



ALS Environmental

Client : SINCLAIR KNIGHT MERZ
Project : ENO1669

Work Order : ES0501569
ALS Quote Reference : SY/221/04

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Issue Date : 11 Mar 2005

Matrix Type: WATER

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

Analyte name		LOR	Method blank result	Actual Results		Recovery Limits	
				Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits Low	High
EP080/071: Total Petroleum Hydrocarbons							
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 48040)							
C10 - C14 Fraction			µg/L		%	%	
50 µg/L			<50				
50 µg/L							
100 µg/L			<100		110	75	
100 µg/L						134	
C15 - C28 Fraction							
50 µg/L							
100 µg/L					108	87	
C29 - C36 Fraction							
50 µg/L			<50				
50 µg/L					99.5	80	
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 48424)			µg/L		%	%	
C6 - C9 Fraction							
20 µg/L			µg/L		95.1	80	
20 µg/L			<20			120	
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 48759)							
C10 - C14 Fraction			µg/L		%	%	
50 µg/L			<50				
50 µg/L							
100 µg/L			<100		106	75	
100 µg/L						134	
C15 - C28 Fraction							
50 µg/L							
100 µg/L					102	87	
C29 - C36 Fraction							
50 µg/L			<50				
50 µg/L					87.7	80	
			200			126	



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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 (DQOs). '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: WATER

Matrix Type: WATER									
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results		Recovery Limits		
					Sample Result	Spike Recovery	MS	Low	High
EG020F: Dissolved Metals by ICP-MS									
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 47782)									
Arsenic	ES0501551-011	Anonymous	0.001 mg/L	0.2 mg/L	0.017 mg/L	121 %	70 %	130 %	
Cadmium			0.0001 mg/L	0.05 mg/L	0.0007 mg/L	99.5 %	70 %	130 %	
Chromium			0.001 mg/L	0.2 mg/L	0.012 mg/L	103 %	70 %	130 %	
Copper			0.001 mg/L	0.2 mg/L	0.021 mg/L	97.7 %	70 %	130 %	
Lead			0.001 mg/L	0.2 mg/L	0.002 mg/L	100 %	70 %	130 %	
Nickel			0.001 mg/L	0.2 mg/L	0.004 mg/L	104 %	70 %	130 %	
Zinc			0.005 mg/L	0.2 mg/L	0.098 mg/L	103 %	70 %	130 %	
EG035F: Dissolved Mercury by FIMS									
EG035F: Dissolved Mercury by FIMS - (QC Lot: 49640)									
Mercury	ES0501551-011	Anonymous	0.0001 mg/L	0.0100 mg/L	<0.0001 mg/L	96.2 %	70 %	130 %	
EG035F: Dissolved Mercury by FIMS - (QC Lot: 4964)									
Mercury	ES0501569-007	MW17D	0.0001 mg/L	0.0100 mg/L	<0.0001 mg/L	95.9 %	70 %	130 %	
EG050F: Hexavalent Chromium - Filtered									
EG050F: Hexavalent Chromium - Filtered - (QC Lot: 47321)									
Hexavalent Chromium	ES0501569-001	MW06S	0.01 mg/L	0.50 mg/L	<0.010 mg/L	103 %	70 %	130 %	
EK055G: Ammonia as N by Discrete Analyser									
EK055G: Ammonia as N by Discrete Analyser - (QC Lot: 47439)									
Ammonia as N	ES0501554-001	Anonymous	0.01 mg/L	1.00 mg/L	1.81 mg/L	72.5 %	70 %	130 %	
EK059G: NOX as N by Discrete Analyser									
EK059G: NOX as N by Discrete Analyser - (QC Lot: 47331)									
Nitrite + Nitrate as N	ES0501569-001	MW06S	0.01 mg/L	0.60 mg/L	0.382 mg/L	102 %	70 %	130 %	
EK061: Total Kjeldahl Nitrogen (TKN)									
EK061: Total Kjeldahl Nitrogen (TKN) - (QC Lot: 47830)									
Total Kjeldahl Nitrogen as N	ES0501501-001	Anonymous	0.1 mg/L	5.0 mg/L	0.8 mg/L	117 %	70 %	130 %	
EP005: Total Organic Carbon (TOC)									
EP005: Total Organic Carbon (TOC) - (QC Lot: 47633)									
Total Organic Carbon	EB0501750-001	Anonymous	1 mg/L	100 mg/L	47 mg/L	114 %	70 %	130 %	

