australasian
(iron & steel) slag
association

Australasian (iron and steel) Slag Association Inc.

Material Classification (Iron and Steel Slag) Monitoring Program 2008/9

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Prepared by
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Glossary

Term	***Definition***
AS	Australian Standard
ASA	Australasian (iron & steel) Slag Association
Chain of Custody (COC)	Documentation which accompanies samples to reduce the potential for loss or erroneous labelling or analysis reporting
DECC	Department of Environment and Climate Change of New South Wales replaced the Environment Protection Authority (EPA) and National Parks and Wildlife Service (NPWS) and Resource NSW.
EQL	Estimated Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The EQL is generally 2 to 5 times the Method of Detection Limit (MDL).
ISO	International Standards Organisation
Leachate	The water solution containing the released substance.
mg/kg	Milligrams per kilogram or 1×10^{-6} (i.e. one in one-million)
mg/L	Milligrams per litre or 1×10^{-6} (i.e. one in one-million)
ug/l	Micrograms per litre or 1×10^{-9} if fluid is assumed to be density of 1mg/mL
NATA	National Association of Testing Authorities
ng/g	Nanograms per gram or 1×10^{-9} (i.e. one in one-thousand-million)
QA / QC	Quality Assurance / Quality Control
SCC	Specific Chemical Concentration
TCLP	Toxicity Characteristic Leaching Procedure – a method of determining the release of a substance via exposure to water solution.
TM	Total Metals analysis - absolute maximum average. Report as mg/kg dry weight
TM (Chara)	Total Metals limit reported for characterisation or once-off tests as specified by DECC approval for a minimum of 20 separate composite samples
TM (Routine)	Total Metals limit reported for routine testing as specified by DECC approval for a minimum of 5 composite samples each 6 months

TM (Max)	Maximum Total Metals limit reported for any single composite sample analysis result as specified by DECC approval.
USEPA	United States Environment Protection Agency

Executive Summary

The Australasian (iron & steel) Slag Association (ASA) annually undertakes an Environmental Monitoring Program (EMP) to monitor and assess iron and steel slags (ISS) produced and processed by its members.

Initiated in 2005, this annual program was established as a response to some of the recommendations outlined in the "*Material Classification of Iron and Steel Slag By-product Waste Classification Investigation Report 2004",* ultimately to establish an annual monitoring program to ensure that the ISS products generated, processed and marketed by its members are assessed annually.

In previous EMP studies, the ASA adopted the "Specified Acceptance Criteria" outlined in the NSW Environmental Protection Authority's (EPA) *Environmental Guidelines*[1], for the purposes of classifying wastes as either 'hazardous', 'industrial, 'solid' or 'inert'. In order to classify as 'inert', ISS products were required to satisfy Total Metal concentrations within the specified "inert" threshold limits.

During the course of 2008, the DECC undertook to simplify the requirements for waste management and accordingly, the relevant regulations. Amendments to the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Waste) Regulation 2005* took effect on 28 April 2008. These changes, made under the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008*, follow extensive consultation during 2007 with industry, organisations and the broader community.

The amendments essentially introduce an "exemption" process to allow for the reclassification of wastes, to promote resource recovery. The 2008 EMP study has adopted this methodology, although at the time, still in draft form;

The steel furnace slag exemption,

The electric arc furnace slag exemption and

The blast furnace slag exemption

collectively referred to as ('the *Exemption* guidelines')[2].

This report assessed a total of seventy two (72) ISS samples collected from Australian Steel Mill Services, BlueScope Steel, HiSmelt Corporation, OneSteel (Whyalla, Rooty Hill and Waratah), MultiServ and New Zealand Steel.

[1] NSW EPA (1999). Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes. EPA 99/21. Sydney, NSW, Australia, Environment Protection Authority.

[2] Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: Draft - The blast furnace slag exemption 2008; Draft – The steel furnace slag exemption 2008; Draft - The electric arc furnace slag exemption 2008

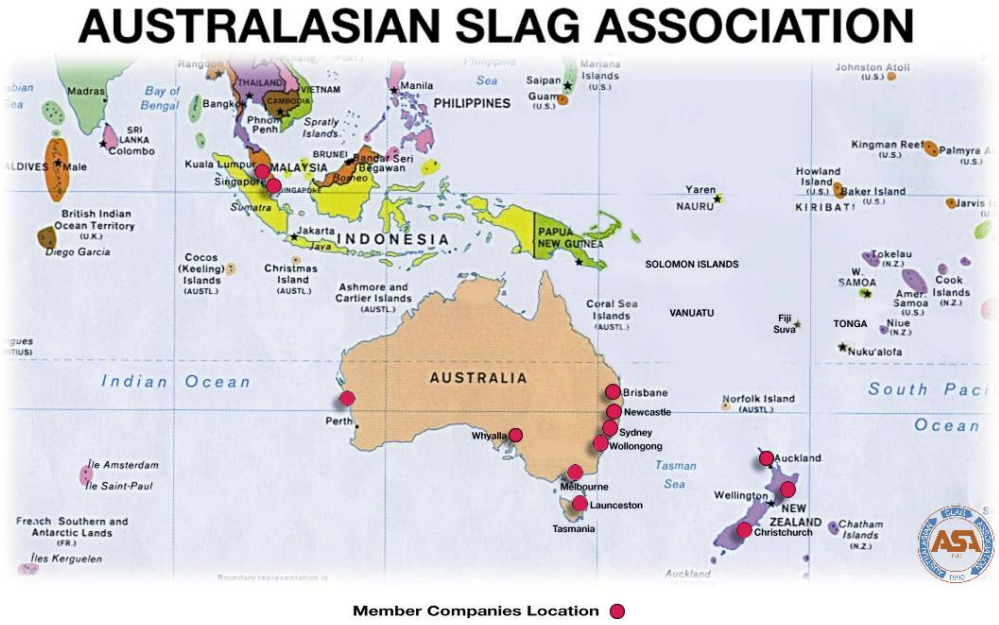
The ISS samples were co-products of metallurgical processes, namely Iron Blast Furnace Slag (BFS), Steel Furnace Slag (SFS), Electric Arc Furnace Slag (EAFS), Sinter Slag Fines, Melter Slag and KOBM Slag.

Based on the acceptance criteria established in the *Exemptions*, each of the following products would be considered as follows;

- Granulated Blast Furnace Slag ***(Exempt)***
- Blast Furnace Slag – Air-cooled aggregates ***(Exempt)***
- Blast Furnace Slag – Air-cooled fines ***(Exempt)***
- Steel Furnace Slag – Air-cooled aggregates ***(Exempt)***
- Steel Furnace Slag – Air-cooled fines ***(Exempt)***
- Electric Arc Furnace Slag – Air-cooled aggregates ***(Exempt)***
- Electric Arc Furnace Slag – Air-cooled fines ***(Exempt)***
- Sinter Slag Fines ***(Not Exempt)***
- Melter Slag ***(Exempt)***
- KOBM Slag ***(Exempt)***

These results when compared against the *Exemption* guidelines and previous studies confirm the stable and ongoing consistent nature of ISS from member sites.

Figure 1 Distribution of Members



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1 Introduction

Building on the capstone Research and Development Program conducted in 2004, responsible for the publication of the *"Material Classification of Iron and Steel Slag By-product Waste Classification Investigation Report 2004"*, the Australasian (iron & steel) Slag Association (ASA) implemented one of the key recommendations arising from the report, namely, for an ongoing monitoring program of the of iron and steel slags (ISS) produced and processed by its members.

> *Extract*
>
> *8.1 Development of an [Environmental] Monitoring Program*
>
> *The ASA to develop and manage an ongoing collection, testing and monitoring program with the assistance of its members.*

This Environmental Monitoring Program (EMP) report represents the third assessment conducted by ASA, consistent with the above recommendation, for ongoing monitoring of ISS generated, processed and sold by its members.

1.1 Iron and Steel Slag Classification System

In previous studies, and EMP reports, the NSW Environmental Protection Authority's (EPA) *Environmental Guidelines*[3] have been a useful aid in established standardise methodology for distinguishing concentrations of substances and their mobility behaviour, and in determining the classification of wastes.

The *Environmental Guidelines*, do not operate as exemptions per se. The Guidelines rather serve to classify assessed materials which meet these requirements from the waste reporting requirements. Nevertheless, they have provided for a sound, consistent basis for characterisation under extreme assessment conditions.

During the course of 2008, the DECC undertook to simplify the requirements for waste management and accordingly, subordinate regulations. The amendments are designed to streamline waste licensing and regulation and better promote resource recovery – to which our industry has advocated and encouraged over many years to the DECC and its predecessors.

Amendments to the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Waste) Regulation 2005* took effect on 28 April 2008. These changes, made under the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008*, follow extensive consultation during 2007 with industry, various organisations and the broader community.

Amendments of particular interest to our industry are summarised below:

[3] NSW EPA (1999). Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes. EPA 99/21. Sydney, NSW, Australia, Environment Protection Authority.

- Fewer and simpler licensing categories for waste
- A streamlined waste classification system
- New resource recovery licensing categories and resource recovery exemptions
- *Exemption* guidelines providing the process for determination of the waste classification, including analytical tables, which indicate the acceptable concentrations of contaminants in the waste.

Resulting from the above changes, aspects of this report has been amended to reflect proposed *Exemption*[4] requirements for iron and steel slag, in particular materials collected under this program have been assessed in section 4 using these draft *Exemption* requirements – regardless of the source jurisdiction of samples.

