Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Matrix Spikes (MS)							
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0712012-004	CS7	gamma-BHC	75.2 %	75.65-110.44 %	Recovery less than lower data quality objective
				Dieldrin	110 %	76.37-109.7 %	Recovery greater than upper data quality objective

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0712012-004	CS7	Toluene-D8	81.0 %	81-117 %	Recovery less than lower data quality objective
	SOIL	ES0712012-008	CS11	4-Bromofluorobenzene	71.5 %	74-121 %	Recovery less than lower data quality objective
Surrogates							
EP080S: TPH(V)/BTEX Surrogates	WATER	ES0712012-001	BH1	Toluene-D8	120 %	88-110 %	Recovery greater than upper data quality objective
				4-Bromofluorobenzene	116 %	86-115 %	Recovery greater than upper data quality objective
	WATER	ES0712012-002	BH2A	Toluene-D8	114 %	88-110 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA005: pH							
Clear Plastic Bottle - Natural							
BH1, BH2A	**29 Aug 2007**	----	----	----	**30 Aug 2007**	29 Aug 2007	**Fail by 1 day**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Method Reference Summary

Matrix Type: SOIL

Preparation Methods

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. 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 (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 21st ed., 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 (1999) Schedule B(3)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Method Reference Summary

Matrix Type: WATER

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Method Reference Summary

Matrix Type: WATER

Preparation Methods

Analytical Methods

EA005 : pH - APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EA010-P : Conductivity by PC Titrator - APHA 21st ed., 2510 This procedure determines conductivity by automated ISE. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EG020A-F : Dissolved Metals by ICP-MS - Suite A - (APHA 21st ed., 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.

EG035F : Dissolved Mercury by FIMS - AS 3550, APHA 21st ed. 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 filtered sample. 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 (1999) Schedule B(3) (Appdx. 2)

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Appendix C

Acid sulfate soil test results

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

Jobno: GEOTTUNC01736AA
sheet 1 of 2

acid sulfate soil screening test

office: TUNCURRY

client: *GREATER TAREE CITY COUNCIL* date: *13.09.2007*

principal: test location: *TUNC LAB*

project: *PITT ST MARINA PRECINCT, TAREE* tested by: *P.E*

location: *SEE FIGURE 4* checked by:

Date samples recovered: *21,22 &28.09.07* pH meter used/serial no: D-54 date of calibration: *13.09.07*

hydrogen peroxide pH prior to use: *4.91* hydrogen peroxide temperature prior to use: *19.9*

sample location	depth (m)	RL (mAHD)	soil description	pH_F pH in 1:5 distilled water	pH_{FOX} (oxidation in 30% hydrogen peroxide) time (mins)	pH FOX	temp (°C)	Effervescence (see note below)	Odour	Colour change during reaction	pH Change (ie pH_F-pH_{FOX})	Additional comments
BH1	*2.0-2.5*		*SEE LOGS*	*7.43*	*20*	*5.09*	22.3	A	N/L	N/L	2.34	
BH1	*4.0-4.5*		*SEE LOGS*	*7.05*	*20*	*5.15*	22.2	A	N/L	N/L	1.90	
BH2A	*4.0-4.5*		*SEE LOGS*	*7.67*	*20*	*5.31*	29.0	A	N/L	N/L	2.36	
BH2A	*1.5-2.0*		*SEE LOGS*	*7.56*	*20*	*4.76*	21.7	A	N/L	N/L	2.80	
BH3	*2.5-3.0*		*SEE LOGS*	*7.09*	*20*	*4.60*	21.7	A	N/L	N/L	2.49	
BH3	*3.0-3.5*		*SEE LOGS*	*6.77*	*20*	*4.58*	22.1	A	N/L	N/L	2.19	
BH4A	*2.0-2.5*		*SEE LOGS*	*6.49*	*20*	*4.76*	23.3	A	N/L	N/L	1.73	
BH4A	*2.5-3.0*		*SEE LOGS*	*6.38*	*20*	*4.71*	25.9	A	N/L	N/L	1.67	

