A	0.0001250	#N/A	0.0001250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			SP		**MAX**	3.8000000	0.0000651	0.0026790	0.0001500	0.0027000	0.0020970	0.0016170	0.0337800	39.00	40.63	81.25	86.08	73.21	68.59	11.34	8.25
			SP		**MIN**	0.0002823	0.0000125	0.0000984	0.0001000	0.0003750	0.0001000	0.0000425	0.0002125	1.00	1.04	2.09	30.01	10.95	-29.68	10.25	3.09
282			Mettalurgical	2003/10/29	IGS	2.9109483	0.0008055	0.0000450	0.0001500	0.0025951	0.0055714	0.0015401	0.0354559	108.15	112.66	225.32	18.53	-94.13	-206.79	10.31	2.37
283			Mettalurgical	2003/10/29	IGS	2.5362772	0.0007817	0.0000450	0.0001500	0.0024102	0.0052950	0.0014352	0.0359583	102.33	106.59	213.19	26.09	-80.50	-187.09	10.90	2.22
284			Mettalurgical	2003/10/29	IGS	1.0336619	0.0000125	0.0014023	0.0001250	0.0051676	0.0012351	0.0040331	0.0340936	15.89	16.55	33.11	20.98	4.42	-12.13	11.36	2.77
285			Mettalurgical	2003/10/29	IGS	1.0173093	0.0000286	0.0014523	0.0001000	0.0051320	0.0014267	0.0000373	0.0614869	23.47	24.45	48.90	38.97	14.52	-9.93	10.21	3.76
286			Mettalurgical	2003/10/29	IGS	0.0266420	0.0001230	0.0004913	0.0001000	0.0018206	0.0001000	0.0027816	0.0007910	2.30	2.40	4.79	38.46	36.07	33.67	10.96	7.52
287			Mettalurgical	2003/10/29	IGS	2.3148233	0.0000150	0.0016114	0.0001500	0.0055780	0.0040984	0.0010591	0.0693229	42.58	44.35	88.70	50.69	6.34	-38.01	11.02	2.62
			Mett		**MEAN**	1.6399437	0.0002944	0.0008412	0.0001292	0.0037839	0.0029544	0.0018144	0.0395181	49.12	51.17	102.33	32.29	-18.88	-70.05	10.79	3.54
			Mett		**STDEV**	1.1164517	0.0003889	0.0007310	0.0000246	0.0016796	0.0023270	0.0014004	0.0242047	45.42	47.31	94.62	12.47	54.36	101.14	0.44	2.02
			Mett		**MODE**	#N/A	#N/A	0.0000450	0.0001500	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			Mett		**MAX**	2.9109483	0.0008055	0.0016114	0.0001500	0.0055780	0.0055714	0.0040331	0.0693229	108.15	112.66	225.32	50.69	36.07	33.67	11.36	7.52
			Mett		**MIN**	0.0266420	0.0000125	0.0000450	0.0001000	0.0018206	0.0001000	0.0000373	0.0007910	2.30	2.40	4.79	18.53	-94.13	-206.79	10.21	2.22

APPENDIX 14:

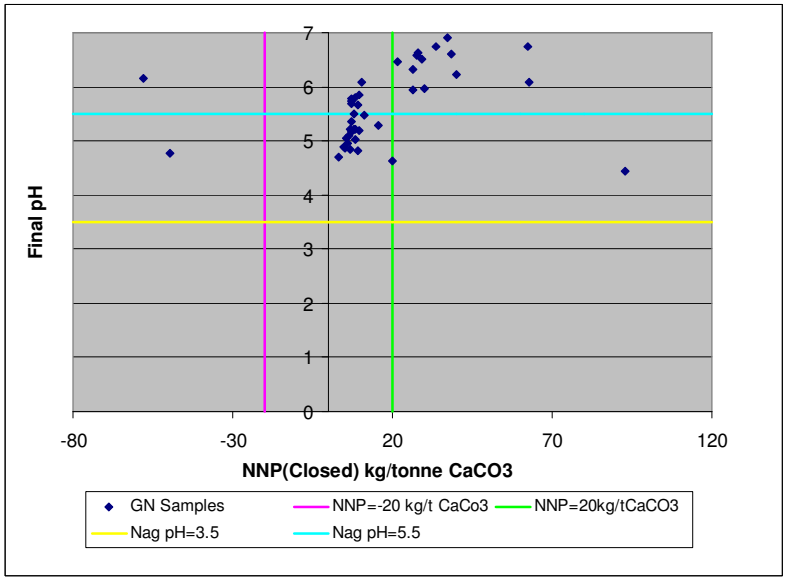
Interpretation of the Static ABA Results – Graphs Showing the Sample Results

Gabbro-Norite

Net Neutralising Potential (NNP) vs Final pH

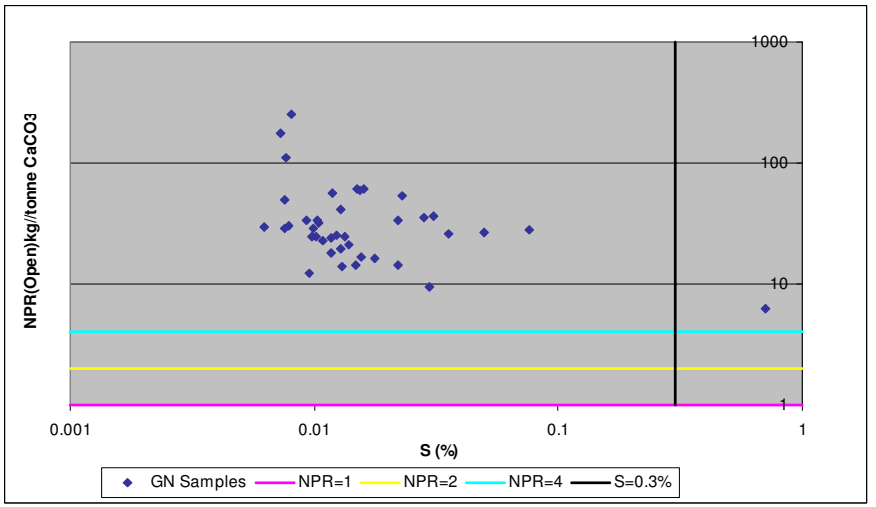


Open System

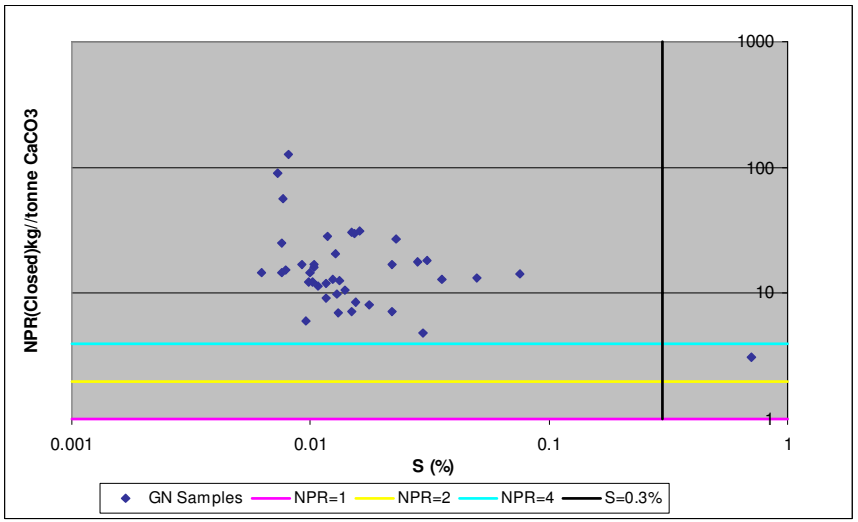


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur
(Note that two samples plotted with negative NPR values and Sulphide-Sulphur values less than 0.3%)



