Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	6	47	**12.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	4	40	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	35	**11.4**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	18	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	17	**11.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	4	34	**11.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EG020A-T: Total Metals by ICP-MS - Suite A	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	11	**18.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

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). - 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
Laboratory Duplicates (DUP)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	ES0610221-018	TP11/0.2	Pyrene	25.7 %	0-20 %	RPD exceeds LOR based limits
Laboratory Control Samples (LCS)							
EP066: Polychlorinated Biphenyls (PCB)	WATER	286316-017	----	Total Polychlorinated biphenyls	107 %	61.6-107 %	Recovery greater than upper control limit
EP068B: Organophosphorus Pesticides (OP)	WATER	286316-022	----	Methyl Azinphos	42.6 %	45.6-138 %	Recovery less than lower control limit
				Naphthalene	116 %	62.4-114 %	Recovery greater than upper control limit
Matrix Spikes (MS)							
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0610221-002	TP18/1.2	Aldrin	72.2 %	77.54-107.0 %	Recovery less than lower data quality objective
				Dieldrin	73.6 %	76.37-109.7 %	Recovery less than lower data quality objective
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0610221-002	TP18/1.2	Bromophos-ethyl	72.2 %	74.94-107.37 %	Recovery less than lower data quality objective
				Prothiofos	75.0 %	75.45-106.05 %	Recovery less than lower data quality objective

- **For all matrices, no method blank result outliers occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP068T: Organophosphorus Pesticide Surrogate	SOIL	ES0610221-022	TP16/1.0	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
Surrogates							
EP075(SIM)S: Phenolic Compound Surrogates	WATER	ES0610221-012	W06	Phenol-d6	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences

Outliers : Analysis Holding Time

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

- **No holding time outliers occur.**

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

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

ASB-SOL : Asbestos - Count (Solid) - Asbestos Count on solid matrices conducted by Subcontracting Laboratory

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 20th 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 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)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed 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) (Method 504)

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)

Matrix Type: SOIL ***Method Reference Summary***

Analytical Methods

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)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

EN25 : Digestion for Total Recoverable Metals - 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 (1999) Schedule B(3) (Appdx. 2)

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.

Analytical Methods

EG020A-T : Total Metals by ICP-MS - Suite A - (APHA 20th 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.

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection ($SnCl_2$)(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 unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by $SnCl_2$ 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)

EP066 : Polychlorinated Biphenyls (PCB) - USEPA SW 846 - 8270D Sample extracts are analysed 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)

EP068 : Pesticides - USEPA SW 846 - 8270D Sample extracts are analysed 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)

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)

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Smithfield NSW 2164 Australia
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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**MACDONALDTOWN**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	ES20050033
Work order	:	**ES0610221**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	18 Aug 2006	**SRA Issue Date**	:	21 Aug 2006
Scheduled Reporting Date	:	**29 Aug 2006**	**Client Requested Date**	:	25 Aug 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice bricks present
No. of coolers/boxes	:	1 HARD	**No. of samples** - **Received**		22
Security Seal	:	Intact.	- **Analysed**		21

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis to be conducted by ASET.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any queries related to sample condition / numbering / breakages to Nazeeh Aoun.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610221
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ES20050033

Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		ASB-SOL - SOIL Asbestos - Count (Solid)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-05 - SOIL** TPH/BTEX/8 Metals	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals	**W-19T - WATER** TPH/BTX/P/Ph/OC/OP/PCB/8 metals
ES0610221-001	**TP16/3.5 - 17 Aug 2006**		⌋	⌋			⌋		⌋		
ES0610221-002	**TP18/1.2 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-003	**TP18/1.9 - 17 Aug 2006**										
ES0610221-004	**TP18/3.2 - 17 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610221-005	**TP18/4.4 - 17 Aug 2006**				⌋			⌋			
ES0610221-006	**DUP08 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-007	**MG10/0.2 - 17 Aug 2006**	⌋									
ES0610221-008	**MG09/B - 17 Aug 2006**	⌋									
ES0610221-009	**TP18 - 17 Aug 2006**	⌋									
ES0610221-010	**TRIP BLANK - 17 Aug 2006**					⌋					
ES0610221-011	**W05 - 17 Aug 2006**										⌋
ES0610221-012	**W06 - 17 Aug 2006**										⌋
ES0610221-013	**QA01 - 17 Aug 2006**										⌋
ES0610221-014	**MG11/0.2 - 17 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610221-015	**MG11/1.5 - 17 Aug 2006**		⌋	⌋							
ES0610221-016	**MG11/2.0 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-017	**MG11/4.0 - 17 Aug 2006**		⌋	⌋			⌋		⌋		
ES0610221-018	**TP11/0.2 - 17 Aug 2006**	⌋			⌋			⌋			
ES0610221-019	**TP11/1.0 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-020	**TP11/3.5 - 17 Aug 2006**							⌋			
ES0610221-021	**TP16/0.3 - 17 Aug 2006**				⌋			⌋			
ES0610221-022	**TP16/1.0 - 17 Aug 2006**		⌋	⌋						⌋	
	Total(s) :	**4**	**10**	**10**	**5**	**1**	**2**	**6**	**2**	**5**	**3**

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610221
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ES20050033

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	Subcontracted Reports	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 5**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0610613**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **rebatch of ES0609995**	*Quote number*	: **EN00605**	*Date received*	: **28 Aug 2006**
Order number	: **- Not provided -**			*Date issued*	: **4 Sep 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **1**
Site	: **- Not provided -**				*Analysed* : **1**

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

This document is issued in accordance with NATA's accreditation requirements.

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*
PHALAK INTHAKESONE	**Organics Co-ordinator**	**Organics - NATA 825 (10911 - Sydney)**
Sarah Millington	**Senior Inorganic Chemist**	**Inorganics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0610613 supersedes any previous reports with this reference. Results apply to the sample 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**

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.

- **Surrogate control limits**

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.

Specific comments for Work Order **ES0610613**

Sample was not extracted within the recommended holding time. Surrogate recoveries are within specification. ALS does not believe results have been compromised.

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Analytical Results

				Client Sample ID :	TP01/0.25			
				Sample Matrix Type / Description :	SOIL			
				Sample Date / Time :	15 Aug 2006 15:00			
				Laboratory Sample ID :	ES0610613-001			
Analyte	*CAS number*	*LOR*	*Units*					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%		14.7			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg		0.6			
Acenaphthylene	208-96-8	0.5	mg/kg		1.3			
Acenaphthene	83-32-9	0.5	mg/kg		<0.5			
Fluorene	86-73-7	0.5	mg/kg		<0.5			
Phenanthrene	85-01-8	0.5	mg/kg		1.5			
Anthracene	120-12-7	0.5	mg/kg		0.9			
Fluoranthene	206-44-0	0.5	mg/kg		4.6			
Pyrene	129-00-0	0.5	mg/kg		7.0			
Benz(a)anthracene	56-55-3	0.5	mg/kg		3.2			
Chrysene	218-01-9	0.5	mg/kg		3.3			
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		2.9			
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		3.2			
Benzo(a)pyrene	50-32-8	0.5	mg/kg		3.5			
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		2.2			
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		0.8			
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		3.2			
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg		<2			
C10 - C14 Fraction		50	mg/kg		<50			
C15 - C28 Fraction		100	mg/kg		250			
C29 - C36 Fraction		100	mg/kg		220			
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg		<0.2			
Toluene	108-88-3	0.2	mg/kg		<0.2			
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2			
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2			
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%		86.9			
2-Chlorophenol-D4	93951-73-6	0.1	%		85.0			
2.4.6-Tribromophenol	118-79-6	0.1	%		94.7			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%		82.8			
Anthracene-d10	1719-06-8	0.1	%		87.3			

ALS Environmental

Analytical Results

	Client Sample ID :	TP01/0.25				
	Sample Matrix Type / Description :	SOIL				
	Sample Date / Time :	15 Aug 2006 15:00				
	Laboratory Sample ID :	ES0610613-001				
Analyte	**CAS number**	**LOR**	**Units**			
EP075(SIM)T: PAH Surrogates						
4-Terphenyl-d14	1718-51-0	0.1	%	81.2		
EP080S: TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4	17060-07-0	0.1	%	101		
Toluene-D8	2037-26-5	0.1	%	99.8		
4-Bromofluorobenzene	460-00-4	0.1	%	97.7		

