

CERTIFICATE OF ANALYSIS

Work Order : **EB1709352**
Client : **CDM SMITH AUSTRALIA PTY LTD**
Contact : MR SCOTT MAINEY
Address : 21 MCLACHLAN STREET PO BOX 359
 FORTITUDE VALLEY QLD 4006
Telephone : +61 07 3303 8775
Project : BES150160.07
Order number : ----
C-O-C number : ----
Sampler : ----
Site : Styx
Quote number : BN/139/17
No. of samples received : 48
No. of samples analysed : 48

Page : 1 of 21
Laboratory : Environmental Division Brisbane
Contact : Carsten Emrich
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 08-May-2017 12:00
Date Analysis Commenced : 10-May-2017
Issue Date : 23-May-2017 08:00



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Epps	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, 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
∅ = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EK061G-TKN as N by Discrete Analyser: EB1709352_035 insufficient sample remains to complete analysis
- ED006(Exchangeable Cations on Alkaline Soils): Unable to calculate Magnesium/Potassium Ratio for some samples as the required results for Magnesium/Potassium are below LOR.
- ED007 (Exchangeable Cations): Magnesium/Potassium ratio could not be determined as both the Magnesium and Potassium results were less than reportable limits for some samples.
- EA058 Emerson: V. = Very, D. = Dark, L. = Light, VD. = Very Dark
- 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	SS01 0-0.1	SS01 0.1-0.2	SS01 0.2-0.3	SS01 0.5-0.6	SS01 0.8-0.9
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-001	EB1709352-002	EB1709352-003	EB1709352-004	EB1709352-005	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	5.3	5.4	5.5	5.5	5.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	20	10	7	7	16	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	9.6	7.9	8.8	9.6	12.2	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Very Dark Gray	----	----	Light Brownish Gray	----	
Texture	----	-	-	Loamy Sand	----	----	Sand	----	
Emerson Class Number	EC/TC	-	-	3	----	----	8	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	11	11	8	11	14	
Silt (2-20 µm)	----	1	%	8	5	9	3	3	
Fine Sand (0.02-0.2 mm)	----	1	%	12	10	10	10	10	
Coarse Sand (0.2-2.0 mm)	----	1	%	19	21	19	16	14	
Gravel (>2mm)	----	1	%	50	53	54	60	59	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.37	2.50	2.40	2.58	2.50	
ED005: Exchange Acidity									
Exchange Acidity	----	0.1	meq/100g	0.6	0.6	0.3	0.5	0.4	
Exchangeable Aluminium	----	0.1	meq/100g	0.4	0.3	0.2	0.3	0.2	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	0.8	0.7	0.3	0.1	<0.1	
Exchangeable Magnesium	----	0.1	meq/100g	0.5	0.5	0.4	0.3	1.1	
Exchangeable Potassium	----	0.1	meq/100g	0.4	0.2	0.2	0.2	0.2	
Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1	
Cation Exchange Capacity	----	0.1	meq/100g	2.3	2.0	1.2	1.1	1.7	
Exchangeable Sodium Percent	----	0.1	%	2.2	1.5	1.9	1.8	6.6	
Calcium/Magnesium Ratio	----	0.1	-	1.6	1.4	0.8	0.3	<0.1	
Magnesium/Potassium Ratio	----	0.1	-	1.3	1.8	2.5	2.1	7.2	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	<10	----	----	<10	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS01 0-0.1	SS01 0.1-0.2	SS01 0.2-0.3	SS01 0.5-0.6	SS01 0.8-0.9
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-001	EB1709352-002	EB1709352-003	EB1709352-004	EB1709352-005	
				Result	Result	Result	Result	Result	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	0.3	----	----	----	----	
ED092: DTPA Extractable Metals									
∅ Copper	7440-50-8	1	mg/kg	<1.00	----	----	----	----	
∅ Iron	7439-89-6	1	mg/kg	197	----	----	----	----	
∅ Manganese	7439-96-5	1	mg/kg	5.64	----	----	----	----	
∅ Zinc	7440-66-6	1	mg/kg	<1.00	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.8	----	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	730	----	----	----	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	730	----	----	----	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	----	----	----	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	2.0	----	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS01 1.1-1.2	SS02 0-0.1	SS02 0.1-0.2	SS02 0.2-0.3	SS02 0.5-0.6
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-006	EB1709352-007	EB1709352-008	EB1709352-009	EB1709352-010	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	5.6	6.2	6.0	6.1	7.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	34	10	38	192	581	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	10.3	3.3	8.2	9.6	13.6	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Light Brownish Gray	Brown	----	----	Pale Brown	
Texture	----	-	-	Loamy Sand	Loamy Sand	----	----	Clay Loam	
Emerson Class Number	EC/TC	-	-	3	3	----	----	2	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	18	18	22	51	42	
Silt (2-20 µm)	----	1	%	4	42	60	32	33	
Fine Sand (0.02-0.2 mm)	----	1	%	9	24	13	15	23	
Coarse Sand (0.2-2.0 mm)	----	1	%	17	2	<1	1	<1	
Gravel (>2mm)	----	1	%	52	14	4	1	1	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.40	2.36	2.56	2.50	2.48	
ED005: Exchange Acidity									
Exchange Acidity	----	0.1	meq/100g	0.3	----	----	----	----	
