REPORT

LEIGH CREEK COALFIELD - COVER AND REHABILITATION MATERIAL CHARACTERISATION

Prepared for Alinta Energy - Flinders Power Partnership

February 2017

© MWH Australia Pty Ltd. All rights reserved. No part of this work may be reproduced in any material form or communicated by any means without the permission of the copyright owner.

This document is confidential. Neither the whole nor any part of this document may be disclosed to any third party without the prior written approval of MWH and Alinta Energy – Flinders Power Partnership.

MWH Australia Pty Ltd undertook the work, and prepared this document, in accordance with specific instructions from Alinta Energy – Flinders Power Partnership to whom this document is addressed, within the time and budgetary requirements of Alinta Energy – Flinders Power Partnership. The conclusions and recommendations stated in this document are based on those instructions and requirements, and they could change if such instructions and requirements change or are in fact inaccurate or incomplete.

MWH Australia Pty Ltd has prepared this document using data and information supplied to MWH Australia Pty Ltd, Alinta Energy – Flinders Power Partnership and other individuals and organisations, most of whom are referred to in this document. Where possible, throughout the document the source of data used has been identified. Unless stated otherwise, MWH Australia Pty Ltd has not verified such data and information. MWH Australia Pty Ltd does not represent such data and information as true or accurate, and disclaims all liability with respect to the use of such data and information. All parties relying on this document, do so entirely at their own risk in the knowledge that the document was prepared using information that MWH Australia Pty Ltd has not verified.

This document is intended to be read in its entirety, and sections or parts of the document should therefore not be read and relied on out of context.

The conclusions and recommendations contained in this document reflect the professional opinion of MWH Australia Pty Ltd, using the data and information supplied. MWH Australia Pty Ltd has used reasonable care and professional judgment in its interpretation and analysis of the data. The conclusions and recommendations must be considered within the agreed scope of work, and the methodology used to carry out the work, both of which are stated in this document.

This document was intended for the sole use of Alinta Energy – Flinders Power Partnership and only for the use for which it was prepared, which is stated in this document. Any representation in the document is made only to Alinta Energy – Flinders Power Partnership. MWH Australia Pty Ltd disclaims all liability with respect to the use of this document by any third party, and with respect to the use of and reliance upon this document by any party, including Alinta Energy – Flinders Power Partnership for a purpose other than the purpose for which it was prepared.

MWH Australia Pty Ltd has conducted environmental field monitoring and/or testing for the purposes of preparing this document. The type and extent of monitoring and/or testing is described in the document.

Subject to the limitations imposed by the instructions and requirements of Alinta Energy – Flinders Power Partnership, the monitoring and testing have been undertaken in a professional manner, according to generally-accepted practices and with a degree of skill and care which is ordinarily exercised by reputable environmental consultants in similar circumstances. MWH Australia Pty Ltd makes no other warranty, express or implied.

Maps produced by MWH Australia Pty Ltd may be compiled from multiple external sources and therefore MWH Australia Pty Ltd does not warrant that the maps provided are error free. MWH Australia Pty Ltd does not purport to represent precise locations of cadastral corners or the surveyed dimensions of cadastral boundaries. MWH Australia Pty Ltd gives no warranty in relation to mapping data (including accuracy, reliability, completeness or suitability) and accepts no liability for any loss, damage or costs relating to any use of the data.

This document has been prepared for the benefit of Alinta Energy - Flinders Power Partnership. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to Alinta Energy - Flinders Power Partnership and other persons for an application for permission or approval to fulfil a legal requirement.

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Matt Braimbridge	Tracey Hassell

PREPARED BY		
Tracey Hassell	…….....	……/……/……
CHECKED BY		
Matt Braimbridge	…….....	……/……/……
REVIEWED BY		
Peter Waters	…….....	……/……/……
APPROVED FOR ISSUE BY		
Matt Braimbridge	…….....	……/……/……

PERTH
41 Bishop Street, Jolimont , WA 6014
TEL +61 (08) 9388 8799, FAX +61 (08) 9388 8633

REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
A	15/12/16	Draft for Client Comment	TH	MB	PW	MB
0	20/12/16	Final	TH	MB	PW	MB
1	3/02/17	Updated Final (addnl data)	TH	MB	PW	MB

Alinta Energy - Flinders Power Partnership

Leigh Creek Coalfield - Cover and Rehabilitation Material Characterisation

CONTENTS

1 Introduction 1
1.1 Scope and Objectives 1
1.2 Field Sample Collection 1
1.3 Sampling Methodology 4
1.4 Quality Assurance and Quality Control Summary 5
2 Assessment of Data 7
2.1 Physical Properties 8
2.2 Soil Chemical Properties 9
2.2.1 Correlation of Field and Laboratory Data 9
2.2.2 Soil pH and Salinity 11
2.2.3 Exchangeable Cations and Exchangeable Sodium Percentage 12
2.2.4 Soil Nutrient and Organic Matter 12
2.3 Geochemical Properties 13
2.3.1 Physiochemical properties 13
2.3.2 Acid Base Accounting 13
2.3.3 Total Multi-elements 15
2.4 Summary of Mine Waste Material Properties 16
3 Summary of Findings and Recommendations 17
3.1 Waste Characterisation Protocol 17
3.2 Recommendations for Management of Hostile Waste 18
4 References 18

LIST OF TABLES

Table 1-1: Summary of sample locations and context 3
Table 1-2: Summary of numbers of field and laboratory samples 4
Table 1-3: Summary of QAQC results 6
Table 2-1: Summary of minimum, maxium and average fine-fraction (clay + silt) in selected samples 9

LIST OF FIGURES

Figure 1-1: Location of DLSP Blocks targeted for field sampling. Note: D&B and Topsoil locations are not shown (image provided by Flinders Power) 2
Figure 1-2: Material loaded from DLSP blocks, waiting to be spread over MT21 (image provided by Flinders Power) 3
Figure 2-1: Summary of Emerson Class ratings for field samples 8
Figure 2-2: Correlation of field and laboratory analysis of pH 10
Figure 2-3: Correlation of field and laboratory analysis of EC 11
Figure 2-4: Average soil pH (field) for each block 11
Figure 2-5: Average soil EC (field) for each block 12
Figure 2-6: ABA Chart for waste samples 15

APPENDICES

Appendix A Results Tables
Appendix B Laboratory Reports

1 Introduction

Flinders Power is currently planning and implementing mine closure operations at the Leigh Creek open cut coal mine (Leigh Creek Mine) which is located approximately 560 km north of Adelaide in the Flinders Ranges region of South Australia. Following the recommendations provided in the Leigh Creek Coalfield – Soil and Waste Characterisation report provided to Alinta Energy – Flinders Power Partnership (Flinders Power) in March 2016 (MWH, 2016a), an additional program of field screening and analysis of mine waste materials has been conducted as part of earthworks being undertaken on site. The earthworks are related to the use of mine waste materials for encapsulation of 'spon com' and rehabilitation of existing landforms on site.

1.1 Scope and Objectives

The key objective of this report is to review and comment on the execution and results of the field sampling and testing program implemented to screen mine waste for suitability for use as cover materials in the management of 'spon com' and other hostile waste. Key components of the work program undertaken were:

- Development of sampling and assessment procedure for field sampling;
- Sampling of target mine waste for both field and laboratory assessment of chemical/geochemical parameters;
- Training of key Flinders Power personnel on the methodology and frequency of field sampling;
- Assessment of field sampling and laboratory results and identification of any improvement actions to be implemented during field sampling and
- Recommendations for the management of any acid and metalliferous drainage (AMD) waste or potentially acidic/metalliferous waste materials which may be uncovered or identified during rehabilitation works.

The sampling and assessment procedure and related training of Flinders Power staff as conducted by MWH personnel in early September 2016. This report provides a summary of field and laboratory data and recommendations for ongoing field screening and laboratory testwork, as well as outlining an AMD Management Plan for the site.

1.2 Field Sample Collection

A total of 254 samples were collected for field analysis. Samples were collected from six individual areas around the site. The cover materials were collected from Dragline Spoil (DLSP) Block areas. These are shown on **Figure 1-1**. Other rehabilitation materials (topsoil and soil for covering inert site refuse) were also sampled; however, these are not materials designated for Cover of potentially 'hostile' or 'spon com' waste. Descriptions and context for the samples are provided in **Table 1-1**.

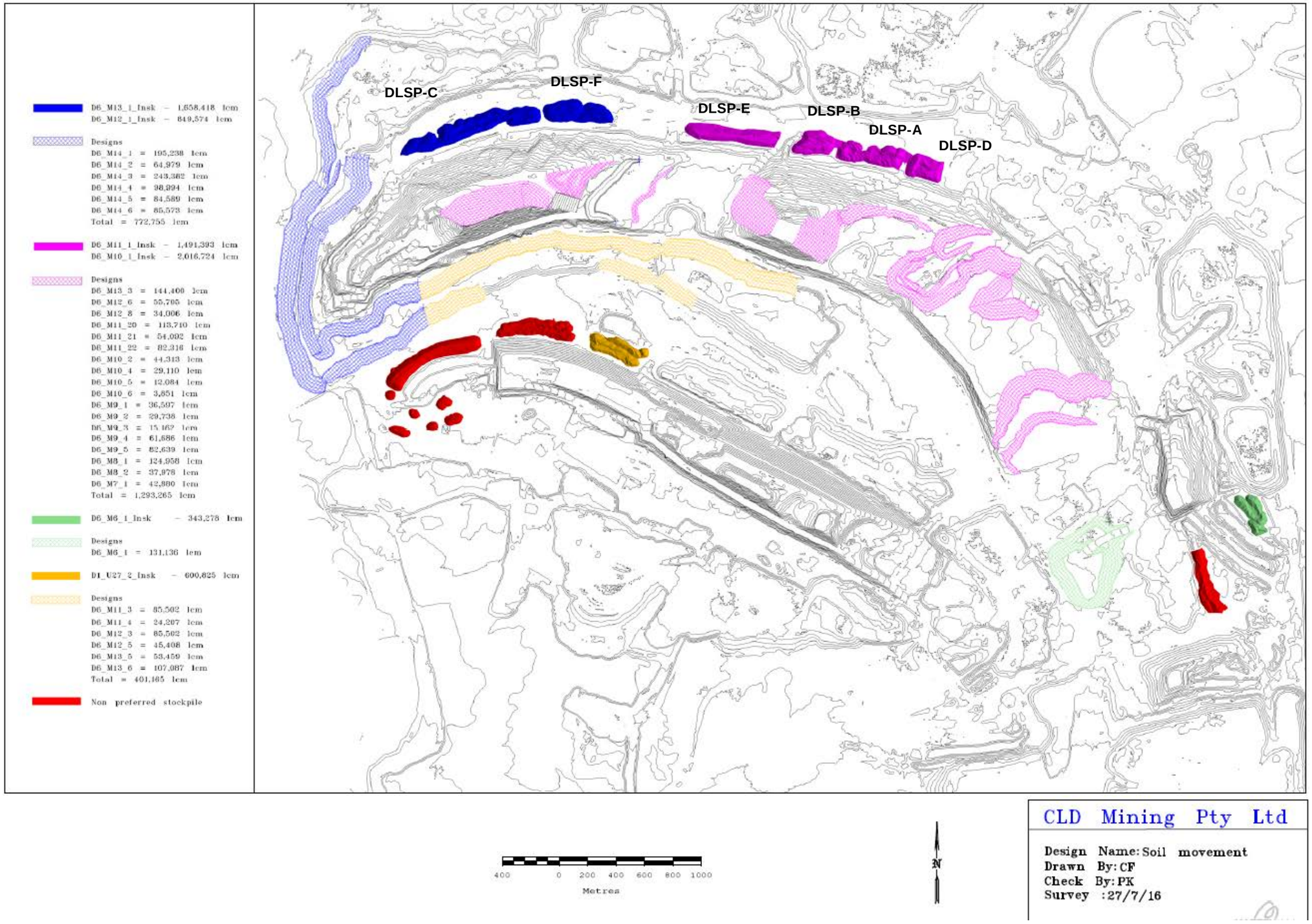


Figure 1-1: Location of DLSP Blocks targeted for field sampling. Note: D&B and Topsoil locations are not shown (image provided by Flinders Power)

Table 1-1: Summary of sample locations and context

Block	Used for 'Spon Com' Cover	Descriptions
DLSP-A	Yes	Used for MT15 and MT21 in-pit landforms
DLSP-B		
DLSP-C		Used for Western Bund
DLSP-D		Used for Cover material
DLSP-E		Used for MT15 in-pit landform
DLSP-F		Used for MT21 in-pit landform, west bund and test track area
D&B	No	Potential use for cover of inert demolition waste (e.g. not for management of hostile or 'spon com' waste)
Topsoil A&B	No	Assessment for potential use on Western Bund surfaces over cover materials

The DLSP Blocks (which were materials designated for use in rehabilitation covers) were located along the Main Series Dragline landform (**Figure 1-1**). In general the materials contained in that landform were dominated by finer soil particles (clay and silt) with some sand-sized material. In the field, the samples presented as light to dark grey-black clayey sand with light yellow brown and orange-brown clayey sands. Visible coarse grained content (>2 cm) ranged between 5 and 30% (MWH, 2016a). Following loading and placement, the DLSP materials were mixed, appearing as an unconsolidated light brown-grey clayey sand, with coarse content (>2 cm) at around 15% (**Figure 1-2**).

Figure 1-2: Material loaded from DLSP blocks, waiting to be spread over MT21 (image provided by Flinders Power)

1.3 Sampling Methodology

Site personnel were trained to undertake sampling and field testing in early September 2016. Field testwork comprised:

- Soil pH (1:5 deionised water suspension);
- Soil electrical conductivity (EC) (1:5 deionised water suspension); and
- Emerson Aggregate test (for structural stability).

A total of 254 field samples have been assessed from four waste landform area on site (DLSP-A, DLSP-B, DLSP-C, DLSP-D, DLSP-E and DLSP-F), topsoil stockpiles (Topsoil A&B) and other potential cover materials for inert site waste (D&B). A summary of samples for each landform area is provided in **Table 1-2**. Field Parameters for all samples are provided in **Appendix A**.

Table 1-2: Summary of numbers of field and laboratory samples

Block	Field samples	Lab samples
DLSP-A	53	10
DLSP-B	60	21
DLSP-C	17	4
DLSP-D	39	4
DLSP-E	34	2
DLSP-F	45	9
Topsoil A&B	2	2
D&B	4	4
TOTAL	**254**	**56**

Selected samples from each Block were collected using hand tools and sent to ALS Environmental laboratory (ALS) for analysis of target physical, chemical and geochemical characteristics (refer to primary laboratory reports in **Appendix B** for a complete list of test parameters and methods used). Parameters tested included:

- Physiochemical parameters: pH, EC, moisture content
- Exchangeable cations and exchangeable sodium percentage (ESP);
- Plant-available nutrients: K and P;
- Organic Matter;
- Geochemical physical parameters: saturated paste pH and EC, field pH screening and acidity;
- Sulfur species; including total sulfur, sulfate (total and soluble)
- Acid Base Accounting parameters: acid neutralising capacity (ANC), net acid production potential (NAPP);
- Total multi-elements; and
- Particle size distribution.

A total of 56 primary samples were sent to ALS for analysis in three batches. As the laboratory scope was focused on verification of field parameters by comparison of laboratory and field parameters, duplicate and field blank samples were not considered to be relevant for interpretation of data quality. Results of key analyses are provided in **Appendix A**.

1.4 Quality Assurance and Quality Control Summary

For quality assurance and quality control (QAQC) purposes, validation of analytical data from ALS was undertaken to assess the data gathered for compliance to project specification and analytical method requirements. The aim of this assessment is to validate that:

- Data of known quality is reported; and
- Data may be used with confidence to fulfil the overall project objectives.

The validation process for the laboratory analytical programme involved checking the compliance of analytical procedures and assessing accuracy and precision of analytical processes using a range of quality control measures. Specific elements of the analytical program checked and assessed for this project are listed below.

- Sample holding time compliance;
- Use of appropriate analytical procedures;
- Required limits of reporting (LOR);
- Frequency of conducting quality control measurements;
- Laboratory blank results;
- Precision [(Relative Percent Difference (RPD)] of laboratory duplicate results; and
- Matrix spike results.

All original quality control assurance reports received from the laboratory are included in Appendix B. ALS is National Association of Testing Authorities (NATA) accredited for all analyses conducted as part of this analytical program with the exception of those listed in **Table 1-3**. Based on validation of laboratory QAQC data, the overall quality of the analytical results is considered to be generally acceptable for interpretive use. A summary of QAQC interpretation is presented in **Table 1-3**.

Table 1-3: Summary of QAQC results

Sample handling and preservation	Sample container and/or preservation non-compliances were noted on batches EB1627092, and EB1700779. The non-compliance noted was not a true non-compliance as the transport of samples in sealed plastic bags for soil is not considered to have impacted the interpretation of results.
Holding time compliance	The following sample extraction/preparation non-compliances existed: • Batch EM1611178: pH and EC (all samples, between 11 and 14 days overdue); total sulfate (all samples, between eight and 11 days overdue). • Batch EB1627092: pH and EC (all samples, between three and 57 days overdue); chromium reducible sulfur, total sulfur and field pH screening (all samples, between nine and 63 days overdue); exchangeable cations (all samples, between 7 and 61 days overdue); soluble sulfate (ten samples, between ten and 36 days overdue); total recoverable mercury (ten samples, between 18 and 44 days overdue); and organic matter (all samples, between four and 58 days overdue). • Batch EB1700779: pH and EC (14 samples, between one and 57 days overdue); chromium reducible sulfur and field pH screening (all samples, between eight and 66 days overdue); exchangeable cations (nine samples, between 7 and 37 days overdue); soluble sulfate (nine samples, between six and 36 days overdue); total sulfur (nine samples, between nine and 39 days overdue) total recoverable mercury (nine samples between 7 and 37 days overdue); and organic matter (all samples, between seven and 37 days overdue). The following sample analysis non-compliances exist: • Batch EM1611178: soil moisture content (all samples, between one and four days overdue). • Batch EB1627092: field pH screening (all samples, between nine and 63 days overdue); moisture content (all samples, between one and 55 days overdue); exchangeable cations (all samples, between 7 and 61 days overdue); and total recoverable mercury (ten samples, between 19 and 45 days overdue). • Batch EB1701779: field pH screening (all samples, between eight and 66 days overdue); moisture content (nine samples, between 19 and 49 days overdue); exchangeable cations (nine samples, between 8 and 38 days overdue); total sulfur (nine samples, between nine and 39 days overdue) and total recoverable mercury (nine samples, between 8 and 38 days overdue); and organic matter (nine samples, between nine and 39 days overdue)
Frequency of Quality Control samples	No quality control sample frequency outliers existed.
Laboratory quality control samples	No laboratory quality control outliers existed for batch EM1611178 and EB1700779. Laboratory duplicate outliers occurred for batch EB1627092: • Recovery of total elements (barium and manganese – for sample DLSA Block 14A) exceeded LOP based limits due to sample heterogeneity
Matrix spike recovery	For all regular sample matrices, no surrogate recovery outliers occurred. Matrix Spike recovery outliers exist: • EM1611178: recovery for total manganese (Mn) in samples DLSB Block 1A and DLSA Block 2A was not determined due to background concentrations greater than or equal to four times the spike level. • EB1627092: recovery for total manganese for sample D+B Block 2A was not determined due to background concentrations greater than or equal to four times the spike level. • EB1627092: Recovery of total vanadium and zinc for sample D+B Block 2A was greater than the data quality objective due to sample heterogeneity. • EB1700779: recovery of total barium and manganese in sample DLSD BLOCK 4A was not determined due to background concentrations greater than or equal to four times the spike level.
Other	LOR was adjusted for analysis of Plant-available nutrients (K) due to dilution required for analysis. ALS is not NATA accredited for analytical methodologies: • Acidity, saturated paste pH and EC, and pH field screening.

The QAQC outliers and exceedances outlined in **Table 1-3** are unlikely to have significant effect on the precision and accuracy, or interpretation of reported results. This is explained further below:

- Exceedances in sample holding times for pH, EC and sulfate are due to the required length of time to transport samples from regional areas to the metropolitan laboratory. Overdue extraction and preparation non-compliances for pH and EC, total recoverable mercury, cation exchange capacity and organic matter are not likely to affect interpretation of results for dry or low moisture content samples. In addition, organic matter in samples is largely related to entrained coal content, so can be considered to be relatively stable (i.e. non-volatile) and as such is unlikely to affect analysis of organic carbon, and total recoverable mercury.
- Overdue extraction and preparation non-compliances related to sulfur species (total, sulfate and chromium reducible sulfur) may impact the calculation of acid potential (AP); however NAPP has been discussed and presented using both the conservative (using Total sulfur for AP calculation) and calculated NAPP (using sulfide sulfur or chromium reducible sulfur for AP calculation) approaches so interpretation of the results is not affected.
- The assessment of results is not considered to be impacted by potential changes in moisture content between sample collection and analysis. The samples were stored in sealed snap lock plastic bags so changes in moisture content between sample collection and analysis are likely to be minimal.
- The assessment of barium and manganese recovery for relevant samples (**Table 1-3**) was not able to be carried out as the concentration of the element in the soil was greater than the spike concentration. This is not considered to have an effect on the interpretation of any results.
- The total elements (barium, manganese, vanadium and zinc) matrix recovery and duplicate recovery non-compliances for samples D+B Block 2A and DLSA Block 14A were as a result of sample heterogeneity (confirmed by visual inspection of sample matrix). The higher value has been adopted for interpretive use where relevant.

The purpose of this review is to assess the effectiveness of field screening and laboratory analysis approach and techniques for identification of potentially problematic materials in relation to use of mine waste for rehabilitation and management of 'spon com' waste at the site. On the basis of the assessment objectives and the laboratory analytical data validation, the overall quality of the analytical results is considered to be acceptable for interpretive use.

2 Assessment of Data

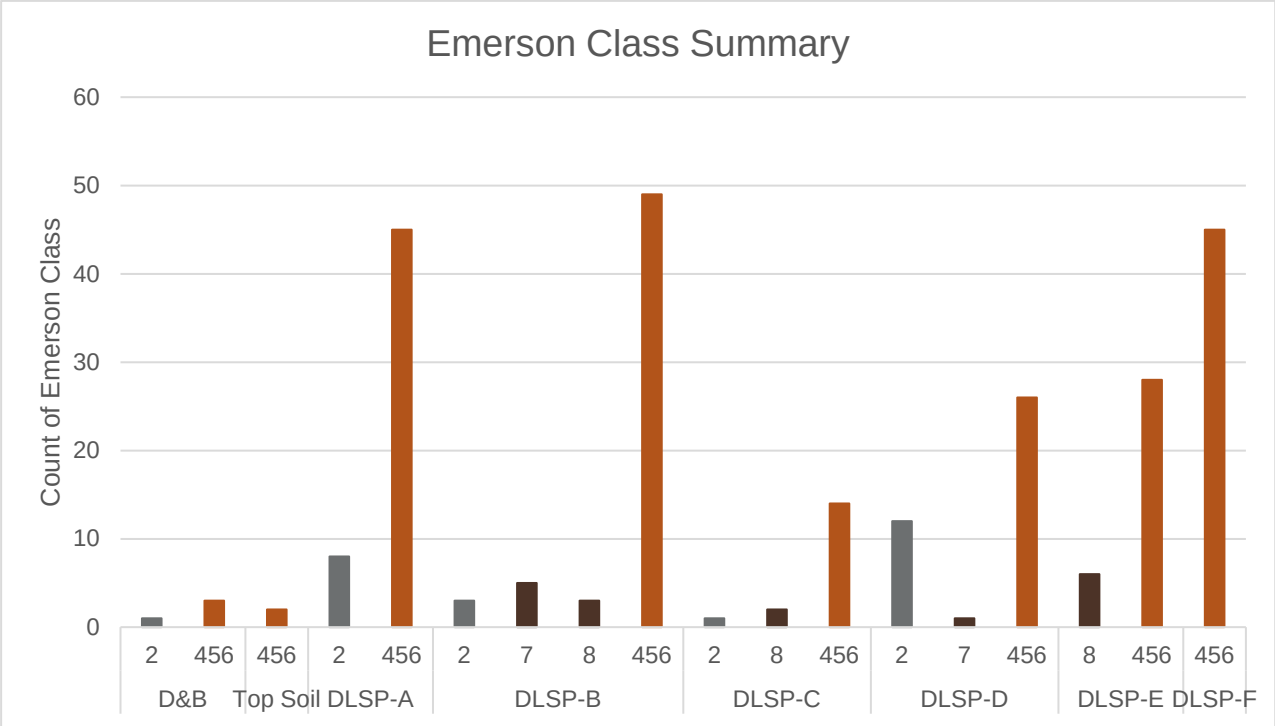
The data derived from the field and laboratory based analyses of chemical, physical and geochemical parameters is provided in **Appendix A**. A summary of results and material properties is provided in the following sections. Refer to the earlier soil and mine waste characterisation report for detailed definition of analytical methods and interpretative protocols used (MWH, 2016a).

2.1 Physical Properties

All samples were assessed for field structural stability properties, determined using the Emerson Aggregate test. The modified test used in the field was designed to distinguish Emerson Class related to structural strength (slaking) and clay dispersion. Properties related to the absence/presence of carbonate minerals and dispersive characteristics after dilution were not assessed.

Of the 254 mine waste samples assessed on site; 25 samples (10%) were classed as Emerson Class 2; 212 samples (83%) were classed with an Emerson Class of >4; and 17 samples (7%) were classed as Emerson Class 7 or 8. This indicates that the majority of samples tested are likely to have poor structural stability when disturbed (i.e. prone to slaking) but are unlikely to be dispersive under normal wetting conditions (i.e. normal rainfall events). Samples classed as Emerson Class 2 have poor structural stability and are prone to dispersion when wet. Soils classed as Emerson Class 7 or 8 are not likely to be structurally unstable or dispersive.

It should be noted that prolonged leaching of the materials classed as Emerson Class 4 may result in some structural decline in some circumstances (i.e. where vegetation establishment and organic content in the soils is poor). A summary of Emerson Class values for samples collected from each Block is provided in **Figure 2-1**.



Notes:
Class 2 = Clay dispersion is likely
Class 456 = Clay dispersion is not likely due to presence of salts and/or carbonate minerals
Class 7 and/or 8 = Aggregates are structurally stable

Figure 2-1: Summary of Emerson Class ratings for field samples

A total of 32 samples were selected for particle size analysis. A summary of minimum, maximum and average fine-fraction percent (clay+silt sized particles – particles less than 60 micrometres (µm)) is provided in **Table 2-1**. The majority of samples tested had greater than the 60% clay+silt threshold recommended for cover materials to be used for management of 'spon com' waste. Samples collected from the D&B waste areas had the lowest combined clay+silt particle size percentages. Samples collected from DLSP landforms generally had >60% clay and silt-sized particles (**Table 2-1**). The placement spreading of cover materials is likely to increase the amount of loose, fine-fraction particles due to mechanical breakdown of aggregates during earthworks activities.

Table 2-1: Summary of minimum, maxium and average fine-fraction (clay + silt) in selected samples

Block	Minimum clay+silt %	Maximum clay+silt %	Average clay+silt %
DLSP-A (n=4)	67%	85%	77%
DLSP-B (n=3)	51%	77%	64%
DLSP-C (n=4)	37%	80%	59%
DLSP-D (n=4)	65%	94%	75%
DLSP-E (n=2)	64%	65%	64.5%
DLSP-F (n=9)	42%	74%	66%
Average for Cover materials	**37%**	**94%**	**68%**
D&B (n=4)	19%	57%	38%
Topsoil (n=2)	39%	46%	42%

Notes:
'n' denotes number of samples

2.2 Soil Chemical Properties

All samples were assessed for field pH and field EC (in deionised water). A total of 56 samples were selected for laboratory analysis of soil chemical properties (pH and EC in deionised water, and exchangeable cations). A subset of samples were selected for analysis of plant-available nutrient (potassium and phosphorus) and organic matter. Results are provided in **Appendix A** and are discussed in the following sections.

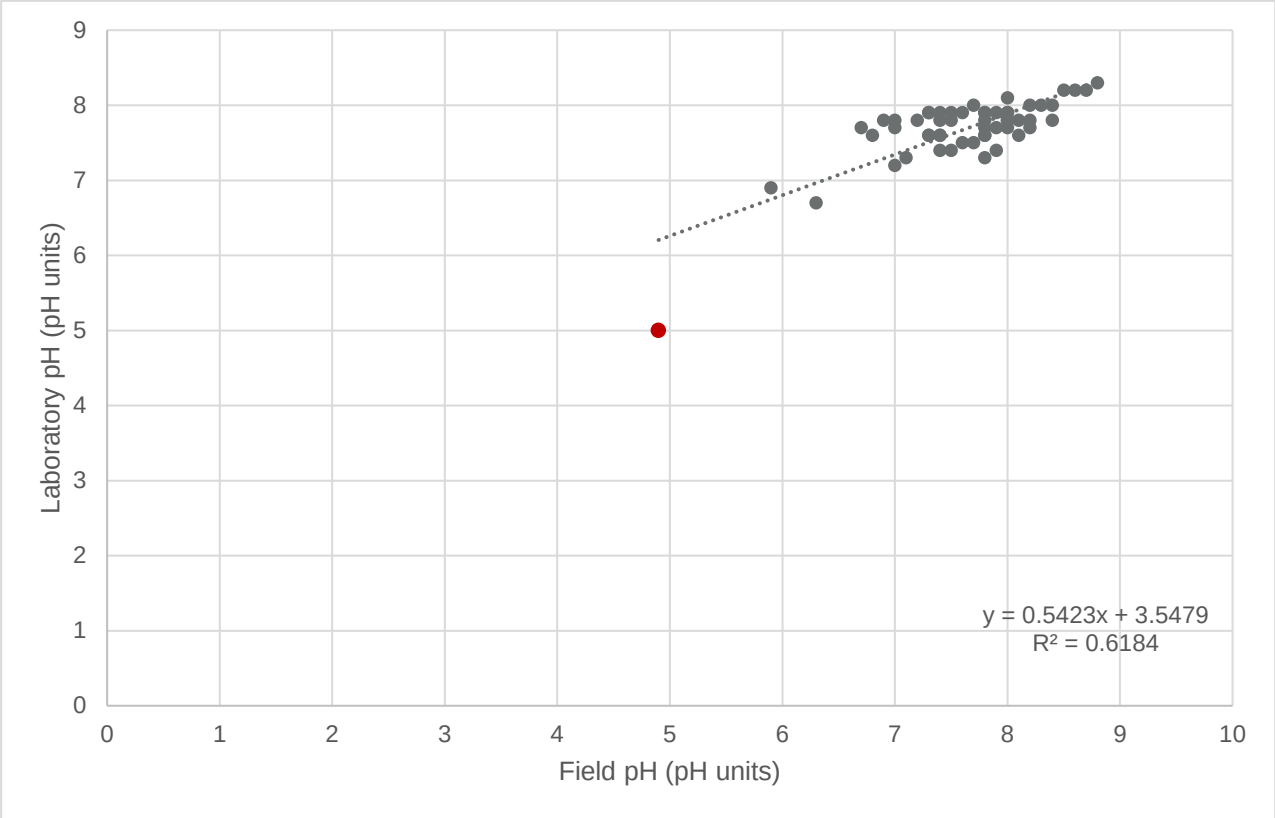
2.2.1 Correlation of Field and Laboratory Data

Field and laboratory data recorded of pH and EC were compared to assess the correlation of the two results.

The field and laboratory pH results have a moderate linear correlation (R^2 value of 0.62). Small variations in pH measured in the field and in the laboratory are observed (**Figure 2-2**). It is not unusual for pH to change during transit, due to changes in soil properties post-disturbance, related to sampling procedures and aeration of soil.

Provided pH probes used in the field are regularly calibrated in accordance with the field sampling procedures provided, field pH is considered to be an accurate representation of soil pH (1:5 suspension of soil in deionised water).

The relationship between field and laboratory measured EC (in 1:5 suspension of soil in deionised water) is more strongly linear compared to pH. The measured R^2 value is 0.78 (**Figure 2-3**). This indicates that field measurements of EC (using 1:5 soil:water suspension method) are a reasonable estimate of soil salinity in field conditions, with some variation observed.



Note: The red data point represents the Black Shale sample (DLSP-A Sample 2)

Figure 2-2: Correlation of field and laboratory analysis of pH

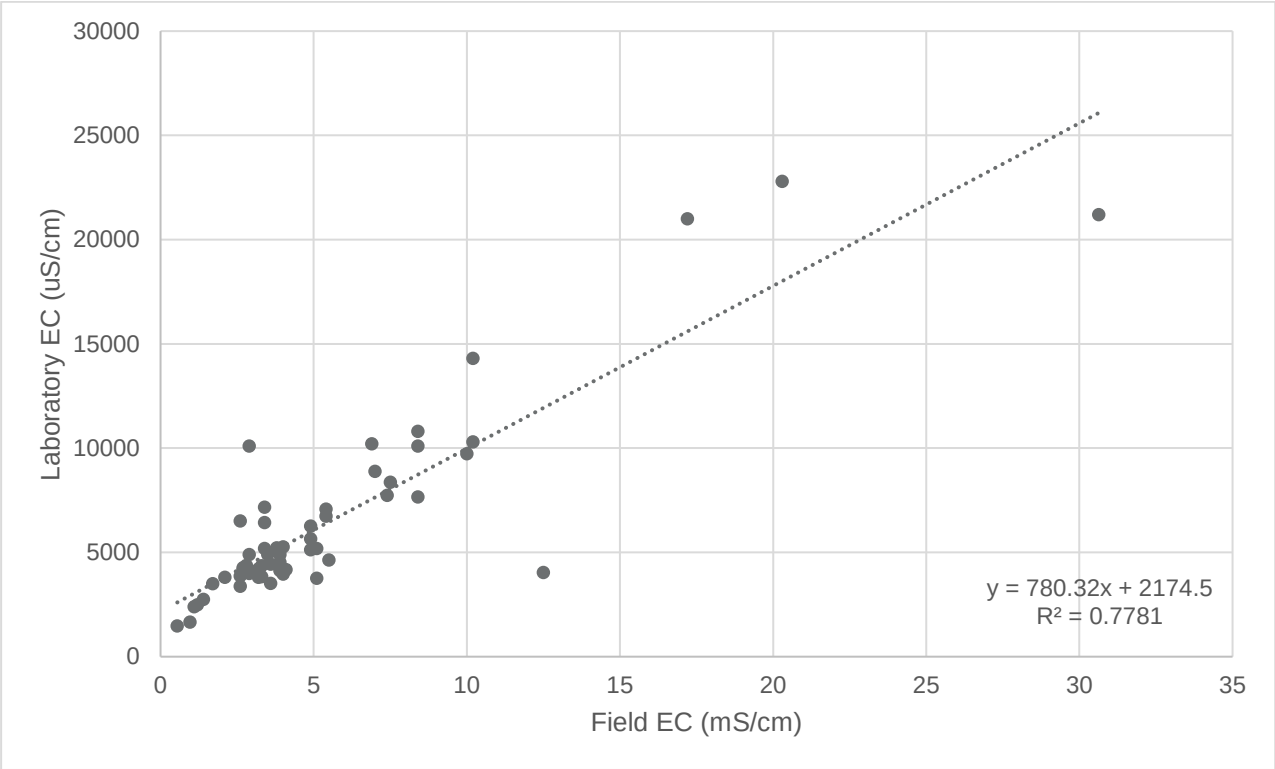


Figure 2-3: Correlation of field and laboratory analysis of EC

2.2.2 Soil pH and Salinity

Soil field pH (in deionised water) generally ranged from slightly acidic (5.9 pH units) to moderately alkaline (8.8 pH units). Average soil pH is 7.8 pH units. One sample had a soil pH value of 4.9 pH units (DLSP-A sample 2 – black shale). The average pH for each block was greater than 7 pH units (**Figure 2-4**) indicating that waste samples were not acidic.

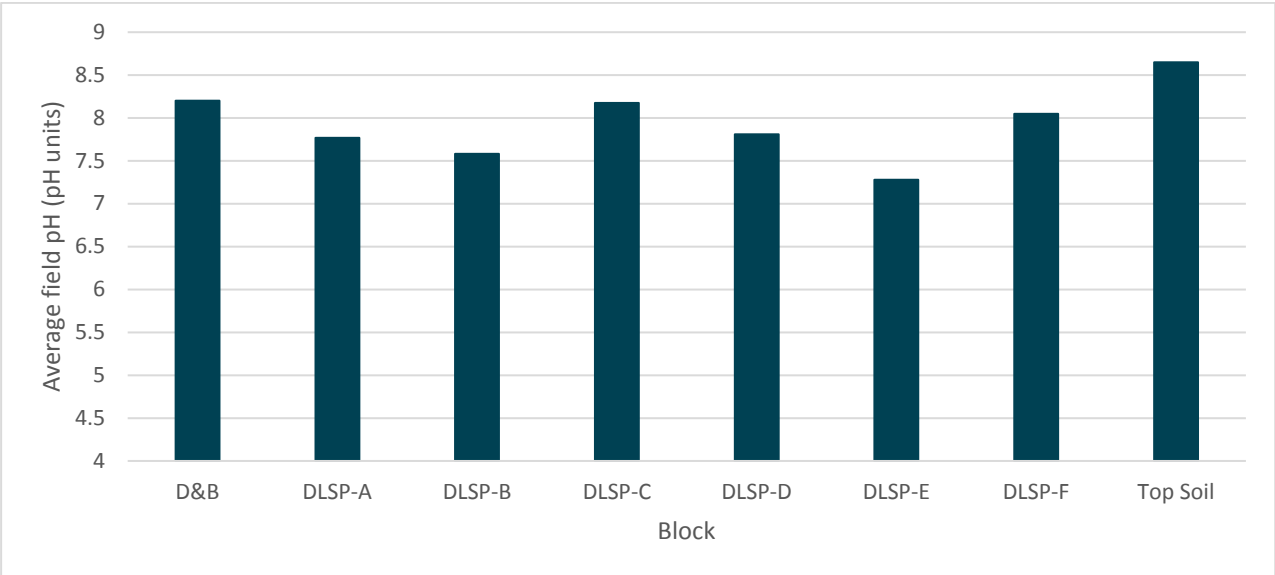


Figure 2-4: Average soil pH (field) for each block

Field EC values ranged from moderately saline (0.55 mS/cm) to extremely saline (30.6 mS/cm), with average EC values for each block being classed as extremely saline (**Figure 2-5)** based on standard CSIRO salinity classes. The high soil salinity measured in the samples included in the field screening, is consistent with the ranges of salinity measures in previous studies (MWH, 2016a). The high salinity of the samples tested may be influencing the soil stability by having a flocculating effect on clay particles, preventing clay dispersion.

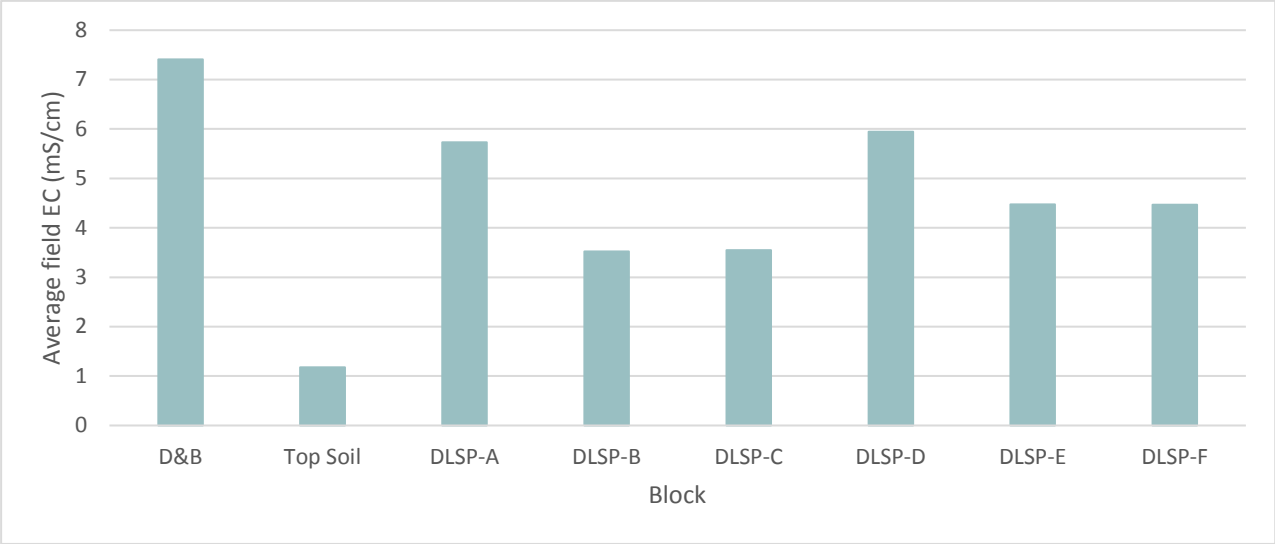


Figure 2-5: Average soil EC (field) for each block

2.2.3 Exchangeable Cations and Exchangeable Sodium Percentage

Exchangeable sodium percentage (ESP) (exchangeable sodium as a % of the cation exchange capacity) was below 6% for the majority of samples, and therefore most of the samples are classed as non-sodic. Sodic soils are generally regarded as being more prone to clay dispersion and structural degradation. Three of the 56 samples analysed recorded an ESP over the 6% threshold. All three samples were collected from DLSP-A block and ESP ranged from 6.6 to 14.4%. Average ESP for the block was 5.8%.

2.2.4 Soil Nutrient and Organic Matter

A total of 32 samples were tested for soil nutrient content (plant-available potassium and phosphorus) and soil organic matter. Plant-available potassium was ranged from below detection limit (<200 mg/kg) to 279 mg/kg, which is considered to be moderate to high relative to nutrient requirements for most agricultural plant species. Plant-available phosphorus values ranged from below detection limit (<5 mg/kg) to 13 mg/kg which is considered to be low for relative to nutrient requirements for most agricultural plant species.

Soil organic matter ranged from low (0.6%) to very high (27.3%) and was likely to be related to the amount of entrained coal in the waste materials sampled. Average organic matter content was 5.9%. While the organic matter content is generally considered to be high, it is likely that the actual percentage of organic matter available for support of soil properties and plant growth is limited.

The nutrient and soil organic carbon content measured in the waste samples collected in this study is consistent with values measured in previous waste samples assessed in 2015 (MWH, 2016a). Consistent with previous findings, plant-available nutrient and soil organic carbon values are generally considered to be favourable to establishment of local provenance species, and are not likely to be a limiting factor related to plant-growth.

2.3 Geochemical Properties

A total of 56 samples were assessed for acid-base accounting properties related to estimation of acid-forming potential. Sub-sets of samples were included for specific parameters. Results are provided in **Appendix A** and are discussed below.

2.3.1 Physiochemical properties

Paste pH values generally range from 5.8 pH units to 8.1 pH units (average 7.3 pH units), indicating that samples are generally circum-neutral, with isolated samples being slightly acidic. One sample had a paste pH value of 4.2 pH units (DLSP-A sample 2 – black shale) which indicates that it is likely to have been acidified by sulfide oxidation. Paste EC values are generally high (ranging from 620 uS/cm to over 53,000 uS/cm) with the average salinity being classed as highly brackish (11,930 uS/cm).

Field pH under deionised water and oxidised conditions was measured for a sub-set of 32 samples. In general field pH (pH_F) and oxidised pH (pH_{FOX}) were similar for the samples testing, indicating that the percentage of un-oxidised sulfur in the samples was generally low, or that samples contained available acid neutralising capacity to prevent generation of acid during oxidation. Based on a comparison of the change in pH with the reaction rates (which ranged from 3 to 4) it is likely that samples contained available carbonate and or organic matter.

It is noted that other components of the waste material may also contribute to a reduction in pH under oxidising conditions (e.g. organic carbon, and organic matter associated with coal) so this field test is not considered to be a reliable indication of the presence of sulfide minerals in the waste material.

2.3.2 Acid Base Accounting

Total sulfur was measured for all 56 samples. Total sulfur percent ranged from to 0.15%S to 1.4 %S. Based on the previous assessment, total sulfur in the waste samples is likely to include various form of sulfur including:

- Sulfide minerals (represented by chromium reducible sulfur – S_{CR})
- Sulfate minerals (gypsum etc.)
- Organic sulfur; and
- Elemental sulfur.

The S_{CR} was measured in the 56 samples and ranged from below detection limit (<0.005 %S) to 0.034 %S. Acid neutralising capacity (ANC) measured in the 56 samples ranged from 1.6 to 162 kg H_2SO_4/tonne.

Based on a conservative calculation of NAPP, where acid generation potential (AP) is estimated from total sulfur percentage, ten of the 56 samples are classified as potentially acid forming. Based on the waste lithologies present at Leigh Creek NAPP calculated conservatively is likely to overestimate acid production potential as sulfur is likely to be present in forms other than pyrite.

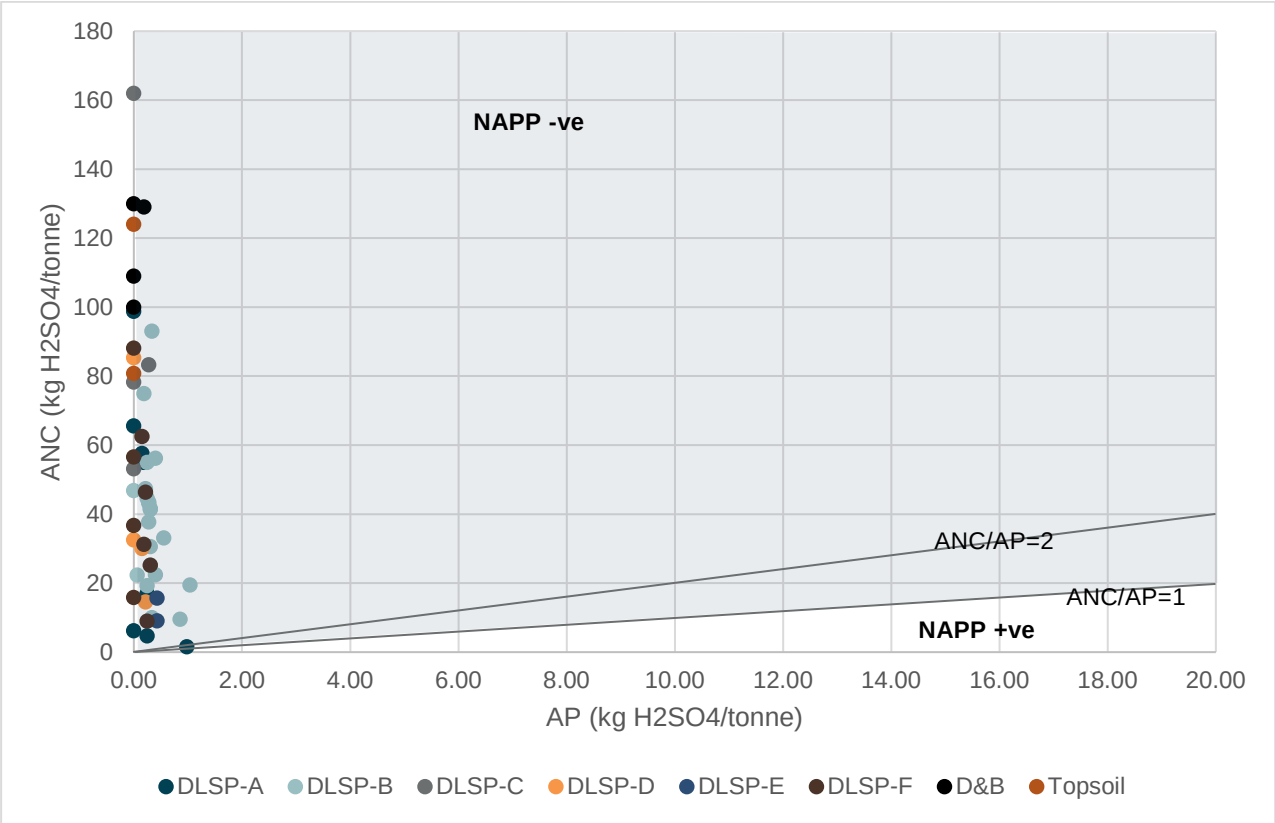
NAPP calculated from S_{CR} sulfur percentage found all 56 samples had NAPP values <0 kg H_2SO_4/tonne indicating that none of the samples tested were likely to be acid forming (**Figure 2-6**). Two of the samples had a calculated NAPP value of >-5 kg H_2SO_4/tonne. The only sample that plots close to the ANC/AP threshold line (ANC/AP = 1) is sample DLSP-A, Sample 2 which is the black shale sample that also had low pH (field pH 4.9, lab pH 5.0). This sample is likely to be potentially acid forming, with a low capacity to generate acid.

A more conservative way of calculating NAPP is to use an estimation of sulfide sulfur to predict acid generation potential. An estimate of sulfide sulfur can be made by removing the sulfate sulfur component of total sulfur. In the case of the waste samples collected from Leigh Creek mine, the calculation of sulfide sulfur is still likely to over-estimate acid generation potential due the presence of other forms of non-acid generating sulfur in the waste samples. However, it is considered to be a more conservative way of calculating NAPP, without overestimating the AP values.

In general, the sulfide sulfur concentrations are higher than S_{CR} sulfur concentrations. When NAPP is calculated using sulfide sulfur to determine AP (as opposed to using total sulfur or S_{CR}) only one sample has a NAPP value greater than zero (DLSP-A, Sample 2 – the black shale sample). This indicates that regardless of the sulfide sulfur form used to estimate NAPP, the majority of samples are not likely to be acid forming and can be classified as NAF.

It is noted that some of the calculated NAPP values are considered to be low negative (e.g. NAPP >-5 kg H_2SO_4/tonne), so if all ANC is not available (e.g. leached before it can be available for neutralisation) then acid formation may occur. However, based on the acid-generation properties of the samples assessed, any acid generated under such conditions is likely to be in low capacity.

Based on the data collected during the waste screening analysis, the acid-generation properties of the samples assessed are considered to be low risk, with the exception of the black shale sample. This waste material is easily identified in the field and should be segregated as part of the current earthmoving operations.



Notes:

Shaded area represents NAPP value less than zero (samples unlikely to be net acid producing)

Figure 2-6: ABA Chart for waste samples

2.3.3 Total Multi-elements

All of the mine waste samples assessed were elevated in concentrations of nickel with respect to the ISQG-low screening criteria (refer to MWH, 2016a for relevant criteria) indicating concentrations above which biological effects rarely occur. Two of the samples were exceeded EIL criteria, and one sample exceeded ISQG-high screening criteria. Total nickel concentrations ranged from 12 to 95 mg/kg.

A total of 25 samples had elevated concentrations of zinc, relative to EIL screening criteria (refer to MWH, 2016a for relevant criteria), concentrations were generally close to the screening criteria value. Concentrations ranged from 39 to 183 mg/kg. Isolated exceedances of mercury and copper were recorded at concentrations that were close to the screening criteria values. These exceedances are considered to be minor.

The total element concentrations measured and exceedances recorded are considered to be within the ranges assessed in the previous report (MWH, 2016a).

2.4 Summary of Mine Waste Material Properties

Soil physical properties of the waste samples were generally consistent with the findings of the previous Soil and Waste Characterisation study undertaken by MWH (MWH, 2016a), indicating that the materials chosen for field sampling and analysis are within the ranges of properties assessed in the earlier study. With respect to physical properties:

- Samples have poor structural strength (tendency to slake) but are unlikely to be dispersive under normal soil wetting conditions (e.g. normal rainfall events). Soil salinity is likely to be preventing clay dispersion.
- The majority of samples collected from DLSP blocks have clay and silt-sized proportions that are greater than the 60% recommended threshold for cover materials.
- Samples collected from the D&B Block are dominated by coarse-sized particles; however, mechanical breakdown during disturbance and earthworks is likely to increase the proportion of clay and silt-sized particles.