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	Anthracene-d10	27	133
	4-Terphenyl-d14	18	137
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	81	117
	4-Bromofluorobenzene	74	121

Nazeeh Aoun

FADI 28/8/06 5:30pm

From: Nanthini Coilparampil
Sent: Monday, 28 August 2006 4:04 PM
To: Nazeeh Aoun
Subject: FW: Additional analysis - Project Quote SY/148/06

Hi Nazee,

Please Flow the E-mail and amend the work orders accordingly

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Monday, 28 August 2006 3:30 PM
To: Nanthini Coilparampil
Subject: FW: Additional analysis - Project Quote SY/148/06

Hi Nanthini

Could you please action my email below.

Thanks

From: Sullivan, Adam /SYD
Sent: Monday, 28 August 2006 3:27 PM
To: 'margaret.valencic@alsenviro.com'
Subject: Additional analysis - Project Quote SY/148/06

Hi Margaret

Re batch Can you add the following additional analysis to the Macdonaldtown project:

→ Work Order #ES0609995 – CH2M HILL sample ID (TP01/0.25) – analyse for analysis code S-7; (released)
Add ← Work Order #ES0610135 – CH2M HILL sample ID (TP14/1.0) – analyse for analysis code S-2 and S-4. still active ###

Please advise when this can be done.

Regards

Adam Sullivan
Project Manager

CH2M HILL Australia Pty Ltd
PO Box 5392
Chatswood NSW 1515
Ph: +61 2 9950 0221
Mob: 0400 500 264
Fax: +61 2 9950 0600

ALS Environmental
Sydney
Work Order
ES0610613
Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 7**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0610613**
					Amendment No.	:	
Project	:	rebatch of ES0609995	**Quote number**	: EN00605	**Date received**	:	28 Aug 2006
Order number	:	- Not provided -			**Date issued**	:	4 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	1
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	1

This final report for the ALSE work order reference ES0610613 supersedes any previous reports with this reference.

Results apply to the sample as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

Sample was not extracted within the recommended holding time. Surrogate recoveries are within specification. ALS does not believe results have been compromised.

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory - 825

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations:* ***LOR*** = *Limit of Reporting,* ***RPD*** = *Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) 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%

Matrix Type: SOIL ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 264414)				**%**	**%**	**%**
ES0610472-019	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	27.9	26.5	5.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)				**mg/kg**	**mg/kg**	**%**
ES0610564-003	Anonymous	Naphthalene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthylene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluorene	0.5 mg/kg	<0.5	<0.5	0.0
		Phenanthrene	0.5 mg/kg	<0.5	<0.5	0.0
		Anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Benz(a)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Chrysene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(a)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	<0.5	0.0
ES0610613-001	TP01/0.25	Naphthalene	0.5 mg/kg	0.6	0.5	0.0
		Acenaphthylene	0.5 mg/kg	1.3	1.2	7.9
		Acenaphthene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluorene	0.5 mg/kg	<0.5	<0.5	0.0
		Phenanthrene	0.5 mg/kg	1.5	1.8	15.2
		Anthracene	0.5 mg/kg	0.9	1.0	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711) - continued				**mg/kg**	**mg/kg**	**%**
ES0610613-001	TP01/0.25	Fluoranthene	0.5 mg/kg	4.6	4.4	4.1
		Pyrene	0.5 mg/kg	7.0	6.8	3.8
		Benz(a)anthracene	0.5 mg/kg	3.2	3.1	5.0
		Chrysene	0.5 mg/kg	3.3	3.1	5.6
		Benzo(b)fluoranthene	0.5 mg/kg	2.9	2.8	3.9
		Benzo(k)fluoranthene	0.5 mg/kg	3.2	2.9	10.9
		Benzo(a)pyrene	0.5 mg/kg	3.5	3.4	3.8
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	2.2	2.1	5.9
		Dibenz(a,h)anthracene	0.5 mg/kg	0.8	0.8	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	3.2	3.0	5.1
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)				**mg/kg**	**mg/kg**	**%**
ES0610579-002	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610617-003	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)				**mg/kg**	**mg/kg**	**%**
ES0610564-003	Anonymous	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0
ES0610613-001	TP01/0.25	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	250	290	12.4
		C29 - C36 Fraction	100 mg/kg	220	250	11.8
EP080: BTEX						
EP080: BTEX - (QC Lot: 264317)				**mg/kg**	**mg/kg**	**%**
ES0610579-002	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0
		Toluene	0.2 mg/kg	<0.2	<0.2	0.0
		Ethylbenzene	0.2 mg/kg	<0.2	<0.2	0.0
		meta- & para-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
ES0610617-003	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 264317) - continued				**mg/kg**	**mg/kg**	**%**
ES0610617-003	Anonymous	Toluene	0.2 mg/kg	<0.2	<0.2	0.0
		Ethylbenzene	0.2 mg/kg	<0.2	<0.2	0.0
		meta- & para-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

