

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.

Matrix Type: WATER		Surrogate Control Limits	
Method name	Analyte name	Lower Limit	Upper Limit
EP074: Volatile Organic Compounds EP074S: VOC Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115
EP075: Semivolatile Organic Compounds EP075S: Acid Extractable Surrogates	2-Fluorophenol	21	100
	Phenol-d6	10	94
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	10	123
	Nitrobenzene-D5	35	114
EP075T: Base/Neutral Extractable Surrogates	1,2-Dichlorobenzene-D4	32	129
	2-Fluorobiphenyl	43	116
	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141
EP075(SIM): PAH/Phenols (GC/MS - SIM) EP075(SIM)S: Phenolic Compound Surrogates	2-Fluorophenol	21	100
	Phenol-d6	10	94
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	10	123
	2-Fluorobiphenyl	43	116
EP075(SIM)T: PAH Surrogates	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141
EP080: TPH Volatiles/BTEX EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115



QUALITY CONTROL REPORT

Client	: SINCLAIR KNIGHT MERZ	Laboratory	: ALS Environmental Sydney	Page	: 1 of 33
Contact	: MS LOUISE MACDONALD	Contact	: Greg Vogel	Work order	: ES0501668
Address	: P O BOX 164 ST LEONARDS NSW AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No.	: 1
Project	: EN01669	Quote number	: ----	Date received	: 4 Mar 2005
Order number	: - Not provided -	E-mail	: Greg.Vogel@alsenviro.com	Date issued	: 17 Mar 2005
C-O-C number	: - Not provided -	Telephone	: 61-2-87848555	No. of samples	
Site	: - Not provided -	Facsimile	: 61-2-87848500	Received	: 11
E-mail	: lmacdonald@skm.com.au			Analysed	: 11
Telephone	: (02) 9928-2100				
Facsimile	: (02) 9928-2272				

This final report for the ALSE work order reference ES0501668 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:

- 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 TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.

LOR raised of Cr6+ due to matrix interference

LOR raised for sample#1 (NH3) due to matrix interference

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



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The Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its scope of accreditation. This document shall not be reproduced except in full.

Signatory

Celine Conceicao
Greg Vogel
Peter Dickenson
Rassem Ayoubi
Sarah Millington

Department

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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: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
ED093F: Dissolved Major Cations						
ED093F: Dissolved Major Cations - (QC Lot: 48930)						
ES0501636-002	Anonymous	Calcium	1 mg/L	40	41	0.0
		Magnesium	1 mg/L	95	97	1.8
ES0501642-004	Anonymous	Calcium	1 mg/L	297	299	0.5
		Magnesium	1 mg/L	428	429	0.0
ED093F: Dissolved Major Cations - (QC Lot: 48932)						
ES0501668-002	MW42S	Calcium	1 mg/L	40	39	0.0
		Magnesium	1 mg/L	8	8	0.0
ED093F: Dissolved Major Cations - (QC Lot: 49509)						
ES0501668-005	MW03D	Calcium	1 mg/L	12	12	0.0
		Magnesium	1 mg/L	27	28	0.0
ES0501680-003	Anonymous	Calcium	1 mg/L	30	30	0.0
		Maonesium	1 mg/L	18	18	0.0