Soil chemical properties of the waste samples were generally consistent with findings of MWH study (MWH, 2016a). The soil chemical properties are summarised as follows:

- Field assessment of soil pH and EC are considered to be representative of the waste material properties based on reasonable correlation between field and laboratory results.
- Soil pH is generally neutral to moderately alkaline, with localised samples with acidic to slightly acidic soil pH indicating presence of potentially acid-forming (PAF) or acidified waste material.
- Soil EC is very to extremely saline, however, elevated salinity is not considered to be a limiting factor for use of the materials for cover application in the management of ‘spon com’ waste.
- Samples were generally non-sodic. Isolated samples (total of three) were classed as sodic; however, on average, samples are not likely to be prone to clay dispersion and structural decline.
- Soil nutrient and soil organic carbon concentrations are not likely to be limiting to plant growth.

Soil geochemical properties indicate that the majority of samples assessed are NAF and are likely to be suitable to use for rehabilitation and cover applications based on the geochemical properties. With respect to geochemical properties:

- Samples generally contain low concentrations of sulfide sulfur and are likely to be NAF.
- One sample, identified as black shale (DLSP-A block, Sample 2) had a lower pH compared to other samples are considered to be acidified and is classed as PAF. The black shale waste is easily identified in the field (visually and through field pH screening) and should be segregated as part of the current earthmoving operations.
- Some samples have low negative NAPP values indicating that samples may generate limited acidity if ANC is not available (e.g. leached before it can be available for neutralisation); however, any acid generated is likely to be in low quantities and is not considered to be a risk.

- Samples are generally elevated in concentrations of total nickel relative to ISQG – low screening criteria for concentrations above which biological effects rarely occur and total zinc relative to the EIL screening criteria. Minor exceedances of other elements were recorded. In general concentrations are within the ranges of other waste materials at the site, and are considered to be minor.

3 Summary of Findings and Recommendations

3.1 Waste Characterisation Protocol

Based on the data reviewed, the field screening and sampling protocol employed to date has identified and classified mine waste material physical, chemical and geochemical properties, with outcomes that are consistent with the previous waste characterisation study findings (MWH, 2016a). It is recommended that field sampling protocols be continued with the following items of note:

- The analysis of basic physical and chemical properties in the field, and confirmation of geochemical characteristics via laboratory-based analysis is an effective method of identifying potentially hostile waste;
- The majority of waste currently being moved as part of earthworks operations on-site is NAF;
- The black shale waste is likely to be hostile with respect to acid-generation properties and should continue to be segregated during earthworks operation. Recommendations are outlined in **Section 3.2** below;
- A cut off trigger value of soil pH 5.5 (field measured pH using a 1:5 suspension of soil in deionised water) should be used as an indicator of potentially hostile mine waste materials, with any materials identified during site based analysis as having a pH <5.5 should not be used for cover materials over 'spon com' waste and should be segregated into separate stockpiles or sent to the laboratory for confirmation of geochemical characteristics if confirmation for use is required;
- The majority of materials assessed are not considered to be dispersive or sodic.
- Stockpile Blocks with an average Emerson Class of <4 (e.g. Class 1, 2, 3a or 3b) or an average ESP >6% should not be used for cover materials over 'spon com' waste and should be segregated into separate stockpiles;
- The on-site testing program should continue as the earthworks/rehabilitation program progresses with representative samples being periodically sent to a NATA accredited laboratory for analysis; and
- Laboratory analysis of representative samples should include the following:
  - Laboratory pH and EC (in 1:5 suspension of soil in deionised water);
  - Saturated paste pH and EC;
  - Exchangeable cations (note that assessment of exchangeable cations should not take into account changes in soil pH for determination of method);
  - NAPP (including total sulfur and ANC);

- Total and soluble sulfate (as SO_4);
- Total multi-elements (15 metals suite for NEPM);
- Particle size determination (Clay, silt, sand and gravel fractions); and
- Any other specific parameters relevant to use of that materials (e.g. plant-available nutrient for growth media).

3.2 Recommendations for Management of Hostile Waste

Potential cover materials (e.g. DLSP Block soils and other mine waste stockpiles identified for use in cover of 'spon com' waste) should meet the following soil physical and chemical criteria measured in the field:

- Field soil pH (field measured pH using a 1:5 suspension of soil in deionised water) of >5.5 pH units
- Average stockpile Emerson class >3

Any soil materials not meeting the above field criteria, should be segregated and stockpiled in areas such that any surface water drainage and/or erosion of sediment reports to in-pit sumps. If needed for use in future rehabilitation works, segregated stockpiles should be sampled and sent to a laboratory for confirmatory analysis prior to use in rehabilitation.

Mine waste stockpiles that are found to be potentially dispersive, sodic, acidic and/or PAF through the field sampling, laboratory analysis and/or visual observation (e.g. black shale) processes should not be used for cover materials over 'spon com' waste.

4 References

MWH. (2016a). *Leigh Creek Coalfield - Soil and Waste Characterisation.* Jolimont, Australia: MWH Australia Pty Ltd.

MWH. (2016b). *Design Considerations ro Minimise Spontaneous Combustion at Leigh Creek.* Jolimont, Australia: MWH Australia Pty Ltd.

Appendices

Appendix A Results Tables

Waste characterisation database
DLSP-A

Block Reference				DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A		
Sample number				1A	1B	1C	2A	2B	2C	2	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C
Date sampled				5/09/16	7/11/16	7/11/16	5/09/16	7/11/16	7/11/16	5/09/16	5/09/16	7/11/16	7/11/16	5/09/16	8/11/16	8/11/16	5/09/16	8/11/16	8/11/16	19/09/16	11/11/16	11/11/16
Comments (bs = black shale observed in sample)										bs												
Field Measurements																						
Average pH (1:5)				7.3	8.2	8.2	6.8	7.9	8	4.9	7.3	8	8.1	6.7	8.1	8.5	7.6	7.9	8	7.5	8.4	8.2
Average EC (1:5) (mS/cm)				10.2	4.3	2.6	30.63	3.3	2.5	20.3	10	2.5	2.6	8.4	2.6	2.5	5.4	3.2	2.7	6	2.7	4.7
Emerson Class				456	456	456	456	456	456	2	456	456	456	456	456	456	456	456	2	456	2	456
Going to				-	MT21	MT21	-	MT21	MT21	-	-	MT21	MT21	-	MT15	MT15	-	MT15	MT15	-	MT15	MT15
Sample sent to Lab?				Y	N	Y	Y	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N
Lab Sample reference				EM1611178001	-	EB1627092005	EM1611178002	-	-	EM1611178003	EM1611178004	-	-	EM1611178005	-	-	EM1611178006	-	-	-	-	-
Analyte Grouping/Analyte	**Units**	**LOR**	**Criteria**																			
Physiochemical Properties																						
Moisture Content (dried @ 103°C)	%	1	-	9	-	5.4	12.3	-	-	9.7	8.3	-	-	7.8	-	-	8.8	-	-	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	7.9	-	8	7.6	-	-	5	7.6	-	-	7.7	-	-	7.5	-	-	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	10300	-	3380	21200	-	-	22800	9730	-	-	7660	-	-	7080	-	-	-	-	-
Exchangeable Cations																						
Exchangeable Calcium	meq/100g	0.2	-	44	-	46	8.6	-	-	7.4	22.1	-	-	54.6	-	-	50.3	-	-	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	3.6	-	2.3	2.4	-	-	4.5	2.1	-	-	1.7	-	-	6.2	-	-	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	0.2	-	0.2	<0.1	-	-	0.1	<0.1	-	-	0.1	-	-	0.1	-	-	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	2.6	-	0.7	1.8	-	-	0.7	1.7	-	-	1.8	-	-	1.9	-	-	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	87.3	-	93	67.2	-	-	58.3	85.3	-	-	93.8	-	-	86.0	-	-	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	7.1	-	5	18.8	-	-	35.4	8.1	-	-	2.9	-	-	10.6	-	-	-	-	-
Exchangeable Potassium Percent	%	0.2	-	0.4	-	0.4	<0.2	-	-	0.8	<0.2	-	-	0.2	-	-	0.2	-	-	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	5.2	-	1.5	14.1	-	-	5.5	6.6	-	-	3.1	-	-	3.2	-	-	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0 [3]	12.2	-	20	3.6	-	-	1.6	10.5	-	-	32.1	-	-	8.1	-	-	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	18	-	10.5	<24	-	-	45	<21	-	-	17	-	-	62	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	50.4	-	49.2	12.8	-	-	12.7	25.9	-	-	58.2	-	-	58.5	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-	50.8	-	49.3	13.2	-	-	13.1	26.2	-	-	58.6	-	-	58.8	-	-	-	-	-
Plant Available Nutrients																						
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	<200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																						
Organic Matter	%	0.5	-	-	-	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																						
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.5	-	7.6	6.9	-	-	4.2	7.2	-	-	7.4	-	-	7.4	-	-	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	23700	-	8440	22600	-	-	30200	25500	-	-	17100	-	-	13800	-	-	-	-	-
pH (F)	pH Unit	0.1	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	-	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																						
Sulfur - Total as S (LECO)	%	0.01	-	0.8	-	0.42	0.25	-	-	0.31	0.29	-	-	0.73	-	-	0.62	-	-	-	-	-
Chromium Reducible Sulphur	%	0.005	-	0.008	-	<0.005	0.008	-	-	0.032	<0.005	-	-	0.005	-	-	0.006	-	-	-	-	-
Total Sulfate	mg/kg	100	-	23800	-	-	3950	-	-	6800	32300	-	-	29300	-	-	16700	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	4830	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	1610	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AP (calc) [1]	kg H2SO4 equiv/t	0.01	-	0.25	-	7.9	0.25	-	-	0.98	<0.15	-	-	0.15	-	-	0.18	-	-	-	-	-
Acid Neutralising Capacity																						
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	17	-	98.8	4.7	-	-	1.6	6.2	-	-	57.6	-	-	55	-	-	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	1.7	-	10.1	0.5	-	-	0.2	0.6	-	-	5.9	-	-	5.6	-	-	-	-	-
Fizz Rating	Fizz Unit	0	-	1	-	2	0	-	-	0	0	-	-	2	-	-	2	-	-	-	-	-
Net Acid Production Potential																						
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	7.5	-	-85.9	3	-	-	7.9	27	-	-	-35.3	-	-	-36	-	-	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-16.8	-	-90.9	-4.46			-0.62	-6.2			-57.6			-54.8					
Total Multi-elements [2]																						
Arsenic	mg/kg	5	x	6	-	12	6	-	-	<5	<5	-	-	<5	-	-	<5	-	-	-	-	-
Barium	mg/kg	10	-	310	-	400	170	-	-	60	220	-	-	110	-	-	110	-	-	-	-	-
Beryllium	mg/kg	1	-	2	-	1	<1	-	-	<1	<1	-	-	<1	-	-	2	-	-	-	-	-
Boron	mg/kg	50	-	<50	-	<50	<50	-	-	<50	<50	-	-	<50	-	-	<50	-	-	-	-	-
Cadmium	mg/kg	1	x	<1	-	<1	<1	-	-	<1	<1	-	-	<1	-	-	<1	-	-	-	-	-
Chromium	mg/kg	2	x	29	-	31	26	-	-	22	27	-	-	21	-	-	27	-	-	-	-	-
Cobalt	mg/kg	2	-	16	-	19	14	-	-	20	10	-	-	9	-	-	8	-	-	-	-	-
Copper	mg/kg	5	x	42	-	39	34	-	-	53	33	-	-	30	-	-	30	-	-	-	-	-
Lead	mg/kg	5	x	18	-	16	19	-	-	22	18	-	-	16	-	-	13	-	-	-	-	-
Manganese	mg/kg	5	-	468	-	843	793	-	-	80	315	-	-	359	-	-	338	-	-	-	-	-
Mercury	mg/kg	0.1	x	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	-	<0.1	-	-	0.1	-	-	-	-	-
Nickel	mg/kg	2	x	22	-	36	20	-	-	38	15	-	-	12	-	-	18	-	-	-	-	-
Selenium	mg/kg	5	-	<5	-	<5	<5	-	-	<5	<5	-	-	<5	-	-	<5	-	-	-	-	-
Vanadium	mg/kg	5	-	51	-	83	43	-	-	34	33	-	-	34	-	-	56	-	-	-	-	-
Zinc	mg/kg	5	x	88	-	97	83	-	-	119	61	-	-	41	-	-	44	-	-	-	-	-
Soil Classification based on Particle Size																						
Clay (<2 µm)	%	1	<60	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-A

Block Reference				DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A		
Sample number				7A	7B	7C	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C
Date sampled				14/09/16	11/11/16	11/11/16	14/09/16	23/09/16	14/11/16	14/09/16	26/09/16	14/11/16	14/09/16	15/11/16	15/11/16	14/09/16	15/11/16	15/11/16	14/09/16	15/11/16	15/11/16
Comments (bs = black shale observed in sample)																					
Field Measurements																					
Average pH (1:5)				6.5	8.2	8.1	7.4	7.8	8	7.4	8.1	8.1	7.7	8.2	7.8	7.2	7.8	7.8	7	7.8	7.7
Average EC (1:5) (mS/cm)				10.7	2.9	3	8	3.4	3.4	8.6	3.1	3	19	3.3	2	9.5	4	3.5	12.6	2.9	2.9
Emerson Class				456	456	456	456	456	456	456	456	456	456	456	2	456	456	456	456	456	2
Going to				-	MT15	MT15	-	-	MT15	-	-	MT15	-	MT15	MT15	-	MT15	MT15	-	MT15	MT15
Sample sent to Lab?				N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N
Lab Sample reference				-	-	-	-	-	-	-	-	-	-	-	-	-	-	EB1700779001	-	-	-
Analyte Grouping/Analyte	**Units**	**LOR**	**Criteria**																		
Physiochemical Properties																					
Moisture Content (dried @ 103°C)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.1	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4900	-	-	-
Exchangeable Cations																					
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76.5	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88.9	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.6	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85.7	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	-	-	-
Plant Available Nutrients																					
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<200	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
Organic Matter																					
Organic Matter	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.9	-	-	-
Geochemical Physiochemical Parameters																					
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9070	-	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	-
Reaction Rate	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-	-
Sulfur Species																					
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.02	-	-	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008	-	-	-
Total Sulfate	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13300	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4440	-	-	-
AP (calc) [1]	kg H2SO4 equiv/t	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-
Acid Neutralising Capacity																					
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	-	-	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Net Acid Production Potential																					
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0													-	-	-15.36	-	-	-
Total Multi-elements [2]																					
Arsenic	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	-
Barium	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	-	-	-
Beryllium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Boron	mg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	-	-	-
Cadmium	mg/kg	1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-
Chromium	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-
Cobalt	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
Copper	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	-	-
Lead	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
Manganese	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	332	-	-	-
Mercury	mg/kg	0.1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-
Nickel	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
Selenium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	-
Vanadium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	-	-	-
Zinc	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	-	-	-
Soil Classification based on Particle Size																					
Clay (<2 µm)	%	1	<60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made u
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-A

Block Reference				DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A			DLSP-A
Sample number				13A	13B	13C	14A	14B	14C	15A	15B	15C	16A	16B	16C	17A	17/18/19B	18A	19A
Date sampled				14/09/16	2/11/16	2/11/16	14/09/16	31/10/16	31/10/16	14/09/16	28/10/16	28/10/16	14/06/16	28/10/16	28/10/16	14/06/16	22/09/16	14/06/16	14/09/16
Comments (bs = black shale observed in sample)																			
Field Measurements																			
Average pH (1:5)				7.3	8.3	8	7.4	8.6	8.3	6.7	8.3	8.3	7.3	8.5	8.2	8.2	8.3	7.8	8
Average EC (1:5) (mS/cm)				8	4.1	3.1	10.2	2.6	2.6	8.3	4.8	3.5	6	3	2.3	3	2.5	3.3	3.4
Emerson Class				456	456	2	456	456	456	456	2	2	456	456	456	456	456	456	456
Going to				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample sent to Lab?				N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y
Lab Sample reference				-	-	-	EB1627092011	-	-	-	-	-	-	-	-	-	-	-	EB1627092008
Analyte Grouping/Analyte	**Units**	**LOR**	**Criteria**																
Physiochemical Properties																			
Moisture Content (dried @ 103°C)	%	1	-	-	-	-	15.2	-	-	-	-	-	-	-	-	-	-	-	17.4
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	7.7
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	14300	-	-	-	-	-	-	-	-	-	-	-	7170
Exchangeable Cations																			
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	41.8	-	-	-	-	-	-	-	-	-	-	-	70
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-	19.5
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	<0.1
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	1.2	-	-	-	-	-	-	-	-	-	-	-	10.5
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	<0.1
Exchangeable Calcium Percent	%	0.2	-	-	-	-	88.9	-	-	-	-	-	-	-	-	-	-	-	70
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	19
Exchangeable Potassium Percent	%	0.2	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	<0.1
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	10.5
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	<0.1
Calcium/Magnesium Ratio	-	0.2	<1.0 [3]	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	3.6
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	46.8	-	-	-	-	-	-	-	-	-	-	-	100
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	47	-	-	-	-	-	-	-	-	-	-	-	100
Plant Available Nutrients																			
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	<200	-	-	-	-	-	-	-	-	-	-	-	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	<5
Organic Matter																			
Organic Matter	%	0.5	-	-	-	-	6.9	-	-	-	-	-	-	-	-	-	-	-	27.3
Total Organic Carbon	%	0.5	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	15.8
Geochemical Physiochemical Parameters																			
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	7.5
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	44400	-	-	-	-	-	-	-	-	-	-	-	14600
pH (F)	pH Unit	0.1	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	8
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	6.5	-	-	-	-	-	-	-	-	-	-	-	6.2
Reaction Rate	-	1	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	3
Acidity	mg/kg	1	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	352
Sulfur Species																			
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	0.76	-	-	-	-	-	-	-	-	-	-	-	1.27
Chromium Reducible Sulphur	%	0.005	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-	-	<0.005
Total Sulfate	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	13100	-	-	-	-	-	-	-	-	-	-	-	14000
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	4360	-	-	-	-	-	-	-	-	-	-	-	4660
AP (calc) [1]	kg H2SO4 equiv/t	0.01	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	<0.15
Acid Neutralising Capacity																			
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	10.2	-	-	-	-	-	-	-	-	-	-	-	65.6
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	6.7
Fizz Rating	Fizz Unit	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Net Acid Production Potential																			
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-26.7
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-10.02	-	-	-	-	-	-	-	-	-	-	-	-65.5
Total Multi-elements [2]																			
Arsenic	mg/kg	5	x	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	11
Barium	mg/kg	10	-	-	-	-	460	-	-	-	-	-	-	-	-	-	-	-	130
Beryllium	mg/kg	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	4
Boron	mg/kg	50	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	<50
Cadmium	mg/kg	1	x	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	<1
Chromium	mg/kg	2	x	-	-	-	36	-	-	-	-	-	-	-	-	-	-	-	48
Cobalt	mg/kg	2	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	14
Copper	mg/kg	5	x	-	-	-	47	-	-	-	-	-	-	-	-	-	-	-	40
Lead	mg/kg	5	x	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	24
Manganese	mg/kg	5	-	-	-	-	2300	-	-	-	-	-	-	-	-	-	-	-	198
Mercury	mg/kg	0.1	x	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	0.5
Nickel	mg/kg	2	x	-	-	-	39	-	-	-	-	-	-	-	-	-	-	-	31
Selenium	mg/kg	5	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	8
Vanadium	mg/kg	5	-	-	-	-	54	-	-	-	-	-	-	-	-	-	-	-	87
Zinc	mg/kg	5	x	-	-	-	114	-	-	-	-	-	-	-	-	-	-	-	102
Soil Classification based on Particle Size																			
Clay (<2 µm)	%	1	<60	-	-	-	21	-	-	-	-	-	-	-	-	-	-	-	19
Silt (2-60 µm)	%	1		-	-	-	64	-	-	-	-	-	-	-	-	-	-	-	58
Sand (0.06-2.00 mm)	%	1	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	9
Gravel (>2mm)	%	1	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	14
Gravel (>2mm)	%	1	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made u
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-B

Block Reference				DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B		
Sample number				1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C
Date sampled				8/09/16	22/09/16	29/09/16	8/09/2016	22/09/16	4/10/16	8/09/16	23/09/16	4/10/16	8/09/2016	23/09/16	4/10/16	8/09/16	23/09/16	4/10/16	8/09/16	23/09/16	5/10/16	8/09/2016	23/09/16	5/10/16
Comments (bs = black shale observed in sample)																								
Field Measurements																								
Average pH (1:5)				7	7.6	7.1	7.4	7.8	7.9	7.5	8	7.8	7.5	7.6	7.9	7.7	7.3	7.7	7.3	7.3	7.9	7.6	7.6	7.5
Average EC (1:5) (mS/cm)				4.1	3	2.5	4	3.2	2.6	5.1	2.6	2.8	5.1	2.3	2.4	5.5	2.7	2.6	4.9	2.6	4.2	3.4	2.5	3.1
Emerson Class				456	456	456	456	456	2	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456
Going to				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample sent to Lab?				Y	N	N	Y	N	Y	Y	N	N	Y	N	N	Y	N	N	Y	N	N	Y	N	N
Lab Sample reference				EM1611178007	-	-	EM1611178008	-	EB1627092007	EM1611178009	-	-	EM1611178010	-	-	EM1611178011	-	-	EM1611178012	-	-	EM1611178013	-	-
Lab Data	**Units**	**LOR**	**Criteria**																					
Physiochemical Properties																								
Moisture Content (dried @ 103°C)	%	1	-	6.4	-	-	11.1	-	8.2	9.9	-	-	9.5	-	-	9	-	-	14.2	-	-	12	-	-
pH (1:5 H_2O)	pH unit	0.1	-	7.8	-	-	7.9	-	7.9	7.8	-	-	7.9	-	-	8	-	-	7.9	-	-	7.9	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	4180	-	-	3960	-	3870	3760	-	-	5180	-	-	4630	-	-	6260	-	-	5180	-	-
Exchangeable Cations																								
Exchangeable Calcium	meq/100g	0.2	-	40	-	-	43.6	-	78.8	32.3	-	-	39.1	-	-	37.6	-	-	41.4	-	-	29.6	-	-
Exchangeable Magnesium	meq/100g	0.2	-	4	-	-	4	-	3.4	3.7	-	-	3.2	-	-	3.7	-	-	5	-	-	4.5	-	-
Exchangeable Potassium	meq/100g	0.2	-	0.1	-	-	0.2	-	0.1	0.2	-	-	0.2	-	-	0.2	-	-	0.2	-	-	0.2	-	-
Exchangeable Sodium	meq/100g	0.2	-	1.8	-	-	0.9	-	1.5	0.8	-	-	0.7	-	-	1	-	-	1.3	-	-	1.2	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	87	-	-	90	-	94	87	-	-	91	-	-	88	-	-	86	-	-	83	-	-
Exchangeable Magnesium Percent	%	0.2	-	8.7	-	-	8.2	-	4	10	-	-	7.4	-	-	8.7	-	-	10	-	-	13	-	-
Exchangeable Potassium Percent	%	0.2	-	0.2	-	-	0.4	-	0.1	0.5	-	-	0.5	-	-	0.5	-	-	0.4	-	-	0.6	-	-
Exchangeable Sodium Percent	%	0.2	>6	3.9	-	-	1.8	-	1.8	2.2	-	-	1.6	-	-	2.4	-	-	2.7	-	-	3.4	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	10	-	-	11	-	23.2	8.7	-	-	12	-	-	10	-	-	8.3	-	-	6.6	-	-
Magnesium/Potassium Ratio	-	0.2	-	40	-	-	20	-	27.2	18.5	-	-	16	-	-	18.5	-	-	25	-	-	22.5	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	45.9	-	-	48.7	-	83.8	37	-	-	43.2	-	-	42.5	-	-	47.9	-	-	35.5	-	-
Cation Exchange Capacity	meq/100g	0.2	-	46.2	-	-	48.9	-	83.8	37.2	-	-	43.5	-	-	48.2	-	-	48.2	-	-	35.8	-	-
Plant Available Nutrients																								
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	<200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																								
Organic Matter	%	0.5	-	-	-	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																								
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.3	-	-	7.4	-	7.7	7.2	-	-	7.4	-	-	7.4	-	-	7.4	-	-	7.4	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	5450	-	-	7380	-	5820	6310	-	-	4880	-	-	10000	-	-	9240	-	-	8790	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																								
Sulfur - Total as S (LECO)	%	0.01	-	0.92	-	-	0.46	-	1.25	0.52	-	-	0.65	-	-	0.51	-	-	0.41	-	-	0.54	-	-
Chromium Reducible Sulphur	%	0.005	-	0.007	-	-	0.01	-	<0.005	0.034	-	-	0.011	-	-	0.01	-	-	0.013	-	-	0.018	-	-
Total Sulfate (as SO4)	mg/kg	100	-	14800	-	-	9770	-	-	17700	-	-	15400	-	-	10400	-	-	12000	-	-	9770	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	9790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	3260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	0.21	-	-	0.31	-	<0.15	1.04	-	-	0.34	-	-	0.31	-	-	0.40	-	-	0.55	-	-
Acid Neutralising Capacity																								
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	47.4	-	-	25.1	-	46.8	19.5	-	-	93	-	-	41.6	-	-	22.4	-	-	33.1	-	-
ANC as CaCO3	% CaCO3	0.1	-	4.8	-	-	26	-	4.8	2	-	-	9.5	-	-	4.2	-	-	23	-	-	3.4	-	-
Fizz Rating	Fizz Unit	0	-	2	-	-	1	-	2	1	-	-	2	-	-	2	-	-	1	-	-	2	-	-
Net Acid Production Potential																								
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-19.2	-	-	-11	-	-8.6	-3.6	-	-	-73.1	-	-	-26	-	-	-9.8	-	-	-16.6	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-47	-	-	-25	-	-46.7	-19	-	-	-93	-	-	-41	-	-	-22	-	-	-33	-	-
Total Multi-elements																								
Arsenic	mg/kg	5	x	7	-	-	7	-	18	9	-	-	10	-	-	9	-	-	12	-	-	9	-	-
Barium	mg/kg	10	-	200	-	-	210	-	150	240	-	-	240	-	-	400	-	-	210	-	-	190	-	-
Beryllium	mg/kg	1	-	<1	-	-	1	-	2	1	-	-	<1	-	-	1	-	-	2	-	-	1	-	-
Boron	mg/kg	50	-	<50	-	-	<50	-	<50	<50	-	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-
Cadmium	mg/kg	1	x	<1	-	-	<1	-	<1	<1	-	-	<1	-	-	<1	-	-	<1	-	-	<1	-	-
Chromium	mg/kg	2	x	27	-	-	25	-	38	32	-	-	26	-	-	29	-	-	30	-	-	31	-	-
Cobalt	mg/kg	2	-	14	-	-	15	-	19	18	-	-	20	-	-	14	-	-	22	-	-	15	-	-
Copper	mg/kg	5	x	43	-	-	42	-	37	42	-	-	46	-	-	36	-	-	42	-	-	41	-	-
Lead	mg/kg	5	x	18	-	-	16	-	16	18	-	-	16	-	-	15	-	-	23	-	-	17	-	-
Manganese	mg/kg	5	-	720	-	-	1070	-	1160	1080	-	-	1910	-	-	619	-	-	1380	-	-	764	-	-
Mercury	mg/kg	0.1	x	0.2	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	-	-	<0.1	-	-	0.1	-	-	<0.1	-	-
Nickel	mg/kg	2	x	27	-	-	28	-	32	33	-	-	39	-	-	27	-	-	38	-	-	32	-	-
Selenium	mg/kg	5	-	<5	-	-	<5	-	<5	<5	-	-	<5	-	-	<5	-	-	<5	-	-	<5	-	-
Vanadium	mg/kg	5	-	46	-	-	51	-	112	62	-	-	61	-	-	53	-	-	117	-	-	65	-	-
Zinc	mg/kg	5	x	85	-	-	88	-	120	123	-	-	89	-	-	101	-	-	127	-	-	93	-	-
Soil Classification based on Particle Size																								
Clay (<2 µm)	%	1	<60	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-B

Block Reference				DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B		
Sample number				8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C	14A	14B	14C
Date sampled				8/09/2016	23/09/16	5/10/16	8/09/2016	26/09/16	10/10/16	8/09/2016	27/09/16	10/10/16	8/09/16	6/10/16	10/1016	8/09/16	6/10/16	10/10/16	8/09/16	12/10/16	12/10/16	8/09/16	12/10/16	12/10/16
Comments (bs = black shale observed in sample)																								
Field Measurements																								
Average pH (1:5)				7.8	7.8	7.6	8	8.1	7.5	5.9	7.7	7.6	6.9	7.2	7.4	7.4	7.2	7.9	7.2	8.1	7.9	7.4	7.8	7.9
Average EC (1:5) (mS/cm)				2.7	3.4	3.3	1.7	3.1	3	8.4	3.3	2.9	8.4	3.4	3	1.1	3.4	2.8	1.2	3.2	2.6	2.9	3.4	3.2
Emerson Class				456	456	456	456	456	7	456	456	8	456	7	8	456	7	8	456	456	456	456	456	456
Going to				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample sent to Lab?				Y	Y	N	Y	N	N	Y	Y	N	Y	N	N	Y	N	N	Y	N	N	Y	N	N
Lab Sample reference				EM1611178014	EB1627092012	-	EM1611178015	-	-	EM1611178016	EB1627092010	-	EM1611178017	-	-	EM1611178018	-	-	EM1611178019	-	-	EM1611178020	-	-
Lab Data	**Units**	**LOR**	**Criteria**																					
Physiochemical Properties																								
Moisture Content (dried @ 103°C)	%	1	-	7.9	9.1	-	13	-	-	9	10.1	-	8.3	-	-	8	-	-	9.7	-	-	9	-	-
pH (1:5 H_2O)	pH unit	0.1	-	7.9	7.9	-	7.9	-	-	6.9	7.5	-	7.8	-	-	7.8	-	-	7.8	-	-	7.6	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	4270	6430	-	3500	-	-	10800	4360	-	10100	-	-	2400	-	-	2480	-	-	4890	-	-
Exchangeable Cations																								
Exchangeable Calcium	meq/100g	0.2	-	38.7	46.1	-	60.5	-	-	16.7	47.5	-	39	-	-	68.3	-	-	79.8	-	-	51.4	-	-
Exchangeable Magnesium	meq/100g	0.2	-	3.8	3.1	-	5.4	-	-	2.3	8.1	-	4	-	-	3.8	-	-	3.9	-	-	5.4	-	-
Exchangeable Potassium	meq/100g	0.2	-	0.2	0.2	-	0.2	-	-	0.1	0.2	-	0.1	-	-	0.2	-	-	0.2	-	-	0.2	-	-
Exchangeable Sodium	meq/100g	0.2	-	1.1	0.8	-	1.1	-	-	0.5	2.7	-	1	-	-	0.2	-	-	0.1	-	-	0.6	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	88	92	-	90	-	-	85	81	-	88	-	-	94	-	-	95	-	-	89	-	-
Exchangeable Magnesium Percent	%	0.2	-	8.7	6	-	8.0	-	-	12	14	-	9.1	-	-	5.2	-	-	4.6	-	-	9	-	-
Exchangeable Potassium Percent	%	0.2	-	0.5	0.3	-	0.3	-	-	0.5	0.3	-	0.2	-	-	0.3	-	-	0.2	-	-	0	-	-
Exchangeable Sodium Percent	%	0.2	>6	2.5	1.7	-	1.6	-	-	2.6	4.6	-	2.3	-	-	0.3	-	-	0.1	-	-	1	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	0.2	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	10	14.9	-	11	-	-	7.3	5.9	-	9.8	-	-	18	-	-	20	-	-	9.5	-	-
Magnesium/Potassium Ratio	-	0.2	-	19	18.7	-	27	-	-	23	41.6	-	40	-	-	19	-	-	19.5	-	-	27	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	43.8	50.2	-	67.2	-	-	19.6	58.5	-	44.1	-	-	72.5	-	-	84	-	-	57.6	-	-
Cation Exchange Capacity	meq/100g	0.2	-	43.9	50.3	-	67.4	-	-	19.8	58.5	-	44.3	-	-	72.7	-	-	84.3	-	-		-	-
Plant Available Nutrients																								
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	<200	-	-	-	-	-	<200	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	12	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																								
Organic Matter	%	0.5	-	-	5.5	-	-	-	-	-	12.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	3.2	-	-	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																								
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.4	7.5	-	7.5	-	-	6.6	7.5	-	7.2	-	-	7.4	-	-	7.5	-	-	7	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	620	13500	-	2810	-	-	16000	7270	-	19600	-	-	2520	-	-	1470	-	-	10700	-	-
pH (F)	pH Unit	0.1	-	-	7.9	-	-	-	-	-	7.3	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	7.9	-	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	4	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	146	-	-	-	-	-	388	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																								
Sulfur - Total as S (LECO)	%	0.01	-	0.71	0.48	-	0.78	-	-	0.48	0.67	-	0.64	-	-	0.89	-	-	1.26	-	-	0.8	-	-
Chromium Reducible Sulphur	%	0.005	-	0.01	0.006	-	0.008	-	-	0.011	0.01	-	0.008	-	-	0.009	-	-	0.008	-	-	0.009	-	-
Total Sulfate (as SO4)	mg/kg	100	-	12600	-	-	19400	-	-	13300	-	-	23400	-	-	12400	-	-	14100	-	-	16400	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	9730	-	-	-	-	-	9740	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	3240	-	-	-	-	-	3250	-	-	-	-	-	-	-	-	-	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	0.31	0.18	-	0.25	-	-	0.34	0.31	-	0.25	-	-	0.3	-	-	0.2	-	-	0.3	-	-
Acid Neutralising Capacity																								
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	41.4	74.9	-	44.6	-	-	10	30.6	-	19.3	-	-	43.2	-	-	55	-	-	37.7	-	-
ANC as CaCO3	% CaCO3	0.1	-	4.2	7.6	-	4.6	-	-	1	3.1	-	2	-	-	4.4	-	-	5.6	-	-	3.8	-	-
Fizz Rating	Fizz Unit	0	-	2	2	-	2	-	-	1	2	-	1	-	-	2	-	-	2	-	-	2	-	-
Net Acid Production Potential																								
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-19.7	-60.2	-	-20.7	-	-	4.7	-10.1	-	<0.5	-	-	-16	-	-	-16.4	-	-	-13.2	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-41	-75	-	-44	-	-	-10	-30	-	-19	-	-	-43	-	-	-55	-	-	-37	-	-
Total Multi-elements																								
Arsenic	mg/kg	5	x	7	11	-	8	-	-	6	13	-	8	-	-	10	-	-	8	-	-	7	-	-
Barium	mg/kg	10	-	490	310	-	200	-	-	380	290	-	200	-	-	190	-	-	190	-	-	180	-	-
Beryllium	mg/kg	1	-	1	1	-	1	-	-	<1	2	-	1	-	-	1	-	-	1	-	-	1	-	-
Boron	mg/kg	50	-	<50	<50	-	<50	-	-	<50	<50	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-
Cadmium	mg/kg	1	x	<1	<1	-	<1	-	-	<1	<1	-	<1	-	-	<1	-	-	<1	-	-	<1	-	-
Chromium	mg/kg	2	x	30	36	-	32	-	-	29	36	-	30	-	-	38	-	-	29	-	-	32	-	-
Cobalt	mg/kg	2	-	15	19	-	17	-	-	16	25	-	17	-	-	13	-	-	11	-	-	11	-	-
Copper	mg/kg	5	x	36	40	-	36	-	-	45	51	-	40	-	-	39	-	-	38	-	-	37	-	-
Lead	mg/kg	5	x	17	22	-	18	-	-	22	30	-	20	-	-	19	-	-	18	-	-	23	-	-
Manganese	mg/kg	5	-	817	918	-	1180	-	-	481	1340	-	1180	-	-	881	-	-	734	-	-	762	-	-
Mercury	mg/kg	0.1	x	<0.1	<0.1	-	0.1	-	-	0.1	0.2	-	0.1	-	-	0.2	-	-	0.2	-	-	0.1	-	-
Nickel	mg/kg	2	x	28	38	-	29	-	-	36	40	-	30	-	-	25	-	-	20	-	-	20	-	-
Selenium	mg/kg	5	-	<5	<5	-	<5	-	-	<5	<5	-	<5	-	-	<5	-	-	<5	-	-	<5	-	-
Vanadium	mg/kg	5	-	51	75	-	64	-	-	40	81	-	59	-	-	71	-	-	50	-	-	48	-	-
Zinc	mg/kg	5	x	90	102	-	86	-	-	112	183	-	108	-	-	79	-	-	59	-	-	58	-	-
Soil Classification based on Particle Size																								
Clay (<2 µm)	%	1	<60	-	23	-	-	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	54	-	-	-	-	-	36	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	10	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	13	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	<1	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is prese
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-B

Block Reference				DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B			DLSP-B		
Sample number				15A	15B	15C	16A	16B	16C	17A	17B	17C	18A	18b	18C	19A	19B	19C	20A	20B	20C
Date sampled				8/09/16	12/10/16	14/10/16	8/09/16	12/10/16	14/10/16	8/09/16	12/10/16	14/10/16	8/09/16	12/10/16	14/10/16	18/10/16	27/10/16	27/10/16	27/10/16	27/10/16	27/10/16
Comments (bs = black shale observed in sample)																					
Field Measurements																					
Average pH (1:5)				7.3	8	8	6.3	8	7.9	7	7.9	7.8	7	7.8	7.8	7.7	8.3	7.5	7.9	7.7	7.7
Average EC (1:5) (mS/cm)				4	3	3.4	6.9	3.2	3	7.5	3.4	2.4	5.4	2.7	3	3.3	3.1	4.6	2.9	4.7	3.1
Emerson Class				456	456	456	456	456	7	456	456	456	456	456	7	2	456	456	456	456	2
Going to				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample sent to Lab?				Y	N	N	Y	N	N	Y	N	N	Y	N	N	N	N	N	N	N	N
Lab Sample reference				EM1611178021	-	-	EM1611178022	-	-	EM1611178023	-	-	EM1611178024	-	-	-	-	-	-	-	-
Lab Data	**Units**	**LOR**	**Criteria**																		
Physiochemical Properties																					
Moisture Content (dried @ 103°C)	%	1	-	9	-	-	12.3	-	-	10.2	-	-	10.5	-	-	-	-	-	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	7.6	-	-	6.7	-	-	7.2	-	-	7.7	-	-	-	-	-	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	5270	-	-	10200	-	-	8370	-	-	6740	-	-	-	-	-	-	-	-
Exchangeable Cations																					
Exchangeable Calcium	meq/100g	0.2	-	33.8	-	-	18.2	-	-	25.5	-	-	30.8	-	-	-	-	-	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	27	-	-	3.8	-	-	4.9	-	-	3.4	-	-	-	-	-	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	0.1	-	-	0.2	-	-	0.2	-	-	0.2	-	-	-	-	-	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	0.4	-	-	0.9	-	-	1	-	-	0.5	-	-	-	-	-	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	55	-	-	79	-	-	81	-	-	88	-	-	-	-	-	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	44	-	-	16	-	-	16	-	-	10	-	-	-	-	-	-	-	-
Exchangeable Potassium Percent	%	0.2	-	0	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	1	-	-	4	-	-	3	-	-	1	-	-	-	-	-	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	1.3	-	-	4.8	-	-	5.2	-	-	9.1	-	-	-	-	-	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	270	-	-	19	-	-	24.5	-	-	17	-	-	-	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	61.3	-	-	23.1	-	-	31.6	-	-	34.9	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-		-	-		-	-		-	-		-	-	-	-	-	-	-	-
Plant Available Nutrients																					
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																					
Organic Matter	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																					
pH (Saturated Paste)	pH Unit	0.1	<4.5	6.8	-	-	5.8	-	-	6.9	-	-	7	-	-	-	-	-	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	11700	-	-	16800	-	-	18400	-	-	2100	-	-	-	-	-	-	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																					
Sulfur - Total as S (LECO)	%	0.01	-	0.67	-	-	0.64	-	-	0.78	-	-	0.43	-	-	-	-	-	-	-	-
Chromium Reducible Sulphur	%	0.005	-	0.009	-	-	0.028	-	-	0.002	-	-	0.013	-	-	-	-	-	-	-	-
Total Sulfate (as SO4)	mg/kg	100	-	18900	-	-	12700	-	-	13400	-	-	9680	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	0.3	-	-	0.9	-	-	0.1	-	-	0.4	-	-	-	-	-	-	-	-
Acid Neutralising Capacity																					
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	43.5	-	-	9.5	-	-	22.3	-	-	56.2	-	-	-	-	-	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	4.4	-	-	1	-	-	23	-	-	5.7	-	-	-	-	-	-	-	-
Fizz Rating	Fizz Unit	0	-	2	-	-	1	-	-	1	-	-	2	-	-	-	-	-	-	-	-
Net Acid Production Potential																					
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-23	-	-	10.1	-	-	1.6	-	-	-43	-	-	-	-	-	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-43	-	-	-9	-	-	-22	-	-	-56	-	-	-	-	-	-	-	-
Total Multi-elements																					
Arsenic	mg/kg	5	x	7	-	-	8	-	-	8	-	-	8	-	-	-	-	-	-	-	-
Barium	mg/kg	10	-	190	-	-	260	-	-	300	-	-	220	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	-	1	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-
Boron	mg/kg	50	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1	x	<1	-	-	<1	-	-	<1	-	-	<1	-	-	-	-	-	-	-	-
Chromium	mg/kg	2	x	30	-	-	31	-	-	34	-	-	30	-	-	-	-	-	-	-	-
Cobalt	mg/kg	2	-	14	-	-	11	-	-	17	-	-	16	-	-	-	-	-	-	-	-
Copper	mg/kg	5	x	41	-	-	40	-	-	41	-	-	45	-	-	-	-	-	-	-	-
Lead	mg/kg	5	x	18	-	-	19	-	-	23	-	-	19	-	-	-	-	-	-	-	-
Manganese	mg/kg	5	-	848	-	-	514	-	-	1470	-	-	1030	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	x	0.1	-	-	0.1	-	-	0.1	-	-	0.1	-	-	-	-	-	-	-	-
Nickel	mg/kg	2	x	27	-	-	25	-	-	32	-	-	32	-	-	-	-	-	-	-	-
Selenium	mg/kg	5	-	<5	-	-	<5	-	-	<5	-	-	<5	-	-	-	-	-	-	-	-
Vanadium	mg/kg	5	-	48	-	-	43	-	-	78	-	-	47	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	x	94	-	-	86	-	-	108	-	-	92	-	-	-	-	-	-	-	-
Soil Classification based on Particle Size																					
Clay (<2 µm)	%	1	<60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is prese
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-C

Block Reference				DLSP-C	DLSP-C	DLSP-C	DLSP-C	DLSP-C		DLSP-C		DLSP-C		DLSP-C		DLSP-C		DLSP-C		
Sample number				17A	18A	19A	20A	21A	21B	22A	22B	23A	23B	24A	24B	25A	25B	26A	26B	26C
Date sampled				19/10/16	19/10/16	10/11/16	19/10/16	18/10/16	10/11/16	11/10/16	14/10/16	11/10/16	14/10/16	6/10/16	10/10/16	6/10/16	13/10/16	6/10/16	13/10/16	10/11/16
Comments (bs = black shale observed in sample)																				
Field Measurements																				
Average pH (1:5)				8	8.1	8.1	8.2	8.2	8	7.9	8.4	8.3	8.2	8.1	8	8	8.4	8.4	8.7	8
Average EC (1:5) (mS/cm)				3.1	2.9	3.8	3	2.4	4.6	9.3	2.2	6.9	2.6	1	2.8	2.9	3.4	2.8	2.7	3.9
Emerson Class				456	456	2	456	456	456	8	456	8	456	456	456	456	456	456	456	456
Going to				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample sent to Lab?				N	N	Y	N	N	N	N	N	N	Y	N	Y	N	N	N	N	Y
Lab Sample reference				-	-	EB1627092015	-	-	-	-	-	-	EB1627092014	-	EB1627092013	-	-	-	-	EB1627092016
Lab Data	**Units**	**LOR**	**Criteria**																	
Physiochemical Properties																				
Moisture Content (dried @ 103°C)	%	1	-	-	-	5.3	-	-	-	-	-	-	3.3	-	1	-	-	-	-	4.1
pH (1:5 H_2O)	pH unit	0.1	-	-	-	7.6	-	-	-	-	-	-	7.8	-	7.9	-	-	-	-	7.8
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	5220	-	-	-	-	-	-	6510	-	4370	-	-	-	-	4890
Exchangeable Cations																				
Exchangeable Calcium	meq/100g	0.2	-	-	-	66.3	-	-	-	-	-	-	113	-	63.6	-	-	-	-	62.2
Exchangeable Magnesium	meq/100g	0.2	-	-	-	5.5	-	-	-	-	-	-	3.1	-	2.6	-	-	-	-	3.9
Exchangeable Potassium	meq/100g	0.2	-	-	-	0.1	-	-	-	-	-	-	0.3	-	0.1	-	-	-	-	0.2
Exchangeable Sodium	meq/100g	0.2	-	-	-	1.7	-	-	-	-	-	-	1.2	-	0.8	-	-	-	-	1.3
Exchangeable Aluminium	meq/100g	0.2	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	-	<0.1
Exchangeable Calcium Percent	%	0.2	-	-	-	90	-	-	-	-	-	-	96	-	95	-	-	-	-	92
Exchangeable Magnesium Percent	%	0.2	-	-	-	8	-	-	-	-	-	-	3	-	4	-	-	-	-	6
Exchangeable Potassium Percent	%	0.2	-	-	-	0.2	-	-	-	-	-	-	0.2	-	0.2	-	-	-	-	0.2
Exchangeable Sodium Percent	%	0.2	>6	-	-	2.3	-	-	-	-	-	-	1	-	1.2	-	-	-	-	1.9
Exchangeable Aluminium Percent	%	0.2	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	-	<0.1
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	12	-	-	-	-	-	-	36.4	-	24.5	-	-	-	-	15.9
Magnesium/Potassium Ratio	-	0.2	-	-	-	42.6	-	-	-	-	-	-	10.1	-	17.7	-	-	-	-	25.8
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	73.6	-	-	-	-	-	-	117.6	-	67.1	-	-	-	-	67.6
Cation Exchange Capacity	meq/100g	0.2	-	-	-	73.8	-	-	-	-	-	-	118	-	67.2	-	-	-	-	67.7
Plant Available Nutrients																				
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	<200	-	-	-	-	-	-	<200	-	<200	-	-	-	-	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	8	-	-	-	-	-	-	6	-	5	-	-	-	-	5
Organic Matter																				
Organic Matter	%	0.5	-	-	-	6.6	-	-	-	-	-	-	1.5	-	2	-	-	-	-	5.8
Total Organic Carbon	%	0.5	-	-	-	3.8	-	-	-	-	-	-	0.9	-	1.2	-	-	-	-	3.4
Geochemical Physiochemical Parameters																				
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	7.6	-	-	-	-	-	-	7.6	-	7.7	-	-	-	-	7.6
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	10000	-	-	-	-	-	-	15000	-	8390	-	-	-	-	8820
pH (F)	pH Unit	0.1	-	-	-	7.7	-	-	-	-	-	-	7.8	-	8.2	-	-	-	-	7.7
pH (Fox)	pH Unit	0.1	<4.5	-	-	7.1	-	-	-	-	-	-	8.3	-	8	-	-	-	-	6.8
Reaction Rate	-	1	-	-	-	4	-	-	-	-	-	-	4	-	4	-	-	-	-	4
Acidity	mg/kg	1	-	-	-	275	-	-	-	-	-	-	170	-	137	-	-	-	-	202
Sulfur Species																				
Sulfur - Total as S (LECO)	%	0.01	-	-	-	1.21	-	-	-	-	-	-	1.4	-	0.64	-	-	-	-	0.86
Chromium Reducible Sulphur	%	0.005	-	-	-	<0.005	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-	0.009
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	10500	-	-	-	-	-	-	9740	-	8200	-	-	-	-	10300
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	3500	-	-	-	-	-	-	3240	-	2730	-	-	-	-	3420
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	<0.15	-	-	-	-	-	-	<0.15	-	<0.15	-	-	-	-	0.3
Acid Neutralising Capacity																				
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	53.1	-	-	-	-	-	-	78.3	-	162	-	-	-	-	83.3
ANC as CaCO3	% CaCO3	0.1	-	-	-	5.4	-	-	-	-	-	-	8	-	16.5	-	-	-	-	8.5
Fizz Rating	Fizz Unit	0	-	-	-	2	-	-	-	-	-	-	2	-	3	-	-	-	-	2
Net Acid Production Potential																				
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-16.1	-	-	-	-	-	-	-35.5	-	-142	-	-	-	-	-57
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-53	-	-	-	-	-	-	-78	-	-162	-	-	-	-	-83
Total Multi-elements																				
Arsenic	mg/kg	5	x	-	-	12	-	-	-	-	-	-	9	-	15	-	-	-	-	11
Barium	mg/kg	10	-	-	-	280	-	-	-	-	-	-	160	-	130	-	-	-	-	140
Beryllium	mg/kg	1	-	-	-	2	-	-	-	-	-	-	1	-	1	-	-	-	-	1
Boron	mg/kg	50	-	-	-	<50	-	-	-	-	-	-	<50	-	<50	-	-	-	-	<50
Cadmium	mg/kg	1	x	-	-	<1	-	-	-	-	-	-	<1	-	<1	-	-	-	-	<1
Chromium	mg/kg	2	x	-	-	40	-	-	-	-	-	-	29	-	28	-	-	-	-	35
Cobalt	mg/kg	2	-	-	-	19	-	-	-	-	-	-	15	-	12	-	-	-	-	10
Copper	mg/kg	5	x	-	-	38	-	-	-	-	-	-	27	-	28	-	-	-	-	30
Lead	mg/kg	5	x	-	-	22	-	-	-	-	-	-	15	-	12	-	-	-	-	17
Manganese	mg/kg	5	-	-	-	750	-	-	-	-	-	-	613	-	455	-	-	-	-	392
Mercury	mg/kg	0.1	x	-	-	0.1	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	-	0.1
Nickel	mg/kg	2	x	-	-	32	-	-	-	-	-	-	23	-	25	-	-	-	-	19
Selenium	mg/kg	5	-	-	-	<5	-	-	-	-	-	-	<5	-	<5	-	-	-	-	<5
Vanadium	mg/kg	5	-	-	-	76	-	-	-	-	-	-	61	-	99	-	-	-	-	71
Zinc	mg/kg	5	x	-	-	91	-	-	-	-	-	-	64	-	70	-	-	-	-	51
Soil Classification based on Particle Size																				
Clay (<2 µm)	%	1	<60	-	-	38	-	-	-	-	-	-	13	-	3	-	-	-	-	7
Silt (2-60 µm)	%	1		-	-	42	-	-	-	-	-	-	53	-	34	-	-	-	-	47
Sand (0.06-2.00 mm)	%	1	-	-	-	9	-	-	-	-	-	-	14	-	15	-	-	-	-	13
Gravel (>2mm)	%	1	-	-	-	11	-	-	-	-	-	-	20	-	48	-	-	-	-	33
Cobbles (>6cm)	%	1	-	-	-	<1	-	-	-	-	-	-	<1	-	<1	-	-	-	-	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-D