1.2 Objective of Scope of Work

The object of the EMP is to collect, analyse, assess and report on the chemical concentration and leachability "potential" assessed against the *Exemption* requirements for Steel Furnace Slag [including sinter slag fines] (SFS), Electric Arc Furnace Slag (EAFS), Blast Furnace Slag (BFS) Melter Slag[5] (MS) and KOBM Slag[6].

The aim of the EMP is **NOT** to replace or undertake by proxy, generator, processor and or consumer responsibilities under the respective legislation, or to replace specific environmental licence requirements to be met by the respective holders. Rather, the study aims to have a nationally-maintained and annually-updated central database on the chemical concentration and leachability potential of ISS, which supplements member data. Accordingly, the data from these reports should not be solely relied upon to replace member responsibilities as outlined above.

The secondary aim is to monitor the ongoing stable and consistent nature of these respective metallurgical processes and resulting products.

The chemical characteristics of several types of metallurgical slags will be examined, these being: Iron Blast Furnace Slag (BFS), Steel Furnace Slag (SFS), Electric Arc Furnace Slag (EAFS), Melter Slag (MS) and KOBM Slag (KOBMS).

[4] Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: Draft - The blast furnace slag exemption 2008; Draft – The steel furnace slag exemption 2008; Draft - The electric arc furnace slag exemption 2008

[5] NOTE: Melter slag is produced in New Zealand, but has been assessed, along with ISS from other jurisdictions, against the exemption requirements for illustrative purposes.

[6] NOTE: KOBM slag is produced in New Zealand, but has been assessed, along with ISS from other jurisdictions, against the exemption requirements for illustrative purposes.

1.3 Material Selection & Sample Identification

The following table sets out the sample identification coding system used to identify each specific iron and steel slag product assessed and total number of samples, being seventy two (72), in this report.

Product Description	Sample Identification range	Number of samples
Granulated Blast Furnace Slag	101 – 103	3
Blast Furnace Slag – Air cooled aggregates	201 – 209	9
Blast Furnace Slag – Air cooled fines	301 – 309	9
Steel Furnace Slag – Air cooled aggregates	401 – 406	6
Steel Furnace Slag – Air cooled fines	501 – 506	6
Electric Arc Furnace Slag – Air cooled aggregates	601 – 618	18
Electric Arc Furnace Slag – Air cooled fines	701 – 715	12
Sinter Slag Fines	801 – 803	3
Melter Slag	901 – 903	3
KOBM Slag	904 – 906	3

1.4 Material Processes

Each metallurgical ISS type can be processed into various physical forms. For example, molten slag material can be poured into cooling pits and allowed to solidify like natural basaltic rock. This solid rock material, when cooled, can then be processed and crushed into aggregates of various sizes like any natural quarried product. Some processes, such as the manufacture of Granulated Blast Furnace Slag (GBFS), require the rapid cooling of the molten material with water sprays, and consequently produce different physical characteristics when compared with air-cooled slag.

Attachment 1 provides an explanation for each of the slag manufacturing processes involved.

1.5 Who is Responsible for Classification/Exemption?

The NSW and other state Environment Protection Authorities (e.g. EPA's) generally do not classify wastes. The task of determining classification is essentially the responsibility of the generators. The generator determines waste classifications according to State requirements.

For NSW, generators are responsible for the assessment using the *Exemption* requirements. Once the material is deemed to meet these requirements, the material is exempt from waste reporting, monitoring and associated levies under section 88 of the Act[7].

Responsibility to assess the material imposes an additional burden on the generator, who is required to not only demonstrate diligence in, but prove the reliability of, the monitoring of co-product stream quality.

To assess the waste, the *Exemption* prescribes a process which:

- Qualitatively describes the sampling techniques and numbers of samples;
- Establishes chemical thresholds
- Methods for analysing contaminant concentration;
- Assesses concentrations in both Total and Available (leachable) forms.

As noted above, this report is not intended to replace generators' responsibility to determine the classification or exemption status of their respective co-products. However, should generators choose to rely on data within this report, they should satisfy themselves with regards to the accuracy, limitations (samples assessed – *n*) of the study.

2 Sampling and Analysis Procedures

2.1 Site Sampling Procedures

Slag co-product samples were taken in accordance with the following standards:

- AS 1199 Sampling procedures and tables for inspection by attributes
- AS 1399 Guide to AS 1199
- AS 1141.3.1 – Methods for Sampling and Testing Aggregates 1996 (Method 3.1- Sampling Aggregates: Section 6.9 - Sampling from Stockpiles)

A Chain of Custody (COC) form was completed and despatched with the samples.

2.2 Samples (n) collected

The Association centrally coordinated the collection of seventy two (72) samples from member sites throughout Australia and New Zealand. The

[7] Protection of the Environment Operations Act 1997

geographic distribution of the Association's members is illustrated in Figure 1 (above).

These samples, along with the COC forms, were delivered to LabMark Pty Ltd, a NATA certified laboratory, for analysis.

2.3 Laboratory Procedures

Laboratory procedures for analysis of Total Metals (TM) and Toxicity Characteristic Leaching Procedure (TCLP) were conducted by LabMark Pty Ltd

2.4 Quality Control / Quality Assurance Procedures

The full breakdown of the analytical results for the QA/QC for this analyses are included within the NATA laboratory reports. All were satisfactory.

3 Assessment and Classification Procedures

3.1 The Classification Process

The assessment and classification process was in accordance with the *Exemption* requirements for collected ISS.

4 Comparison of Analytical Results with Environmental Guidelines

4.1 Product Category Assessment Results

Each of the samples were assessed according to the requirements specified by the *Exemption.* Their results, depicted by the arithmetic mean, are reported in the following tables.

4.2 Granulated Blast Furnace Slag Assessment

Granulated Blast Furnace Slag						
Element			**NSW**			
	Mean	Mean	Table 2 values[8]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	10	N/A
B		38.3	N/A	N/A	N/A	N/A
Ba		343.0	N/A	N/A	N/A	N/A
Be		6.7	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		0.5	N/A	N/A	N/A	N/A
Cr		5.0	50	N/A	100	N/A
Cu		1.3	10	10	20	N/A
Hg		0.03	0.5	N/A	1	N/A
Mo		0.5	5	5	10	N/A
Ni		4.0	10	N/A	20	N/A
Pb		1.0	10	N/A	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		0.5	N/A	N/A	N/A	N/A
Zn		6.0	25	25	50	N/A
Mn		2697	N/A	N/A	N/A	N/A
Al		53750	N/A	N/A	N/A	N/A

Sample Identification 101 to 103 (n=3)
As can be seen from this assessment the co-product ***would be considered exempt***.

[8] Draft - The blast furnace slag exemption 2008

4.3 Blast Furnace Slag Aggregate Assessment

Blast Furnace Slag - Air cooled aggregates						
Element			**NSW**			
	Mean	Mean	Table 2 values[9]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	10	N/A
B		32.4	N/A	N/A	N/A	N/A
Ba		269.8	N/A	N/A	N/A	N/A
Be		6.3	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		0.5	N/A	N/A	N/A	N/A
Cr		24.9	50	N/A	100	N/A
Cu		3.1	10	10	20	N/A
Hg		0.03	0.5	N/A	1	N/A
Mo		0.5	5	5	10	N/A
Ni		4.3	10	N/A	20	N/A
Pb		1.0	10	N/A	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		1.5	N/A	N/A	N/A	N/A
Zn		2.5	25	25	50	N/A
Mn		2548	N/A	N/A	N/A	N/A
Al		51067	N/A	N/A	N/A	N/A

Sample Identification 201 to 209 (n=9)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[9] Draft - The blast furnace slag exemption 2008

4.4 Blast Furnace Slag Fines Assessment

Blast Furnace Slag - Air cooled fines						
Element			**NSW**			
	Mean	Mean	Table 2 values[10]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	10	N/A
B		30.6	N/A	N/A	N/A	N/A
Ba		273.7	N/A	N/A	N/A	N/A
Be		6.4	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		0.6	N/A	N/A	N/A	N/A
Cr		21.7	50	N/A	100	N/A
Cu		5.4	10	10	20	N/A
Hg		0.03	0.5	N/A	1	N/A
Mo		1.2	5	5	10	N/A
Ni		7.0	10	N/A	20	N/A
Pb		1.0	10	N/A	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		0.6	N/A	N/A	N/A	N/A
Zn		3.1	25	25	50	N/A
Mn		2620	N/A	N/A	N/A	N/A
Al		50056	N/A	N/A	N/A	N/A

Sample Identification 301 to 309 (n=9)
As can be seen from this assessment the co-product ***would be considered exempt***.