NOTES: 1. Observed Reaction: a. No visible effervescence b. Slight to moderate effervescence c. Vigorous effervescent reaction
2. Strong Odour:

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

job no: GEOTTUNC01736AA
sheet 2 of 2

acid sulfate soil screening test

office: TUNCURRY

client: *GREATER TAREE CITY COUNCIL*
date: *13.09.2007*
principal:
test location: *TUNC LAB*
project: *PITT ST MARINA PRECINCT, TAREE*
tested by: *P.E*
location: *SEE FIGURE 4*
checked by:

date samples recovered: *21,22 &28.09.07* pH meter used/serial no: D-54
date of calibration: *13.09.07*

hydrogen peroxide pH prior to use: *4.91*
hydrogen peroxide temperature prior to use: *19.9*

sample location	depth (m)	RL (mAHD)	soil description	pH_F pH in 1:5 distilled water	pH_{FOX} (oxidation in 30% hydrogen peroxide) time (mins)	pH FOX	temp (°C)	Effervescence (see note below)	Odour	Colour change during reaction	pH Change (ie pH_F-pH_{FOX})	Additional comments
BH5	*1.5-2.0*		*SEE LOGS*	*7.13*	*20*	*3.94*	22.0	A	N/L	N/L	3.19	
BH5	*2.0-2.0*		*SEE LOGS*	*6.73*	*20*	*3.55*	23.7	A	N/L	N/L	3.18	
BH16	*1.0-1.5*		*SEE LOGS*	*6.70*	*20*	*4.40*	23.5	A	N/L	N/L	2.30	
BH16	*1.5-2.0*		*SEE LOGS*	*6.65*	*20*	*1.48*	30.9	A	N/L	N/L	5.17	

NOTES: 1. Observed Reaction: a. No visible effervescence b. Slight to moderate effervescence c. Vigorous effervescent reaction
2. Strong Odour:

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SPECIALISTS MANAGING THE EARTH

Jobno: GEOTTUNC01736AA

sheet 1 of 2

acid sulfate soil screening test

office: TUNCURRY

client: **GREATER TAREE CITY COUNCIL**

principal:

project: **PROPOEEO SUBDIVISION**

location: **SEE FIGURE 9**

date: **14.09.07**

test location: **TUNC LAB**

tested by: **P.E**

checked by:

date samples recovered: **14.09.2007** pH meter used/serial D-54 date of calibration: **14.09.07**

hydrogen peroxide pH prior to use: **5.35** hydrogen peroxide temperature prior to use: **20.5**

sample location	depth (m)	RL (mAHD)	soil description	pH_F pH in 1:5 distilled water	pH_{FOX} (oxidation in 30% hydrogen peroxide) time (mins)	pH FOX	temp (°C)	Effervescence (see note below)	Odour	Colour change during reaction	pH Change (ie pH_F-pH_{FOX})	Additional comments
BH 17	2.5-3.0		SEE LOGS	5.15	10	2.06	50.5	C	N/L	YELLOW	3.90	
BH 17	2.0-2.5		SEE LOGS	5.18	15	2.35	70.0	C	N/L	N/L	2.83	
BH 18	3.5-4.0		SEE LOGS	5.44	10	4.29	23.1	A	N/L	N/L	1.15	
BH 18	4.0-4.5		SEE LOGS	5.29	10	2.11	59.4	C	N/L	GREEN	3.18	
BH19	0-0.5		SEE LOGS	4.32	10	3.63	42.5	C	N/L	N/L	0.69	
BH19	0.5-1.0		SEE LOGS	4.77	10	4.04	22.3	A	N/L	N/L	0.73	
BH20	1.5-2.0		SEE LOGS	4.60	10	3.93	53.3	C	N/L	N/L	0.67	
BH20	2.0-2.5		SEE LOGS	4.75	10	1.56	29.3	A	N/L	N/L	3.19	