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Matrix Type: WATER

Matrix Type: WATER								
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Low	High
EP026: Chemical Oxygen Demand (COD)								
EP026: Chemical Oxygen Demand (COD) - (QC Lot: 47779)				mg/L		%	%	%
Chemical Oxygen Demand	ES0501528-001	Anonymous	5 mg/L	143	64	105	70	130
EP026: Chemical Oxygen Demand (COD) - (QC Lot: 48044)				mg/L	mg/L	%	%	%
Chemical Oxygen Demand	ES0501569-005	MW18D	5 mg/L	143	19	103	70	130
EP074A: Monocyclic Aromatic Hydrocarbons								
EP074A: Monocyclic Aromatic Hydrocarbons - (QC Lot: 48425)								
Benzene	ES0501569-001	MW06S	5 µg/L	25	<5	112	70	130
Toluene			5 µg/L	25	<5	108	70	130
EP074E: Halogenated Aliphatic Compounds								
EP074E: Halogenated Aliphatic Compounds - (QC Lot: 48425)								
1,1-Dichloroethene	ES0501569-001	MW06S	5 µg/L	25	<5	84.5	70	130
Trichloroethene			5 µg/L	25	<5	114	70	130
EP074F: Halogenated Aromatic Compounds								
EP074F: Halogenated Aromatic Compounds - (QC Lot: 48425)								
Chlorobenzene	ES0501569-001	MW06S	5 µg/L	25	<5	110	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 48424)								
C6 - C9 Fraction	ES0501569-002	MW06D	20 µg/L	250	<20	96.5	80	120



ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	: SINCLAIR KNIGHT MERZ	Laboratory	: ALS Environmental Sydney	Page	: 1 of 9
Contact	: MS LOUISIE MACDONALD	Contact	: Greg Vogel	Work order	: ES0501569
Address	: P O BOX 164 ST LEONARDS NSW AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No.	:
Project	: ENO1669	Quote number	: SY/221/04	Date received	: 2 Mar 2005
Order number	: - Not provided -	E-mail	: Greg.Vogel@alsenviro.com	Date issued	: 11 Mar 2005
C-O-C number	: - Not provided -	Telephone	: 61-2-87848555	No. of samples Received	: 7
Site	: - Not provided -	Facsimile	: 61-2-87848500	Analysed	: 7
E-mail	: lmacdonald@skm.com.au				
Telephone	: (02) 9928-2100				
Facsimile	: (02) 9928-2272				

This Interpretive Quality Control Report was issued on 11 Mar 2005 for the ALS work order reference ES0501569 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



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Project : ENO1669

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: WATER

Analysis Holding Time and Preservation

Method	Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation		Pass?	Analysis	
			Date extracted	Due for extraction		Date analysed	Due for analysis
ED093F: Major Cations - Filtered							
Clear Plastic Bottle - Natural							
MW06S, MW20S, MW18D, MW13D	MW06D, MW07D, MW13D	28 Feb 2005	----	----	----	8 Mar 2005	28 Mar 2005
Clear Plastic Bottle - Natural							
MW17D		1 Mar 2005	----	----	----	8 Mar 2005	29 Mar 2005
EG020A-F: Dissolved Metals by ICP-MS - Suite A							
Clear Plastic Bottle - Nitric Acid; Filtered							
MW06S, MW20S, MW18D, MW13D	MW06D, MW07D, MW13D	28 Feb 2005	----	----	----	4 Mar 2005	27 Aug 2005
Clear Plastic Bottle - Nitric Acid; Filtered							
MW17D		1 Mar 2005	----	----	----	4 Mar 2005	28 Aug 2005
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered							
MW06S, MW20S, MW18D, MW13D	MW06D, MW07D, MW13D	28 Feb 2005	----	----	----	9 Mar 2005	28 Mar 2005
Clear Plastic Bottle - Nitric Acid; Filtered							
MW17D		1 Mar 2005	----	----	----	9 Mar 2005	29 Mar 2005
EG050G-F: Hexavalent Chromium by Discrete Analyser - Filtered							
Clear Plastic Bottle - Natural							
MW06S, MW20S, MW18D, MW13D	MW06D, MW07D, MW13D	28 Feb 2005	----	----	----	2 Mar 2005	1 Mar 2005
Clear Plastic Bottle - Natural							
MW17D		1 Mar 2005	----	----	----	2 Mar 2005	2 Mar 2005
EK055G: Ammonia as N by Discrete analyser							
Clear Plastic Bottle - Sulphuric Acid							
MW06S, MW20S, MW18D, MW13D	MW06D, MW07D, MW13D	28 Feb 2005	----	----	----	3 Mar 2005	28 Mar 2005
Clear Plastic Bottle - Sulphuric Acid							
MW17D		1 Mar 2005	----	----	----	3 Mar 2005	29 Mar 2005
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser							

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Analysis Holding Time and Preservation