[10] Draft - The blast furnace slag exemption 2008

4.5 Steel Furnace Slag Aggregates Assessment

Steel Furnace Slag - Air cooled aggregates						
Element			**NSW**			
	Mean	Mean	Table 2 values[11]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	N/A	N/A
B		25.8	N/A	N/A	N/A	N/A
Ba		41.3	N/A	N/A	N/A	N/A
Be		0.5	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		1.5	N/A	N/A	N/A	N/A
Cr	0.025	503.5	1000	N/A	2000	0.2
Cu	0.025	11.8	20	N/A	40	0.2
Hg		0.29	0.5	N/A	1	N/A
Mo	0.0083	8.0	50	50	100	0.1
Ni		10.8	30	30	60	N/A
Pb		1.3	10	10	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		2.8	N/A	N/A	N/A	N/A
Zn	0.025	27.0	50	50	100	1
Mn		19417	N/A	N/A	N/A	N/A
Al		9850	N/A	N/A	N/A	N/A

Sample Identification 401 to 406 (n=6)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[11] Draft – The steel furnace slag exemption 2008

4.6 Steel Furnace Slag Fines Assessment

Steel Furnace Slag - Air cooled fines						
Element			**NSW**			
	Mean	Mean	Table 2 values[12]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.8	5	N/A	N/A	N/A
B		22.2	N/A	N/A	N/A	N/A
Ba		41.5	N/A	N/A	N/A	N/A
Be		0.5	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		3.3	N/A	N/A	N/A	N/A
Cr	0.025	416.7	1000	N/A	2000	0.2
Cu	0.025	13.0	20	N/A	40	0.2
Hg		0.46	0.5	N/A	1	N/A
Mo	0.125	9.0	50	50	100	N/A
Ni	0.025	20.3	30	30	60	0.1
Pb		2.2	10	10	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		1.0	N/A	N/A	N/A	N/A
Zn	0.025	52.0	50	50	100	1
Mn		18683	N/A	N/A	N/A	N/A
Al		10750	N/A	N/A	N/A	N/A

Sample Identification 501 to 506 (n=6)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[12] Draft – The steel furnace slag exemption 2008

4.7 Electric Arc Furnace Slag Aggregates Assessment

Electric Arc Furnace Slag - Air cooled aggregates						
Element			**NSW**			
	Mean	Mean	Table 2 values[13]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		1.4	5	N/A	10	N/A
B		70.5	N/A	N/A	N/A	N/A
Ba		587.8	N/A	N/A	N/A	N/A
Be		0.5	10	N/A	20	N/A
Cd		0.1	1	1	2	N/A
Co		2.8	N/A	N/A	N/A	N/A
Cr	0.025	2683.1	10,000	N/A	20000	0.2
Cu	0.025	106.8	100	100	200	0.2
Hg		0.45	1	N/A	2	N/A
Mo	0.025	14.4	35	35	70	0.2
Ni	0.025	24.0	50	50	100	0.1
Pb		5.7	25	25	50	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		10.8	N/A	N/A	N/A	N/A
Zn	0.025	186.3	350	350	700	1
Mn		25658	N/A	N/A	N/A	N/A
Al		17758	N/A	N/A	N/A	N/A

Sample Identification 601 to 618 (n=18)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[13] Draft - The electric arc furnace slag exemption 2008

4.8 Electric Arc Furnace Slag Fines Assessment

Electric Arc Furnace Slag - Air cooled fines						
Element			**NSW**			
	Mean	Mean	Table 2 values[14]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		2.6	5	N/A	10	N/A
B		67.6	N/A	N/A	N/A	N/A
Ba		545.9	N/A	N/A	N/A	N/A
Be		0.5	5	N/A	10	N/A
Cd		0.3	0.5	0.5	1	N/A
Co		3.6	N/A	N/A	N/A	N/A
Cr	0.049	3162.2	10,000	N/A	20000	0.2
Cu	0.025	173.7	100	100	200	0.2
Hg		0.44	0.5	N/A	1	N/A
Mo	0.030	18.5	35	35	70	0.2
Ni	0.025	35.1	50	50	100	0.1
Pb		10.3	25	25	50	N/A
Sb		0.7	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		10.3	N/A	N/A	N/A	N/A
Zn	0.025	366.4	350	350	700	1
Mn		26011	N/A	N/A	N/A	N/A
Al		17172	N/A	N/A	N/A	N/A

Sample Identification 701 to 715 (n=12)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[14] Draft - The electric arc furnace slag exemption 2008

4.9 Sinter Slag Fines Assessment

Steel Furnace Slag - Sinter Fines						
Element			**NSW**			
	Mean	Mean	Table 2 values[15]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		1.5	5	N/A	N/A	N/A
B		28.0	N/A	N/A	N/A	N/A
Ba		69.3	N/A	N/A	N/A	N/A
Be		0.8	10	N/A	20	N/A
Cd		0.2	0.5	0.5	1	N/A
Co		6.0	N/A	N/A	N/A	N/A
Cr	0.025	489.0	1000	N/A	2000	0.2
Cu	0.025	18.0	20	N/A	40	0.2
Hg		0.11	0.5	N/A	1	N/A
Mo	0.007	11.3	50	50	100	N/A
Ni	0.025	57.3	30	30	60	0.1
Pb	0.005	13.7	10	10	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		5.7	N/A	N/A	N/A	N/A
Zn	0.033	409.0	50	50	100	1
Mn		20667	N/A	N/A	N/A	N/A
Al		19533	N/A	N/A	N/A	N/A

Sample Identification 801 to 803 (n=3)
As can be seen from this assessment the co-product ***would NOT be considered exempt***.

[15] Draft – The steel furnace slag exemption 2008

4.10 Melter Slag Assessment

Melter						
Element			**NSW**			
	Mean	Mean	Table 2 values[16]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	10	N/A
B		260.3	N/A	N/A	N/A	N/A
Ba		90.0	N/A	N/A	N/A	N/A
Be		0.5	10	N/A	20	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		5.0	N/A	N/A	N/A	N/A
Cr	0.033	57.3	50	N/A	100	N/A
Cu		5.0	10	10	20	N/A
Hg		0.03	0.5	N/A	1	N/A
Mo		0.5	5	5	10	N/A
Ni		3.0	10	N/A	20	N/A
Pb		1.0	10	N/A	20	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		2.7	N/A	N/A	N/A	N/A
Zn		9.0	25	25	50	N/A
Mn		2043	N/A	N/A	N/A	N/A
Al		4800	N/A	N/A	N/A	N/A

Sample Identification 901 to 903 (n=3)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[16] Draft - The blast furnace slag exemption 2008

4.11 KOBM Slag Assessment

KOBM						
Element			**NSW**			
	Mean	Mean	Table 2 values[17]			
	TCLP	TM	TM (Chara)	TM (Routine)	TM (Max)	TCLP (Max)
	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
As		0.5	5	N/A	10	N/A
B		114.7	N/A	N/A	N/A	N/A
Ba		91.0	N/A	N/A	N/A	N/A
Be		0.5	5	N/A	10	N/A
Cd		0.1	0.5	0.5	1	N/A
Co		16.7	N/A	N/A	N/A	N/A
Cr	0.025	984.3	10,000	N/A	20000	0.2
Cu	0.025	11.0	100	100	200	0.2
Hg		0.40	0.5	N/A	1	N/A
Mo	0.005	0.7	35	35	70	0.2
Ni	0.025	24.3	50	50	100	0.1
Pb		1.0	25	25	50	N/A
Sb		0.5	N/A	N/A	N/A	N/A
Se		1.0	2	N/A	5	N/A
Sn		4.3	N/A	N/A	N/A	N/A
Zn	0.025	14.7	350	350	700	1
Mn		10933	N/A	N/A	N/A	N/A
Al		5833	N/A	N/A	N/A	N/A

Sample Identification 904 to 906 (n=3)
As can be seen from this assessment the co-product ***would be considered exempt*.**

[17] Draft - The electric arc furnace slag exemption 2008

5 Discussion of Results

5.1 Summary

From the seventy two (72) ISS samples analysed for their TM concentrations from seven (7) separate process locations throughout Australasia, five (5) ISS co-products had selected element [TM] concentrations equal to, or slightly above the nominated thresholds specified under Column 2 of Table 2 of the *Exemption* for the elements – namely Copper, Chromium, Lead, Nickel, Zinc.

- Steel Furnace Slag Fines (Zn)
- Electric Arc Furnace Slag (Cu)
- Electric Arc Furnace Slag Fines (Cu, Zn)
- Sinter Slag Fines (Ni, Pb, Zn)
- Melter Slag Assessment (Cr)

Thirty nine (39) samples were submitted for further analysis based on TCLP requirements, all co-products results were well below the concentration specified under Column 4 of the Table 2 of the *Exemption*.

The results are discussed in more detail below for each of the slag types.

5.2 Granulated Blast Furnace Slag

As demonstrated by the results in Table 4.2, each of the elements assessed show TM concentrations well below the maximum values specified under Table 2 of the *Exemption*[18] requirements.

Based on this assessment, the co-product ***would be considered exempt.***

5.3 Blast Furnace Slag Aggregates

As demonstrated by the results in Table 4.3, each of the elements assessed show TM concentrations well below the maximum values specified under Table 2 of the *Exemption*[19] requirements.

Based on this assessment, the co-product ***would be considered exempt.***

5.4 Blast Furnace Slag Fines

As demonstrated by the results in Table 4.4, each of the elements assessed show TM concentrations well below the maximum values specified under Table 2 of the *Exemption*[20] requirements.

Based on this assessment, the co-product ***would be considered exempt.***

[18] Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A: Draft - The blast furnace slag exemption 2008; Draft – The steel furnace slag exemption 2008; Draft - The electric arc furnace slag exemption 2008

[19] ibid

[20] ibid

5.5 Steel Furnace Slag Aggregates

As demonstrated by the results in Table 4.5, each of the elements assessed show TM concentrations well below the maximum values specified under Table 2 of the *Exemption*[21] requirements.

As specified under Table 2 of the *Exemption*, TCLP assessment was required for four (4) elements, namely Chromium, Copper, Molybdenum and Zinc. As demonstrated by the results in Table 4.5, all results are well below the maximum concentration values under Column 4 of the Table.

Based on this assessment, the co-product ***would be considered exempt.***

5.6 Steel Furnace Slag Fines

As demonstrated by the results in Table 4.6, one (1) element, Zinc reported slightly above at 52 mg/kg for the TM characterisation value of 50 mg/kg under Column 2 of Table 2 of the E*xemption*[22] requirements.

As specified under Table 2 of the *Exemption*, TCLP testing was required for four (4) elements, namely Chromium, Copper, Molybdenum and Zinc. As demonstrated by the results in Table 4.6, all results are well below the maximum concentration values under Column 4 of the Table 2, in particular Zinc which was 40 times below threshold of 1 mg/L at <0.025 mg/L, which is below the detection limits.