Block Reference				DLSP-D			DLSP-D			DLSP-D			DLSP-D			DLSP-D			DLSP-D			DLSP-D		
Sample number				1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C
Date sampled				14/11/2016	18/11/2016	23/11/2016	14/11/2016	18/11/2016	23/11/2016	14/11/2016	18/11/2016	23/11/2016	14/11/2016	18/11/2016	23/11/2016	15/11/2016	18/11/2016	23/11/2016	15/11/2016	18/11/2016	24/11/2016	15/11/2016	21/11/2016	28/11/2016
Comments (bs = black shale observed in sample)																								
Field Measurements																								
Average pH (1:5)				8.2	8.3	8.2	8.3	8	8.1	8.3	8	8.2	7.9	8.2	8.2	7.7	8.1	8	7.5	7.9	8	7.7	7.5	6.7
Average EC (1:5) (mS/cm)				11.4	2.9	3	8.6	3.9	3.1	5.7	3.8	2.9	7.4	3.4	3.5	7	2.7	4.2	22.3	2.9	3.3	22.5	3.9	3.2
Emerson Class				2	2	456	456	456	456	456	2	456	456	2	456	7	456	2	456	456	2	456	456	456
Going to				MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15
Sample sent to Lab?				N	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N
Lab Sample reference				-	-	-	-	EB1700779003	-	-	-	-	EB1700779002	-	-	-	-	-	-	-	-	-	-	-
Lab Data	**Units**	**LOR**	**Criteria**																					
Physiochemical Properties																								
Moisture Content (dried @ 103°C)			-	-	-	-	-	13.6	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	7.8	-	-	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	4530	-	-	-	-	7740	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Cations																								
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	86.4	-	-	-	-	36.5	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	2.3	-	-	-	-	2.1	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	<0.1	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	0.8	-	-	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	96.3	-	-	-	-	92.3	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	2.6	-	-	-	-	5.4	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	<0.1	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	0.9	-	-	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	-	-	37.6	-	-	-	-	17.4	-	-	-	-	-	-	-	-	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	17.1	-	-	-	-	-	-	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	89.5	-	-	-	-	39.3	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	89.7	-	-	-	-	39.6	-	-	-	-	-	-	-	-	-	-	-
Plant Available Nutrients																								
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	<200	-	-	-	-	<200	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	<5	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																								
Organic Matter	%	0.5	-	-	-	-	-	3.1	-	-	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	1.8	-	-	-	-	4.5	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																								
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	7.5	-	-	-	-	7.3	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	8370	-	-	-	-	18800	-	-	-	-	-	-	-	-	-	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	7.7	-	-	-	-	7.3	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	7.9	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	-	-	-	4	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	104	-	-	-	-	104	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																								
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	0.81	-	-	-	-	0.27	-	-	-	-	-	-	-	-	-	-	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	<0.005	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	11500	-	-	-	-	7280	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	3820	-	-	-	-	2430	-	-	-	-	-	-	-	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	-	-	<0.15	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-	-	-
Acid Neutralising Capacity																								
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	85.3	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	8.7	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Net Acid Production Potential																								
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-60.5	-	-	-	-	-21.7	-	-	-	-	-	-	-	-	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-	-85.2	-	-	-	-	-29.8	-	-	-	-	-	-	-	-	-	-	-
Total Multi-elements																								
Arsenic	mg/kg	5	x	-	-	-	-	13	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	10	-	-	-	-	-	460	-	-	-	-	280	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	-	-	-	-	-	4	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/kg	50	-	-	-	-	-	<50	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1	x	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	2	x	-	-	-	-	27	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	2	-	-	-	-	-	59	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	x	-	-	-	-	44	-	-	-	-	45	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	x	-	-	-	-	38	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	5	-	-	-	-	-	1420	-	-	-	-	585	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	x	-	-	-	-	0.2	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	2	x	-	-	-	-	95	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	5	-	-	-	-	-	14	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	5	-	-	-	-	-	175	-	-	-	-	59	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	x	-	-	-	-	134	-	-	-	-	79	-	-	-	-	-	-	-	-	-	-	-
Soil Classification based on Particle Size																								
Clay (<2 µm)	%	1	<60	-	-	-	-	23	-	-	-	-	38	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	42	-	-	-	-	56	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	6	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	29	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Cobbles (>6cm)	%	1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-D

Block Reference				DLSP-D			DLSP-D			DLSP-D			DLSP-D			DLSP-D			DLSP-D		
Sample number				8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C
Date sampled				16/11/2016	21/11/2016	28/11/2016	16/11/2016	21/11/2016	28/11/2016	16/11/2016	21/11/2016	29/11/2016	16/11/2016	22/11/2016	29/11/2016	16/11/2016	22/11/2016	29/11/2016	16/11/2016	22/11/2016	29/11/2016
Comments (bs = black shale observed in sample)																					
Field Measurements																					
Average pH (1:5)				7.6	7.7	6.8	7.4	7.8	7.1	7.2	7.7	7.7	7.6	8.2	7.3	8.2	8.1	7.7	7.6	7.9	7.9
Average EC (1:5) (mS/cm)				15.9	3	2.1	14.8	2.9	2.1	16.8	2.9	2.9	7.3	2.5	3.4	2.7	2.7	2.9	9.3	3.2	3.1
Emerson Class				456	456	2	456	456	2	456	456	456	456	2	456	456	456	2	456	456	456
Going to				MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15
Sample sent to Lab?				N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N
Lab Sample reference				-	-	-	-	-	EB1700779005	-	-	-	-	-		-	EB1700779004		-	-	
Lab Data	**Units**	**LOR**	**Criteria**																		
Physiochemical Properties																					
Moisture Content (dried @ 103°C)			-	-	-	-	-	-	10.5	-	-	-	-	-	-	-	13	-	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	-	7.3	-	-	-	-	-	-	-	7.8	-	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	-	3810	-	-	-	-	-	-	-	4180	-	-	-	-
Exchangeable Cations																					
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	-	40.5	-	-	-	-	-	-	-	46.5	-	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	-	6.1	-	-	-	-	-	-	-	3	-	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	0.1	-	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	0.2	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	-	82.9	-	-	-	-	-	-	-	91.5	-	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	-	12.4	-	-	-	-	-	-	-	6	-	-	-	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	0.2	-	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	-	4.2	-	-	-	-	-	-	-	2	-	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	0.4	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	-	-	-	6.6	-	-	-	-	-	-	-	15.5	-	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.9	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	-	48.6	-	-	-	-	-	-	-	50.6	-	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	-	48.9	-	-	-	-	-	-	-	50.8	-	-	-	-
Plant Available Nutrients																					
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	<200	-	-	-	-	-	-	-	<200	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	<5	-	-	-	-	-	-	-	<5	-	-	-	-
Organic Matter																					
Organic Matter	%	0.5	-	-	-	-	-	-	7.9	-	-	-	-	-	-	-	5.6	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	4.6	-	-	-	-	-	-	-	3.3	-	-	-	-
Geochemical Physiochemical Parameters																					
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	-	7.2	-	-	-	-	-	-	-	7.5	-	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	-	6150	-	-	-	-	-	-	-	9880	-	-	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	8	-	-	-	-	-	-	-	7.9	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	6.4	-	-	-	-	-	-	-	7.6	-	-	-	-
Reaction Rate	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	4	-	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	312	-	-	-	-	-	-	-	144	-	-	-	-
Sulfur Species																					
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	-	0.22	-	-	-	-	-	-	-	0.42	-	-	-	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	-	<0.005	-	-	-	-	-	-	-	0.007	-	-	-	-
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	10300	-	-	-	-	-	-	-	8400	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	3420	-	-	-	-	-	-	-	2800	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	-	-	-	<0.15	-	-	-	-	-	-	-	0.21	-	-	-	-
Acid Neutralising Capacity																					
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	-	32.5	-	-	-	-	-	-	-	14.5	-	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	1.5	-	-	-	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-
Net Acid Production Potential																					
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-25.8	-	-	-	-	-	-	-	-1.6	-	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-32.4	-	-	-	-	-	-	-	-14.3	-	-	-	-
Total Multi-elements																					
Arsenic	mg/kg	5	x	-	-	-	-	-	<5	-	-	-	-	-	-	-	7	-	-	-	-
Barium	mg/kg	10	-	-	-	-	-	-	70	-	-	-	-	-	-	-	420	-	-	-	-
Beryllium	mg/kg	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-
Boron	mg/kg	50	-	-	-	-	-	-	<50	-	-	-	-	-	-	-	<50	-	-	-	-
Cadmium	mg/kg	1	x	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-	-	-
Chromium	mg/kg	2	x	-	-	-	-	-	33	-	-	-	-	-	-	-	36	-	-	-	-
Cobalt	mg/kg	2	-	-	-	-	-	-	7	-	-	-	-	-	-	-	13	-	-	-	-
Copper	mg/kg	5	x	-	-	-	-	-	21	-	-	-	-	-	-	-	64	-	-	-	-
Lead	mg/kg	5	x	-	-	-	-	-	19	-	-	-	-	-	-	-	25	-	-	-	-
Manganese	mg/kg	5	-	-	-	-	-	-	166	-	-	-	-	-	-	-	529	-	-	-	-
Mercury	mg/kg	0.1	x	-	-	-	-	-	0.1	-	-	-	-	-	-	-	<0.1	-	-	-	-
Nickel	mg/kg	2	x	-	-	-	-	-	14	-	-	-	-	-	-	-	26	-	-	-	-
Selenium	mg/kg	5	-	-	-	-	-	-	<5	-	-	-	-	-	-	-	<5	-	-	-	-
Vanadium	mg/kg	5	-	-	-	-	-	-	54	-	-	-	-	-	-	-	58	-	-	-	-
Zinc	mg/kg	5	x	-	-	-	-	-	39	-	-	-	-	-	-	-	92	-	-	-	-
Soil Classification based on Particle Size																					
Clay (<2 µm)	%	1	<60	-	-	-	-	-	26	-	-	-	-	-	-	-	31	-	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	46	-	-	-	-	-	-	-	38	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	21	-	-	-	-	-	-	-	5	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	7	-	-	-	-	-	-	-	26	-	-	-	-
Cobbles (>6cm)	%	1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is prese
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-E

Block Reference				DLSP-E			DLSP-E			DLSP-E			DLSP-E			DLSP-E			DLSP-E		
Sample number				1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C
Date sampled				28/11/16	7/12/16	13/12/16	28/11/16	7/12/16	13/12/16	28/11/16	7/12/16	13/12/16	29/11/16	7/12/16	13/12/16	29/11/16	7/12/16	13/12/16	8/12/16	9/12/16	13/12/16
Comments (bs = black shale observed in sample)																					
Field Measurements																					
Average pH (1:5)				7.6	7.8	7.3	7.8	7.5	6.3	7.7	7.3	6.8	7.2	7.5	6.5	7.3	7.4	6.8	7.7	7.5	7.4
Average EC (1:5) (mS/cm)				3.3	3.0	4.0	2.9	2.4	2.9	3.5	3.4	3.4	10.7	3.2	3.5	6.1	3.9	3.4	6.4	3.6	3.4
Emerson Class				456	456	456	456	456	8	456	456	8	456	456	456	456	456	8	456	456	8
Going to				MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15
Sample sent to Lab?				N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	Y	N
Lab Sample reference				-	-	-	-	-	-	-	-	-	-	-	-	-	EB1700779006	-	-	EB1700779007	-
Lab Data	**Units**	**LOR**	**Criteria**																		
Physiochemical Properties																					
Moisture Content (dried @ 103°C)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5	-	-	4.4	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	7.4	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4130	-	-	3520	-
Exchangeable Cations																					
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32.6	-	-	37.2	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	-	-	3.1	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	0.2	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	0.9	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	0.2	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85.8	-	-	89.5	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1	-	-	7.4	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-	0.5	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	-	-	-	-	-	-	-	-	-	3.3	-	-	2.2	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	0.4	-
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6	-	-	12	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.2	-	-	13.6	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37.8	-	-	41.4	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	41.6	-
Plant Available Nutrients																					
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<200	-	-	<200	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	6	-
Organic Matter																					
Organic Matter	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.4	-	-	7.7	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4	-	-	4.5	-
Geochemical Physiochemical Parameters																					
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	7	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5970	-	-	7070	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	7.3	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	4	-
Reaction Rate	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-
Acidity	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248	-	-	224	-
Sulfur Species																					
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.38	-	-	0.15	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.014	-	-	0.014	-
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8820	-	-	7100	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2940	-	-	2370	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	-	-	0.43	-
Acid Neutralising Capacity																					
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.7	-	-	9.1	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	-	-	0.9	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-
Net Acid Production Potential																					
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-	-	-	-	-	-	-	-4.1	-	-	-4.5	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-	-	-	-	-	-	-	-15.3	-	-	-8.7	-
Total Multi-elements																					
Arsenic	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	7	-
Barium	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	790	-
Beryllium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-
Boron	mg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	-	-	<50	-
Cadmium	mg/kg	1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	<1	-
Chromium	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	29	-
Cobalt	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	17	-
Copper	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	-	41	-
Lead	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	24	-
Manganese	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	827	-	-	818	-
Mercury	mg/kg	0.1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-
Nickel	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	-	39	-
Selenium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	<5	-
Vanadium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	-	-	52	-
Zinc	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	137	-	-	85	-
Soil Classification based on Particle Size																					
Clay (<2 µm)	%	1	<60	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	24	-
Silt (2-60 µm)	%	1		-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	40	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	9	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	-	-	27	-
Cobbles (>6cm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	<1	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-E

Block Reference				DLSP-E			DLSP-E			DLSP-E			DLSP-E			DLSP-E	DLSP-E	DLSP-E	DLSP-E
Sample number				7A	7B	7C	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	12A	13A	14A
Date sampled				8/12/16	9/12/16	13/12/16	8/12/16	9/12/16	13/12/16	8/12/16	9/12/16	13/12/16	8/12/16	14/12/16	14/12/16	8/12/16	8/12/16	8/12/16	8/12/16
Comments (bs = black shale observed in sample)																			
Field Measurements																			
Average pH (1:5)				7.5	7.2	7.2	7.3	6.8	7.2	7.2	7.2	6.5	7.3	7.4	7.2	7.2	7.4	7.7	7.8
Average EC (1:5) (mS/cm)				4.6	3.1	3.2	5.2	5.0	3.0	8	4.1	4.5	4	3.4	3.2	5.4	9.4	7.2	5.8
Emerson Class				456	456	8	456	456	456	456	456	456	456	8	456	456	456	456	456
Going to				MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15	MT15
Sample sent to Lab?				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Lab Sample reference				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lab Data	**Units**	**LOR**	**Criteria**																
Physiochemical Properties																			
Moisture Content (dried @ 103°C)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Cations																			
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Available Nutrients																			
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Matter																			
Organic Matter	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geochemical Physiochemical Parameters																			
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reaction Rate	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur Species																			
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acid Neutralising Capacity																			
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Acid Production Potential																			
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Multi-elements																			
Arsenic	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	2	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soil Classification based on Particle Size																			
Clay (<2 µm)	%	1	<60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobbles (>6cm)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made u
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-F

Block Reference				DLSP-F			DLSP-F			DLSP-F			DLSP-F			DLSP-F		
Sample number				1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C
Date sampled				14/12/16	15/12/16	4/01/17	14/12/16	15/12/16	4/01/17	14/12/16	15/12/16	4/01/17	14/12/16	15/12/16	4/01/17	14/12/16	15/12/16	4/01/17
Comments (bs = black shale observed in sample)																		
Field Measurements																		
Average pH (1:5)				7.8	8	7.5	7.7	8.2	7.9	7.9	8.2	8	7.8	8.3	8.1	8.1	7.9	8.2
Average EC (1:5) (mS/cm)				3.6	2.1	2.8	5.4	2.0	3.2	6.2	2.0	3.1	7.7	2.6	4.0	6.0	1.9	3.2
Emerson Class				456	456	456	456	456	456	456	456	456	456	456	456	456	456	456
Going to				MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track
Sample sent to Lab?				Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y
Lab Sample reference				EB1700779008	-	-	-	-	EB1700779013	-	-	-	-	-	-	-	-	EB1700779010
Lab Data	**Units**	**LOR**	**Criteria**															
Physiochemical Properties																		
Moisture Content (dried @ 103°C)			-	4.6	-	-	-	-	4.8	-	-	-	-	-	-	-	-	5.1
pH (1:5 H_2O)	pH unit	0.1	-	7.8	-	-	-	-	7.4	-	-	-	-	-	-	-	-	7.7
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	4430	-	-	-	-	3810	-	-	-	-	-	-	-	-	4210
Exchangeable Cations																		
Exchangeable Calcium	meq/100g	0.2	-	44.1	-	-	-	-	46.5	-	-	-	-	-	-	-	-	50.1
Exchangeable Magnesium	meq/100g	0.2	-	3.1	-	-	-	-	3.9	-	-	-	-	-	-	-	-	4
Exchangeable Potassium	meq/100g	0.2	-	0.3	-	-	-	-	0.3	-	-	-	-	-	-	-	-	0.3
Exchangeable Sodium	meq/100g	0.2	-	0.9	-	-	-	-	1.1	-	-	-	-	-	-	-	-	1.1
Exchangeable Aluminium	meq/100g	0.2	-	0.1	-	-	-	-	0.2	-	-	-	-	-	-	-	-	0.1
Exchangeable Calcium Percent	%	0.2	-	90.8	-	-	-	-	89.4	-	-	-	-	-	-	-	-	89.9
Exchangeable Magnesium Percent	%	0.2	-	6.4	-	-	-	-	7.5	-	-	-	-	-	-	-	-	7.2
Exchangeable Potassium Percent	%	0.2	-	0.7	-	-	-	-	0.6	-	-	-	-	-	-	-	-	0.6
Exchangeable Sodium Percent	%	0.2	>6	1.8	-	-	-	-	2.2	-	-	-	-	-	-	-	-	2
Exchangeable Aluminium Percent	%	0.2	-	0.2	-	-	-	-	0.3	-	-	-	-	-	-	-	-	0.2
Calcium/Magnesium Ratio	-	0.2	<1.0	14.2	-	-	-	-	11.9	-	-	-	-	-	-	-	-	12.5
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	13.2	-	-	-	-	-	-	-	-	11.9
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	48.4	-	-	-	-	51.8	-	-	-	-	-	-	-	-	55.5
Cation Exchange Capacity	meq/100g	0.2	-	48.6	-	-	-	-	52	-	-	-	-	-	-	-	-	55.8
Plant Available Nutrients																		
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	<200	-	-	-	-	<200	-	-	-	-	-	-	-	-	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	<5	-	-	-	-	<5	-	-	-	-	-	-	-	-	6
Organic Matter																		
Organic Matter	%	0.5	-	5.1	-	-	-	-	6	-	-	-	-	-	-	-	-	4.4
Total Organic Carbon	%	0.5	-	3	-	-	-	-	3.5	-	-	-	-	-	-	-	-	2.6
Geochemical Physiochemical Parameters																		
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.4	-	-	-	-	6.8	-	-	-	-	-	-	-	-	7.4
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	6980	-	-	-	-	5760	-	-	-	-	-	-	-	-	7330
pH (F)	pH Unit	0.1	-	7.8	-	-	-	-	7.8	-	-	-	-	-	-	-	-	8
pH (Fox)	pH Unit	0.1	<4.5	7.7	-	-	-	-	7.6	-	-	-	-	-	-	-	-	8.3
Reaction Rate	-	1	-	4	-	-	-	-	4	-	-	-	-	-	-	-	-	4
Acidity	mg/kg	1	-	128	-	-	-	-	328	-	-	-	-	-	-	-	-	248
Sulfur Species																		
Sulfur - Total as S (LECO)	%	0.01	-	0.5	-	-	-	-	0.84	-	-	-	-	-	-	-	-	0.69
Chromium Reducible Sulphur	%	0.005	-	<0.005	-	-	-	-	<0.005	-	-	-	-	-	-	-	-	0.006
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	10500	-	-	-	-	9210	-	-	-	-	-	-	-	-	10800
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	3520	-	-	-	-	3070	-	-	-	-	-	-	-	-	3610
AP (calc)	kg H2SO4 equiv/t	0.01	-	<0.15	-	-	-	-	<0.15	-	-	-	-	-	-	-	-	0.18
Acid Neutralising Capacity																		
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	15.8	-	-	-	-	36.7	-	-	-	-	-	-	-	-	31.2
ANC as CaCO3	% CaCO3	0.1	-	1.6	-	-	-	-	3.7	-	-	-	-	-	-	-	-	3.2
Fizz Rating	Fizz Unit	0	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Net Acid Production Potential																		
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-0.5	-	-	-	-	-11	-	-	-	-	-	-	-	-	-10.1
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-15.7	-	-	-	-	-36.6	-	-	-	-	-	-	-	-	-31.0
Total Multi-elements																		
Arsenic	mg/kg	5	x	7	-	-	-	-	5	-	-	-	-	-	-	-	-	6
Barium	mg/kg	10	-	220	-	-	-	-	210	-	-	-	-	-	-	-	-	170
Beryllium	mg/kg	1	-	1	-	-	-	-	<1	-	-	-	-	-	-	-	-	1
Boron	mg/kg	50	-	<50	-	-	-	-	<50	-	-	-	-	-	-	-	-	<50
Cadmium	mg/kg	1	x	<1	-	-	-	-	1	-	-	-	-	-	-	-	-	<1
Chromium	mg/kg	2	x	28	-	-	-	-	25	-	-	-	-	-	-	-	-	27
Cobalt	mg/kg	2	-	25	-	-	-	-	17	-	-	-	-	-	-	-	-	18
Copper	mg/kg	5	x	46	-	-	-	-	34	-	-	-	-	-	-	-	-	38
Lead	mg/kg	5	x	18	-	-	-	-	11	-	-	-	-	-	-	-	-	17
Manganese	mg/kg	5	-	951	-	-	-	-	2910	-	-	-	-	-	-	-	-	1750
Mercury	mg/kg	0.1	x	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1
Nickel	mg/kg	2	x	36	-	-	-	-	29	-	-	-	-	-	-	-	-	30
Selenium	mg/kg	5	-	<5	-	-	-	-	<5	-	-	-	-	-	-	-	-	<5
Vanadium	mg/kg	5	-	50	-	-	-	-	40	-	-	-	-	-	-	-	-	50
Zinc	mg/kg	5	x	108	-	-	-	-	70	-	-	-	-	-	-	-	-	91
Soil Classification based on Particle Size																		
Clay (<2 µm)	%	1	<60	50	-	-	-	-	33	-	-	-	-	-	-	-	-	35
Silt (2-60 µm)	%	1		19	-	-	-	-	34	-	-	-	-	-	-	-	-	37
Sand (0.06-2.00 mm)	%	1	-	23	-	-	-	-	5	-	-	-	-	-	-	-	-	18
Gravel (>2mm)	%	1	-	8	-	-	-	-	28	-	-	-	-	-	-	-	-	10
Cobbles (>6cm)	%	1	-	<1	-	-	-	-	<1	-	-	-	-	-	-	-	-	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-F

Block Reference				DLSP-F			DLSP-F			DLSP-F			DLSP-F			DLSP-F			DLSP-F			DLSP-F		
Sample number				6A	6B	6C	7A	7B	7C	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C
Date sampled				15/12/16	16/12/16	4/01/17	15/12/16	16/12/16	4/01/17	15/12/16	16/12/16	4/01/17	15/12/16	16/12/16	4/01/17	15/12/16	16/12/16	4/01/17	9/01/17	9/01/17	9/01/17	10/01/17	11/01/17	11/01/17
Comments (bs = black shale observed in sample)																								
Field Measurements																								
Average pH (1:5)				8.1	7.8	7.3	8.3	8	7.9	8.3	8.3	8.0	8.2	8.2	8.1	8.5	8.3	8.7	8.3	8.1	8.4	7.7	7.9	8.4
Average EC (1:5) (mS/cm)				2.4	3.3	2.8	2.7	3.0	2.6	3.1	1.8	2.9	5.0	2.5	2.0	1.2	3.0	2.9	4.9	4.7	3.2	19.7	3.6	2.9
Emerson Class				456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456
Going to				MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track	MT21	MT21	test track	test track	test track	test track	test track	test track	test track
Sample sent to Lab?				N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	Y
Lab Sample reference				-	EB1700779009	-	-	-	-	-	-	EB1700779016	-	-	-	-	-	EB1700779014	EB1700779011	-	-	-	-	EB1700779012
Lab Data	**Units**	**LOR**	**Criteria**																					
Physiochemical Properties																								
Moisture Content (dried @ 103°C)			-	-	6	-	-	-	-	-	-	1.7	-	-	-	-	-	6.7	5.8	-	-	-	-	12.2
pH (1:5 H_2O)	pH unit	0.1	-	-	7.6	-	-	-	-	-	-	7.8	-	-	-	-	-	8.2	8	-	-	-	-	7.8
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	3840	-	-	-	-	-	-	10100	-	-	-	-	-	4040	5650	-	-	-	-	3990
Exchangeable Cations																								
Exchangeable Calcium	meq/100g	0.2	-	-	44.1	-	-	-	-	-	-	37.3	-	-	-	-	-	35.1	43.1	-	-	-	-	46.2
Exchangeable Magnesium	meq/100g	0.2	-	-	3.3	-	-	-	-	-	-	3.3	-	-	-	-	-	4.7	4	-	-	-	-	5.5
Exchangeable Potassium	meq/100g	0.2	-	-	0.3	-	-	-	-	-	-	0.3	-	-	-	-	-	0.6	0.5	-	-	-	-	0.4
Exchangeable Sodium	meq/100g	0.2	-	-	0.8	-	-	-	-	-	-	0.5	-	-	-	-	-	1.3	1.2	-	-	-	-	1.5
Exchangeable Aluminium	meq/100g	0.2	-	-	0.1	-	-	-	-	-	-	0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1
Exchangeable Calcium Percent	%	0.2	-	-	90.7	-	-	-	-	-	-	89.7	-	-	-	-	-	84.1	88	-	-	-	-	86.2
Exchangeable Magnesium Percent	%	0.2	-	-	6.7	-	-	-	-	-	-	8	-	-	-	-	-	11.2	8.2	-	-	-	-	10.2
Exchangeable Potassium Percent	%	0.2	-	-	0.6	-	-	-	-	-	-	0.8	-	-	-	-	-	1.4	1	-	-	-	-	0.7
Exchangeable Sodium Percent	%	0.2	>6	-	1.7	-	-	-	-	-	-	1.2	-	-	-	-	-	3	2.6	-	-	-	-	2.7
Exchangeable Aluminium Percent	%	0.2	-	-	0.2	-	-	-	-	-	-	0.3	-	-	-	-	-	0.2	0.2	-	-	-	-	0.2
Calcium/Magnesium Ratio	-	0.2	<1.0	-	13.4	-	-	-	-	-	-	11.3	-	-	-	-	-	7.5	10.8	-	-	-	-	8.4
Magnesium/Potassium Ratio	-	0.2	-	-	11.5	-	-	-	-	-	-	10.4	-	-	-	-	-	7.8	-	-	-	-	-	14.4
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	48.5	-	-	-	-	-	-	41.4	-	-	-	-	-	41.7	48.8	-	-	-	-	53.6
Cation Exchange Capacity	meq/100g	0.2	-	-	48.7	-	-	-	-	-	-	41.6	-	-	-	-	-	41.8	49	-	-	-	-	53.6
Plant Available Nutrients																								
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	<200	-	-	-	-	-	-	<200	-	-	-	-	-	<200	<200	-	-	-	-	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	<5	-	-	-	-	-	-	8	-	-	-	-	-	8	11	-	-	-	-	<5
Organic Matter																								
Organic Matter	%	0.5	-	-	6.6	-	-	-	-	-	-	2.7	-	-	-	-	-	0.9	1.1	-	-	-	-	5
Total Organic Carbon	%	0.5	-	-	3.8	-	-	-	-	-	-	1.6	-	-	-	-	-	0.5	0.6	-	-	-	-	2.9
Geochemical Physiochemical Parameters																								
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	7.2	-	-	-	-	-	-	7.4	-	-	-	-	-	8.1	7.7	-	-	-	-	7.6
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	5980	-	-	-	-	-	-	22900	-	-	-	-	-	10400	10200	-	-	-	-	8850
pH (F)	pH Unit	0.1	-	-	7.9	-	-	-	-	-	-	7.9	-	-	-	-	-	8.4	8.4	-	-	-	-	8.1
pH (Fox)	pH Unit	0.1	<4.5	-	7.8	-	-	-	-	-	-	8.3	-	-	-	-	-	8.2	8.1	-	-	-	-	8.1
Reaction Rate	-	1	-	-	4	-	-	-	-	-	-	4	-	-	-	-	-	4	4	-	-	-	-	4
Acidity	mg/kg	1	-	-	200	-	-	-	-	-	-	160	-	-	-	-	-	48	80	-	-	-	-	192
Sulfur Species																								
Sulfur - Total as S (LECO)	%	0.01	-	-	0.39	-	-	-	-	-	-	0.29	-	-	-	-	-	0.23	0.64	-	-	-	-	1.43
Chromium Reducible Sulphur	%	0.005	-	-	0.008	-	-	-	-	-	-	0.005	-	-	-	-	-	<0.005	<0.005	-	-	-	-	0.007
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	9310	-	-	-	-	-	-	9420	-	-	-	-	-	6580	11100	-	-	-	-	9560
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	3100	-	-	-	-	-	-	3140	-	-	-	-	-	2200	3700	-	-	-	-	3190
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	0.25	-	-	-	-	-	-	0.15	-	-	-	-	-	<0.15	<0.15	-	-	-	-	0.21
Acid Neutralising Capacity																								
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	9	-	-	-	-	-	-	62.5	-	-	-	-	-	88.1	56.6	-	-	-	-	46.4
ANC as CaCO3	% CaCO3	0.1	-	-	0.9	-	-	-	-	-	-	6.4	-	-	-	-	-	9	5.8	-	-	-	-	4.7
Fizz Rating	Fizz Unit	0	-	-	0.0	-	-	-	-	-	-	2	-	-	-	-	-	2	2	-	-	-	-	2
Net Acid Production Potential																								
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	2.9	-	-	-	-	-	-	-53.6	-	-	-	-	-	-81.1	-37	-	-	-	-	-2.6
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-8.8	-	-	-	-	-	-	-62.3	-	-	-	-	-	-88	-56.5	-	-	-	-	-46.2
Total Multi-elements																								
Arsenic	mg/kg	5	x	-	9	-	-	-	-	-	-	10	-	-	-	-	-	8	8	-	-	-	-	8
Barium	mg/kg	10	-	-	330	-	-	-	-	-	-	180	-	-	-	-	-	120	140	-	-	-	-	130
Beryllium	mg/kg	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	-	1
Boron	mg/kg	50	-	-	<50	-	-	-	-	-	-	<50	-	-	-	-	-	<50	<50	-	-	-	-	<50
Cadmium	mg/kg	1	x	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	<1	<1	-	-	-	-	<1
Chromium	mg/kg	2	x	-	28	-	-	-	-	-	-	29	-	-	-	-	-	28	30	-	-	-	-	27
Cobalt	mg/kg	2	-	-	10	-	-	-	-	-	-	17	-	-	-	-	-	13	13	-	-	-	-	15
Copper	mg/kg	5	x	-	49	-	-	-	-	-	-	39	-	-	-	-	-	29	38	-	-	-	-	33
Lead	mg/kg	5	x	-	21	-	-	-	-	-	-	14	-	-	-	-	-	13	15	-	-	-	-	14
Manganese	mg/kg	5	-	-	518	-	-	-	-	-	-	654	-	-	-	-	-	575	656	-	-	-	-	916
Mercury	mg/kg	0.1	x	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1
Nickel	mg/kg	2	x	-	20	-	-	-	-	-	-	24	-	-	-	-	-	22	23	-	-	-	-	26
Selenium	mg/kg	5	-	-	<5	-	-	-	-	-	-	<5	-	-	-	-	-	<5	<5	-	-	-	-	<5
Vanadium	mg/kg	5	-	-	43	-	-	-	-	-	-	57	-	-	-	-	-	53	48	-	-	-	-	51
Zinc	mg/kg	5	x	-	97	-	-	-	-	-	-	72	-	-	-	-	-	63	68	-	-	-	-	76
Soil Classification based on Particle Size																								
Clay (<2 µm)	%	1	<60	-	26	-	-	-	-	-	-	31	-	-	-	-	-	21	9	-	-	-	-	24
Silt (2-60 µm)	%	1		-	48	-	-	-	-	-	-	43	-	-	-	-	-	44	55	-	-	-	-	40
Sand (0.06-2.00 mm)	%	1	-	-	10	-	-	-	-	-	-	7	-	-	-	-	-	29	17	-	-	-	-	12
Gravel (>2mm)	%	1	-	-	16	-	-	-	-	-	-	19	-	-	-	-	-	6	19	-	-	-	-	24
Cobbles (>6cm)	%	1	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	<1	<1	-	-	-	-	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is prese
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
DLSP-F

Block Reference				DLSP-F			DLSP-F			DLSP-F		
Sample number				13A	13B	13C	14A	14B	14C	15A	15B	15C
Date sampled				10/01/17	18/01/17	18/01/17	10/01/17	23/01/17	23/01/17	10/01/17	30/01/17	30/01/17
Comments (bs = black shale observed in sample)												
Field Measurements												
Average pH (1:5)				7.9	8	8	7.8	8.7	8	7.8	7.8	7.8
Average EC (1:5) (mS/cm)				19.7	3.2	4.5	12.4	2.0	3.2	12.5	3.8	3.8
Emerson Class				456	456	456	456	456	456	456	456	456
Going to				test track	west bund	west bund	test track	west bund	west bund	test track	west bund	west bund
Sample sent to Lab?				N	N	N	N	N	N	Y	N	N
Lab Sample reference				-	-	-	-	-	-	EB1700779015	-	-
Lab Data	**Units**	**LOR**	**Criteria**									
Physiochemical Properties												
Moisture Content (dried @ 103°C)			-	-	-	-	-	-	-	12.8	-	-
pH (1:5 H_2O)	pH unit	0.1	-	-	-	-	-	-	-	7.6	-	-
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	-	-	-	-	-	-	4040	-	-
Exchangeable Cations												
Exchangeable Calcium	meq/100g	0.2	-	-	-	-	-	-	-	44.9	-	-
Exchangeable Magnesium	meq/100g	0.2	-	-	-	-	-	-	-	3	-	-
Exchangeable Potassium	meq/100g	0.2	-	-	-	-	-	-	-	0.3	-	-
Exchangeable Sodium	meq/100g	0.2	-	-	-	-	-	-	-	0.8	-	-
Exchangeable Aluminium	meq/100g	0.2	-	-	-	-	-	-	-	0.1	-	-
Exchangeable Calcium Percent	%	0.2	-	-	-	-	-	-	-	91.4	-	-
Exchangeable Magnesium Percent	%	0.2	-	-	-	-	-	-	-	6.1	-	-
Exchangeable Potassium Percent	%	0.2	-	-	-	-	-	-	-	0.7	-	-
Exchangeable Sodium Percent	%	0.2	>6	-	-	-	-	-	-	1.6	-	-
Exchangeable Aluminium Percent	%	0.2	-	-	-	-	-	-	-	0.3	-	-
Calcium/Magnesium Ratio	-	0.2	<1.0	-	-	-	-	-	-	15	-	-
Magnesium/Potassium Ratio	-	0.2	-	-	-	-	-	-	-	8.6	-	-
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	-	-	-	-	-	-	49	-	-
Cation Exchange Capacity	meq/100g	0.2	-	-	-	-	-	-	-	49.1	-	-
Plant Available Nutrients												
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	-	-	-	-	-	-	<200	-	-
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	-	-	-	-	-	-	<5	-	-
Organic Matter												
Organic Matter	%	0.5	-	-	-	-	-	-	-	5.8	-	-
Total Organic Carbon	%	0.5	-	-	-	-	-	-	-	3.4	-	-
Geochemical Physiochemical Parameters												
pH (Saturated Paste)	pH Unit	0.1	<4.5	-	-	-	-	-	-	7.5	-	-
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	-	-	-	-	-	-	7090	-	-
pH (F)	pH Unit	0.1	-	-	-	-	-	-	-	7.4	-	-
pH (Fox)	pH Unit	0.1	<4.5	-	-	-	-	-	-	7.4	-	-
Reaction Rate	-	1	-	-	-	-	-	-	-	4	-	-
Acidity	mg/kg	1	-	-	-	-	-	-	-	264	-	-
Sulfur Species												
Sulfur - Total as S (LECO)	%	0.01	-	-	-	-	-	-	-	0.8	-	-
Chromium Reducible Sulphur	%	0.005	-	-	-	-	-	-	-	0.01	-	-
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	10900	-	-
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	-	-	-	-	-	-	3620	-	-
AP (calc)	kg H2SO4 equiv/t	0.01	-	-	-	-	-	-	-	0.31	-	-
Acid Neutralising Capacity												
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	-	-	-	-	-	-	25.2	-	-
ANC as CaCO3	% CaCO3	0.1	-	-	-	-	-	-	-	2.6	-	-
Fizz Rating	Fizz Unit	0	-	-	-	-	-	-	-	1	-	-
Net Acid Production Potential												
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-0.7	-	-
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-	-	-	-	-	-	-24.9	-	-
Total Multi-elements												
Arsenic	mg/kg	5	x	-	-	-	-	-	-	8	-	-
Barium	mg/kg	10	-	-	-	-	-	-	-	270	-	-
Beryllium	mg/kg	1	-	-	-	-	-	-	-	1	-	-
Boron	mg/kg	50	-	-	-	-	-	-	-	<50	-	-
Cadmium	mg/kg	1	x	-	-	-	-	-	-	<1	-	-
Chromium	mg/kg	2	x	-	-	-	-	-	-	30	-	-
Cobalt	mg/kg	2	-	-	-	-	-	-	-	20	-	-
Copper	mg/kg	5	x	-	-	-	-	-	-	50	-	-
Lead	mg/kg	5	x	-	-	-	-	-	-	20	-	-
Manganese	mg/kg	5	-	-	-	-	-	-	-	944	-	-
Mercury	mg/kg	0.1	x	-	-	-	-	-	-	<0.1	-	-
Nickel	mg/kg	2	x	-	-	-	-	-	-	36	-	-
Selenium	mg/kg	5	-	-	-	-	-	-	-	<5	-	-
Vanadium	mg/kg	5	-	-	-	-	-	-	-	52	-	-
Zinc	mg/kg	5	x	-	-	-	-	-	-	127	-	-
Soil Classification based on Particle Size												
Clay (<2 µm)	%	1	<60	-	-	-	-	-	-	14	-	-
Silt (2-60 µm)	%	1		-	-	-	-	-	-	28	-	-
Sand (0.06-2.00 mm)	%	1	-	-	-	-	-	-	-	11	-	-
Gravel (>2mm)	%	1	-	-	-	-	-	-	-	47	-	-
Cobbles (>6cm)	%	1	-	-	-	-	-	-	-	<1	-	-

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4), or S_{CR} and that sulfide is prese
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
Topsoil A&B

Block Reference				Top Soil	
Sample number				TSA-A	TSB-A
Date sampled				42648	42648
Comments (bs = black shale observed in sample)					
Field Measurements					
Average pH (1:5)				8.5	8.8
Average EC (1:5) (mS/cm)				1.4	0.96
Emerson Class				456	456
Going to				-	-
Sample sent to Lab?				Y	Y
Lab Sample reference				EB1627092006	EB1627092009
Lab Data	**Units**	**LOR**	**Criteria**		
Physiochemical Properties					
Moisture Content (dried @ 103°C)	%	1	-	3.6	2.6
pH (1:5 H_2O)	pH unit	0.1	-	8.2	8.3
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	2750	1660
Exchangeable Cations					
Exchangeable Calcium	meq/100g	0.2	-	44.8	38.4
Exchangeable Magnesium	meq/100g	0.2	-	2.7	3.5
Exchangeable Potassium	meq/100g	0.2	-	0.4	0.4
Exchangeable Sodium	meq/100g	0.2	-	0.4	0.4
Exchangeable Aluminium	meq/100g	0.2	-	<0.1	<0.1
Exchangeable Calcium Percent	%	0.2	-	93	90
Exchangeable Magnesium Percent	%	0.2	-	6	8
Exchangeable Potassium Percent	%	0.2	-	0.9	1.0
Exchangeable Sodium Percent	%	0.2	>6	0.7	0.9
Exchangeable Aluminium Percent	%	0.2	-	0.1	0.1
Calcium/Magnesium Ratio	-	0.2	<1.0	16.6	11
Magnesium/Potassium Ratio	-	0.2	-	6.3	8.4
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	48.3	42.7
Cation Exchange Capacity	meq/100g	0.2	-	48.3	42.7
Plant Available Nutrients					
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	243	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	8	10
Organic Matter					
Organic Matter	%	0.5	-	<0.5	<0.5
Total Organic Carbon	%	0.5	-	<0.5	<0.5
Geochemical Physiochemical Parameters					
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.8	7.8
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	5390	3140
pH (F)	pH Unit	0.1	-	8.4	8.5
pH (Fox)	pH Unit	0.1	<4.5	9.2	9.3
Reaction Rate	-	1	-	4	4
Acidity	mg/kg	1	-	69	44
Sulfur Species					
Sulfur - Total as S (LECO)	%	0.01	-	0.51	0.23
Chromium Reducible Sulphur	%	0.005	-	<0.005	<0.005
Total Sulfate (as SO4)	mg/kg	100	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	6280	3300
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	2090	1100
AP (calc)	kg H2SO4 equiv/t	0.01	-	<0.15	<0.15
Acid Neutralising Capacity					
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	124	80.8
ANC as CaCO3	% CaCO3	0.1	-	12.6	8.2
Fizz Rating	Fizz Unit	0	-	3	2
Net Acid Production Potential					
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-108	-73.8
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-124	-80.7
Total Multi-elements					
Arsenic	mg/kg	5	x	7	6
Barium	mg/kg	10	-	120	100
Beryllium	mg/kg	1	-	<1	<1
Boron	mg/kg	50	-	<50	<50
Cadmium	mg/kg	1	x	<1	<1
Chromium	mg/kg	2	x	31	29
Cobalt	mg/kg	2	-	14	12
Copper	mg/kg	5	x	20	19
Lead	mg/kg	5	x	15	13
Manganese	mg/kg	5	-	493	416
Mercury	mg/kg	0.1	x	<0.1	<0.1
Nickel	mg/kg	2	x	24	22
Selenium	mg/kg	5	-	<5	<5
Vanadium	mg/kg	5	-	72	53
Zinc	mg/kg	5	x	60	60
Soil Classification based on Particle Size					
Clay (<2 µm)	%	1	<60	10	15
Silt (2-60 µm)	%	1		36	24
Sand (0.06-2.00 mm)	%	1	-	13	18
Gravel (>2mm)	%	1	-	41	43
Gravel (>2mm)	%	1	-	<1	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4) and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Waste characterisation database
D&Blast

Block Reference				D&B			
Sample number				1A	2A	3A	4A
Date sampled				07/11/2016	07/11/2016	07/11/2016	07/11/2016
Comments (bs = black shale observed in sample)							
Field Measurements							
Average pH (1:5)				8.4	7.8	8.6	8
Average EC (1:5) (mS/cm)				7	17.2	0.546	4.9
Emerson Class				456	456	2	456
Going to				-	-	-	-
Sample sent to Lab?				Y	Y	Y	Y
Lab Sample reference				EB1627092001	EB1627092002	EB1627092003	EB1627092004
Lab Data	**Units**	**LOR**	**Criteria**				
Physiochemical Properties							
Moisture Content (dried @ 103°C)	%	1	-	4.8	4.3	1	2.5
pH (1:5 H_2O)	pH unit	0.1	-	8	7.7	8.2	8.1
Electrical Conductivity @ 25°C (1:5 H_2O)	uS/cm	1	-	8890	21000	1470	5120
Exchangeable Cations							
Exchangeable Calcium	meq/100g	0.2	-	44.6	47.3	34.5	75
Exchangeable Magnesium	meq/100g	0.2	-	3.8	1.8	0.6	2.6
Exchangeable Potassium	meq/100g	0.2	-	0.5	0.1	0.1	0.1
Exchangeable Sodium	meq/100g	0.2	-	0.6	0.8	<0.1	0.4
Exchangeable Aluminium	meq/100g	0.2	-	<0.1	<0.1	<0.1	<0.1
Exchangeable Calcium Percent	%	0.2	-	90	94	98	96
Exchangeable Sodium Percent	%	0.2	-	8	4	2	3
Exchangeable Potassium Percent	%	0.2	-	1	0	0	0
Exchangeable Sodium Percent	%	0.2	>6	1.2	1.6	0.1	0.5
Exchangeable Aluminium Percent	%	0.2	-	<0.1	0.2	0.1	<0.1
Calcium/Magnesium Ratio	-	0.2	<1.0	11.7	26.3	57.5	28.8
Magnesium/Potassium Ratio	-	0.2	-	8.2	12.8	5.2	18.4
Effective Cation Exchange Capacity (calc)	meq/100g	0.2	-	49.5	50	35.2	78.1
Cation Exchange Capacity	meq/100g	0.2	-	49.6	50.2	35.3	78.2
Plant Available Nutrients							
Bicarbonate Extractable K (Colwell)	mg/kg	100	-	279	<200	<200	<200
Bicarbonate Ext. P (Colwell)	mg/kg	5	-	8	13	8	10
Organic Matter							
Organic Matter	%	0.5	-	0.6	3.9	<0.5	2.6
Total Organic Carbon	%	0.5	-	<0.5	2.3	<0.5	1.5
Geochemical Physiochemical Parameters							
pH (Saturated Paste)	pH Unit	0.1	<4.5	7.5	6.7	7.9	7.6
Electrical Conductivity (Saturated Paste)	µS/cm	1	-	15500	53100	1060	15000
pH (F)	pH Unit	0.1	-	8.1	7.7	8.2	8.1
pH (Fox)	pH Unit	0.1	<4.5	8.8	7.5	8.8	7.6
Reaction Rate	-	1	-	4	4	4	4
Acidity	mg/kg	1	-	73	137	24	56
Sulfur Species							
Sulfur - Total as S (LECO)	%	0.01	-	0.42	0.51	0.47	1.11
Chromium Reducible Sulphur	%	0.005	-	<0.005	0.006	0.005	<0.005
Total Sulfate (as SO4)	mg/kg	100	-	-	-	-	-
Soluble Sulfate as SO4 2- (1:5 H_2O)	mg/kg	10	-	8200	9990	4340	8240
Soluble Sulfur as S (1:5 H_2O)	mg/kg	10	-	2730	3330	1450	2750
AP (calc)	kg H2SO4 equiv/t	0.01	-	<0.15	0.18	<0.15	<0.15
Acid Neutralising Capacity							
ANC as H2SO4	kg H2SO4 equiv./t	0.5	-	109	129	130	100
ANC as CaCO3	% CaCO3	0.1	-	11.1	13.2	13.2	10.2
Fizz Rating	Fizz Unit	0	-	3	3	3	3
Net Acid Production Potential							
Net Acid Production Potential (MPA-ANC)	kg H2SO4/t	0.5	>0	-96.1	-113	-116	-66
Net Acid Production Potential (Calculated)	kg H2SO4/t	0.5	>0	-109	-129	-130	-100
Total Multi-elements							
Arsenic	mg/kg	5	x	7	9	18	10
Barium	mg/kg	10	-	100	190	200	110
Beryllium	mg/kg	1	-	1	1	1	<1
Boron	mg/kg	50	-	<50	<50	<50	<50
Cadmium	mg/kg	1	x	<1	<1	<1	<1
Chromium	mg/kg	2	x	32	30	32	35
Cobalt	mg/kg	2	-	14	13	29	17
Copper	mg/kg	5	x	25	26	90	23
Lead	mg/kg	5	x	16	15	24	13
Manganese	mg/kg	5	-	646	788	4440	554
Mercury	mg/kg	0.1	x	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	x	25	26	37	27
Selenium	mg/kg	5	-	<5	<5	<5	<5
Vanadium	mg/kg	5	-	59	60	101	78
Zinc	mg/kg	5	x	77	75	105	64
Soil Classification based on Particle Size							
Clay (<2 µm)	%	1	<60	6	7	8	5
Silt (2-60 µm)	%	1		51	35	11	28
Silt (2-60 µm)	%	1	-	24	17	29	13
Gravel (>2mm)	%	1	-	19	41	52	54
Cobbles (>6cm)	%	1	-	<1	<1	<1	<1

Notes:
- denotes parameter not analysed
< denotes calculated value where one or more parameters is below detection limit. Calculation is made using the detection limit as a whole number.
1 AP assumes sulfide sulfur is equivalent to Total S - Sulfate (as SO4) and that sulfide is present as pyrite
2 Shading represents exceedance of one or more criteria presented in (MWH, 2016a)
3 Screening criteria of Ca:Mg ratio is only relevant where ESP >6.0

Appendix B Laboratory Reports

CHAIN OF CUSTODY

ALS Laboratory: **please tick** →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2175 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Flinders Power	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	168 Greenhill Road Parkside		
PROJECT:	LCK 16002	**ALS QUOTE NO.:**	
ORDER NUMBER:			
PROJECT MANAGER:	Paul Jones	**CONTACT PH: 0407 972 078**	
SAMPLER:	P Jones	**SAMPLER MOBILE:**	
COC emailed to ALS?	(YES / NO)	**EDD FORMAT (or default):**	
Email Reports to:	paul.jones@flindersgower.com.au		
Email Invoice to:			

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
			000
DATE/TIME:	DATE/TIME: 10/11/16	DATE/TIME:	DATE/TIME: 14/11/16 15:05

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	See Attached								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	D+B BLOCK 1A		S	Bag	1	X								
2	D+B BLOCK 2A													
3	D+B BLOCK 3A													
4	D+B BLOCK 4A													
5	DLSA BLOCK 1C													
6	TOPSOIL A BLOCK 1A													
7	DLSB BLOCK 2C													
8	DLSA BLOCK 19A													
9	TOPSOIL B BLOCK 1A													
10	DLSB BLOCK 10B													
11	DLSA BLOCK 14A													
12	DLSB BLOCK 8B													
13	DLSC BLOCK 24B													
14	DLSC BLOCK 23B													
15	DLSC BLOCK 19A													
16	DLSC BLOCK 26C													
					TOTAL	16	16							

Environmental Division
Brisbane
Work Order Reference
EB1627092

Telephone : + 61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB1627092**

Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: paul.jones@flinderspower.com.au	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LCK 16002	Page	: 1 of 6
Order number	: ----	Quote number	: EB2016FLIPOW0001 (BNBQ/333/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: PAUL JONES		

Dates

Date Samples Received	: 14-Nov-2016 3:05 PM	Issue Date	: 16-Nov-2016
Client Requested Due Date	: 28-Nov-2016	Scheduled Reporting Date	: **28-Nov-2016**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 28.7°C
Receipt Detail	: PLASTIC CRATE	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples requiring Cation Exchange Capacity analysis have been assigned pH and Electrical Conductivity analysis in order to determine the appropriate CEC method, as per Raymont and Lyons (2011).**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Soil Particle Density : EA152		
D+B BLOCK 1A	- Snap Lock Bag	- Dried soil
D+B BLOCK 2A	- Snap Lock Bag	- Dried soil
D+B BLOCK 3A	- Snap Lock Bag	- Dried soil
D+B BLOCK 4A	- Snap Lock Bag	- Dried soil
DLSA BLOCK 1C	- Snap Lock Bag	- Dried soil
TOPSOIL A BLOCK 1A	- Snap Lock Bag	- Dried soil
DLSB BLOCK 2C	- Snap Lock Bag	- Dried soil
DLSA BLOCK 19A	- Snap Lock Bag	- Dried soil
TOPSOIL B BLOCK 1A	- Snap Lock Bag	- Dried soil
DLSB BLOCK 10B	- Snap Lock Bag	- Dried soil
DLSA BLOCK 14A	- Snap Lock Bag	- Dried soil
DLSB BLOCK 8B	- Snap Lock Bag	- Dried soil
DLSC BLOCK 24B	- Snap Lock Bag	- Dried soil
DLSC BLOCK 23B	- Snap Lock Bag	- Dried soil
DLSC BLOCK 19A	- Snap Lock Bag	- Dried soil
DLSC BLOCK 26C	- Snap Lock Bag	- Dried soil