Exchangeable Aluminium	----	0.1	meq/100g	0.2	----	----	----	----	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	----	----	----	----	2.1	
Exchangeable Magnesium	----	0.2	meq/100g	----	----	----	----	4.0	
Exchangeable Potassium	----	0.2	meq/100g	----	----	----	----	<0.2	
Exchangeable Sodium	----	0.2	meq/100g	----	----	----	----	1.3	
Cation Exchange Capacity	----	0.2	meq/100g	----	----	----	----	7.4	
Exchangeable Sodium Percent	----	0.2	%	----	----	----	----	17.0	
Calcium/Magnesium Ratio	----	0.2	-	----	----	----	----	0.5	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	<0.1	2.4	4.1	5.1	----	
Exchangeable Magnesium	----	0.1	meq/100g	1.3	1.9	5.7	7.9	----	
Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.2	0.2	0.3	----	
Exchangeable Sodium	----	0.1	meq/100g	0.4	0.2	1.1	2.0	----	
Cation Exchange Capacity	----	0.1	meq/100g	2.0	----	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS01 1.1-1.2	SS02 0-0.1	SS02 0.1-0.2	SS02 0.2-0.3	SS02 0.5-0.6
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-006	EB1709352-007	EB1709352-008	EB1709352-009	EB1709352-010	
				Result	Result	Result	Result	Result	
ED007: Exchangeable Cations - Continued									
Cation Exchange Capacity	----	0.1	meq/100g	----	4.7	11.4	15.5	----	
Exchangeable Sodium Percent	----	0.1	%	21.1	3.9	9.6	13.1	----	
Calcium/Magnesium Ratio	----	0.1	-	<0.1	1.3	0.7	0.6	----	
Magnesium/Potassium Ratio	----	0.1	-	----	10.6	21.9	28.3	----	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	<0.01	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	40	<10	----	----	990	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	----	0.2	----	----	----	
ED092: DTPA Extractable Metals									
∅ Copper	7440-50-8	1	mg/kg	----	<1.00	----	----	----	
∅ Iron	7439-89-6	1	mg/kg	----	62.5	----	----	----	
∅ Manganese	7439-96-5	1	mg/kg	----	62.7	----	----	----	
∅ Zinc	7440-66-6	1	mg/kg	----	<1.00	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<0.1	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	550	----	----	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	550	----	----	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	<5	----	----	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	1.3	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS02 0.8-0.9	SS02 1.1-1.2	SS03 0-0.1	SS03 0.1-0.2	SS03 0.2-0.3
Client sampling date / time				[06-May-2017]	[06-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-011	EB1709352-012	EB1709352-013	EB1709352-014	EB1709352-015	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	8.0	8.0	6.3	6.5	7.0	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	554	517	7	13	51	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	10.0	10.0	2.8	3.2	6.4	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	----	Brown	Brown	----	----	
Texture	----	-	-	----	Clay Loam	Clay Loam	----	----	
Emerson Class Number	EC/TC	-	-	----	2	3	----	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	35	36	23	26	45	
Silt (2-20 µm)	----	1	%	31	29	15	17	14	
Fine Sand (0.02-0.2 mm)	----	1	%	29	30	20	19	12	
Coarse Sand (0.2-2.0 mm)	----	1	%	4	4	12	11	8	
Gravel (>2mm)	----	1	%	1	1	30	27	21	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.33	2.35	2.38	2.37	2.32	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	2.1	1.8	----	----	----	
Exchangeable Magnesium	----	0.2	meq/100g	3.6	3.1	----	----	----	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	----	----	----	
Exchangeable Sodium	----	0.2	meq/100g	1.5	1.3	----	----	----	
Cation Exchange Capacity	----	0.2	meq/100g	7.2	6.1	----	----	----	
Exchangeable Sodium Percent	----	0.2	%	20.9	21.3	----	----	----	
Calcium/Magnesium Ratio	----	0.2	-	0.6	0.6	----	----	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	1.6	1.3	1.8	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	2.5	2.6	4.6	
Exchangeable Potassium	----	0.1	meq/100g	----	----	<0.1	<0.1	<0.1	
Exchangeable Sodium	----	0.1	meq/100g	----	----	0.3	0.6	1.4	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	4.8	4.6	7.9	
Exchangeable Sodium Percent	----	0.1	%	----	----	7.0	12.4	18.1	
Calcium/Magnesium Ratio	----	0.1	-	----	----	0.6	0.5	0.4	
ED042T: Total Sulfur by LECO									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS02 0.8-0.9	SS02 1.1-1.2	SS03 0-0.1	SS03 0.1-0.2	SS03 0.2-0.3
Client sampling date / time				[06-May-2017]	[06-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-011	EB1709352-012	EB1709352-013	EB1709352-014	EB1709352-015	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO - Continued									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	<0.01	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	820	<10	----	----	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	----	----	0.3	----	----	
ED092: DTPA Extractable Metals									
∅ Copper	7440-50-8	1	mg/kg	----	----	<1.00	----	----	
∅ Iron	7439-89-6	1	mg/kg	----	----	40.5	----	----	
∅ Manganese	7439-96-5	1	mg/kg	----	----	36.9	----	----	
