



Australian Laboratory Services Pty. Ltd.

32 Shand Street
Stafford
Brisbane QLD 4053
Phone: +61 (7) 3243 7222 Fax: +61 (7) 3243 7218
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No: 825, Corporate Site No: 23001.

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Plus Appendix Pages
Finalized Date: 8-FEB-2019
Account: ACCELE

CERTIFICATE AD19011054

Project: Thomas Creek

This report is for 23 Soil samples submitted to our lab in Adelaide, SA, Australia on 16-JAN-2019.

The following have access to data associated with this certificate:

ROBERT REID

ANDY RUST

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
PUL-32	Pulverize 1000g to 85% < 75 um
PUL-QC	Pulverizing QC Test
LOG-22	Sample login - Rcd w/o BarCode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au-ICP21	Au 30g FA ICP-AES Finish	ICP-AES
ME-MS61	48 element four acid ICP-MS	

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Cameron Brosnan, Laboratory Manager, Perth



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CERTIFICATE OF ANALYSIS AD19011054

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	ME-MS61 Ag ppm 0.01	ME-MS61 Al % 0.01	ME-MS61 As ppm 0.2	ME-MS61 Ba ppm 10	ME-MS61 Be ppm 0.05	ME-MS61 Bi ppm 0.01	ME-MS61 Ca % 0.01	ME-MS61 Cd ppm 0.02	ME-MS61 Ce ppm 0.01	ME-MS61 Co ppm 0.1	ME-MS61 Cr ppm 1	ME-MS61 Cs ppm 0.05	ME-MS61 Cu ppm 0.2	ME-MS61 Fe % 0.01
TC402		0.14	0.06	9.15	12.6	290	0.76	0.50	1.26	<0.02	53.1	8.6	203	1.56	406	11.20
TC403		0.19	0.06	8.85	11.6	190	0.97	0.38	3.04	0.05	44.4	17.2	272	0.93	573	11.60
TC404		0.15	0.07	8.88	14.0	410	1.33	0.38	0.88	0.06	79.0	24.5	178	0.94	1400	17.55
TC405		0.17	0.02	7.75	13.9	80	1.19	0.25	4.56	0.05	34.9	13.5	196	0.83	72.0	11.45
TC406		0.15	0.02	7.36	12.5	80	0.94	0.33	2.70	0.03	50.9	14.3	163	1.28	74.6	12.70
TC407		0.12	0.02	6.43	16.0	40	0.86	0.28	2.73	0.02	50.1	20.2	166	0.69	42.5	18.55
TC408		0.12	0.02	1.25	25.9	20	0.72	0.14	4.75	0.04	330	31.7	43	0.23	46.3	22.3
TC409		0.15	0.01	7.84	12.1	20	1.11	0.16	3.08	<0.02	20.6	17.4	192	0.66	19.5	10.10
TC410		0.17	0.01	8.79	14.4	40	0.84	0.23	2.45	0.02	25.2	19.4	194	1.10	39.8	13.10
TC411		0.17	0.01	9.99	13.3	50	0.37	0.24	0.34	0.02	12.15	8.8	214	3.65	23.0	10.65
TC412		0.15	0.02	6.37	13.2	260	0.77	0.46	3.04	0.04	21.2	19.4	233	0.81	32.4	15.90
TC413		0.13	0.02	9.50	12.3	240	0.55	0.17	1.27	0.03	17.65	14.3	260	1.73	12.3	8.47
TC414		0.12	0.01	6.07	9.7	610	0.78	0.07	0.93	0.03	40.7	12.7	70	1.28	12.6	7.44
TC415		0.18	<0.01	8.68	3.5	370	1.12	0.07	3.33	0.02	13.40	13.4	85	0.60	6.5	3.04
TC416		0.18	0.02	10.35	11.5	180	0.84	0.14	1.99	0.03	23.2	23.3	164	1.01	84.2	9.19
TC417		0.18	0.02	9.96	7.6	260	0.82	0.12	2.12	<0.02	9.68	15.3	116	0.96	105.0	11.95
TC418		0.23	0.01	9.00	8.5	90	0.89	0.10	1.88	0.02	11.40	12.7	73	0.71	65.8	10.40
TC419		0.19	0.05	11.75	9.6	40	0.40	0.22	0.08	<0.02	2.04	6.1	162	1.00	57.8	11.15
TC420		0.14	0.13	11.35	3.6	320	0.73	0.16	0.19	<0.02	211	13.9	67	1.73	14.2	1.72
TC421		0.18	0.05	7.41	9.7	170	1.44	0.21	3.35	0.02	53.6	18.8	181	1.01	48.1	7.73
TC422		0.33	0.05	7.45	15.0	200	0.80	0.21	1.00	<0.02	37.5	16.8	166	0.97	85.2	13.75
TC423		0.16	0.05	9.17	12.3	170	1.06	0.24	2.34	<0.02	48.7	23.6	359	1.09	154.0	7.82
TC424		0.16	0.06	8.61	11.3	250	0.78	0.25	1.60	<0.02	36.1	15.4	259	1.59	206	10.20