Based on this assessment, the co-product ***would be considered exempt.***

5.7 Electric Arc Furnace Slag Aggregates

As demonstrated by the results in Table 4.7, one (1) element, Copper reported slight above at 106.8 mg/kg for the TM characterisation value of 100 mg/kg under Column 2 of Table 2 of the *Exemption* requirements.

As specified under Table 2 of the *Exemption,* TCLP testing was required for five (5) elements, namely Chromium, Copper, Molybdenum Nickel and Zinc. As demonstrated by the results in Table 4.7, all results are well below the maximum concentration values under Column 4 of the Table, in particular Copper which was 8 times below threshold of 0.2 mg/L at <0.025 mg/L, which is below the detection limits.

Based on this assessment, the co-product ***would be considered exempt.***

5.8 Electric Arc Furnace Slag Fines

As demonstrated by the results in Table 4.8, two (2) elements, Copper and Zinc, reported slightly above at 173.7 mg/kg and 366.4 mg/kg respectively for the TM characterisation values of 100 mg/kg and 350 mg/kg respectively under Column 2 of Table 2 of the *Exemption* requirements.

As specified under Table 2 of the *Exemption*, TCLP testing was required for five (5) elements, namely Chromium, Copper, Molybdenum Nickel and Zinc.

[21] ibid

[22] ibid

As demonstrated by the results in table 4.8, all results are well below the maximum concentration values under Column 4 of the Table, in particular Copper which was 8 times below threshold of 0.2 mg/L at <0.025 mg/L and Zinc was 20 times below the threshold of 1 mg/L at <0.025 mg/L, which are below the detection limits.

Based on this assessment, the co-product ***would be considered exempt.***

5.9 Sinter Slag Fines

As demonstrated by the results in Table 4.9, three (3) elements, Nickel, Lead and Zinc, reported above at 57.3 mg/kg, 13.7 mg/kg and 409 mg/kg for the TM characterisation values of 30 mg/kg, 10 mg/kg and 50 mg/kg respectively under Column 2 of the Table 2 the *Exemption*.

As specified under Table 2 of the *Exemption,* TCLP testing was required for four (4) elements, namely Chromium, Copper, Nickel and Zinc. As demonstrated by the results in Table 4.9, all results are well below the maximum concentration value under Column 4 of the Table, in particular Nickel was 4 times below threshold of 0.1 mg/L at <0.025 mg/L, Lead was <0.005 mg/L with no specified threshold and Zinc was 30 times below the threshold of 1 mg/L at 0.033 mg/L

Based on this assessment, the co-product ***would NOT be considered exempt due to high TM results for Zn, but the TCLP results are significantly below the nominated threshold.***

5.10 Melter Slag

As demonstrated by the results in Table 4.10, one (1) element, Chromium, reported slightly above at 57.3 mg/kg for the TM characterisation value of 50 mg/kg under Column 2 of Table 2 of the *Exemption*.

All Melter slag samples, bar one, returned a result of Chromium concentrations less than the absolute maximum 100 mg/kg specified under Column 3 of the Table, one sample slightly exceeded this maximum, with a total metal concentration of 110 mg/kg.

There are no specified maximum concentration value for Chromium under the *Exemption* requirements relevant to TCLP testing. Regardless, samples were tested and the results in Table 4.9, are shown at 0.033 mg/L.

It is noteworthy to mention that Melter Slag is a co-product of New Zealand Steel and is not currently exported to, or sold in New South Wales.

Based on this assessment, the co-product ***would be considered exempt.***

5.11 KOBM Slag

As demonstrated by the results in Table 4.11, each of the elements assessed show TM concentrations well below the maximum values specified under Table 2 of the *Exemption* requirements.

As specified under Table 2 of the *Exemption,* TCLP testing was required for five (5) elements, namely Chromium, Copper, Molybdenum, Nickel and Zinc. As demonstrated by the results in Table 4.11, all results were below the maximum concentration value under Column 4 of the Table.

Based on this assessment, the co-product ***would be considered exempt.***

5.12 Limitations

This report has been produced by assessing the samples as received, analysed and assessed against the *Exemption* requirements, in particular Table 2. The number of samples taken for each co-product was **NOT** consistent with the requirements of Table 3 of the *Exemption.* These results could be considered appropriate where:

- For a screening evaluation of the product range to determine the degree of compliance with the accepted standards;
- When coupled with previous investigations, n = Table 3 requirements, and;
- To investigate the consistency of the product.

From the seventy two (72) iron and steel slag samples collected from across Australasia, it can be argued (and demonstrated in previous reports) that the overall product quality, consistent nature and low coefficient of variation when assessed in conjunction with the previous studies and reports published. For example

- Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbond Rock Blast Furnace Slag – 1994
- Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbound Basic Oxygen Steel Slag – 1996
- Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbond Electric Arc Furnace Steel Slag – 1997
- Material Classification of Iron and Steel Slag Co-product Waste Classification Investigation Report 2004 by Moeyan Management
- Material Classification (Iron and Steel Slag) Monitoring Report 2006

Despite some sample numbers for selected individual products being low in a statistical sense (n<30), we believe that the consistency exhibited, coupled with ongoing investigations, only confirm the findings of this report.

6 Conclusions

6.1 Compliance with Acceptance Criteria

Based on the acceptance criteria established in the *Exemptions*, each of the following products are assessed in this report as follows;

- Granulated Blast Furnace Slag ***(Exempt)***
- Blast Furnace Slag – Air-cooled aggregates ***(Exempt)***
- Blast Furnace Slag – Air-cooled fines ***(Exempt)***
- Steel Furnace Slag – Air-cooled aggregates ***(Exempt)***

- Steel Furnace Slag – Air-cooled fines ***(Exempt)***
- Electric Arc Furnace Slag – Air-cooled aggregates ***(Exempt)***
- Electric Arc Furnace Slag – Air-cooled fines ***(Exempt)***
- Sinter Slag Fines ***(Not Exempt)***
- Melter Slag ***(Exempt)***
- KOBM Slag ***(Exempt)***

These results, when compared against the *Exemption* guidelines and previous studies, confirm the stable and ongoing consistent nature of ISS from member sites.

7 Related Documents

1. Golder Associates, **Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbound Rock Blast Furnace Slag**, May 1993, 92620109(A).

2. Golder Associates, **Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbound Basic Oxygen Steel Slag**, April 1996, 95623062.I.

3. Golder Associates, **Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbound Electric Arc Furnace Steel Slag**, January 1997, 96623018.P.

4. Moeyan Management, **Material Classification of Iron and Steel Slag By-product Waste Classification Investigation Report 2004**, 2004.

5. Material Classification (Iron and Steel Slag) Monitoring Program 2005/6

6. Material Classification (Iron and Steel Slag) Monitoring Program 2007/8

7. Material Classification (Iron and Steel Slag) Monitoring Program 2008/9

Attachment 1 Slag co-product Manufacturing Process

Blast Furnace Slag - Air Cooled Slag

The first step in the production of steel is the manufacturing of iron. This process begins by combining iron ore (a mixture of iron oxides, silica and alumina) with a fuel consisting of coke, natural gas, oxygen and pulverised coal, and limestone – which serves as a fluxing agent in a blast furnace. The furnace consists of a large vertical chamber through which high volumes of hot air are blasted.

The liquid blast furnace slag flows into pits where it is predominantly air-cooled and sprayed with a small quantity of water. The cooled slag is then transported to a crushing and screening plant where it is further processed into various products including aggregates.

Air-cooled slag is produced when molten blast furnace slag is placed into a slag pit. The slag is then permitted to cool for a period of time whilst water is sprayed over the slag for the primary purpose of increasing the rate of solidification. The resulting solidified slag is referred to as “rock slag” or “air-cooled slag”.

Granulated Blast Furnace Slag

Granulated slag is produced when molten blast furnace slag is introduced to a high-pressure water stream. The effect of this process is to blast the slag stream apart, making small globules of slag that are almost instantaneously solidified. The slag created from this process is typically smaller then 6 mm. On examination, the macro components of granulated blast furnace slag are very consistent.

Both air-cooled and granulated slags are reclaimed by loader, transported by truck to the BlueScope Steel Recycling area where it is stockpiled in appropriate areas.

Steel Furnace BOS (Basic Oxygen System process) Slag

In the BOS process, molten iron, steel scrap and lime are placed in an open-top vessel. High pressure oxygen is blown into the vessel and a violent chemical reaction takes place. Upon completion of the reaction, the steel is drained into one ladle and the slag is poured into another. The molten steel furnace slag is then poured into a slag put where it is allowed to cool.

The steel furnace slag is reclaimed by loader, transported by truck to the BlueScope Steel recycling area where it is reprocessed and stockpiled in appropriate areas for despatch.

BlueScope Steel produces steel furnace slag as a co-product of the steel making process, which is very consistent.

Electric Arc Furnace Slag

In the EAF process, steel scrap and fluxes are added to a refractory lined cup-shaped vessel. This vessel has a lid through which carbon electrodes are passed. An arc is induced between the scrap and electrodes and the resultant

heat generated melts scrap and fluxes which react similarly to the BOS process. Steel and slag are also separated similarly.

Melter Slag

Iron is mined using conventional earthmoving equipment before being separated magnetically, by creating a slurry and running it over magnetic drums. This is followed by gravimetric separation through a series of cones and spiral separators, where the heavier iron-bearing materials gravitate towards the centre, while residual clays and silts gravitate outwards. The slurry is then pumped 18 kilometres to the steel mill through an underground pipeline, where it is finally dewatered and stockpiled.