∅ Zinc	7440-66-6	1	mg/kg	----	----	<1.00	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	<0.1	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	440	----	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	----	440	----	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	<5	----	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	1.1	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS03 0.5-0.6	SS03 0.8-0.9	SS03 1.1-1.2	SS04 0-0.1	SS04 0.1-0.2
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-016	EB1709352-017	EB1709352-018	EB1709352-019	EB1709352-020	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	8.3	9.1	9.1	7.0	7.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	215	492	412	45	71	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	8.4	8.4	7.5	7.3	8.3	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Yellowish Brown	----	Yellowish Brown	Dark Grayish Brown	----	
Texture	----	-	-	Clay Loam	----	Clay Loam	Clay Loam	----	
Emerson Class Number	EC/TC	-	-	1	----	1	2	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	38	34	32	35	40	
Silt (2-20 µm)	----	1	%	17	14	16	14	13	
Fine Sand (0.02-0.2 mm)	----	1	%	20	23	24	12	12	
Coarse Sand (0.2-2.0 mm)	----	1	%	8	11	11	10	13	
Gravel (>2mm)	----	1	%	17	18	17	29	22	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.32	2.46	2.43	2.45	2.47	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	0.8	0.7	0.8	----	1.1	
Exchangeable Magnesium	----	0.2	meq/100g	3.3	3.2	3.5	----	3.7	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	<0.2	----	<0.2	
Exchangeable Sodium	----	0.2	meq/100g	1.7	2.1	2.6	----	1.0	
Cation Exchange Capacity	----	0.2	meq/100g	5.8	6.0	6.9	----	5.7	
Exchangeable Sodium Percent	----	0.2	%	29.0	35.2	37.7	----	17.2	
Calcium/Magnesium Ratio	----	0.2	-	0.2	0.2	0.2	----	0.3	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	2.8	----	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	7.4	----	
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	0.3	----	
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	1.8	----	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	12.5	----	
Exchangeable Sodium Percent	----	0.1	%	----	----	----	15.0	----	
Calcium/Magnesium Ratio	----	0.1	-	----	----	----	0.4	----	
Magnesium/Potassium Ratio	----	0.1	-	----	----	----	22.4	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS03 0.5-0.6	SS03 0.8-0.9	SS03 1.1-1.2	SS04 0-0.1	SS04 0.1-0.2
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-016	EB1709352-017	EB1709352-018	EB1709352-019	EB1709352-020	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	----	<0.01	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	190	----	430	30	----	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	----	----	----	0.5	----	
ED092: DTPA Extractable Metals									
∅ Copper	7440-50-8	1	mg/kg	----	----	----	<1.00	----	
∅ Iron	7439-89-6	1	mg/kg	----	----	----	64.6	----	
∅ Manganese	7439-96-5	1	mg/kg	----	----	----	2.03	----	
∅ Zinc	7440-66-6	1	mg/kg	----	----	----	<1.00	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	0.2	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	1000	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	1000	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	----	<5	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	----	1.6	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS04 0.2-0.3	SS04 0.45-0.5	SS05 0-0.1	SS05 0.1-0.2	SS05 0.2-0.3
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-021	EB1709352-022	EB1709352-023	EB1709352-024	EB1709352-025	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	8.2	9.5	6.8	6.7	6.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	160	339	16	12	9	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	9.0	7.5	6.2	6.2	7.2	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	----	Brown	Very Dark Grayish Brown	----	----	
Texture	----	-	-	----	Sandy Clay Loam	Loam	----	----	
Emerson Class Number	EC/TC	-	-	----	2	3	----	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	32	19	20	23	20	
Silt (2-20 µm)	----	1	%	13	13	16	13	11	
Fine Sand (0.02-0.2 mm)	----	1	%	14	13	22	18	24	
Coarse Sand (0.2-2.0 mm)	----	1	%	11	18	28	30	30	
Gravel (>2mm)	----	1	%	30	37	14	16	15	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.37	2.47	2.33	2.55	2.49	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	0.9	1.2	----	----	----	
Exchangeable Magnesium	----	0.2	meq/100g	3.0	3.1	----	----	----	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	----	----	----	
Exchangeable Sodium	----	0.2	meq/100g	0.9	1.1	----	----	----	
Cation Exchange Capacity	----	0.2	meq/100g	4.8	5.4	----	----	----	
Exchangeable Sodium Percent	----	0.2	%	19.3	19.7	----	----	----	
Calcium/Magnesium Ratio	----	0.2	-	0.3	0.4	----	----	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	5.8	5.1	6.2	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	2.0	1.8	2.3	
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.9	0.6	0.4	
Exchangeable Sodium	----	0.1	meq/100g	----	----	<0.1	<0.1	<0.1	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	8.7	7.6	9.0	
Exchangeable Sodium Percent	----	0.1	%	----	----	0.6	0.6	0.6	