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 type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. 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. Abbreviations: LOR = Limit of reporting.

Matrix Type: SOIL

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.1	81.5	112
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	80.9	79.6	113
Anthracene	0.5 mg/kg	----	4	85.0	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	78.5	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.2	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	79.2	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	77.1	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	85.5	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	----	4	83.6	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.6	71.7	113
Fluoranthene	0.5 mg/kg	----	4	81.3	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.9	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	77.9	71	113

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Matrix Type: SOIL

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

Analyte name	*LOR*	*Method blank result*	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
				LCS	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711) - continued		mg/kg	mg/kg	%	%	%
Naphthalene	0.5 mg/kg	----	4	83.1	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.9	79.4	114
Pyrene	0.5 mg/kg	----	4	82.1	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	93.5	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	89.1	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	90.1	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	87.5	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 264317)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	90.9	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	86.4	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	87.2	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.7	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	83.9	69	122

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Quality Control Report - Matrix Spikes (MS)

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 type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations:* ***LOR*** *= Limit of Reporting,* ***RPD*** *= Relative Percent Difference.*

* Indicates failed QC

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610564-001	Anonymous	0.5 mg/kg	10	<0.5	79.2	70	130
Pyrene			0.5 mg/kg	10	<0.5	81.2	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610579-002	Anonymous	2 mg/kg	26	<2	103	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610564-003	Anonymous	50 mg/kg	700	<50	96.5	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	120	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	94.3	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 264317)				mg/kg	mg/kg	%	%	%
Benzene	ES0610579-002	Anonymous	0.2 mg/kg	2.5	<0.2	77.0	70	130
Toluene			0.2 mg/kg	2.5	<0.2	74.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	76.3	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	74.3	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	76.1	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610613**
						Amendment No.	:
Project	:	rebatch of ES0609995	**Quote number**	:	EN00605	**Date received**	: 28 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 4 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 1
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 1

This Interpretive Quality Control Report was issued on 4 Sep 2006 for the ALS work order reference ES0610613 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	----	----	----	**29 Aug 2006**	22 Aug 2006	**Fail by 7 days**
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**29 Aug 2006**	29 Aug 2006	Pass	**29 Aug 2006**	29 Aug 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	1	3	**33.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	16	**12.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	15	**13.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

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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

- **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.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

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?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	----	----	----	**29 Aug 2006**	22 Aug 2006	**Fail by 7 days**
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

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.

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)

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)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 McDonaldtown Gasworks**
Order number	:	**REBATCH OF ES0609995**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	ES20050033
Work order	:	**ES0610613**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	28 Aug 2006	**SRA Issue Date**	:	28 Aug 2006
Scheduled Reporting Date	:	**4 Sep 2006**	**Client Requested Date**	:	4 Sep 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**		:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples**	**- Received**		1
Security Seal	:	Intact.		**- Analysed**		1

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any queries related to sample condition / numbering / breakages to Nazeeh Aoun.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610613
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ES20050033

Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		S-07 - SOIL TPH/BTEX/PAH (SIM)									
ES0610613-001	**TP01/0.25 - 15 Aug 2006**	]									
	Total(s) :	**1**									

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610613
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ES20050033

ALS Environmental

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

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CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 10
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0612955
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No.	: 1
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 MACDONALDTOWN GASWORKS	Quote number	: ----	Date received	: 17 Oct 2006
Order number	: - Not provided -			Date issued	: 25 Oct 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 22
Site	: - Not provided -				Analysed : 17

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

This document is issued in accordance with NATA's accreditation requirements.