To convert the iron, a direct reduction process is used, adding coal and limestone to the irons before pre-heating them in four multi-hearth furnaces. This drives off the volatile constituents of the coal. The material then enters one of four rotary kilns where the direct reduction takes place over a period of eight hours.

The directly reduced product is then melted in one of two large electric melters. It is from this stage of the process that SteelServ Ltd obtains about 250,000 tonnes per annum of "melter" slag. The chemistry of New Zealand's melter slag differs from other variants of slag. This product consists of a high percentage of titanium and quantities of magnesium oxide and alumina typically higher than the industry norm. In contrast, the material has a characteristically low amount of silica, calcium oxide and sulphur.

KOBM Slag

New Zealand Steel uses a KOBM Oxygen Steel Converter vessel. The vessel is charged with the molten iron from the melters and a small proportion of scrap before refining begins using a top lance and bottom blown tuyeres to produce. The remaining steel making operation follows conventional practices, apart from the chemistry of the slag, which again differs from international equivalents due to irons and source.

KOBM slag is high in fines and cannot be used as an aggregate for road making or surfacings. KOBM can be used, however, as a lime substitute in stabilising clay sub-bases, as an additive to cement manufacture and as a soil conditioner for horticultural farming.

Attachment 2 Nata Laboratory Reports

LabMark
ENVIRONMENTAL LABORATORIES

ilac-MRA NATA Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	E039462	Cover Page 1 of 3 plus Sample Results
Client Name:	Australasian Iron and Steel Slag Assoc.	
Client Reference:	MCDS/08	
Contact Name:	Craig Heidrich	
Chain of Custody No:	na	Date Received: 02/09/2008
Sample Matrix:	SOIL	Date Reported: 18/11/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs: batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material	
not applicable	r:	RPD relative % difference	mb:	method blank	

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NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

Reported by Sydney Analytical Laboratories, NATA accreditation No.1884.

Laboratory Report: E039462

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	Acid extractable metals - mercury	72	9	13%	0	4	6%
7	Acid extractable metals	72	11	15%	3	4	6%
19	Moisture	72	--	--	--	--	--

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.
B. Metals spike recovery for antinomy in sample 173897s at 49%, corresponding lcs recovery at 96%.
C. Metals spike recovery for antinomy in sample 173917s at 48%, corresponding lcs recovery at 96%.
D. Metals lab #173927d RPD for copper and nickel are 55% and 58% respectively, triplicate results issued.
E. Metals lab #173946d RPD for copper and nickel are 75% and 54% respectively, triplicate results issued.
F. Report reissued with duplicate rsults included for Lab#'s 173942, 173943, 173905 and 173909 for Metals analysis.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

Laboratory Identification		**173896**	**173897**	**173898**	**173899**	**173900**	**173901**	**173902**	**173903**	**173904**	**173905**
Sample Identification		101	102	103	201	202	203	204	205	206	207
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		4/9/08	4/9/08	11/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173906**	**173907**	**173908**	**173909**	**173910**	**173911**	**173912**	**173913**	**173914**	**173915**
Sample Identification		208	209	301	302	303	304	305	306	307	308
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08
Laboratory Analysis Date		10/9/08	10/9/08	10/9/08	10/9/08	4/9/08	10/9/08	10/9/08	10/9/08	4/9/08	4/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173916**	**173917**	**173918**	**173919**	**173920**	**173921**	**173922**	**173923**	**173924**	**173925**
Sample Identification		309	401	402	403	404	405	406	501	502	503
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08	8/9/08
Laboratory Analysis Date		4/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	4/9/08	4/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173926**	**173927**	**173928**	**173929**	**173930**	**173931**	**173932**	**173933**	**173934**	**173935**
Sample Identification		504	505	506	601	602	603	610	611	612	613
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	9/9/08	9/9/08	3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		4/9/08	10/9/08	10/9/08	5/9/08	4/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	0.15	<0.05	<0.05	<0.05	<0.05	0.05	0.07	0.10	0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173936**	**173937**	**173938**	**173939**	**173940**	**173941**	**173942**	**173943**	**173944**	**173945**
Sample Identification		614	615	616	617	618	701	702	703	713	714
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		10/9/08	10/9/08	10/9/08	11/9/08	10/9/08	10/9/08	11/9/08	11/9/08	10/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	<0.05	0.14	0.31	0.05	6.85	0.22	0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173946**	**173947**	**173948**	**173949**	**173950**	**173951**	**173952**	**173953**	**173954**	**173955**
Sample Identification		715	801	802	803	901	902	903	904	905	906
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		11/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	12/9/08	10/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	0.07	0.11	0.10	0.12	<0.05	<0.05	<0.05	0.07	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**174069**	**174072**	**174073**	**174074**	**174075**	**174076**	**174077**	**174078**	**174079**	**174080**
Sample Identification		604	605	606	607	608	609	704	705	706	707
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		10/9/08	11/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08	10/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	0.06	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**174081**	**174082**	**173896d**	**173896r**	**173906d**	**173906r**	**173916d**	**173916r**	**173927d**	**173927r**
Sample Identification		708	709	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	3/9/08	--	8/9/08	--	3/9/08	--	8/9/08	--
Laboratory Analysis Date		10/9/08	10/9/08	4/9/08	--	10/9/08	--	4/9/08	--	11/9/08	--
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	<0.05	--	<0.05	--	<0.05	--	0.08	61%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173937d**	**173937r**	**173942d**	**173942r**	**173946d**	**173946r**	**174069d**	**174069r**	**174081d**	**174081r**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	--	14/11/08	--	8/9/08	--	8/9/08	--	8/9/08	--
Laboratory Analysis Date		10/9/08	--	14/11/08	--	11/9/08	--	10/9/08	--	10/9/08	--
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	<0.05	--	0.87	155%	0.06	15%	<0.05	--	<0.05	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173897s**	**173917s**	**173938s**	**174072s**	**crm**	**crm**	**crm**	**crm**	**lcs**	**lcs**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		3/9/08	8/9/08	8/9/08	8/9/08	3/9/08	8/9/08	9/9/08	14/11/08	3/9/08	8/9/08
Laboratory Analysis Date		5/9/08	10/9/08	10/9/08	10/9/08	3/9/08	8/9/08	10/9/08	17/11/08	3/9/08	8/9/08
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	81%	72%	127%	75%	84%	80%	86%	103%	77%	74%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**lcs**	**lcs**	**mb**	**mb**	**mb**	**mb**				
Sample Identification		QC	QC	QC	QC	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		--	--	--	--	--	--				
Laboratory Extraction (Preparation) Date		9/9/08	14/11/08	3/9/08	8/9/08	9/9/08	14/11/08				
Laboratory Analysis Date		10/9/08	17/11/08	3/9/08	8/9/08	10/9/08	17/11/08				
Method : E026.2											
Acid extractable metals - mercury	**EQL**										
Mercury	0.05	82%	103%	<0.05	<0.05	<0.05	<0.05				

Results expressed in mg/kg dry weight unless otherwise specified

Comments: -

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**173896**	**173897**	**173898**	**173899**	**173900**	**173901**	**173902**	**173903**	**173904**	**173905**
Sample Identification		101	102	103	201	202	203	204	205	206	207
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		3/9/08	3/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	53600	52600	54900	45500	51200	51700	57700	57400	57800	47400
Antimony	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Barium	5	313	326	390	277	328	311	226	241	211	280
Beryllium	1	7	6	7	6	6	6	9	9	9	4
Boron	5	38	35	42	33	32	31	31	41	40	29
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	5	5	5	2	2	2	11	9	6	72
Cobalt	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	2	<2	<2	2	<2	<2	<2	<2	5	4	6
Lead	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Manganese	5	2650	2580	2860	2120	2490	2450	2020	1920	1800	3460
Molybdenum	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	1	3	4	4	5	4	4	4	5	5	4
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	<1	<1	<1	<1	<1	2	4	3	2	<1
Zinc	5	6	6	6	<5	<5	<5	<5	<5	<5	<5

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173906**	**173907**	**173908**	**173909**	**173910**	**173911**	**173912**	**173913**	**173914**	**173915**
Sample Identification		208	209	301	302	303	304	305	306	307	308
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	3/9/08	9/9/08	9/9/08	9/9/08	3/9/08	3/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	45800	45100	52800	53800	40800	54400	54300	45800	52800	48600
Antimony	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Barium	5	283	271	194	182	272	340	342	295	217	321
Beryllium	1	4	4	9	9	5	8	7	6	7	4
Boron	5	28	27	39	34	22	44	41	33	24	21
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	61	59	33	11	3	2	2	1	33	54
Cobalt	1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Copper	2	5	4	6	28	<2	4	4	3	<2	<2
Lead	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Manganese	5	3520	3150	2850	2230	1990	2460	2420	2050	2570	3600
Molybdenum	1	<1	<1	<1	7	<1	<1	<1	<1	<1	<1
Nickel	1	4	4	6	30	3	6	6	5	3	2
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1
Zinc	5	<5	<5	8	<5	<5	<5	<5	<5	<5	<5