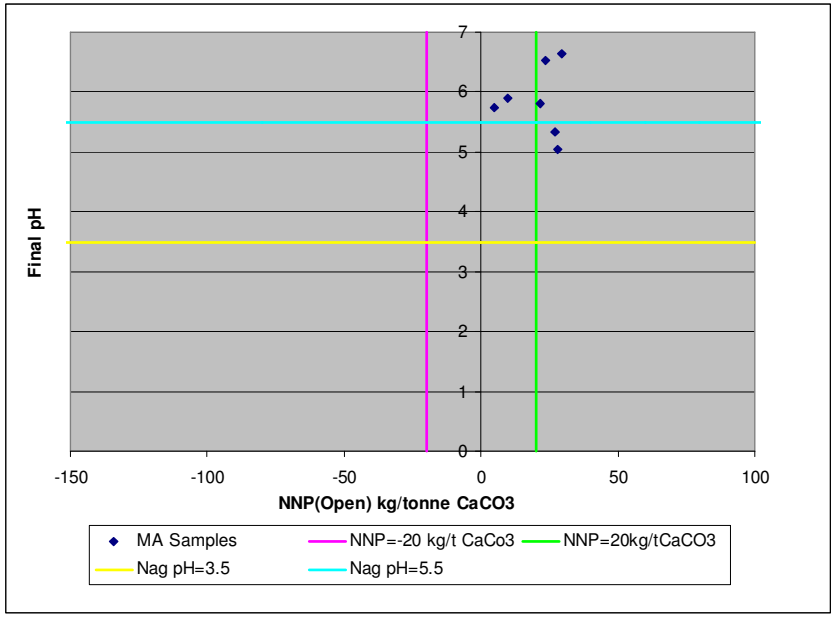
Open System



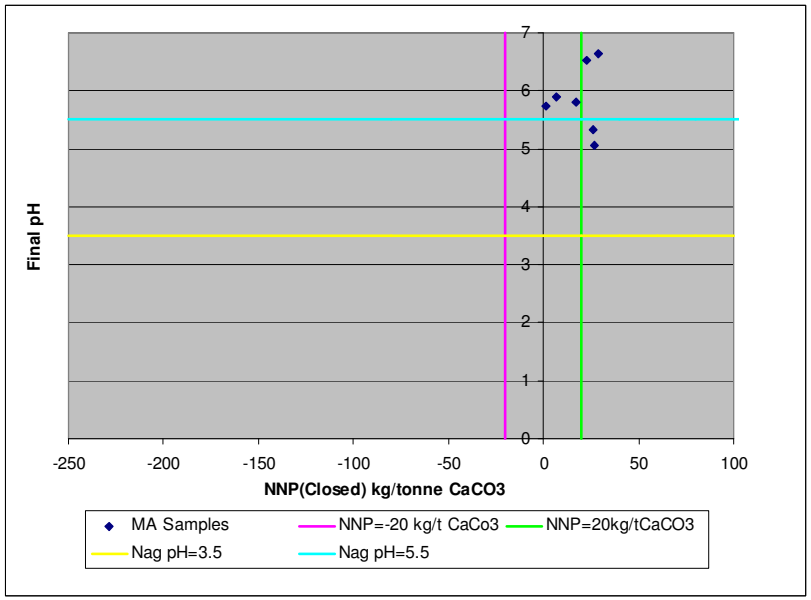
Closed System

Mottled Anorthosite

Net Neutralising Potential (NNP) vs Final pH

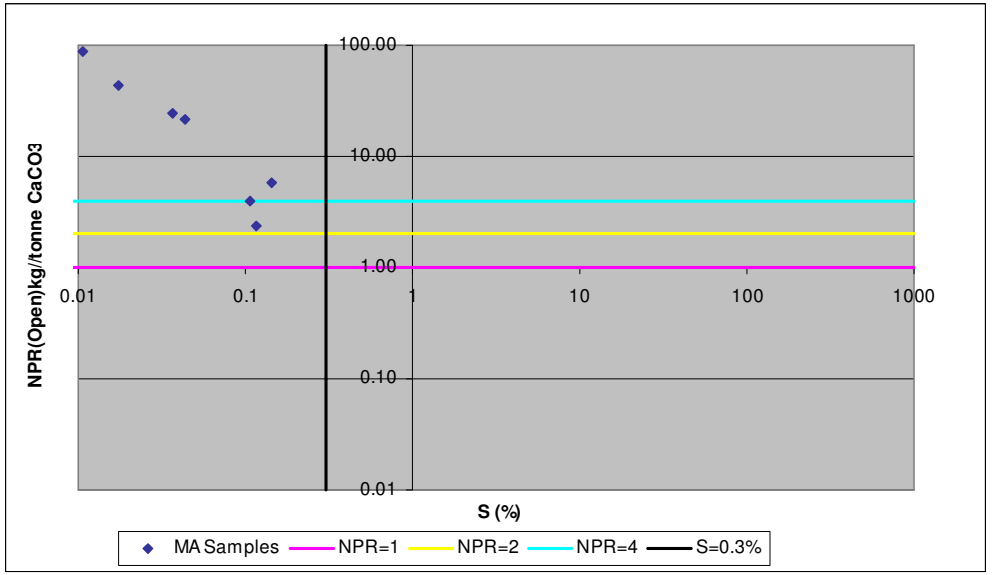


Open System

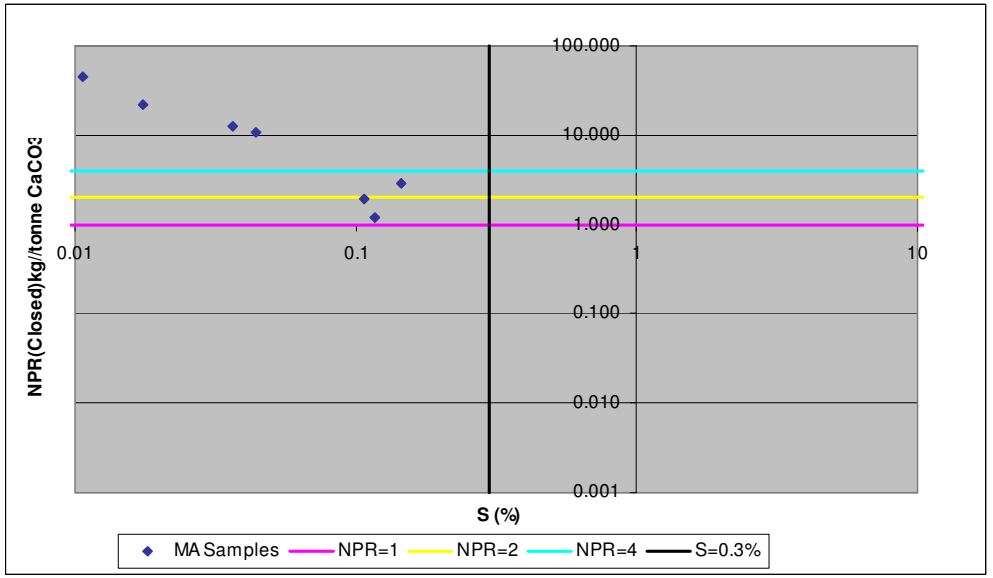


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



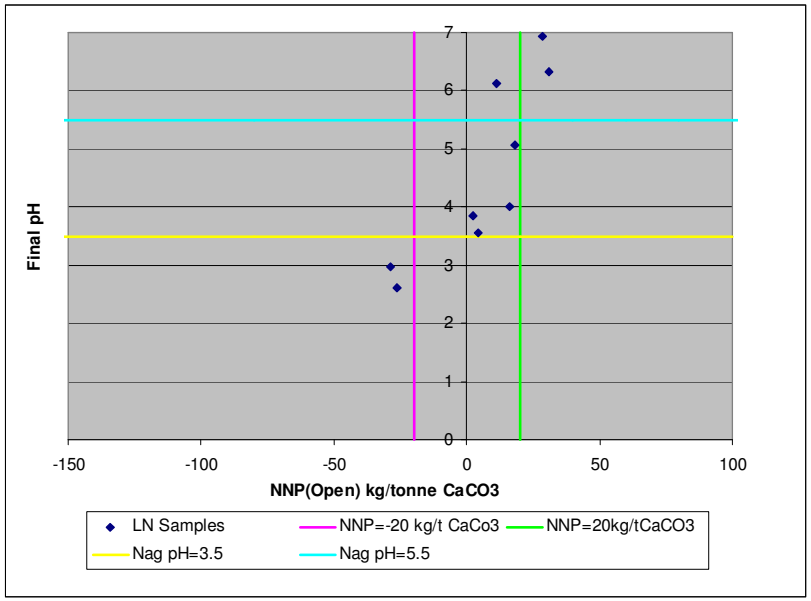
Open System



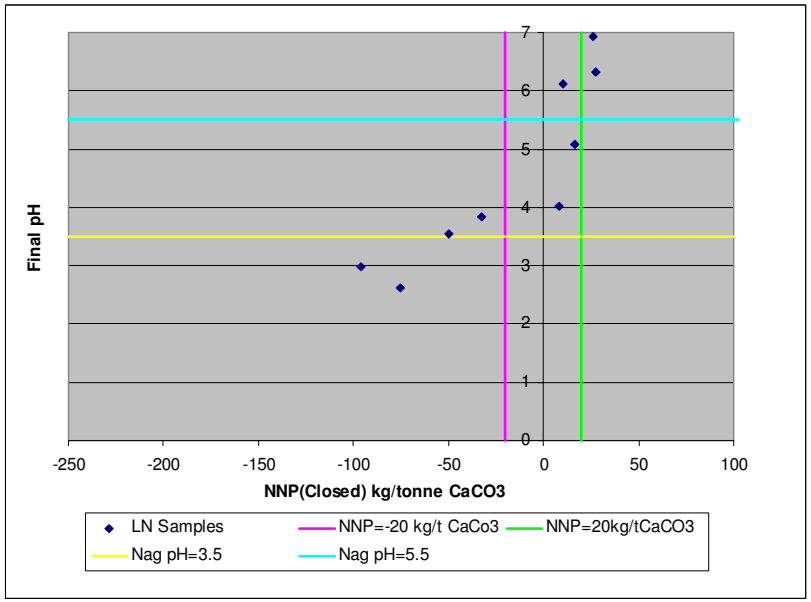
Closed System

Leuco-Norite

Net Neutralising Potential (NNP) vs Final pH

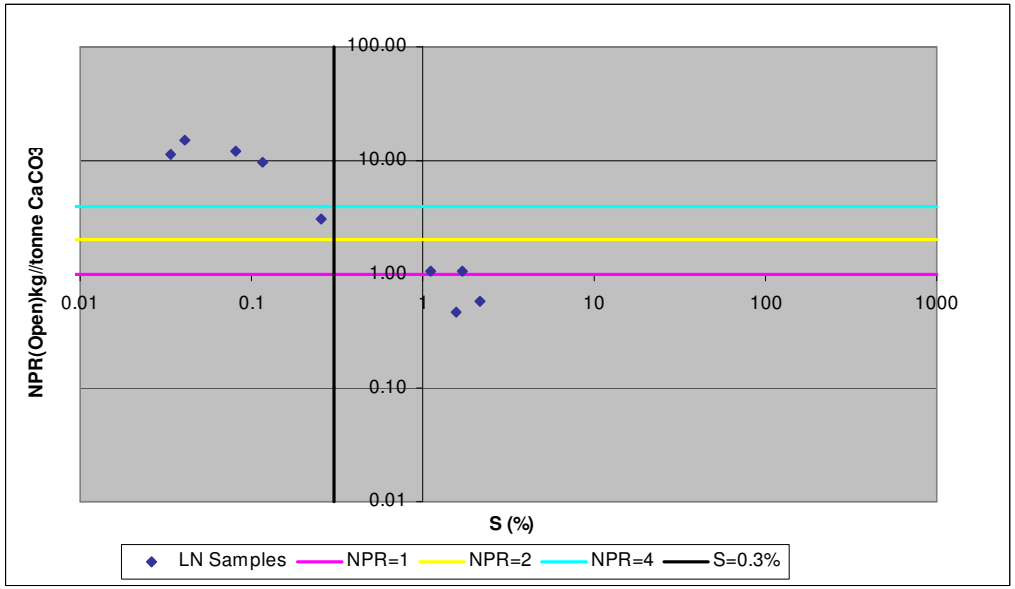


Open System

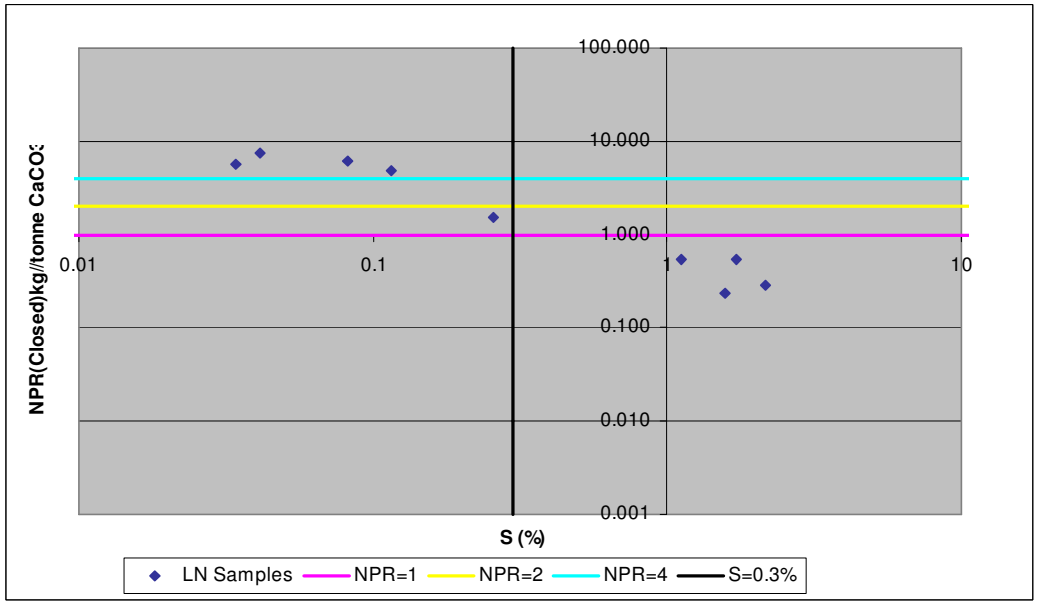


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



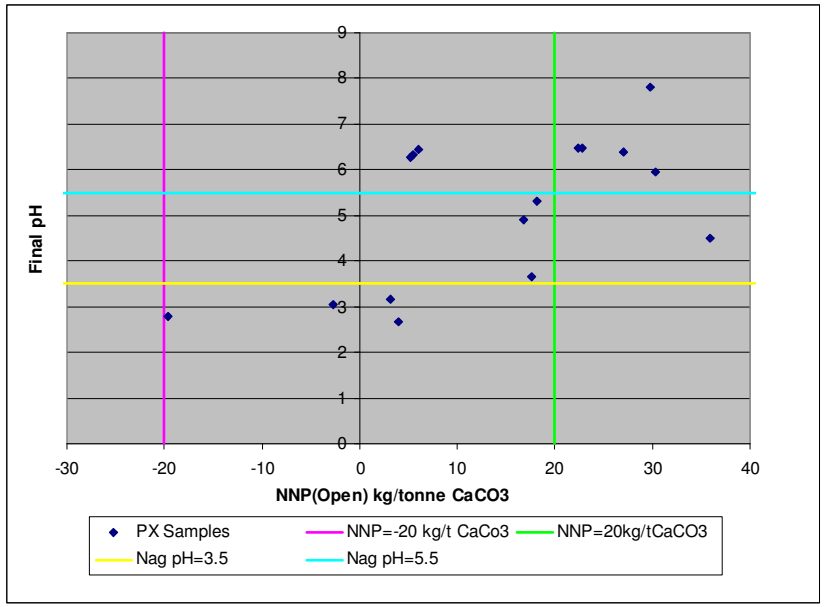
Open System



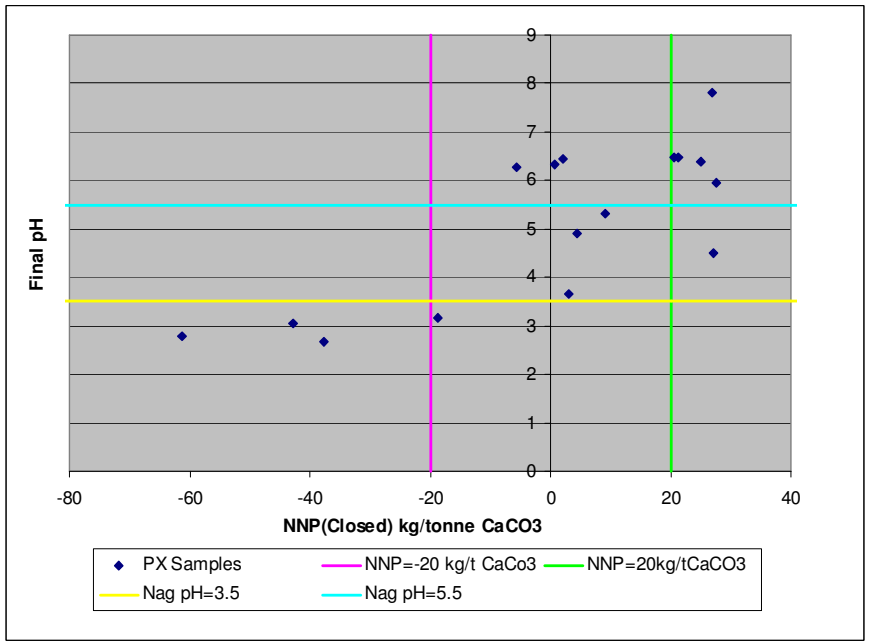
Closed System

Pyroxenite

Net Neutralising Potential (NNP) vs Final pH

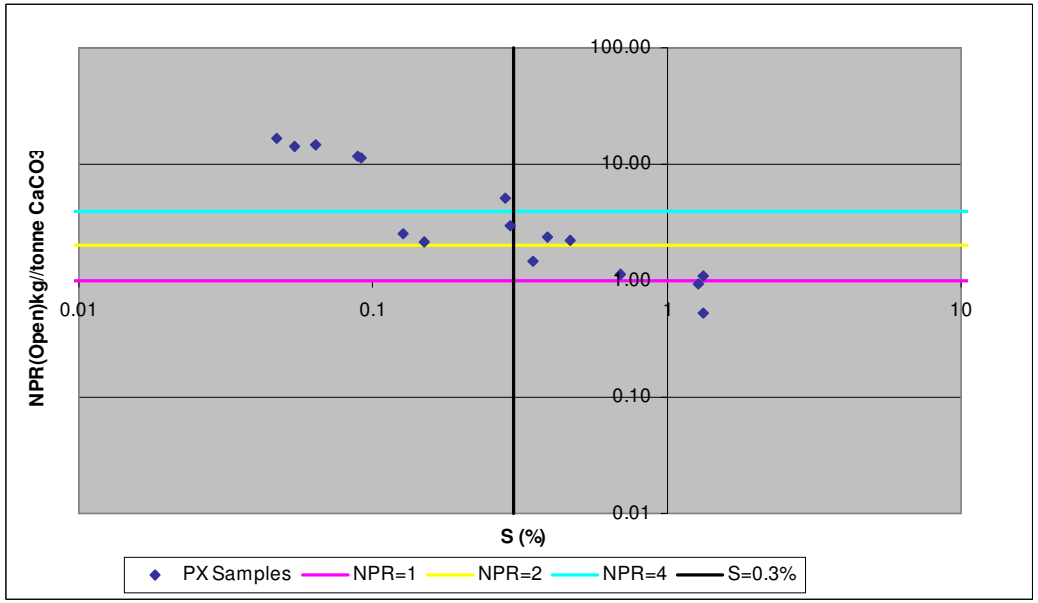


Open System

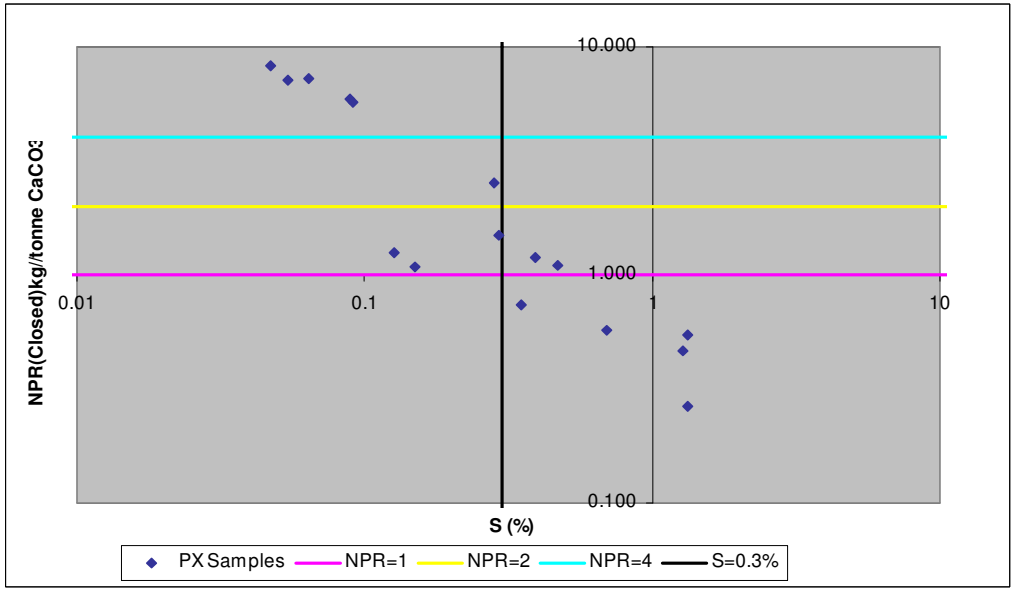


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



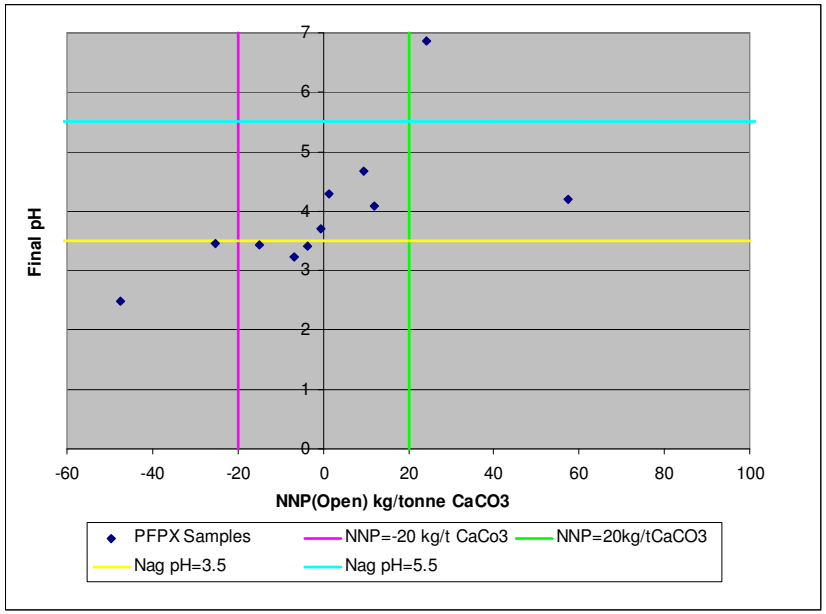
Open System



Closed System

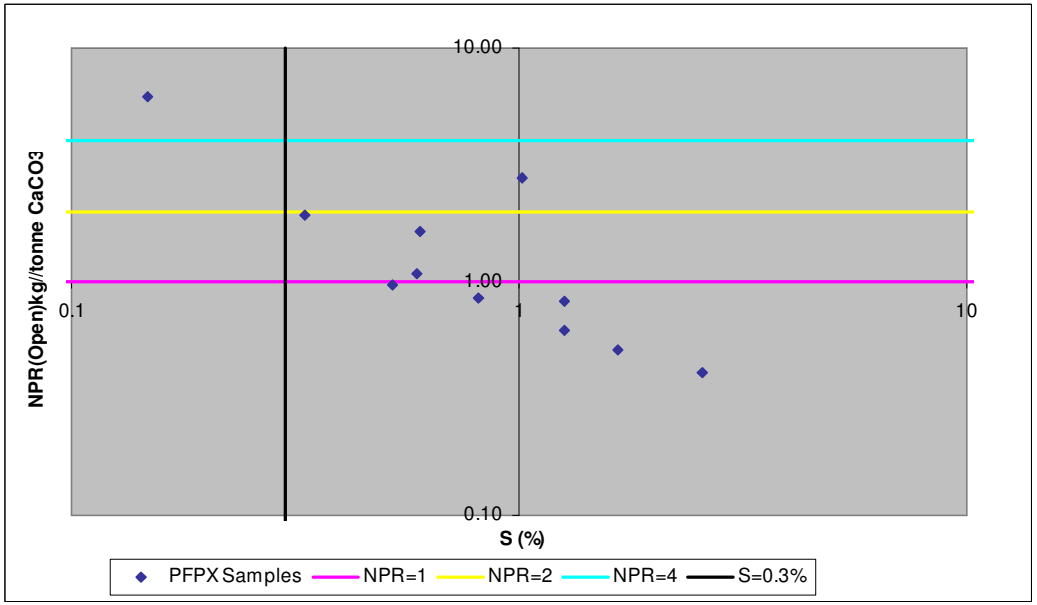
Pegmatitic Feldspathic Pyroxenite

Net Neutralising Potential (NNP) vs Final pH

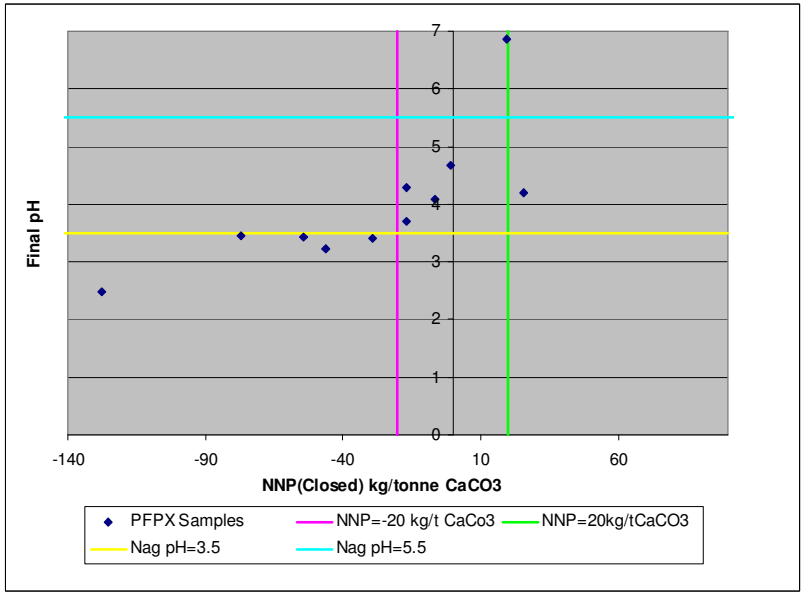


Open System

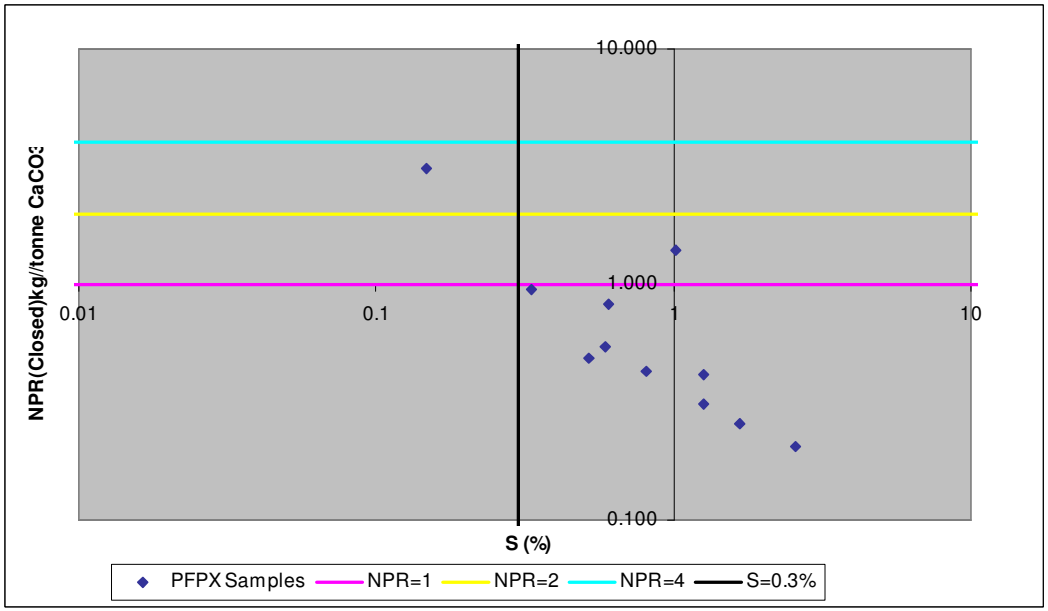
Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