Calcium/Magnesium Ratio	----	0.1	-	----	----	2.9	2.8	2.7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS04 0.2-0.3	SS04 0.45-0.5	SS05 0-0.1	SS05 0.1-0.2	SS05 0.2-0.3
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-021	EB1709352-022	EB1709352-023	EB1709352-024	EB1709352-025	
				Result	Result	Result	Result	Result	
ED007: Exchangeable Cations - Continued									
Magnesium/Potassium Ratio	----	0.1	-	----	----	2.3	2.8	5.4	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	<0.01	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	130	<10	----	----	
ED091 : Calcium Chloride Extractable Boron									
Ø Boron	7440-42-8	0.2	mg/kg	----	----	0.3	----	----	
ED092: DTPA Extractable Metals									
Ø Copper	7440-50-8	1	mg/kg	----	----	<1.00	----	----	
Ø Iron	7439-89-6	1	mg/kg	----	----	75.5	----	----	
Ø Manganese	7439-96-5	1	mg/kg	----	----	19.1	----	----	
Ø Zinc	7440-66-6	1	mg/kg	----	----	1.19	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	0.2	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	990	----	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	----	990	----	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	28	----	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	2.4	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS05 0.5-0.6	SS05 0.8-0.9	SS05 1.1-1.2	SS06 0-0.1	SS06 0.1-0.2
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-026	EB1709352-027	EB1709352-028	EB1709352-029	EB1709352-030	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	6.6	6.7	6.7	7.5	7.9	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	6	6	5	26	64	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	10.9	12.4	11.7	9.2	9.0	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Brown	----	Yellowish Brown	Dark Grayish Brown	----	
Texture	----	-	-	Loam	----	Loamy Sand	Sandy Clay	----	
Emerson Class Number	EC/TC	-	-	3	----	3	3	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	22	20	21	34	38	
Silt (2-20 µm)	----	1	%	15	10	11	30	30	
Fine Sand (0.02-0.2 mm)	----	1	%	23	23	20	24	22	
Coarse Sand (0.2-2.0 mm)	----	1	%	30	33	34	5	4	
Gravel (>2mm)	----	1	%	10	14	13	7	6	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.65	2.26	2.45	2.43	2.32	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	----	----	----	2.9	2.9	
Exchangeable Magnesium	----	0.2	meq/100g	----	----	----	2.0	2.0	
Exchangeable Potassium	----	0.2	meq/100g	----	----	----	<0.2	<0.2	
Exchangeable Sodium	----	0.2	meq/100g	----	----	----	0.2	0.2	
Cation Exchange Capacity	----	0.2	meq/100g	----	----	----	5.3	5.3	
Exchangeable Sodium Percent	----	0.2	%	----	----	----	4.2	4.7	
Calcium/Magnesium Ratio	----	0.2	-	----	----	----	1.4	1.4	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	5.0	3.7	3.8	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	2.6	2.4	2.2	----	----	
Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.2	----	----	
Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.1	0.1	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	7.9	6.4	6.4	----	----	
Exchangeable Sodium Percent	----	0.1	%	0.8	2.0	2.0	----	----	
Calcium/Magnesium Ratio	----	0.1	-	1.9	1.5	1.7	----	----	
Magnesium/Potassium Ratio	----	0.1	-	10.9	12.9	12.7	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS05 0.5-0.6	SS05 0.8-0.9	SS05 1.1-1.2	SS06 0-0.1	SS06 0.1-0.2
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-026	EB1709352-027	EB1709352-028	EB1709352-029	EB1709352-030	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	----	<0.01	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	<10	----	<10	<10	----	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	----	----	----	1.2	----	
ED092: DTPA Extractable Metals									
∅ Copper	7440-50-8	1	mg/kg	----	----	----	2.65	----	
∅ Iron	7439-89-6	1	mg/kg	----	----	----	112	----	
∅ Manganese	7439-96-5	1	mg/kg	----	----	----	23.5	----	
∅ Zinc	7440-66-6	1	mg/kg	----	----	----	<1.00	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	0.6	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	1590	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	1590	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	----	47	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	----	2.3	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS06 0.2-0.3	SS06 0.5-0.6	SS06 0.8-0.9	SS06 1.1-1.2	SS07 0-0.1
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-031	EB1709352-032	EB1709352-033	EB1709352-034	EB1709352-035	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	9.0	9.3	9.1	9.2	5.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	189	396	1160	1190	7	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	11.2	12.3	14.8	11.5	6.0	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	----	Dark Grayish Brown	----	Brown	Dark Red	
Texture	----	-	-	----	Sandy Clay	----	Sandy Clay	Silty Clay Loam	
Emerson Class Number	EC/TC	-	-	----	1	----	2	4	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	44	40	48	49	35	
Silt (2-20 µm)	----	1	%	29	26	26	26	5	
Fine Sand (0.02-0.2 mm)	----	1	%	18	18	15	13	10	
Coarse Sand (0.2-2.0 mm)	----	1	%	3	3	4	3	14	