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Matrix Type: WATER

Matrix Type: WATER						
Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 48904)						
ES0501651-014	Anonymous	Arsenic	0.001 mg/L	0.002	0.002	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Copper	0.001 mg/L	<0.001	<0.001	0.0
		Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	0.002	0.002	0.0
		Zinc	0.005 mg/L	<0.005	<0.005	0.0
ES0501651-024	Anonymous	Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Copper	0.001 mg/L	0.008	0.007	0.0
		Lead	0.001 mg/L	0.002	<0.001	0.0
		Nickel	0.001 mg/L	0.039	0.037	4.6
		Zinc	0.005 mg/L	0.045	0.042	5.3
EG020T: Total Metals by ICP-MS - (QC Lot: 48906)						
ES0501668-007	MW38D	Arsenic	0.001 mg/L	0.017	0.015	11.4
		Cadmium	0.0001 mg/L	0.0008	0.0008	0.0
		Copper	0.001 mg/L	0.245	0.231	6.0
		Lead	0.001 mg/L	0.126	0.118	6.2
		Nickel	0.001 mg/L	0.087	0.080	8.2
		Zinc	0.005 mg/L	0.369	0.419	12.6
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 50078)						
ES0501640-004	Anonymous	Mercury	0.0001 mg/L	0.0004	0.0004	0.0
		Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
ES0501651-014	Anonymous					
EG035T: Total Mercury by FIMS - (QC Lot: 50079)						
ES0501668-011	RINSATE 2	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
		Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
ES0501705-008	Anonymous					
EG050T: Hexavalent Chromium - Total						
EG050T: Hexavalent Chromium - Total - (QC Lot: 48684)						
ES0501668-001	MW42D	Hexavalent Chromium	0.010 mg/L	<0.100	<0.100	0.0
EK055G: Ammonia as N by Discrete Analyser						
EK055G: Ammonia as N by Discrete Analyser - (QC Lot: 50140)						
ES0501668-001	MW42D	Ammonia as N	0.010 mg/L	0.114	0.110	3.6
		Ammonia as N	0.010 mg/L	0.010	<0.010	0.0



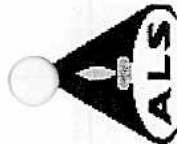
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Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EK059G: NOX as N by Discrete Analyser - (QC Lot: 48818)						
EK059G: NOX as N by Discrete Analyser - (QC Lot: 48818)						
ES0501581-001	Anonymous	Nitrite + Nitrate as N	0.010 mg/L	5.95	5.55	7.0
ES0501668-004	MW37S	Nitrite + Nitrate as N	0.010 mg/L	0.011	0.024	74.3
EK061: Total Kjeldahl Nitrogen (TKN)						
EK061: Total Kjeldahl Nitrogen (TKN) - (QC Lot: 48939)						
ES0501581-001	Anonymous	Total Kjeldahl Nitrogen as N	0.1 mg/L	0.5	0.5	0.0
ES0501665-001	Anonymous	Total Kjeldahl Nitrogen as N	0.1 mg/L	0.8	0.7	0.0
EP005: Total Organic Carbon (TOC)						
EP005: Total Organic Carbon (TOC) - (QC Lot: 49042)						
ES0501651-015	Anonymous	Total Organic Carbon	1 mg/L	<1	<1	0.0
ES0501651-026	Anonymous	Total Organic Carbon	1 mg/L	39	41	5.0
EP005: Total Organic Carbon (TOC) - (QC Lot: 49043)						
ES0501668-010	RINSATE 1	Total Organic Carbon	1 mg/L	<1	<1	0.0
EP026: Chemical Oxygen Demand (COD)						
EP026: Chemical Oxygen Demand (COD) - (QC Lot: 50060)						
ES0501646-001	Anonymous	Chemical Oxygen Demand	5 mg/L	8	7	13.3
EP026: Chemical Oxygen Demand (COD) - (QC Lot: 50066)						
ES0501668-010	RINSATE 1	Chemical Oxygen Demand	5 mg/L	7	16	78.3
EP030: Biochemical Oxygen Demand (BOD)						
EP030: Biochemical Oxygen Demand (BOD) - (QC Lot: 48685)						
ES0501581-001	Anonymous	Biochemical Oxygen Demand	2 mg/L	<2	<2	0.0
ES0501668-004	MW37S	Biochemical Oxygen Demand	2 mg/L	<2	<2	0.0
EP030: Biochemical Oxygen Demand (BOD) - (QC Lot: 48686)						
ES0501668-010	RINSATE 1	Biochemical Oxygen Demand	2 mg/L	<2	<2	0.0