Open System



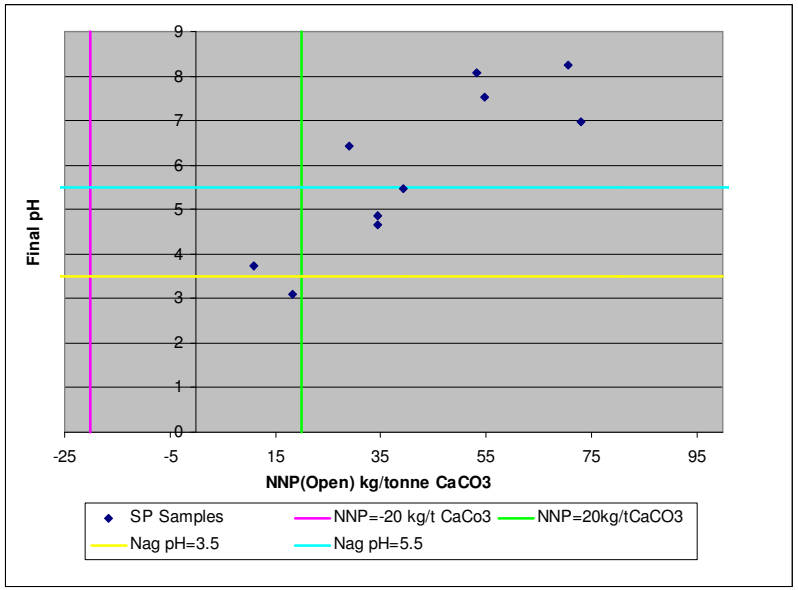
Closed System



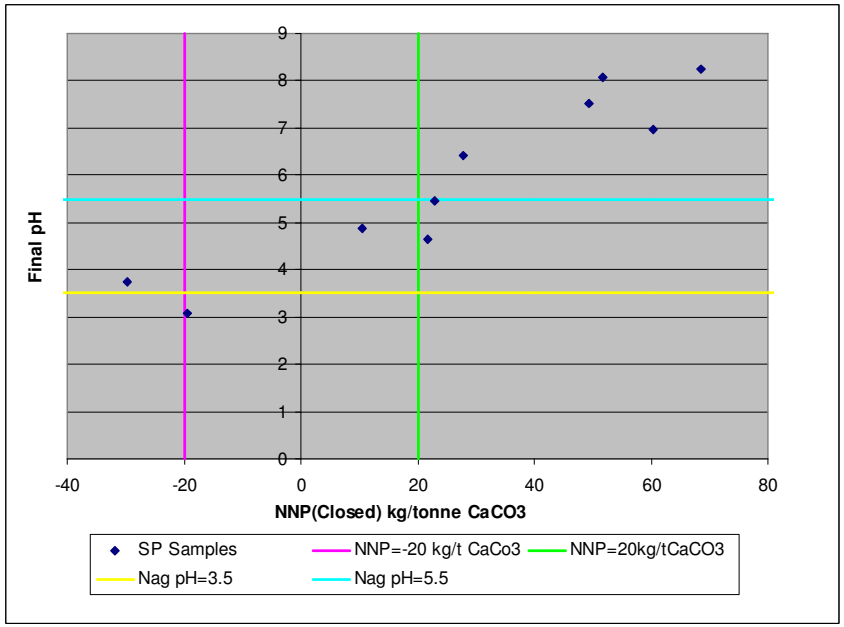
Closed System

Serpentinite

Net Neutralising Potential (NNP) vs Final pH

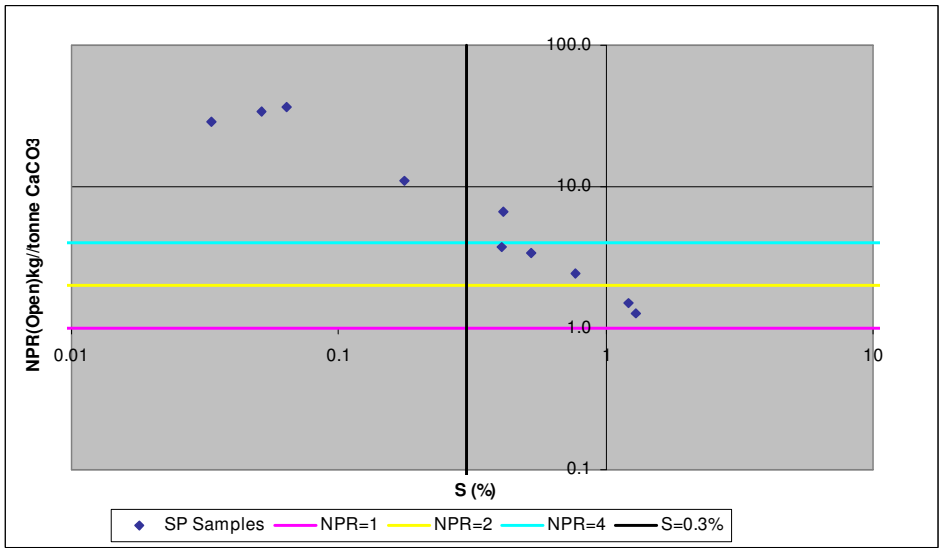


Open System

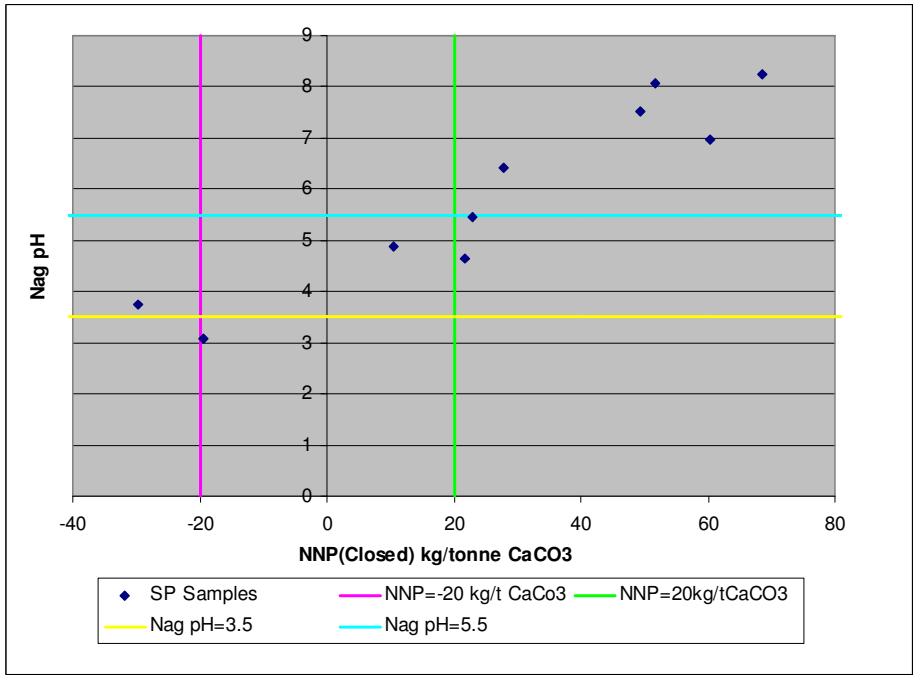


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



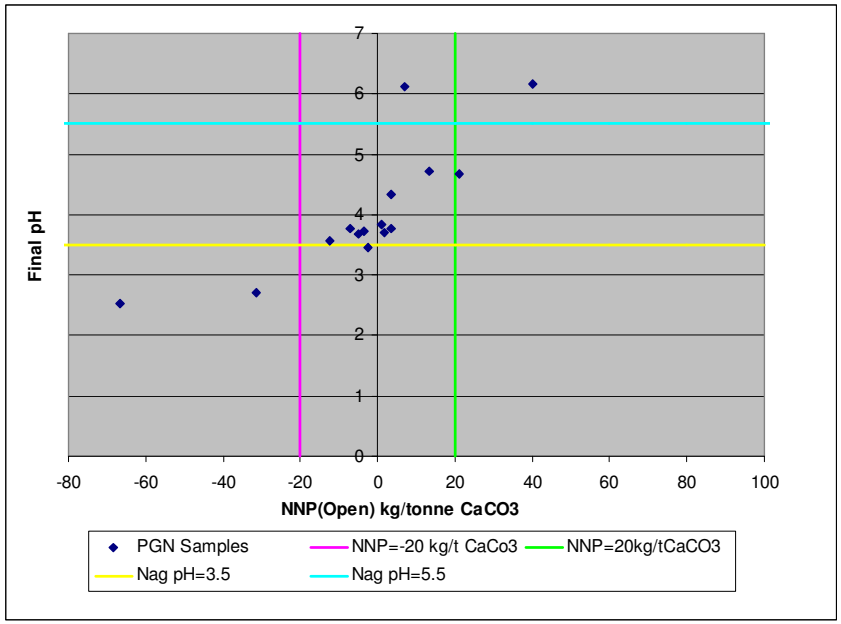
Open System



Closed System

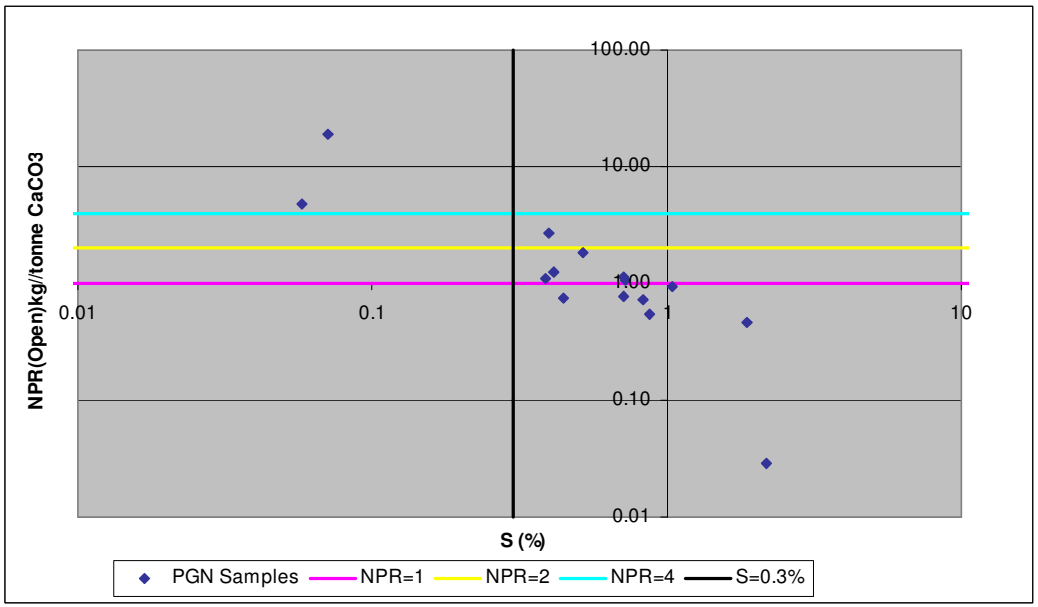
Pegmatitic Gabbro-Norite

Net Neutralising Potential (NNP) vs Final pH

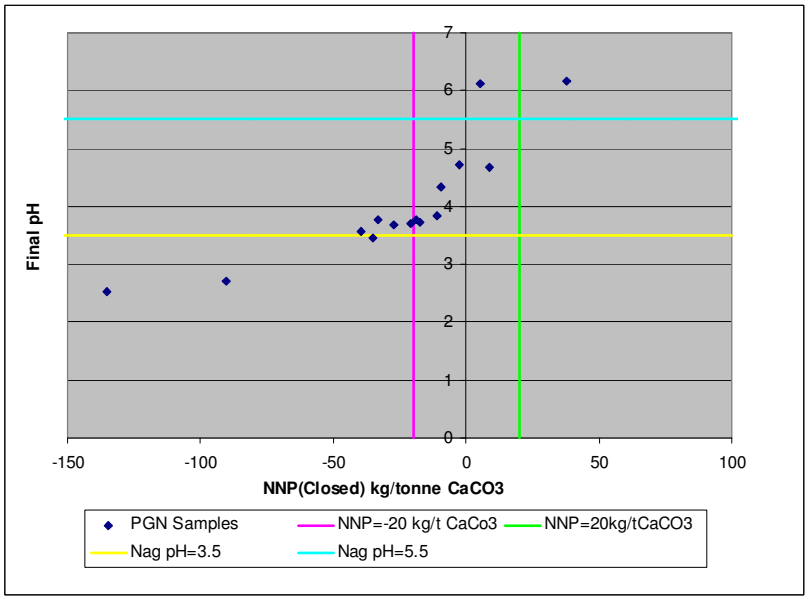


Open System

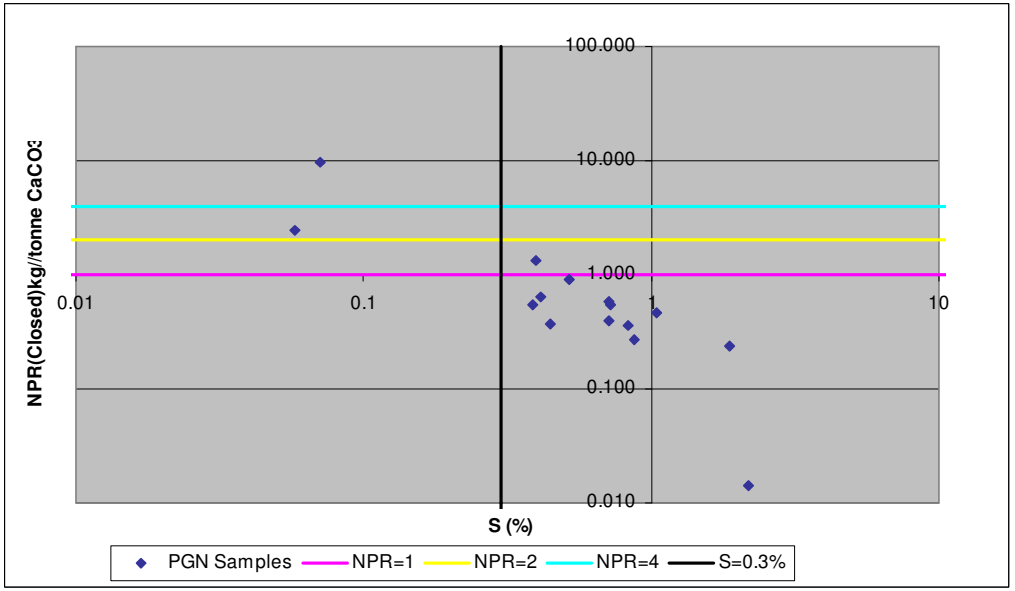
Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