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CERTIFICATE OF ANALYSIS AD19011054

Sample Description	Method Analyte Units LOD	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61
		Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P
		ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
		0.05	0.05	0.1	0.005	0.01	0.5	0.2	0.01	5	0.05	0.01	0.1	0.2	10
TC402		24.3	0.09	4.4	0.150	0.98	29.8	38.5	1.34	205	36.6	0.97	10.8	51.3	150
TC403		20.5	0.10	3.8	0.127	0.56	21.2	41.0	2.97	414	7.10	1.07	9.0	100.5	190
TC404		17.80	0.14	2.6	0.099	1.49	36.6	34.6	1.54	257	4.72	0.25	8.3	161.5	1160
TC405		25.1	0.08	3.1	0.093	0.29	15.2	31.3	2.22	332	3.77	0.32	12.2	90.5	210
TC406		25.6	0.08	4.5	0.087	0.31	21.8	24.3	2.23	237	5.04	0.38	17.6	84.8	290
TC407		26.1	0.25	2.9	0.100	0.18	22.2	17.6	2.65	227	2.26	0.41	11.6	162.0	650
TC408		22.3	0.31	1.6	0.085	0.08	122.0	3.6	2.15	287	0.75	0.18	7.8	267	>10000
TC409		21.0	0.06	3.6	0.098	0.18	8.9	18.9	2.39	372	0.81	1.21	13.6	125.0	370
TC410		22.2	0.13	2.6	0.084	0.19	11.1	18.5	1.83	265	1.34	0.70	11.5	167.5	510
TC411		22.6	0.08	3.6	0.077	0.44	5.1	17.4	0.54	228	1.16	0.07	14.3	52.0	120
TC412		16.50	0.05	2.0	0.074	0.83	8.0	13.5	2.71	575	0.45	1.52	6.8	73.1	290
TC413		23.7	0.08	3.6	0.075	0.83	8.8	38.5	1.30	485	1.61	0.77	11.1	87.9	170
TC414		19.60	0.06	4.9	0.041	2.07	20.6	13.1	1.70	485	0.49	1.90	12.9	27.7	220
TC415		15.55	0.06	1.6	0.046	1.10	5.9	10.4	1.99	449	0.18	4.61	1.8	44.1	30
TC416		22.7	0.11	2.5	0.082	0.97	12.1	54.7	2.96	566	1.05	0.65	8.0	71.4	190
TC417		20.0	0.14	2.1	0.105	0.96	4.8	24.2	2.17	341	0.77	0.99	4.2	71.1	80
TC418		19.25	0.08	2.4	0.089	0.56	5.7	23.7	1.69	284	0.86	2.49	4.1	65.5	150
TC419		24.3	0.53	1.9	0.065	0.32	0.7	13.2	0.22	86	1.54	0.05	12.1	31.9	100
TC420		28.5	0.24	3.5	0.056	2.02	85.7	11.6	0.48	151	1.07	0.16	9.5	51.2	250
TC421		15.40	0.14	2.6	0.054	0.94	22.9	10.9	2.98	466	0.31	2.09	6.4	51.8	1950
TC422		18.80	0.18	3.8	0.069	0.84	16.0	47.5	1.63	244	1.85	0.33	9.4	65.5	440
TC423		18.75	0.15	2.6	0.072	0.99	20.9	43.7	4.16	272	3.13	0.29	14.4	84.3	470
TC424		20.6	0.20	3.4	0.081	1.05	15.8	55.1	2.30	195	7.59	0.56	12.1	49.4	260



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CERTIFICATE OF ANALYSIS AD19011054