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Matrix Type: WATER

Matrix Type: WATER							
Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD	
EP074A: Monocyclic Aromatic Hydrocarbons							
EP074A: Monocyclic Aromatic Hydrocarbons - (QC Lot: 50458)							
ES0501662-006	Anonymous	Benzene	5 µg/L	<5	<5	0.0	
		Toluene	5 µg/L	38	39	0.0	
		Ethylbenzene	5 µg/L	60	61	2.0	
		meta- & para-Xylene	5 µg/L	556	559	0.6	
		Styrene	5 µg/L	<5	<5	0.0	
		ortho-Xylene	5 µg/L	348	350	0.5	
		Isopropylbenzene	5 µg/L	26	26	0.0	
		n-Propylbenzene	5 µg/L	55	58	4.9	
		1,3,5-Trimethylbenzene	5 µg/L	200	209	4.3	
		sec-Butylbenzene	5 µg/L	<5	<5	0.0	
		1,2,4-Trimethylbenzene	5 µg/L	603	606	0.4	
		tert-Butylbenzene	5 µg/L	<5	<5	0.0	
		p-Isopropyltoluene	5 µg/L	<5	<5	0.0	
		n-Butylbenzene	5 µg/L	<5	<5	0.0	
ES0501818-004	Anonymous	Benzene	5 µg/L	<5	<5	0.0	
		Toluene	5 µg/L	<5	<5	0.0	
		Ethylbenzene	5 µg/L	<5	<5	0.0	
		meta- & para-Xylene	5 µg/L	<5	<5	0.0	
		Styrene	5 µg/L	<5	<5	0.0	
		ortho-Xylene	5 µg/L	<5	<5	0.0	
		Isopropylbenzene	5 µg/L	<5	<5	0.0	
		n-Propylbenzene	5 µg/L	<5	<5	0.0	
		1,3,5-Trimethylbenzene	5 µg/L	<5	<5	0.0	
		sec-Butylbenzene	5 µg/L	<5	<5	0.0	
		1,2,4-Trimethylbenzene	5 µg/L	<5	<5	0.0	
		tert-Butylbenzene	5 µg/L	<5	<5	0.0	
		p-Isopropyltoluene	5 µg/L	<5	<5	0.0	
		n-Butylbenzene	5 µg/L	<5	<5	0.0	
EP074B: Oxygenated Compounds							
EP074B: Oxygenated Compounds - (QC Lot: 50458)							
ES0501662-006	Anonymous	Vinyl Acetate	50 µg/L	<50	<50	0.0	
		2-Butanone (MEK)	50 µg/L	<50	<50	0.0	
		4-Methyl-2-pentanone (MIBK)	50 µg/L	<50	<50	0.0	
		2-Hexanone (MBK)	50 µg/L	<50	<50	0.0	
ES0501818-004	Anonymous	Vinyl Acetate	50 µg/L	<50	<50	0.0	
		2-Butanone (MEK)	50 µg/L	<50	<50	0.0	
		4-Methyl-2-pentanone (MIBK)	50 µg/L	<50	<50	0.0	
		2-Hexanone (MBK)	50 µg/L	<50	<50	0.0	