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA010 (solids): Electrical Conductivity (1:5)	SOIL - EA013 Acid Neutralising Capacity (ANC)	SOIL - EA026 Chromium Reducible Sulphur	SOIL - EA037 ASS Field Screening Analysis	SOIL - ED021 Bicarbonate Extractable K (Colwell)	SOIL - ED038 Acidity in Soil	SOIL - EK080 Bicarbonate Extractable P (Colwell)
EB1627092-001	[07-Nov-2016]	D+B BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-002	[07-Nov-2016]	D+B BLOCK 2A	✓	✓	✓	✓	✓	✓	✓
EB1627092-003	[07-Nov-2016]	D+B BLOCK 3A	✓	✓	✓	✓	✓	✓	✓
EB1627092-004	[07-Nov-2016]	D+B BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EB1627092-005	[07-Nov-2016]	DLSA BLOCK 1C	✓	✓	✓	✓	✓	✓	✓
EB1627092-006	[04-Oct-2016]	TOPSOIL A BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-007	[04-Oct-2016]	DLSB BLOCK 2C	✓	✓	✓	✓	✓	✓	✓
EB1627092-008	[14-Sep-2016]	DLSA BLOCK 19A	✓	✓	✓	✓	✓	✓	✓
EB1627092-009	[05-Nov-2016]	TOPSOIL B BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-010	[27-Sep-2016]	DLSB BLOCK 10B	✓	✓	✓	✓	✓	✓	✓
EB1627092-011	[14-Sep-2016]	DLSA BLOCK 14A	✓	✓	✓	✓	✓	✓	✓
EB1627092-012	[23-Sep-2016]	DLSB BLOCK 8B	✓	✓	✓	✓	✓	✓	✓
EB1627092-013	[10-Oct-2016]	DLSC BLOCK 24B	✓	✓	✓	✓	✓	✓	✓
EB1627092-014	[10-Oct-2016]	DLSC BLOCK 23B	✓	✓	✓	✓	✓	✓	✓
EB1627092-015	[10-Oct-2016]	DLSC BLOCK 19A	✓	✓	✓	✓	✓	✓	✓
EB1627092-016	[10-Oct-2016]	DLSC BLOCK 26C	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA009 Net Acid Production Potential (NAPP)	SOIL - EA032 Electrical Conductivity (Saturated Paste)	SOIL - EA055-103 Moisture Content	SOIL - EA150H/EA152 Particle Sizing with Hydrometer + Soil Particle	SOIL - ED040S Soluble Major Anions	SOIL - EP004 (Carbon) Organic Matter & Total Organic Carbon (Calc.)	SOIL - S-02 8 Metals (incl. Digestion)
EB1627092-001	[07-Nov-2016]	D+B BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-002	[07-Nov-2016]	D+B BLOCK 2A	✓	✓	✓	✓	✓	✓	✓
EB1627092-003	[07-Nov-2016]	D+B BLOCK 3A	✓	✓	✓	✓	✓	✓	✓
EB1627092-004	[07-Nov-2016]	D+B BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EB1627092-005	[07-Nov-2016]	DLSA BLOCK 1C	✓	✓	✓	✓	✓	✓	✓
EB1627092-006	[04-Oct-2016]	TOPSOIL A BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-007	[04-Oct-2016]	DLSB BLOCK 2C	✓	✓	✓	✓	✓	✓	✓
EB1627092-008	[14-Sep-2016]	DLSA BLOCK 19A	✓	✓	✓	✓	✓	✓	✓
EB1627092-009	[05-Nov-2016]	TOPSOIL B BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1627092-010	[27-Sep-2016]	DLSB BLOCK 10B	✓	✓	✓	✓	✓	✓	✓
EB1627092-011	[14-Sep-2016]	DLSA BLOCK 14A	✓	✓	✓	✓	✓	✓	✓
EB1627092-012	[23-Sep-2016]	DLSB BLOCK 8B	✓	✓	✓	✓	✓	✓	✓
EB1627092-013	[10-Oct-2016]	DLSC BLOCK 24B	✓	✓	✓	✓	✓	✓	✓
EB1627092-014	[10-Oct-2016]	DLSC BLOCK 23B	✓	✓	✓	✓	✓	✓	✓
EB1627092-015	[10-Oct-2016]	DLSC BLOCK 19A	✓	✓	✓	✓	✓	✓	✓
EB1627092-016	[10-Oct-2016]	DLSC BLOCK 26C	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA002 pH (1:5)	SOIL - EA031 pH (Saturated Paste)	SOIL - ED042T Sulfur - Total as S (high temperature furnace	SOIL - EG005T (solids) Total Metals by ICP-AES
EB1627092-001	[07-Nov-2016]	D+B BLOCK 1A	✓	✓	✓	✓
EB1627092-002	[07-Nov-2016]	D+B BLOCK 2A	✓	✓	✓	✓
EB1627092-003	[07-Nov-2016]	D+B BLOCK 3A	✓	✓	✓	✓
EB1627092-004	[07-Nov-2016]	D+B BLOCK 4A	✓	✓	✓	✓
EB1627092-005	[07-Nov-2016]	DLSA BLOCK 1C	✓	✓	✓	✓
EB1627092-006	[04-Oct-2016]	TOPSOIL A BLOCK 1A	✓	✓	✓	✓
EB1627092-007	[04-Oct-2016]	DLSB BLOCK 2C	✓	✓	✓	✓
EB1627092-008	[14-Sep-2016]	DLSA BLOCK 19A	✓	✓	✓	✓
EB1627092-009	[05-Nov-2016]	TOPSOIL B BLOCK 1A	✓	✓	✓	✓
EB1627092-010	[27-Sep-2016]	DLSB BLOCK 10B	✓	✓	✓	✓
EB1627092-011	[14-Sep-2016]	DLSA BLOCK 14A	✓	✓	✓	✓
EB1627092-012	[23-Sep-2016]	DLSB BLOCK 8B	✓	✓	✓	✓
EB1627092-013	[10-Oct-2016]	DLSC BLOCK 24B	✓	✓	✓	✓
EB1627092-014	[10-Oct-2016]	DLSC BLOCK 23B	✓	✓	✓	✓

			SOIL - EA002 pH (1:5)	SOIL - EA031 pH (Saturated Paste)	SOIL - ED042T Sulfur - Total as S (high temperature furnace	SOIL - EG005T (solids) Total Metals by ICP-AES
EB1627092-015	[10-Oct-2016]	DLSC BLOCK 19A	✓	✓	✓	✓
EB1627092-016	[10-Oct-2016]	DLSC BLOCK 26C	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA002: pH (1:5)							
DLSA BLOCK 14A	Snap Lock Bag	21-Sep-2016	21-Sep-2016	14-Nov-2016	×	----	----
DLSA BLOCK 19A	Snap Lock Bag	21-Sep-2016	21-Sep-2016	14-Nov-2016	×	----	----
DLSB BLOCK 10B	Snap Lock Bag	04-Oct-2016	04-Oct-2016	14-Nov-2016	×	----	----
DLSB BLOCK 2C	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	×	----	----
DLSB BLOCK 8B	Snap Lock Bag	30-Sep-2016	30-Sep-2016	14-Nov-2016	×	----	----
DLSC BLOCK 19A	Snap Lock Bag	17-Oct-2016	17-Oct-2016	14-Nov-2016	×	----	----
DLSC BLOCK 23B	Snap Lock Bag	17-Oct-2016	17-Oct-2016	14-Nov-2016	×	----	----
DLSC BLOCK 24B	Snap Lock Bag	17-Oct-2016	17-Oct-2016	14-Nov-2016	×	----	----
DLSC BLOCK 26C	Snap Lock Bag	17-Oct-2016	17-Oct-2016	14-Nov-2016	×	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	×	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	12-Nov-2016	12-Nov-2016	14-Nov-2016	×	----	----
EA010: Electrical Conductivity (1:5)							
DLSA BLOCK 14A	Snap Lock Bag	21-Sep-2016	19-Oct-2016	14-Nov-2016	×	----	----
DLSA BLOCK 19A	Snap Lock Bag	21-Sep-2016	19-Oct-2016	14-Nov-2016	×	----	----
DLSB BLOCK 10B	Snap Lock Bag	04-Oct-2016	01-Nov-2016	14-Nov-2016	×	----	----
DLSB BLOCK 2C	Snap Lock Bag	11-Oct-2016	08-Nov-2016	14-Nov-2016	×	----	----
DLSB BLOCK 8B	Snap Lock Bag	30-Sep-2016	28-Oct-2016	14-Nov-2016	×	----	----
DLSC BLOCK 19A	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	×	----	----
DLSC BLOCK 23B	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	×	----	----
DLSC BLOCK 24B	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	×	----	----
DLSC BLOCK 26C	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	×	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	11-Oct-2016	08-Nov-2016	14-Nov-2016	×	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	12-Nov-2016	10-Dec-2016	14-Nov-2016	×	----	----
EA026: Chromium Reducible Sulphur							
D+B BLOCK 1A	Snap Lock Bag	08-Nov-2016	06-Feb-2017	14-Nov-2016	×	----	----
D+B BLOCK 2A	Snap Lock Bag	08-Nov-2016	06-Feb-2017	14-Nov-2016	×	----	----
D+B BLOCK 3A	Snap Lock Bag	08-Nov-2016	06-Feb-2017	14-Nov-2016	×	----	----
D+B BLOCK 4A	Snap Lock Bag	08-Nov-2016	06-Feb-2017	14-Nov-2016	×	----	----
DLSA BLOCK 14A	Snap Lock Bag	15-Sep-2016	14-Dec-2016	14-Nov-2016	×	----	----
DLSA BLOCK 19A	Snap Lock Bag	15-Sep-2016	14-Dec-2016	14-Nov-2016	×	----	----
DLSA BLOCK 1C	Snap Lock Bag	08-Nov-2016	06-Feb-2017	14-Nov-2016	×	----	----
DLSB BLOCK 10B	Snap Lock Bag	28-Sep-2016	27-Dec-2016	14-Nov-2016	×	----	----
DLSB BLOCK 2C	Snap Lock Bag	05-Oct-2016	03-Jan-2017	14-Nov-2016	×	----	----
DLSB BLOCK 8B	Snap Lock Bag	24-Sep-2016	23-Dec-2016	14-Nov-2016	×	----	----
DLSC BLOCK 19A	Snap Lock Bag	11-Oct-2016	09-Jan-2017	14-Nov-2016	×	----	----
DLSC BLOCK 23B	Snap Lock Bag	11-Oct-2016	09-Jan-2017	14-Nov-2016	×	----	----
DLSC BLOCK 24B	Snap Lock Bag	11-Oct-2016	09-Jan-2017	14-Nov-2016	×	----	----
DLSC BLOCK 26C	Snap Lock Bag	11-Oct-2016	09-Jan-2017	14-Nov-2016	×	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	05-Oct-2016	03-Jan-2017	14-Nov-2016	×	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	06-Nov-2016	04-Feb-2017	14-Nov-2016	×	----	----

EA037: ASS Field Screening Analysis							
D+B BLOCK 1A	Snap Lock Bag	08-Nov-2016	08-Nov-2016	14-Nov-2016	✘	----	----
D+B BLOCK 2A	Snap Lock Bag	08-Nov-2016	08-Nov-2016	14-Nov-2016	✘	----	----
D+B BLOCK 3A	Snap Lock Bag	08-Nov-2016	08-Nov-2016	14-Nov-2016	✘	----	----
D+B BLOCK 4A	Snap Lock Bag	08-Nov-2016	08-Nov-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 14A	Snap Lock Bag	15-Sep-2016	15-Sep-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	15-Sep-2016	15-Sep-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 1C	Snap Lock Bag	08-Nov-2016	08-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	28-Sep-2016	28-Sep-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 2C	Snap Lock Bag	05-Oct-2016	05-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	24-Sep-2016	24-Sep-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	11-Oct-2016	11-Oct-2016	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	05-Oct-2016	05-Oct-2016	14-Nov-2016	✘	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	06-Nov-2016	06-Nov-2016	14-Nov-2016	✘	----	----
EA055-103: Moisture Content							
DLSA BLOCK 14A	Snap Lock Bag	----	28-Sep-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	----	28-Sep-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	----	11-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 2C	Snap Lock Bag	----	18-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	----	07-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	----	24-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	----	24-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	----	24-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	----	24-Oct-2016	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	----	18-Oct-2016	14-Nov-2016	✘	----	----
ED040S: Major Anions - Soluble							
DLSA BLOCK 14A	Snap Lock Bag	12-Oct-2016	09-Nov-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	12-Oct-2016	09-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	25-Oct-2016	22-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 2C	Snap Lock Bag	01-Nov-2016	29-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	21-Oct-2016	18-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	07-Nov-2016	05-Dec-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	07-Nov-2016	05-Dec-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	07-Nov-2016	05-Dec-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	07-Nov-2016	05-Dec-2016	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	01-Nov-2016	29-Nov-2016	14-Nov-2016	✘	----	----
ED042T: Sulfur - Total as S (LECO)							
DLSA BLOCK 14A	Snap Lock Bag	21-Sep-2016	20-Mar-2017	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	21-Sep-2016	20-Mar-2017	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	04-Oct-2016	02-Apr-2017	14-Nov-2016	✘	----	----
DLSB BLOCK 2C	Snap Lock Bag	11-Oct-2016	09-Apr-2017	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	30-Sep-2016	29-Mar-2017	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	17-Oct-2016	15-Apr-2017	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	17-Oct-2016	15-Apr-2017	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	17-Oct-2016	15-Apr-2017	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	17-Oct-2016	15-Apr-2017	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	11-Oct-2016	09-Apr-2017	14-Nov-2016	✘	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	12-Nov-2016	11-May-2017	14-Nov-2016	✘	----	----
EG035T: Total Mercury by FIMS							
DLSA BLOCK 14A	Snap Lock Bag	12-Oct-2016	12-Oct-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	12-Oct-2016	12-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	25-Oct-2016	25-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 2C	Snap Lock Bag	01-Nov-2016	01-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	21-Oct-2016	21-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	07-Nov-2016	07-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	07-Nov-2016	07-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	07-Nov-2016	07-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	07-Nov-2016	07-Nov-2016	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	01-Nov-2016	01-Nov-2016	14-Nov-2016	✘	----	----
EP004: Organic Matter							
DLSA BLOCK 14A	Snap Lock Bag	21-Sep-2016	19-Oct-2016	14-Nov-2016	✘	----	----
DLSA BLOCK 19A	Snap Lock Bag	21-Sep-2016	19-Oct-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 10B	Snap Lock Bag	04-Oct-2016	01-Nov-2016	14-Nov-2016	✘	----	----

DLSB BLOCK 2C	Snap Lock Bag	11-Oct-2016	08-Nov-2016	14-Nov-2016	✘	----	----
DLSB BLOCK 8B	Snap Lock Bag	30-Sep-2016	28-Oct-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 19A	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 23B	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 24B	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	✘	----	----
DLSC BLOCK 26C	Snap Lock Bag	17-Oct-2016	14-Nov-2016	14-Nov-2016	✘	----	----
TOPSOIL A BLOCK 1	Snap Lock Bag	11-Oct-2016	08-Nov-2016	14-Nov-2016	✘	----	----
TOPSOIL B BLOCK 1	Snap Lock Bag	12-Nov-2016	10-Dec-2016	14-Nov-2016	✘	----	----

Requested Deliverables

PAUL JONES

- *AU Certificate of Analysis - NATA (COA)	Email	paul.jones@flinderspower.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	paul.jones@flinderspower.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	paul.jones@flinderspower.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	paul.jones@flinderspower.com.au
- A4 - AU Tax Invoice (INV)	Email	paul.jones@flinderspower.com.au
- Attachment - Report (SUBCO)	Email	paul.jones@flinderspower.com.au
- Chain of Custody (CoC) (COC)	Email	paul.jones@flinderspower.com.au
- EDI Format - ENMRG (ENMRG)	Email	paul.jones@flinderspower.com.au
- EDI Format - XTab (XTAB)	Email	paul.jones@flinderspower.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1627092**	Page	: 1 of 14
Amendment	: **1**		
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Project	: LCK 16002	Date Samples Received	: 14-Nov-2016 15:05
Order number	: ----	Date Analysis Commenced	: 17-Nov-2016
C-O-C number	: ----	Issue Date	: 15-Dec-2016 17:32
Sampler	: PAUL JONES		
Site	: ----		
Quote number	: BNBQ/333/16		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ED006 (Exchangeable Cations): Sample EB1627092-001 shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- ED006 Exchangeable Cations (Magnesium/Potassium Ratio): Results could not be calculated for some samples as the required Magnesium or Potassium analytes were less than reportable limits.
- EG005T (Total Metals) Sample EB1627092-002 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection
- ED021 (Bicarbonate Extractable K - Colwell): Samples diluted due to matrix interference. LOR adjusted accordingly.
- EG005T (Total Metals) Sample EB1627092-011 shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- 17/11/16: CEC methods assigned according to pH/EC decision tree.
- ED038 (Acidity): NATA accreditation does not cover the performance of this service.
- EA031 (Saturated Paste pH): NATA accreditation does not cover the performance of this service.
- EA032 (Saturated Paste EC): NATA accreditation does not cover the performance of this service.
- Amendment (12/12/2016): This report has been amended and re-released to allow the reporting of additional analytical data.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	D+B BLOCK 1A	D+B BLOCK 2A	D+B BLOCK 3A	D+B BLOCK 4A	DLSA BLOCK 1C
			Client sampling date / time	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-001	EB1627092-002	EB1627092-003	EB1627092-004	EB1627092-005
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	7.7	8.2	8.1	8.0
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-96.1	-113	-116	-66.0	-85.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	8890	21000	1470	5120	3380
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	109	129	130	100	98.8
ANC as CaCO3	----	0.1	% CaCO3	11.1	13.2	13.2	10.2	10.1
Fizz Rating	----	0	Fizz Unit	3	3	3	3	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	<0.005	0.006	<0.005	<0.005	<0.005
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.5	6.7	7.9	7.6	7.6
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	15500	53100	1060	15000	8440
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	8.1	7.7	8.2	8.1	8.1
ø pH (Fox)	----	0.1	pH Unit	8.8	7.5	8.8	7.6	8.4
ø Reaction Rate	----	1	-	4	4	4	4	4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	4.8	4.3	1.0	2.5	5.4
EA150: Particle Sizing								
+75µm	----	1	%	40	57	78	65	32
+150µm	----	1	%	28	52	76	63	30
+300µm	----	1	%	24	49	74	62	30
+425µm	----	1	%	23	48	71	61	30
+600µm	----	1	%	22	46	68	60	29
+1180µm	----	1	%	21	43	59	57	29
+2.36mm	----	1	%	19	40	48	52	27
+4.75mm	----	1	%	17	35	37	40	23
+9.5mm	----	1	%	9	27	29	27	15
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	D+B BLOCK 1A	D+B BLOCK 2A	D+B BLOCK 3A	D+B BLOCK 4A	DLSA BLOCK 1C
			Client sampling date / time	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-001	EB1627092-002	EB1627092-003	EB1627092-004	EB1627092-005
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	6	7	8	5	27
Silt (2-60 µm)	----	1	%	51	35	11	28	40
Sand (0.06-2.00 mm)	----	1	%	24	17	29	13	5
Gravel (>2mm)	----	1	%	19	41	52	54	28
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.64	2.59	2.66	2.72	2.59
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	44.6	47.3	34.5	75.0	46.0
Exchangeable Magnesium	----	0.1	meq/100g	3.8	1.8	0.6	2.6	2.3
Exchangeable Potassium	----	0.1	meq/100g	0.5	0.1	0.1	0.1	0.2
Exchangeable Sodium	----	0.1	meq/100g	0.6	0.8	<0.1	0.4	0.7
Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	49.6	50.2	35.3	78.2	49.3
Exchangeable Calcium Percent	----	0.1	%	90.0	94.3	97.7	95.9	93.2
Exchangeable Magnesium Percent	----	0.1	%	7.7	3.7	1.8	3.3	4.6
Exchangeable Potassium Percent	----	0.1	%	0.9	0.3	0.3	0.2	0.4
Exchangeable Sodium Percent	----	0.1	%	1.2	1.6	0.1	0.5	1.5
Exchangeable Aluminium Percent	----	0.1	%	<0.1	0.2	0.1	<0.1	0.2
Calcium/Magnesium Ratio	----	0.1	-	11.7	26.3	57.5	28.8	20.0
Magnesium/Potassium Ratio	----	0.1	-	8.2	12.8	5.2	18.4	10.5
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	279	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	73	137	24	56	89
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	8200	9990	4340	8240	4830
Sulfur as S	63705-05-5	10	mg/kg	2730	3330	1450	2750	1610
Silica	7631-86-9	1	mg/kg	33	15	31	29	23
Silicon	7440-21-3	1	mg/kg	15	7	15	13	11
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.42	0.51	0.47	1.11	0.42

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	D+B BLOCK 1A	D+B BLOCK 2A	D+B BLOCK 3A	D+B BLOCK 4A	DLSA BLOCK 1C
			Client sampling date / time	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00	07-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-001	EB1627092-002	EB1627092-003	EB1627092-004	EB1627092-005
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	100	190	200	110	400
Beryllium	7440-41-7	1	mg/kg	1	1	1	<1	1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	14	13	29	17	19
Manganese	7439-96-5	5	mg/kg	646	788	4440	554	843
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	59	60	101	78	83
Arsenic	7440-38-2	5	mg/kg	7	9	18	10	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	32	30	32	35	31
Copper	7440-50-8	5	mg/kg	25	26	90	23	39
Lead	7439-92-1	5	mg/kg	16	15	24	13	16
Nickel	7440-02-0	2	mg/kg	25	26	37	27	36
Zinc	7440-66-6	5	mg/kg	77	75	105	64	97
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	8	13	8	10	9
EP004: Organic Matter								
Organic Matter	----	0.5	%	0.6	3.9	<0.5	2.6	3.2
Total Organic Carbon	----	0.5	%	<0.5	2.3	<0.5	1.5	1.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TOPSOIL A BLOCK 1A	DLSB BLOCK 2C	DLSA BLOCK 19A	TOPSOIL B BLOCK 1A	DLSB BLOCK 10B
			Client sampling date / time	04-Oct-2016 00:00	04-Oct-2016 00:00	14-Sep-2016 00:00	05-Nov-2016 00:00	27-Sep-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-006	EB1627092-007	EB1627092-008	EB1627092-009	EB1627092-010
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.2	7.9	7.7	8.3	7.5
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-108	-8.6	-26.7	-73.8	-10.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	2750	3870	7170	1660	4360
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	124	46.8	65.6	80.8	30.6
ANC as CaCO3	----	0.1	% CaCO3	12.6	4.8	6.7	8.2	3.1
Fizz Rating	----	0	Fizz Unit	3	2	2	2	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	<0.005	<0.005	<0.005	<0.005	0.010
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.8	7.7	7.5	7.8	7.5
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	5390	5820	14600	3140	7270
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	8.4	8.2	8.0	8.5	7.3
ø pH (Fox)	----	0.1	pH Unit	9.2	8.1	6.2	9.3	7.1
ø Reaction Rate	----	1	-	4	4	3	4	4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	3.6	8.2	17.4	2.6	10.1
EA150: Particle Sizing								
+75µm	----	1	%	54	48	22	59	34
+150µm	----	1	%	48	45	18	50	32
+300µm	----	1	%	46	43	16	47	31
+425µm	----	1	%	45	41	16	47	31
+600µm	----	1	%	45	40	15	46	30
+1180µm	----	1	%	43	36	14	45	29
+2.36mm	----	1	%	40	32	14	42	26
+4.75mm	----	1	%	34	24	12	36	22
+9.5mm	----	1	%	19	15	2	28	15
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TOPSOIL A BLOCK 1A	DLSB BLOCK 2C	DLSA BLOCK 19A	TOPSOIL B BLOCK 1A	DLSB BLOCK 10B
			Client sampling date / time	04-Oct-2016 00:00	04-Oct-2016 00:00	14-Sep-2016 00:00	05-Nov-2016 00:00	27-Sep-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-006	EB1627092-007	EB1627092-008	EB1627092-009	EB1627092-010
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	10	5	19	15	29
Silt (2-60 µm)	----	1	%	36	46	58	24	36
Sand (0.06-2.00 mm)	----	1	%	13	16	9	18	8
Gravel (>2mm)	----	1	%	41	33	14	43	27
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.67	2.65	2.44	2.65	2.50
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	44.8	78.8	70.0	38.4	47.5
Exchangeable Magnesium	----	0.1	meq/100g	2.7	3.4	19.5	3.5	8.1
Exchangeable Potassium	----	0.1	meq/100g	0.4	0.1	<0.1	0.4	0.2
Exchangeable Sodium	----	0.1	meq/100g	0.4	1.5	10.5	0.4	2.7
Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	48.3	83.8	100	42.7	58.5
Exchangeable Calcium Percent	----	0.1	%	92.7	93.9	69.9	89.8	81.2
Exchangeable Magnesium Percent	----	0.1	%	5.6	4.0	19.4	8.2	13.8
Exchangeable Potassium Percent	----	0.1	%	0.9	0.1	<0.1	1.0	0.3
Exchangeable Sodium Percent	----	0.1	%	0.7	1.8	10.5	0.9	4.6
Exchangeable Aluminium Percent	----	0.1	%	0.1	<0.1	<0.1	0.1	0.1
Calcium/Magnesium Ratio	----	0.1	-	16.6	23.2	3.6	11.0	5.9
Magnesium/Potassium Ratio	----	0.1	-	6.3	27.2	----	8.4	41.6
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	243	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	69	97	352	44	388
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	6280	9790	14000	3300	9740
Sulfur as S	63705-05-5	10	mg/kg	2090	3260	4660	1100	3250
Silica	7631-86-9	1	mg/kg	32	23	6	36	12
Silicon	7440-21-3	1	mg/kg	15	11	3	17	6
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.51	1.25	1.27	0.23	0.67

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TOPSOIL A BLOCK 1A	DLSB BLOCK 2C	DLSA BLOCK 19A	TOPSOIL B BLOCK 1A	DLSB BLOCK 10B
			Client sampling date / time	04-Oct-2016 00:00	04-Oct-2016 00:00	14-Sep-2016 00:00	05-Nov-2016 00:00	27-Sep-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-006	EB1627092-007	EB1627092-008	EB1627092-009	EB1627092-010
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	120	150	130	100	290
Beryllium	7440-41-7	1	mg/kg	<1	2	4	<1	2
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	14	19	14	12	25
Manganese	7439-96-5	5	mg/kg	493	1160	198	416	1340
Selenium	7782-49-2	5	mg/kg	<5	<5	8	<5	<5
Vanadium	7440-62-2	5	mg/kg	72	112	87	53	81
Arsenic	7440-38-2	5	mg/kg	7	18	11	6	13
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	31	38	48	29	36
Copper	7440-50-8	5	mg/kg	20	37	40	19	51
Lead	7439-92-1	5	mg/kg	15	16	24	13	30
Nickel	7440-02-0	2	mg/kg	24	32	31	22	40
Zinc	7440-66-6	5	mg/kg	60	120	102	60	183
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.5	<0.1	0.2
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	8	<5	<5	10	6
EP004: Organic Matter								
Organic Matter	----	0.5	%	<0.5	3.4	27.3	<0.5	12.8
Total Organic Carbon	----	0.5	%	<0.5	2.0	15.8	<0.5	7.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 14A	DLSB BLOCK 8B	DLSC BLOCK 24B	DLSC BLOCK 23B	DLSC BLOCK 19A
			Client sampling date / time	14-Sep-2016 00:00	23-Sep-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-011	EB1627092-012	EB1627092-013	EB1627092-014	EB1627092-015
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.6	7.9	7.9	7.8	7.6
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	13.0	-60.2	-142	-35.5	-16.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	14300	6430	4370	6510	5220
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	10.2	74.9	162	78.3	53.1
ANC as CaCO3	----	0.1	% CaCO3	1.0	7.6	16.5	8.0	5.4
Fizz Rating	----	0	Fizz Unit	1	2	3	2	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.006	0.006	<0.005	<0.005	<0.005
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.0	7.5	7.7	7.6	7.6
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	44400	13500	8390	15000	10000
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	7.2	7.9	8.2	7.8	7.7
ø pH (Fox)	----	0.1	pH Unit	6.5	7.9	8.0	8.3	7.1
ø Reaction Rate	----	1	-	4	4	4	4	4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	15.2	9.1	1.0	3.3	5.3
EA150: Particle Sizing								
+75µm	----	1	%	14	22	62	31	18
+150µm	----	1	%	13	21	60	28	16
+300µm	----	1	%	12	20	58	25	15
+425µm	----	1	%	12	19	57	24	15
+600µm	----	1	%	12	18	56	23	14
+1180µm	----	1	%	11	16	52	21	13
+2.36mm	----	1	%	9	12	46	19	11
+4.75mm	----	1	%	5	7	33	16	8
+9.5mm	----	1	%	<1	2	25	10	3
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 14A	DLSB BLOCK 8B	DLSC BLOCK 24B	DLSC BLOCK 23B	DLSC BLOCK 19A
			Client sampling date / time	14-Sep-2016 00:00	23-Sep-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-011	EB1627092-012	EB1627092-013	EB1627092-014	EB1627092-015
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	21	23	3	13	38
Silt (2-60 µm)	----	1	%	64	54	34	53	42
Sand (0.06-2.00 mm)	----	1	%	6	10	15	14	9
Gravel (>2mm)	----	1	%	9	13	48	20	11
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.63	2.63	2.62	2.69	2.66
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	41.8	46.1	63.6	113	66.3
Exchangeable Magnesium	----	0.1	meq/100g	3.8	3.1	2.6	3.1	5.5
Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.2	0.1	0.3	0.1
Exchangeable Sodium	----	0.1	meq/100g	1.2	0.8	0.8	1.2	1.7
Exchangeable Aluminium	----	0.1	meq/100g	0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	47.0	50.3	67.2	118	73.8
Exchangeable Calcium Percent	----	0.1	%	88.9	91.6	94.6	96.0	89.9
Exchangeable Magnesium Percent	----	0.1	%	8.1	6.2	3.8	2.6	7.5
Exchangeable Potassium Percent	----	0.1	%	0.2	0.3	0.2	0.2	0.2
Exchangeable Sodium Percent	----	0.1	%	2.5	1.7	1.2	1.0	2.3
Exchangeable Aluminium Percent	----	0.1	%	0.2	0.2	<0.1	<0.1	<0.1
Calcium/Magnesium Ratio	----	0.1	-	11.0	14.9	24.5	36.4	12.0
Magnesium/Potassium Ratio	----	0.1	-	----	18.7	17.7	10.1	42.6
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	218	146	137	170	275
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	13100	9730	8200	9740	10500
Sulfur as S	63705-05-5	10	mg/kg	4360	3240	2730	3240	3500
Silica	7631-86-9	1	mg/kg	8	16	22	29	22
Silicon	7440-21-3	1	mg/kg	4	8	10	14	10
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.76	0.48	0.64	1.40	1.21

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 14A	DLSB BLOCK 8B	DLSC BLOCK 24B	DLSC BLOCK 23B	DLSC BLOCK 19A
			Client sampling date / time	14-Sep-2016 00:00	23-Sep-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00	10-Oct-2016 00:00
Compound	CAS Number	LOR	Unit	EB1627092-011	EB1627092-012	EB1627092-013	EB1627092-014	EB1627092-015
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	460	310	130	160	280
Beryllium	7440-41-7	1	mg/kg	1	1	1	1	2
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	24	19	12	15	19
Manganese	7439-96-5	5	mg/kg	2300	918	455	613	750
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	54	75	99	61	76
Arsenic	7440-38-2	5	mg/kg	8	11	15	9	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	36	36	28	29	40
Copper	7440-50-8	5	mg/kg	47	40	28	27	38
Lead	7439-92-1	5	mg/kg	28	22	12	15	22
Nickel	7440-02-0	2	mg/kg	39	38	25	23	32
Zinc	7440-66-6	5	mg/kg	114	102	70	64	91
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	9	12	5	6	8
EP004: Organic Matter								
Organic Matter	----	0.5	%	6.9	5.5	2.0	1.5	6.6
Total Organic Carbon	----	0.5	%	4.0	3.2	1.2	0.9	3.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSC BLOCK 26C	----	----	----	----
			Client sampling date / time	10-Oct-2016 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1627092-016	--------	--------	--------	--------
				Result	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.8	----	----	----	----
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-57.0	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	4890	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	83.3	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	8.5	----	----	----	----
Fizz Rating	----	0	Fizz Unit	2	----	----	----	----
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.009	----	----	----	----
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.6	----	----	----	----
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	8820	----	----	----	----
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	7.7	----	----	----	----
ø pH (Fox)	----	0.1	pH Unit	6.8	----	----	----	----
ø Reaction Rate	----	1	-	4	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	4.1	----	----	----	----
EA150: Particle Sizing								
+75µm	----	1	%	45	----	----	----	----
+150µm	----	1	%	42	----	----	----	----
+300µm	----	1	%	40	----	----	----	----
+425µm	----	1	%	39	----	----	----	----
+600µm	----	1	%	38	----	----	----	----
+1180µm	----	1	%	36	----	----	----	----
+2.36mm	----	1	%	32	----	----	----	----
+4.75mm	----	1	%	25	----	----	----	----
+9.5mm	----	1	%	15	----	----	----	----
+19.0mm	----	1	%	<1	----	----	----	----
+37.5mm	----	1	%	<1	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSC BLOCK 26C	----	----	----	----
			Client sampling date / time	10-Oct-2016 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1627092-016	--------	--------	--------	--------
				Result	----	----	----	----
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	----	----	----	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	7	----	----	----	----
Silt (2-60 µm)	----	1	%	47	----	----	----	----
Sand (0.06-2.00 mm)	----	1	%	13	----	----	----	----
Gravel (>2mm)	----	1	%	33	----	----	----	----
Cobbles (>6cm)	----	1	%	<1	----	----	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.59	----	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	62.2	----	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	3.9	----	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.2	----	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	1.3	----	----	----	----
Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	67.7	----	----	----	----
Exchangeable Calcium Percent	----	0.1	%	92.0	----	----	----	----
Exchangeable Magnesium Percent	----	0.1	%	5.8	----	----	----	----
Exchangeable Potassium Percent	----	0.1	%	0.2	----	----	----	----
Exchangeable Sodium Percent	----	0.1	%	1.9	----	----	----	----
Exchangeable Aluminium Percent	----	0.1	%	<0.1	----	----	----	----
Calcium/Magnesium Ratio	----	0.1	-	15.9	----	----	----	----
Magnesium/Potassium Ratio	----	0.1	-	25.8	----	----	----	----
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	----	----	----	----
ED038A: Acidity								
ø Acidity	----	1	mg/kg	202	----	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	10300	----	----	----	----
Sulfur as S	63705-05-5	10	mg/kg	3420	----	----	----	----
Silica	7631-86-9	1	mg/kg	24	----	----	----	----
Silicon	7440-21-3	1	mg/kg	11	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.86	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSC BLOCK 26C	----	----	----	----
			Client sampling date / time	10-Oct-2016 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1627092-016	--------	--------	--------	--------
				Result	----	----	----	----
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	**140**	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	**1**	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	**10**	----	----	----	----
Manganese	7439-96-5	5	mg/kg	**392**	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	**71**	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	**11**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**35**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**30**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**17**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**19**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**51**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	**5**	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	**5.8**	----	----	----	----
Total Organic Carbon	----	0.5	%	**3.4**	----	----	----	----

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-001 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	D+B BLOCK 1A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	91%
4.75	83%
2.36	81%
1.18	79%
0.600	78%
0.425	77%
0.300	75%
0.150	72%
0.075	60%
Particle Size (microns)	
68	60%
50	53%
36	46%
19	38%
10	32%
5	6%
2	6%

Samples analysed as received.

Median Particle Size (mm)*	0.044

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.64 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-001DUP / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	D+B BLOCK 1A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	91%
4.75	83%
2.36	81%
1.18	79%
0.600	78%
0.425	77%
0.300	75%
0.150	72%
0.075	60%
Particle Size (microns)	
68	60%
50	53%
36	46%
19	38%
10	32%
5	6%
2	6%

Samples analysed as received.

Median Particle Size (mm)*	0.044

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.64 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-002 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	D+B BLOCK 2A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	73%
4.75	65%
2.36	60%
1.18	57%
0.600	54%
0.425	52%
0.300	51%
0.150	48%
0.075	43%
Particle Size (microns)	
69	43%
49	40%
36	37%
18	31%
10	26%
5	7%
2	7%

Samples analysed as received.

Median Particle Size (mm)*	0.250

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.59 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-003 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	D+B BLOCK 3A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	71%
4.75	63%
2.36	52%
1.18	41%
0.600	32%
0.425	29%
0.300	27%
0.150	24%
0.075	22%
Particle Size (microns)	
73	21%
54	19%
38	17%
19	14%
10	12%
5	10%
1	7%

Samples analysed as received.

Median Particle Size (mm)*	2.145

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.66 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-004 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	D+B BLOCK 4A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	73%
4.75	60%
2.36	48%
1.18	43%
0.600	40%
0.425	39%
0.300	38%
0.150	37%
0.075	35%
Particle Size (microns)	
69	34%
49	32%
35	29%
18	23%
9	20%
5	10%
1	5%

Samples analysed as received.

Median Particle Size (mm)*	2.758

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.72 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-005 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSA BLOCK 1C

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	85%
4.75	77%
2.36	73%
1.18	71%
0.600	71%
0.425	70%
0.300	70%
0.150	70%
0.075	68%
Particle Size (microns)	
65	67%
46	66%
33	63%
16	56%
8	49%
4	39%
1	24%

Samples analysed as received.

Median Particle Size (mm)*	0.009

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.59 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-006 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	TOPSOIL A BLOCK 1A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	81%
4.75	67%
2.36	60%
1.18	57%
0.600	55%
0.425	55%
0.300	54%
0.150	52%
0.075	46%
Particle Size (microns)	
63	46%
45	43%
33	38%
18	33%
9	29%
5	24%
1	6%

Samples analysed as received.

Median Particle Size (mm)*	0.125

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.67 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-007 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSB BLOCK 2C

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	85%
4.75	76%
2.36	68%
1.18	64%
0.600	60%
0.425	59%
0.300	57%
0.150	55%
0.075	52%
Particle Size (microns)	
63	51%
47	50%
33	46%
17	40%
9	36%
5	12%
1	5%

Samples analysed as received.

Median Particle Size (mm)*	0.047

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.65 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-008 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSA BLOCK 19A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	98%
4.75	88%
2.36	85%
1.18	85%
0.600	85%
0.425	84%
0.300	84%
0.150	82%
0.075	78%
Particle Size (microns)	
67	78%
48	74%
34	72%
17	63%
9	54%
5	44%
2	13%

Median Particle Size (mm)*	0.007

Samples analysed as received.

** Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results*

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.44 (2.45)* g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-009 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	TOPSOIL B BLOCK 1A

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	72%
4.75	64%
2.36	58%
1.18	55%
0.600	54%
0.425	53%
0.300	53%
0.150	50%
0.075	41%
Particle Size (microns)	
67	40%
47	36%
35	32%
18	27%
9	23%
5	20%
1	14%

Samples analysed as received.

Median Particle Size (mm)*	0.150

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.65 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-010 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSB BLOCK 10B

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	85%
4.75	78%
2.36	74%
1.18	71%
0.600	70%
0.425	69%
0.300	69%
0.150	68%
0.075	66%
Particle Size (microns)	
66	66%
47	64%
33	61%
17	55%
9	48%
5	40%
1	25%

Samples analysed as received.

Median Particle Size (mm)*	0.012

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.5 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-011 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSA BLOCK 14A

Particle Size Distribution

Particle Size (mm)	Percent Passing
9.50	100%
4.75	95%
2.36	91%
1.18	89%
0.600	88%
0.425	88%
0.300	88%
0.150	87%
0.075	86%
Particle Size (microns)	
64	86%
45	83%
32	81%
16	74%
8	65%
4	56%
2	11%

Samples analysed as received.

Median Particle Size (mm)*	0.003

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.63 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-011DUP / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSA BLOCK 14A

Particle Size Distribution

Particle Size (mm)	Percent Passing
9.50	100%
4.75	95%
2.36	91%
1.18	89%
0.600	88%
0.425	88%
0.300	88%
0.150	87%
0.075	86%
Particle Size (microns)	
64	86%
45	83%
32	81%
16	74%
8	65%
4	56%
2	11%

Samples analysed as received.

Median Particle Size (mm)*	0.003

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.63 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

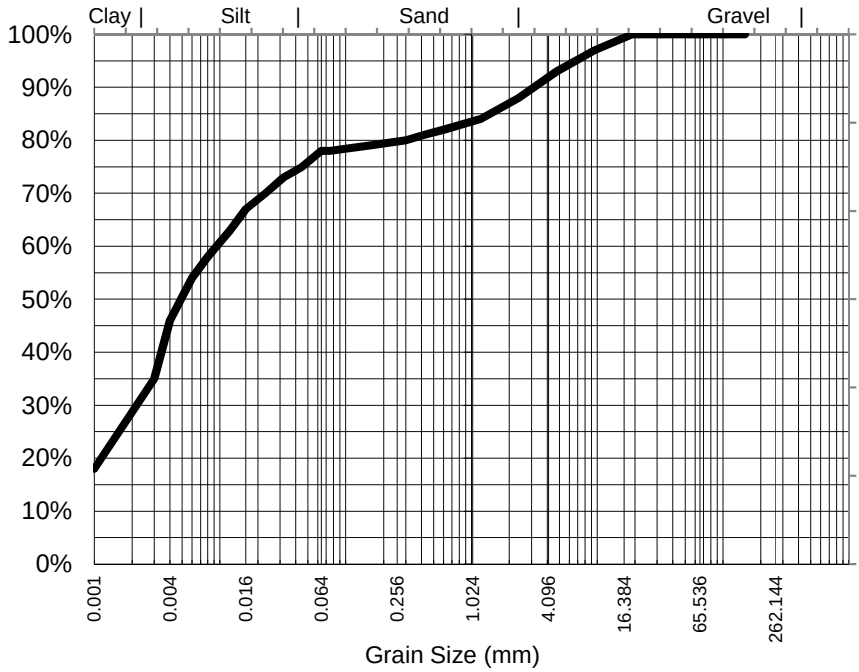
ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-012 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSB BLOCK 8B

Particle Size Distribution



Particle Size (mm)	Percent Passing
19.0	100%
9.50	97%
4.75	93%
2.36	88%
1.18	84%
0.600	82%
0.425	81%
0.300	80%
0.150	79%
0.075	78%
Particle Size (microns)	
64	78%
45	75%
32	73%
16	67%
8	58%
4	46%
1	18%

Samples analysed as received.

Median Particle Size (mm)*	0.005

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.63 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-013 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSC BLOCK 24B

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	75%
4.75	67%
2.36	54%
1.18	48%
0.600	44%
0.425	43%
0.300	42%
0.150	40%
0.075	38%
Particle Size (microns)	
68	38%
48	36%
34	35%
18	31%
9	26%
5	23%
2	3%

Samples analysed as received.

Median Particle Size (mm)*	1.573

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.62 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-014 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSC BLOCK 23B

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	90%
4.75	84%
2.36	81%
1.18	79%
0.600	77%
0.425	76%
0.300	75%
0.150	73%
0.075	69%
Particle Size (microns)	
63	66%
45	66%
32	66%
16	58%
8	50%
4	45%
1	8%

Samples analysed as received.

Median Particle Size (mm)*	0.008

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.69 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

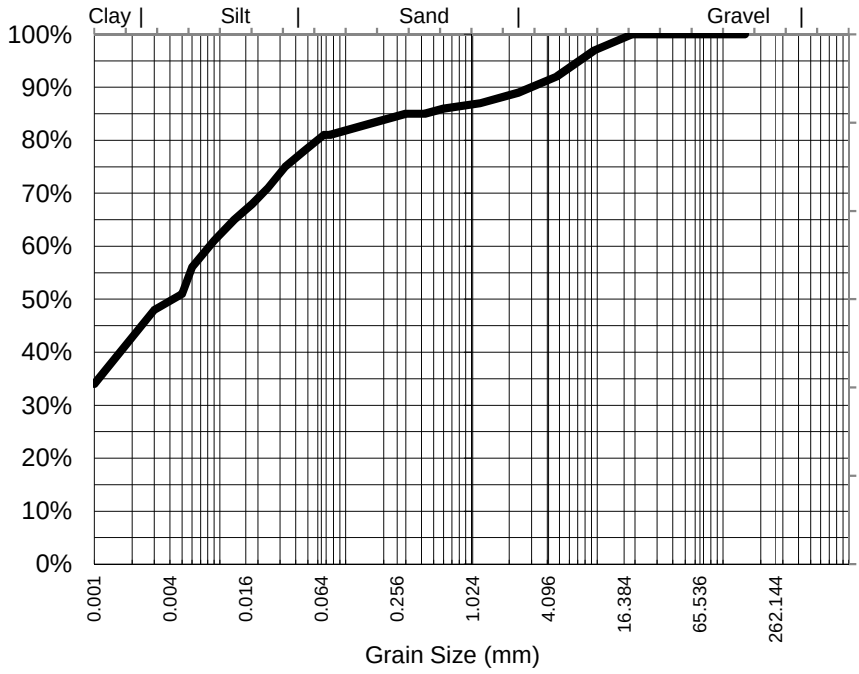
ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-015 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSC BLOCK 19A

Particle Size Distribution



Particle Size (mm)	Percent Passing
19.0	100%
9.50	97%
4.75	92%
2.36	89%
1.18	87%
0.600	86%
0.425	85%
0.300	85%
0.150	83%
0.075	81%
Particle Size (microns)	
67	81%
47	78%
33	75%
18	68%
9	61%
5	51%
1	34%

Samples analysed as received.

Median Particle Size (mm)*	0.004

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.66 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

Certificate of Analysis

ALS Laboratory Group Pty Ltd
2 Byth Street, Stafford, QLD 4053
pH 07 3552 8678
fax 07 3352 3662
samples.brisbane@alsglobal.com

ALS Environmental

Brisbane, QLD

CLIENT:	Pauljones	**DATE REPORTED:**	24-Nov-2016
COMPANY:	FLINDERS POWER	**DATE RECEIVED:**	14-Nov-2016
ADDRESS:	GPO BOX 2535 ADELAIDE SA 5001	**REPORT NO:**	EB1627092-016 / PSD
PROJECT:	LCK 16002	**SAMPLE ID:**	DLSC BLOCK 26C

Particle Size Distribution

Particle Size (mm)	Percent Passing
19.0	100%
9.50	85%
4.75	75%
2.36	68%
1.18	64%
0.600	62%
0.425	61%
0.300	60%
0.150	58%
0.075	55%
Particle Size (microns)	
65	55%
46	51%
33	48%
16	43%
9	36%
5	31%
2	4%

Samples analysed as received.