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173916**	**173917**	**173918**	**173919**	**173920**	**173921**	**173922**	**173923**	**173924**	**173925**
Sample Identification		309	401	402	403	404	405	406	501	502	503
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08	8/9/08
Laboratory Analysis Date		3/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	3/9/08	3/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	47200	9200	9000	10600	9100	8700	12500	7900	10300	12600
Antimony	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Barium	5	300	36	35	41	54	48	34	43	38	48
Beryllium	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	5	17	25	24	28	24	27	27	16	17	30
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Chromium	1	56	652	571	597	354	457	390	444	436	605
Cobalt	1	<1	1	<1	<1	2	2	3	1	2	2
Copper	2	<2	7	7	11	11	14	21	6	9	13
Lead	2	<2	<2	<2	<2	<2	2	2	<2	<2	<2
Manganese	5	3410	21700	21300	23400	13600	14500	22000	21700	21000	25800
Molybdenum	1	<1	5	13	6	4	5	15	8	11	18
Nickel	1	2	8	7	7	10	14	19	8	12	15
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	<1	3	4	4	3	2	<1	<1	<1	<1
Zinc	5	<5	9	10	16	37	43	47	28	23	42

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173926**	**173927**	**173928**	**173929**	**173930**	**173931**	**173932**	**173933**	**173934**	**173935**
Sample Identification		504	505	506	601	602	603	610	611	612	613
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	9/9/08	9/9/08	3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		3/9/08	9/9/08	9/9/08	3/9/08	3/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	10600	7900	15200	18800	16300	20300	21600	22800	22000	22300
Antimony	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1
Arsenic	1	<1	2	<1	1	3	3	<1	1	1	3
Barium	5	45	25	50	639	575	663	730	755	761	657
Beryllium	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	5	17	25	28	43	38	69	101	107	99	81
Cadmium	0.1	<0.1	<0.1	<0.1	0.1	0.1	0.2	<0.1	<0.1	<0.1	0.1
Chromium	1	244	346	425	833	904	2130	2990	3240	2630	3730
Cobalt	1	3	9	3	1	3	4	3	5	4	4
Copper	2	12	24	14	77	113	152	114	128	123	153
Lead	2	4	3	3	8	6	8	5	4	5	4
Manganese	5	12000	17000	14600	16300	17800	26700	31100	32600	28900	26500
Molybdenum	1	4	3	10	7	10	10	9	16	9	16
Nickel	1	17	26	44	10	26	29	15	24	21	40
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	2	<1	2	10	14	16	14	18	18	9
Zinc	5	84	59	76	101	79	130	337	351	149	129

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173936**	**173937**	**173938**	**173939**	**173940**	**173941**	**173942**	**173943**	**173944**	**173945**
Sample Identification		614	615	616	617	618	701	702	703	713	714
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	23700	22100	13000	13800	16000	19800	22100	17100	14800	13600
Antimony	1	<1	<1	<1	<1	<1	1	<1	1	<1	<1
Arsenic	1	2	3	3	3	1	4	2	5	2	2
Barium	5	636	650	491	607	495	658	723	562	478	446
Beryllium	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	5	81	78	56	64	57	70	89	65	54	48
Cadmium	0.1	<0.1	<0.1	0.1	<0.1	0.1	0.2	0.3	2.1	0.2	0.2
Chromium	1	3930	2910	3560	2570	4030	1180	2210	1750	5010	3410
Cobalt	1	3	3	4	4	3	4	3	7	3	2
Copper	2	127	136	166	130	100	191	132	261	116	104
Lead	2	2	2	4	4	4	10	15	71	8	4
Manganese	5	29700	24000	33400	38300	28500	18100	24200	21300	36900	27300
Molybdenum	1	14	15	31	16	22	11	10	14	31	21
Nickel	1	33	35	49	41	29	42	25	53	40	30
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	7	7	10	7	9	20	17	29	10	7
Zinc	5	87	77	206	158	184	302	456	2870	298	182

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173946**	**173947**	**173948**	**173949**	**173950**	**173951**	**173952**	**173953**	**173954**	**173955**
Sample Identification		715	801	802	803	901	902	903	904	905	906
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	21400	16300	30200	12100	4700	5300	4400	4900	7100	5500
Antimony	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	1	3	2	<1	2	<1	<1	<1	<1	<1	<1
Barium	5	616	67	85	56	89	93	88	78	97	98
Beryllium	1	<1	<1	1	1	<1	<1	<1	<1	<1	<1
Boron	5	71	24	28	32	259	273	249	116	119	109
Cadmium	0.1	0.2	0.3	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	1	3910	455	568	444	30	32	110	1040	937	976
Cobalt	1	4	6	3	9	2	5	8	20	9	21
Copper	2	127	17	11	26	3	5	7	11	8	14
Lead	2	8	18	11	12	<2	<2	<2	<2	<2	<2
Manganese	5	28100	19800	23000	19200	1940	1980	2210	11800	10600	10400
Molybdenum	1	15	17	7	10	<1	<1	<1	<1	<1	2
Nickel	1	38	51	41	80	1	3	5	27	20	26
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	7	4	3	10	3	3	2	3	7	3
Zinc	5	225	550	130	547	7	9	11	9	16	19

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**174069**	**174072**	**174073**	**174074**	**174075**	**174076**	**174077**	**174078**	**174079**	**174080**
Sample Identification		604	605	606	607	608	609	704	705	706	707
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	13000	13500	14100	15300	18400	17000	12800	14300	11400	17200
Antimony	1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
Arsenic	1	<1	1	1	2	2	1	1	1	4	2
Barium	5	417	404	428	535	629	517	412	443	400	527
Beryllium	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	5	53	49	55	67	87	78	61	62	55	73
Cadmium	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Chromium	1	4130	4160	3610	1880	2890	2800	3590	3190	3470	2960
Cobalt	1	2	2	2	2	3	2	2	2	6	3
Copper	2	79	93	106	102	106	88	103	98	183	113
Lead	2	6	5	5	4	8	4	5	5	7	11
Manganese	5	28900	29900	28800	19500	25700	21700	22000	22600	22400	22100
Molybdenum	1	29	27	27	9	10	10	22	21	35	13
Nickel	1	24	26	30	27	30	26	18	18	59	26
Selenium	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Tin	1	7	8	8	5	6	6	6	6	13	7
Zinc	5	182	234	199	104	217	152	243	221	409	217

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**174081**	**174082**	**173896d**	**173896r**	**173905d**	**173905r**	**173906d**	**173906r**	**173909d**	**173909r**
Sample Identification		708	709	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	3/9/08	--	14/11/08	--	8/9/08	--	14/11/08	--
Laboratory Analysis Date		9/9/08	9/9/08	3/9/08	--	14/11/08	--	9/9/08	--	14/11/08	--
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	18400	15300	57300	7%	--	--	46600	2%	--	--
Antimony	1	3	<1	<1	--	--	--	<1	--	--	--
Arsenic	1	3	2	<1	--	--	--	<1	--	--	--
Barium	5	559	467	356	13%	--	--	276	3%	--	--
Beryllium	1	<1	<1	7	0%	--	--	4	0%	--	--
Boron	5	82	69	40	5%	--	--	28	0%	--	--
Cadmium	0.1	0.2	0.1	<0.1	--	--	--	<0.1	--	--	--
Chromium	1	3360	2150	6	18%	83	14%	63	3%	--	--
Cobalt	1	4	3	<1	--	--	--	<1	--	--	--
Copper	2	802	84	2	>0%	--	--	5	0%	<2	>173%
Lead	2	14	8	<2	--	--	--	<2	--	--	--
Manganese	5	23800	19000	2850	7%	--	--	3540	1%	--	--
Molybdenum	1	16	10	<1	--	--	--	<1	--	--	--
Nickel	1	35	20	4	29%	--	--	4	0%	3	164%
Selenium	2	<2	<2	<2	--	--	--	<2	--	--	--
Tin	1	9	5	<1	--	--	--	<1	--	--	--
Zinc	5	217	115	8	29%	--	--	<5	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173916d**	**173916r**	**173927d**	**173927r**	**173937d**	**173937r**	**173943d**	**173943r**	**173946d**	**173946r**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		3/9/08	--	8/9/08	--	8/9/08	--	14/11/08	--	8/9/08	--
Laboratory Analysis Date		3/9/08	--	9/9/08	--	9/9/08	--	14/11/08	--	9/9/08	--
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	48200	2%	7500	5%	22600	2%	--	--	19400	10%
Antimony	1	<1	--	<1	--	<1	--	--	--	<1	--
Arsenic	1	<1	--	3	40%	2	40%	--	--	5	50%
Barium	5	328	9%	24	4%	636	2%	--	--	561	9%
Beryllium	1	3	0%	<1	--	<1	--	--	--	<1	--
Boron	5	20	16%	26	4%	79	1%	--	--	59	18%
Cadmium	0.1	<0.1	--	<0.1	--	<0.1	--	--	--	0.2	0%
Chromium	1	60	7%	344	1%	3380	15%	--	--	3400	14%
Cobalt	1	<1	--	14	43%	3	0%	--	--	6	40%
Copper	2	<2	--	42	55%	130	5%	--	--	278	75%
Lead	2	<2	--	3	0%	4	67%	--	--	7	13%
Manganese	5	3550	4%	16800	1%	25800	7%	--	--	25100	11%
Molybdenum	1	<1	--	3	0%	15	0%	--	--	17	13%
Nickel	1	2	0%	47	58%	39	11%	--	--	66	54%
Selenium	2	<2	--	<2	--	<2	--	--	--	<2	--
Tin	1	<1	--	2	>67%	7	0%	--	--	9	25%
Zinc	5	5	>0%	66	11%	74	4%	1100	89%	267	17%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**174069d**	**174069r**	**174081d**	**174081r**	**173927t**	**173946t**	**174081t**	**173897s**	**173917s**	**173938s**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	--	8/9/08	--	9/9/08	9/9/08	10/9/08	3/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	--	9/9/08	--	10/9/08	10/9/08	11/9/08	4/9/08	9/9/08	9/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	14800	13%	19300	5%	--	--	--	#	#	#
Antimony	1	<1	--	<1	>100%	--	--	--	49%	48%	111%
Arsenic	1	1	>0%	3	0%	--	--	--	73%	82%	102%
Barium	5	405	3%	568	2%	--	--	--	#	#	#
Beryllium	1	<1	--	<1	--	--	--	--	85%	94%	102%
Boron	5	52	2%	82	0%	--	--	--	#	111%	#
Cadmium	0.1	0.2	0%	0.2	0%	--	--	--	91%	92%	98%
Chromium	1	4210	2%	3330	1%	--	--	--	90%	#	#
Cobalt	1	2	0%	4	0%	--	--	--	80%	95%	99%
Copper	2	98	21%	120	148%	22	196	169	81%	103%	#
Lead	2	8	29%	11	24%	--	--	--	73%	97%	87%
Manganese	5	29100	1%	24800	4%	--	--	--	#	#	#
Molybdenum	1	29	0%	14	13%	--	--	--	81%	88%	77%
Nickel	1	24	0%	30	15%	19	60	--	83%	79%	#
Selenium	2	<2	--	<2	--	--	--	--	73%	74%	86%
Tin	1	8	13%	7	25%	--	--	--	82%	#	#
Zinc	5	238	27%	241	10%	--	--	--	96%	89%	#