Open System



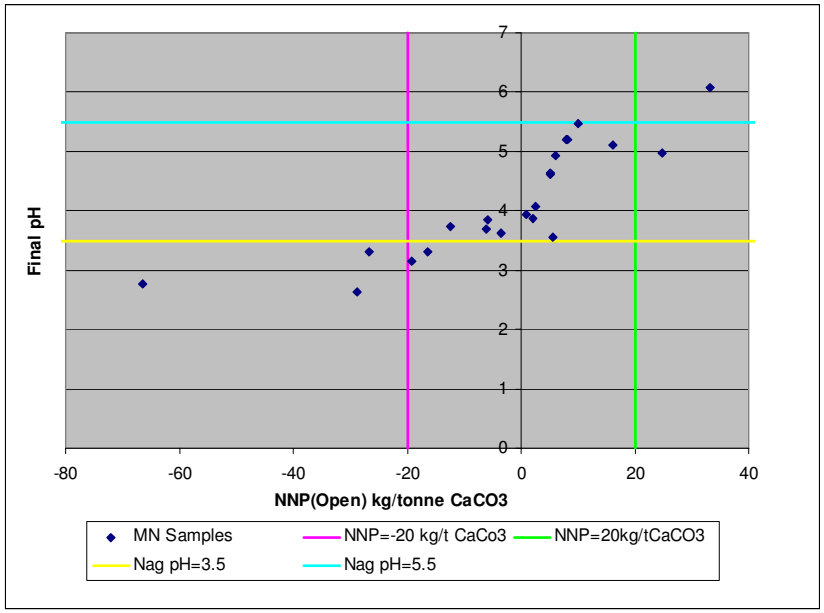
Closed System



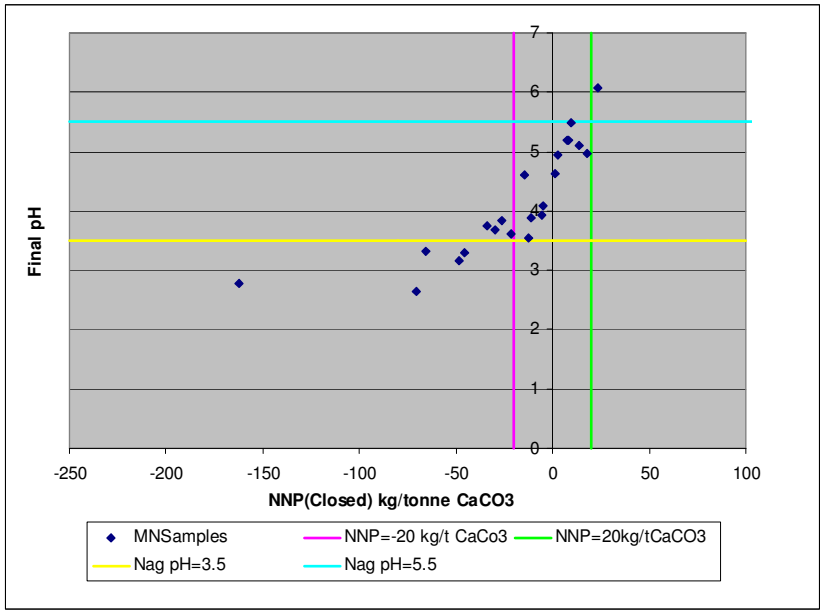
Closed System

Melanorite

Net Neutralising Potential (NNP) vs Final pH

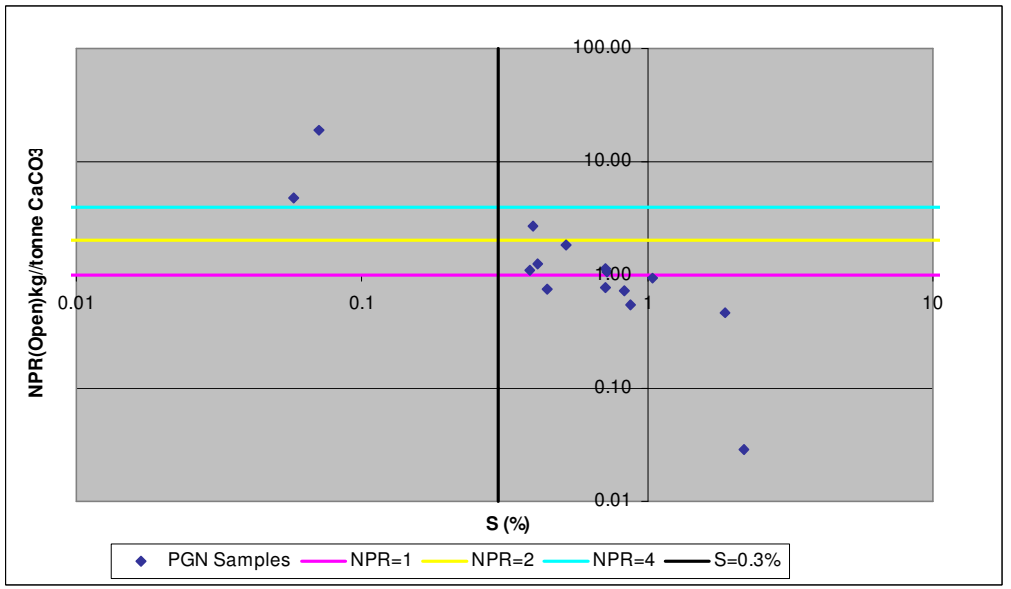


Open System

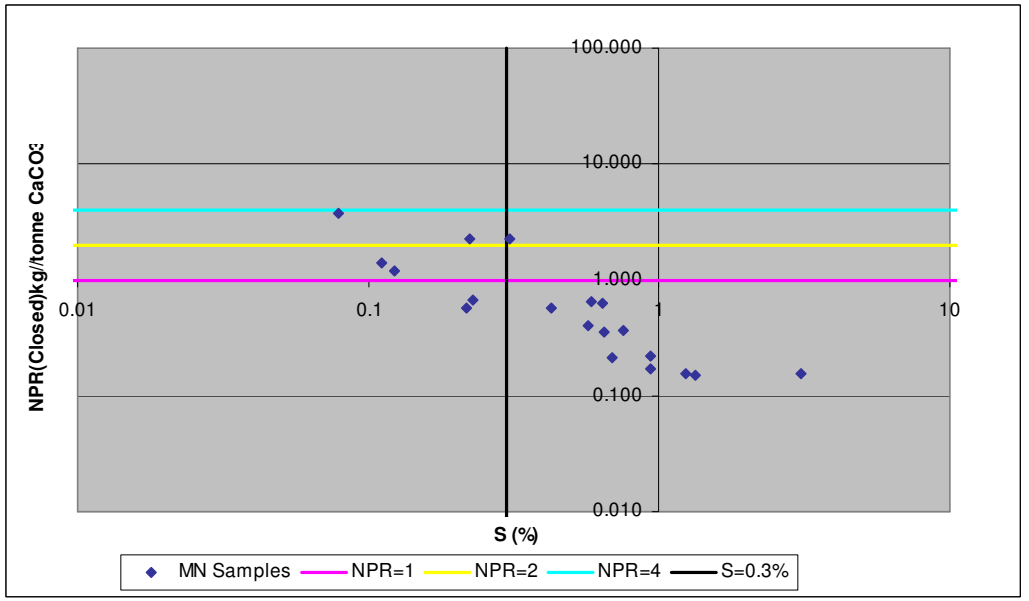


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



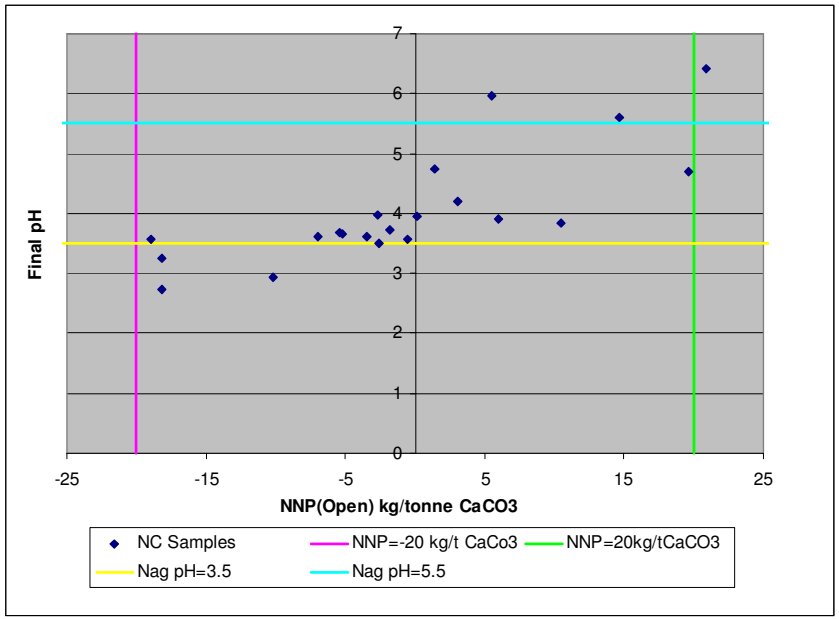
Open System



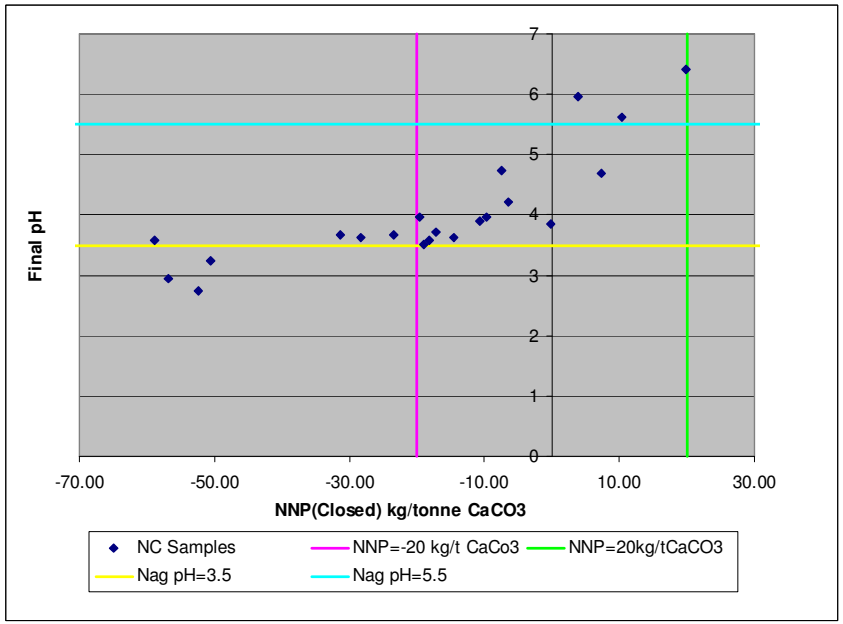
Closed System

Norite Cycles

Net Neutralising Potential (NNP) vs Final pH

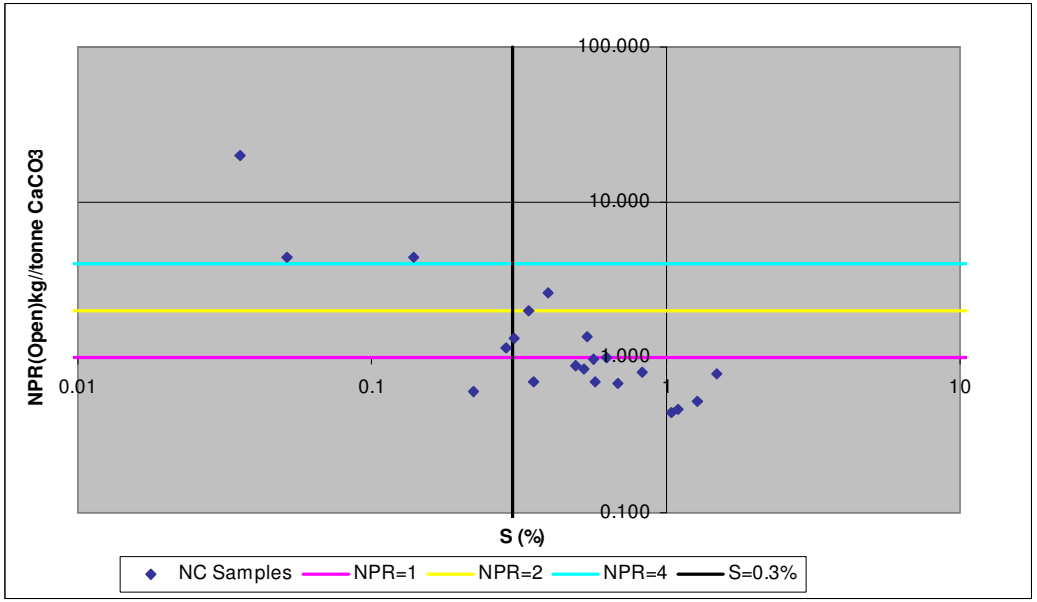


Open System

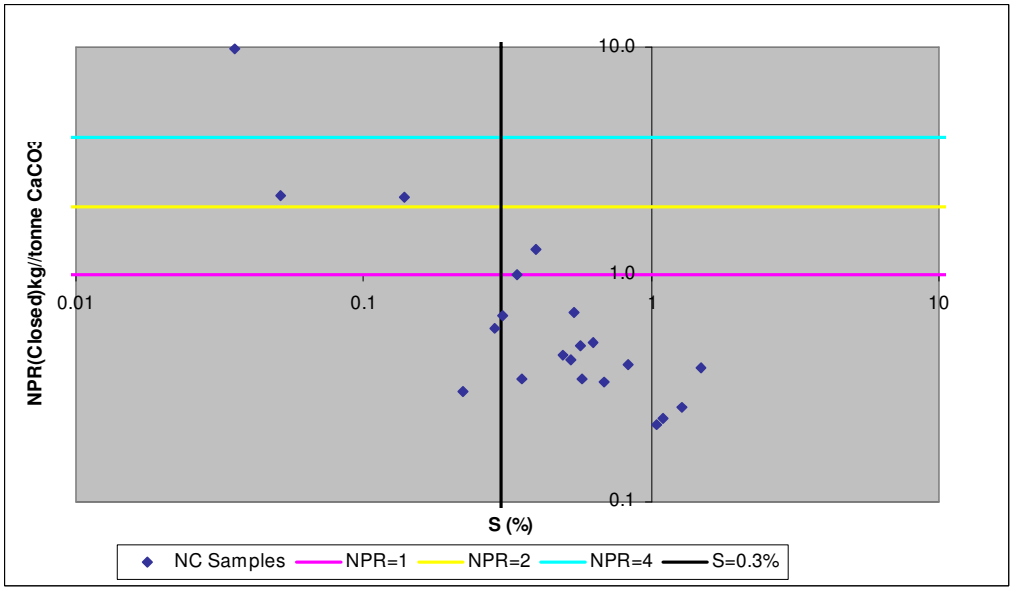


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



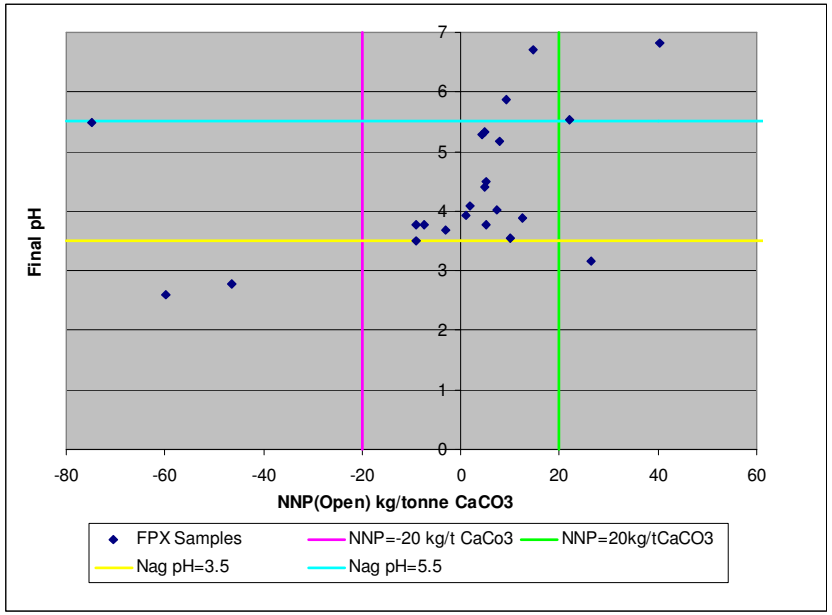
Open System



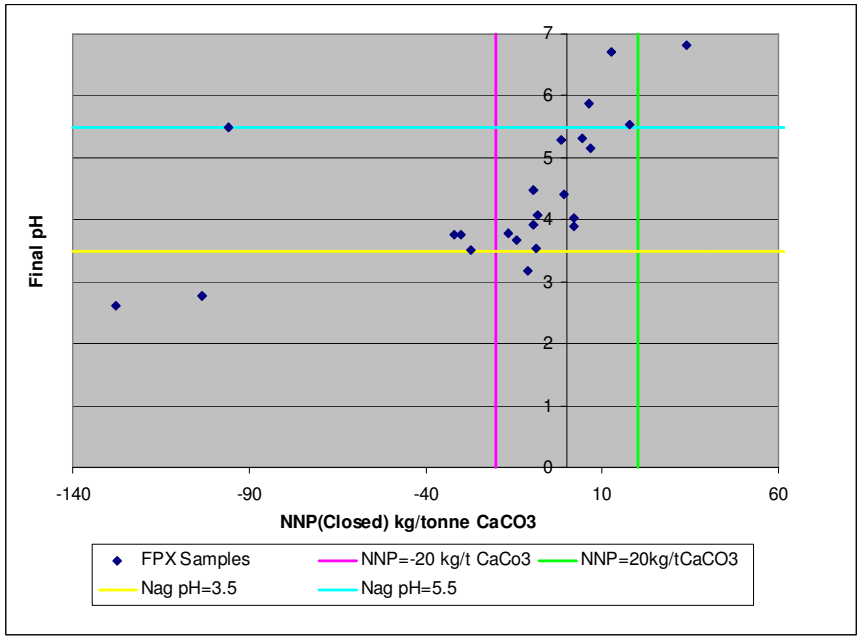
Closed System

Felsdpathic Pyroxenite

Net Neutralising Potential (NNP) vs Final pH



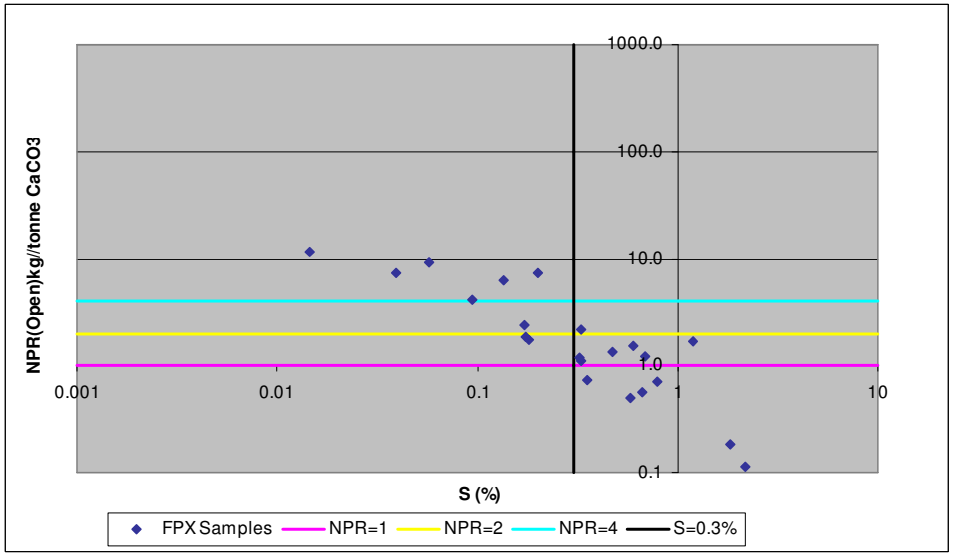
Open System



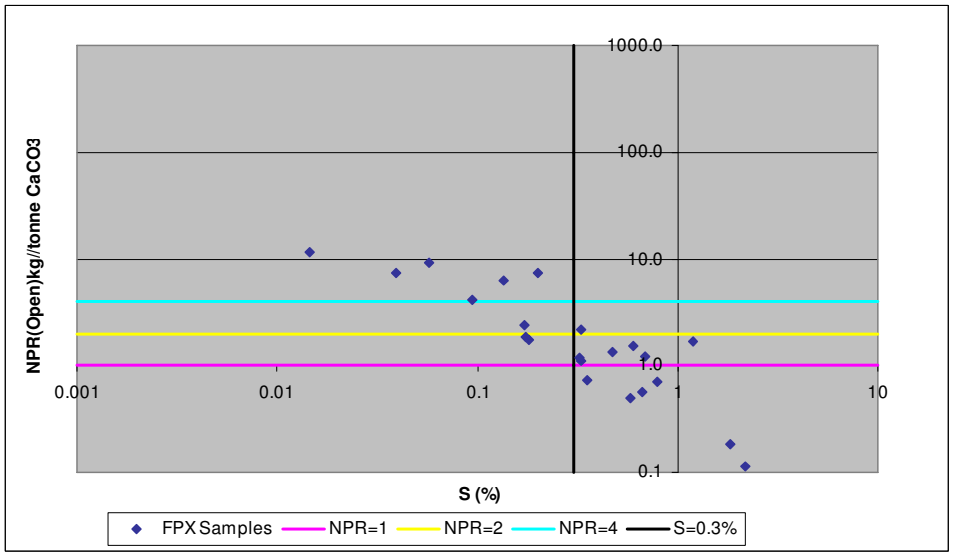
Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur

(Note that one sample plotted with a negative NPR and sulphide-sulphur greater than 0.3%)