Median Particle Size (mm)*	0.042

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 18-Nov-16

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.3 2003

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.59 g/cm3

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

Satish Trivedi
Soil Chemist
Authorised Signatory

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1627092**	Page	: 1 of 7
Amendment	: **1**		
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Project	: LCK 16002	Date Samples Received	: 14-Nov-2016
Order number	: ----	Date Analysis Commenced	: 17-Nov-2016
C-O-C number	: ----	Issue Date	: 15-Dec-2016
Sampler	: PAUL JONES		
Site	: ----		
Quote number	: BNBQ/333/16		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002 : pH (Soils) (QC Lot: 656178)									
EB1627092-001	D+B BLOCK 1A	EA002: pH Value	----	0.1	pH Unit	8.0	8.1	0.00	0% - 20%
EB1627092-010	DLSB BLOCK 10B	EA002: pH Value	----	0.1	pH Unit	7.5	7.5	0.00	0% - 20%
EA010: Conductivity (QC Lot: 656179)									
EB1627092-001	D+B BLOCK 1A	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	8890	7510	16.8	0% - 20%
EB1627092-010	DLSB BLOCK 10B	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	4360	4450	2.04	0% - 20%
EA013: Acid Neutralising Capacity (QC Lot: 657366)									
EB1627092-001	D+B BLOCK 1A	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	109	107	2.09	0% - 20%
EB1627092-012	DLSB BLOCK 8B	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	74.9	74.9	0.00	0% - 20%
EA026 : Chromium Reducible Sulfur (QC Lot: 657365)									
EB1627092-001	D+B BLOCK 1A	EA026: Chromium Reducible Sulphur	----	0.005	%	<0.005	<0.005	0.00	No Limit
EB1627092-012	DLSB BLOCK 8B	EA026: Chromium Reducible Sulphur	----	0.005	%	0.006	0.006	0.00	No Limit
EA031: pH (saturated paste) (QC Lot: 659496)									
EB1627092-001	D+B BLOCK 1A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	7.5	7.4	0.00	0% - 20%
EB1627092-011	DLSA BLOCK 14A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	7.0	7.1	0.00	0% - 20%
EA032: Electrical Conductivity (saturated paste) (QC Lot: 659497)									
EB1627092-001	D+B BLOCK 1A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	15500	15300	1.33	0% - 20%
EB1627092-011	DLSA BLOCK 14A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	44400	43400	2.34	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 656189)									
EB1627092-001	D+B BLOCK 1A	EA037: pH (F)	----	0.1	pH Unit	8.1	8.2	1.23	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	8.8	8.8	0.00	0% - 20%
EB1627092-011	DLSA BLOCK 14A	EA037: pH (F)	----	0.1	pH Unit	7.2	7.3	1.38	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	6.5	6.3	3.12	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA055: Moisture Content (QC Lot: 663451)									
EB1627092-001	D+B BLOCK 1A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	4.8	4.6	2.67	No Limit
EB1627092-011	DLSA BLOCK 14A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.2	15.4	1.46	0% - 50%
ED008: Exchangeable Cations (QC Lot: 687999)									
EB1627092-001	D+B BLOCK 1A	ED008: Exchangeable Calcium	----	0.1	meq/100g	44.6	42.0	6.06	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.8	3.6	7.03	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.5	0.4	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.6	0.6	0.00	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
EB1627092-009	TOPSOIL B BLOCK 1A	ED008: Exchangeable Calcium	----	0.1	meq/100g	38.4	36.9	3.96	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.5	3.5	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.4	0.4	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.4	0.00	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
ED021: Bicarbonate Extractable Potassium (Colwell) (QC Lot: 656828)									
EB1627092-001	D+B BLOCK 1A	ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	279	264	5.55	No Limit
EB1627092-009	TOPSOIL B BLOCK 1A	ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	204	2.04	No Limit
ED038A: Acidity (QC Lot: 656180)									
EB1627092-001	D+B BLOCK 1A	ED038: Acidity	----	1	mg/kg	73	73	0.00	0% - 50%
EB1627092-010	DLSB BLOCK 10B	ED038: Acidity	----	1	mg/kg	388	396	1.98	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 656181)									
EB1627092-001	D+B BLOCK 1A	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	8200	7440	9.67	0% - 20%
EB1627092-010	DLSB BLOCK 10B	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	9740	10000	2.70	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 664611)									
EB1627092-001	D+B BLOCK 1A	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.42	0.49	14.7	0% - 20%
EB1627092-010	DLSB BLOCK 10B	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.67	0.66	2.10	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 663444)									
EB1627092-001	D+B BLOCK 1A	EG005T: Beryllium	7440-41-7	1	mg/kg	1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	100	100	0.00	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	32	31	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	14	14	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	25	26	6.31	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	25	24	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	14	11.1	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	646	567	13.1	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	59	59	0.00	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	77	76	2.45	0% - 50%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 663444) - continued									
EB1627092-001	D+B BLOCK 1A	EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EB1627092-011	DLSA BLOCK 14A	EG005T: Beryllium	7440-41-7	1	mg/kg	1	1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	460	# 320	37.3	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	36	36	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	24	18	31.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	39	33	17.8	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	47	45	4.42	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	24	18.3	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	2300	# 1200	62.9	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	54	55	2.01	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	114	105	7.83	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 663445)									
EB1627092-001	D+B BLOCK 1A	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EB1627092-011	DLSA BLOCK 14A	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QC Lot: 656838)									
EB1627092-001	D+B BLOCK 1A	EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	8	10	22.7	No Limit
EB1627092-011	DLSA BLOCK 14A	EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	9	6	45.3	No Limit
EP004: Organic Matter (QC Lot: 656827)									
EB1627092-001	D+B BLOCK 1A	EP004: Organic Matter	----	0.5	%	0.6	0.6	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.00	No Limit
EB1627092-010	DLSB BLOCK 10B	EP004: Organic Matter	----	0.5	%	12.8	13.9	7.94	0% - 20%
		EP004: Total Organic Carbon	----	0.5	%	7.4	8.0	7.92	0% - 50%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA002 : pH (Soils) (QCLot: 656178)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	101	98	102
				----	7 pH Unit	101	98	102
EA010: Conductivity (QCLot: 656179)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	101	97	103
EA013: Acid Neutralising Capacity (QCLot: 657366)								
EA013: ANC as H2SO4	----	----	kg H2SO4 equiv./t	----	100 kg H2SO4 equiv./t	109	82	120
EA026 : Chromium Reducible Sulfur (QCLot: 657365)								
EA026: Chromium Reducible Sulphur	----	0.005	%	<0.005	0.25483 %	92.1	70	130
EA031: pH (saturated paste) (QCLot: 659496)								
EA031: pH (Saturated Paste)	----	----	pH Unit	----	4 pH Unit	100	99	101
				----	7 pH Unit	100	99	101
EA032: Electrical Conductivity (saturated paste) (QCLot: 659497)								
EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	<1	1413 µS/cm	100	97	103
ED008: Exchangeable Cations (QCLot: 687999)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	10.925 meq/100g	100	91	109
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	5.9518 meq/100g	106	89	111
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.4769 meq/100g	87.0	79	116
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.8718 meq/100g	81.0	75	118
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	18.2255 meq/100g	101	88	110
ED021: Bicarbonate Extractable Potassium (Colwell) (QCLot: 656828)								
ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	----	----	----	----
ED038A: Acidity (QCLot: 656180)								
ED038: Acidity	----	1	mg/kg	<1	100 mg/kg	99.4	95	105
ED040S: Soluble Major Anions (QCLot: 656181)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	500 mg/kg	103	90	114
ED040S: Sulfur as S	63705-05-5	10	mg/kg	<10	----	----	----	----
ED040S: Silica	7631-86-9	1	mg/kg	<1	----	----	----	----
ED040S: Silicon	7440-21-3	1	mg/kg	<1	----	----	----	----
ED042T: Total Sulfur by LECO (QCLot: 664611)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	107	70	130
EG005T: Total Metals by ICP-AES (QCLot: 663444)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	118.9 mg/kg	112	84	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 663444) - continued								
EG005T: Barium	7440-39-3	10	mg/kg	<10	105.1967 mg/kg	106	89	129
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.59196 mg/kg	126	94	128
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.87125 mg/kg	109	88	117
EG005T: Chromium	7440-47-3	2	mg/kg	<2	22.7 mg/kg	115	83	125
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.5 mg/kg	113	89	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	55 mg/kg	116	86	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	72.1 mg/kg	109	84	119
EG005T: Manganese	7439-96-5	5	mg/kg	<5	604.6 mg/kg	105	84	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	16.6 mg/kg	117	89	126
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	69.8 mg/kg	116	91	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	182.3 mg/kg	117	87	127
EG035T: Total Recoverable Mercury by FIMS (QCLot: 663445)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.09821 mg/kg	115	78	122
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QCLot: 656838)								
EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	100 mg/kg	100	70	130
				<5	27 mg/kg	115	80	120
				<5	58.07 mg/kg	101	80	120
EP004: Organic Matter (QCLot: 656827)								
EP004: Organic Matter	----	0.5	%	<0.5	80 %	88.1	83	115
EP004: Total Organic Carbon	----	0.5	%	<0.5	46.4 %	88.1	85	115

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 663444)							
EB1627092-002	D+B BLOCK 2A	EG005T: Arsenic	7440-38-2	50 mg/kg	121	70	130
		EG005T: Barium	7440-39-3	50 mg/kg	129	70	130
		EG005T: Beryllium	7440-41-7	5 mg/kg	120	70	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	112	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	114	70	130
		EG005T: Cobalt	7440-48-4	50 mg/kg	124	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	110	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG005T: Total Metals by ICP-AES (QCLot: 663444) - continued							
EB1627092-002	D+B BLOCK 2A	EG005T: Lead	7439-92-1	50 mg/kg	115	70	130
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	122	70	130
		EG005T: Vanadium	7440-62-2	50 mg/kg	# 142	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	# 142	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 663445)							
EB1627092-002	D+B BLOCK 2A	EG035T: Mercury	7439-97-6	2.5 mg/kg	93.9	70	130
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QCLot: 656838)							
EB1627092-002	D+B BLOCK 2A	EK080: Bicarbonate Ext. P (Colwell)	----	40 mg/kg	106	70	130
EP004: Organic Matter (QCLot: 656827)							
EB1627092-002	D+B BLOCK 2A	EP004: Organic Matter	----	1.84 %	84.0	70	130
		EP004: Total Organic Carbon	----	1.04 %	84.2	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1627092**	Page	: 1 of 20
Amendment	: **1**		
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Telephone	: +61-7-3243 7222
Project	: LCK 16002	Date Samples Received	: 14-Nov-2016
Site	: ----	Issue Date	: 15-Dec-2016
Sampler	: PAUL JONES	No. of samples received	: 16
Order number	: ----	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	EB1627092--011	DLSA BLOCK 14A	**Barium**	7440-39-3	37.3 %	0% - 20%	**RPD exceeds LOR based limits**
EG005T: Total Metals by ICP-AES	EB1627092--011	DLSA BLOCK 14A	**Manganese**	7439-96-5	62.9 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EB1627092--002	D+B BLOCK 2A	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EB1627092--002	D+B BLOCK 2A	**Vanadium**	7440-62-2	142 %	70-130%	**Recovery greater than upper data quality objective**
EG005T: Total Metals by ICP-AES	EB1627092--002	D+B BLOCK 2A	**Zinc**	7440-66-6	142 %	70-130%	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method		*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA002 : pH (Soils)							
Snap Lock Bag TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	17-Nov-2016	11-Oct-2016	**37**	----	----	----
Snap Lock Bag TOPSOIL B BLOCK 1A		17-Nov-2016	12-Nov-2016	**5**	----	----	----
Snap Lock Bag D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	17-Nov-2016	14-Nov-2016	**3**	----	----	----
Snap Lock Bag DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	17-Nov-2016	17-Oct-2016	**31**	----	----	----
Snap Lock Bag DLSA BLOCK 19A,	DLSA BLOCK 14A	17-Nov-2016	21-Sep-2016	**57**	----	----	----
Snap Lock Bag DLSB BLOCK 8B		17-Nov-2016	30-Sep-2016	**48**	----	----	----
Snap Lock Bag DLSB BLOCK 10B		17-Nov-2016	04-Oct-2016	**44**	----	----	----
EA010: Conductivity							
Snap Lock Bag TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	17-Nov-2016	11-Oct-2016	**37**	----	----	----
Snap Lock Bag TOPSOIL B BLOCK 1A		17-Nov-2016	12-Nov-2016	**5**	----	----	----

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA010: Conductivity - Analysis Holding Time Compliance							
Snap Lock Bag							
D+B BLOCK 1A,	D+B BLOCK 2A,	17-Nov-2016	14-Nov-2016	**3**	----	----	----
D+B BLOCK 3A,	D+B BLOCK 4A,						
DLSA BLOCK 1C							
Snap Lock Bag							
DLSC BLOCK 24B,	DLSC BLOCK 23B,	17-Nov-2016	17-Oct-2016	**31**	----	----	----
DLSC BLOCK 19A,	DLSC BLOCK 26C						
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	17-Nov-2016	21-Sep-2016	**57**	----	----	----
Snap Lock Bag							
DLSB BLOCK 8B		17-Nov-2016	30-Sep-2016	**48**	----	----	----
Snap Lock Bag							
DLSB BLOCK 10B		17-Nov-2016	04-Oct-2016	**44**	----	----	----
EA026 : Chromium Reducible Sulfur							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	17-Nov-2016	05-Oct-2016	**43**	----	----	----
Snap Lock Bag							
TOPSOIL B BLOCK 1A		17-Nov-2016	06-Nov-2016	**11**	----	----	----
Snap Lock Bag							
D+B BLOCK 1A,	D+B BLOCK 2A,	17-Nov-2016	08-Nov-2016	**9**	----	----	----
D+B BLOCK 3A,	D+B BLOCK 4A,						
DLSA BLOCK 1C							
Snap Lock Bag							
DLSC BLOCK 24B,	DLSC BLOCK 23B,	17-Nov-2016	11-Oct-2016	**37**	----	----	----
DLSC BLOCK 19A,	DLSC BLOCK 26C						
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	17-Nov-2016	15-Sep-2016	**63**	----	----	----
Snap Lock Bag							
DLSB BLOCK 8B		17-Nov-2016	24-Sep-2016	**54**	----	----	----
Snap Lock Bag							
DLSB BLOCK 10B		17-Nov-2016	28-Sep-2016	**50**	----	----	----
EA037: Ass Field Screening Analysis							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	17-Nov-2016	05-Oct-2016	**43**	17-Nov-2016	05-Oct-2016	**43**
Snap Lock Bag							
TOPSOIL B BLOCK 1A		17-Nov-2016	06-Nov-2016	**11**	17-Nov-2016	06-Nov-2016	**11**
Snap Lock Bag							
D+B BLOCK 1A,	D+B BLOCK 2A,	17-Nov-2016	08-Nov-2016	**9**	17-Nov-2016	08-Nov-2016	**9**
D+B BLOCK 3A,	D+B BLOCK 4A,						
DLSA BLOCK 1C							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA037: Ass Field Screening Analysis - Analysis Holding Time Compliance							
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	17-Nov-2016	11-Oct-2016	**37**	17-Nov-2016	11-Oct-2016	**37**
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	17-Nov-2016	15-Sep-2016	**63**	17-Nov-2016	15-Sep-2016	**63**
Snap Lock Bag							
DLSB BLOCK 8B		17-Nov-2016	24-Sep-2016	**54**	17-Nov-2016	24-Sep-2016	**54**
Snap Lock Bag							
DLSB BLOCK 10B		17-Nov-2016	28-Sep-2016	**50**	17-Nov-2016	28-Sep-2016	**50**
EA055: Moisture Content							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	----	----	----	22-Nov-2016	18-Oct-2016	**35**
Snap Lock Bag							
TOPSOIL B BLOCK 1A		----	----	----	22-Nov-2016	19-Nov-2016	**3**
Snap Lock Bag							
D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	----	----	----	22-Nov-2016	21-Nov-2016	**1**
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	----	----	----	22-Nov-2016	24-Oct-2016	**29**
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	----	----	----	22-Nov-2016	28-Sep-2016	**55**
Snap Lock Bag							
DLSB BLOCK 8B		----	----	----	22-Nov-2016	07-Oct-2016	**46**
Snap Lock Bag							
DLSB BLOCK 10B		----	----	----	22-Nov-2016	11-Oct-2016	**42**
ED008: Exchangeable Cations							
Pulp Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	12-Dec-2016	01-Nov-2016	**41**	12-Dec-2016	01-Nov-2016	**41**
Pulp Bag							
TOPSOIL B BLOCK 1A		12-Dec-2016	03-Dec-2016	**9**	12-Dec-2016	03-Dec-2016	**9**
Pulp Bag							
D+B BLOCK 1A, D+B BLOCK 3A,	D+B BLOCK 2A, DLSA BLOCK 1C	12-Dec-2016	05-Dec-2016	**7**	12-Dec-2016	05-Dec-2016	**7**
Pulp Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	12-Dec-2016	07-Nov-2016	**35**	12-Dec-2016	07-Nov-2016	**35**
Pulp Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	12-Dec-2016	12-Oct-2016	**61**	12-Dec-2016	12-Oct-2016	**61**

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED008: Exchangeable Cations - Analysis Holding Time Compliance							
Pulp Bag							
DLSB BLOCK 8B		12-Dec-2016	21-Oct-2016	**52**	12-Dec-2016	21-Oct-2016	**52**
Pulp Bag							
DLSB BLOCK 10B		12-Dec-2016	25-Oct-2016	**48**	12-Dec-2016	25-Oct-2016	**48**
Snap Lock Bag							
D+B BLOCK 4A		12-Dec-2016	05-Dec-2016	**7**	12-Dec-2016	05-Dec-2016	**7**
ED040S : Soluble Sulfate by ICPAES							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	17-Nov-2016	01-Nov-2016	**16**	----	----	----
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	17-Nov-2016	07-Nov-2016	**10**	----	----	----
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	17-Nov-2016	12-Oct-2016	**36**	----	----	----
Snap Lock Bag							
DLSB BLOCK 8B		17-Nov-2016	21-Oct-2016	**27**	----	----	----
Snap Lock Bag							
DLSB BLOCK 10B		17-Nov-2016	25-Oct-2016	**23**	----	----	----
ED042T: Total Sulfur by LECO							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	23-Nov-2016	11-Oct-2016	**43**	----	----	----
Snap Lock Bag							
TOPSOIL B BLOCK 1A		23-Nov-2016	12-Nov-2016	**11**	----	----	----
Snap Lock Bag							
D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	23-Nov-2016	14-Nov-2016	**9**	----	----	----
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	23-Nov-2016	17-Oct-2016	**37**	----	----	----
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	23-Nov-2016	21-Sep-2016	**63**	----	----	----
Snap Lock Bag							
DLSB BLOCK 8B		23-Nov-2016	30-Sep-2016	**54**	----	----	----
Snap Lock Bag							
DLSB BLOCK 10B		23-Nov-2016	04-Oct-2016	**50**	----	----	----
EG035T: Total Recoverable Mercury by FIMS							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	25-Nov-2016	01-Nov-2016	**24**	26-Nov-2016	01-Nov-2016	**25**

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EG035T: Total Recoverable Mercury by FIMS - Analysis Holding Time Compliance							
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	25-Nov-2016	07-Nov-2016	**18**	26-Nov-2016	07-Nov-2016	**19**
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	25-Nov-2016	12-Oct-2016	**44**	26-Nov-2016	12-Oct-2016	**45**
Snap Lock Bag							
DLSB BLOCK 8B		25-Nov-2016	21-Oct-2016	**35**	26-Nov-2016	21-Oct-2016	**36**
Snap Lock Bag							
DLSB BLOCK 10B		25-Nov-2016	25-Oct-2016	**31**	26-Nov-2016	25-Oct-2016	**32**
EP004: Organic Matter							
Snap Lock Bag							
TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	18-Nov-2016	11-Oct-2016	**38**	----	----	----
Snap Lock Bag							
TOPSOIL B BLOCK 1A		18-Nov-2016	12-Nov-2016	**6**	----	----	----
Snap Lock Bag							
D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	18-Nov-2016	14-Nov-2016	**4**	----	----	----
Snap Lock Bag							
DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	18-Nov-2016	17-Oct-2016	**32**	----	----	----
Snap Lock Bag							
DLSA BLOCK 19A,	DLSA BLOCK 14A	18-Nov-2016	21-Sep-2016	**58**	----	----	----
Snap Lock Bag							
DLSB BLOCK 8B		18-Nov-2016	30-Sep-2016	**49**	----	----	----
Snap Lock Bag							
DLSB BLOCK 10B		18-Nov-2016	04-Oct-2016	**45**	----	----	----

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002 : pH (Soils)								
Snap Lock Bag (EA002) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	11-Oct-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	12-Nov-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	14-Nov-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	17-Oct-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	21-Sep-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	30-Sep-2016	×	**17-Nov-2016**	17-Nov-2016	✓
Snap Lock Bag (EA002) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	04-Oct-2016	×	**17-Nov-2016**	17-Nov-2016	✓
EA010: Conductivity								
Snap Lock Bag (EA010) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	11-Oct-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	12-Nov-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	14-Nov-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	17-Oct-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	21-Sep-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	30-Sep-2016	×	**17-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (EA010) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	04-Oct-2016	×	**17-Nov-2016**	15-Dec-2016	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA013: Acid Neutralising Capacity								
Snap Lock Bag (EA013) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	04-Oct-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	05-Nov-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	07-Nov-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	10-Oct-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	14-Sep-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	23-Sep-2017	✓	**18-Nov-2016**	16-May-2017	✓
Snap Lock Bag (EA013) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	27-Sep-2017	✓	**18-Nov-2016**	16-May-2017	✓
EA026 : Chromium Reducible Sulfur								
Snap Lock Bag (EA026) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	05-Oct-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	06-Nov-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	08-Nov-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	11-Oct-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	15-Sep-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	24-Sep-2016	×	**17-Nov-2016**	15-Feb-2017	✓
Snap Lock Bag (EA026) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	28-Sep-2016	×	**17-Nov-2016**	15-Feb-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA031: pH (saturated paste)								
Snap Lock Bag (EA031) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	----	----	----	18-Nov-2016	02-Apr-2017	✓
Snap Lock Bag (EA031) TOPSOIL B BLOCK 1A		05-Nov-2016	----	----	----	18-Nov-2016	04-May-2017	✓
Snap Lock Bag (EA031) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	07-Nov-2016	----	----	----	18-Nov-2016	06-May-2017	✓
Snap Lock Bag (EA031) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	----	----	----	18-Nov-2016	08-Apr-2017	✓
Snap Lock Bag (EA031) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	----	----	----	18-Nov-2016	13-Mar-2017	✓
Snap Lock Bag (EA031) DLSB BLOCK 8B		23-Sep-2016	----	----	----	18-Nov-2016	22-Mar-2017	✓
Snap Lock Bag (EA031) DLSB BLOCK 10B		27-Sep-2016	----	----	----	18-Nov-2016	26-Mar-2017	✓
EA032: Electrical Conductivity (saturated paste)								
Snap Lock Bag (EA032) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	----	----	----	18-Nov-2016	02-Apr-2017	✓
Snap Lock Bag (EA032) TOPSOIL B BLOCK 1A		05-Nov-2016	----	----	----	18-Nov-2016	04-May-2017	✓
Snap Lock Bag (EA032) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	07-Nov-2016	----	----	----	18-Nov-2016	06-May-2017	✓
Snap Lock Bag (EA032) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	----	----	----	18-Nov-2016	08-Apr-2017	✓
Snap Lock Bag (EA032) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	----	----	----	18-Nov-2016	13-Mar-2017	✓
Snap Lock Bag (EA032) DLSB BLOCK 8B		23-Sep-2016	----	----	----	18-Nov-2016	22-Mar-2017	✓
Snap Lock Bag (EA032) DLSB BLOCK 10B		27-Sep-2016	----	----	----	18-Nov-2016	26-Mar-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag (EA037) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	05-Oct-2016	×	**17-Nov-2016**	05-Oct-2016	×
Snap Lock Bag (EA037) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	06-Nov-2016	×	**17-Nov-2016**	06-Nov-2016	×
Snap Lock Bag (EA037) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	08-Nov-2016	×	**17-Nov-2016**	08-Nov-2016	×
Snap Lock Bag (EA037) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	11-Oct-2016	×	**17-Nov-2016**	11-Oct-2016	×
Snap Lock Bag (EA037) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	15-Sep-2016	×	**17-Nov-2016**	15-Sep-2016	×
Snap Lock Bag (EA037) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	24-Sep-2016	×	**17-Nov-2016**	24-Sep-2016	×
Snap Lock Bag (EA037) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	28-Sep-2016	×	**17-Nov-2016**	28-Sep-2016	×
EA055: Moisture Content								
Snap Lock Bag (EA055-103) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**----**	----	----	**22-Nov-2016**	18-Oct-2016	×
Snap Lock Bag (EA055-103) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**----**	----	----	**22-Nov-2016**	19-Nov-2016	×
Snap Lock Bag (EA055-103) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**----**	----	----	**22-Nov-2016**	21-Nov-2016	×
Snap Lock Bag (EA055-103) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**----**	----	----	**22-Nov-2016**	24-Oct-2016	×
Snap Lock Bag (EA055-103) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**----**	----	----	**22-Nov-2016**	28-Sep-2016	×
Snap Lock Bag (EA055-103) DLSB BLOCK 8B		**23-Sep-2016**	**----**	----	----	**22-Nov-2016**	07-Oct-2016	×
Snap Lock Bag (EA055-103) DLSB BLOCK 10B		**27-Sep-2016**	**----**	----	----	**22-Nov-2016**	11-Oct-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Particle Sizing								
Snap Lock Bag (EA150H) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	----	----	----	24-Nov-2016	02-Apr-2017	✓
Snap Lock Bag (EA150H) TOPSOIL B BLOCK 1A		05-Nov-2016	----	----	----	24-Nov-2016	04-May-2017	✓
Snap Lock Bag (EA150H) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	07-Nov-2016	----	----	----	24-Nov-2016	06-May-2017	✓
Snap Lock Bag (EA150H) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	----	----	----	24-Nov-2016	08-Apr-2017	✓
Snap Lock Bag (EA150H) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	----	----	----	24-Nov-2016	13-Mar-2017	✓
Snap Lock Bag (EA150H) DLSB BLOCK 8B		23-Sep-2016	----	----	----	24-Nov-2016	22-Mar-2017	✓
Snap Lock Bag (EA150H) DLSB BLOCK 10B		27-Sep-2016	----	----	----	24-Nov-2016	26-Mar-2017	✓
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	----	----	----	24-Nov-2016	02-Apr-2017	✓
Snap Lock Bag (EA150H) TOPSOIL B BLOCK 1A		05-Nov-2016	----	----	----	24-Nov-2016	04-May-2017	✓
Snap Lock Bag (EA150H) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	07-Nov-2016	----	----	----	24-Nov-2016	06-May-2017	✓
Snap Lock Bag (EA150H) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	----	----	----	24-Nov-2016	08-Apr-2017	✓
Snap Lock Bag (EA150H) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	----	----	----	24-Nov-2016	13-Mar-2017	✓
Snap Lock Bag (EA150H) DLSB BLOCK 8B		23-Sep-2016	----	----	----	24-Nov-2016	22-Mar-2017	✓
Snap Lock Bag (EA150H) DLSB BLOCK 10B		27-Sep-2016	----	----	----	24-Nov-2016	26-Mar-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA152: Soil Particle Density								
Snap Lock Bag (EA152) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	----	----	----	24-Nov-2016	02-Apr-2017	✓
Snap Lock Bag (EA152) TOPSOIL B BLOCK 1A		05-Nov-2016	----	----	----	24-Nov-2016	04-May-2017	✓
Snap Lock Bag (EA152) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	07-Nov-2016	----	----	----	24-Nov-2016	06-May-2017	✓
Snap Lock Bag (EA152) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	----	----	----	24-Nov-2016	08-Apr-2017	✓
Snap Lock Bag (EA152) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	----	----	----	24-Nov-2016	13-Mar-2017	✓
Snap Lock Bag (EA152) DLSB BLOCK 8B		23-Sep-2016	----	----	----	24-Nov-2016	22-Mar-2017	✓
Snap Lock Bag (EA152) DLSB BLOCK 10B		27-Sep-2016	----	----	----	24-Nov-2016	26-Mar-2017	✓
ED008: Exchangeable Cations								
Pulp Bag (ED008) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	04-Oct-2016	12-Dec-2016	01-Nov-2016	×	12-Dec-2016	01-Nov-2016	×
Pulp Bag (ED008) TOPSOIL B BLOCK 1A		05-Nov-2016	12-Dec-2016	03-Dec-2016	×	12-Dec-2016	03-Dec-2016	×
Pulp Bag (ED008) D+B BLOCK 1A, D+B BLOCK 3A,	D+B BLOCK 2A, DLSA BLOCK 1C	07-Nov-2016	12-Dec-2016	05-Dec-2016	×	12-Dec-2016	05-Dec-2016	×
Pulp Bag (ED008) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	10-Oct-2016	12-Dec-2016	07-Nov-2016	×	12-Dec-2016	07-Nov-2016	×
Pulp Bag (ED008) DLSA BLOCK 19A,	DLSA BLOCK 14A	14-Sep-2016	12-Dec-2016	12-Oct-2016	×	12-Dec-2016	12-Oct-2016	×
Pulp Bag (ED008) DLSB BLOCK 8B		23-Sep-2016	12-Dec-2016	21-Oct-2016	×	12-Dec-2016	21-Oct-2016	×
Pulp Bag (ED008) DLSB BLOCK 10B		27-Sep-2016	12-Dec-2016	25-Oct-2016	×	12-Dec-2016	25-Oct-2016	×
Snap Lock Bag (ED008) D+B BLOCK 4A		07-Nov-2016	12-Dec-2016	05-Dec-2016	×	12-Dec-2016	05-Dec-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED021: Bicarbonate Extractable Potassium (Colwell)								
Snap Lock Bag (ED021) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**18-Nov-2016**	02-Apr-2017	✓	**23-Nov-2016**	02-Apr-2017	✓
Snap Lock Bag (ED021) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**18-Nov-2016**	04-May-2017	✓	**23-Nov-2016**	04-May-2017	✓
Snap Lock Bag (ED021) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**18-Nov-2016**	06-May-2017	✓	**23-Nov-2016**	06-May-2017	✓
Snap Lock Bag (ED021) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**18-Nov-2016**	08-Apr-2017	✓	**23-Nov-2016**	08-Apr-2017	✓
Snap Lock Bag (ED021) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**18-Nov-2016**	13-Mar-2017	✓	**23-Nov-2016**	13-Mar-2017	✓
Snap Lock Bag (ED021) DLSB BLOCK 8B		**23-Sep-2016**	**18-Nov-2016**	22-Mar-2017	✓	**23-Nov-2016**	22-Mar-2017	✓
Snap Lock Bag (ED021) DLSB BLOCK 10B		**27-Sep-2016**	**18-Nov-2016**	26-Mar-2017	✓	**23-Nov-2016**	26-Mar-2017	✓
ED038A: Acidity								
Snap Lock Bag (ED038) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	02-Apr-2017	✓	**18-Nov-2016**	02-Apr-2017	✓
Snap Lock Bag (ED038) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	04-May-2017	✓	**18-Nov-2016**	04-May-2017	✓
Snap Lock Bag (ED038) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	06-May-2017	✓	**18-Nov-2016**	06-May-2017	✓
Snap Lock Bag (ED038) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	08-Apr-2017	✓	**18-Nov-2016**	08-Apr-2017	✓
Snap Lock Bag (ED038) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	13-Mar-2017	✓	**18-Nov-2016**	13-Mar-2017	✓
Snap Lock Bag (ED038) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	22-Mar-2017	✓	**18-Nov-2016**	22-Mar-2017	✓
Snap Lock Bag (ED038) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	26-Mar-2017	✓	**18-Nov-2016**	26-Mar-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED040S : Soluble Sulfate by ICPAES								
Snap Lock Bag (ED040S) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**17-Nov-2016**	01-Nov-2016	×	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**17-Nov-2016**	03-Dec-2016	✓	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**17-Nov-2016**	05-Dec-2016	✓	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**17-Nov-2016**	07-Nov-2016	×	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**17-Nov-2016**	12-Oct-2016	×	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) DLSB BLOCK 8B		**23-Sep-2016**	**17-Nov-2016**	21-Oct-2016	×	**24-Nov-2016**	15-Dec-2016	✓
Snap Lock Bag (ED040S) DLSB BLOCK 10B		**27-Sep-2016**	**17-Nov-2016**	25-Oct-2016	×	**24-Nov-2016**	15-Dec-2016	✓
ED042T: Total Sulfur by LECO								
Snap Lock Bag (ED042T) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**23-Nov-2016**	11-Oct-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**23-Nov-2016**	12-Nov-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**23-Nov-2016**	14-Nov-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**23-Nov-2016**	17-Oct-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**23-Nov-2016**	21-Sep-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) DLSB BLOCK 8B		**23-Sep-2016**	**23-Nov-2016**	30-Sep-2016	×	**23-Nov-2016**	22-May-2017	✓
Snap Lock Bag (ED042T) DLSB BLOCK 10B		**27-Sep-2016**	**23-Nov-2016**	04-Oct-2016	×	**23-Nov-2016**	22-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES								
Snap Lock Bag (EG005T) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**25-Nov-2016**	02-Apr-2017	✓	**25-Nov-2016**	02-Apr-2017	✓
Snap Lock Bag (EG005T) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**25-Nov-2016**	04-May-2017	✓	**25-Nov-2016**	04-May-2017	✓
Snap Lock Bag (EG005T) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**25-Nov-2016**	06-May-2017	✓	**25-Nov-2016**	06-May-2017	✓
Snap Lock Bag (EG005T) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**25-Nov-2016**	08-Apr-2017	✓	**25-Nov-2016**	08-Apr-2017	✓
Snap Lock Bag (EG005T) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**25-Nov-2016**	13-Mar-2017	✓	**25-Nov-2016**	13-Mar-2017	✓
Snap Lock Bag (EG005T) DLSB BLOCK 8B		**23-Sep-2016**	**25-Nov-2016**	22-Mar-2017	✓	**25-Nov-2016**	22-Mar-2017	✓
Snap Lock Bag (EG005T) DLSB BLOCK 10B		**27-Sep-2016**	**25-Nov-2016**	26-Mar-2017	✓	**25-Nov-2016**	26-Mar-2017	✓
EG035T: Total Recoverable Mercury by FIMS								
Snap Lock Bag (EG035T) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**25-Nov-2016**	01-Nov-2016	×	**26-Nov-2016**	01-Nov-2016	×
Snap Lock Bag (EG035T) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**25-Nov-2016**	03-Dec-2016	✓	**26-Nov-2016**	03-Dec-2016	✓
Snap Lock Bag (EG035T) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**25-Nov-2016**	05-Dec-2016	✓	**26-Nov-2016**	05-Dec-2016	✓
Snap Lock Bag (EG035T) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**25-Nov-2016**	07-Nov-2016	×	**26-Nov-2016**	07-Nov-2016	×
Snap Lock Bag (EG035T) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**25-Nov-2016**	12-Oct-2016	×	**26-Nov-2016**	12-Oct-2016	×
Snap Lock Bag (EG035T) DLSB BLOCK 8B		**23-Sep-2016**	**25-Nov-2016**	21-Oct-2016	×	**26-Nov-2016**	21-Oct-2016	×
Snap Lock Bag (EG035T) DLSB BLOCK 10B		**27-Sep-2016**	**25-Nov-2016**	25-Oct-2016	×	**26-Nov-2016**	25-Oct-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Snap Lock Bag (EK080) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**----**	----	----	**17-Nov-2016**	02-Apr-2017	✓
Snap Lock Bag (EK080) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**----**	----	----	**17-Nov-2016**	04-May-2017	✓
Snap Lock Bag (EK080) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**----**	----	----	**17-Nov-2016**	06-May-2017	✓
Snap Lock Bag (EK080) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**----**	----	----	**17-Nov-2016**	08-Apr-2017	✓
Snap Lock Bag (EK080) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**----**	----	----	**17-Nov-2016**	13-Mar-2017	✓
Snap Lock Bag (EK080) DLSB BLOCK 8B		**23-Sep-2016**	**----**	----	----	**17-Nov-2016**	22-Mar-2017	✓
Snap Lock Bag (EK080) DLSB BLOCK 10B		**27-Sep-2016**	**----**	----	----	**17-Nov-2016**	26-Mar-2017	✓
EP004: Organic Matter								
Snap Lock Bag (EP004) TOPSOIL A BLOCK 1A,	DLSB BLOCK 2C	**04-Oct-2016**	**18-Nov-2016**	11-Oct-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) TOPSOIL B BLOCK 1A		**05-Nov-2016**	**18-Nov-2016**	12-Nov-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) D+B BLOCK 1A, D+B BLOCK 3A, DLSA BLOCK 1C	D+B BLOCK 2A, D+B BLOCK 4A,	**07-Nov-2016**	**18-Nov-2016**	14-Nov-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) DLSC BLOCK 24B, DLSC BLOCK 19A,	DLSC BLOCK 23B, DLSC BLOCK 26C	**10-Oct-2016**	**18-Nov-2016**	17-Oct-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) DLSA BLOCK 19A,	DLSA BLOCK 14A	**14-Sep-2016**	**18-Nov-2016**	21-Sep-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) DLSB BLOCK 8B		**23-Sep-2016**	**18-Nov-2016**	30-Sep-2016	×	**20-Nov-2016**	16-Dec-2016	✓
Snap Lock Bag (EP004) DLSB BLOCK 10B		**27-Sep-2016**	**18-Nov-2016**	04-Oct-2016	×	**20-Nov-2016**	16-Dec-2016	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Acid Neutralising Capacity (ANC)	EA013	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Acidity in Soil	ED038	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
ASS Field Screening Analysis	EA037	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable K (Colwell)	ED021	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055-103	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (Saturated Paste)	EA031	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Acid Neutralising Capacity (ANC)	EA013	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Acidity in Soil	ED038	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	3	16	18.75	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (Saturated Paste)	EA031	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Acidity in Soil	ED038	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable K (Colwell)	ED021	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Chromium Reducible Sulphur	EA026	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Bicarbonate Extractable P (Colwell)	EK080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Net Acid Production Potential	EA009	SOIL	In house: Referenced to Coastech Research (Canada)(Mod.). NAPP = Acid Production Potential (APP or MAP-Maximum Acid Potential) minus Neutralising Capacity (ANC). NAPP may be +ve, zero or -ve.
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
Acid Neutralising Capacity (ANC)	EA013	SOIL	In house: Referenced to USEPA 600/2-78-054, I. Miller (2000). A fizz test is done to semiquanititatively estimate the likely reactivity. The soil is then reacted with an known excess quanitity of an appropriate acid. Titration determines the acid remaining, and the ANC can be calculated from comparison with a blank titration.
Chromium Reducible Sulphur	EA026	SOIL	In house: Referenced to Sullivan et al (1998) The CRS method converts reduced inorganic sulfur to H2S by CrCl2 solution ; the evolved H2S is trapped in a zinc acetate solution as ZnS which is quantified by iodometric titration.
pH (Saturated Paste)	* EA031	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - pH determined on a saturated paste by ISE.
Electrical Conductivity (Saturated Paste)	* EA032	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - conductivity determined on a saturated paste.
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1-2006 : Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Bicarbonate Extractable K (Colwell)	ED021	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 18A1 Potassium is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by ICP.
Acidity in Soil	* ED038	SOIL	In house: Referenced to APHA 2310B
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Bicarbonate Extractable P (Colwell)	EK080	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 9B1 Phosphorus is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by FIA.
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons 2011 method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Bicarbonate Extractable K (Colwell)	ED021PR	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 18A1 Potassium is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by ICP.
Drying only	EN020D	SOIL	In house
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: MWH Global	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: 41 Bishop Street, JOLIMONT, Perth 6014		
PROJECT: LCRK-SS-16001	ALS QUOTE NO.: EP/1003/16	COC SEQUENCE NUMBER (Circle)
ORDER NUMBER: PO MWH3142		COC: 1 2 3 4 5 6 7
PROJECT MANAGER: Matt Braimbridge	CONTACT PH: 08 9388 8799	OF: 1 2 3 4 5 6 7
SAMPLER: Tracey Hassell	SAMPLER MOBILE: 0407 861 462	
COC emailed to ALS? (YES ~~NO~~)	EDD FORMAT (or default): ESDAT	
Email Reports to (will default to PM if no other addresses are listed): Tracey.Hassell@mwhglobal.com		
Email Invoice to (will default to PM if no other addresses are listed): Accounts.aus@mwhglobal.com		

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Tracey Hassell			Kerra (Ken)
DATE/TIME: *21/09/2016 1300 hrs*	DATE/TIME:	DATE/TIME:	DATE/TIME: 22/9, 13:20

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: HOLD all samples - awaiting analyiss confirmation

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Moisture	pH and EC (1:5)	pH and EC (saturated paste)	Exchangable cations (with pre-wash)	Total metals (15 metals NEPM)	ASLP Leach (DI water) and Leachable metals (15 metlas NEPM)	ASLP Leach (acetic acid) and Leachable metals (15 metlas NEPM)	NAPP, Sulfate - Total as SO4, SCR	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	DLSA BLOCK 1A	5/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
2	DLSA BLOCK 2A	5/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
3	DLSA BLOCK 2S	8/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
4	DLSA BLOCK 3A	5/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
5	DLSA BLOCK 4A	5/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
6	DLSA BLOCK 5A	8/09/2016 8:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
7	DLSB BLOCK 1A	8/09/2016 9:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
8	DLSB BLOCK 2A	8/09/2016 9:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
9	DLSB BLOCK 3A	8/09/2016 9:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
10	DLSB BLOCK 4A	8/09/2016 9:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
11	DLSB BLOCK 5A	8/09/2016 9:00:00 AM	soil	1B	1	x	x	x	x	x	x	x	x	
			soil											
				LAB ID	11	11	11	11	11	11	11	11	11	

Environmental Division
Melbourne
Work Order Reference
EM1611178

Telephone : + 61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: MWH Global
OFFICE: 41 Bishop Street, JOLIMONT, Perth 6014
PROJECT: LCRK-SS-16001
ORDER NUMBER:
PROJECT MANAGER: Matt Braimbridge — **CONTACT PH:** 08 9388 8799

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Moisture	pH and EC (1:5)	pH and EC (saturated paste)	Exchangable cations (with pre-wash)	Total metals (15 metals NEPM)	ASLP Leach (DI water) and Leachable metals (15 metlas NEPM)	ASLP Leach (acetic acid) and Leachable metals (15 metlas NEPM)	NAPP, Sulfate - Total as SO4, SCR	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
12	DLSB BLOCK 6A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
13	DLSB BLOCK 7A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
14	DLSB BLOCK 8A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
15	DLSB BLOCK 9A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
16	DLSB BLOCK 10A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
17	DLSB BLOCK 11A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
18	DLSB BLOCK 12A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
19	DLSB BLOCK 13A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
20	DLSB BLOCK 14A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
21	DLSB BLOCK 15A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
22	DLSB BLOCK 16A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
23	DLSB BLOCK 17A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
24	DLSB BLOCK 18A	8/09/2016 9:00:00 AM	s	1B	1	x	x	x	x	x	x	x	x	
			s											
			s											
				LAB ID	13	13	13	13	13	13	13	13	13	

Barry (ALS) 22/9, 13:20

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1611178**

Client	: **MWH AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MATT BRAIMBRIDGE	Contact	: Luke Jones
Address	: 41 BISHOP ST JOLIMONT PERTH, WESTERN AUSTRALIA 6014	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: Matt.F.Braimbridge@mwhglobal.com	E-mail	: LUKE.JONES@alsglobal.com
Telephone	: 08 9388 8799	Telephone	: 08 9209 7631
Facsimile	: 08 9388 8633	Facsimile	: +61-3-8549 9601
Project	: LCRK-SS-16001	Page	: 1 of 5
Order number	: MWH3142	Quote number	: EP2016MWHAUS0022 (EP/1003/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: TRACEY HASSELL		

Dates

Date Samples Received	: 22-Sep-2016 1:20 PM	Issue Date	: 23-Sep-2016
Client Requested Due Date	: 04-Oct-2016	Scheduled Reporting Date	: **04-Oct-2016**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 14.9
Receipt Detail	: PALLET	No. of samples received / analysed	: 24 / 24

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - ASS1 NAPP	SOIL - EA026 Chromium Reducible Sulphur	SOIL - EA032 Electrical Conductivity (Saturated Paste)	SOIL - ED007/ED008 - Melb CEC / Exchangeable Cations (ED007/ED008) -	SOIL - EG020C Leachable Metals by ICPMS	SOIL - EG035C Leachable Mercury by FIMS	SOIL - IN-4S pH plus EC (1:5)
EM1611178-001	05-Sep-2016 08:00	DLSA BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EM1611178-002	05-Sep-2016 08:00	DLSA BLOCK 2A	✓	✓	✓	✓	✓	✓	✓
EM1611178-003	05-Sep-2016 08:00	DLSA BLOCK 2S	✓	✓	✓	✓	✓	✓	✓
EM1611178-004	05-Sep-2016 08:00	DLSA BLOCK 3A	✓	✓	✓	✓	✓	✓	✓
EM1611178-005	05-Sep-2016 08:00	DLSA BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EM1611178-006	08-Sep-2016 08:00	DLSA BLOCK 5A	✓	✓	✓	✓	✓	✓	✓
EM1611178-007	08-Sep-2016 09:00	DLSB BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EM1611178-008	08-Sep-2016 09:00	DLSB BLOCK 2A	✓	✓	✓	✓	✓	✓	✓
EM1611178-009	08-Sep-2016 09:00	DLSB BLOCK 3A	✓	✓	✓	✓	✓	✓	✓
EM1611178-010	08-Sep-2016 09:00	DLSB BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EM1611178-011	08-Sep-2016 09:00	DLSB BLOCK 5A	✓	✓	✓	✓	✓	✓	✓
EM1611178-012	08-Sep-2016 09:00	DLSB BLOCK 6A	✓	✓	✓	✓	✓	✓	✓
EM1611178-013	08-Sep-2016 09:00	DLSB BLOCK 7A	✓	✓	✓	✓	✓	✓	✓
EM1611178-014	08-Sep-2016 09:00	DLSB BLOCK 8A	✓	✓	✓	✓	✓	✓	✓
EM1611178-015	08-Sep-2016 09:00	DLSB BLOCK 9A	✓	✓	✓	✓	✓	✓	✓
EM1611178-016	08-Sep-2016 09:00	DLSB BLOCK 10A	✓	✓	✓	✓	✓	✓	✓
EM1611178-017	08-Sep-2016 09:00	DLSB BLOCK 11A	✓	✓	✓	✓	✓	✓	✓
EM1611178-018	08-Sep-2016 09:00	DLSB BLOCK 12A	✓	✓	✓	✓	✓	✓	✓
EM1611178-019	08-Sep-2016 09:00	DLSB BLOCK 13A	✓	✓	✓	✓	✓	✓	✓
EM1611178-020	08-Sep-2016 09:00	DLSB BLOCK 14A	✓	✓	✓	✓	✓	✓	✓
EM1611178-021	08-Sep-2016 09:00	DLSB BLOCK 15A	✓	✓	✓	✓	✓	✓	✓
EM1611178-022	08-Sep-2016 09:00	DLSB BLOCK 16A	✓	✓	✓	✓	✓	✓	✓
EM1611178-023	08-Sep-2016 09:00	DLSB BLOCK 17A	✓	✓	✓	✓	✓	✓	✓
EM1611178-024	08-Sep-2016 09:00	DLSB BLOCK 18A	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA031 pH (Saturated Paste)	SOIL - EA055-103 Moisture Content	SOIL - ED040T Sulfate Total	SOIL - EG020W Water Leachable Metals by ICPMS	SOIL - EG035W Water Leachable Mercury by FIMS	SOIL - S-03 15 Metals (NEPM 2013 Suite - incl. Digestion)
EM1611178-001	05-Sep-2016 08:00	DLSA BLOCK 1A	✓	✓	✓	✓	✓	✓
EM1611178-002	05-Sep-2016 08:00	DLSA BLOCK 2A	✓	✓	✓	✓	✓	✓
EM1611178-003	05-Sep-2016 08:00	DLSA BLOCK 2S	✓	✓	✓	✓	✓	✓
EM1611178-004	05-Sep-2016 08:00	DLSA BLOCK 3A	✓	✓	✓	✓	✓	✓
EM1611178-005	05-Sep-2016 08:00	DLSA BLOCK 4A	✓	✓	✓	✓	✓	✓
EM1611178-006	08-Sep-2016 08:00	DLSA BLOCK 5A	✓	✓	✓	✓	✓	✓
EM1611178-007	08-Sep-2016 09:00	DLSB BLOCK 1A	✓	✓	✓	✓	✓	✓
EM1611178-008	08-Sep-2016 09:00	DLSB BLOCK 2A	✓	✓	✓	✓	✓	✓
EM1611178-009	08-Sep-2016 09:00	DLSB BLOCK 3A	✓	✓	✓	✓	✓	✓
EM1611178-010	08-Sep-2016 09:00	DLSB BLOCK 4A	✓	✓	✓	✓	✓	✓
EM1611178-011	08-Sep-2016 09:00	DLSB BLOCK 5A	✓	✓	✓	✓	✓	✓
EM1611178-012	08-Sep-2016 09:00	DLSB BLOCK 6A	✓	✓	✓	✓	✓	✓
EM1611178-013	08-Sep-2016 09:00	DLSB BLOCK 7A	✓	✓	✓	✓	✓	✓
EM1611178-014	08-Sep-2016 09:00	DLSB BLOCK 8A	✓	✓	✓	✓	✓	✓
EM1611178-015	08-Sep-2016 09:00	DLSB BLOCK 9A	✓	✓	✓	✓	✓	✓
EM1611178-016	08-Sep-2016 09:00	DLSB BLOCK 10A	✓	✓	✓	✓	✓	✓
EM1611178-017	08-Sep-2016 09:00	DLSB BLOCK 11A	✓	✓	✓	✓	✓	✓
EM1611178-018	08-Sep-2016 09:00	DLSB BLOCK 12A	✓	✓	✓	✓	✓	✓
EM1611178-019	08-Sep-2016 09:00	DLSB BLOCK 13A	✓	✓	✓	✓	✓	✓
EM1611178-020	08-Sep-2016 09:00	DLSB BLOCK 14A	✓	✓	✓	✓	✓	✓
EM1611178-021	08-Sep-2016 09:00	DLSB BLOCK 15A	✓	✓	✓	✓	✓	✓
EM1611178-022	08-Sep-2016 09:00	DLSB BLOCK 16A	✓	✓	✓	✓	✓	✓
EM1611178-023	08-Sep-2016 09:00	DLSB BLOCK 17A	✓	✓	✓	✓	✓	✓
EM1611178-024	08-Sep-2016 09:00	DLSB BLOCK 18A	✓	✓	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / **Client Sample ID(s)**	**Container**	**Due for extraction**	**Due for analysis**	**Samples Received**		**Instructions Received**	
				Date	**Evaluation**	**Date**	**Evaluation**
EA002: pH (1:5)							
DLSA BLOCK 1A	Soil Glass Jar - Unpreserved	12-Sep-2016	12-Sep-2016	22-Sep-2016	×	----	----
DLSA BLOCK 2A	Soil Glass Jar - Unpreserved	12-Sep-2016	12-Sep-2016	22-Sep-2016	×	----	----
DLSA BLOCK 2S	Soil Glass Jar - Unpreserved	12-Sep-2016	12-Sep-2016	22-Sep-2016	×	----	----
DLSA BLOCK 3A	Soil Glass Jar - Unpreserved	12-Sep-2016	12-Sep-2016	22-Sep-2016	×	----	----
DLSA BLOCK 4A	Soil Glass Jar - Unpreserved	12-Sep-2016	12-Sep-2016	22-Sep-2016	×	----	----
DLSA BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 10A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 11A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 12A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 13A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 14A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----
DLSB BLOCK 15A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	×	----	----

DLSB BLOCK 16A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 17A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 18A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 1A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 2A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 3A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 4A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 6A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 7A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 8A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 9A	Soil Glass Jar - Unpreserved	15-Sep-2016	15-Sep-2016	22-Sep-2016	✘	----	----
EA010: Electrical Conductivity (1:5)							
DLSA BLOCK 1A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2S	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 3A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 4A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 10A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 11A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 12A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 13A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 14A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 15A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 16A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 17A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 18A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 1A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 2A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 3A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 4A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 6A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 7A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 8A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 9A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
EA055-103: Moisture Content							
DLSA BLOCK 1A	Soil Glass Jar - Unpreserved	----	19-Sep-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2A	Soil Glass Jar - Unpreserved	----	19-Sep-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2S	Soil Glass Jar - Unpreserved	----	19-Sep-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 3A	Soil Glass Jar - Unpreserved	----	19-Sep-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 4A	Soil Glass Jar - Unpreserved	----	19-Sep-2016	22-Sep-2016	✘	----	----
ED040T: Sulfate as SO4 2- Total							
DLSA BLOCK 1A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 2S	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 3A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 4A	Soil Glass Jar - Unpreserved	12-Sep-2016	10-Oct-2016	22-Sep-2016	✘	----	----
DLSA BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 10A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 11A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 12A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 13A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 14A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 15A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 16A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 17A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 18A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 1A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 2A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 3A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 4A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 5A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 6A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 7A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----

DLSB BLOCK 8A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----
DLSB BLOCK 9A	Soil Glass Jar - Unpreserved	15-Sep-2016	13-Oct-2016	22-Sep-2016	✘	----	----

Requested Deliverables

ACCOUNTS ADDRESS

- A4 - AU Tax Invoice (INV)	Email	accounts.aus@mwhglobal.com

MATT BRAIMBRIDGE

- *AU Certificate of Analysis - NATA (COA)	Email	Matt.F.Braimbridge@mwhglobal.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Matt.F.Braimbridge@mwhglobal.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Matt.F.Braimbridge@mwhglobal.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Matt.F.Braimbridge@mwhglobal.com
- Chain of Custody (CoC) (COC)	Email	Matt.F.Braimbridge@mwhglobal.com
- EDI Format - ENMRG (ENMRG)	Email	Matt.F.Braimbridge@mwhglobal.com
- EDI Format - ESDAT (ESDAT)	Email	Matt.F.Braimbridge@mwhglobal.com
- EDI Format - XTab (XTAB)	Email	Matt.F.Braimbridge@mwhglobal.com

