

QUALITY CONTROL REPORT

Work Order	: ES1610764	Page	: 1 of 5
Client	: WARRUMBUNGL SHIRE COUNCIL	Laboratory	: Environmental Division Sydney
Contact	: Scott Stanley	Contact	:
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Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: ----	Date Samples Received	: 19-May-2016
Order number	: ----	Date Analysis Commenced	: 20-May-2016
C-O-C number	: ----	Issue Date	: 26-May-2016
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 4		
No. of samples analysed	: 4		



NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW



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: 462840)									
ES1610764-001	NATIVE GROVE SITE 1	EA002: pH Value	----	0.1	pH Unit	6.2	6.2	0.00	0% - 20%
ES1610886-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.4	5.1	5.36	0% - 20%
EA010: Conductivity (QC Lot: 462841)									
ES1610764-001	NATIVE GROVE SITE 1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	7	7	0.00	No Limit
ES1610886-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	358	371	3.57	0% - 20%
EA055: Moisture Content (QC Lot: 460566)									
EM1605552-015	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	18.9	18.2	3.83	0% - 50%
ES1610771-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	8.2	8.4	2.67	No Limit
ED007: Exchangeable Cations (QC Lot: 464706)									
EM1605700-004	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	10.2	9.6	5.65	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	2.5	2.7	4.82	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.5	0.4	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.3	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	3.5	3.6	3.14	0% - 20%
		ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 462842)									
ES1610764-001	NATIVE GROVE SITE 1	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.8	0.9	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 462385)									
ES1609931-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	3810	4060	6.31	0% - 20%
ES1610764-004	NATIVE GROVE SITE 4	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	390	380	3.66	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 462384)									
EB1612973-001	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	206	236	13.4	0% - 20%
ES1610764-004	NATIVE GROVE SITE 4	EK067G: Total Phosphorus as P	----	2	mg/kg	151	156	2.96	0% - 20%

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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 (%)
EK072: Phosphate Sorption Capacity (QC Lot: 463211)									
ES1609931-004	Anonymous	EK072: Phosphate Sorption Capacity	----	250	mg P sorbed/kg	<250	<250	0.00	No Limit
ES1609931-044	Anonymous	EK072: Phosphate Sorption Capacity	----	250	mg P sorbed/kg	1550	1760	12.8	No Limit
EP004: Organic Matter (QC Lot: 460990)									
ES1610764-001	NATIVE GROVE SITE 1	EP004: Total Organic Carbon	----	0.5	%	0.7	0.7	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EA010: Conductivity (QCLot: 462841)									
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.6	92	108	
ED007: Exchangeable Cations (QCLot: 464706)									
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	104	76	122	
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	94.0	76	118	
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	90.2	80	120	
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	97.7	80	120	
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----	
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 462842)									
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	109	88	118	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 462385)									
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	91.2	72	106	
				<20	100 mg/kg	89.9	70	122	
				<20	500 mg/kg	100	74	118	
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 462384)									
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	96.8	76	108	
				<2	44.2 mg/kg	85.4	70	118	
				<2	100 mg/kg	92.0	78	116	
EP004: Organic Matter (QCLot: 460990)									
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.46 %	94.8	81	99	

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	Spike Recovery (%)	Recovery Limits (%)	
						MS	Low
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 462842)							
ES1610764-001	NATIVE GROVE SITE 1	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	107	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 462385)							
ES1609931-004	Anonymous						



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) Report</i>			
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>	
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 462385) - continued							
ES1609931-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	# Not Determined	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 462384)							
EB1612973-001	Anonymous	EK067G: Total Phosphorus as P	----	100 mg/kg	76.9	70	130
EP004: Organic Matter (QCLot: 460990)							
ES1610764-001	NATIVE GROVE SITE 1	EP004: Total Organic Carbon	----	2.66 %	96.3	70	130