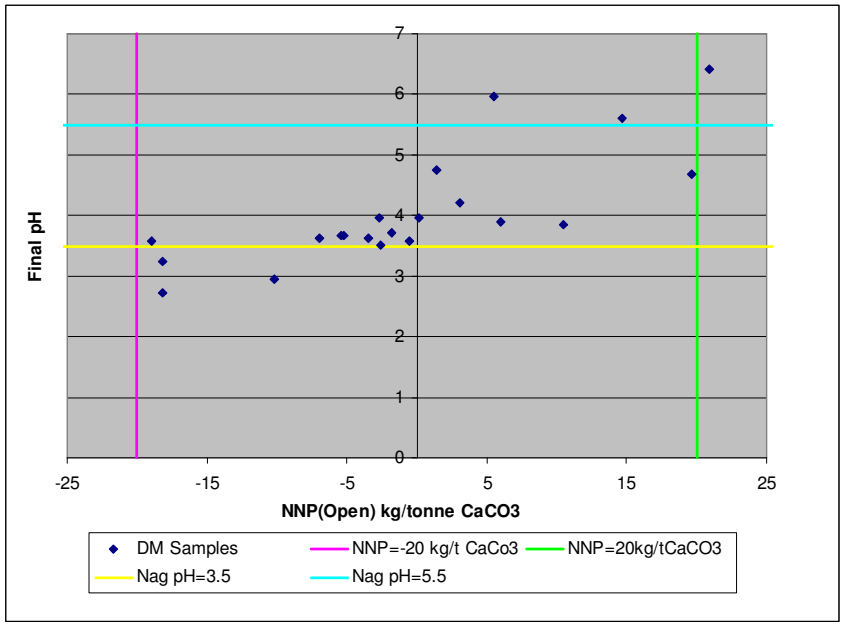
Open System



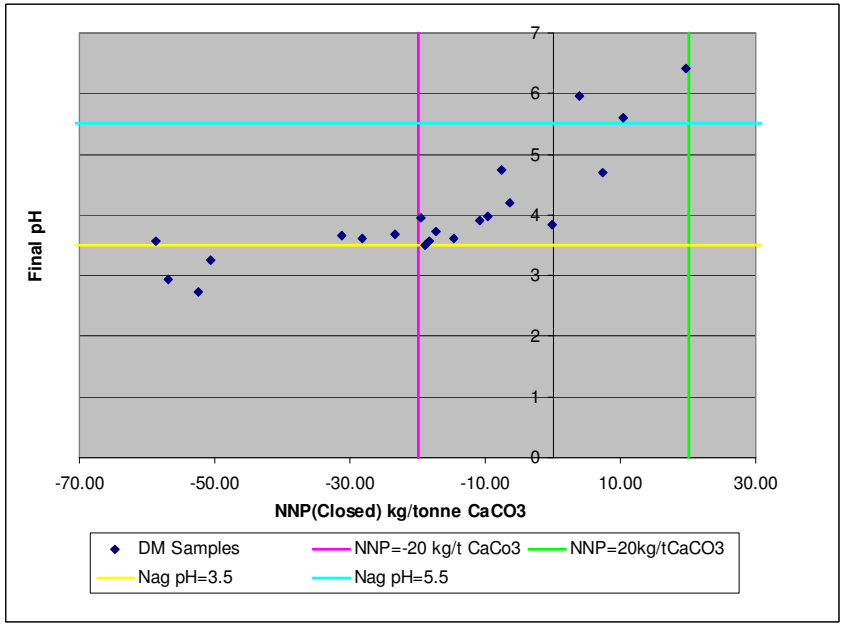
Closed System

Dolomite

Net Neutralising Potential (NNP) vs Final pH

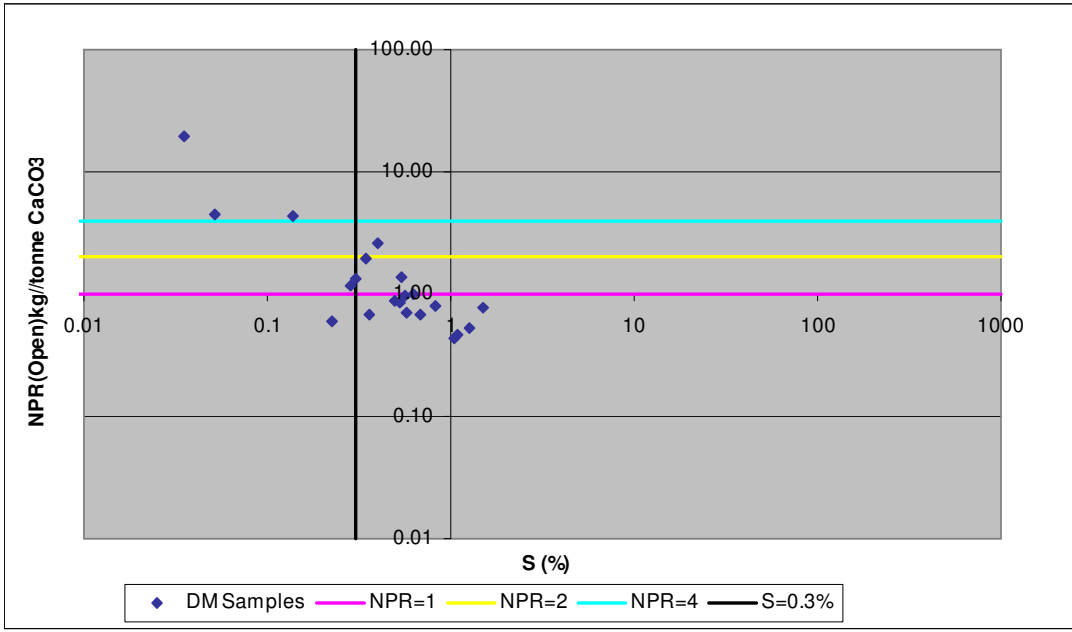


Open System

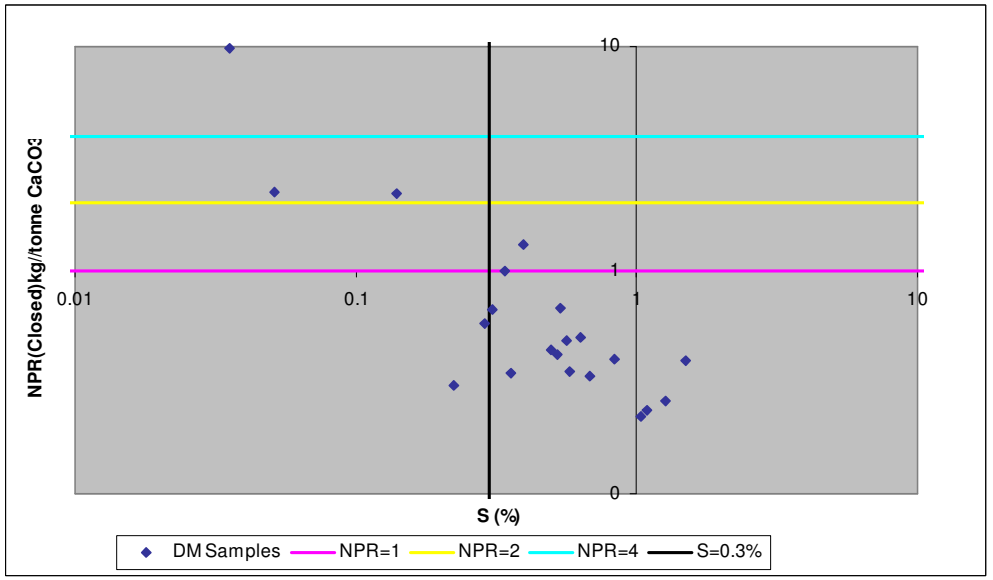


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



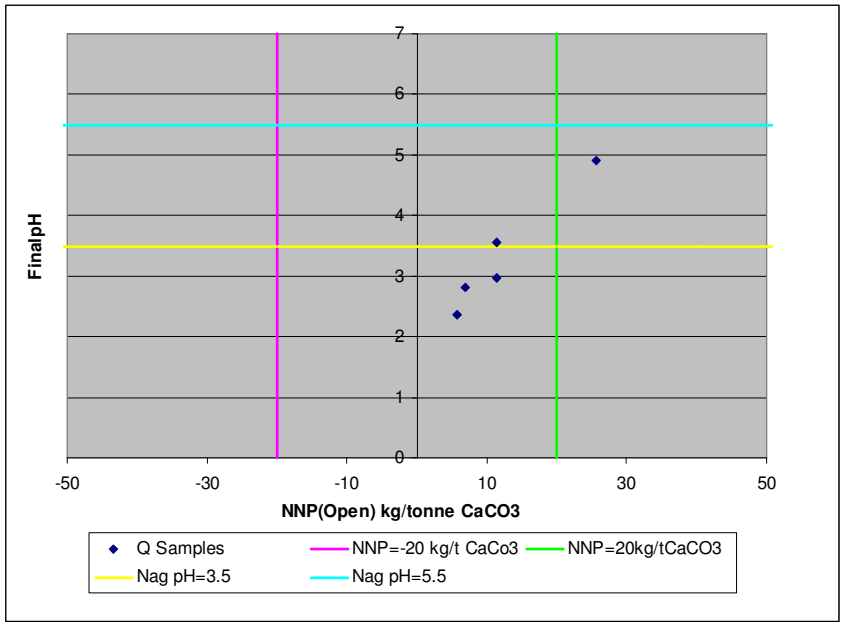
Open System



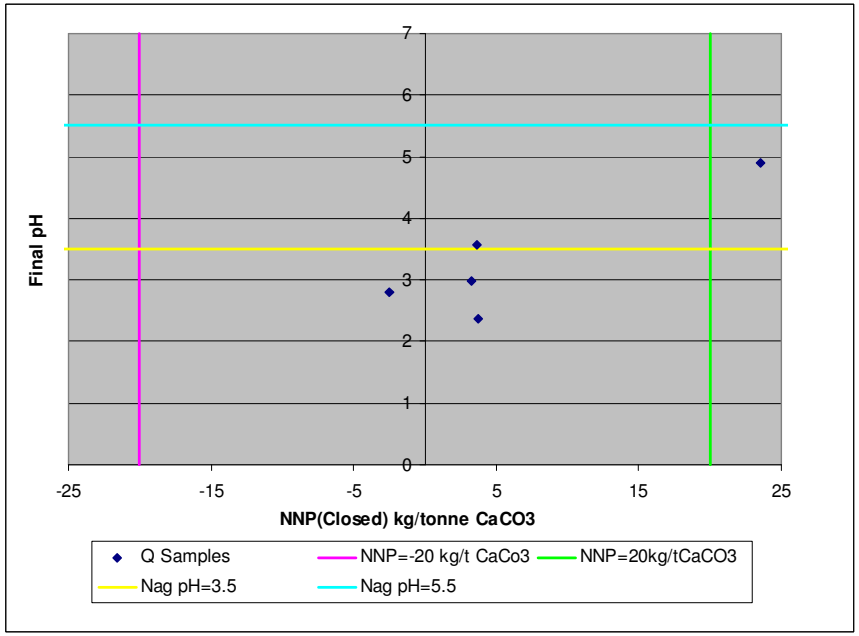
Closed System

Quartzite

Net Neutralising Potential (NNP) vs Final pH

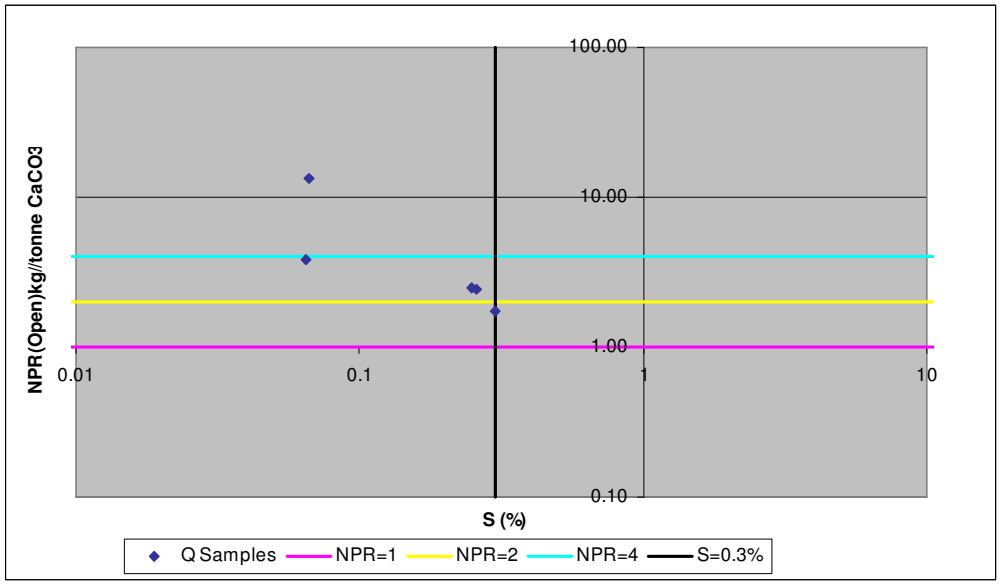


Open System

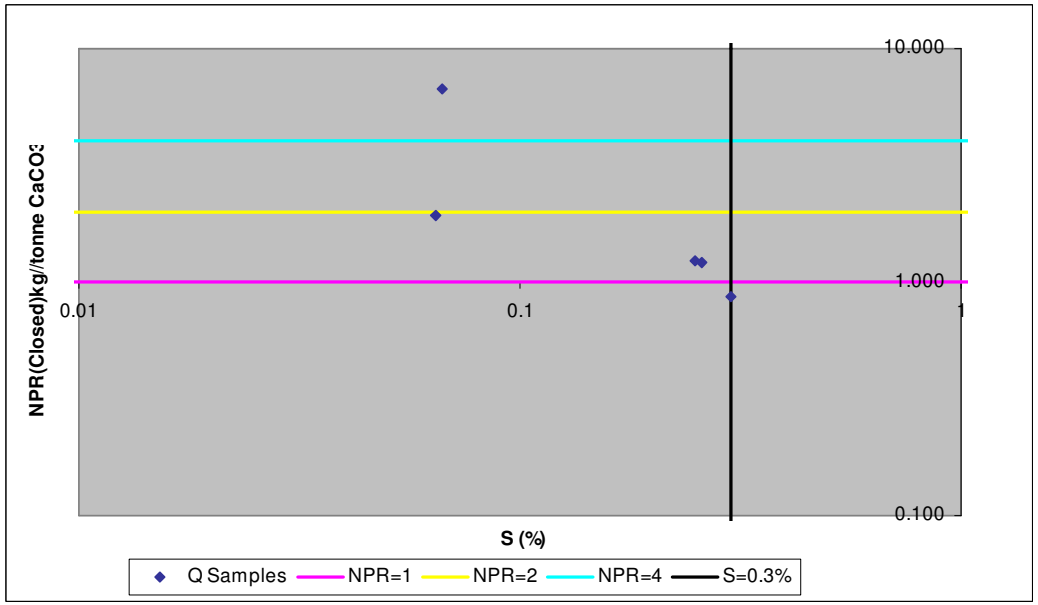


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur

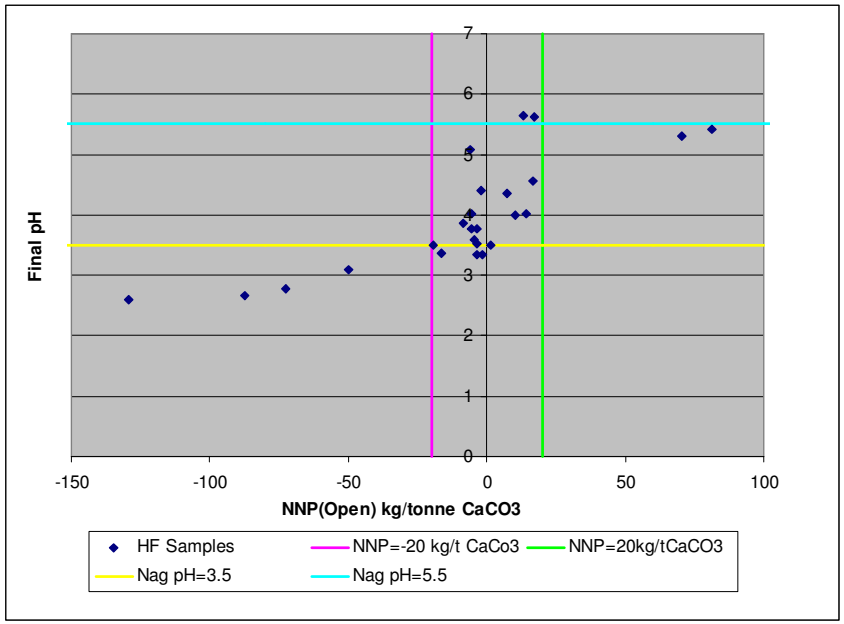


Open System

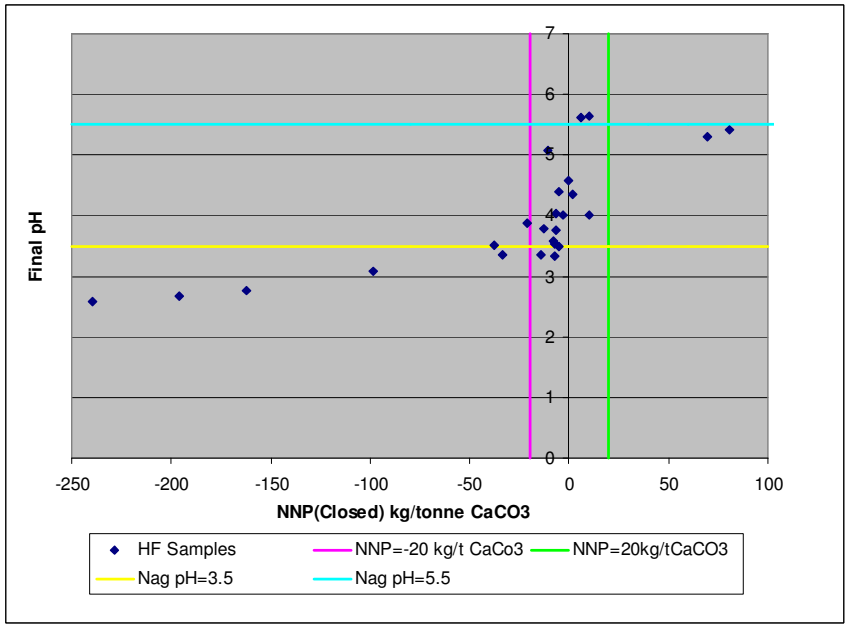


Closed System

Net Neutralising Potential (NNP) vs Final pH



Open System

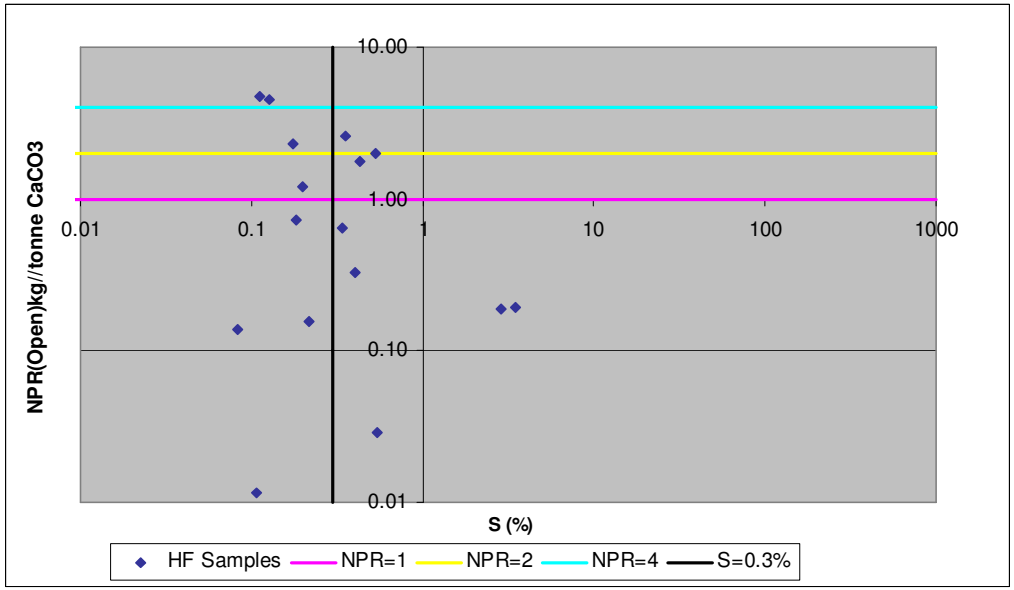


Closed System

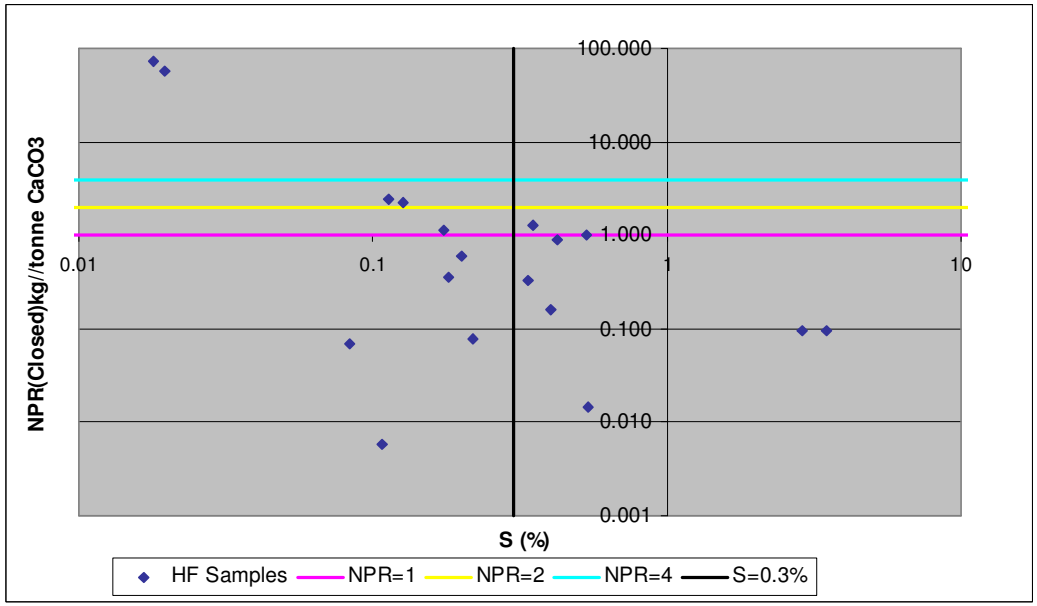
Hornfels

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur

(Note that seven samples plotted with negative NPR values. Three of these samples recorded Sulphide-sulphur values above 0.3%).