Sample Description	Method Analyte Units LOD	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61
		Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U
		ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
		0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.01	0.005	0.02	0.1
TC402		36.6	<0.002	0.06	0.81	24.2	5	10.1	81.7	0.79	0.05	12.00	0.651	0.17	9.0
TC403		21.4	<0.002	0.05	0.88	30.8	5	10.1	117.5	0.60	<0.05	11.90	0.544	0.11	9.1
TC404		37.8	<0.002	0.06	0.87	23.7	4	4.4	52.2	0.45	<0.05	11.85	0.364	0.11	6.1
TC405		10.1	<0.002	0.05	1.01	22.9	6	4.6	720	0.62	<0.05	14.90	0.461	0.06	4.0
TC406		10.3	<0.002	0.07	0.57	27.7	6	4.8	130.0	0.94	<0.05	16.45	0.624	0.07	4.7
TC407		5.6	<0.002	0.07	0.61	25.4	7	4.4	100.0	0.61	<0.05	20.9	0.479	0.05	3.9
TC408		1.7	<0.002	0.03	0.57	10.7	1	3.4	88.7	0.47	<0.05	26.0	0.471	<0.02	2.8
TC409		8.5	<0.002	0.04	0.79	23.9	4	5.7	211	1.03	<0.05	10.95	0.467	0.03	4.2
TC410		8.6	<0.002	0.05	0.66	29.5	4	4.3	149.0	0.61	<0.05	10.80	0.489	0.05	3.8
TC411		30.9	<0.002	0.03	2.24	22.6	4	2.1	34.9	1.10	<0.05	19.85	0.804	0.11	2.3
TC412		37.6	<0.002	0.05	0.46	31.0	1	1.9	150.0	0.47	<0.05	9.53	0.385	0.12	1.9
TC413		37.7	<0.002	0.07	0.49	16.7	4	1.5	92.9	0.83	<0.05	10.30	0.577	0.13	1.9
TC414		86.3	<0.002	0.02	0.55	20.4	1	1.6	150.5	0.87	<0.05	10.80	0.455	0.20	2.7
TC415		66.9	<0.002	0.03	0.53	11.9	<1	1.0	271	0.14	<0.05	5.27	0.155	0.20	0.8
TC416		47.1	<0.002	0.05	1.07	32.8	4	3.1	138.0	0.56	<0.05	14.00	0.506	0.14	2.5
TC417		52.0	<0.002	0.04	0.83	26.9	3	3.5	85.2	0.35	<0.05	11.65	0.364	0.15	2.3
TC418		27.5	<0.002	0.06	0.76	22.5	3	2.7	96.1	0.46	<0.05	14.90	0.368	0.09	2.2
TC419		22.9	<0.002	0.04	0.95	27.1	3	3.2	6.5	0.93	0.05	17.30	0.519	0.08	2.8
TC420		143.0	<0.002	0.02	0.75	38.3	2	3.9	41.4	0.99	<0.05	24.6	0.517	0.31	6.1
TC421		67.0	<0.002	0.02	0.43	23.1	2	1.3	168.5	0.64	<0.05	16.15	0.320	0.15	2.0
TC422		47.0	<0.002	0.07	0.62	16.6	5	2.3	50.0	0.71	<0.05	26.7	0.405	0.12	4.2
TC423		65.5	<0.002	0.04	0.61	35.0	4	3.0	49.9	0.61	<0.05	15.05	0.454	0.14	7.7
TC424		52.7	<0.002	0.06	0.60	24.5	5	4.3	55.9	0.61	<0.05	12.95	0.485	0.13	6.2



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CERTIFICATE OF ANALYSIS AD19011054

Sample Description	Method Analyte Units LOD	ME-MS61	ME-MS61	ME-MS61	ME-MS61	Au-ICP21	PUL-QC
		W	Y	Zn	Zr	Au	Pass75um
		ppm	ppm	ppm	ppm	ppm	%
		0.1	0.1	2	0.5	0.001	0.01
TC402		2.9	10.3	21	153.0	0.079	94.0
TC403		3.4	13.6	38	134.0	0.113	
TC404		2.0	14.2	45	91.0	0.089	
TC405		1.3	15.0	18	105.5	0.007	
TC406		1.6	20.5	15	147.5	0.006	
TC407		1.3	19.8	13	96.2	0.005	
TC408		1.3	77.2	13	53.0	0.003	
TC409		1.1	14.8	19	128.0	0.002	
TC410		1.2	15.4	17	84.3	0.003	
TC411		2.1	6.1	21	132.5	0.001	
TC412		0.5	13.9	52	61.9	0.001	
TC413		1.0	8.9	26	132.0	<0.001	
TC414		1.2	13.6	52	177.0	<0.001	
TC415		0.6	12.6	32	54.9	<0.001	
TC416		1.9	17.3	54	82.2	0.002	
TC417		1.8	13.2	25	78.0	0.001	
TC418		3.1	10.3	22	77.3	0.002	
TC419		1.6	1.4	15	70.5	0.002	
TC420		2.7	29.4	22	140.0	0.002	
TC421		0.6	33.5	20	97.2	0.001	
TC422		1.4	17.9	20	146.5	0.014	
TC423		1.2	27.7	17	94.1	0.003	
TC424		1.2	17.2	13	130.0	0.006	



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CERTIFICATE OF ANALYSIS AD19011054

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

Applies to Method:

REE's may not be totally soluble in this method.
ME-MS61

ACCREDITATION COMMENTS

Applies to Method:

NATA Accreditation covers the performance of this service but does not cover the performance of ALS Perth Sample Preparation. Corporate Accreditation No: 825, Corporate Site No: 23001. The Technical Signatory is Wendy Wong, Senior QC Chemist
Au-ICP21 ME-MS61

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Perth located at 31 Denninup Way, Malaga, Australia. Processed at ALS Perth Sample Preparation at 79 Distinction Road, Wangara, WA, Australia
Au-ICP21 ME-MS61

Applies to Method:

Processed at ALS Adelaide located at Unit 1, 1 Burma Road, Pooraka, Adelaide, SA, Australia.
LEV-01 LOG-22 PUL-32 PUL-QC
WEI-21