TRACEY HASSELL

- *AU Certificate of Analysis - NATA (COA)	Email	Tracey.Hassell@mwhglobal.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Tracey.Hassell@mwhglobal.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Tracey.Hassell@mwhglobal.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Tracey.Hassell@mwhglobal.com
- Chain of Custody (CoC) (COC)	Email	Tracey.Hassell@mwhglobal.com
- EDI Format - ENMRG (ENMRG)	Email	Tracey.Hassell@mwhglobal.com
- EDI Format - ESDAT (ESDAT)	Email	Tracey.Hassell@mwhglobal.com
- EDI Format - XTab (XTAB)	Email	Tracey.Hassell@mwhglobal.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1611178**	Page	: 1 of 22
Client	: **MWH AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MATT BRAIMBRIDGE	Contact	: Luke Jones
Address	: 41 BISHOP ST JOLIMONT PERTH, WESTERN AUSTRALIA 6014	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 08 9388 8799	Telephone	: 08 9209 7631
Project	: LCRK-SS-16001	Date Samples Received	: 22-Sep-2016 13:20
Order number	: MWH3142	Date Analysis Commenced	: 23-Sep-2016
C-O-C number	: ----	Issue Date	: 04-Oct-2016 16:33
Sampler	: TRACEY HASSELL		
Site	: ----		
Quote number	: ----		
No. of samples received	: 24		
No. of samples analysed	: 24		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA031 (Saturated Paste pH): NATA accreditation does not cover the performance of this service.
- EA032 (Saturated Paste EC): NATA accreditation does not cover the performance of this service.
- EG005T: EM1611178 #1 Manganese result has been confirmed by re-digestion and re-analysis.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)			Client sample ID	DLSA BLOCK 1A	DLSA BLOCK 2A	DLSA BLOCK 2S	DLSA BLOCK 3A	DLSA BLOCK 4A
			Client sampling date / time	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00
Compound	CAS Number	LOR	Unit	EM1611178-001	EM1611178-002	EM1611178-003	EM1611178-004	EM1611178-005
				Result	Result	Result	Result	Result
EG020C: Leachable Metals by ICPMS								
Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	**0.008**	<0.005	<0.005
Boron	7440-42-8	0.1	mg/L	**0.3**	**0.3**	**0.4**	**0.2**	**0.2**
Barium	7440-39-3	0.1	mg/L	**0.1**	<0.1	<0.1	<0.1	<0.1
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.001	mg/L	**0.001**	**0.001**	**0.003**	<0.001	<0.001
Cobalt	7440-48-4	0.01	mg/L	**0.02**	**0.02**	**0.28**	<0.01	<0.01
Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	<0.01
Manganese	7439-96-5	0.01	mg/L	**1.62**	**1.36**	**0.96**	**0.64**	**0.55**
Nickel	7440-02-0	0.01	mg/L	**0.04**	**0.02**	**0.32**	**0.02**	**0.02**
Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	7782-49-2	0.01	mg/L	**0.02**	**0.02**	**0.17**	**0.01**	**0.01**
Zinc	7440-66-6	0.1	mg/L	<0.1	**0.2**	**1.3**	<0.1	<0.1
Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)			Client sample ID	DLSA BLOCK 5A	DLSB BLOCK 1A	DLSB BLOCK 2A	DLSB BLOCK 3A	DLSB BLOCK 4A
			Client sampling date / time	08-Sep-2016 08:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-006	EM1611178-007	EM1611178-008	EM1611178-009	EM1611178-010
				Result	Result	Result	Result	Result
EG020C: Leachable Metals by ICPMS								
Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.1	mg/L	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**
Barium	7440-39-3	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.01	mg/L	<0.01	**0.01**	<0.01	**0.02**	**0.01**
Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	7439-96-5	0.01	mg/L	**0.61**	**4.86**	**2.54**	**5.82**	**4.45**
Nickel	7440-02-0	0.01	mg/L	<0.01	**0.01**	**0.01**	**0.02**	**0.01**
Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	7782-49-2	0.01	mg/L	**0.03**	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	<0.1	**0.1**	<0.1
Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 5A	DLSB BLOCK 6A	DLSB BLOCK 7A	DLSB BLOCK 8A	DLSB BLOCK 9A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-011	EM1611178-012	EM1611178-013	EM1611178-014	EM1611178-015
				Result	Result	Result	Result	Result
EG020C: Leachable Metals by ICPMS								
Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.1	mg/L	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Barium	7440-39-3	0.1	mg/L	**0.1**	<0.1	<0.1	<0.1	<0.1
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	<0.01
Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	7439-96-5	0.01	mg/L	**3.28**	**3.78**	**4.42**	**2.02**	**0.60**
Nickel	7440-02-0	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	<0.01
Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 10A	DLSB BLOCK 11A	DLSB BLOCK 12A	DLSB BLOCK 13A	DLSB BLOCK 14A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-016	EM1611178-017	EM1611178-018	EM1611178-019	EM1611178-020
				Result	Result	Result	Result	Result
EG020C: Leachable Metals by ICPMS								
Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.1	mg/L	**0.2**	**0.3**	**0.1**	**0.1**	**0.2**
Barium	7440-39-3	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.01	mg/L	**0.03**	<0.01	<0.01	<0.01	<0.01
Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	7439-96-5	0.01	mg/L	**2.13**	**1.69**	**0.50**	**0.39**	**1.85**
Nickel	7440-02-0	0.01	mg/L	**0.05**	**0.01**	<0.01	<0.01	**0.01**
Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	7782-49-2	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.1	mg/L	**0.3**	<0.1	<0.1	<0.1	<0.1
Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 15A	DLSB BLOCK 16A	DLSB BLOCK 17A	DLSB BLOCK 18A	----
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	----
Compound	CAS Number	LOR	Unit	EM1611178-021	EM1611178-022	EM1611178-023	EM1611178-024	--------
				Result	Result	Result	Result	----
EG020C: Leachable Metals by ICPMS								
Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Boron	7440-42-8	0.1	mg/L	**0.1**	**0.2**	**0.2**	**0.2**	----
Barium	7440-39-3	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.01	mg/L	<0.01	**0.02**	<0.01	**0.01**	----
Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Manganese	7439-96-5	0.01	mg/L	**1.76**	**3.33**	**2.00**	**2.21**	----
Nickel	7440-02-0	0.01	mg/L	<0.01	**0.03**	**0.01**	**0.02**	----
Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.1	mg/L	<0.1	**0.2**	<0.1	<0.1	----
Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----

Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)			Client sample ID	DLSA BLOCK 1A	DLSA BLOCK 2A	DLSA BLOCK 2S	DLSA BLOCK 3A	DLSA BLOCK 4A
			Client sampling date / time	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00
Compound	CAS Number	LOR	Unit	EM1611178-001	EM1611178-002	EM1611178-003	EM1611178-004	EM1611178-005
				Result	Result	Result	Result	Result
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	**0.005**	<0.001	<0.001
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.035**	**0.022**	**0.021**	**0.015**	**0.013**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	**0.0031**	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	**0.003**	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	**0.216**	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	**0.001**	**0.001**	**0.008**	**0.001**	**0.001**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	**0.001**	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.028**	**0.121**	**0.896**	**0.016**	**0.014**
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.001**	**0.203**	<0.001	**0.002**
Selenium	7782-49-2	0.01	mg/L	**0.02**	**0.01**	**0.16**	**0.01**	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	**0.02**	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	**0.873**	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L	**0.21**	**0.20**	**0.40**	**0.17**	**0.17**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)			Client sample ID	DLSA BLOCK 5A	DLSB BLOCK 1A	DLSB BLOCK 2A	DLSB BLOCK 3A	DLSB BLOCK 4A
			Client sampling date / time	08-Sep-2016 08:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-006	EM1611178-007	EM1611178-008	EM1611178-009	EM1611178-010
				Result	Result	Result	Result	Result
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.015**	**0.021**	**0.016**	**0.023**	**0.028**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	**0.001**	**0.001**
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.016**	**0.710**	**0.146**	**0.721**	**0.710**
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.002**	**0.002**	**0.003**	**0.002**
Selenium	7782-49-2	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L	**0.24**	**0.18**	**0.14**	**0.11**	**0.14**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 5A	DLSB BLOCK 6A	DLSB BLOCK 7A	DLSB BLOCK 8A	DLSB BLOCK 9A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-011	EM1611178-012	EM1611178-013	EM1611178-014	EM1611178-015
				Result	Result	Result	Result	Result
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.025**	**0.025**	**0.027**	**0.018**	**0.012**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	**0.001**	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.408**	**0.396**	**0.440**	**0.162**	**0.003**
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.001**	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L	**0.15**	**0.17**	**0.15**	**0.16**	**0.16**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 10A	DLSB BLOCK 11A	DLSB BLOCK 12A	DLSB BLOCK 13A	DLSB BLOCK 14A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-016	EM1611178-017	EM1611178-018	EM1611178-019	EM1611178-020
				Result	Result	Result	Result	Result
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.030**	**0.020**	**0.018**	**0.012**	**0.018**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	**0.002**	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	**0.002**	**0.003**	<0.001	<0.001	**0.002**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.167**	**0.042**	**0.017**	**0.004**	**0.070**
Nickel	7440-02-0	0.001	mg/L	**0.005**	**0.002**	<0.001	<0.001	**0.001**
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	**0.006**	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L	**0.17**	**0.19**	**0.13**	**0.08**	**0.13**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)			Client sample ID	DLSB BLOCK 15A	DLSB BLOCK 16A	DLSB BLOCK 17A	DLSB BLOCK 18A	----
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	----
Compound	CAS Number	LOR	Unit	EM1611178-021	EM1611178-022	EM1611178-023	EM1611178-024	--------
				Result	Result	Result	Result	----
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Barium	7440-39-3	0.001	mg/L	**0.020**	**0.020**	**0.015**	**0.023**	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	**0.0001**	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.004**	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	**0.001**	**0.001**	**0.001**	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.123**	**1.07**	**0.069**	**0.028**	----
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.005**	**0.002**	**0.001**	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.016**	<0.005	<0.005	----
Boron	7440-42-8	0.05	mg/L	**0.12**	**0.14**	**0.11**	**0.14**	----
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 1A	DLSA BLOCK 2A	DLSA BLOCK 2S	DLSA BLOCK 3A	DLSA BLOCK 4A
			Client sampling date / time	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00
Compound	CAS Number	LOR	Unit	EM1611178-001	EM1611178-002	EM1611178-003	EM1611178-004	EM1611178-005
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.9	7.6	5.0	7.6	7.7
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	7.5	3.0	7.9	2.7	-35.3
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	10300	21200	22800	9730	7660
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	17.0	4.7	1.6	6.2	57.6
ANC as CaCO3	----	0.1	% CaCO3	1.7	0.5	0.2	0.6	5.9
Fizz Rating	----	0	Fizz Unit	1	0	0	0	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.008	0.008	0.032	<0.005	0.005
EA031: pH (saturated paste)								
pH (Saturated Paste)	----	0.1	pH Unit	7.5	6.9	4.2	7.2	7.4
EA032: Electrical Conductivity (saturated paste)								
Electrical Conductivity (Saturated Paste)	----	1	µS/cm	23700	22600	30200	25500	17100
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	9.0	12.3	9.7	8.3	7.8
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	44.0	8.6	7.4	22.1	54.6
Exchangeable Magnesium	----	0.1	meq/100g	3.6	2.4	4.5	2.1	1.7
Exchangeable Potassium	----	0.1	meq/100g	0.2	<0.1	0.1	<0.1	0.1
Exchangeable Sodium	----	0.1	meq/100g	2.6	1.8	0.7	1.7	1.8
Cation Exchange Capacity	----	0.1	meq/100g	50.8	13.2	13.1	26.2	58.6
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	23800	3950	6800	32300	29300
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.80	0.25	0.31	0.29	0.73
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	6	<5	<5	<5
Barium	7440-39-3	10	mg/kg	310	170	60	220	110
Beryllium	7440-41-7	1	mg/kg	2	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 1A	DLSA BLOCK 2A	DLSA BLOCK 2S	DLSA BLOCK 3A	DLSA BLOCK 4A
			Client sampling date / time	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00	05-Sep-2016 08:00
Compound	CAS Number	LOR	Unit	EM1611178-001	EM1611178-002	EM1611178-003	EM1611178-004	EM1611178-005
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	29	26	22	27	21
Cobalt	7440-48-4	2	mg/kg	16	14	20	10	9
Copper	7440-50-8	5	mg/kg	42	34	53	33	30
Lead	7439-92-1	5	mg/kg	18	19	22	18	16
Manganese	7439-96-5	5	mg/kg	468	793	80	315	359
Nickel	7440-02-0	2	mg/kg	22	20	38	15	12
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	51	43	34	33	34
Zinc	7440-66-6	5	mg/kg	88	83	119	61	41
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EN60: ASLP Leaching Procedure								
Initial pH	----	0.1	pH Unit	8.7	7.3	5.1	7.9	8.2
After HCl pH	----	0.1	pH Unit	1.4	1.3	1.4	1.4	1.4
Extraction Fluid pH	----	0.1	pH Unit	5.0	5.0	5.0	5.0	5.0
Final pH	----	0.1	pH Unit	5.2	5.0	5.0	5.1	5.7
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	7.9	8.5	5.2	7.9	7.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 5A	DLSB BLOCK 1A	DLSB BLOCK 2A	DLSB BLOCK 3A	DLSB BLOCK 4A
			Client sampling date / time	08-Sep-2016 08:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-006	EM1611178-007	EM1611178-008	EM1611178-009	EM1611178-010
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.5	7.8	7.9	7.8	7.9
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-36.0	-19.2	-11.0	-3.6	-73.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	7080	4180	3960	3760	5180
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	55.0	47.4	25.1	19.5	93.0
ANC as CaCO3	----	0.1	% CaCO3	5.6	4.8	2.6	2.0	9.5
Fizz Rating	----	0	Fizz Unit	2	2	1	1	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.006	0.007	0.010	0.034	0.011
EA031: pH (saturated paste)								
pH (Saturated Paste)	----	0.1	pH Unit	7.4	7.3	7.4	7.2	7.4
EA032: Electrical Conductivity (saturated paste)								
Electrical Conductivity (Saturated Paste)	----	1	µS/cm	13800	5450	7380	6310	4880
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	8.8	6.4	11.1	9.9	9.5
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	50.3	40.0	43.6	32.3	39.1
Exchangeable Magnesium	----	0.1	meq/100g	6.2	4.0	4.0	3.7	3.2
Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.2	0.2	0.2
Exchangeable Sodium	----	0.1	meq/100g	1.9	1.8	0.9	0.8	0.7
Cation Exchange Capacity	----	0.1	meq/100g	58.8	46.2	48.9	37.2	43.5
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	16700	14800	9770	17700	15400
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.62	0.92	0.46	0.52	0.65
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	7	7	9	10
Barium	7440-39-3	10	mg/kg	110	200	210	240	240
Beryllium	7440-41-7	1	mg/kg	2	<1	1	1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 5A	DLSB BLOCK 1A	DLSB BLOCK 2A	DLSB BLOCK 3A	DLSB BLOCK 4A
			Client sampling date / time	08-Sep-2016 08:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-006	EM1611178-007	EM1611178-008	EM1611178-009	EM1611178-010
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	27	27	25	32	26
Cobalt	7440-48-4	2	mg/kg	8	14	15	18	20
Copper	7440-50-8	5	mg/kg	30	43	42	42	46
Lead	7439-92-1	5	mg/kg	13	18	16	18	16
Manganese	7439-96-5	5	mg/kg	338	720	1070	1080	1910
Nickel	7440-02-0	2	mg/kg	18	27	28	33	39
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	56	46	51	62	61
Zinc	7440-66-6	5	mg/kg	44	85	88	123	89
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
EN60: ASLP Leaching Procedure								
Initial pH	----	0.1	pH Unit	8.7	8.7	8.8	9.2	8.7
After HCl pH	----	0.1	pH Unit	1.3	1.4	1.4	1.4	1.4
Extraction Fluid pH	----	0.1	pH Unit	5.0	5.0	5.0	5.0	5.0
Final pH	----	0.1	pH Unit	6.0	5.9	5.8	5.3	6.3
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	7.7	7.9	7.9	7.9	8.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 5A	DLSB BLOCK 6A	DLSB BLOCK 7A	DLSB BLOCK 8A	DLSB BLOCK 9A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-011	EM1611178-012	EM1611178-013	EM1611178-014	EM1611178-015
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	7.9	7.9	7.9	7.9
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-26.0	-9.8	-16.6	-19.7	-20.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	4630	6260	5180	4270	3500
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	41.6	22.4	33.1	41.4	44.6
ANC as CaCO3	----	0.1	% CaCO3	4.2	2.3	3.4	4.2	4.6
Fizz Rating	----	0	Fizz Unit	2	1	2	2	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.010	0.013	0.018	0.010	0.008
EA031: pH (saturated paste)								
pH (Saturated Paste)	----	0.1	pH Unit	7.4	7.4	7.4	7.4	7.5
EA032: Electrical Conductivity (saturated paste)								
Electrical Conductivity (Saturated Paste)	----	1	µS/cm	10000	9240	8780	620	2810
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	9.0	14.2	12.0	7.9	13.0
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	37.6	41.4	29.6	38.7	60.5
Exchangeable Magnesium	----	0.1	meq/100g	3.7	5.0	4.5	3.8	5.4
Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.2	0.2	0.2
Exchangeable Sodium	----	0.1	meq/100g	1.0	1.3	1.2	1.1	1.1
Cation Exchange Capacity	----	0.1	meq/100g	42.8	48.2	35.8	43.9	67.4
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	10400	12000	9770	12600	19400
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.51	0.41	0.54	0.71	0.78
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	12	9	7	8
Barium	7440-39-3	10	mg/kg	400	210	190	490	200
Beryllium	7440-41-7	1	mg/kg	1	2	1	1	1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 5A	DLSB BLOCK 6A	DLSB BLOCK 7A	DLSB BLOCK 8A	DLSB BLOCK 9A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-011	EM1611178-012	EM1611178-013	EM1611178-014	EM1611178-015
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	29	30	31	30	32
Cobalt	7440-48-4	2	mg/kg	14	22	15	15	17
Copper	7440-50-8	5	mg/kg	36	42	41	36	36
Lead	7439-92-1	5	mg/kg	15	23	17	17	18
Manganese	7439-96-5	5	mg/kg	619	1380	764	817	1180
Nickel	7440-02-0	2	mg/kg	27	38	32	28	29
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	53	117	65	51	64
Zinc	7440-66-6	5	mg/kg	101	127	93	90	86
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	<0.1	<0.1	0.1
EN60: ASLP Leaching Procedure								
Initial pH	----	0.1	pH Unit	8.8	8.8	8.8	8.6	9.0
After HCl pH	----	0.1	pH Unit	1.4	1.4	1.4	1.3	1.4
Extraction Fluid pH	----	0.1	pH Unit	5.0	5.0	5.0	5.0	5.0
Final pH	----	0.1	pH Unit	6.3	6.0	5.8	6.1	6.1
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	8.0	8.1	8.0	8.0	8.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 10A	DLSB BLOCK 11A	DLSB BLOCK 12A	DLSB BLOCK 13A	DLSB BLOCK 14A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-016	EM1611178-017	EM1611178-018	EM1611178-019	EM1611178-020
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.9	7.8	7.8	7.8	7.6
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	4.7	<0.5	-16.0	-16.4	-13.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	10800	10100	2400	2480	4890
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	10.0	19.3	43.2	55.0	37.7
ANC as CaCO3	----	0.1	% CaCO3	1.0	2.0	4.4	5.6	3.8
Fizz Rating	----	0	Fizz Unit	1	1	2	2	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.011	0.008	0.009	0.008	0.009
EA031: pH (saturated paste)								
pH (Saturated Paste)	----	0.1	pH Unit	6.6	7.2	7.4	7.5	7.0
EA032: Electrical Conductivity (saturated paste)								
Electrical Conductivity (Saturated Paste)	----	1	µS/cm	16000	19600	2520	1470	10700
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	9.0	8.3	8.0	9.7	9.0
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	16.7	39.0	68.3	79.8	51.4
Exchangeable Magnesium	----	0.1	meq/100g	2.3	4.0	3.8	3.9	5.4
Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.2	0.2	0.2
Exchangeable Sodium	----	0.1	meq/100g	0.5	1.0	0.2	0.1	0.6
Cation Exchange Capacity	----	0.1	meq/100g	19.8	44.3	72.7	84.3	57.8
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	13300	23400	12400	14100	16400
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.48	0.64	0.89	1.26	0.80
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	8	10	8	7
Barium	7440-39-3	10	mg/kg	380	200	230	190	180
Beryllium	7440-41-7	1	mg/kg	<1	1	2	1	1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 10A	DLSB BLOCK 11A	DLSB BLOCK 12A	DLSB BLOCK 13A	DLSB BLOCK 14A
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00
Compound	CAS Number	LOR	Unit	EM1611178-016	EM1611178-017	EM1611178-018	EM1611178-019	EM1611178-020
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	29	30	38	29	32
Cobalt	7440-48-4	2	mg/kg	16	17	13	11	11
Copper	7440-50-8	5	mg/kg	45	40	39	38	37
Lead	7439-92-1	5	mg/kg	22	20	19	18	23
Manganese	7439-96-5	5	mg/kg	481	1180	881	734	762
Nickel	7440-02-0	2	mg/kg	36	30	25	20	20
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	40	59	71	50	48
Zinc	7440-66-6	5	mg/kg	112	108	79	58	58
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.2	0.2	0.1
EN60: ASLP Leaching Procedure								
Initial pH	----	0.1	pH Unit	7.3	8.4	8.4	8.4	8.1
After HCl pH	----	0.1	pH Unit	1.4	1.3	1.3	1.4	1.4
Extraction Fluid pH	----	0.1	pH Unit	5.0	5.0	5.0	5.0	5.0
Final pH	----	0.1	pH Unit	5.0	5.5	6.2	6.3	5.6
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	7.6	7.8	7.8	7.9	7.7

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 15A	DLSB BLOCK 16A	DLSB BLOCK 17A	DLSB BLOCK 18A	----
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	----
Compound	CAS Number	LOR	Unit	EM1611178-021	EM1611178-022	EM1611178-023	EM1611178-024	--------
				Result	Result	Result	Result	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.6	6.7	7.2	7.7	----
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-23.0	10.1	1.6	-43.0	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	5270	10200	8370	6740	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	43.5	9.5	22.3	56.2	----
ANC as CaCO3	----	0.1	% CaCO3	4.4	1.0	2.3	5.7	----
Fizz Rating	----	0	Fizz Unit	2	1	1	2	----
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.009	0.028	0.020	0.013	----
EA031: pH (saturated paste)								
pH (Saturated Paste)	----	0.1	pH Unit	6.8	5.8	6.9	7.0	----
EA032: Electrical Conductivity (saturated paste)								
Electrical Conductivity (Saturated Paste)	----	1	µS/cm	11700	16800	18400	21100	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	9.0	12.3	10.2	10.5	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	33.8	18.2	25.5	30.8	----
Exchangeable Magnesium	----	0.1	meq/100g	2.7	3.8	4.9	3.4	----
Exchangeable Potassium	----	0.1	meq/100g	0.1	0.2	0.2	0.2	----
Exchangeable Sodium	----	0.1	meq/100g	0.4	0.9	1.0	0.5	----
Cation Exchange Capacity	----	0.1	meq/100g	37.3	23.2	31.8	35.1	----
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	18900	12700	13400	9680	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.67	0.64	0.78	0.43	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	8	8	8	----
Barium	7440-39-3	10	mg/kg	190	260	300	220	----
Beryllium	7440-41-7	1	mg/kg	1	1	1	1	----
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSB BLOCK 15A	DLSB BLOCK 16A	DLSB BLOCK 17A	DLSB BLOCK 18A	----
			Client sampling date / time	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	08-Sep-2016 09:00	----
Compound	CAS Number	LOR	Unit	EM1611178-021	EM1611178-022	EM1611178-023	EM1611178-024	--------
				Result	Result	Result	Result	----
EG005T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	30	31	34	30	----
Cobalt	7440-48-4	2	mg/kg	14	11	17	16	----
Copper	7440-50-8	5	mg/kg	41	40	41	45	----
Lead	7439-92-1	5	mg/kg	18	19	23	19	----
Manganese	7439-96-5	5	mg/kg	848	514	1470	1030	----
Nickel	7440-02-0	2	mg/kg	27	25	32	32	----
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Vanadium	7440-62-2	5	mg/kg	48	43	78	47	----
Zinc	7440-66-6	5	mg/kg	94	86	108	92	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.1	0.1	----
EN60: ASLP Leaching Procedure								
Initial pH	----	0.1	pH Unit	7.9	6.6	7.7	7.5	----
After HCl pH	----	0.1	pH Unit	1.4	1.4	1.4	1.4	----
Extraction Fluid pH	----	0.1	pH Unit	5.0	5.0	5.0	5.0	----
Final pH	----	0.1	pH Unit	5.6	5.1	5.3	5.4	----
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	7.6	6.8	7.8	8.0	----

QUALITY CONTROL REPORT

Work Order	: **EM1611178**	Page	: 1 of 15
Client	: **MWH AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MATT BRAIMBRIDGE	Contact	: Luke Jones
Address	: 41 BISHOP ST JOLIMONT PERTH, WESTERN AUSTRALIA 6014	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 08 9388 8799	Telephone	: 08 9209 7631
Project	: LCRK-SS-16001	Date Samples Received	: 22-Sep-2016
Order number	: MWH3142	Date Analysis Commenced	: 23-Sep-2016
C-O-C number	: ----	Issue Date	: 04-Oct-2016
Sampler	: TRACEY HASSELL		
Site	: ----		
Quote number	: ----		
No. of samples received	: 24		
No. of samples analysed	: 24		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002 : pH (Soils) (QC Lot: 594673)									
EM1611178-011	DLSB BLOCK 5A	EA002: pH Value	----	0.1	pH Unit	8.0	7.9	1.26	0% - 20%
EM1611178-001	DLSA BLOCK 1A	EA002: pH Value	----	0.1	pH Unit	7.9	7.9	0.00	0% - 20%
EA002 : pH (Soils) (QC Lot: 594676)									
EM1611178-021	DLSB BLOCK 15A	EA002: pH Value	----	0.1	pH Unit	7.6	7.5	1.32	0% - 20%
EA010: Conductivity (QC Lot: 594674)									
EM1611178-011	DLSB BLOCK 5A	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	4630	4940	6.48	0% - 20%
EM1611178-001	DLSA BLOCK 1A	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	10300	10400	0.581	0% - 20%
EA010: Conductivity (QC Lot: 594675)									
EM1611178-021	DLSB BLOCK 15A	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	5270	5750	8.71	0% - 20%
EA013: Acid Neutralising Capacity (QC Lot: 601217)									
EM1611178-001	DLSA BLOCK 1A	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	17.0	16.3	4.42	0% - 20%
EM1611178-012	DLSB BLOCK 6A	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	22.4	22.8	1.74	0% - 20%
EA013: Acid Neutralising Capacity (QC Lot: 601220)									
EM1611178-021	DLSB BLOCK 15A	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	43.5	42.3	2.75	0% - 20%
EA026 : Chromium Reducible Sulfur (QC Lot: 601218)									
EM1611178-001	DLSA BLOCK 1A	EA026: Chromium Reducible Sulphur	----	0.005	%	0.008	0.007	0.00	No Limit
EM1611178-012	DLSB BLOCK 6A	EA026: Chromium Reducible Sulphur	----	0.005	%	0.013	0.012	0.00	No Limit
EA026 : Chromium Reducible Sulfur (QC Lot: 601219)									
EM1611178-021	DLSB BLOCK 15A	EA026: Chromium Reducible Sulphur	----	0.005	%	0.009	0.009	0.00	No Limit
EA031: pH (saturated paste) (QC Lot: 594912)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA031: pH (saturated paste) (QC Lot: 594912) - continued									
EM1611178-001	DLSA BLOCK 1A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	7.5	7.4	1.34	0% - 20%
EM1611178-010	DLSB BLOCK 4A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	7.4	7.5	1.34	0% - 20%
EA031: pH (saturated paste) (QC Lot: 594913)									
EM1611178-021	DLSB BLOCK 15A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	6.8	6.9	1.46	0% - 20%
EA032: Electrical Conductivity (saturated paste) (QC Lot: 594753)									
EM1611178-001	DLSA BLOCK 1A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	23700	23600	0.296	0% - 20%
EM1611178-010	DLSB BLOCK 4A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	4880	4920	0.816	0% - 20%
EA032: Electrical Conductivity (saturated paste) (QC Lot: 594754)									
EM1611178-021	DLSB BLOCK 15A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	11700	11000	6.44	0% - 20%
EA055: Moisture Content (QC Lot: 594949)									
EM1611178-001	DLSA BLOCK 1A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	9.0	9.2	1.76	No Limit
EM1611178-011	DLSB BLOCK 5A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	9.0	7.9	11.9	No Limit
EA055: Moisture Content (QC Lot: 594950)									
EM1611178-021	DLSB BLOCK 15A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	9.0	9.6	6.77	No Limit
EM1611226-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	5.5	4.9	10.9	No Limit
ED008: Exchangeable Cations (QC Lot: 595005)									
EM1611178-001	DLSA BLOCK 1A	ED008: Exchangeable Calcium	----	0.1	meq/100g	44.0	43.8	0.329	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.6	3.6	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	2.6	2.6	0.00	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	50.8	50.4	0.644	0% - 20%
EM1611178-010	DLSB BLOCK 4A	ED008: Exchangeable Calcium	----	0.1	meq/100g	39.1	39.5	1.06	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.2	3.3	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.7	0.7	0.00	No Limit
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	43.5	43.9	0.946	0% - 20%
ED008: Exchangeable Cations (QC Lot: 595008)									
EM1611178-021	DLSB BLOCK 15A	ED008: Exchangeable Calcium	----	0.1	meq/100g	33.8	34.0	0.436	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	2.7	2.8	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.4	0.00	No Limit
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	37.3	37.4	0.272	0% - 20%
ED040T : Total Sulfate by ICPAES (QC Lot: 594677)									
EM1611178-001	DLSA BLOCK 1A	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	23800	24600	3.33	0% - 20%
EM1611178-010	DLSB BLOCK 4A	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	15400	15400	0.273	0% - 20%
ED040T : Total Sulfate by ICPAES (QC Lot: 594678)									
EM1611178-021	DLSB BLOCK 15A	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	18900	16700	12.1	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 599840)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED042T: Total Sulfur by LECO (QC Lot: 599840) - continued									
EM1611178-001	DLSA BLOCK 1A	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.80	0.80	0.00	0% - 20%
EM1611178-010	DLSB BLOCK 4A	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.65	0.66	0.00	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 599841)									
EM1611178-021	DLSB BLOCK 15A	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.67	0.65	1.98	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 599390)									
EM1611178-006	DLSA BLOCK 5A	EG005T: Beryllium	7440-41-7	1	mg/kg	2	2	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	110	140	26.1	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	27	32	16.8	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	10	24.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	18	21	18.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	6	22.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	47	46.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	18	33.2	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	338	374	10.1	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	56	64	14.4	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	44	63	35.4	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1611178-015	DLSB BLOCK 9A	EG005T: Beryllium	7440-41-7	1	mg/kg	1	1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	200	200	0.00	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	32	29	7.59	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	17	16	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	29	32	10.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	36	38	5.90	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	18	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	1180	1240	4.90	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	64	63	0.00	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	86	98	12.2	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 599608)									
EM1611178-001	DLSA BLOCK 1A	EG005T: Manganese	7439-96-5	5	mg/kg	468	458	2.09	0% - 20%
EM1611386-002	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	30	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	9	9	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 599608) - continued									
EM1611386-002	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	6	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	93	111	17.9	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	30	30	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	14	13	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1611178-001	DLSA BLOCK 1A	EG005T: Beryllium	7440-41-7	1	mg/kg	2	2	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	310	270	14.0	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	29	30	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	16	20	19.8	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	22	27	18.3	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	42	49	13.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	22	18.8	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	51	47	8.42	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	88	105	17.9	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 599389)									
EM1611178-006	DLSA BLOCK 5A	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.00	No Limit
EM1611178-015	DLSB BLOCK 9A	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 599609)									
EM1611178-001	DLSA BLOCK 1A	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.3	95.8	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020C: Leachable Metals by ICPMS (QC Lot: 596840)									
EM1611178-001	DLSA BLOCK 1A	EG020D-C: Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
EM1611178-011	DLSB BLOCK 5A	EG020D-C: Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
EG020C: Leachable Metals by ICPMS (QC Lot: 596841)									
EM1611178-001	DLSA BLOCK 1A	EG020A-C: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-C: Cadmium	7440-43-9	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-C: Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-C: Cobalt	7440-48-4	0.01	mg/L	0.02	0.02	0.00	No Limit
		EG020A-C: Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Copper	7440-50-8	0.01	mg/L	<0.01	0.02	68.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG020C: Leachable Metals by ICPMS (QC Lot: 596841) - continued									
EM1611178-001	DLSA BLOCK 1A	EG020A-C: Manganese	7439-96-5	0.01	mg/L	1.62	1.54	5.26	0% - 20%
		EG020A-C: Nickel	7440-02-0	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-C: Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.00	No Limit
		EG020A-C: Boron	7440-42-8	0.1	mg/L	0.3	0.3	0.00	No Limit
		EG020A-C: Barium	7440-39-3	0.1	mg/L	0.1	0.1	0.00	No Limit
		EG020A-C: Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EM1611178-011	DLSB BLOCK 5A	EG020A-C: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-C: Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-C: Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-C: Cobalt	7440-48-4	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Manganese	7439-96-5	0.01	mg/L	3.28	3.23	1.67	0% - 20%
		EG020A-C: Nickel	7440-02-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Boron	7440-42-8	0.1	mg/L	0.2	0.2	0.00	No Limit
		EG020A-C: Barium	7440-39-3	0.1	mg/L	0.1	0.1	0.00	No Limit
		EG020A-C: Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EG020C: Leachable Metals by ICPMS (QC Lot: 596842)									
EM1611178-021	DLSB BLOCK 15A	EG020A-C: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-C: Cadmium	7440-43-9	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-C: Arsenic	7440-38-2	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-C: Cobalt	7440-48-4	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Chromium	7440-47-3	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Copper	7440-50-8	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Manganese	7439-96-5	0.01	mg/L	1.76	1.76	0.00	0% - 20%
		EG020A-C: Nickel	7440-02-0	0.01	mg/L	<0.01	0.01	0.00	No Limit
		EG020A-C: Lead	7439-92-1	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-C: Boron	7440-42-8	0.1	mg/L	0.1	0.2	0.00	No Limit
		EG020A-C: Barium	7440-39-3	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG020A-C: Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EG020C: Leachable Metals by ICPMS (QC Lot: 596843)									
EM1611178-021	DLSB BLOCK 15A	EG020D-C: Ytterbium	7440-64-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 599005)									
EM1611178-001	DLSA BLOCK 1A	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 599005) - continued									
EM1611178-001	DLSA BLOCK 1A	EG020A-W: Barium	7440-39-3	0.001	mg/L	0.035	0.037	4.34	0% - 20%
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Manganese	7439-96-5	0.001	mg/L	0.028	0.026	5.15	0% - 20%
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-W: Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.00	No Limit
		EG020A-W: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-W: Boron	7440-42-8	0.05	mg/L	0.21	0.23	8.78	No Limit
EM1611178-010	DLSB BLOCK 4A	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Barium	7440-39-3	0.001	mg/L	0.028	0.026	5.61	0% - 20%
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Manganese	7439-96-5	0.001	mg/L	0.710	0.687	3.23	0% - 20%
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-W: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-W: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-W: Boron	7440-42-8	0.05	mg/L	0.14	0.14	0.00	No Limit
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 599006)									
EM1611178-021	DLSB BLOCK 15A	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Barium	7440-39-3	0.001	mg/L	0.020	0.019	0.00	0% - 50%
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-W: Manganese	7439-96-5	0.001	mg/L	0.123	0.119	3.64	0% - 20%
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-W: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-W: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-W: Boron	7440-42-8	0.05	mg/L	0.12	0.11	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035C: Leachable Mercury by FIMS (QC Lot: 603657)									
EM1609567-008	Anonymous	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
EM1611178-006	DLSA BLOCK 5A	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
EG035C: Leachable Mercury by FIMS (QC Lot: 603659)									
EM1611178-017	DLSB BLOCK 11A	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
EG035W: Water Leachable Mercury by FIMS (QC Lot: 603658)									
EM1611178-001	DLSA BLOCK 1A	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1611178-011	DLSB BLOCK 5A	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035W: Water Leachable Mercury by FIMS (QC Lot: 603660)									
EM1611178-021	DLSB BLOCK 15A	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA010: Conductivity (QCLot: 594674)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	98.8	95	105
EA010: Conductivity (QCLot: 594675)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	96.0	95	105
EA013: Acid Neutralising Capacity (QCLot: 601217)								
EA013: ANC as H2SO4	----	----	kg H2SO4 equiv./t	----	100 kg H2SO4 equiv./t	101	82	120
EA013: Acid Neutralising Capacity (QCLot: 601220)								
EA013: ANC as H2SO4	----	----	kg H2SO4 equiv./t	----	100 kg H2SO4 equiv./t	101	82	120
EA026 : Chromium Reducible Sulfur (QCLot: 601218)								
EA026: Chromium Reducible Sulphur	----	0.005	%	<0.005	0.305 %	82.8	70	130
EA026 : Chromium Reducible Sulfur (QCLot: 601219)								
EA026: Chromium Reducible Sulphur	----	0.005	%	<0.005	0.305 %	81.2	70	130
EA032: Electrical Conductivity (saturated paste) (QCLot: 594753)								
EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	<1	1413 µS/cm	100	70	130
EA032: Electrical Conductivity (saturated paste) (QCLot: 594754)								
EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	<1	1413 µS/cm	100	70	130
ED008: Exchangeable Cations (QCLot: 595005)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	12.85 meq/100g	92.4	80	120
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	8.69 meq/100g	107	80	120
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.38 meq/100g	85.0	80	120
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.8 meq/100g	80.2	80	120
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Cations (QCLot: 595008)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	12.85 meq/100g	92.2	80	120
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	8.69 meq/100g	108	80	120
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.38 meq/100g	81.6	80	120
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.8 meq/100g	86.8	80	120
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED040T : Total Sulfate by ICPAES (QCLot: 594677)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	99.4	87	111
ED040T : Total Sulfate by ICPAES (QCLot: 594678)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	92.7	87	111
ED042T: Total Sulfur by LECO (QCLot: 599840)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
ED042T: Total Sulfur by LECO (QCLot: 599840) - continued								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	113	70	130
ED042T: Total Sulfur by LECO (QCLot: 599841)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	113	70	130
EG005T: Total Metals by ICP-AES (QCLot: 599390)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.8	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	96.5	87	114
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	107	77	125
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	105	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	94.2	85	109
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	104	89	113
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	99.7	81	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	100	84	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.3	85	107
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	109	87	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	110	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	102	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	103	81	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	89	111
EG005T: Total Metals by ICP-AES (QCLot: 599608)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.8	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	92.6	87	114
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	97.0	77	125
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	102	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	94.8	85	109
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.4	89	113
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	89.8	81	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	94.6	84	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	89.1	85	107
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	97.2	87	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	99.8	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	88.9	81	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	92.1	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 599389)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	90.8	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 599609)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	99.6	85	103

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020C: Leachable Metals by ICPMS (QCLot: 596840)								
EG020D-C: Ytterbium	7440-64-4	0.001	mg/L	<0.001	----	----	----	----
EG020C: Leachable Metals by ICPMS (QCLot: 596841)								
EG020A-C: Arsenic	7440-38-2	0.005	mg/L	<0.005	0.1 mg/L	105	80	120
EG020A-C: Boron	7440-42-8	0.1	mg/L	<0.1	0.5 mg/L	102	80	120
EG020A-C: Barium	7440-39-3	0.1	mg/L	<0.1	0.1 mg/L	94.3	80	120
EG020A-C: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	94.5	80	120
EG020A-C: Cadmium	7440-43-9	0.001	mg/L	<0.001	0.1 mg/L	97.7	80	120
EG020A-C: Cobalt	7440-48-4	0.01	mg/L	<0.01	0.1 mg/L	105	80	120
EG020A-C: Chromium	7440-47-3	0.01	mg/L	<0.01	0.1 mg/L	94.0	80	120
EG020A-C: Copper	7440-50-8	0.01	mg/L	<0.01	0.1 mg/L	94.9	80	120
EG020A-C: Manganese	7439-96-5	0.01	mg/L	<0.01	0.1 mg/L	94.9	80	120
EG020A-C: Nickel	7440-02-0	0.01	mg/L	<0.01	0.1 mg/L	104	80	120
EG020A-C: Lead	7439-92-1	0.01	mg/L	<0.01	0.1 mg/L	104	80	120
EG020A-C: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	80	120
EG020A-C: Zinc	7440-66-6	0.1	mg/L	<0.1	0.1 mg/L	93.5	80	120
EG020C: Leachable Metals by ICPMS (QCLot: 596842)								
EG020A-C: Arsenic	7440-38-2	0.005	mg/L	<0.005	0.1 mg/L	101	80	120
EG020A-C: Boron	7440-42-8	0.1	mg/L	<0.1	0.5 mg/L	109	80	120
EG020A-C: Barium	7440-39-3	0.1	mg/L	<0.1	0.1 mg/L	102	80	120
EG020A-C: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	95.2	80	120
EG020A-C: Cadmium	7440-43-9	0.001	mg/L	<0.001	0.1 mg/L	94.1	80	120
EG020A-C: Cobalt	7440-48-4	0.01	mg/L	<0.01	0.1 mg/L	98.6	80	120
EG020A-C: Chromium	7440-47-3	0.01	mg/L	<0.01	0.1 mg/L	95.2	80	120
EG020A-C: Copper	7440-50-8	0.01	mg/L	<0.01	0.1 mg/L	96.0	80	120
EG020A-C: Manganese	7439-96-5	0.01	mg/L	<0.01	0.1 mg/L	97.4	80	120
EG020A-C: Nickel	7440-02-0	0.01	mg/L	<0.01	0.1 mg/L	99.3	80	120
EG020A-C: Lead	7439-92-1	0.01	mg/L	<0.01	0.1 mg/L	95.2	80	120
EG020A-C: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.7	80	120
EG020A-C: Zinc	7440-66-6	0.1	mg/L	<0.1	0.1 mg/L	104	80	120
EG020C: Leachable Metals by ICPMS (QCLot: 596843)								
EG020D-C: Ytterbium	7440-64-4	0.001	mg/L	<0.001	----	----	----	----
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599005)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	80	120
EG020A-W: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	108	80	120
EG020A-W: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	105	89	113
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	80	120
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.4	80	120
EG020A-W: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	103	80	120

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599005) - continued								
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.4	80	120
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.1	80	120
EG020A-W: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.2	88	112
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	80	120
EG020A-W: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	87	109
EG020A-W: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	99.9	80	120
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.4	87	115
EG020A-W: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	106	89	111
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599006)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	80	120
EG020A-W: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	107	80	120
EG020A-W: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	94.6	89	113
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.6	80	120
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	80	120
EG020A-W: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.4	80	120
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.0	80	120
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.5	80	120
EG020A-W: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.0	88	112
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.4	80	120
EG020A-W: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	94.4	87	109
EG020A-W: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	98.0	80	120
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.8	87	115
EG020A-W: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	106	89	111
EG035C: Leachable Mercury by FIMS (QCLot: 603657)								
EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	84	116
EG035C: Leachable Mercury by FIMS (QCLot: 603659)								
EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	108	84	116
EG035W: Water Leachable Mercury by FIMS (QCLot: 603658)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.2	80	122
EG035W: Water Leachable Mercury by FIMS (QCLot: 603660)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	80	122

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report: Spike	SpikeRecovery(%)	Recovery Limits (%)

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG005T: Total Metals by ICP-AES (QCLot: 599390)							
EM1611178-007	DLSB BLOCK 1A	EG005T: Arsenic	7440-38-2	50 mg/kg	93.4	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	96.0	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	96.8	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.7	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	92.8	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	96.8	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	91.8	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	112	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	90.5	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	102	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	90.1	74	128
EG005T: Total Metals by ICP-AES (QCLot: 599608)							
EM1611178-002	DLSA BLOCK 2A	EG005T: Arsenic	7440-38-2	50 mg/kg	94.9	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	110	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	100.0	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.8	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	97.8	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	94.8	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	85.8	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	90.3	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	88.5	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	99.2	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	115	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 599389)							
EM1611178-007	DLSB BLOCK 1A	EG035T: Mercury	7439-97-6	5 mg/kg	93.4	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 599609)							
EM1611178-002	DLSA BLOCK 2A	EG035T: Mercury	7439-97-6	5 mg/kg	78.8	76	116

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020C: Leachable Metals by ICPMS (QCLot: 596841)							
EM1611178-001	DLSA BLOCK 1A	EG020A-C: Arsenic	7440-38-2	1 mg/L	106	70	130
		EG020A-C: Barium	7440-39-3	1 mg/L	110	70	130
		EG020A-C: Beryllium	7440-41-7	1 mg/L	89.8	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020C: Leachable Metals by ICPMS (QCLot: 596841) - continued							
EM1611178-001	DLSA BLOCK 1A	EG020A-C: Cadmium	7440-43-9	1 mg/L	97.0	70	130
		EG020A-C: Cobalt	7440-48-4	1 mg/L	98.5	70	130
		EG020A-C: Chromium	7440-47-3	1 mg/L	98.3	70	130
		EG020A-C: Copper	7440-50-8	1 mg/L	95.8	70	130
		EG020A-C: Manganese	7439-96-5	1 mg/L	77.9	70	130
		EG020A-C: Nickel	7440-02-0	1 mg/L	105	70	130
		EG020A-C: Lead	7439-92-1	1 mg/L	93.3	70	130
		EG020A-C: Zinc	7440-66-6	1 mg/L	103	70	130
EG020C: Leachable Metals by ICPMS (QCLot: 596842)							
EM1611178-021	DLSB BLOCK 15A	EG020A-C: Arsenic	7440-38-2	1 mg/L	96.8	70	130
		EG020A-C: Barium	7440-39-3	1 mg/L	97.7	70	130
		EG020A-C: Beryllium	7440-41-7	1 mg/L	88.4	70	130
		EG020A-C: Cadmium	7440-43-9	1 mg/L	97.5	70	130
		EG020A-C: Cobalt	7440-48-4	1 mg/L	86.1	70	130
		EG020A-C: Chromium	7440-47-3	1 mg/L	91.5	70	130
		EG020A-C: Copper	7440-50-8	1 mg/L	89.1	70	130
		EG020A-C: Manganese	7439-96-5	1 mg/L	80.6	70	130
		EG020A-C: Nickel	7440-02-0	1 mg/L	90.8	70	130
		EG020A-C: Lead	7439-92-1	1 mg/L	94.1	70	130
		EG020A-C: Zinc	7440-66-6	1 mg/L	91.7	70	130
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599005)							
EM1611178-001	DLSA BLOCK 1A	EG020A-W: Arsenic	7440-38-2	1 mg/L	108	70	130
		EG020A-W: Beryllium	7440-41-7	1 mg/L	112	70	126
		EG020A-W: Barium	7440-39-3	1 mg/L	111	89	119
		EG020A-W: Cadmium	7440-43-9	0.25 mg/L	93.2	86	116
		EG020A-W: Chromium	7440-47-3	1 mg/L	108	79	115
		EG020A-W: Cobalt	7440-48-4	1 mg/L	105	85	115
		EG020A-W: Copper	7440-50-8	1 mg/L	110	83	115
		EG020A-W: Lead	7439-92-1	1 mg/L	107	87	119
		EG020A-W: Manganese	7439-96-5	1 mg/L	107	77	115
		EG020A-W: Nickel	7440-02-0	1 mg/L	111	76	126
		EG020A-W: Vanadium	7440-62-2	1 mg/L	109	87	111
		EG020A-W: Zinc	7440-66-6	1 mg/L	110	70	129
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599006)							
EM1611178-021	DLSB BLOCK 15A	EG020A-W: Arsenic	7440-38-2	1 mg/L	114	70	130
		EG020A-W: Beryllium	7440-41-7	1 mg/L	107	70	126
		EG020A-W: Barium	7440-39-3	1 mg/L	103	89	119
		EG020A-W: Cadmium	7440-43-9	0.25 mg/L	96.7	86	116

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 599006) - continued							
EM1611178-021	DLSB BLOCK 15A	EG020A-W: Chromium	7440-47-3	1 mg/L	110	79	115
		EG020A-W: Cobalt	7440-48-4	1 mg/L	106	85	115
		EG020A-W: Copper	7440-50-8	1 mg/L	105	83	115
		EG020A-W: Lead	7439-92-1	1 mg/L	106	87	119
		EG020A-W: Manganese	7439-96-5	1 mg/L	98.8	77	115
		EG020A-W: Nickel	7440-02-0	1 mg/L	109	76	126
		EG020A-W: Vanadium	7440-62-2	1 mg/L	108	87	111
		EG020A-W: Zinc	7440-66-6	1 mg/L	108	70	129
EG035C: Leachable Mercury by FIMS (QCLot: 603657)							
EM1609567-018	Anonymous	EG035C: Mercury	7439-97-6	0.01 mg/L	109	84	118
EG035C: Leachable Mercury by FIMS (QCLot: 603659)							
EM1611178-018	DLSB BLOCK 12A	EG035C: Mercury	7439-97-6	0.01 mg/L	110	84	118
EG035W: Water Leachable Mercury by FIMS (QCLot: 603658)							
EM1611178-002	DLSA BLOCK 2A	EG035W: Mercury	7439-97-6	0.01 mg/L	109	78	120
EG035W: Water Leachable Mercury by FIMS (QCLot: 603660)							
EM1611178-022	DLSB BLOCK 16A	EG035W: Mercury	7439-97-6	0.01 mg/L	92.1	78	120

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1611178**	Page	: 1 of 17
Client	: **MWH AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MATT BRAIMBRIDGE	Telephone	: 08 9209 7631
Project	: LCRK-SS-16001	Date Samples Received	: 22-Sep-2016
Site	: ----	Issue Date	: 04-Oct-2016
Sampler	: TRACEY HASSELL	No. of samples received	: 24
Order number	: MWH3142	No. of samples analysed	: 24

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1611178--007	DLSB BLOCK 1A	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EM1611178--002	DLSA BLOCK 2A	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA002 : pH (Soils)							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 1A,	DLSA BLOCK 2A,	26-Sep-2016	12-Sep-2016	**14**	----	----	----
DLSA BLOCK 2S,	DLSA BLOCK 3A,						
DLSA BLOCK 4A							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 5A,	DLSB BLOCK 1A,	26-Sep-2016	15-Sep-2016	**11**	----	----	----
DLSB BLOCK 2A,	DLSB BLOCK 3A,						
DLSB BLOCK 4A,	DLSB BLOCK 5A,						
DLSB BLOCK 6A,	DLSB BLOCK 7A,						
DLSB BLOCK 8A,	DLSB BLOCK 9A,						
DLSB BLOCK 10A,	DLSB BLOCK 11A,						
DLSB BLOCK 12A,	DLSB BLOCK 13A,						
DLSB BLOCK 14A,	DLSB BLOCK 15A,						
DLSB BLOCK 16A,	DLSB BLOCK 17A,						
DLSB BLOCK 18A							
EA010: Conductivity							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 1A,	DLSA BLOCK 2A,	26-Sep-2016	12-Sep-2016	**14**	----	----	----
DLSA BLOCK 2S,	DLSA BLOCK 3A,						
DLSA BLOCK 4A							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA010: Conductivity - Analysis Holding Time Compliance							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 5A,	DLSB BLOCK 1A,	26-Sep-2016	15-Sep-2016	**11**	----	----	----
DLSB BLOCK 2A,	DLSB BLOCK 3A,						
DLSB BLOCK 4A,	DLSB BLOCK 5A,						
DLSB BLOCK 6A,	DLSB BLOCK 7A,						
DLSB BLOCK 8A,	DLSB BLOCK 9A,						
DLSB BLOCK 10A,	DLSB BLOCK 11A,						
DLSB BLOCK 12A,	DLSB BLOCK 13A,						
DLSB BLOCK 14A,	DLSB BLOCK 15A,						
DLSB BLOCK 16A,	DLSB BLOCK 17A,						
DLSB BLOCK 18A							
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 1A,	DLSA BLOCK 2A,	----	----	----	23-Sep-2016	19-Sep-2016	**4**
DLSA BLOCK 2S,	DLSA BLOCK 3A,						
DLSA BLOCK 4A							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 5A,	DLSB BLOCK 1A,	----	----	----	23-Sep-2016	22-Sep-2016	**1**
DLSB BLOCK 2A,	DLSB BLOCK 3A,						
DLSB BLOCK 4A,	DLSB BLOCK 5A,						
DLSB BLOCK 6A,	DLSB BLOCK 7A,						
DLSB BLOCK 8A,	DLSB BLOCK 9A,						
DLSB BLOCK 10A,	DLSB BLOCK 11A,						
DLSB BLOCK 12A,	DLSB BLOCK 13A,						
DLSB BLOCK 14A,	DLSB BLOCK 15A,						
DLSB BLOCK 16A,	DLSB BLOCK 17A,						
DLSB BLOCK 18A							
ED040: Sulfur as SO4 2-							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 1A,	DLSA BLOCK 2A,	23-Sep-2016	12-Sep-2016	**11**	----	----	----
DLSA BLOCK 2S,	DLSA BLOCK 3A,						
DLSA BLOCK 4A							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED040: Sulfur as SO4 2- - Analysis Holding Time Compliance							
Soil Glass Jar - Unpreserved							
DLSA BLOCK 5A,	DLSB BLOCK 1A,	23-Sep-2016	15-Sep-2016	**8**	----	----	----
DLSB BLOCK 2A,	DLSB BLOCK 3A,						
DLSB BLOCK 4A,	DLSB BLOCK 5A,						
DLSB BLOCK 6A,	DLSB BLOCK 7A,						
DLSB BLOCK 8A,	DLSB BLOCK 9A,						
DLSB BLOCK 10A,	DLSB BLOCK 11A,						
DLSB BLOCK 12A,	DLSB BLOCK 13A,						
DLSB BLOCK 14A,	DLSB BLOCK 15A,						
DLSB BLOCK 16A,	DLSB BLOCK 17A,						
DLSB BLOCK 18A							