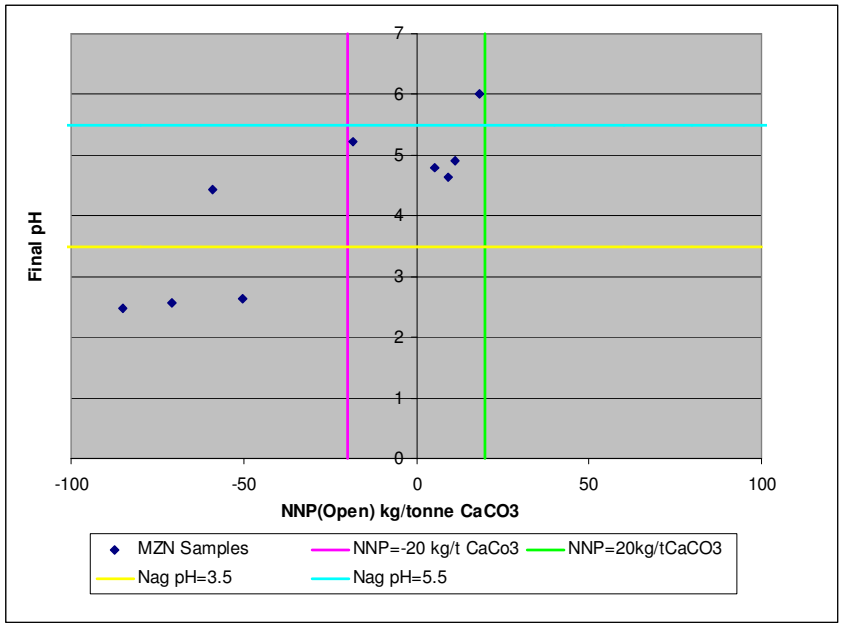
Open System



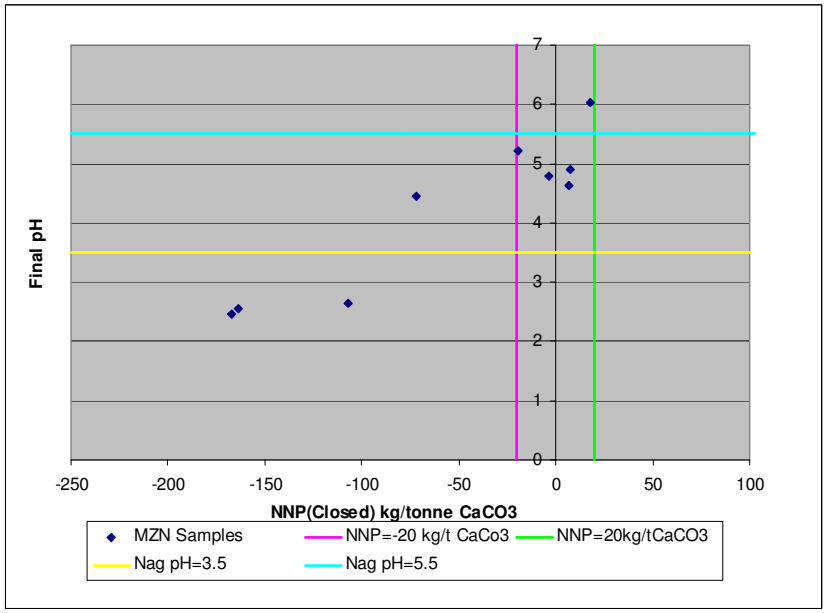
Closed System

Marginal Zone Norite

Net Neutralising Potential (NNP) vs Final pH



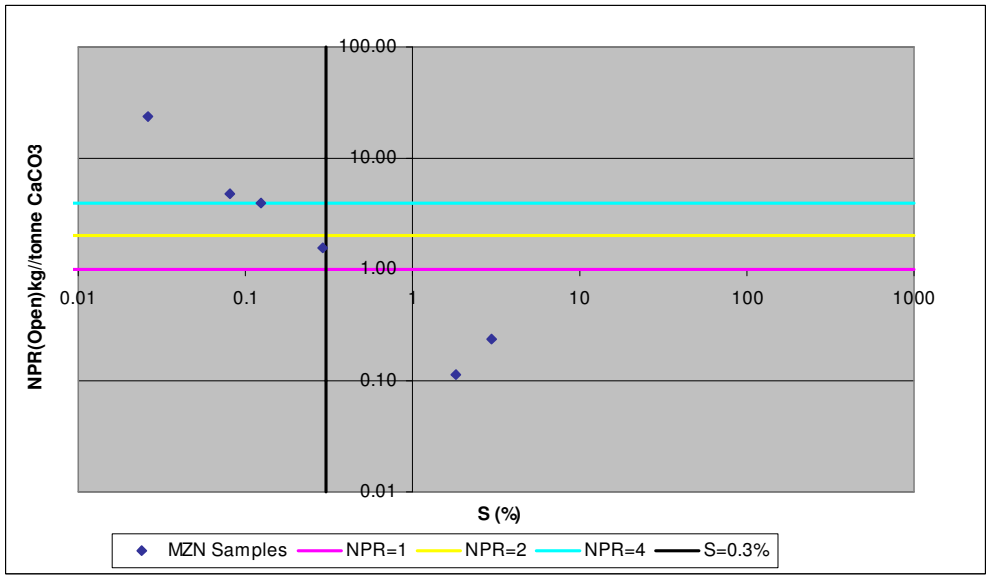
Open System



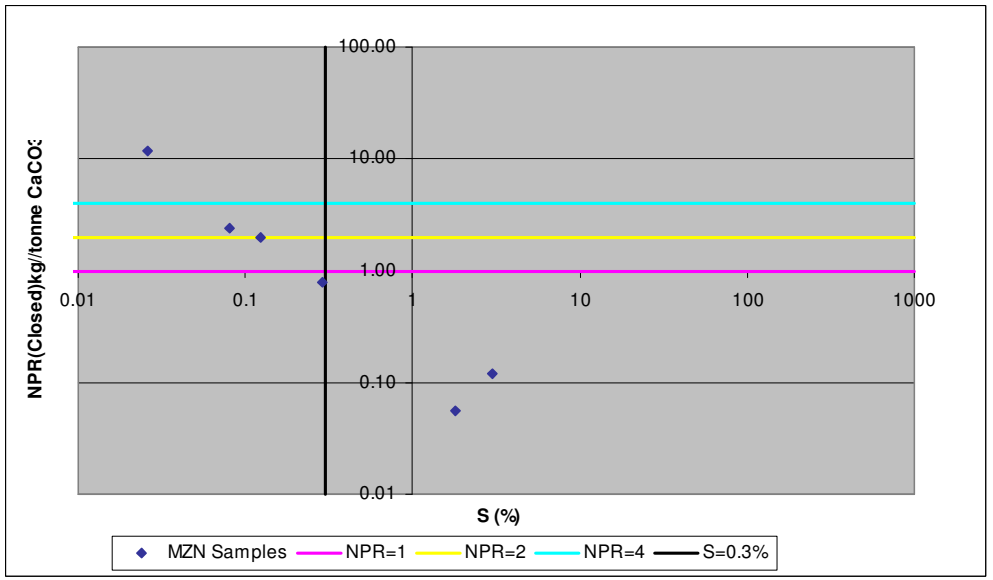
Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur

(Note that three samples plotted with negative NPR values. Two of these samples recorded Sulphide-sulphur values above 0.3%).