NOTES: 1. Observed Reaction: a. No visible effervescence b. Slight to moderate effervescence c. Vigorous effervescent reaction
2. Strong Odour:

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

job no:
GEOTTUNCO1657AA
sheet 2 of 2

acid sulfate soil screening test

office: TUNCURRY

client: *LIDBURY SUMERS WHITEMAN*
date: *13.09.07*
principal:
test location: *TUNC LAB*
project: *PROPOEEO SUBDIVISION*
tested by: *P.E*
location: *MCBRIDE PROPERTY, SOUTH FORSTER*
checked by:

date samples recovered: pH meter used/serial D-54 date of calibration: *13.09.07*

hydrogen peroxide pH prior to use: *4.19* hydrogen peroxide temperature prior to use: *19.9*

sample location	depth (m)	RL (mAHD)	soil description	pH_F pH in 1:5 distilled water	pH_{FOX} (oxidation in 30% hydrogen peroxide) time (mins)	pH FOX	temp (°C)	Effervescence (see note below)	Odour	Colour change during reaction	pH Change (ie pH_F-pH_{FOX})	Additional comments
BH21	*0.5-1.0*		*SEE LOGS*	*8.25*	*15*	*4.03*	23.0	A	N/L	N/L	4.22	
BH21	*1.5-2.0*		*SEE LOGS*	*8.25*	*15*	*4.02*	22.9	A	N/L	N/L	4.23	
BH21	*2.0-2.5*		*SEE LOGS*		*15*	*4.06*	23.0	*A*	N/L	N/L	4.04	
BH21	*2.5-3.0*		*SEE LOGS*		*15*	*4.09*	22.9	A	N/L	N/L	4.25	
BH21	*4.5-5.0*		*SEE LOGS*		*15*	*4.11*	22.8	A	N/L	N/L	4.29	
BH22	*0-0.5*		*SEE LOGS*		*15*	*4.26*	22.8	A	N/L	N/L	3.99	
BH22	*0.5-1.0*		*SEE LOGS*		*15*	*4.28*	22.8	A	N/L	N/L	4.11	
BH22	*1.0-1.5*		*SEE LOGS*		*15*	*4.31*	22.7	A	N/L	N/L	3.92	
BH22	*1.5-2.0*		*SEE LOGS*		*15*	*4.28*	22.8	A	N/L	N/L	3.91	
BH22	*2.0-2.5*		*SEE LOGS*		*15*	*4.16*	22.8	A	N/L	N/L	4.11	

NOTES: 1. Observed Reaction: a. No visible effervescenceb. Slight to moderate effervescence c. Vigorous effervescent reaction
2. Strong Odour:

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: COFFEY GEOTECHNICS	*Laboratory*	: Environmental Division Sydney	*Page*	: 1 of 7
Contact	: MR STEVE MORTON	*Contact*	: Victor Kedicioglu	*Work Order*	: ES0712913
Address	: UNIT 1/4 DOUGLAS AVENUE TUNCURRY NSW AUSTRALIA 2428	*Address*	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: steve_morton@coffey.com	*E-mail*	: Victor.Kedicioglu@alsenviro.com		
Telephone	: 6555 8554	*Telephone*	: +61-2-8784 8555		
Facsimile	: - Not provided -	*Facsimile*	: +61-2-8784 8500		
Project	: TUNC01736AA	*Quote number*	: EN/007/07	*Date received*	: 18 Sep 2007
Order number	: - Not provided -			*Date issued*	: 28 Sep 2007
C-O-C number	: 14513			*No. of samples*	- *Received* : 8
Site	: - Not provided -				*Analysed* : 8

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Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*

ALS Environmental

Comments

This report for the ALSE reference ES0712913 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **ES0712913**

Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m3'.
Retained Acidity not required because pH KCl greater than or equal to 4.5