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Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP074C: Sulfonated Compounds						
EP074C: Sulfonated Compounds - (QC Lot: 50458)						
ES0501662-006	Anonymous	Carbon disulfide	5 µg/L	<5 µg/L	<5 µg/L	0.0
ES0501818-004	Anonymous	Carbon disulfide	5 µg/L	<5 µg/L	<5 µg/L	0.0
EP074D: Fumigants						
EP074D: Fumigants - (QC Lot: 50458)						
ES0501662-006	Anonymous	2,2-Dichloropropane	5 µg/L	<5 µg/L	<5 µg/L	0.0
		1,2-Dichloropropane	5 µg/L	<5 µg/L	<5 µg/L	0.0
		cis-1,3-Dichloropropylene	5 µg/L	<5 µg/L	<5 µg/L	0.0
		trans-1,3-Dichloropropylene	5 µg/L	<5 µg/L	<5 µg/L	0.0
		1,2-Dibromoethane (EDB)	5 µg/L	<5 µg/L	<5 µg/L	0.0
ES0501818-004	Anonymous	2,2-Dichloropropane	5 µg/L	<5 µg/L	<5 µg/L	0.0
		1,2-Dichloropropane	5 µg/L	<5 µg/L	<5 µg/L	0.0
		cis-1,3-Dichloropropylene	5 µg/L	<5 µg/L	<5 µg/L	0.0
		trans-1,3-Dichloropropylene	5 µg/L	<5 µg/L	<5 µg/L	0.0
		1,2-Dibromoethane (EDB)	5 µg/L	<5 µg/L	<5 µg/L	0.0

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Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP074E: Halogenated Aliphatic Compounds						
EP074E: Halogenated Aliphatic Compounds - (QC Lot: 50458)						
ES0501662-006	Anonymous	Dichlorodifluoromethane	50 µg/L	<50	<50	0.0
		Chloromethane	50 µg/L	<50	<50	0.0
		Vinyl chloride	50 µg/L	<50	<50	0.0
		Bromomethane	50 µg/L	<50	<50	0.0
		Chloroethane	50 µg/L	<50	<50	0.0
		Trichlorofluoromethane	50 µg/L	<50	<50	0.0
		1,1-Dichloroethene	5 µg/L	<5	<5	0.0
		Iodomethane	5 µg/L	<5	<5	0.0
		trans-1,2-Dichloroethene	5 µg/L	<5	<5	0.0
		1,1-Dichloroethane	5 µg/L	<5	<5	0.0
		cis-1,2-Dichloroethene	5 µg/L	13	13	0.0
		1,1,1-Trichloroethane	5 µg/L	<5	<5	0.0
		1,1-Dichloropropylene	5 µg/L	<5	<5	0.0
		Carbon Tetrachloride	5 µg/L	<5	<5	0.0
		1,2-Dichloroethane	5 µg/L	<5	<5	0.0
		Trichloroethene	5 µg/L	129	126	2.2
		Dibromomethane	5 µg/L	<5	<5	0.0
		1,1,2-Trichloroethane	5 µg/L	<5	<5	0.0
		1,3-Dichloropropane	5 µg/L	<5	<5	0.0
		Tetrachloroethene	5 µg/L	<5	<5	0.0
		1,1,1,2-Tetrachloroethane	5 µg/L	<5	<5	0.0
		trans-1,4-Dichloro-2-butene	5 µg/L	<5	<5	0.0
		cis-1,4-Dichloro-2-butene	5 µg/L	<5	<5	0.0
		1,1,2,2-Tetrachloroethane	5 µg/L	<5	<5	0.0
		1,2,3-Trichloropropane	5 µg/L	<5	<5	0.0
		Pentachloroethane	5 µg/L	<5	<5	0.0
		1,2-Dibromo-3-chloropropane	5 µg/L	<5	<5	0.0
		Hexachlorobutadiene	5 µg/L	<5	<5	0.0
ES0501818-004	Anonymous	Dichlorodifluoromethane	50 µg/L	<50	<50	0.0
		Chloromethane	50 µg/L	<50	<50	0.0
		Vinyl chloride	50 µg/L	<50	<50	0.0
		Bromomethane	50 µg/L	<50	<50	0.0
		Chloroethane	50 µg/L	<50	<50	0.0
		Trichlorofluoromethane	50 µg/L	<50	<50	0.0
		1,1-Dichloroethene	5 µg/L	<5	<5	0.0
		Iodomethane	5 µg/L	<5	<5	0.0
		trans-1,2-Dichloroethene	5 µg/L	<5	<5	0.0
		1,1-Dichloroethane	5 µg/L	<5	<5	0.0