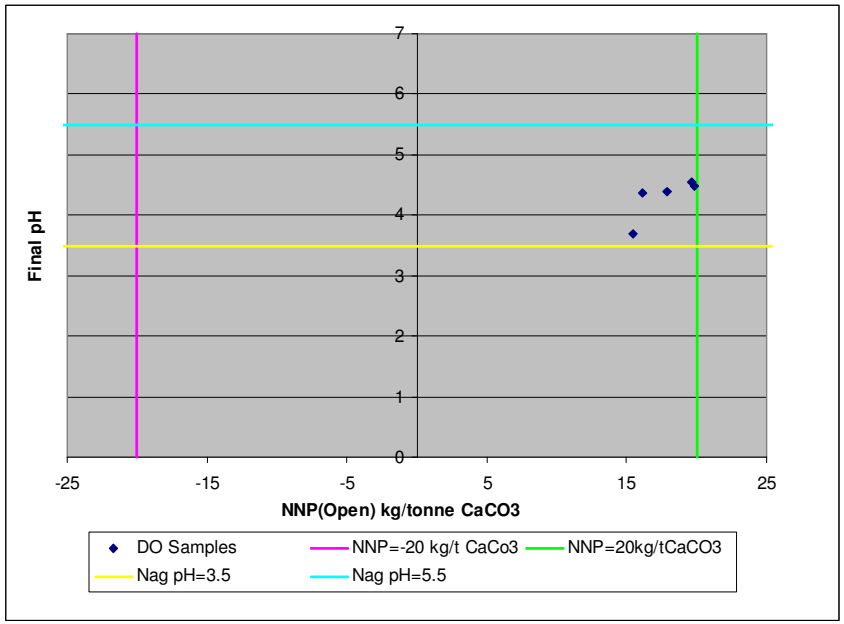
Open System



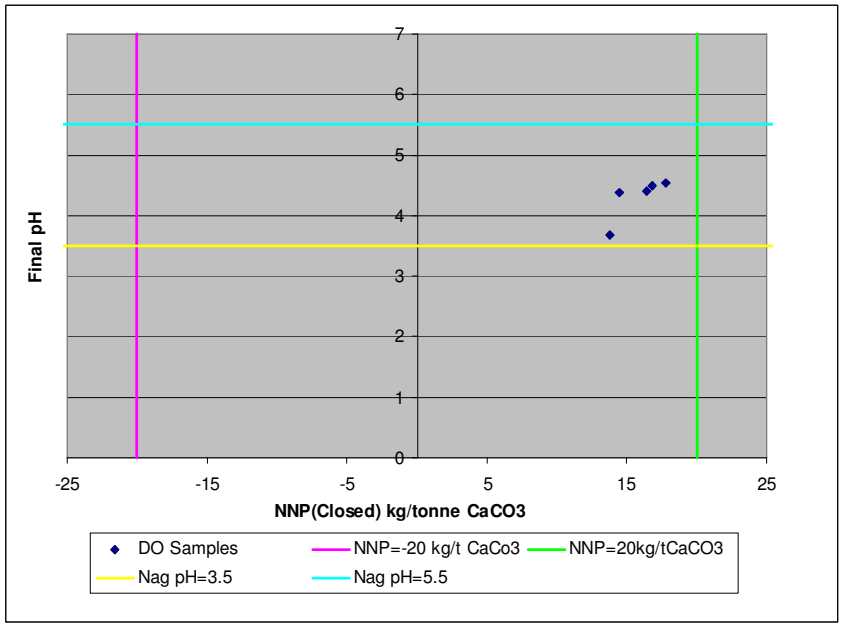
Closed System

Dolerite

Net Neutralising Potential (NNP) vs Final pH

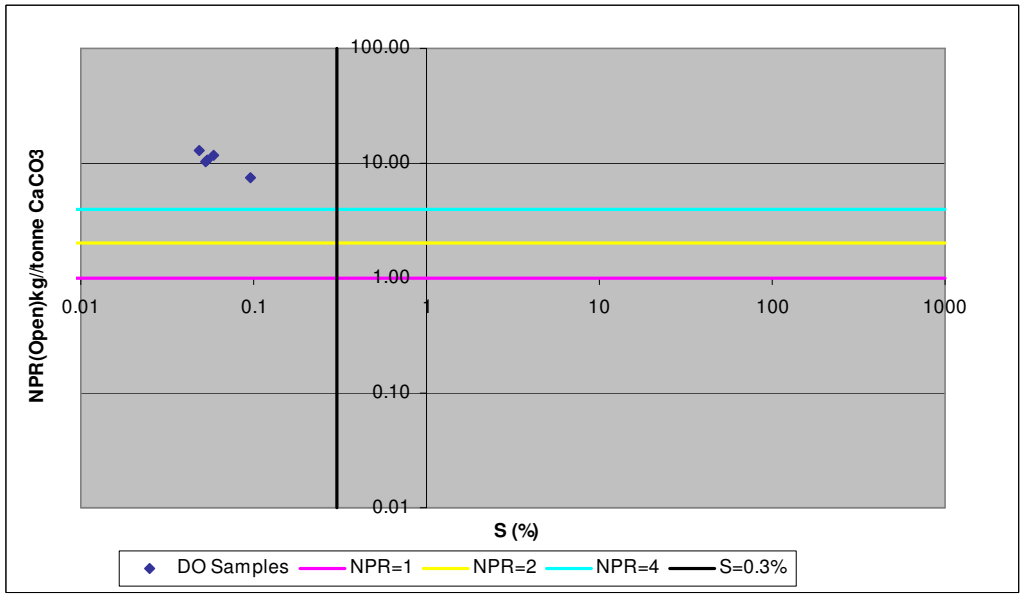


Open System

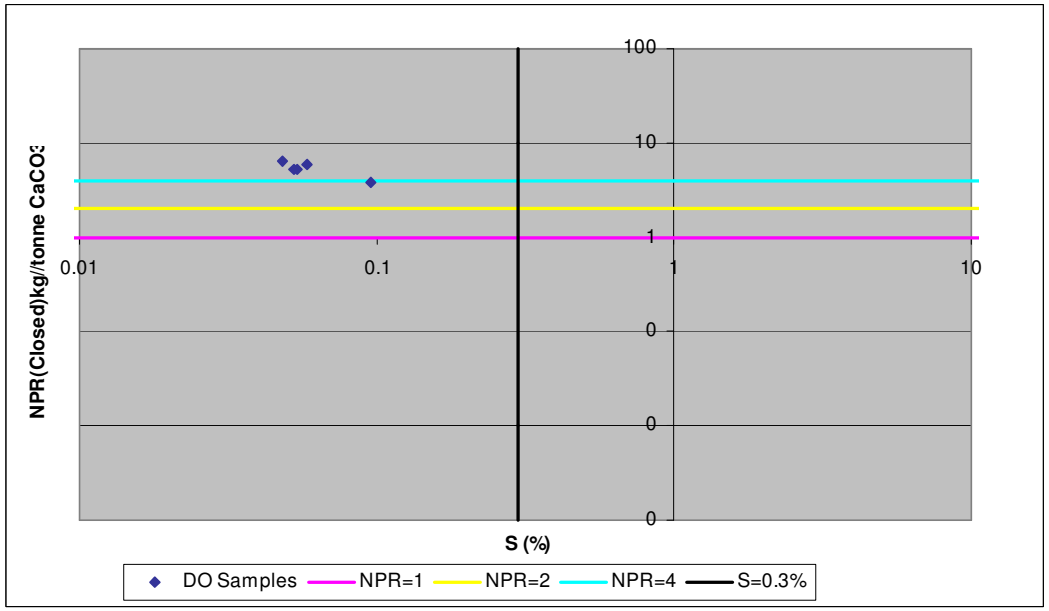


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



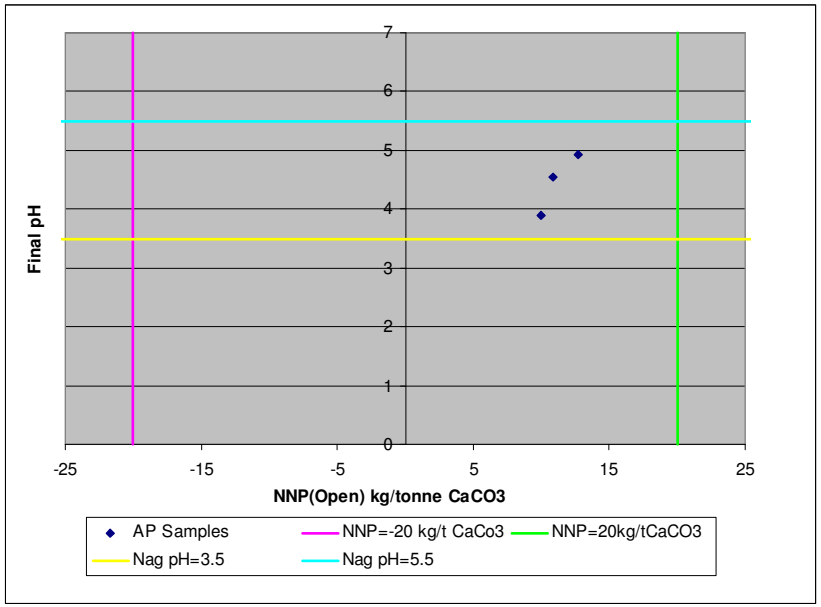
Open System



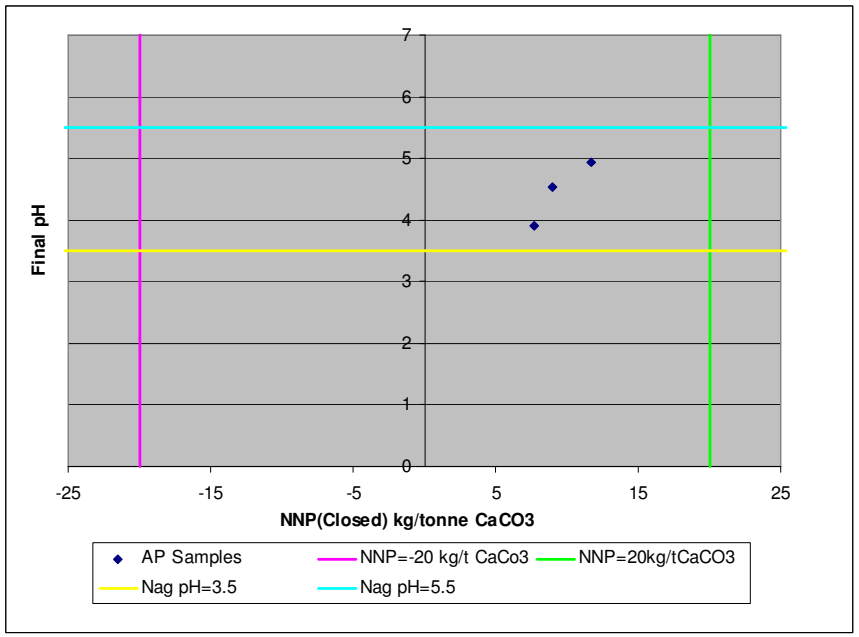
Closed System

Aplite

Net Neutralising Potential (NNP) vs Final pH

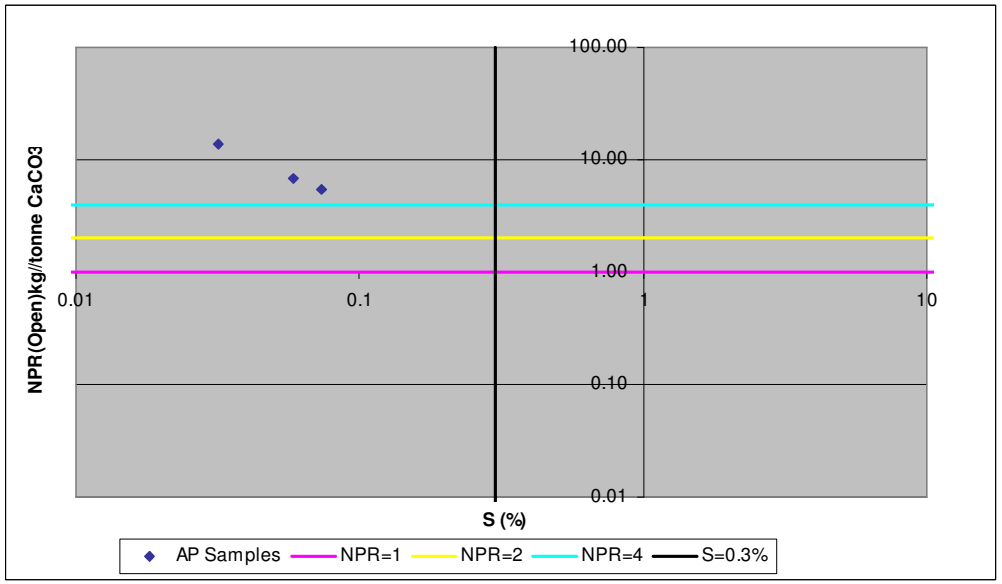


Open System

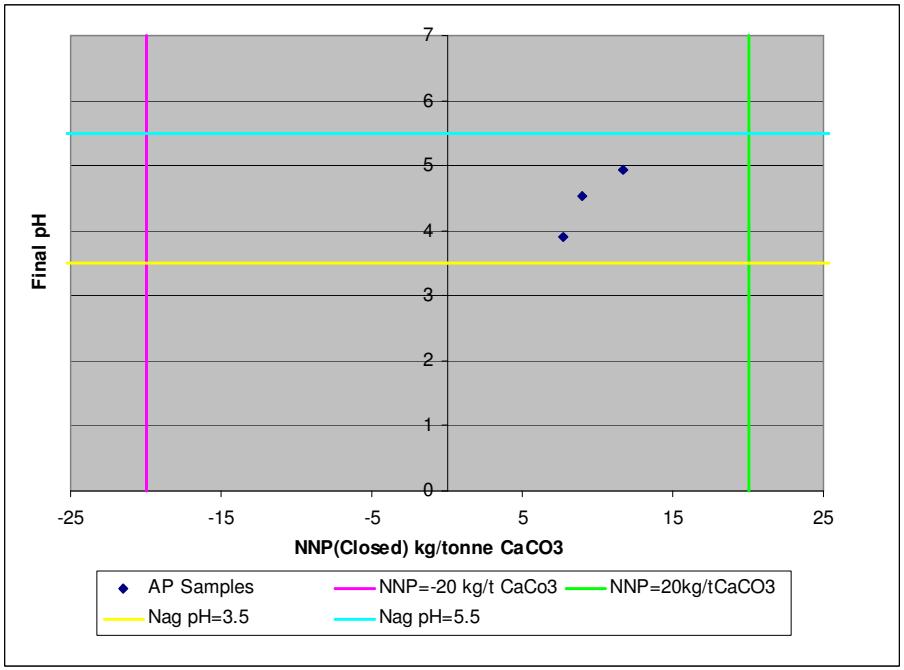


Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur



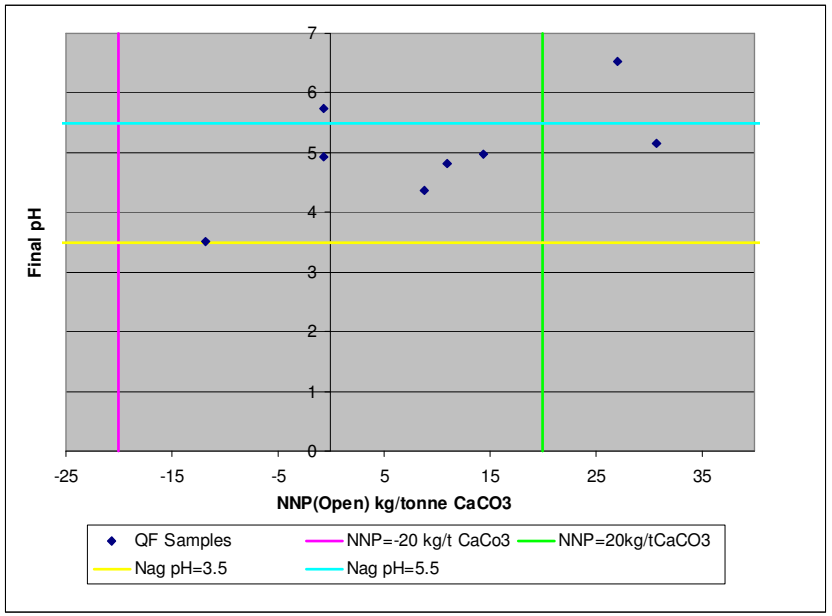
Open System



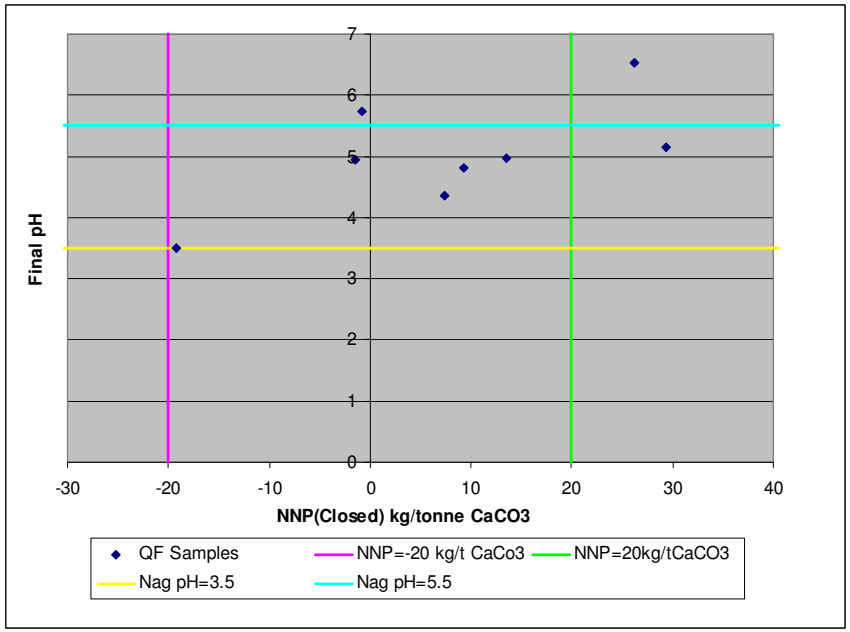
Closed System

Quartz Feldspar

Net Neutralising Potential (NNP) vs Final pH



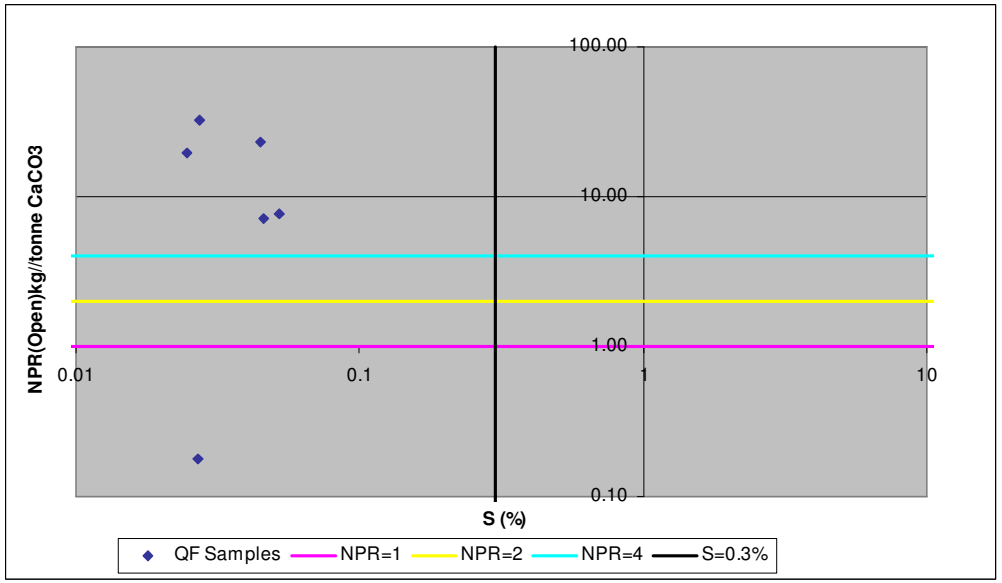
Open System



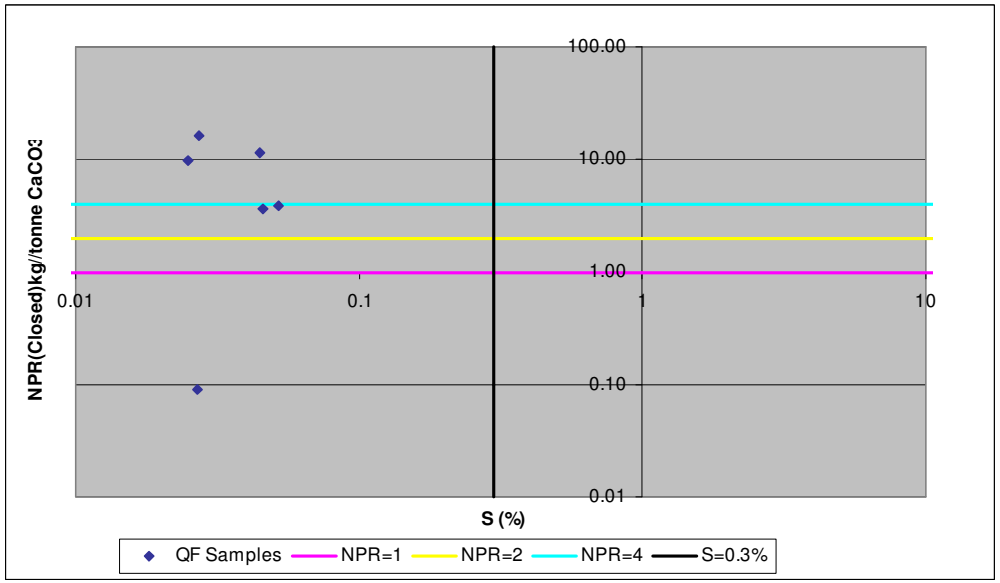
Closed System

Neutralising Potential Ratio (NPR) vs Sulphide-Sulphur

(Note that two samples plotted with negative NPR values. Both of these samples recorded Sulphide-sulphur values less than 0.3%).



Open System

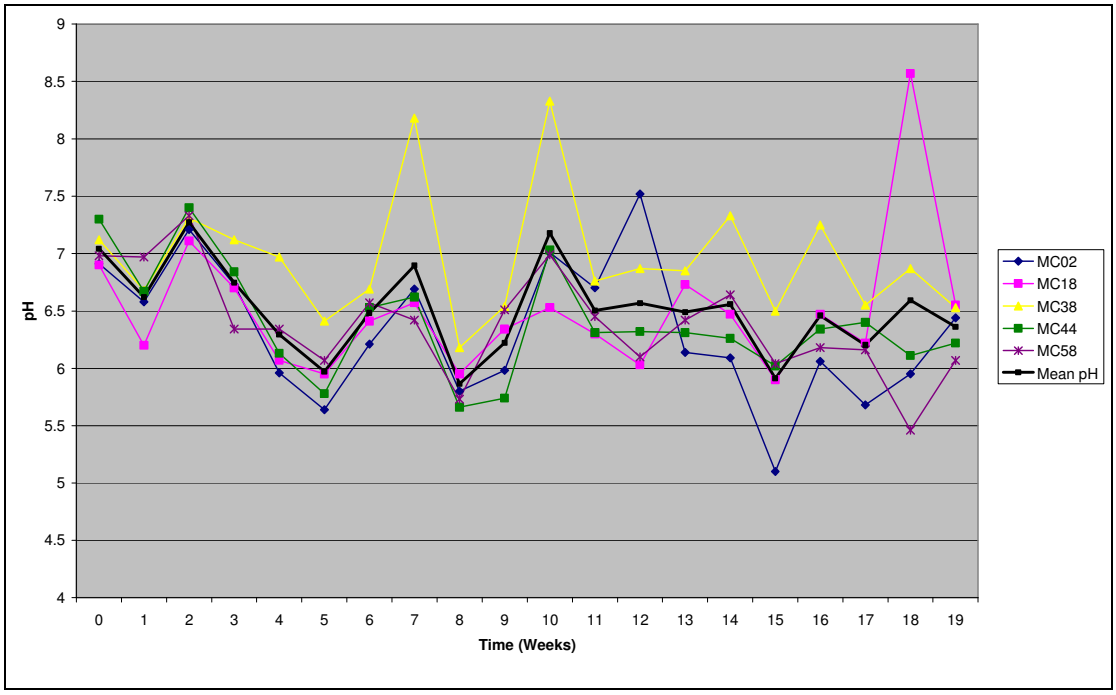


Closed System

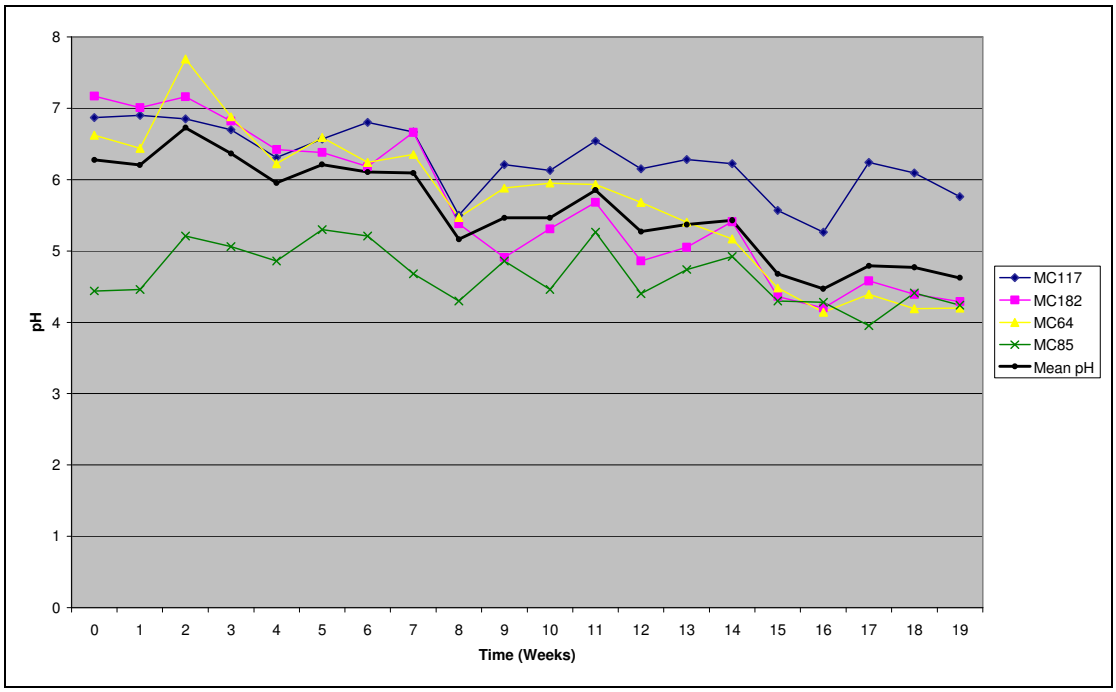
APPENDIX 15:

Kinetic Sample Test Results

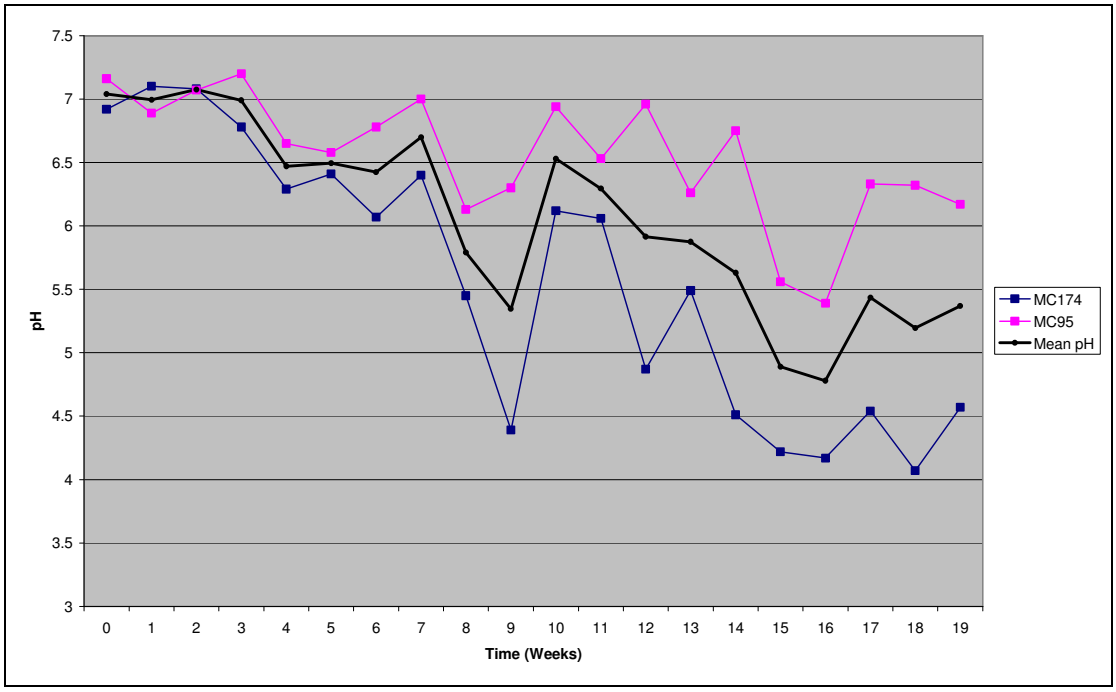
Kinetic Sample Test Results: Changes in pH over time