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA002 : pH (Soils)								
Soil Glass Jar - Unpreserved (EA002)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**05-Sep-2016**	**26-Sep-2016**	12-Sep-2016	×	**26-Sep-2016**	26-Sep-2016	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A								
Soil Glass Jar - Unpreserved (EA002)								
DLSA BLOCK 5A,	DLSB BLOCK 1A,	**08-Sep-2016**	**26-Sep-2016**	15-Sep-2016	×	**26-Sep-2016**	26-Sep-2016	✓
DLSB BLOCK 2A,	DLSB BLOCK 3A,							
DLSB BLOCK 4A,	DLSB BLOCK 5A,							
DLSB BLOCK 6A,	DLSB BLOCK 7A,							
DLSB BLOCK 8A,	DLSB BLOCK 9A,							
DLSB BLOCK 10A,	DLSB BLOCK 11A,							
DLSB BLOCK 12A,	DLSB BLOCK 13A,							
DLSB BLOCK 14A,	DLSB BLOCK 15A,							
DLSB BLOCK 16A,	DLSB BLOCK 17A,							
DLSB BLOCK 18A								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**26-Sep-2016**	12-Sep-2016	×	**26-Sep-2016**	24-Oct-2016	✓
Soil Glass Jar - Unpreserved (EA010) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**26-Sep-2016**	15-Sep-2016	×	**26-Sep-2016**	24-Oct-2016	✓
EA013: Acid Neutralising Capacity							
Pulp Bag (EA013) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**04-Oct-2016**	05-Sep-2017	✓	**04-Oct-2016**	02-Apr-2017	✓
Pulp Bag (EA013) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**04-Oct-2016**	08-Sep-2017	✓	**04-Oct-2016**	02-Apr-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA026 : Chromium Reducible Sulfur							
Pulp Bag (EA026) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**04-Oct-2016**	01-Jun-2019	✓	**04-Oct-2016**	02-Jan-2017	✓
Pulp Bag (EA026) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**04-Oct-2016**	04-Jun-2019	✓	**04-Oct-2016**	02-Jan-2017	✓
EA031: pH (saturated paste)							
Soil Glass Jar - Unpreserved (EA031) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**----**	----	----	**23-Sep-2016**	04-Mar-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**----**	----	----	**23-Sep-2016**	07-Mar-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA032: Electrical Conductivity (saturated paste)								
Soil Glass Jar - Unpreserved (EA032)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**05-Sep-2016**	**----**	----	----	**23-Sep-2016**	04-Mar-2017	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A								
Soil Glass Jar - Unpreserved (EA032)								
DLSA BLOCK 5A,	DLSB BLOCK 1A,	**08-Sep-2016**	**----**	----	----	**23-Sep-2016**	07-Mar-2017	✓
DLSB BLOCK 2A,	DLSB BLOCK 3A,							
DLSB BLOCK 4A,	DLSB BLOCK 5A,							
DLSB BLOCK 6A,	DLSB BLOCK 7A,							
DLSB BLOCK 8A,	DLSB BLOCK 9A,							
DLSB BLOCK 10A,	DLSB BLOCK 11A,							
DLSB BLOCK 12A,	DLSB BLOCK 13A,							
DLSB BLOCK 14A,	DLSB BLOCK 15A,							
DLSB BLOCK 16A,	DLSB BLOCK 17A,							
DLSB BLOCK 18A								
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**05-Sep-2016**	**----**	----	----	**23-Sep-2016**	19-Sep-2016	✗
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A								
Soil Glass Jar - Unpreserved (EA055-103)								
DLSA BLOCK 5A,	DLSB BLOCK 1A,	**08-Sep-2016**	**----**	----	----	**23-Sep-2016**	22-Sep-2016	✗
DLSB BLOCK 2A,	DLSB BLOCK 3A,							
DLSB BLOCK 4A,	DLSB BLOCK 5A,							
DLSB BLOCK 6A,	DLSB BLOCK 7A,							
DLSB BLOCK 8A,	DLSB BLOCK 9A,							
DLSB BLOCK 10A,	DLSB BLOCK 11A,							
DLSB BLOCK 12A,	DLSB BLOCK 13A,							
DLSB BLOCK 14A,	DLSB BLOCK 15A,							
DLSB BLOCK 16A,	DLSB BLOCK 17A,							
DLSB BLOCK 18A								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**23-Sep-2016**	03-Oct-2016	✓	**27-Sep-2016**	03-Oct-2016	✓
Soil Glass Jar - Unpreserved (ED008) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**23-Sep-2016**	06-Oct-2016	✓	**27-Sep-2016**	06-Oct-2016	✓
ED040: Sulfur as SO4 2-							
Soil Glass Jar - Unpreserved (ED040T) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**23-Sep-2016**	12-Sep-2016	×	**26-Sep-2016**	21-Oct-2016	✓
Soil Glass Jar - Unpreserved (ED040T) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**23-Sep-2016**	15-Sep-2016	×	**26-Sep-2016**	21-Oct-2016	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag (ED042T) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**28-Sep-2016**	03-Oct-2016	✓	**28-Sep-2016**	03-Oct-2016	✓
Pulp Bag (ED042T) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**28-Sep-2016**	06-Oct-2016	✓	**28-Sep-2016**	06-Oct-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**28-Sep-2016**	04-Mar-2017	✓	**29-Sep-2016**	04-Mar-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**28-Sep-2016**	07-Mar-2017	✓	**29-Sep-2016**	07-Mar-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**28-Sep-2016**	03-Oct-2016	✓	**29-Sep-2016**	03-Oct-2016	✓
Soil Glass Jar - Unpreserved (EG035T) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**28-Sep-2016**	06-Oct-2016	✓	**29-Sep-2016**	06-Oct-2016	✓
EN60: ASLP Leaching Procedure							
Non-Volatile Leach: 28 day HT(e.g. Hg, CrVI) (EN60a) DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**23-Sep-2016**	03-Oct-2016	✓	**----**	----	----
Non-Volatile Leach: 28 day HT(e.g. Hg, CrVI) (EN60a) DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**23-Sep-2016**	06-Oct-2016	✓	**----**	----	----

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EN60: Bottle Leaching Procedure							
Non-Volatile Leach: 28 day HT(e.g. Hg, CrVI) (EN60-Dla)							
DLSA BLOCK 1A, DLSA BLOCK 2A, DLSA BLOCK 2S, DLSA BLOCK 3A, DLSA BLOCK 4A	**05-Sep-2016**	**26-Sep-2016**	03-Oct-2016	✓	**----**	----	----
Non-Volatile Leach: 28 day HT(e.g. Hg, CrVI) (EN60-Dla)							
DLSA BLOCK 5A, DLSB BLOCK 1A, DLSB BLOCK 2A, DLSB BLOCK 3A, DLSB BLOCK 4A, DLSB BLOCK 5A, DLSB BLOCK 6A, DLSB BLOCK 7A, DLSB BLOCK 8A, DLSB BLOCK 9A, DLSB BLOCK 10A, DLSB BLOCK 11A, DLSB BLOCK 12A, DLSB BLOCK 13A, DLSB BLOCK 14A, DLSB BLOCK 15A, DLSB BLOCK 16A, DLSB BLOCK 17A, DLSB BLOCK 18A	**08-Sep-2016**	**26-Sep-2016**	06-Oct-2016	✓	**----**	----	----

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020C: Leachable Metals by ICPMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-C)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**23-Sep-2016**	**26-Sep-2016**	22-Mar-2017	✓	**27-Sep-2016**	22-Mar-2017	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A,	DLSA BLOCK 5A,							
DLSB BLOCK 1A,	DLSB BLOCK 2A,							
DLSB BLOCK 3A,	DLSB BLOCK 4A,							
DLSB BLOCK 5A,	DLSB BLOCK 6A,							
DLSB BLOCK 7A,	DLSB BLOCK 8A,							
DLSB BLOCK 9A,	DLSB BLOCK 10A,							
DLSB BLOCK 11A,	DLSB BLOCK 12A,							
DLSB BLOCK 13A,	DLSB BLOCK 14A,							
DLSB BLOCK 15A,	DLSB BLOCK 16A,							
DLSB BLOCK 17A,	DLSB BLOCK 18A							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020D-C)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**23-Sep-2016**	**26-Sep-2016**	22-Mar-2017	✓	**28-Sep-2016**	22-Mar-2017	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A,	DLSA BLOCK 5A,							
DLSB BLOCK 1A,	DLSB BLOCK 2A,							
DLSB BLOCK 3A,	DLSB BLOCK 4A,							
DLSB BLOCK 5A,	DLSB BLOCK 6A,							
DLSB BLOCK 7A,	DLSB BLOCK 8A,							
DLSB BLOCK 9A,	DLSB BLOCK 10A,							
DLSB BLOCK 11A,	DLSB BLOCK 12A,							
DLSB BLOCK 13A,	DLSB BLOCK 14A,							
DLSB BLOCK 15A,	DLSB BLOCK 16A,							
DLSB BLOCK 17A,	DLSB BLOCK 18A							
EG020W: Water Leachable Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-W)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**26-Sep-2016**	**28-Sep-2016**	25-Mar-2017	✓	**28-Sep-2016**	25-Mar-2017	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A,	DLSA BLOCK 5A,							
DLSB BLOCK 1A,	DLSB BLOCK 2A,							
DLSB BLOCK 3A,	DLSB BLOCK 4A,							
DLSB BLOCK 5A,	DLSB BLOCK 6A,							
DLSB BLOCK 7A,	DLSB BLOCK 8A,							
DLSB BLOCK 9A,	DLSB BLOCK 10A,							
DLSB BLOCK 11A,	DLSB BLOCK 12A,							
DLSB BLOCK 13A,	DLSB BLOCK 14A,							
DLSB BLOCK 15A,	DLSB BLOCK 16A,							
DLSB BLOCK 17A,	DLSB BLOCK 18A							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035C: Leachable Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**23-Sep-2016**	**----**	----	----	**03-Oct-2016**	21-Oct-2016	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A,	DLSA BLOCK 5A,							
DLSB BLOCK 1A,	DLSB BLOCK 2A,							
DLSB BLOCK 3A,	DLSB BLOCK 4A,							
DLSB BLOCK 5A,	DLSB BLOCK 6A,							
DLSB BLOCK 7A,	DLSB BLOCK 8A,							
DLSB BLOCK 9A,	DLSB BLOCK 10A,							
DLSB BLOCK 11A,	DLSB BLOCK 12A,							
DLSB BLOCK 13A,	DLSB BLOCK 14A,							
DLSB BLOCK 15A,	DLSB BLOCK 16A,							
DLSB BLOCK 17A,	DLSB BLOCK 18A							
EG035W: Water Leachable Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035W)								
DLSA BLOCK 1A,	DLSA BLOCK 2A,	**26-Sep-2016**	**----**	----	----	**03-Oct-2016**	24-Oct-2016	✓
DLSA BLOCK 2S,	DLSA BLOCK 3A,							
DLSA BLOCK 4A,	DLSA BLOCK 5A,							
DLSB BLOCK 1A,	DLSB BLOCK 2A,							
DLSB BLOCK 3A,	DLSB BLOCK 4A,							
DLSB BLOCK 5A,	DLSB BLOCK 6A,							
DLSB BLOCK 7A,	DLSB BLOCK 8A,							
DLSB BLOCK 9A,	DLSB BLOCK 10A,							
DLSB BLOCK 11A,	DLSB BLOCK 12A,							
DLSB BLOCK 13A,	DLSB BLOCK 14A,							
DLSB BLOCK 15A,	DLSB BLOCK 16A,							
DLSB BLOCK 17A,	DLSB BLOCK 18A							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Acid Neutralising Capacity (ANC)	EA013	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055-103	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (Saturated Paste)	EA031	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	3	28	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	5	40	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Acid Neutralising Capacity (ANC)	EA013	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Reducible Sulphur	EA026	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Leachable Mercury by FIMS	EG035C	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite A	EG020A-C	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite D	EG020D-C	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Mercury by FIMS	EG035W	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Mercury by FIMS	EG035C	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite A	EG020A-C	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Mercury by FIMS	EG035W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Mercury by FIMS	EG035C	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite A	EG020A-C	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite D	EG020D-C	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Mercury by FIMS	EG035W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Mercury by FIMS	EG035C	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPMS - Suite A	EG020A-C	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Mercury by FIMS	EG035W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Net Acid Production Potential	EA009	SOIL	In house: Referenced to Coastech Research (Canada)(Mod.). NAPP = Acid Production Potential (APP or MAP-Maximum Acid Potential) minus Neutralising Capacity (ANC). NAPP may be +ve, zero or -ve.
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
Acid Neutralising Capacity (ANC)	EA013	SOIL	In house: Referenced to USEPA 600/2-78-054, I. Miller (2000). A fizz test is done to semiquanititatively estimate the likely reactivity. The soil is then reacted with an known excess quanitity of an appropriate acid. Titration determines the acid remaining, and the ANC can be calculated from comparison with a blank titration.
Chromium Reducible Sulphur	EA026	SOIL	In house: Referenced to Sullivan et al (1998) The CRS method converts reduced inorganic sulfur to H2S by CrCl2 solution ; the evolved H2S is trapped in a zinc acetate solution as ZnS which is quantified by iodometric titration.
pH (Saturated Paste)	EA031	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - pH determined on a saturated paste by ISE.
Electrical Conductivity (Saturated Paste)	EA032	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - conductivity determined on a saturated paste.
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Sulfate as SO4 2- Total	ED040T	SOIL	In house: Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Leachable Metals by ICPMS - Suite A	EG020A-C	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020: The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, AS 4439.3, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Leachable Metals by ICPMS - Suite D	EG020D-C	SOIL	In house: referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Leachable Mercury by FIMS	EG035C	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Water Leachable Mercury by FIMS	EG035W	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals in DI Water Leachate	EN25W	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
ASLP for Non & Semivolatile Analytes	EN60a	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates
Deionised Water Leach	EN60-DIa	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Flinders Power	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	156 Greenhill Road Parkside		
PROJECT:	[illegible]	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
ORDER NUMBER:			
PROJECT MANAGER:	Paul Jones	CONTACT PH: 0407 972 078	
SAMPLER:		SAMPLER MOBILE:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):	
Email Reports to: paul.jones@flinderspower.com.au			
Email Invoice to: paul.jones@flinderspower.com.au			

FOR LABORATORY USE ONLY (Circle)
Custody Seals Intact? Yes No N/A
Free ice / frozen ice brick present upon receipt? Yes No N/A
Random Sample Temperature on Receipt C
Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Paul Jones	TOLL Priority, Adelaide Airport		
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:
13/01/17 16.45 pm	13/01/17 16.45 pm		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
														URGENT
1	DLSA BLOCK 11C	15/11/2016	S	BAG	1	Analysis Required for all samples as per SRN 1627092								
2	DLSD BLOCK 4A	14/11/2016	S	BAG	1									
3	DLSD BLOCK 2B	18/11/2016	S	BAG	1									
4	DLSD BLOCK 12B	22/11/2016	S	BAG	1									
5	DLSD BLOCK 9C	28/11/2016	S	BAG	1									
6	DLSE BLOCK 5B	7/12/2016	S	BAG	1									
7	DLSE BLOCK 6B	9/12/2016	S	BAG	1									
8	DLSF BLOCK 1A	14/12/2016	S	BAG	1									
9	DLSF BLOCK 6B	16/11/2016	S	BAG	1									
10	DLSF BLOCK 5C	4/01/2017	S	BAG	1									
11	DLSF BLOCK 11A	9/01/2017	S	BAG	1									
12	DLSF BLOCK 12C	11/01/2017	S	BAG	1									
13	DLSF BLOCK 2C	4/01/2017	S	BAG	1									
14	DLSF BLOCK 10C	4/01/2017	S	BAG	1									
15	DLSF BLOCK 15A	10/01/2017	S	BAG	1									
16	DLSF BLOCK 8C	4/01/2017	S	BAG	1									
				TOTAL	16									

Environmental Division Brisbane
Work Order Reference
EB1700779
Telephone : +61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB1700779**

Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: paul.jones@flinderspower.com.au	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LCK 17001	Page	: 1 of 6
Order number	: ----	Quote number	: EB2016FLIPOW0001 (BNBQ/333/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 16-Jan-2017 10:10	Issue Date	: 16-Jan-2017
Client Requested Due Date	: 23-Jan-2017	Scheduled Reporting Date	: **23-Jan-2017**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 26.4, 26.3, 25.8°C
Receipt Detail	: BUCKETS	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- As requested on the Chain of Custody analysis will be assigned per previous work order EB1627092. As per the previous work the CEC method used will be ED008, regardless of pH/EC results. If this is not correct of for more information please contact client services at ALSEnviro.Brisbane@alsglobal.com.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Particle Size Analysis by Hydrometer : EA150H		
DLSA BLOCK 11C	- Plastic Bag	- Snap Lock Bag
DLSD BLOCK 4A	- Plastic Bag	- Snap Lock Bag
DLSD BLOCK 2B	- Plastic Bag	- Snap Lock Bag
DLSD BLOCK 12B	- Plastic Bag	- Snap Lock Bag
DLSD BLOCK 9C	- Plastic Bag	- Snap Lock Bag
DLSE BLOCK 5B	- Plastic Bag	- Snap Lock Bag
DLSE BLOCK 6B	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 1A	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 6B	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 5C	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 11A	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 12C	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 2C	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 10C	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 15A	- Plastic Bag	- Snap Lock Bag
DLSF BLOCK 8C	- Plastic Bag	- Snap Lock Bag

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA010 (solids): Electrical Conductivity (1:5)	SOIL - EA013 Acid Neutralising Capacity (ANC)	SOIL - EA026 Chromium Reducible Sulphur	SOIL - EA037 ASS Field Screening Analysis	SOIL - ED021 Bicarbonate Extractable K (Colwell)	SOIL - ED038 Acidity in Soil	SOIL - EK080 Bicarbonate Extractable P (Colwell)
EB1700779-001	15-Nov-2016 00:00	DLSA BLOCK 11C	✓	✓	✓	✓	✓	✓	✓
EB1700779-002	14-Nov-2016 00:00	DLSD BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EB1700779-003	18-Nov-2016 00:00	DLSD BLOCK 2B	✓	✓	✓	✓	✓	✓	✓
EB1700779-004	22-Nov-2016 00:00	DLSD BLOCK 12B	✓	✓	✓	✓	✓	✓	✓
EB1700779-005	28-Nov-2016 00:00	DLSD BLOCK 9C	✓	✓	✓	✓	✓	✓	✓
EB1700779-006	07-Dec-2016 00:00	DLSE BLOCK 5B	✓	✓	✓	✓	✓	✓	✓
EB1700779-007	09-Dec-2016 00:00	DLSE BLOCK 6B	✓	✓	✓	✓	✓	✓	✓
EB1700779-008	14-Dec-2016 00:00	DLSF BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1700779-009	16-Nov-2016 00:00	DLSF BLOCK 6B	✓	✓	✓	✓	✓	✓	✓
EB1700779-010	04-Jan-2017 00:00	DLSF BLOCK 5C	✓	✓	✓	✓	✓	✓	✓
EB1700779-011	09-Jan-2017 00:00	DLSF BLOCK 11A	✓	✓	✓	✓	✓	✓	✓
EB1700779-012	11-Jan-2017 00:00	DLSF BLOCK 12C	✓	✓	✓	✓	✓	✓	✓
EB1700779-013	04-Jan-2017 00:00	DLSF BLOCK 2C	✓	✓	✓	✓	✓	✓	✓
EB1700779-014	04-Jan-2017 00:00	DLSF BLOCK 10C	✓	✓	✓	✓	✓	✓	✓
EB1700779-015	10-Jan-2017 00:00	DLSF BLOCK 15A	✓	✓	✓	✓	✓	✓	✓
EB1700779-016	04-Jan-2017 00:00	DLSF BLOCK 8C	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA009 Net Acid Production Potential (NAPP)	SOIL - EA032 Electrical Conductivity (Saturated Paste)	SOIL - EA055-103 Moisture Content	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - ED040S Soluble Major Anions	SOIL - EP004 (Carbon) Organic Matter & Total Organic Carbon (Calc.)	SOIL - S-02 8 Metals (incl. Digestion)
EB1700779-001	15-Nov-2016 00:00	DLSA BLOCK 11C	✓	✓	✓	✓	✓	✓	✓
EB1700779-002	14-Nov-2016 00:00	DLSD BLOCK 4A	✓	✓	✓	✓	✓	✓	✓
EB1700779-003	18-Nov-2016 00:00	DLSD BLOCK 2B	✓	✓	✓	✓	✓	✓	✓
EB1700779-004	22-Nov-2016 00:00	DLSD BLOCK 12B	✓	✓	✓	✓	✓	✓	✓
EB1700779-005	28-Nov-2016 00:00	DLSD BLOCK 9C	✓	✓	✓	✓	✓	✓	✓
EB1700779-006	07-Dec-2016 00:00	DLSE BLOCK 5B	✓	✓	✓	✓	✓	✓	✓
EB1700779-007	09-Dec-2016 00:00	DLSE BLOCK 6B	✓	✓	✓	✓	✓	✓	✓
EB1700779-008	14-Dec-2016 00:00	DLSF BLOCK 1A	✓	✓	✓	✓	✓	✓	✓
EB1700779-009	16-Nov-2016 00:00	DLSF BLOCK 6B	✓	✓	✓	✓	✓	✓	✓
EB1700779-010	04-Jan-2017 00:00	DLSF BLOCK 5C	✓	✓	✓	✓	✓	✓	✓
EB1700779-011	09-Jan-2017 00:00	DLSF BLOCK 11A	✓	✓	✓	✓	✓	✓	✓
EB1700779-012	11-Jan-2017 00:00	DLSF BLOCK 12C	✓	✓	✓	✓	✓	✓	✓
EB1700779-013	04-Jan-2017 00:00	DLSF BLOCK 2C	✓	✓	✓	✓	✓	✓	✓
EB1700779-014	04-Jan-2017 00:00	DLSF BLOCK 10C	✓	✓	✓	✓	✓	✓	✓
EB1700779-015	10-Jan-2017 00:00	DLSF BLOCK 15A	✓	✓	✓	✓	✓	✓	✓
EB1700779-016	04-Jan-2017 00:00	DLSF BLOCK 8C	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA002 pH (1:5)	SOIL - EA031 pH (Saturated Paste)	SOIL - EA150H/EA152 Particle Sizing with Hydrometer + Soil Particle	SOIL - ED042T Sulfur - Total as S (high temperature furnace	SOIL - EG005T (solids) Total Metals by ICP-AES
EB1700779-001	15-Nov-2016 00:00	DLSA BLOCK 11C	✓	✓	✓	✓	✓
EB1700779-002	14-Nov-2016 00:00	DLSD BLOCK 4A	✓	✓	✓	✓	✓
EB1700779-003	18-Nov-2016 00:00	DLSD BLOCK 2B	✓	✓	✓	✓	✓
EB1700779-004	22-Nov-2016 00:00	DLSD BLOCK 12B	✓	✓	✓	✓	✓
EB1700779-005	28-Nov-2016 00:00	DLSD BLOCK 9C	✓	✓	✓	✓	✓
EB1700779-006	07-Dec-2016 00:00	DLSE BLOCK 5B	✓	✓	✓	✓	✓
EB1700779-007	09-Dec-2016 00:00	DLSE BLOCK 6B	✓	✓	✓	✓	✓
EB1700779-008	14-Dec-2016 00:00	DLSF BLOCK 1A	✓	✓	✓	✓	✓
EB1700779-009	16-Nov-2016 00:00	DLSF BLOCK 6B	✓	✓	✓	✓	✓
EB1700779-010	04-Jan-2017 00:00	DLSF BLOCK 5C	✓	✓	✓	✓	✓
EB1700779-011	09-Jan-2017 00:00	DLSF BLOCK 11A	✓	✓	✓	✓	✓
EB1700779-012	11-Jan-2017 00:00	DLSF BLOCK 12C	✓	✓	✓	✓	✓
EB1700779-013	04-Jan-2017 00:00	DLSF BLOCK 2C	✓	✓	✓	✓	✓
EB1700779-014	04-Jan-2017 00:00	DLSF BLOCK 10C	✓	✓	✓	✓	✓

			SOIL - EA002 pH (1:5)	SOIL - EA031 pH (Saturated Paste)	SOIL - EA150H/EA152 Particle Sizing with Hydrometer + Soil Particle	SOIL - ED042T Sulfur - Total as S (high temperature furnace	SOIL - EG005T (solids) Total Metals by ICP-AES
EB1700779-015	10-Jan-2017 00:00	DLSF BLOCK 15A	✓	✓	✓	✓	✓
EB1700779-016	04-Jan-2017 00:00	DLSF BLOCK 8C	✓	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / **Client Sample ID(s)**	**Container**	**Due for extraction**	**Due for analysis**	**Samples Received**		**Instructions Received**	
				Date	**Evaluation**	**Date**	**Evaluation**
EA002: pH (1:5)							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	22-Nov-2016	22-Nov-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	29-Nov-2016	29-Nov-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	25-Nov-2016	25-Nov-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	21-Nov-2016	21-Nov-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	05-Dec-2016	05-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	14-Dec-2016	14-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	16-Dec-2016	16-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 10C	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	21-Dec-2016	21-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 2C	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 5C	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	23-Nov-2016	23-Nov-2016	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 8C	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
EA010: Electrical Conductivity (1:5)							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	22-Nov-2016	20-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	29-Nov-2016	27-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	25-Nov-2016	23-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	21-Nov-2016	19-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	05-Dec-2016	02-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	14-Dec-2016	11-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	16-Dec-2016	13-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 10C	Soil Glass Jar - Unpreserved	11-Jan-2017	08-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	21-Dec-2016	18-Jan-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 2C	Soil Glass Jar - Unpreserved	11-Jan-2017	08-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 5C	Soil Glass Jar - Unpreserved	11-Jan-2017	08-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	23-Nov-2016	21-Dec-2016	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 8C	Soil Glass Jar - Unpreserved	11-Jan-2017	08-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
EA026: Chromium Reducible Sulphur							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	16-Nov-2016	14-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	23-Nov-2016	21-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	19-Nov-2016	17-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	15-Nov-2016	13-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	29-Nov-2016	27-Feb-2017	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	08-Dec-2016	08-Mar-2017	16-Jan-2017	×	16-Jan-2017	×
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	10-Dec-2016	10-Mar-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 10C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Apr-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 11A	Soil Glass Jar - Unpreserved	10-Jan-2017	10-Apr-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 12C	Soil Glass Jar - Unpreserved	12-Jan-2017	12-Apr-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 15A	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Apr-2017	16-Jan-2017	×	16-Jan-2017	×
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	15-Dec-2016	15-Mar-2017	16-Jan-2017	×	16-Jan-2017	×

DLSF BLOCK 2C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Apr-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 5C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Apr-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	17-Nov-2016	15-Feb-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 8C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Apr-2017	16-Jan-2017	✘	16-Jan-2017	✘
EA037: ASS Field Screening Analysis							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	16-Nov-2016	16-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	23-Nov-2016	23-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	19-Nov-2016	19-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	15-Nov-2016	15-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	29-Nov-2016	29-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	08-Dec-2016	08-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	10-Dec-2016	10-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 10C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 11A	Soil Glass Jar - Unpreserved	10-Jan-2017	10-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 12C	Soil Glass Jar - Unpreserved	12-Jan-2017	12-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 15A	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	15-Dec-2016	15-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 2C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 5C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	17-Nov-2016	17-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 8C	Soil Glass Jar - Unpreserved	05-Jan-2017	05-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
EA055-103: Moisture Content							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	----	29-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	----	06-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	----	02-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	----	28-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	----	12-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	----	21-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	----	23-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	----	28-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	----	30-Nov-2016	16-Jan-2017	✘	16-Jan-2017	✘
ED008: Exchangeable Cations with pre-treatment							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	13-Dec-2016	13-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	20-Dec-2016	20-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	16-Dec-2016	16-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	12-Dec-2016	12-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	26-Dec-2016	26-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	04-Jan-2017	04-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	06-Jan-2017	06-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	14-Dec-2016	14-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
ED040S: Major Anions - Soluble							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	13-Dec-2016	10-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	20-Dec-2016	17-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	16-Dec-2016	13-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	12-Dec-2016	09-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	26-Dec-2016	23-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	04-Jan-2017	01-Feb-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	06-Jan-2017	03-Feb-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	11-Jan-2017	08-Feb-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	14-Dec-2016	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
ED042T: Sulfur - Total as S (LECO)							
DLSA BLOCK 11C	Pulp Bag	13-Dec-2016	13-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Pulp Bag	20-Dec-2016	20-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Pulp Bag	16-Dec-2016	16-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Pulp Bag	12-Dec-2016	12-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Pulp Bag	26-Dec-2016	26-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Pulp Bag	04-Jan-2017	04-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Pulp Bag	06-Jan-2017	06-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Pulp Bag	11-Jan-2017	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Pulp Bag	14-Dec-2016	14-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
EG035T: Total Mercury by FIMS							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	13-Dec-2016	13-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	20-Dec-2016	20-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	16-Dec-2016	16-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	12-Dec-2016	12-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘

DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	26-Dec-2016	26-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	04-Jan-2017	04-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	06-Jan-2017	06-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	14-Dec-2016	14-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
EP004: Organic Matter							
DLSA BLOCK 11C	Soil Glass Jar - Unpreserved	13-Dec-2016	13-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 12B	Soil Glass Jar - Unpreserved	20-Dec-2016	20-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 2B	Soil Glass Jar - Unpreserved	16-Dec-2016	16-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 4A	Soil Glass Jar - Unpreserved	12-Dec-2016	12-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSD BLOCK 9C	Soil Glass Jar - Unpreserved	26-Dec-2016	26-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 5B	Soil Glass Jar - Unpreserved	04-Jan-2017	04-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSE BLOCK 6B	Soil Glass Jar - Unpreserved	06-Jan-2017	06-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 1A	Soil Glass Jar - Unpreserved	11-Jan-2017	11-Jan-2017	16-Jan-2017	✘	16-Jan-2017	✘
DLSF BLOCK 6B	Soil Glass Jar - Unpreserved	14-Dec-2016	14-Dec-2016	16-Jan-2017	✘	16-Jan-2017	✘

Requested Deliverables

PAUL JONES

- *AU Certificate of Analysis - NATA (COA)	Email	paul.jones@flinderspower.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	paul.jones@flinderspower.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	paul.jones@flinderspower.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	paul.jones@flinderspower.com.au
- A4 - AU Tax Invoice (INV)	Email	paul.jones@flinderspower.com.au
- Attachment - Report (SUBCO)	Email	paul.jones@flinderspower.com.au
- Chain of Custody (CoC) (COC)	Email	paul.jones@flinderspower.com.au
- EDI Format - ENMRG (ENMRG)	Email	paul.jones@flinderspower.com.au
- EDI Format - XTab (XTAB)	Email	paul.jones@flinderspower.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1700779**	Page	: 1 of 14
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Project	: LCK 17001	Date Samples Received	: 16-Jan-2017 10:10
Order number	: ----	Date Analysis Commenced	: 16-Jan-2017
C-O-C number	: ----	Issue Date	: 23-Jan-2017 16:52
Sampler	: ----		
Site	: ----		
Quote number	: BNBQ/333/16		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ED021 (Bicarbonate Extractable K Colwell) LOR for some samples have been raised due to matrix interference.
- ED008 (Exchangeable Cation with pre-treatment) and ED006 (Exchangeable Cations on Alkaline Soil): Magnesium/Potassium ratio could not be determined as both the Magnesium and Potassium results were less than reportable limits for some samples.
- ED038 (Acidity): NATA accreditation does not cover the performance of this service.
- EA031 (Saturated Paste pH): NATA accreditation does not cover the performance of this service.
- EA032 (Saturated Paste EC): NATA accreditation does not cover the performance of this service.
- Amendment (12/12/2016): This report has been amended and re-released to allow the reporting of additional analytical data.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 11C	DLSD BLOCK 4A	DLSD BLOCK 2B	DLSD BLOCK 12B	DLSD BLOCK 9C
			Client sampling date / time	15-Nov-2016 00:00	14-Nov-2016 00:00	18-Nov-2016 00:00	22-Nov-2016 00:00	28-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1700779-001	EB1700779-002	EB1700779-003	EB1700779-004	EB1700779-005
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.3	7.7	7.8	7.8	7.3
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	15.6	-21.7	-60.5	-1.6	-25.8
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	4900	7740	4530	4180	3810
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	15.6	30.0	85.3	14.5	32.5
ANC as CaCO3	----	0.1	% CaCO3	1.6	3.1	8.7	1.5	3.3
Fizz Rating	----	0	Fizz Unit	1	2	2	1	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.008	0.005	<0.005	0.007	<0.005
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	6.6	7.3	7.5	7.5	7.2
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	9070	18800	8370	9880	6150
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	7.1	7.3	7.7	7.9	8.0
ø pH (Fox)	----	0.1	pH Unit	6.6	7.1	7.9	7.6	6.4
ø Reaction Rate	----	1	-	3	4	4	4	2
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	13.1	7.2	13.6	13.0	10.5
EA150: Particle Sizing								
+75µm	----	1	%	19	4	35	29	26
+150µm	----	1	%	16	3	34	28	17
+300µm	----	1	%	15	2	32	27	12
+425µm	----	1	%	14	2	32	27	10
+600µm	----	1	%	14	2	31	27	10
+1180µm	----	1	%	13	1	30	26	8
+2.36mm	----	1	%	12	<1	28	25	6
+4.75mm	----	1	%	9	<1	26	24	4
+9.5mm	----	1	%	7	<1	23	23	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 11C	DLSD BLOCK 4A	DLSD BLOCK 2B	DLSD BLOCK 12B	DLSD BLOCK 9C
			Client sampling date / time	15-Nov-2016 00:00	14-Nov-2016 00:00	18-Nov-2016 00:00	22-Nov-2016 00:00	28-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1700779-001	EB1700779-002	EB1700779-003	EB1700779-004	EB1700779-005
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	34	38	23	31	26
Silt (2-60 µm)	----	1	%	45	56	42	38	46
Sand (0.06-2.00 mm)	----	1	%	9	5	6	5	21
Gravel (>2mm)	----	1	%	12	1	29	26	7
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.52	2.44	2.60	2.73	2.54
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	76.5	36.5	86.4	46.5	40.5
Exchangeable Magnesium	----	0.1	meq/100g	6.6	2.1	2.3	3.0	6.1
Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.1	<0.1	0.1	<0.1
Exchangeable Sodium	----	0.1	meq/100g	2.6	0.6	0.8	1.0	2.0
Exchangeable Aluminium	----	0.1	meq/100g	0.2	0.1	0.1	0.2	0.1
Cation Exchange Capacity	----	0.1	meq/100g	86.0	39.6	89.7	50.8	48.9
Exchangeable Calcium Percent	----	0.1	%	88.9	92.3	96.3	91.5	82.9
Exchangeable Magnesium Percent	----	0.1	%	7.7	5.4	2.6	6.0	12.4
Exchangeable Potassium Percent	----	0.1	%	<0.1	0.3	<0.1	0.2	0.2
Exchangeable Sodium Percent	----	0.1	%	3.0	1.6	0.9	2.0	4.2
Exchangeable Aluminium Percent	----	0.1	%	0.2	0.4	0.1	0.4	0.3
Calcium/Magnesium Ratio	----	0.1	-	11.6	17.4	37.6	15.5	6.6
Magnesium/Potassium Ratio	----	0.1	-	----	17.1	----	26.9	----
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	264	104	104	144	312
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	13300	7280	11500	8400	10300
Sulfur as S	63705-05-5	10	mg/kg	4440	2430	3820	2800	3420
Silica	7631-86-9	1	mg/kg	14	14	16	11	18
Silicon	7440-21-3	1	mg/kg	6	7	8	5	8
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	1.02	0.27	0.81	0.42	0.22

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSA BLOCK 11C	DLSD BLOCK 4A	DLSD BLOCK 2B	DLSD BLOCK 12B	DLSD BLOCK 9C
			Client sampling date / time	15-Nov-2016 00:00	14-Nov-2016 00:00	18-Nov-2016 00:00	22-Nov-2016 00:00	28-Nov-2016 00:00
Compound	CAS Number	LOR	Unit	EB1700779-001	EB1700779-002	EB1700779-003	EB1700779-004	EB1700779-005
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	220	280	460	420	70
Beryllium	7440-41-7	1	mg/kg	1	1	4	1	2
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	10	14	59	13	7
Manganese	7439-96-5	5	mg/kg	332	585	1420	529	166
Selenium	7782-49-2	5	mg/kg	<5	<5	14	<5	<5
Vanadium	7440-62-2	5	mg/kg	49	59	175	58	54
Arsenic	7440-38-2	5	mg/kg	<5	6	13	7	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	30	27	36	33
Copper	7440-50-8	5	mg/kg	28	45	44	64	21
Lead	7439-92-1	5	mg/kg	18	17	38	25	19
Nickel	7440-02-0	2	mg/kg	20	25	95	26	14
Zinc	7440-66-6	5	mg/kg	47	79	134	92	39
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.2	<0.1	0.1
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	6	6	<5	<5	<5
EP004: Organic Matter								
Organic Matter	----	0.5	%	10.1	7.7	3.1	5.6	7.9
Total Organic Carbon	----	0.5	%	5.9	4.5	1.8	3.3	4.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSE BLOCK 5B	DLSE BLOCK 6B	DLSF BLOCK 1A	DLSF BLOCK 6B	DLSF BLOCK 5C
			Client sampling date / time	07-Dec-2016 00:00	09-Dec-2016 00:00	14-Dec-2016 00:00	16-Nov-2016 00:00	04-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-006	EB1700779-007	EB1700779-008	EB1700779-009	EB1700779-010
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.4	7.4	7.8	7.6	7.7
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-4.1	-4.5	-0.5	2.9	-10.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	4130	3520	4430	3840	4210
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	15.7	9.1	15.8	9.0	31.2
ANC as CaCO3	----	0.1	% CaCO3	1.6	0.9	1.6	0.9	3.2
Fizz Rating	----	0	Fizz Unit	1	1	1	0	2
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.014	0.014	<0.005	0.008	0.006
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.0	7.0	7.4	7.2	7.4
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	5970	7070	6980	5980	7330
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	7.3	7.3	7.8	7.9	8.0
ø pH (Fox)	----	0.1	pH Unit	5.0	4.0	7.7	7.8	8.3
ø Reaction Rate	----	1	-	2	2	4	4	4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	10.5	4.4	4.6	6.0	5.1
EA150: Particle Sizing								
+75µm	----	1	%	34	32	18	25	22
+150µm	----	1	%	33	31	15	22	18
+300µm	----	1	%	33	31	13	20	16
+425µm	----	1	%	32	30	12	20	15
+600µm	----	1	%	32	30	11	19	14
+1180µm	----	1	%	32	29	10	17	12
+2.36mm	----	1	%	30	26	8	15	9
+4.75mm	----	1	%	26	22	5	13	6
+9.5mm	----	1	%	22	16	<1	7	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSE BLOCK 5B	DLSE BLOCK 6B	DLSF BLOCK 1A	DLSF BLOCK 6B	DLSF BLOCK 5C
			Client sampling date / time	07-Dec-2016 00:00	09-Dec-2016 00:00	14-Dec-2016 00:00	16-Nov-2016 00:00	04-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-006	EB1700779-007	EB1700779-008	EB1700779-009	EB1700779-010
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	25	24	50	26	35
Silt (2-60 µm)	----	1	%	40	40	19	48	37
Sand (0.06-2.00 mm)	----	1	%	4	9	23	10	18
Gravel (>2mm)	----	1	%	31	27	8	16	10
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.42	2.45	2.61	2.57	2.57
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	32.6	37.2	44.1	44.1	50.1
Exchangeable Magnesium	----	0.1	meq/100g	3.8	3.1	3.1	3.3	4.0
Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.3	0.3	0.3
Exchangeable Sodium	----	0.1	meq/100g	1.2	0.9	0.9	0.8	1.1
Exchangeable Aluminium	----	0.1	meq/100g	0.1	0.2	0.1	0.1	0.1
Cation Exchange Capacity	----	0.1	meq/100g	38.0	41.6	48.6	48.7	55.8
Exchangeable Calcium Percent	----	0.1	%	85.8	89.5	90.8	90.7	89.9
Exchangeable Magnesium Percent	----	0.1	%	10.1	7.4	6.4	6.7	7.2
Exchangeable Potassium Percent	----	0.1	%	0.6	0.5	0.7	0.6	0.6
Exchangeable Sodium Percent	----	0.1	%	3.3	2.2	1.8	1.7	2.0
Exchangeable Aluminium Percent	----	0.1	%	0.3	0.4	0.2	0.2	0.2
Calcium/Magnesium Ratio	----	0.1	-	8.6	12.0	14.2	13.4	12.5
Magnesium/Potassium Ratio	----	0.1	-	18.2	13.6	----	11.5	11.9
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	248	224	128	200	248
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	8820	7100	10500	9310	10800
Sulfur as S	63705-05-5	10	mg/kg	2940	2370	3520	3100	3610
Silica	7631-86-9	1	mg/kg	14	16	18	14	23
Silicon	7440-21-3	1	mg/kg	7	7	9	7	11
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.38	0.15	0.50	0.39	0.69

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSE BLOCK 5B	DLSE BLOCK 6B	DLSF BLOCK 1A	DLSF BLOCK 6B	DLSF BLOCK 5C
			Client sampling date / time	07-Dec-2016 00:00	09-Dec-2016 00:00	14-Dec-2016 00:00	16-Nov-2016 00:00	04-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-006	EB1700779-007	EB1700779-008	EB1700779-009	EB1700779-010
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	130	790	220	330	170
Beryllium	7440-41-7	1	mg/kg	1	1	1	1	1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	25	17	25	10	18
Manganese	7439-96-5	5	mg/kg	827	818	951	518	1750
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	43	52	50	43	50
Arsenic	7440-38-2	5	mg/kg	10	7	7	9	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	21	29	28	28	27
Copper	7440-50-8	5	mg/kg	46	41	46	49	38
Lead	7439-92-1	5	mg/kg	17	24	18	21	17
Nickel	7440-02-0	2	mg/kg	46	39	36	20	30
Zinc	7440-66-6	5	mg/kg	137	85	108	97	91
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	6	<5	<5	6
EP004: Organic Matter								
Organic Matter	----	0.5	%	9.4	7.7	5.1	6.6	4.4
Total Organic Carbon	----	0.5	%	5.4	4.5	3.0	3.8	2.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 11A	DLSF BLOCK 12C	DLSF BLOCK 2C	DLSF BLOCK 10C	DLSF BLOCK 15A
			Client sampling date / time	09-Jan-2017 00:00	11-Jan-2017 00:00	04-Jan-2017 00:00	04-Jan-2017 00:00	10-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-011	EB1700779-012	EB1700779-013	EB1700779-014	EB1700779-015
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	7.8	7.4	8.2	7.6
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-37.0	-2.6	-11.0	-81.1	-0.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	5650	3990	3810	4040	4040
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	56.6	46.4	36.7	88.1	25.2
ANC as CaCO3	----	0.1	% CaCO3	5.8	4.7	3.7	9.0	2.6
Fizz Rating	----	0	Fizz Unit	2	2	2	2	1
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	<0.005	0.007	<0.005	<0.005	0.010
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.7	7.6	6.8	8.1	7.5
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	10200	8850	5760	10400	7090
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	8.4	8.1	7.8	8.4	7.4
ø pH (Fox)	----	0.1	pH Unit	8.1	8.1	7.6	8.2	7.4
ø Reaction Rate	----	1	-	4	4	4	4	4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	5.8	12.2	4.8	6.7	12.8
EA150: Particle Sizing								
+75µm	----	1	%	32	34	33	24	57
+150µm	----	1	%	25	31	31	11	55
+300µm	----	1	%	22	29	30	8	54
+425µm	----	1	%	22	28	30	7	53
+600µm	----	1	%	21	27	30	7	52
+1180µm	----	1	%	20	26	29	6	50
+2.36mm	----	1	%	18	23	28	6	46
+4.75mm	----	1	%	16	19	24	5	39
+9.5mm	----	1	%	10	13	20	3	25
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 11A	DLSF BLOCK 12C	DLSF BLOCK 2C	DLSF BLOCK 10C	DLSF BLOCK 15A
			Client sampling date / time	09-Jan-2017 00:00	11-Jan-2017 00:00	04-Jan-2017 00:00	04-Jan-2017 00:00	10-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-011	EB1700779-012	EB1700779-013	EB1700779-014	EB1700779-015
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	9	24	33	21	14
Silt (2-60 µm)	----	1	%	55	40	34	44	28
Sand (0.06-2.00 mm)	----	1	%	17	12	5	29	11
Gravel (>2mm)	----	1	%	19	24	28	6	47
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.69	2.63	2.50	2.69	3.31
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	43.1	46.2	46.5	35.1	44.9
Exchangeable Magnesium	----	0.1	meq/100g	4.0	5.5	3.9	4.7	3.0
Exchangeable Potassium	----	0.1	meq/100g	0.5	0.4	0.3	0.6	0.3
Exchangeable Sodium	----	0.1	meq/100g	1.2	1.5	1.1	1.3	0.8
Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.2	<0.1	0.1
Cation Exchange Capacity	----	0.1	meq/100g	49.0	53.6	52.0	41.8	49.1
Exchangeable Calcium Percent	----	0.1	%	88.0	86.2	89.4	84.1	91.4
Exchangeable Magnesium Percent	----	0.1	%	8.2	10.2	7.5	11.2	6.1
Exchangeable Potassium Percent	----	0.1	%	1.0	0.7	0.6	1.4	0.7
Exchangeable Sodium Percent	----	0.1	%	2.6	2.7	2.2	3.0	1.6
Exchangeable Aluminium Percent	----	0.1	%	0.2	0.2	0.3	0.2	0.3
Calcium/Magnesium Ratio	----	0.1	-	10.8	8.4	11.9	7.5	15.0
Magnesium/Potassium Ratio	----	0.1	-	----	14.4	13.2	7.8	8.6
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	<200	<200	<200
ED038A: Acidity								
ø Acidity	----	1	mg/kg	80	192	328	48	264
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	11100	9560	9210	6580	10900
Sulfur as S	63705-05-5	10	mg/kg	3700	3190	3070	2200	3620
Silica	7631-86-9	1	mg/kg	30	22	20	46	16
Silicon	7440-21-3	1	mg/kg	14	10	9	22	7
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.64	1.43	0.84	0.23	0.80