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**174072s**	**crm**	**crm**	**crm**	**crm**	**crm**	**lcs**	**lcs**	**lcs**	**lcs**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	3/9/08	8/9/08	9/9/08	10/9/08	14/11/08	3/9/08	8/9/08	9/9/08	10/9/08
Laboratory Analysis Date		9/9/08	3/9/08	9/9/08	9/9/08	11/9/08	14/11/08	3/9/08	9/9/08	10/9/08	11/9/08
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	#	--	--	--	--	--	102%	116%	--	--
Antimony	1	92%	112%	100%	86%	--	--	96%	96%	93%	--
Arsenic	1	86%	110%	100%	109%	--	--	97%	99%	101%	--
Barium	5	#	98%	91%	75%	--	--	91%	95%	93%	--
Beryllium	1	95%	99%	95%	104%	--	--	96%	102%	104%	--
Boron	5	#	82%	97%	98%	--	--	103%	102%	100%	--
Cadmium	0.1	99%	99%	90%	92%	--	--	93%	96%	91%	--
Chromium	1	#	125%	100%	103%	--	97%	111%	104%	102%	--
Cobalt	1	93%	116%	98%	106%	--	--	114%	102%	105%	--
Copper	2	#	106%	97%	102%	101%	97%	99%	99%	103%	104%
Lead	2	86%	99%	97%	101%	--	--	98%	97%	94%	--
Manganese	5	#	110%	93%	99%	--	--	104%	101%	101%	--
Molybdenum	1	102%	109%	100%	104%	--	--	92%	98%	97%	--
Nickel	1	#	111%	96%	104%	--	97%	101%	98%	101%	--
Selenium	2	82%	102%	82%	97%	--	--	96%	97%	102%	--
Tin	1	#	90%	76%	97%	--	--	100%	95%	89%	--
Zinc	5	#	105%	92%	92%	--	92%	89%	97%	98%	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**lcs**	**mb**	**mb**	**mb**	**mb**	**mb**				
Sample Identification		QC	QC	QC	QC	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		--	--	--	--	--	--				
Laboratory Extraction (Preparation) Date		14/11/08	3/9/08	8/9/08	9/9/08	10/9/08	14/11/08				
Laboratory Analysis Date		14/11/08	3/9/08	9/9/08	10/9/08	11/9/08	14/11/08				
Method : E022.2											
Acid extractable metals	**EQL**										
Aluminium	100	--	<100	<100	<100	--	--				
Antimony	1	--	<1	<1	<1	--	--				
Arsenic	1	--	<1	<1	<1	--	--				
Barium	5	--	<5	<5	<5	--	--				
Beryllium	1	--	<1	<1	<1	--	--				
Boron	5	--	<5	<5	<5	--	--				
Cadmium	0.1	--	<0.1	<0.1	<0.1	--	--				
Chromium	1	89%	<1	<1	<1	--	<1				
Cobalt	1	--	<1	<1	<1	--	--				
Copper	2	91%	<2	<2	<2	<2	<2				
Lead	2	--	<2	<2	<2	--	--				
Manganese	5	--	<5	<5	<5	--	--				
Molybdenum	1	--	<1	<1	<1	--	--				
Nickel	1	91%	<1	<1	<1	--	<1				
Selenium	2	--	<2	<2	<2	--	--				
Tin	1	--	<1	<1	<1	--	--				
Zinc	5	81%	<5	<5	<5	--	<5				

Results expressed in mg/kg dry weight unless otherwise specified

Comments: - # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**173896**	**173897**	**173898**	**173899**	**173900**	**173901**	**173902**	**173903**	**173904**	**173905**
Sample Identification		101	102	103	201	202	203	204	205	206	207
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		4/9/08	4/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	11	12	10	3	3	3	--	--	--	--

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173906**	**173907**	**173908**	**173909**	**173910**	**173911**	**173912**	**173913**	**173914**	**173915**
Sample Identification		208	209	301	302	303	304	305	306	307	308
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	4/9/08	9/9/08	9/9/08	9/9/08	4/9/08	4/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	--	--	--	1	1	4	3	3	--	--

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173916**	**173917**	**173918**	**173919**	**173920**	**173921**	**173922**	**173923**	**173924**	**173925**
Sample Identification		309	401	402	403	404	405	406	501	502	503
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	3/9/08	3/9/08	8/9/08
Laboratory Analysis Date		4/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	4/9/08	4/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	--	--	--	--	--	1	4	3	2	5

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173926**	**173927**	**173928**	**173929**	**173930**	**173931**	**173932**	**173933**	**173934**	**173935**
Sample Identification		504	505	506	601	602	603	610	611	612	613
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/9/08	8/9/08	8/9/08	3/9/08	3/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		4/9/08	9/9/08	9/9/08	4/9/08	4/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	4	2	2	2	2	2	1	1	1	2

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173936**	**173937**	**173938**	**173939**	**173940**	**173941**	**173942**	**173943**	**173944**	**173945**
Sample Identification		614	615	616	617	618	701	702	703	713	714
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	3	2	3	--	1	5	4	5	3	4

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173946**	**173947**	**173948**	**173949**	**173950**	**173951**	**173952**	**173953**	**173954**	**173955**
Sample Identification		715	801	802	803	901	902	903	904	905	906
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	3	2	1	3	2	2	3	--	2	2

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**174069**	**174072**	**174073**	**174074**	**174075**	**174076**	**174077**	**174078**	**174079**	**174080**
Sample Identification		604	605	606	607	608	609	704	705	706	707
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08	8/9/08
Laboratory Analysis Date		9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08	9/9/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	3	4	4	3	2	2	2	2	2	2

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**174081**	**174082**	**173896d**	**173896r**	**173906d**	**173906r**	**173916d**	**173916r**	**173927d**	**173927r**
Sample Identification		708	709	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/9/08	8/9/08	3/9/08	--	8/9/08	--	3/9/08	--	8/9/08	--
Laboratory Analysis Date		9/9/08	9/9/08	4/9/08	--	9/9/08	--	4/9/08	--	9/9/08	--
Method : E005.2											
Moisture	**EQL**										
Moisture	--	2	2	11	0%	--	--	--	--	2	0%

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**173937d**	**173937r**	**173946d**	**173946r**	**174069d**	**174069r**	**174081d**	**174081r**		
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC		
Depth (m)		--	--	--	--	--	--	--	--		
Sampling Date recorded on COC		--	--	--	--	--	--	--	--		
Laboratory Extraction (Preparation) Date		8/9/08	--	8/9/08	--	8/9/08	--	8/9/08	--		
Laboratory Analysis Date		9/9/08	--	9/9/08	--	9/9/08	--	9/9/08	--		
Method : E005.2											
Moisture	**EQL**										
Moisture	--	2	0%	3	0%	4	29%	3	40%		

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

LabMark
ENVIRONMENTAL LABORATORIES

ilac-MRA NATA Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	E040747	Cover Page 1 of 4
Client Name:	Australasian Iron and Steel Slag Assoc.	plus Sample Results
Client Reference:	MCDS/08 - Additional Request	
Contact Name:	Craig Heidrich	
Chain of Custody No:	na	Date Received: 26/11/2008
Sample Matrix:	SOIL	Date Reported: 05/12/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs: batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material	
not applicable	r:	RPD relative % difference	mb:	method blank	

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NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
11	Moisture	39	--	--	--	--	--

Matrix: **SOIL-LEACHATE**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	TCLP Preparation	39	0	0%	0	0	0%
5	TCLP metals	39	4	10%	0	2	5%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.
B. Please note spike recovery for Nickel in sample 187159s is at 67%, corresponding LCS is 96%.

LabMark
ENVIRONMENTAL LABORATORIES

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

Environmental Laboratory Industry Group
Foundation Member

Laboratory Report: E040747

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Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

LabMark Environmental Laboratories ABN 30 008 127 802
* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077 * MELBOURNE: 1868 Dandenong Road, Clayton VIC 3168
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Laboratory Identification		**187158**	**187159**	**187160**	**187161**	**187162**	**187163**	**187164**	**187165**	**187166**	**187167**
Sample Identification		401	402	403	404	405	406	501	502	503	504
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08
Laboratory Analysis Date		--	--	--	--	--	--	--	--	--	--
Method : E019.2											
TCLP Preparation	**EQL**										
TCLP Fluid No.	--	1	1	1	1	1	1	1	1	1	1
Initial pH (pH units)	--	11.8	11.7	11.8	11.6	11.7	11.7	11.7	6.6	11.9	10.6
pH after HCl (pH units)	--	4.9	4.9	5.0	5.0	4.7	5.0	4.9	4.9	5.0	4.9
Final pH (pH units)	--	11.1	10.5	11.3	11.3	11.7	11.9	12.0	12.0	12.1	11.8

Results expressed in pH units unless otherwise specified

Comments:

E019.2: Soil leached for 18 hours with fluid as specified above . Refer to relevant water method for results. TCLP preparation is equivalent to AS4439.3 (also known as ASLP).