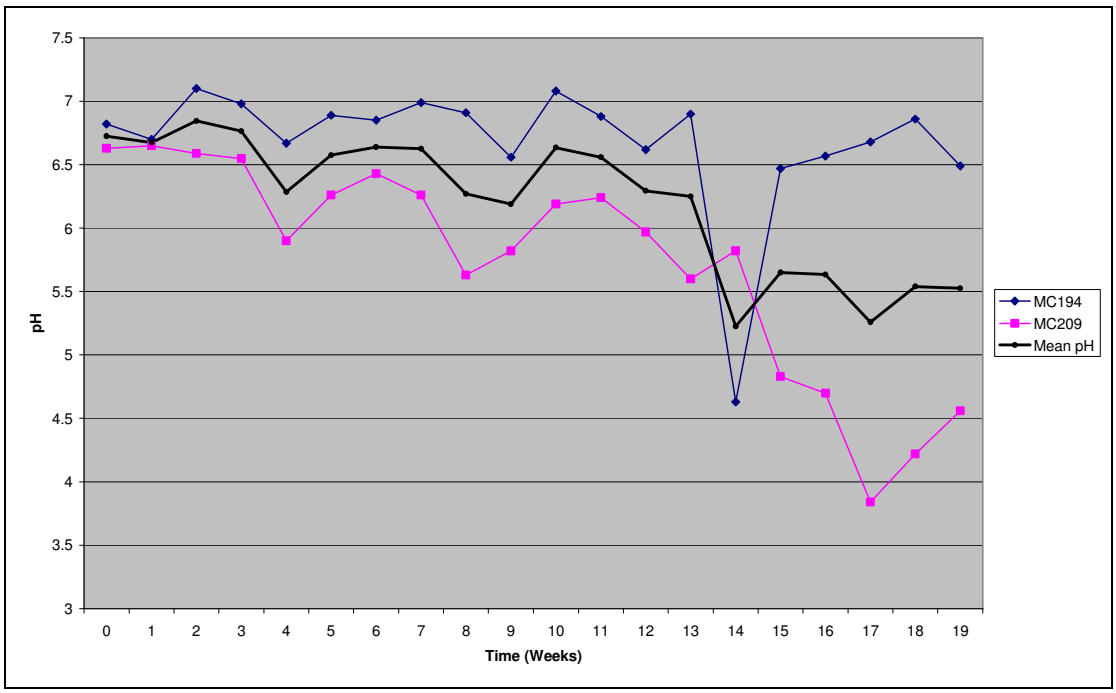
Gabbro Norite



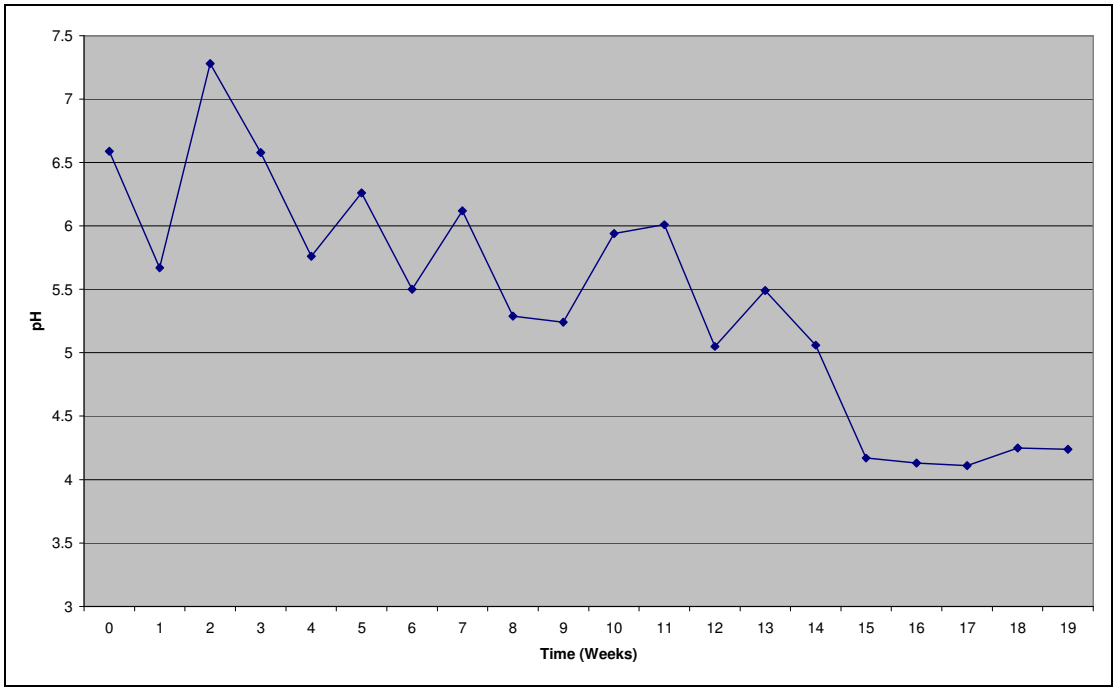
Hornfels



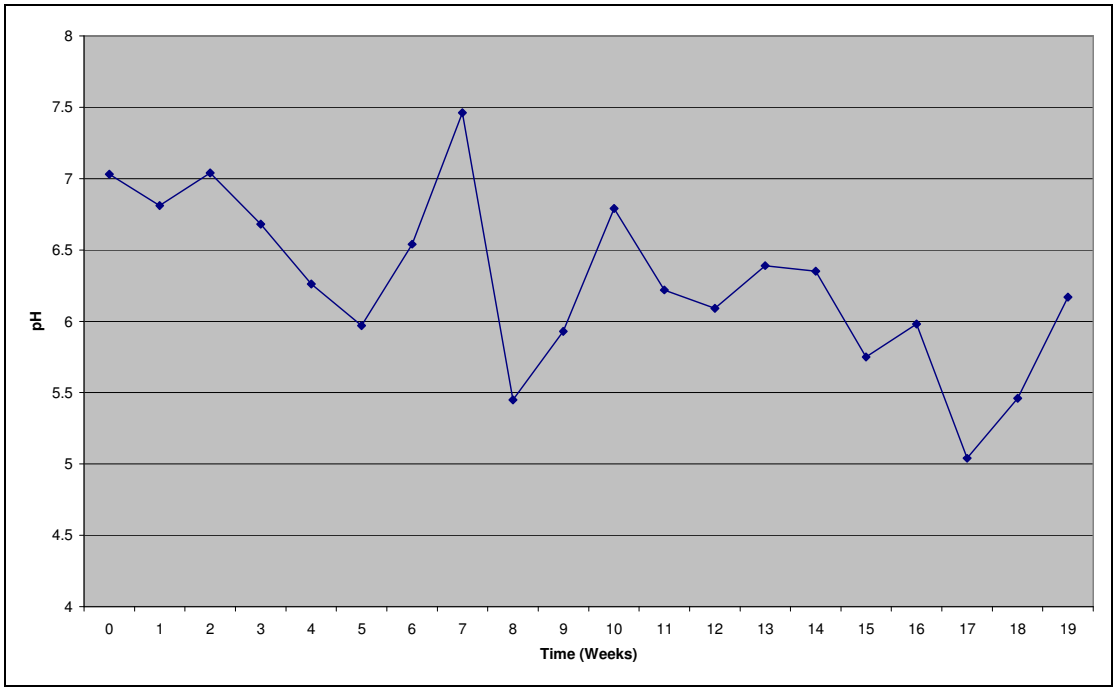
Dolomite



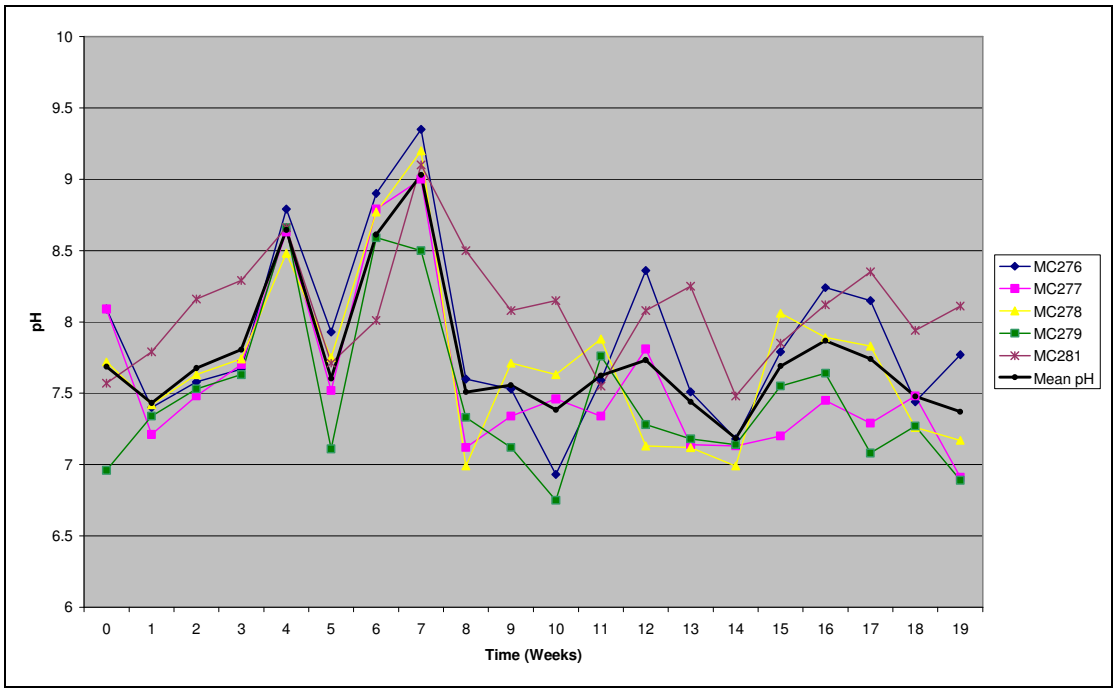
Quartzite



Melanorite



Feldspathic Pyroxenite


10
9.5
9
8.5
8
7.5
7
6.5
6
pH
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Time (Weeks)
MC276
MC277
MC278
MC279
MC281
Mean pH

Tailings

APPENDIX 16:

Non-Acid Generating/Potentially Acid Neutralizing Rock Types

Non-acid generating/Potentially acid neutralizing rock types									
Lithology	**Number of Samples taken**	**Mean NNP(Open)**	**Mean NNP(Closed)**	**Mean Final pH**	**Mean %S and NPR (Open)**	**Mean %S and NPR (Closed)**	**Std Deviation**	**Sample Results**	**Estimated Tonnes ($x10^6$) To Dump**
GN	**42**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>5.5 Non-acid generating	<0.3% Sulphide - S >4 NPR Low probability of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation	Relatively High	In both open and closed systems, 95% samples with NNP results and Final pH results indicating the samples as potentially non-acid generating to low risk acid generating. Only 5% of samples had NNP results indicating potentially acid generating, and the Final pH results did not support this.	2000
MA	**7**	Mean NNP>20 Material may neutralise acid produced	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>5.5 Non-acid generating	<0.3% Sulphide - S >4 NPR Low probability of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation			19.1
SP	**10**	Mean NNP >>20 Material may neutralise acid produced	Mean NNP > 20 Material may neutralise acid produced	>5.5 Non-acid generating	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation			
DM	**11**	Mean NNP > >20 Strong ability to neutralise acid produced	Mean NNP > >20 Strong ability to neutralise acid produced	>5.5 Non-acid generating	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation	Relatively Very High	In both Open and Closed systems, 64% samples with NNP results and Final pH results indicating the samples as potentially non-acid generating. 36% samples with NNP(Open) and Final pH results indicating the samples as potentially low to high acid producing.	39.2

APPENDIX 17:

Low-Risk Acid Producing Rock Types

Low-risk acid producing rock types									
LITH	**Number of Samples taken**	**NNP(Open)**	**NNP(Closed)**	**Final pH**	**%S and NPR (Open)**	**%S and NPR (Closed)**	**Std Deviation**	**Sample Results**	**Estimated Tonnes ($x10^6$) To Dump**
DO	**5**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation			9.8
QF	**8**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation	<0.3%; NPR,4 Inconclusive Probability of Acid Generation			
AP	**3**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	<0.3% Sulphide - S >4 NPR Low probability of acid generation	<0.3%; NPR,4 Inconclusive Probability of Acid Generation			8.8
PX	**16**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	>0.3%; > NPR 1(2) Inconclusive Probability of Acid Generation	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation			

APPENDIX 18:

High-Risk Acid Producing Rock Types

High-risk acid producing rock types									
LITH	**Number of Samples taken**	**NNP(Open)**	**NNP(Closed)**	**Final pH**	**%S and NPR (Open)**	**%S and NPR (Closed)**	**Std Deviation**	**Sample Results**	**Estimated Tonnes ($x10^6$) To Dump**
PGN	**15**	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	Mean NNP < -20 Potential to generate acid.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation			
MN	**22**	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	Mean NNP < -20 Potential to generate acid.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation			
NC	**21**	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation			
FPX	**23**	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation			
HF	**25**	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	Mean NNP < -20 Potential to generate acid.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation	Relatively High	72% samples (Open system) and 64% (Closed system) with NNP results and Final pH results indicating the samples as potentially non-acid generating to low risk acid generating. 28% samples (Open system) and 36% samples (Closed system) with NNP(Open) and Final pH results indicating the samples as potentially low to high acid producing.	
MZN	**9**	Mean NNP < -20 Potential to generate acid.	Mean NNP < -20 Potential to generate acid.	>3.5<5.5 Low risk of acid generation	>0.3%; NPR<1 High probability of acid generation	>0.3%; NPR<1 High probability of acid generation	Relatively High	56% samples (Open and Closed system) with NNP results and Final pH results indicating the samples as potentially non-acid generating to low risk acid generating. 44% samples (Open and Closed system) with NNP(Open) and Final pH results indicating the samples as potentially low to high acid producing.	

APPENDIX 19:

Rock types with Inconclusive Acid Producing Potential

Rock types with inconclusive acid producing potential									
Lithology	**Number of Samples taken**	**Mean NNP(Open)**	**Mean NNP(Closed)**	**Mean Final pH**	**Mean %S and NPR (Open)**	**Mean %S and NPR (Closed)**	**Std Deviation**	**Sample Results**	**Estimated Tonnes ($x10^6$) To Dump**
LN	**9**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	-20 <Mean NNP < 0 Potential to generate acid. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	>3.5<5.5 Low risk of acid generation	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation	>0.3%; NPR<1 High probability of acid generation			
Q	**5**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	<3.5 High risk of acid generation	<0.3% NPR<1 Inconclusive Probability of Acid Generation	<0.3% NPR<1 Inconclusive Probability of Acid Generation			45.8
PFPX	**11**	0< Mean NNP < 20 Potential to neutralise acid produced. Acid producing potential considered Inconclusive and other criteria should be used to confirm acid generation status.	Mean NNP < -20 Potential to generate acid.	>3.5<5.5 Low risk of acid generation	>0.3%; > NPR 1 Inconclusive Probability of Acid Generation	>0.3%; NPR<1 High probability of acid generation			

APPENDIX 20:

Relative Abundance and Weighted Mean Percent Sulphur of Rock Types Projected to Occur in Platreef Material and Waste Rock Piles in the Region to be Mined Initially at the Platreef Project

Turfspruit Platreef East

Table 1: Weighted Volume of Proposed Platreef East Material

Stratigraphy	Lithology	Relative Abundance (Percent)	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Platreef	Pegmatitic Gabbro-Norite	2.1	0.91	0.0190
	Leuconorite	1.3	1.21	0.0156
	Melanorite	1.04	0.99	0.0103
	Norite Cycles	1.92	0.59	0.0112
	Pyroxenite	3.53	0.52	0.0183
	Feldspathic Pyroxenite	30.05	0.69	0.2080
	Pegmatitic Feldspathic Pyroxenite	0.29	1.18	0.0034
	Serpentinite	4.65	0.74	0.0342
Xenoliths	Marginal Zone Norite	1	1.74	0.0175
	Hornfels	0.78	1.08	0.0085
Total				**0.346**

Table 2: Weighted Volume of Proposed Platreef East Waste Rock Pile

Stratigraphy	Lithology	Relative Abundance (Percent)	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Hanging Wall	Gabbro-Norite	2.63	0.05	0.0012
	Mottled Anorthosite	0.56	0.08	0.0004
Footwall	Dolomite	9.30	3.41	0.3177
	Quartzite	15.85	1.08	0.1718
	Marginal Zone Norite	9.41	1.74	0.1636
	Hornfels	5.33	0.22	0.0117
Intrusions	Dolerite	0	N/A	N/A
	Quartz Feldspar	2.04	0.05	0.0011
	Aplite	0	N/A	N/A
Total				**0.6676**

Turfspruit Central Platreef

Table 3: Weighted Volume of Proposed Platreef Central Tailings Material

Stratigraphy	Lithology	Relative Abundance (Percent)	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Platreef	Pegmatitic Gabbro-Norite	3.42	0.91	0.0310
	Leuconorite	1.42	1.21	0.0171
	Melanorite	4.94	0.99	0.0488
	Norite Cycles	9.34	0.59	0.0546
	Pyroxenite	0	N/A	N/A
	Feldspathic Pyroxenite	32.30	0.69	0.2236
	Pegmatitic Feldspathic Pyroxenite	0	1.18	0
	Serpentinite	5.61	0.74	0.0413
Xenoliths	Marginal Zone Norite	2.31	1.74	0.0401
	Hornfels	6.00	1.08	0.0650
Total				**0.5216**

Table 4: Weighted Volume of Proposed Platreef Central Waste Rock Pile

Stratigraphy	Lithology	Relative Abundance (Percent)	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Hanging Wall	Gabbro-Norite	6.45	0.05	0.0030
	Mottled Anorthosite	0.00	0.08	0.0000
Footwall	Dolomite	7.52	3.41	0.2567
	Quartzite	1.17	0.22	0.0026
	Marginal Zone Norite	4.35	1.74	0.0756
	Hornfels	7.86	1.08	0.0852
Intrusions	Dolerite	0	N/A	N/A
	Quartz Feldspar	0.22	0.05	0.0001
	Aplite	0	N/A	N/A
Total				**0.4233**

Turfspruit West Platreef

Table 5: Weighted Volume of Proposed Platreef West Tailings Material

Stratigraphy	Lithology	Relative Abundance (Percent)	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Platreef	Pegmatitic Gabbro-Norite	0.62	0.91	0.0056
	Leuconorite	1.69	1.21	0.0204
	Melanorite	5.58	0.99	0.0552
	Norite Cycles	3.16	0.59	0.0185
	Pyroxenite	0.68	0.52	0.0036
	Feldspathic Pyroxenite	10.53	0.69	0.0729
	Pegmatitic Feldspathic Pyroxenite	0	N/A	N/A
	Serpentinite	5.58	0.74	0.0411
Xenoliths	Marginal Zone Norite	0.99	1.74	0.0173
	Hornfels	6.56	1.08	0.0711
Total				**0.3055**

Table 6: Weighted Volume of Proposed Platreef West Waste Rock Pile

Stratigraphy	Lithology	Relative Abundance	Mean Percent Sulphur	Weighted Mean Percent Sulphur
Hanging Wall	Gabbro-Norite	17.34	0.05	0.0081
	Mottled Anorthosite	0.14	0.08	0.0001
Footwall	Dolomite	2.82	3.41	0.0964
	Quartzite	0.07	0.22	0.0002
	Marginal Zone Norite	1.35	1.74	0.0235
	Hornfels	21.02	1.08	0.2278
Intrusions	Dolerite	0	N/A	N/A
	Quartz Feldspar	2.65	0.05	0.0014
	Aplite	0	N/A	N/A
				0.3576