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BH17 2.5-3.0M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-001	BH17 3.0-3.5M SOIL 14 Sep 2007 15:00 ES0712913-002	BH18 2.0-2.5M SOIL 14 Sep 2007 15:00 ES0712913-003	BH18 2.5-3.0M SOIL 14 Sep 2007 15:00 ES0712913-004	BH19 2.0-2.5M SOIL 14 Sep 2007 15:00 ES0712913-005
EA029-A: pH Measurements								
pH KCl (23A)		0.1	pH Unit	4.7	5.3	6.3	5.8	5.8
pH OX (23B)		0.1	pH Unit	2.1	2.3	7.2	2.1	6.6
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)		2	mole H+ / t	26	16	4	9	9
Titratable Peroxide Acidity (23G)		2	mole H+ / t	1150	454	<2	840	<2
Titratable Sulfidic Acidity (23H)		2	mole H+ / t	1130	437	<2	831	<2
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	0.04	0.03	<0.02	<0.02	<0.02
sulfidic - Titratable Peroxide Acidity (s-23G)		0.02	% pyrite S	1.85	0.73	<0.02	1.35	<0.02
sulfidic - Titratable Sulfidic Acidity (s-23H)		0.02	% pyrite S	1.81	0.70	<0.02	1.33	<0.02
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)		0.02	% S	0.17	0.07	<0.02	0.07	<0.02
Peroxide Sulfur (23De)		0.02	% S	2.16	1.00	0.04	1.69	0.02
Peroxide Oxidisable Sulfur (23E)		0.02	% S	2.00	0.92	0.04	1.62	0.02
acidity - Peroxide Oxidisable Sulfur (a-23E)		10	mole H+ / t	1240	576	26	1010	13
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)		0.02	% Ca	0.10	0.07	0.09	0.10	0.16
Peroxide Calcium (23Wh)		0.02	% Ca	0.12	0.09	0.12	0.13	0.18
Acid Reacted Calcium (23X)		0.02	% Ca	0.02	0.02	0.03	0.03	0.02
acidity - Acid Reacted Calcium (a-23X)		10	mole H+ / t	10	12	14	15	11
sulfidic - Acid Reacted Calcium (s-23X)		0.02	% S	<0.02	<0.02	0.02	0.02	<0.02
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)		0.02	% Mg	0.10	0.07	0.10	0.10	0.12
Peroxide Magnesium (23Tm)		0.02	% Mg	0.12	0.09	0.11	0.13	0.13
Acid Reacted Magnesium (23U)		0.02	% Mg	0.02	0.02	<0.02	0.02	<0.02
acidity - Acid Reacted Magnesium (a-23U)		10	mole H+ / t	16	17	<10	20	<10
sulfidic - Acid Reacted Magnesium (s-23U)		0.02	% S	0.03	0.03	<0.02	0.03	<0.02
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)		0.02	% CaCO3	—	—	0.24	—	0.25
acidity - Excess Acid Neutralising Capacity (a-23Q)		10	mole H+ / t	—	—	47	—	50
sulfidic - Excess Acid Neutralising Capacity (s-23Q)		0.02	% S	—	—	0.08	—	0.08