Laboratory Identification		**187168**	**187169**	**187170**	**187171**	**187172**	**187173**	**187174**	**187175**	**187176**	**187177**
Sample Identification		505	506	601	602	603	610	611	612	613	614
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	3/12/08	3/12/08	3/12/08
Laboratory Analysis Date		--	--	--	--	--	--	--	--	--	--
Method : E019.2											
TCLP Preparation	**EQL**										
TCLP Fluid No.	--	1	1	1	1	1	1	1	1	1	1
Initial pH (pH units)	--	11.6	11.6	10.5	11.8	11.7	11.7	10.7	11.7	11.1	11.8
pH after HCl (pH units)	--	5.0	4.9	4.8	5.0	5.0	4.9	4.9	4.9	5.0	5.0
Final pH (pH units)	--	12.1	11.8	9.6	9.2	9.3	9.5	9.2	9.8	10.2	10.2

Results expressed in pH units unless otherwise specified

Comments:

E019.2: Soil leached for 18 hours with fluid as specified above . Refer to relevant water method for results. TCLP preparation is equivalent to AS4439.3 (also known as ASLP).

Laboratory Identification		**187178**	**187179**	**187180**	**187181**	**187182**	**187183**	**187184**	**187185**	**187186**	**187187**
Sample Identification		615	616	617	618	701	702	703	713	714	715
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08
Laboratory Analysis Date		--	--	--	--	--	--	--	--	--	--
Method : E019.2											
TCLP Preparation	**EQL**										
TCLP Fluid No.	--	1	1	1	1	1	1	1	1	1	1
Initial pH (pH units)	--	11.2	11.7	10.4	11.4	11.6	11.4	11.2	11.2	10.2	11.4
pH after HCl (pH units)	--	5.0	5.0	4.7	5.0	5.0	5.0	5.0	4.9	4.6	4.9
Final pH (pH units)	--	10.0	10.1	9.9	10.0	9.8	10.3	10.1	10.0	10.0	10.0

Results expressed in pH units unless otherwise specified

Comments:

E019.2: Soil leached for 18 hours with fluid as specified above . Refer to relevant water method for results. TCLP preparation is equivalent to AS4439.3 (also known as ASLP).

Laboratory Identification		**187188**	**187189**	**187190**	**187191**	**187192**	**187193**	**187194**	**187195**	**187196**	
Sample Identification		801	802	803	901	902	903	904	905	906	
Depth (m)		--	--	--	--	--	--	--	--	--	
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	
Laboratory Extraction (Preparation) Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	
Laboratory Analysis Date		--	--	--	--	--	--	--	--	--	
Method : E019.2											
TCLP Preparation	**EQL**										
TCLP Fluid No.	--	1	1	1	1	1	1	1	1	1	
Initial pH (pH units)	--	11.4	10.9	9.5	11.4	10.3	11.6	11.8	11.6	11.8	
pH after HCl (pH units)	--	4.9	5.0	4.9	4.9	4.9	5.0	4.9	4.9	4.9	
Final pH (pH units)	--	7.2	7.1	7.1	5.0	5.0	5.1	12.1	12.1	12.1	

Results expressed in pH units unless otherwise specified

Comments:

E019.2: Soil leached for 18 hours with fluid as specified above . Refer to relevant water method for results. TCLP preparation is equivalent to AS4439.3 (also known as ASLP).

Laboratory Identification		**187158**	**187159**	**187160**	**187161**	**187162**	**187163**	**187164**	**187165**	**187166**	**187167**
Sample Identification		401	402	403	404	405	406	501	502	503	504
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08
Laboratory Analysis Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Copper	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Lead	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Molybdenum	10	10	10	10	<10	<10	10	20	20	20	<10
Nickel	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**187168**	**187169**	**187170**	**187171**	**187172**	**187173**	**187174**	**187175**	**187176**	**187177**
Sample Identification		505	506	601	602	603	610	611	612	613	614
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	4/12/08	4/12/08	4/12/08
Laboratory Analysis Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	4/12/08	4/12/08	4/12/08
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Copper	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Lead	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Molybdenum	10	<10	<10	20	20	20	20	20	20	30	30
Nickel	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**187178**	**187179**	**187180**	**187181**	**187182**	**187183**	**187184**	**187185**	**187186**	**187187**
Sample Identification		615	616	617	618	701	702	703	713	714	715
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08
Laboratory Analysis Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	<50	<50	<50	<50	50	60	50	120	130	<50
Copper	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Lead	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Molybdenum	10	30	30	30	30	30	30	30	40	30	20
Nickel	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**187188**	**187189**	**187190**	**187191**	**187192**	**187193**	**187194**	**187195**	**187196**	**187158d**
Sample Identification		801	802	803	901	902	903	904	905	906	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	--
Laboratory Extraction (Preparation) Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	3/12/08
Laboratory Analysis Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	3/12/08
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	<50	<50	<50	<50	<50	50	<50	<50	<50	<50
Copper	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Lead	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Molybdenum	10	<10	10	<10	<10	<10	<10	<10	<10	<10	10
Nickel	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**187158r**	**187168d**	**187168r**	**187178d**	**187178r**	**187188d**	**187188r**	**187159s**	**187179s**	**lcs**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		--	3/12/08	--	3/12/08	--	4/12/08	--	3/12/08	4/12/08	2/12/08
Laboratory Analysis Date		--	3/12/08	--	4/12/08	--	4/12/08	--	3/12/08	4/12/08	2/12/08
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	--	<50	--	<50	--	<50	--	75%	73%	84%
Copper	50	--	<50	--	<50	--	<50	--	72%	82%	79%
Lead	10	--	<10	--	<10	--	<10	--	83%	89%	89%
Molybdenum	10	0%	<10	--	30	0%	<10	--	91%	97%	91%
Nickel	50	--	<50	--	<50	--	<50	--	67%	80%	78%
Zinc	50	--	<50	--	<50	--	<50	--	77%	85%	82%

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**lcs**	**lcs**	**mb**	**mb**	**mb**					
Sample Identification		QC	QC	QC	QC	QC					
Depth (m)		--	--	--	--	--					
Sampling Date recorded on COC		--	--	--	--	--					
Laboratory Extraction (Preparation) Date		3/12/08	4/12/08	2/12/08	3/12/08	4/12/08					
Laboratory Analysis Date		3/12/08	4/12/08	2/12/08	3/12/08	4/12/08					
Method : E022.1											
TCLP metals	**EQL**										
Chromium	50	103%	87%	<50	<50	<50					
Copper	50	95%	--	<50	<50	--					
Lead	10	93%	90%	<10	<10	<10					
Molybdenum	10	91%	--	<10	<10	--					
Nickel	50	96%	76%	<50	<50	<50					
Zinc	50	88%	--	<50	<50	--					

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: Filtered TCLP leachate acidifed with nitric/hydrochloric acid. Analysis by ICP/MS. Results are expressed as in the leachate.

Laboratory Identification		**187158**	**187159**	**187160**	**187161**	**187162**	**187163**	**187164**	**187165**	**187166**	**187167**
Sample Identification		401	402	403	404	405	406	501	502	503	504
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08
Laboratory Analysis Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	--	1	--	--	1	3	4	4	5	3

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**187168**	**187169**	**187170**	**187171**	**187172**	**187173**	**187174**	**187175**	**187176**	**187177**
Sample Identification		505	506	601	602	603	610	611	612	613	614
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	2/12/08	3/12/08	3/12/08	3/12/08
Laboratory Analysis Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	4/12/08	4/12/08	4/12/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	2	1	3	3	2	--	--	1	2	2

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**187178**	**187179**	**187180**	**187181**	**187182**	**187183**	**187184**	**187185**	**187186**	**187187**
Sample Identification		615	616	617	618	701	702	703	713	714	715
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08
Laboratory Extraction (Preparation) Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08
Laboratory Analysis Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08
Method : E005.2											
Moisture	**EQL**										
Moisture	--	--	3	--	1	4	4	5	2	4	3

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**187188**	**187189**	**187190**	**187191**	**187192**	**187193**	**187194**	**187195**	**187196**	**187158d**
Sample Identification		801	802	803	901	902	903	904	905	906	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	19/8/08	--
Laboratory Extraction (Preparation) Date		3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	3/12/08	--
Laboratory Analysis Date		4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	4/12/08	--
Method : E005.2											
Moisture	**EQL**										
Moisture	--	2	1	3	2	2	3	--	2	1	--

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**187158r**	**187168d**	**187168r**	**187178d**	**187178r**	**187188d**	**187188r**			
Sample Identification		QC	QC	QC	QC	QC	QC	QC			
Depth (m)		--	--	--	--	--	--	--			
Sampling Date recorded on COC		--	--	--	--	--	--	--			
Laboratory Extraction (Preparation) Date		--	--	--	3/12/08	--	3/12/08	--			
Laboratory Analysis Date		--	--	--	4/12/08	--	4/12/08	--			
Method : E005.2											
Moisture	**EQL**										
Moisture	--	--	2	0%	1	--	2	0%			

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.