Gravel (>2mm)	----	1	%	6	13	7	9	36	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.40	2.35	2.35	2.57	2.51	
ED005: Exchange Acidity									
Exchange Acidity	----	0.1	meq/100g	----	----	----	----	0.2	
Exchangeable Aluminium	----	0.1	meq/100g	----	----	----	----	0.2	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	4.9	5.5	2.8	3.5	----	
Exchangeable Magnesium	----	0.2	meq/100g	3.9	6.8	4.3	5.4	----	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	<0.2	<0.2	----	
Exchangeable Sodium	----	0.2	meq/100g	0.9	4.3	3.4	4.0	----	
Cation Exchange Capacity	----	0.2	meq/100g	9.9	16.7	10.6	12.8	----	
Exchangeable Sodium Percent	----	0.2	%	9.3	26.0	32.4	30.8	----	
Calcium/Magnesium Ratio	----	0.2	-	1.2	0.8	0.7	0.6	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	----	0.6	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	----	1.8	
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	----	0.1	
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	----	<0.1	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	2.7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS06 0.2-0.3	SS06 0.5-0.6	SS06 0.8-0.9	SS06 1.1-1.2	SS07 0-0.1
Client sampling date / time				[05-May-2017]	[05-May-2017]	[05-May-2017]	[05-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-031	EB1709352-032	EB1709352-033	EB1709352-034	EB1709352-035	
				Result	Result	Result	Result	Result	
ED007: Exchangeable Cations - Continued									
Exchangeable Sodium Percent	----	0.1	%	----	----	----	----	----	2.0
Calcium/Magnesium Ratio	----	0.1	-	----	----	----	----	----	0.3
Magnesium/Potassium Ratio	----	0.1	-	----	----	----	----	----	17.9
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	----	----	----	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	310	----	1630	----	<10
ED091 : Calcium Chloride Extractable Boron									
ø Boron	7440-42-8	0.2	mg/kg	----	----	----	----	----	0.2
ED092: DTPA Extractable Metals									
ø Copper	7440-50-8	1	mg/kg	----	----	----	----	----	<1.00
ø Iron	7439-89-6	1	mg/kg	----	----	----	----	----	15.9
ø Manganese	7439-96-5	1	mg/kg	----	----	----	----	----	1.36
ø Zinc	7440-66-6	1	mg/kg	----	----	----	----	----	<1.00
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	----	----	----	<5
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	----	----	----	0.8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS07 0.1-0.2	SS07 0.2-0.3	SS07 0.5-0.6	SS07 0.8-0.9	SS07 1.1-1.2
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-036	EB1709352-037	EB1709352-038	EB1709352-039	EB1709352-040	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	5.7	5.6	5.6	5.6	6.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	9	9	9	8	7	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	6.9	10.0	10.5	9.6	9.1	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	----	----	Dark Red	----	Dark Red	
Texture	----	-	-	----	----	Silty Clay Loam	----	Clay Loam	
Emerson Class Number	EC/TC	-	-	----	----	4	----	4	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	42	50	44	37	38	
Silt (2-20 µm)	----	1	%	5	3	4	4	6	
Fine Sand (0.02-0.2 mm)	----	1	%	9	7	12	13	10	
Coarse Sand (0.2-2.0 mm)	----	1	%	12	13	12	14	14	
Gravel (>2mm)	----	1	%	32	27	29	32	32	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.42	2.53	2.66	2.63	2.60	
ED005: Exchange Acidity									
Exchange Acidity	----	0.1	meq/100g	0.2	0.2	0.2	<0.1	----	
Exchangeable Aluminium	----	0.1	meq/100g	0.2	0.1	<0.1	<0.1	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	0.6	0.5	<0.1	<0.1	<0.1	
Exchangeable Magnesium	----	0.1	meq/100g	2.1	2.5	2.7	2.6	2.4	
Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1	
Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1	
Cation Exchange Capacity	----	0.1	meq/100g	2.9	3.2	2.9	2.6	----	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	2.6	
Exchangeable Sodium Percent	----	0.1	%	2.3	2.8	3.3	3.6	2.8	
Calcium/Magnesium Ratio	----	0.1	-	0.3	0.2	<0.1	<0.1	<0.1	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	----	<10	----	<10	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS08 0-0.1	SS08 0.1-0.2	SS08 0.2-0.3	SS08 0.5-0.6	SS08 0.8-0.9
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-041	EB1709352-042	EB1709352-043	EB1709352-044	EB1709352-045	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	6.3	7.2	7.3	7.4	8.4	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	15	16	26	85	592	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	3.8	5.7	8.9	5.8	8.6	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Brown	----	----	Yellowish Brown	----	
Texture	----	-	-	Clay Loam	----	----	Sandy Clay Loam	----	
Emerson Class Number	EC/TC	-	-	3	----	----	1	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	21	47	49	35	38	
Silt (2-20 µm)	----	1	%	17	14	10	15	15	
Fine Sand (0.02-0.2 mm)	----	1	%	18	12	14	15	12	
Coarse Sand (0.2-2.0 mm)	----	1	%	11	8	7	11	10	
Gravel (>2mm)	----	1	%	33	19	20	24	25	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.44	2.48	2.54	2.55	2.43	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	----	----	----	0.4	0.7	