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
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

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Comments

This report for the ALSE reference ES0612955 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 **ES0612955**

The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.

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Analytical Results

				Client Sample ID :	BHA/5.0	BHA/7.0	BHA/10.2	BHA1/7.0	BHA1/10.2
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0612955-001	ES0612955-002	ES0612955-003	ES0612955-004	ES0612955-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%		19.7	19.8	11.4	17.0	17.6
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	0.6	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	3.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction		2	mg/kg		<2	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg		<100	<100	<100	<100	<100

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHA/5.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 16 Oct 2006 15:00 Laboratory Sample ID: ES0612955-001	BHA/7.0 SOIL 16 Oct 2006 15:00 ES0612955-002	BHA/10.2 SOIL 16 Oct 2006 15:00 ES0612955-003	BHA1/7.0 SOIL 16 Oct 2006 15:00 ES0612955-004	BHA1/10.2 SOIL 16 Oct 2006 15:00 ES0612955-005
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	0.4	0.3	1.6	1.4
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	104	96.6	96.6	116	115
2-Chlorophenol-D4	93951-73-6	0.1	%	105	98.6	97.8	119	119
2.4.6-Tribromophenol	118-79-6	0.1	%	96.4	92.8	83.2	97.2	106
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	110	106	104	106	105
Anthracene-d10	1719-06-8	0.1	%	102	92.8	102	109	106
4-Terphenyl-d14	1718-51-0	0.1	%	112	108	106	109	111
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.8	109	96.2	95.8	114
Toluene-D8	2037-26-5	0.1	%	83.8	99.5	87.7	87.0	102
4-Bromofluorobenzene	460-00-4	0.1	%	101	119	104	106	113

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHA2/7.0	BHA2/10.2	BHB/6.0	BHE/2.2	BHE/3.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				16 Oct 2006 15:00	16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID:				ES0612955-006	ES0612955-007	ES0612955-008	ES0612955-009	ES0612955-010
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	18.6	15.3	21.7	18.3	15.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	<1.0	1.6
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	5.9	24.6	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	4	155	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	170	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	190	<100

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : BHA2/7.0	BHA2/10.2	BHB/6.0	BHE/2.2	BHE/3.5
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				16 Oct 2006 15:00	16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID :				ES0612955-006	ES0612955-007	ES0612955-008	ES0612955-009	ES0612955-010
EP080/071: Total Petroleum Hydrocarbons								
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	0.9	2.0	0.4	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	0.4	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.5	16.1	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.4	6.5	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.5	10.5	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	117	123	125	124	117
2-Chlorophenol-D4	93951-73-6	0.1	%	120	127	120	128	121
2.4.6-Tribromophenol	118-79-6	0.1	%	106	106	116	111	74.3
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	108	107	116	117	108
Anthracene-d10	1719-06-8	0.1	%	109	109	107	115	105
4-Terphenyl-d14	1718-51-0	0.1	%	113	113	123	119	113
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.0	85.1	84.6	102	101
Toluene-D8	2037-26-5	0.1	%	112	86.2	85.7	100	99.0
4-Bromofluorobenzene	460-00-4	0.1	%	98.0	82.5	80.0	99.7	97.6

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: DUP20	BHF/3.6	BHF/1.0	BH12A/4.2	TRIP SPIKE 1
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID:				ES0612955-011	ES0612955-012	ES0612955-013	ES0612955-014	ES0612955-015
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.5	14.8	11.6	10.0	<1.0
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	5.3	4.6	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	6.9	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	8.1	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	12.7	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	16.2	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	2.5	166	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	2.1	12.1	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	8.1	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.9	42.3	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	11.9	78.6	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	4.0	32.2	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	12.9	49.8	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	13.5	38.8	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	7.8	22.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	7.5	16.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	7.0	13.9	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	3.7	9.4	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	6.4	13.9	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	3.4	4.9	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	1.2	1.6	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	4.2	5.0	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	228	27
C10 - C14 Fraction		50	mg/kg	<50	<50	90	1190	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	740	3350	<100