Matrix Type: WATER

Matrix Type: WATER						
Method	Date Sampled	Extraction / Preparation		Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser - continued						
Clear Plastic Bottle - Natural MW06S, MW07D, MW20S, MW13D	28 Feb 2005	----	----	----	2 Mar 2005	2 Mar 2005
Clear Plastic Bottle - Natural MW17D	1 Mar 2005	----	----	----	2 Mar 2005	3 Mar 2005
EK061: Total Kjeldahl Nitrogen as N						
Clear Plastic Bottle - Sulphuric Acid MW06S, MW07D, MW20S, MW13D	28 Feb 2005	7 Mar 2005	28 Mar 2005	Pass	7 Mar 2005	28 Mar 2005
Clear Plastic Bottle - Sulphuric Acid MW17D	1 Mar 2005	7 Mar 2005	29 Mar 2005	Pass	7 Mar 2005	29 Mar 2005
EP005: Total Organic Carbon						
Amber TOC Vial- Sulphuric Acid MW06S, MW07D, MW20S, MW18D,	28 Feb 2005	----	----	----	4 Mar 2005	28 Mar 2005
Amber TOC Vial- Sulphuric Acid MW17D	1 Mar 2005	----	----	----	4 Mar 2005	29 Mar 2005
EP026: Chemical Oxygen Demand (COD)						
Clear Plastic Bottle - Sulphuric Acid MW06S, MW20S, MW18D,	28 Feb 2005	----	----	----	9 Mar 2005	28 Mar 2005
Clear Plastic Bottle - Sulphuric Acid MW17D	1 Mar 2005	----	----	----	9 Mar 2005	29 Mar 2005
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural MW06S, MW20S, MW18D,	28 Feb 2005	----	----	----	3 Mar 2005	2 Mar 2005
Clear Plastic Bottle - Natural MW17D	1 Mar 2005	----	----	----	3 Mar 2005	3 Mar 2005
EP071: TPH - Semivolatile Fraction						
Amber Glass Bottle - Unpreserved MW06S, MW20S, MW18D,	28 Feb 2005	4 Mar 2005	7 Mar 2005	Pass	7 Mar 2005	13 Apr 2005
Amber Glass Bottle - Unpreserved MW17D	1 Mar 2005	7 Mar 2005	8 Mar 2005	Pass	9 Mar 2005	16 Apr 2005
EP074: Volatile Organic Compounds						



Matrix Type: WATER

Method		Date Sampled		Extraction / Preparation		Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP074: Volatile Organic Compounds - continued							
Clear Plastic Bottle - Natural							
MW06D, MW07D, MW13D		28 Feb 2005	----	----	7 Mar 2005	14 Mar 2005	Pass
Clear Plastic Bottle - Natural							
MW17D		1 Mar 2005	----	----	7 Mar 2005	15 Mar 2005	Pass
EP075: Semivolatile Organic Compounds							
Amber Glass Bottle - Unpreserved							
MW06D, MW07D, MW13D		28 Feb 2005	4 Mar 2005	7 Mar 2005	7 Mar 2005	13 Apr 2005	Pass
Amber Glass Bottle - Unpreserved							
MW17D		1 Mar 2005	7 Mar 2005	8 Mar 2005	10 Mar 2005	16 Apr 2005	Pass
EP080: TPH Volatiles/BTEX							
Amber Glass Bottle - Unpreserved							
MW06D, MW07D, MW13D		28 Feb 2005	----	----	7 Mar 2005	14 Mar 2005	Pass
Amber Glass Bottle - Unpreserved							
MW17D		1 Mar 2005	----	----	7 Mar 2005	15 Mar 2005	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.

Frequency of Quality Control Samples

Matrix Type: WATER		Quality Control Specification		
Quality Control Sample Type	Method	Count	Rate (%)	Expected
		QC	Actual	Expected
Laboratory Duplicates (DUP)				
ED093F: Major Cations - Filtered		4	10.0	10.0
EG020A-F: Dissolved Metals by ICP-MS - Suite A		2	12.5	10.0
EG035F: Dissolved Mercury by FIMS		4	10.0	10.0
EG050G-F: Hexavalent Chromium by Discrete Analyser - Filtered		1	14.3	10.0
EK055G: Ammonia as N by Discrete analyser		2	10.0	10.0
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser		1	14.3	10.0
EK061: Total Kjeldahl Nitrogen as N		1	11.1	10.0
EP005: Total Organic Carbon		2	12.5	10.0
EP026: Chemical Oxygen Demand (COD)		3	23.1	10.0
EP030: Biochemical Oxygen Demand (BOD)		1	14.3	13.3
EP074: Volatile Organic Compounds		2	11.1	10.0
EP080: TPH Volatiles/BTEX		2	13.3	10.0
Laboratory Control Samples (LCS)				
ED093F: Major Cations - Filtered		2	5.0	5.0
EG020A-F: Dissolved Metals by ICP-MS - Suite A		1	6.3	5.0
EG035F: Dissolved Mercury by FIMS		2	5.0	5.0
EG050G-F: Hexavalent Chromium by Discrete Analyser - Filtered		1	14.3	5.0
EK055G: Ammonia as N by Discrete analyser		1	5.0	5.0
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser		1	14.3	5.0
EK061: Total Kjeldahl Nitrogen as N		1	11.1	5.0
EP005: Total Organic Carbon		1	6.3	5.0
EP026: Chemical Oxygen Demand (COD)		4	30.8	10.0
EP030: Biochemical Oxygen Demand (BOD)		1	14.3	6.7
EP071: TPH - Semivolatile Fraction		2	5.0	5.0
EP074: Volatile Organic Compounds		1	5.6	5.0
EP075: Semivolatile Organic Compounds		2	8.7	5.0
EP080: TPH Volatiles/BTEX		1	6.7	5.0