Exchangeable Magnesium	----	0.2	meq/100g	----	----	----	1.5	3.7	
Exchangeable Potassium	----	0.2	meq/100g	----	----	----	<0.2	<0.2	
Exchangeable Sodium	----	0.2	meq/100g	----	----	----	0.6	1.8	
Cation Exchange Capacity	----	0.2	meq/100g	----	----	----	2.5	6.2	
Exchangeable Sodium Percent	----	0.2	%	----	----	----	24.0	29.2	
Calcium/Magnesium Ratio	----	0.2	-	----	----	----	0.3	<0.2	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	5.0	4.3	4.4	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	3.9	5.0	6.2	----	----	
Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.1	----	----	
Exchangeable Sodium	----	0.1	meq/100g	0.3	0.7	1.0	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	9.3	10.2	11.7	----	----	
Exchangeable Sodium Percent	----	0.1	%	3.3	7.2	8.8	----	----	
Calcium/Magnesium Ratio	----	0.1	-	1.3	0.9	0.7	----	----	
Magnesium/Potassium Ratio	----	0.1	-	34.9	46.7	50.1	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS08 0-0.1	SS08 0.1-0.2	SS08 0.2-0.3	SS08 0.5-0.6	SS08 0.8-0.9
Client sampling date / time				[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	[06-May-2017]	
Compound	CAS Number	LOR	Unit	EB1709352-041	EB1709352-042	EB1709352-043	EB1709352-044	EB1709352-045	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	----	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	<10	----	----	40	----	
ED091 : Calcium Chloride Extractable Boron									
Ø Boron	7440-42-8	0.2	mg/kg	0.3	----	----	----	----	
ED092: DTPA Extractable Metals									
Ø Copper	7440-50-8	1	mg/kg	<1.00	----	----	----	----	
Ø Iron	7439-89-6	1	mg/kg	69.5	----	----	----	----	
Ø Manganese	7439-96-5	1	mg/kg	62.8	----	----	----	----	
Ø Zinc	7440-66-6	1	mg/kg	<1.00	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	910	----	----	----	----	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	910	----	----	----	----	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	----	----	----	----	
EP004: Organic Matter									
Organic Matter	----	0.5	%	1.9	----	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS08 1.1-1.2	QC01	QC02	----	----
Client sampling date / time				[06-May-2017]	05-May-2017 00:00	05-May-2017 00:00	----	----	
Compound	CAS Number	LOR	Unit	EB1709352-046	EB1709352-047	EB1709352-048	-----	-----	
				Result	Result	Result	----	----	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	8.5	6.9	6.8	----	----	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	636	5	5	----	----	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	10.0	10.6	11.6	----	----	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Dark Yellowish Brown	----	Dark Yellowish Brown	----	----	
Texture	----	-	-	Sandy Clay	----	Clay Loam	----	----	
Emerson Class Number	EC/TC	-	-	1	----	3	----	----	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	38	----	----	----	----	
Silt (2-20 µm)	----	1	%	16	----	----	----	----	
Fine Sand (0.02-0.2 mm)	----	1	%	20	----	----	----	----	
Coarse Sand (0.2-2.0 mm)	----	1	%	11	----	----	----	----	
Gravel (>2mm)	----	1	%	15	----	----	----	----	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.50	----	----	----	----	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	1.0	----	----	----	----	
Exchangeable Magnesium	----	0.2	meq/100g	4.9	----	----	----	----	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	----	----	----	----	
Exchangeable Sodium	----	0.2	meq/100g	2.5	----	----	----	----	
Cation Exchange Capacity	----	0.2	meq/100g	8.5	----	----	----	----	
Exchangeable Sodium Percent	----	0.2	%	29.9	----	----	----	----	
Calcium/Magnesium Ratio	----	0.2	-	0.2	----	----	----	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	3.8	4.0	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	----	2.5	2.4	----	----	
Exchangeable Potassium	----	0.1	meq/100g	----	0.2	0.2	----	----	
Exchangeable Sodium	----	0.1	meq/100g	----	0.1	0.1	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	----	6.7	6.7	----	----	
Exchangeable Sodium Percent	----	0.1	%	----	2.2	2.0	----	----	
Calcium/Magnesium Ratio	----	0.1	-	----	1.5	1.7	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS08 1.1-1.2	QC01	QC02	----	----
Client sampling date / time				[06-May-2017]	05-May-2017 00:00	05-May-2017 00:00	----	----	
Compound	CAS Number	LOR	Unit	EB1709352-046	EB1709352-047	EB1709352-048	-----	-----	
				Result	Result	Result	----	----	
ED007: Exchangeable Cations - Continued									
Magnesium/Potassium Ratio	----	0.1	-	----	12.8	13.1	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	1030	----	----	----	----	



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
∅ = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ED006 (Exchangeable Cations on Alkaline Soils): Magnesium/Potassium ratio could not be determined as both the Magnesium and Potassium results were less than reportable limits
- EG005T (Total Metals) Sample EB1712446-001 shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- ED007(Exchangeable Cations): Unable to calculate Magnesium/Potassium Ratio for some samples as the required results for Magnesium/Potassium are below LOR.