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BH17 2.5-3.0M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-001	Client Sample ID: BH17 3.0-3.5M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-002	Client Sample ID: BH18 2.0-2.5M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-003	Client Sample ID: BH18 2.5-3.0M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-004	Client Sample ID: BH19 2.0-2.5M Sample Matrix Type / Description: SOIL Sample Date / Time: 14 Sep 2007 15:00 Laboratory Sample ID: ES0712913-005
EA029-H: Acid Base Accounting								
ANC Fineness Factor		0.5		1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)		0.02	% S	2.04	0.95	0.05	1.64	0.04
Net Acidity (acidity units)		10	mole H+ / t	1270	592	29	1020	22
Liming Rate		1	kg CaCO3/t	95	44	2	77	2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : BH19 2.5-3.0M Sample Matrix Type / Description : SOIL Sample Date / Time : 14 Sep 2007 15:00 Laboratory Sample ID : ES0712913-006	Client Sample ID : BH20 2.0-2.5M Sample Matrix Type / Description : SOIL Sample Date / Time : 14 Sep 2007 15:00 Laboratory Sample ID : ES0712913-007	Client Sample ID : BH20 3.0-3.5M Sample Matrix Type / Description : SOIL Sample Date / Time : 14 Sep 2007 15:00 Laboratory Sample ID : ES0712913-008		
EA029-A: pH Measurements								
pH KCl (23A)		0.1	pH Unit	5.9	5.5	5.3		
pH OX (23B)		0.1	pH Unit	6.8	6.9	3.6		
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)		2	mole H+ / t	4	16	16		
Titratable Peroxide Acidity (23G)		2	mole H+ / t	<2	<2	78		
Titratable Sulfidic Acidity (23H)		2	mole H+ / t	<2	<2	62		
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	0.02	0.02		
sulfidic - Titratable Peroxide Acidity (s-23G)		0.02	% pyrite S	<0.02	<0.02	0.12		
sulfidic - Titratable Sulfidic Acidity (s-23H)		0.02	% pyrite S	<0.02	<0.02	0.10		
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)		0.02	% S	<0.02	<0.02	<0.02		
Peroxide Sulfur (23De)		0.02	% S	<0.02	<0.02	0.16		
Peroxide Oxidisable Sulfur (23E)		0.02	% S	<0.02	<0.02	0.16		
acidity - Peroxide Oxidisable Sulfur (a-23E)		10	mole H+ / t	<10	<10	99		
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)		0.02	% Ca	0.10	0.17	0.07		
Peroxide Calcium (23Wh)		0.02	% Ca	0.12	0.15	0.09		
Acid Reacted Calcium (23X)		0.02	% Ca	<0.02	<0.02	0.03		
acidity - Acid Reacted Calcium (a-23X)		10	mole H+ / t	<10	<10	14		
sulfidic - Acid Reacted Calcium (s-23X)		0.02	% S	<0.02	<0.02	0.02		
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)		0.02	% Mg	0.09	0.14	0.06		
Peroxide Magnesium (23Tm)		0.02	% Mg	0.09	0.11	0.07		
Acid Reacted Magnesium (23U)		0.02	% Mg	<0.02	<0.02	<0.02		
acidity - Acid Reacted Magnesium (a-23U)		10	mole H+ / t	<10	<10	<10		
sulfidic - Acid Reacted Magnesium (s-23U)		0.02	% S	<0.02	<0.02	<0.02		
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)		0.02	% CaCO3	0.17	0.24	----		
acidity - Excess Acid Neutralising Capacity (a-23Q)		10	mole H+ / t	35	49	----		
sulfidic - Excess Acid Neutralising Capacity (s-23Q)		0.02	% S	0.06	0.08	----		

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Analytical Results

	Client Sample ID :	BH19 2.5-3.0M	BH20 2.0-2.5M	BH20 3.0-3.5M		
	Sample Matrix Type / Description :	SOIL	SOIL	SOIL		
	Sample Date / Time :	14 Sep 2007 15:00	14 Sep 2007 15:00	14 Sep 2007 15:00		
	Laboratory Sample ID :	ES0712913-006	ES0712913-007	ES0712913-008		
Analyte	CAS number / LOR / Units					
EA029-H: Acid Base Accounting						
ANC Fineness Factor	0.5	1.5	1.5	1.5		
Net Acidity (sulfur units)	0.02 % S	<0.02	0.02	0.18		
Net Acidity (acidity units)	10 mole H+ / t	<10	16	115		
Liming Rate	1 kg CaCO3/t	<1	1	9		

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Surrogate Control Limits

- **No surrogates present on this report.**