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 11A	DLSF BLOCK 12C	DLSF BLOCK 2C	DLSF BLOCK 10C	DLSF BLOCK 15A
			Client sampling date / time	09-Jan-2017 00:00	11-Jan-2017 00:00	04-Jan-2017 00:00	04-Jan-2017 00:00	10-Jan-2017 00:00
Compound	CAS Number	LOR	Unit	EB1700779-011	EB1700779-012	EB1700779-013	EB1700779-014	EB1700779-015
				Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	140	130	210	120	270
Beryllium	7440-41-7	1	mg/kg	1	1	<1	1	1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cobalt	7440-48-4	2	mg/kg	13	15	17	13	20
Manganese	7439-96-5	5	mg/kg	656	916	2910	575	944
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	48	51	40	53	52
Arsenic	7440-38-2	5	mg/kg	8	8	5	8	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	1	<1	<1
Chromium	7440-47-3	2	mg/kg	30	27	25	28	30
Copper	7440-50-8	5	mg/kg	38	33	34	29	50
Lead	7439-92-1	5	mg/kg	15	14	11	13	20
Nickel	7440-02-0	2	mg/kg	23	26	29	22	36
Zinc	7440-66-6	5	mg/kg	68	76	70	63	127
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	11	<5	<5	8	<5
EP004: Organic Matter								
Organic Matter	----	0.5	%	1.1	5.0	6.0	0.9	5.8
Total Organic Carbon	----	0.5	%	0.6	2.9	3.5	0.5	3.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 8C	----	----	----	----
			Client sampling date / time	04-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1700779-016	--------	--------	--------	--------
				Result	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.8	----	----	----	----
EA009: Nett Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-53.6	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	10100	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	62.5	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	6.4	----	----	----	----
Fizz Rating	----	0	Fizz Unit	2	----	----	----	----
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.005	----	----	----	----
EA031: pH (saturated paste)								
ø pH (Saturated Paste)	----	0.1	pH Unit	7.4	----	----	----	----
EA032: Electrical Conductivity (saturated paste)								
ø Electrical Conductivity (Saturated Paste)	----	1	µS/cm	22900	----	----	----	----
EA037: Ass Field Screening Analysis								
ø pH (F)	----	0.1	pH Unit	7.9	----	----	----	----
ø pH (Fox)	----	0.1	pH Unit	8.3	----	----	----	----
ø Reaction Rate	----	1	-	4	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	1.7	----	----	----	----
EA150: Particle Sizing								
+75µm	----	1	%	26	----	----	----	----
+150µm	----	1	%	24	----	----	----	----
+300µm	----	1	%	22	----	----	----	----
+425µm	----	1	%	22	----	----	----	----
+600µm	----	1	%	21	----	----	----	----
+1180µm	----	1	%	20	----	----	----	----
+2.36mm	----	1	%	18	----	----	----	----
+4.75mm	----	1	%	16	----	----	----	----
+9.5mm	----	1	%	13	----	----	----	----
+19.0mm	----	1	%	<1	----	----	----	----
+37.5mm	----	1	%	<1	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 8C	----	----	----	----
			Client sampling date / time	04-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1700779-016	--------	--------	--------	--------
				Result	----	----	----	----
EA150: Particle Sizing - Continued								
+75.0mm	----	1	%	<1	----	----	----	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	31	----	----	----	----
Silt (2-60 µm)	----	1	%	43	----	----	----	----
Sand (0.06-2.00 mm)	----	1	%	7	----	----	----	----
Gravel (>2mm)	----	1	%	19	----	----	----	----
Cobbles (>6cm)	----	1	%	<1	----	----	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.64	----	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	37.3	----	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	3.3	----	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.3	----	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	0.5	----	----	----	----
Exchangeable Aluminium	----	0.1	meq/100g	0.1	----	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	41.6	----	----	----	----
Exchangeable Calcium Percent	----	0.1	%	89.7	----	----	----	----
Exchangeable Magnesium Percent	----	0.1	%	8.0	----	----	----	----
Exchangeable Potassium Percent	----	0.1	%	0.8	----	----	----	----
Exchangeable Sodium Percent	----	0.1	%	1.2	----	----	----	----
Exchangeable Aluminium Percent	----	0.1	%	0.3	----	----	----	----
Calcium/Magnesium Ratio	----	0.1	-	11.3	----	----	----	----
Magnesium/Potassium Ratio	----	0.1	-	10.4	----	----	----	----
ED021: Bicarbonate Extractable Potassium (Colwell)								
Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	----	----	----	----
ED038A: Acidity								
ø Acidity	----	1	mg/kg	160	----	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	9420	----	----	----	----
Sulfur as S	63705-05-5	10	mg/kg	3140	----	----	----	----
Silica	7631-86-9	1	mg/kg	32	----	----	----	----
Silicon	7440-21-3	1	mg/kg	15	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.29	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DLSF BLOCK 8C	----	----	----	----
			Client sampling date / time	04-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1700779-016	--------	--------	--------	--------
				Result	----	----	----	----
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	**180**	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	**1**	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	**17**	----	----	----	----
Manganese	7439-96-5	5	mg/kg	**654**	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	**57**	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	**10**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**29**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**39**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**14**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**24**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**72**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	**8**	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	**2.7**	----	----	----	----
Total Organic Carbon	----	0.5	%	**1.6**	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **EB1700779**	Page	: 1 of 7
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Contact	: Customer Services EB
Address	: GPO BOX 2535 ADELAIDE SA 5001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 8372 8605	Telephone	: +61-7-3243 7222
Project	: LCK 17001	Date Samples Received	: 16-Jan-2017
Order number	: ----	Date Analysis Commenced	: 16-Jan-2017
C-O-C number	: ----	Issue Date	: 23-Jan-2017
Sampler	: ----		
Site	: ----		
Quote number	: BNBQ/333/16		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils, Stafford, QLD
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002 : pH (Soils) (QC Lot: 721360)									
EB1700779-011	DLSF BLOCK 11A	EA002: pH Value	----	0.1	pH Unit	8.0	8.0	0.00	0% - 20%
EB1700779-001	DLSA BLOCK 11C	EA002: pH Value	----	0.1	pH Unit	7.3	7.3	0.00	0% - 20%
EA010: Conductivity (QC Lot: 721361)									
EB1700779-011	DLSF BLOCK 11A	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	5650	5850	3.48	0% - 20%
EB1700779-001	DLSA BLOCK 11C	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	4900	5060	3.21	0% - 20%
EA013: Acid Neutralising Capacity (QC Lot: 726318)									
EB1700779-001	DLSA BLOCK 11C	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	15.6	15.6	0.00	0% - 20%
EB1700779-012	DLSF BLOCK 12C	EA013: ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	46.4	45.9	1.06	0% - 20%
EA026 : Chromium Reducible Sulfur (QC Lot: 726319)									
EB1700779-001	DLSA BLOCK 11C	EA026: Chromium Reducible Sulphur	----	0.005	%	0.008	0.008	0.00	No Limit
EB1700779-012	DLSF BLOCK 12C	EA026: Chromium Reducible Sulphur	----	0.005	%	0.007	0.007	0.00	No Limit
EA031: pH (saturated paste) (QC Lot: 722824)									
EB1700779-001	DLSA BLOCK 11C	EA031: pH (Saturated Paste)	----	0.1	pH Unit	6.6	6.6	0.00	0% - 20%
EB1700779-011	DLSF BLOCK 11A	EA031: pH (Saturated Paste)	----	0.1	pH Unit	7.7	7.8	0.00	0% - 20%
EA032: Electrical Conductivity (saturated paste) (QC Lot: 722865)									
EB1700779-001	DLSA BLOCK 11C	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	9070	9100	0.352	0% - 20%
EB1700779-011	DLSF BLOCK 11A	EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	10200	10200	0.196	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 722375)									
EB1700779-001	DLSA BLOCK 11C	EA037: pH (F)	----	0.1	pH Unit	7.1	7.2	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	6.6	6.5	1.83	0% - 20%
EB1700779-011	DLSF BLOCK 11A	EA037: pH (F)	----	0.1	pH Unit	8.4	8.5	1.30	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	8.1	8.1	0.00	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA055: Moisture Content (QC Lot: 721363)									
EB1700779-001	DLSA BLOCK 11C	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	13.1	14.1	7.38	0% - 50%
EB1700779-011	DLSF BLOCK 11A	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	5.8	6.0	4.79	No Limit
ED008: Exchangeable Cations (QC Lot: 722075)									
EB1700779-001	DLSA BLOCK 11C	ED008: Exchangeable Calcium	----	0.1	meq/100g	76.5	76.2	0.415	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	6.6	6.6	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	2.6	2.6	0.00	0% - 20%
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
EB1700779-009	DLSF BLOCK 6B	ED008: Exchangeable Calcium	----	0.1	meq/100g	44.1	44.1	0.00	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.3	3.3	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.3	0.3	0.00	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.8	0.8	0.00	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	0.1	0.1	0.00	No Limit
ED021: Bicarbonate Extractable Potassium (Colwell) (QC Lot: 722072)									
EB1700779-001	DLSA BLOCK 11C	ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	0.00	No Limit
EB1700779-009	DLSF BLOCK 6B	ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	<200	0.00	No Limit
ED038A: Acidity (QC Lot: 721362)									
EB1700779-010	DLSF BLOCK 5C	ED038: Acidity	----	1	mg/kg	248	256	3.17	0% - 20%
EB1700779-001	DLSA BLOCK 11C	ED038: Acidity	----	1	mg/kg	264	260	1.53	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 721359)									
EB1700779-010	DLSF BLOCK 5C	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	10800	10500	3.52	0% - 20%
EB1700779-001	DLSA BLOCK 11C	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	13300	13100	1.28	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 727857)									
EB1700779-001	DLSA BLOCK 11C	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	1.02	0.96	5.98	0% - 20%
EB1700779-010	DLSF BLOCK 5C	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.69	0.69	0.00	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 721357)									
EB1700779-001	DLSA BLOCK 11C	EG005T: Beryllium	7440-41-7	1	mg/kg	1	1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	220	220	0.00	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	26	27	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	20	20	0.00	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	28	28	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	19	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	332	331	0.498	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	49	49	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	47	47	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 721357) - continued									
EB1700779-001	DLSA BLOCK 11C	EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EB1700779-011	DLSF BLOCK 11A	EG005T: Beryllium	7440-41-7	1	mg/kg	1	1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	140	140	0.00	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	30	30	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	13	13	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	23	24	4.73	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	38	38	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	15	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	656	655	0.00	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	48	48	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	68	68	0.00	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 721358)									
EB1700779-001	DLSA BLOCK 11C	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.00	No Limit
EB1700779-011	DLSF BLOCK 11A	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QC Lot: 722077)									
EB1700779-001	DLSA BLOCK 11C	EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	6	<5	0.00	No Limit
EB1700779-011	DLSF BLOCK 11A	EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	11	10	0.00	No Limit
EP004: Organic Matter (QC Lot: 722074)									
EB1700779-001	DLSA BLOCK 11C	EP004: Organic Matter	----	0.5	%	10.1	10.0	1.29	0% - 20%
		EP004: Total Organic Carbon	----	0.5	%	5.9	5.8	0.00	0% - 50%
EB1700779-010	DLSF BLOCK 5C	EP004: Organic Matter	----	0.5	%	4.4	4.8	7.83	No Limit
		EP004: Total Organic Carbon	----	0.5	%	2.6	2.8	7.88	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA002 : pH (Soils) (QCLot: 721360)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98	102
				----	7 pH Unit	99.7	98	102
EA010: Conductivity (QCLot: 721361)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.2	97	103
EA013: Acid Neutralising Capacity (QCLot: 726318)								
EA013: ANC as H2SO4	----	----	kg H2SO4 equiv./t	----	100 kg H2SO4 equiv./t	111	82	120
EA026 : Chromium Reducible Sulfur (QCLot: 726319)								
EA026: Chromium Reducible Sulphur	----	0.005	%	<0.005	0.25483 %	95.4	70	130
EA031: pH (saturated paste) (QCLot: 722824)								
EA031: pH (Saturated Paste)	----	----	pH Unit	----	4 pH Unit	100	99	101
				----	7 pH Unit	100	99	101
EA032: Electrical Conductivity (saturated paste) (QCLot: 722865)								
EA032: Electrical Conductivity (Saturated Paste)	----	1	µS/cm	<1	1413 µS/cm	99.8	97	103
ED008: Exchangeable Cations (QCLot: 722075)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	10.925 meq/100g	101	91	109
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	5.9518 meq/100g	105	89	111
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.4769 meq/100g	87.0	79	116
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.8718 meq/100g	77.0	75	118
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	18.2255 meq/100g	102	88	110
ED021: Bicarbonate Extractable Potassium (Colwell) (QCLot: 722072)								
ED021: Bicarbonate Extractable K (Colwell)	----	100	mg/kg	<200	----	----	----	----
ED038A: Acidity (QCLot: 721362)								
ED038: Acidity	----	1	mg/kg	<1	100 mg/kg	101	95	105
ED040S: Soluble Major Anions (QCLot: 721359)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	500 mg/kg	96.8	90	114
ED040S: Sulfur as S	63705-05-5	10	mg/kg	<10	----	----	----	----
ED040S: Silica	7631-86-9	1	mg/kg	<1	----	----	----	----
ED040S: Silicon	7440-21-3	1	mg/kg	<1	----	----	----	----
ED042T: Total Sulfur by LECO (QCLot: 727857)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.16 %	103	70	130
EG005T: Total Metals by ICP-AES (QCLot: 721357)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	118.9 mg/kg	94.8	84	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 721357) - continued								
EG005T: Barium	7440-39-3	10	mg/kg	<10	105.1967 mg/kg	93.1	89	129
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.59196 mg/kg	103	94	128
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.87125 mg/kg	114	88	117
EG005T: Chromium	7440-47-3	2	mg/kg	<2	22.7 mg/kg	94.9	83	125
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.5 mg/kg	103	89	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	55 mg/kg	107	86	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	72.1 mg/kg	101	84	119
EG005T: Manganese	7439-96-5	5	mg/kg	<5	604.6 mg/kg	99.0	84	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	16.6 mg/kg	93.1	89	126
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	69.8 mg/kg	98.7	91	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	182.3 mg/kg	104	87	127
EG035T: Total Recoverable Mercury by FIMS (QCLot: 721358)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.09821 mg/kg	104	78	122
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QCLot: 722077)								
EK080: Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	100 mg/kg	96.8	70	130
				<5	27 mg/kg	105	80	120
				<5	58.07 mg/kg	95.0	80	120
EP004: Organic Matter (QCLot: 722074)								
EP004: Organic Matter	----	0.5	%	<0.5	80 %	103	83	115
EP004: Total Organic Carbon	----	0.5	%	<0.5	46.4 %	103	85	115

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 721357)							
EB1700779-002	DLSD BLOCK 4A	EG005T: Arsenic	7440-38-2	50 mg/kg	105	70	130
		EG005T: Barium	7440-39-3	50 mg/kg	# Not Determined	70	130
		EG005T: Beryllium	7440-41-7	5 mg/kg	119	70	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	70	130
		EG005T: Cobalt	7440-48-4	50 mg/kg	110	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 721357) - continued							
EB1700779-002	DLSD BLOCK 4A	EG005T: Copper	7440-50-8	50 mg/kg	115	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	108	70	130
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	112	70	130
		EG005T: Vanadium	7440-62-2	50 mg/kg	115	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	117	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 721358)							
EB1700779-002	DLSD BLOCK 4A	EG035T: Mercury	7439-97-6	2.5 mg/kg	113	70	130
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QCLot: 722077)							
EB1700779-002	DLSD BLOCK 4A	EK080: Bicarbonate Ext. P (Colwell)	----	40 mg/kg	95.2	70	130
EP004: Organic Matter (QCLot: 722074)							
EB1700779-002	DLSD BLOCK 4A	EP004: Organic Matter	----	1.84 %	93.2	70	130
		EP004: Total Organic Carbon	----	1.04 %	93.1	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1700779**	Page	: 1 of 31
Client	: **FLINDERS POWER**	Laboratory	: Environmental Division Brisbane
Contact	: MR PAUL JONES	Telephone	: +61-7-3243 7222
Project	: LCK 17001	Date Samples Received	: 16-Jan-2017
Site	: ----	Issue Date	: 23-Jan-2017
Sampler	: ----	No. of samples received	: 16
Order number	: ----	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EB1700779--002	DLSD BLOCK 4A	**Barium**	7440-39-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EB1700779--002	DLSD BLOCK 4A	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA002 : pH (Soils)						
Soil Glass Jar - Unpreserved DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	17-Jan-2017	11-Jan-2017	**6**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	17-Jan-2017	14-Dec-2016	**34**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	17-Jan-2017	16-Dec-2016	**32**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 11A	17-Jan-2017	16-Jan-2017	**1**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	17-Jan-2017	21-Dec-2016	**27**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	17-Jan-2017	21-Nov-2016	**57**	----	----	----
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	17-Jan-2017	22-Nov-2016	**56**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	17-Jan-2017	23-Nov-2016	**55**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	17-Jan-2017	25-Nov-2016	**53**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	17-Jan-2017	29-Nov-2016	**49**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	17-Jan-2017	05-Dec-2016	**43**	----	----	----
EA010: Conductivity						
Soil Glass Jar - Unpreserved DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	17-Jan-2017	11-Jan-2017	**6**	----	----	----

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA010: Conductivity - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	17-Jan-2017	14-Dec-2016	**34**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	17-Jan-2017	16-Dec-2016	**32**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 11A	17-Jan-2017	16-Jan-2017	**1**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	17-Jan-2017	21-Dec-2016	**27**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	17-Jan-2017	21-Nov-2016	**57**	----	----	----
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	17-Jan-2017	22-Nov-2016	**56**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	17-Jan-2017	23-Nov-2016	**55**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	17-Jan-2017	25-Nov-2016	**53**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	17-Jan-2017	29-Nov-2016	**49**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	17-Jan-2017	05-Dec-2016	**43**	----	----	----
EA026 : Chromium Reducible Sulfur						
Soil Glass Jar - Unpreserved DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	20-Jan-2017	05-Jan-2017	**15**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	20-Jan-2017	08-Dec-2016	**43**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	20-Jan-2017	10-Dec-2016	**41**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 11A	20-Jan-2017	10-Jan-2017	**10**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 15A	20-Jan-2017	11-Jan-2017	**9**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 12C	20-Jan-2017	12-Jan-2017	**8**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	20-Jan-2017	15-Dec-2016	**36**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	20-Jan-2017	15-Nov-2016	**66**	----	----	----
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	20-Jan-2017	16-Nov-2016	**65**	----	----	----

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA026 : Chromium Reducible Sulfur - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved						
DLSF BLOCK 6B	20-Jan-2017	17-Nov-2016	**64**	----	----	----
Soil Glass Jar - Unpreserved						
DLSD BLOCK 2B	20-Jan-2017	19-Nov-2016	**62**	----	----	----
Soil Glass Jar - Unpreserved						
DLSD BLOCK 12B	20-Jan-2017	23-Nov-2016	**58**	----	----	----
Soil Glass Jar - Unpreserved						
DLSD BLOCK 9C	20-Jan-2017	29-Nov-2016	**52**	----	----	----
EA037: Ass Field Screening Analysis						
Soil Glass Jar - Unpreserved						
DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	20-Jan-2017	05-Jan-2017	**15**	20-Jan-2017	05-Jan-2017	**15**
Soil Glass Jar - Unpreserved						
DLSE BLOCK 5B	20-Jan-2017	08-Dec-2016	**43**	20-Jan-2017	08-Dec-2016	**43**
Soil Glass Jar - Unpreserved						
DLSE BLOCK 6B	20-Jan-2017	10-Dec-2016	**41**	20-Jan-2017	10-Dec-2016	**41**
Soil Glass Jar - Unpreserved						
DLSF BLOCK 11A	20-Jan-2017	10-Jan-2017	**10**	20-Jan-2017	10-Jan-2017	**10**
Soil Glass Jar - Unpreserved						
DLSF BLOCK 15A	20-Jan-2017	11-Jan-2017	**9**	20-Jan-2017	11-Jan-2017	**9**
Soil Glass Jar - Unpreserved						
DLSF BLOCK 12C	20-Jan-2017	12-Jan-2017	**8**	20-Jan-2017	12-Jan-2017	**8**
Soil Glass Jar - Unpreserved						
DLSF BLOCK 1A	20-Jan-2017	15-Dec-2016	**36**	20-Jan-2017	15-Dec-2016	**36**
Soil Glass Jar - Unpreserved						
DLSD BLOCK 4A	20-Jan-2017	15-Nov-2016	**66**	20-Jan-2017	15-Nov-2016	**66**
Soil Glass Jar - Unpreserved						
DLSA BLOCK 11C	20-Jan-2017	16-Nov-2016	**65**	20-Jan-2017	16-Nov-2016	**65**
Soil Glass Jar - Unpreserved						
DLSF BLOCK 6B	20-Jan-2017	17-Nov-2016	**64**	20-Jan-2017	17-Nov-2016	**64**
Soil Glass Jar - Unpreserved						
DLSD BLOCK 2B	20-Jan-2017	19-Nov-2016	**62**	20-Jan-2017	19-Nov-2016	**62**
Soil Glass Jar - Unpreserved						
DLSD BLOCK 12B	20-Jan-2017	23-Nov-2016	**58**	20-Jan-2017	23-Nov-2016	**58**
Soil Glass Jar - Unpreserved						
DLSD BLOCK 9C	20-Jan-2017	29-Nov-2016	**52**	20-Jan-2017	29-Nov-2016	**52**
EA055: Moisture Content						
Soil Glass Jar - Unpreserved						
DLSE BLOCK 5B	----	----	----	16-Jan-2017	21-Dec-2016	**26**
Soil Glass Jar - Unpreserved						
DLSE BLOCK 6B	----	----	----	16-Jan-2017	23-Dec-2016	**24**

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA055: Moisture Content - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	----	----	----	16-Jan-2017	28-Dec-2016	**19**
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	----	----	----	16-Jan-2017	28-Nov-2016	**49**
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	----	----	----	16-Jan-2017	29-Nov-2016	**48**
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	----	----	----	16-Jan-2017	30-Nov-2016	**47**
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	----	----	----	16-Jan-2017	02-Dec-2016	**45**
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	----	----	----	16-Jan-2017	06-Dec-2016	**41**
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	----	----	----	16-Jan-2017	12-Dec-2016	**35**
ED008: Exchangeable Cations						
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	18-Jan-2017	04-Jan-2017	**14**	19-Jan-2017	04-Jan-2017	**15**
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	18-Jan-2017	06-Jan-2017	**12**	19-Jan-2017	06-Jan-2017	**13**
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	18-Jan-2017	11-Jan-2017	**7**	19-Jan-2017	11-Jan-2017	**8**
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	18-Jan-2017	12-Dec-2016	**37**	19-Jan-2017	12-Dec-2016	**38**
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	18-Jan-2017	13-Dec-2016	**36**	19-Jan-2017	13-Dec-2016	**37**
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	18-Jan-2017	14-Dec-2016	**35**	19-Jan-2017	14-Dec-2016	**36**
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	18-Jan-2017	16-Dec-2016	**33**	19-Jan-2017	16-Dec-2016	**34**
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	18-Jan-2017	20-Dec-2016	**29**	19-Jan-2017	20-Dec-2016	**30**
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	18-Jan-2017	26-Dec-2016	**23**	19-Jan-2017	26-Dec-2016	**24**
ED040S : Soluble Sulfate by ICPAES						
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	17-Jan-2017	04-Jan-2017	**13**	----	----	----
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	17-Jan-2017	06-Jan-2017	**11**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	17-Jan-2017	11-Jan-2017	**6**	----	----	----

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED040S : Soluble Sulfate by ICPAES - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	17-Jan-2017	12-Dec-2016	**36**	----	----	----
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	17-Jan-2017	13-Dec-2016	**35**	----	----	----
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	17-Jan-2017	14-Dec-2016	**34**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	17-Jan-2017	16-Dec-2016	**32**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	17-Jan-2017	20-Dec-2016	**28**	----	----	----
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	17-Jan-2017	26-Dec-2016	**22**	----	----	----
ED042T: Total Sulfur by LECO						
Pulp Bag DLSE BLOCK 5B	20-Jan-2017	04-Jan-2017	**16**	20-Jan-2017	04-Jan-2017	**16**
Pulp Bag DLSE BLOCK 6B	20-Jan-2017	06-Jan-2017	**14**	20-Jan-2017	06-Jan-2017	**14**
Pulp Bag DLSF BLOCK 1A	20-Jan-2017	11-Jan-2017	**9**	20-Jan-2017	11-Jan-2017	**9**
Pulp Bag DLSD BLOCK 4A	20-Jan-2017	12-Dec-2016	**39**	20-Jan-2017	12-Dec-2016	**39**
Pulp Bag DLSA BLOCK 11C	20-Jan-2017	13-Dec-2016	**38**	20-Jan-2017	13-Dec-2016	**38**
Pulp Bag DLSF BLOCK 6B	20-Jan-2017	14-Dec-2016	**37**	20-Jan-2017	14-Dec-2016	**37**
Pulp Bag DLSD BLOCK 2B	20-Jan-2017	16-Dec-2016	**35**	20-Jan-2017	16-Dec-2016	**35**
Pulp Bag DLSD BLOCK 12B	20-Jan-2017	20-Dec-2016	**31**	20-Jan-2017	20-Dec-2016	**31**
Pulp Bag DLSD BLOCK 9C	20-Jan-2017	26-Dec-2016	**25**	20-Jan-2017	26-Dec-2016	**25**
EG035T: Total Recoverable Mercury by FIMS						
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	18-Jan-2017	04-Jan-2017	**14**	19-Jan-2017	04-Jan-2017	**15**
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	18-Jan-2017	06-Jan-2017	**12**	19-Jan-2017	06-Jan-2017	**13**
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	18-Jan-2017	11-Jan-2017	**7**	19-Jan-2017	11-Jan-2017	**8**
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	18-Jan-2017	12-Dec-2016	**37**	19-Jan-2017	12-Dec-2016	**38**

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EG035T: Total Recoverable Mercury by FIMS - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	18-Jan-2017	13-Dec-2016	**36**	19-Jan-2017	13-Dec-2016	**37**
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	18-Jan-2017	14-Dec-2016	**35**	19-Jan-2017	14-Dec-2016	**36**
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	18-Jan-2017	16-Dec-2016	**33**	19-Jan-2017	16-Dec-2016	**34**
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	18-Jan-2017	20-Dec-2016	**29**	19-Jan-2017	20-Dec-2016	**30**
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	18-Jan-2017	26-Dec-2016	**23**	19-Jan-2017	26-Dec-2016	**24**
EP004: Organic Matter						
Soil Glass Jar - Unpreserved DLSE BLOCK 5B	18-Jan-2017	04-Jan-2017	**14**	20-Jan-2017	04-Jan-2017	**16**
Soil Glass Jar - Unpreserved DLSE BLOCK 6B	18-Jan-2017	06-Jan-2017	**12**	20-Jan-2017	06-Jan-2017	**14**
Soil Glass Jar - Unpreserved DLSF BLOCK 1A	18-Jan-2017	11-Jan-2017	**7**	20-Jan-2017	11-Jan-2017	**9**
Soil Glass Jar - Unpreserved DLSD BLOCK 4A	18-Jan-2017	12-Dec-2016	**37**	20-Jan-2017	12-Dec-2016	**39**
Soil Glass Jar - Unpreserved DLSA BLOCK 11C	18-Jan-2017	13-Dec-2016	**36**	20-Jan-2017	13-Dec-2016	**38**
Soil Glass Jar - Unpreserved DLSF BLOCK 6B	18-Jan-2017	14-Dec-2016	**35**	20-Jan-2017	14-Dec-2016	**37**
Soil Glass Jar - Unpreserved DLSD BLOCK 2B	18-Jan-2017	16-Dec-2016	**33**	20-Jan-2017	16-Dec-2016	**35**
Soil Glass Jar - Unpreserved DLSD BLOCK 12B	18-Jan-2017	20-Dec-2016	**29**	20-Jan-2017	20-Dec-2016	**31**
Soil Glass Jar - Unpreserved DLSD BLOCK 9C	18-Jan-2017	26-Dec-2016	**23**	20-Jan-2017	26-Dec-2016	**25**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002 : pH (Soils)							
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**17-Jan-2017**	11-Jan-2017	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSE BLOCK 5B	**07-Dec-2016**	**17-Jan-2017**	14-Dec-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSE BLOCK 6B	**09-Dec-2016**	**17-Jan-2017**	16-Dec-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 11A	**09-Jan-2017**	**17-Jan-2017**	16-Jan-2017	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 15A	**10-Jan-2017**	**17-Jan-2017**	17-Jan-2017	✓	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 12C	**11-Jan-2017**	**17-Jan-2017**	18-Jan-2017	✓	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 1A	**14-Dec-2016**	**17-Jan-2017**	21-Dec-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSD BLOCK 4A	**14-Nov-2016**	**17-Jan-2017**	21-Nov-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSA BLOCK 11C	**15-Nov-2016**	**17-Jan-2017**	22-Nov-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSF BLOCK 6B	**16-Nov-2016**	**17-Jan-2017**	23-Nov-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSD BLOCK 2B	**18-Nov-2016**	**17-Jan-2017**	25-Nov-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSD BLOCK 12B	**22-Nov-2016**	**17-Jan-2017**	29-Nov-2016	×	**17-Jan-2017**	17-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA002) DLSD BLOCK 9C	**28-Nov-2016**	**17-Jan-2017**	05-Dec-2016	×	**17-Jan-2017**	17-Jan-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**17-Jan-2017**	11-Jan-2017	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSE BLOCK 5B	**07-Dec-2016**	**17-Jan-2017**	14-Dec-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSE BLOCK 6B	**09-Dec-2016**	**17-Jan-2017**	16-Dec-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 11A	**09-Jan-2017**	**17-Jan-2017**	16-Jan-2017	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 15A	**10-Jan-2017**	**17-Jan-2017**	17-Jan-2017	✓	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 12C	**11-Jan-2017**	**17-Jan-2017**	18-Jan-2017	✓	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 1A	**14-Dec-2016**	**17-Jan-2017**	21-Dec-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSD BLOCK 4A	**14-Nov-2016**	**17-Jan-2017**	21-Nov-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSA BLOCK 11C	**15-Nov-2016**	**17-Jan-2017**	22-Nov-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSF BLOCK 6B	**16-Nov-2016**	**17-Jan-2017**	23-Nov-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSD BLOCK 2B	**18-Nov-2016**	**17-Jan-2017**	25-Nov-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSD BLOCK 12B	**22-Nov-2016**	**17-Jan-2017**	29-Nov-2016	×	**17-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (EA010) DLSD BLOCK 9C	**28-Nov-2016**	**17-Jan-2017**	05-Dec-2016	×	**17-Jan-2017**	14-Feb-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA013: Acid Neutralising Capacity							
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**20-Jan-2017**	04-Jan-2018	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSE BLOCK 5B	**07-Dec-2016**	**20-Jan-2017**	07-Dec-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSE BLOCK 6B	**09-Dec-2016**	**20-Jan-2017**	09-Dec-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 11A	**09-Jan-2017**	**20-Jan-2017**	09-Jan-2018	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 15A	**10-Jan-2017**	**20-Jan-2017**	10-Jan-2018	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 12C	**11-Jan-2017**	**20-Jan-2017**	11-Jan-2018	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 1A	**14-Dec-2016**	**20-Jan-2017**	14-Dec-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSD BLOCK 4A	**14-Nov-2016**	**20-Jan-2017**	14-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSA BLOCK 11C	**15-Nov-2016**	**20-Jan-2017**	15-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSF BLOCK 6B	**16-Nov-2016**	**20-Jan-2017**	16-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSD BLOCK 2B	**18-Nov-2016**	**20-Jan-2017**	18-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSD BLOCK 12B	**22-Nov-2016**	**20-Jan-2017**	22-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA013) DLSD BLOCK 9C	**28-Nov-2016**	**20-Jan-2017**	28-Nov-2017	✓	**23-Jan-2017**	19-Jul-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA026 : Chromium Reducible Sulfur							
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**20-Jan-2017**	05-Jan-2017	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSE BLOCK 5B	**07-Dec-2016**	**20-Jan-2017**	08-Dec-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSE BLOCK 6B	**09-Dec-2016**	**20-Jan-2017**	10-Dec-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 11A	**09-Jan-2017**	**20-Jan-2017**	10-Jan-2017	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 15A	**10-Jan-2017**	**20-Jan-2017**	11-Jan-2017	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 12C	**11-Jan-2017**	**20-Jan-2017**	12-Jan-2017	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 1A	**14-Dec-2016**	**20-Jan-2017**	15-Dec-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSD BLOCK 4A	**14-Nov-2016**	**20-Jan-2017**	15-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSA BLOCK 11C	**15-Nov-2016**	**20-Jan-2017**	16-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSF BLOCK 6B	**16-Nov-2016**	**20-Jan-2017**	17-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSD BLOCK 2B	**18-Nov-2016**	**20-Jan-2017**	19-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSD BLOCK 12B	**22-Nov-2016**	**20-Jan-2017**	23-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓
Soil Glass Jar - Unpreserved (EA026) DLSD BLOCK 9C	**28-Nov-2016**	**20-Jan-2017**	29-Nov-2016	×	**23-Jan-2017**	20-Apr-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA031: pH (saturated paste)							
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**17-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**17-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**17-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 11A	**09-Jan-2017**	**----**	----	----	**17-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 15A	**10-Jan-2017**	**----**	----	----	**17-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**17-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**17-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**17-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**17-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**17-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**17-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**17-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (EA031) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**17-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA032: Electrical Conductivity (saturated paste)							
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**17-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**17-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**17-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 11A	**09-Jan-2017**	**----**	----	----	**17-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 15A	**10-Jan-2017**	**----**	----	----	**17-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**17-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**17-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**17-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**17-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**17-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**17-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**17-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (EA032) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**17-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis							
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**20-Jan-2017**	05-Jan-2017	×	**20-Jan-2017**	05-Jan-2017	×
Soil Glass Jar - Unpreserved (EA037) DLSE BLOCK 5B	**07-Dec-2016**	**20-Jan-2017**	08-Dec-2016	×	**20-Jan-2017**	08-Dec-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSE BLOCK 6B	**09-Dec-2016**	**20-Jan-2017**	10-Dec-2016	×	**20-Jan-2017**	10-Dec-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 11A	**09-Jan-2017**	**20-Jan-2017**	10-Jan-2017	×	**20-Jan-2017**	10-Jan-2017	×
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 15A	**10-Jan-2017**	**20-Jan-2017**	11-Jan-2017	×	**20-Jan-2017**	11-Jan-2017	×
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 12C	**11-Jan-2017**	**20-Jan-2017**	12-Jan-2017	×	**20-Jan-2017**	12-Jan-2017	×
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 1A	**14-Dec-2016**	**20-Jan-2017**	15-Dec-2016	×	**20-Jan-2017**	15-Dec-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSD BLOCK 4A	**14-Nov-2016**	**20-Jan-2017**	15-Nov-2016	×	**20-Jan-2017**	15-Nov-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSA BLOCK 11C	**15-Nov-2016**	**20-Jan-2017**	16-Nov-2016	×	**20-Jan-2017**	16-Nov-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSF BLOCK 6B	**16-Nov-2016**	**20-Jan-2017**	17-Nov-2016	×	**20-Jan-2017**	17-Nov-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSD BLOCK 2B	**18-Nov-2016**	**20-Jan-2017**	19-Nov-2016	×	**20-Jan-2017**	19-Nov-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSD BLOCK 12B	**22-Nov-2016**	**20-Jan-2017**	23-Nov-2016	×	**20-Jan-2017**	23-Nov-2016	×
Soil Glass Jar - Unpreserved (EA037) DLSD BLOCK 9C	**28-Nov-2016**	**20-Jan-2017**	29-Nov-2016	×	**20-Jan-2017**	29-Nov-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**16-Jan-2017**	18-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA055-103) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**16-Jan-2017**	21-Dec-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**16-Jan-2017**	23-Dec-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 11A	**09-Jan-2017**	**----**	----	----	**16-Jan-2017**	23-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 15A	**10-Jan-2017**	**----**	----	----	**16-Jan-2017**	24-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**16-Jan-2017**	25-Jan-2017	✓
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**16-Jan-2017**	28-Dec-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**16-Jan-2017**	28-Nov-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**16-Jan-2017**	29-Nov-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**16-Jan-2017**	30-Nov-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**16-Jan-2017**	02-Dec-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**16-Jan-2017**	06-Dec-2016	×
Soil Glass Jar - Unpreserved (EA055-103) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**16-Jan-2017**	12-Dec-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Particle Sizing							
Plastic Bag (EA150H) DLSF BLOCK 5C, DLSF BLOCK 11A, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 15A, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**20-Jan-2017**	03-Jul-2017	✓
Plastic Bag (EA150H) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**20-Jan-2017**	05-Jun-2017	✓
Plastic Bag (EA150H) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**20-Jan-2017**	07-Jun-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**20-Jan-2017**	10-Jul-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**20-Jan-2017**	12-Jun-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**20-Jan-2017**	13-May-2017	✓
Plastic Bag (EA150H) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**20-Jan-2017**	14-May-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**20-Jan-2017**	15-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**20-Jan-2017**	17-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**20-Jan-2017**	21-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**20-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Soil Classification based on Particle Size							
Plastic Bag (EA150H) DLSF BLOCK 5C, DLSF BLOCK 11A, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 15A, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**20-Jan-2017**	03-Jul-2017	✓
Plastic Bag (EA150H) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**20-Jan-2017**	05-Jun-2017	✓
Plastic Bag (EA150H) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**20-Jan-2017**	07-Jun-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**20-Jan-2017**	10-Jul-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**20-Jan-2017**	12-Jun-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**20-Jan-2017**	13-May-2017	✓
Plastic Bag (EA150H) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**20-Jan-2017**	14-May-2017	✓
Plastic Bag (EA150H) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**20-Jan-2017**	15-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**20-Jan-2017**	17-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**20-Jan-2017**	21-May-2017	✓
Plastic Bag (EA150H) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**20-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA152: Soil Particle Density							
Plastic Bag (EA152) DLSF BLOCK 5C, DLSF BLOCK 11A, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 15A, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**20-Jan-2017**	03-Jul-2017	✓
Plastic Bag (EA152) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**20-Jan-2017**	05-Jun-2017	✓
Plastic Bag (EA152) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**20-Jan-2017**	07-Jun-2017	✓
Plastic Bag (EA152) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**20-Jan-2017**	10-Jul-2017	✓
Plastic Bag (EA152) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**20-Jan-2017**	12-Jun-2017	✓
Plastic Bag (EA152) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**20-Jan-2017**	13-May-2017	✓
Plastic Bag (EA152) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**20-Jan-2017**	14-May-2017	✓
Plastic Bag (EA152) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**20-Jan-2017**	15-May-2017	✓
Plastic Bag (EA152) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**20-Jan-2017**	17-May-2017	✓
Plastic Bag (EA152) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**20-Jan-2017**	21-May-2017	✓
Plastic Bag (EA152) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**20-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**18-Jan-2017**	01-Feb-2017	✓	**19-Jan-2017**	01-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED008) DLSE BLOCK 5B	**07-Dec-2016**	**18-Jan-2017**	04-Jan-2017	×	**19-Jan-2017**	04-Jan-2017	×
Soil Glass Jar - Unpreserved (ED008) DLSE BLOCK 6B	**09-Dec-2016**	**18-Jan-2017**	06-Jan-2017	×	**19-Jan-2017**	06-Jan-2017	×
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 11A	**09-Jan-2017**	**18-Jan-2017**	06-Feb-2017	✓	**19-Jan-2017**	06-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 15A	**10-Jan-2017**	**18-Jan-2017**	07-Feb-2017	✓	**19-Jan-2017**	07-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 12C	**11-Jan-2017**	**18-Jan-2017**	08-Feb-2017	✓	**19-Jan-2017**	08-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 1A	**14-Dec-2016**	**18-Jan-2017**	11-Jan-2017	×	**19-Jan-2017**	11-Jan-2017	×
Soil Glass Jar - Unpreserved (ED008) DLSD BLOCK 4A	**14-Nov-2016**	**18-Jan-2017**	12-Dec-2016	×	**19-Jan-2017**	12-Dec-2016	×
Soil Glass Jar - Unpreserved (ED008) DLSA BLOCK 11C	**15-Nov-2016**	**18-Jan-2017**	13-Dec-2016	×	**19-Jan-2017**	13-Dec-2016	×
Soil Glass Jar - Unpreserved (ED008) DLSF BLOCK 6B	**16-Nov-2016**	**18-Jan-2017**	14-Dec-2016	×	**19-Jan-2017**	14-Dec-2016	×
Soil Glass Jar - Unpreserved (ED008) DLSD BLOCK 2B	**18-Nov-2016**	**18-Jan-2017**	16-Dec-2016	×	**19-Jan-2017**	16-Dec-2016	×
Soil Glass Jar - Unpreserved (ED008) DLSD BLOCK 12B	**22-Nov-2016**	**18-Jan-2017**	20-Dec-2016	×	**19-Jan-2017**	20-Dec-2016	×
Soil Glass Jar - Unpreserved (ED008) DLSD BLOCK 9C	**28-Nov-2016**	**18-Jan-2017**	26-Dec-2016	×	**19-Jan-2017**	26-Dec-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED021: Bicarbonate Extractable Potassium (Colwell)							
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**17-Jan-2017**	03-Jul-2017	✓	**19-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSE BLOCK 5B	**07-Dec-2016**	**17-Jan-2017**	05-Jun-2017	✓	**19-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSE BLOCK 6B	**09-Dec-2016**	**17-Jan-2017**	07-Jun-2017	✓	**19-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 11A	**09-Jan-2017**	**17-Jan-2017**	08-Jul-2017	✓	**19-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 15A	**10-Jan-2017**	**17-Jan-2017**	09-Jul-2017	✓	**19-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 12C	**11-Jan-2017**	**17-Jan-2017**	10-Jul-2017	✓	**19-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 1A	**14-Dec-2016**	**17-Jan-2017**	12-Jun-2017	✓	**19-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSD BLOCK 4A	**14-Nov-2016**	**17-Jan-2017**	13-May-2017	✓	**19-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSA BLOCK 11C	**15-Nov-2016**	**17-Jan-2017**	14-May-2017	✓	**19-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSF BLOCK 6B	**16-Nov-2016**	**17-Jan-2017**	15-May-2017	✓	**19-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSD BLOCK 2B	**18-Nov-2016**	**17-Jan-2017**	17-May-2017	✓	**19-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSD BLOCK 12B	**22-Nov-2016**	**17-Jan-2017**	21-May-2017	✓	**19-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (ED021) DLSD BLOCK 9C	**28-Nov-2016**	**17-Jan-2017**	27-May-2017	✓	**19-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED038A: Acidity							
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**17-Jan-2017**	03-Jul-2017	✓	**17-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSE BLOCK 5B	**07-Dec-2016**	**17-Jan-2017**	05-Jun-2017	✓	**17-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSE BLOCK 6B	**09-Dec-2016**	**17-Jan-2017**	07-Jun-2017	✓	**17-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 11A	**09-Jan-2017**	**17-Jan-2017**	08-Jul-2017	✓	**17-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 15A	**10-Jan-2017**	**17-Jan-2017**	09-Jul-2017	✓	**17-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 12C	**11-Jan-2017**	**17-Jan-2017**	10-Jul-2017	✓	**17-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 1A	**14-Dec-2016**	**17-Jan-2017**	12-Jun-2017	✓	**17-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSD BLOCK 4A	**14-Nov-2016**	**17-Jan-2017**	13-May-2017	✓	**17-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSA BLOCK 11C	**15-Nov-2016**	**17-Jan-2017**	14-May-2017	✓	**17-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSF BLOCK 6B	**16-Nov-2016**	**17-Jan-2017**	15-May-2017	✓	**17-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSD BLOCK 2B	**18-Nov-2016**	**17-Jan-2017**	17-May-2017	✓	**17-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSD BLOCK 12B	**22-Nov-2016**	**17-Jan-2017**	21-May-2017	✓	**17-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (ED038) DLSD BLOCK 9C	**28-Nov-2016**	**17-Jan-2017**	27-May-2017	✓	**17-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED040S : Soluble Sulfate by ICPAES							
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**17-Jan-2017**	01-Feb-2017	✓	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSE BLOCK 5B	**07-Dec-2016**	**17-Jan-2017**	04-Jan-2017	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSE BLOCK 6B	**09-Dec-2016**	**17-Jan-2017**	06-Jan-2017	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 11A	**09-Jan-2017**	**17-Jan-2017**	06-Feb-2017	✓	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 15A	**10-Jan-2017**	**17-Jan-2017**	07-Feb-2017	✓	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 12C	**11-Jan-2017**	**17-Jan-2017**	08-Feb-2017	✓	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 1A	**14-Dec-2016**	**17-Jan-2017**	11-Jan-2017	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSD BLOCK 4A	**14-Nov-2016**	**17-Jan-2017**	12-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSA BLOCK 11C	**15-Nov-2016**	**17-Jan-2017**	13-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSF BLOCK 6B	**16-Nov-2016**	**17-Jan-2017**	14-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSD BLOCK 2B	**18-Nov-2016**	**17-Jan-2017**	16-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSD BLOCK 12B	**22-Nov-2016**	**17-Jan-2017**	20-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓
Soil Glass Jar - Unpreserved (ED040S) DLSD BLOCK 9C	**28-Nov-2016**	**17-Jan-2017**	26-Dec-2016	×	**20-Jan-2017**	14-Feb-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag (ED042T) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**20-Jan-2017**	01-Feb-2017	✓	**20-Jan-2017**	01-Feb-2017	✓
Pulp Bag (ED042T) DLSE BLOCK 5B	**07-Dec-2016**	**20-Jan-2017**	04-Jan-2017	×	**20-Jan-2017**	04-Jan-2017	×
Pulp Bag (ED042T) DLSE BLOCK 6B	**09-Dec-2016**	**20-Jan-2017**	06-Jan-2017	×	**20-Jan-2017**	06-Jan-2017	×
Pulp Bag (ED042T) DLSF BLOCK 11A	**09-Jan-2017**	**20-Jan-2017**	06-Feb-2017	✓	**20-Jan-2017**	06-Feb-2017	✓
Pulp Bag (ED042T) DLSF BLOCK 15A	**10-Jan-2017**	**20-Jan-2017**	07-Feb-2017	✓	**20-Jan-2017**	07-Feb-2017	✓
Pulp Bag (ED042T) DLSF BLOCK 12C	**11-Jan-2017**	**20-Jan-2017**	08-Feb-2017	✓	**20-Jan-2017**	08-Feb-2017	✓
Pulp Bag (ED042T) DLSF BLOCK 1A	**14-Dec-2016**	**20-Jan-2017**	11-Jan-2017	×	**20-Jan-2017**	11-Jan-2017	×
Pulp Bag (ED042T) DLSD BLOCK 4A	**14-Nov-2016**	**20-Jan-2017**	12-Dec-2016	×	**20-Jan-2017**	12-Dec-2016	×
Pulp Bag (ED042T) DLSA BLOCK 11C	**15-Nov-2016**	**20-Jan-2017**	13-Dec-2016	×	**20-Jan-2017**	13-Dec-2016	×
Pulp Bag (ED042T) DLSF BLOCK 6B	**16-Nov-2016**	**20-Jan-2017**	14-Dec-2016	×	**20-Jan-2017**	14-Dec-2016	×
Pulp Bag (ED042T) DLSD BLOCK 2B	**18-Nov-2016**	**20-Jan-2017**	16-Dec-2016	×	**20-Jan-2017**	16-Dec-2016	×
Pulp Bag (ED042T) DLSD BLOCK 12B	**22-Nov-2016**	**20-Jan-2017**	20-Dec-2016	×	**20-Jan-2017**	20-Dec-2016	×
Pulp Bag (ED042T) DLSD BLOCK 9C	**28-Nov-2016**	**20-Jan-2017**	26-Dec-2016	×	**20-Jan-2017**	26-Dec-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**18-Jan-2017**	03-Jul-2017	✓	**19-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSE BLOCK 5B	**07-Dec-2016**	**18-Jan-2017**	05-Jun-2017	✓	**19-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSE BLOCK 6B	**09-Dec-2016**	**18-Jan-2017**	07-Jun-2017	✓	**19-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 11A	**09-Jan-2017**	**18-Jan-2017**	08-Jul-2017	✓	**19-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 15A	**10-Jan-2017**	**18-Jan-2017**	09-Jul-2017	✓	**19-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 12C	**11-Jan-2017**	**18-Jan-2017**	10-Jul-2017	✓	**19-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 1A	**14-Dec-2016**	**18-Jan-2017**	12-Jun-2017	✓	**19-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSD BLOCK 4A	**14-Nov-2016**	**18-Jan-2017**	13-May-2017	✓	**19-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSA BLOCK 11C	**15-Nov-2016**	**18-Jan-2017**	14-May-2017	✓	**19-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSF BLOCK 6B	**16-Nov-2016**	**18-Jan-2017**	15-May-2017	✓	**19-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSD BLOCK 2B	**18-Nov-2016**	**18-Jan-2017**	17-May-2017	✓	**19-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSD BLOCK 12B	**22-Nov-2016**	**18-Jan-2017**	21-May-2017	✓	**19-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (EG005T) DLSD BLOCK 9C	**28-Nov-2016**	**18-Jan-2017**	27-May-2017	✓	**19-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**18-Jan-2017**	01-Feb-2017	✓	**19-Jan-2017**	01-Feb-2017	✓
Soil Glass Jar - Unpreserved (EG035T) DLSE BLOCK 5B	**07-Dec-2016**	**18-Jan-2017**	04-Jan-2017	×	**19-Jan-2017**	04-Jan-2017	×
Soil Glass Jar - Unpreserved (EG035T) DLSE BLOCK 6B	**09-Dec-2016**	**18-Jan-2017**	06-Jan-2017	×	**19-Jan-2017**	06-Jan-2017	×
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 11A	**09-Jan-2017**	**18-Jan-2017**	06-Feb-2017	✓	**19-Jan-2017**	06-Feb-2017	✓
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 15A	**10-Jan-2017**	**18-Jan-2017**	07-Feb-2017	✓	**19-Jan-2017**	07-Feb-2017	✓
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 12C	**11-Jan-2017**	**18-Jan-2017**	08-Feb-2017	✓	**19-Jan-2017**	08-Feb-2017	✓
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 1A	**14-Dec-2016**	**18-Jan-2017**	11-Jan-2017	×	**19-Jan-2017**	11-Jan-2017	×
Soil Glass Jar - Unpreserved (EG035T) DLSD BLOCK 4A	**14-Nov-2016**	**18-Jan-2017**	12-Dec-2016	×	**19-Jan-2017**	12-Dec-2016	×
Soil Glass Jar - Unpreserved (EG035T) DLSA BLOCK 11C	**15-Nov-2016**	**18-Jan-2017**	13-Dec-2016	×	**19-Jan-2017**	13-Dec-2016	×
Soil Glass Jar - Unpreserved (EG035T) DLSF BLOCK 6B	**16-Nov-2016**	**18-Jan-2017**	14-Dec-2016	×	**19-Jan-2017**	14-Dec-2016	×
Soil Glass Jar - Unpreserved (EG035T) DLSD BLOCK 2B	**18-Nov-2016**	**18-Jan-2017**	16-Dec-2016	×	**19-Jan-2017**	16-Dec-2016	×
Soil Glass Jar - Unpreserved (EG035T) DLSD BLOCK 12B	**22-Nov-2016**	**18-Jan-2017**	20-Dec-2016	×	**19-Jan-2017**	20-Dec-2016	×
Soil Glass Jar - Unpreserved (EG035T) DLSD BLOCK 9C	**28-Nov-2016**	**18-Jan-2017**	26-Dec-2016	×	**19-Jan-2017**	26-Dec-2016	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK080: Bicarbonate Extractable Phosphorus (Colwell)							
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**----**	----	----	**17-Jan-2017**	03-Jul-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSE BLOCK 5B	**07-Dec-2016**	**----**	----	----	**17-Jan-2017**	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSE BLOCK 6B	**09-Dec-2016**	**----**	----	----	**17-Jan-2017**	07-Jun-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 11A	**09-Jan-2017**	**----**	----	----	**17-Jan-2017**	08-Jul-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 15A	**10-Jan-2017**	**----**	----	----	**17-Jan-2017**	09-Jul-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 12C	**11-Jan-2017**	**----**	----	----	**17-Jan-2017**	10-Jul-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 1A	**14-Dec-2016**	**----**	----	----	**17-Jan-2017**	12-Jun-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSD BLOCK 4A	**14-Nov-2016**	**----**	----	----	**17-Jan-2017**	13-May-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSA BLOCK 11C	**15-Nov-2016**	**----**	----	----	**17-Jan-2017**	14-May-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSF BLOCK 6B	**16-Nov-2016**	**----**	----	----	**17-Jan-2017**	15-May-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSD BLOCK 2B	**18-Nov-2016**	**----**	----	----	**17-Jan-2017**	17-May-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSD BLOCK 12B	**22-Nov-2016**	**----**	----	----	**17-Jan-2017**	21-May-2017	✓
Soil Glass Jar - Unpreserved (EK080) DLSD BLOCK 9C	**28-Nov-2016**	**----**	----	----	**17-Jan-2017**	27-May-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 5C, DLSF BLOCK 2C, DLSF BLOCK 10C, DLSF BLOCK 8C	**04-Jan-2017**	**18-Jan-2017**	01-Feb-2017	✓	**20-Jan-2017**	01-Feb-2017	✓
Soil Glass Jar - Unpreserved (EP004) DLSE BLOCK 5B	**07-Dec-2016**	**18-Jan-2017**	04-Jan-2017	×	**20-Jan-2017**	04-Jan-2017	×
Soil Glass Jar - Unpreserved (EP004) DLSE BLOCK 6B	**09-Dec-2016**	**18-Jan-2017**	06-Jan-2017	×	**20-Jan-2017**	06-Jan-2017	×
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 11A	**09-Jan-2017**	**18-Jan-2017**	06-Feb-2017	✓	**20-Jan-2017**	06-Feb-2017	✓
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 15A	**10-Jan-2017**	**18-Jan-2017**	07-Feb-2017	✓	**20-Jan-2017**	07-Feb-2017	✓
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 12C	**11-Jan-2017**	**18-Jan-2017**	08-Feb-2017	✓	**20-Jan-2017**	08-Feb-2017	✓
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 1A	**14-Dec-2016**	**18-Jan-2017**	11-Jan-2017	×	**20-Jan-2017**	11-Jan-2017	×
Soil Glass Jar - Unpreserved (EP004) DLSD BLOCK 4A	**14-Nov-2016**	**18-Jan-2017**	12-Dec-2016	×	**20-Jan-2017**	12-Dec-2016	×
Soil Glass Jar - Unpreserved (EP004) DLSA BLOCK 11C	**15-Nov-2016**	**18-Jan-2017**	13-Dec-2016	×	**20-Jan-2017**	13-Dec-2016	×
Soil Glass Jar - Unpreserved (EP004) DLSF BLOCK 6B	**16-Nov-2016**	**18-Jan-2017**	14-Dec-2016	×	**20-Jan-2017**	14-Dec-2016	×
Soil Glass Jar - Unpreserved (EP004) DLSD BLOCK 2B	**18-Nov-2016**	**18-Jan-2017**	16-Dec-2016	×	**20-Jan-2017**	16-Dec-2016	×
Soil Glass Jar - Unpreserved (EP004) DLSD BLOCK 12B	**22-Nov-2016**	**18-Jan-2017**	20-Dec-2016	×	**20-Jan-2017**	20-Dec-2016	×
Soil Glass Jar - Unpreserved (EP004) DLSD BLOCK 9C	**28-Nov-2016**	**18-Jan-2017**	26-Dec-2016	×	**20-Jan-2017**	26-Dec-2016	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Acid Neutralising Capacity (ANC)	EA013	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Acidity in Soil	ED038	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
ASS Field Screening Analysis	EA037	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable K (Colwell)	ED021	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055-103	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (Saturated Paste)	EA031	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Acid Neutralising Capacity (ANC)	EA013	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Acidity in Soil	ED038	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	3	16	18.75	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Chromium Reducible Sulphur	EA026	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (Saturated Paste)	EA031	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Acidity in Soil	ED038	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable K (Colwell)	ED021	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Bicarbonate Extractable P (Colwell)	EK080	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Chromium Reducible Sulphur	EA026	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (Saturated Paste)	EA032	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Bicarbonate Extractable P (Colwell)	EK080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Net Acid Production Potential	EA009	SOIL	In house: Referenced to Coastech Research (Canada)(Mod.). NAPP = Acid Production Potential (APP or MAP-Maximum Acid Potential) minus Neutralising Capacity (ANC). NAPP may be +ve, zero or -ve.
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
Acid Neutralising Capacity (ANC)	EA013	SOIL	In house: Referenced to USEPA 600/2-78-054, I. Miller (2000). A fizz test is done to semiquanititatively estimate the likely reactivity. The soil is then reacted with an known excess quanitity of an appropriate acid. Titration determines the acid remaining, and the ANC can be calculated from comparison with a blank titration.
Chromium Reducible Sulphur	EA026	SOIL	In house: Referenced to Sullivan et al (1998) The CRS method converts reduced inorganic sulfur to H2S by CrCl2 solution ; the evolved H2S is trapped in a zinc acetate solution as ZnS which is quantified by iodometric titration.
pH (Saturated Paste)	* EA031	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - pH determined on a saturated paste by ISE.
Electrical Conductivity (Saturated Paste)	* EA032	SOIL	In house: Referenced to USEPA 600/2 - 78 - 054 - conductivity determined on a saturated paste.
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1-2006 : Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Bicarbonate Extractable K (Colwell)	ED021	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 18A1 Potassium is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by ICP.
Acidity in Soil	* ED038	SOIL	In house: Referenced to APHA 2310B
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Bicarbonate Extractable P (Colwell)	EK080	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 9B1 Phosphorus is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by FIA.
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Bicarbonate Extractable K (Colwell)	ED021PR	SOIL	In house: Referenced to Rayment & Higginson (1992) Method 18A1 Potassium is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by ICP.
Drying only	EN020D	SOIL	In house
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

Perth
41 Bishop Street,
Jolimont , WA 6014
Tel +61 (08) 9388 8799
Fax +61 (08) 9388 8633
www.mwhglobal.com