- EA058 Emerson: V. = Very, D. = Dark, L. = Light, VD. = Very Dark
- 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	SS09 0 - 0.1	SS09 0.1 - 0.2	SS09 0.2 - 0.3	SS09 0.5 - 0.6	SS10 0 - 0.1
Client sampling date / time				14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	
Compound	CAS Number	LOR	Unit	EB1712446-001	EB1712446-002	EB1712446-003	EB1712446-004	EB1712446-005	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	6.4	7.3	8.0	8.9	6.6	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	48	365	588	750	49	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	5.3	----	----	9.3	5.3	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	Brown	----	----	Brown	Brown	
Texture	----	-	-	Sandy Clay	----	----	Sandy Clay	Loam	
Emerson Class Number	EC/TC	-	-	1	----	----	2	2	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	26	47	45	41	----	
Silt (2-20 µm)	----	1	%	11	12	13	12	----	
Fine Sand (0.02-0.2 mm)	----	1	%	33	23	21	20	----	
Coarse Sand (0.2-2.0 mm)	----	1	%	16	11	10	18	----	
Gravel (>2mm)	----	1	%	14	7	11	9	----	
EA152: Soil Particle Density									
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.73	2.67	2.75	2.72	----	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	----	0.7	0.8	0.8	----	
Exchangeable Magnesium	----	0.2	meq/100g	----	3.4	4.6	3.8	----	
Exchangeable Potassium	----	0.2	meq/100g	----	<0.2	<0.2	<0.2	----	
Exchangeable Sodium	----	0.2	meq/100g	----	1.3	2.0	2.1	----	
Cation Exchange Capacity	----	0.2	meq/100g	----	5.3	7.5	6.7	----	
Exchangeable Sodium Percent	----	0.2	%	----	24.0	27.4	32.0	----	
Calcium/Magnesium Ratio	----	0.2	-	----	0.2	<0.2	<0.2	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	1.2	----	----	----	0.7	
Exchangeable Magnesium	----	0.1	meq/100g	2.8	----	----	----	0.7	
Exchangeable Potassium	----	0.1	meq/100g	0.2	----	----	----	<0.1	
Exchangeable Sodium	----	0.1	meq/100g	0.5	----	----	----	0.6	
Cation Exchange Capacity	----	0.1	meq/100g	4.6	----	----	----	2.1	
Exchangeable Sodium Percent	----	0.1	%	11.6	----	----	----	27.3	
Calcium/Magnesium Ratio	----	0.1	-	0.4	----	----	----	1.0	
Magnesium/Potassium Ratio	----	0.1	-	16.1	----	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS09 0 - 0.1	SS09 0.1 - 0.2	SS09 0.2 - 0.3	SS09 0.5 - 0.6	SS10 0 - 0.1
Client sampling date / time				14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	
Compound	CAS Number	LOR	Unit	EB1712446-001	EB1712446-002	EB1712446-003	EB1712446-004	EB1712446-005	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	----	----	----	----	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	40	----	----	1190	50	
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	<0.2	----	----	----	<0.2	
EG005T: Total Metals by ICP-AES									
Copper	7440-50-8	5	mg/kg	13	----	----	----	<5	
Iron	7439-89-6	50	mg/kg	76300	----	----	----	5480	
Manganese	7439-96-5	5	mg/kg	178	----	----	----	35	
Zinc	7440-66-6	5	mg/kg	20	----	----	----	<5	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.2	----	----	----	<0.1	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	470	----	----	----	450	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	470	----	----	----	450	
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	<5	----	----	----	<5	
EP004: Organic Matter									
Organic Matter	----	0.5	%	1.4	----	----	----	1.0	
Total Organic Carbon	----	0.5	%	0.8	----	----	----	0.6	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS10 0.1 - 0.2	SS10 0.2 - 0.3	SS10 0.5 - 0.6	SS10 0.8 - 0.9	SS11 0 - 0.1
Client sampling date / time				14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	
Compound	CAS Number	LOR	Unit	EB1712446-006	EB1712446-007	EB1712446-008	EB1712446-009	EB1712446-010	
				Result	Result	Result	Result	Result	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	7.4	7.7	8.7	9.4	6.1	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	220	310	680	792	5	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	----	----	9.0	----	6.7	
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-	----	----	Brown	----	Brown	
Texture	----	-	-	----	----	Clay Loam	----	Sandy Loam	
Emerson Class Number	EC/TC	-	-	----	----	1	----	3	
EA150: Soil Classification - National Committee on Soil and Terrain (2009)									
Clay (<2 µm)	----	1	%	----	----	----	----	16	
Silt (2-20 µm)	----	1	%	----	----	----	----	17	
Fine Sand (0.02-0.2 mm)	----	1	%	----	----	----	----	61	
Coarse Sand (0.2-2.0 mm)	----	1	%	----	----	----	----	6	
Gravel (>2mm)	----	1	%	----	----	----	----	<1	
EA152: Soil Particle Density									
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	----	2.61	
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g	0.3	0.9	0.6	1.5	----	
Exchangeable Magnesium	----	0.2	meq/100g	1.0	3.1	3.1	3.8	----	
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	<0.2	<0.2	----	
Exchangeable Sodium	----	0.2	meq/100g	0.6	1.8	2.3	2.6	----	
Cation Exchange Capacity	----	0.2	meq/100g	2.0	5.8	6.1	7.9	----	
Exchangeable Sodium Percent	----	0.2	%	31.3	31.4	38.3	33.2	----	
Calcium/Magnesium Ratio	----	0.2	-	0.3	0.3	0.2	0.4	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	----	1.4	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	----	1.5	
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	----	0.2	
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	----	<0.1	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	3.3	
Exchangeable Sodium Percent	----	0.1	%	----	----	----	----	3.0	
Calcium/Magnesium Ratio	----	0.1	-	----	----	----	----	0.9	
Magnesium/Potassium Ratio	----	0.1	-	----	----	----	----	8.0	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS10 0.1 - 0.2	SS10 0.2 - 0.3	SS10 0.5 - 0.6	SS10 0.8 - 0.9	SS11 0 - 0.1
Client sampling date / time				14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	
Compound	CAS Number	LOR	Unit	EB1712446-006	EB1712446-007	EB1712446-008	EB1712446-009	EB1712446-010	
				Result	Result	Result	Result	Result	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	----	----	----	----	----	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	----	920	----	----	<10
ED091 : Calcium Chloride Extractable Boron									
∅ Boron	7440-42-8	0.2	mg/kg	----	----	----	----	----	<0.2
EG005T: Total Metals by ICP-AES									
Copper	7440-50-8	5	mg/kg	----	----	----	----	----	5
Iron	7439-89-6	50	mg/kg	----	----	----	----	----	14900
Manganese	7439-96-5	5	mg/kg	----	----	----	----	----	409
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----	12
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	----	----	0.2
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	----	----	560
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	----	----	560
EK080: Bicarbonate Extractable Phosphorus (Colwell)									
Bicarbonate Ext. P (Colwell)	----	5	mg/kg	----	----	----	----	----	5
EP004: Organic Matter									
Organic Matter	----	0.5	%	----	----	----	----	----	0.9
Total Organic Carbon	----	0.5	%	----	----	----	----	----	0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SS11 0.1 - 0.2	SS11 0.2 - 0.3	SS11 0.5 - 0.6	SS11 0.8 - 0.9	----
Client sampling date / time			14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	----	----
Compound	CAS Number	LOR	Unit	EB1712446-011	EB1712446-012	EB1712446-013	EB1712446-014	-----
				Result	Result	Result	Result	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.3	6.6	8.0	8.6	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	8	42	521	873	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	----	----	9.3	----	----
EA058: Emerson Aggregate Test								
Color (Munsell)	----	-	-	----	----	Brown	----	----
Texture	----	-	-	----	----	Clay Loam	----	----
Emerson Class Number	EC/TC	-	-	----	----	1	----	----
EA150: Soil Classification - National Committee on Soil and Terrain (2009)								
Clay (<2 µm)	----	1	%	16	20	33	29	----
Silt (2-20 µm)	----	1	%	18	18	21	19	----
Fine Sand (0.02-0.2 mm)	----	1	%	57	59	43	48	----
Coarse Sand (0.2-2.0 mm)	----	1	%	9	3	2	4	----
Gravel (>2mm)	----	1	%	<1	<1	1	<1	----
EA152: Soil Particle Density								
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.64	2.63	2.68	2.69	----
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	----	----	1.0	1.2	----
Exchangeable Magnesium	----	0.2	meq/100g	----	----	2.7	3.2	----
Exchangeable Potassium	----	0.2	meq/100g	----	----	<0.2	<0.2	----
Exchangeable Sodium	----	0.2	meq/100g	----	----	2.1	3.1	----
Cation Exchange Capacity	----	0.2	meq/100g	----	----	5.8	7.6	----
Exchangeable Sodium Percent	----	0.2	%	----	----	35.6	40.7	----
Calcium/Magnesium Ratio	----	0.2	-	----	----	0.4	0.4	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	1.1	0.8	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	1.6	1.7	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	0.2	0.6	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	3.0	3.3	----	----	----
Exchangeable Sodium Percent	----	0.1	%	7.4	19.9	----	----	----
Calcium/Magnesium Ratio	----	0.1	-	0.7	0.5	----	----	----
ED045G: Chloride by Discrete Analyser								



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS11 0.1 - 0.2	SS11 0.2 - 0.3	SS11 0.5 - 0.6	SS11 0.8 - 0.9	----
Client sampling date / time				14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	14-Jun-2017 00:00	----	
Compound	CAS Number	LOR	Unit	EB1712446-011	EB1712446-012	EB1712446-013	EB1712446-014	-----	
				Result	Result	Result	Result	----	
ED045G: Chloride by Discrete Analyser - Continued									
Chloride	16887-00-6	10	mg/kg	----	----	810	----	----	