



Australian Laboratory Services Pty. Ltd.

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www.alsglobal.com

ALS Brisbane is a NATA Accredited Testing Laboratory. Corporate
Accreditation No: 825, Corporate Site No: 818.

CERTIFICATE

The following have access to data associated with this certificate:

To: **ALS MINERALS - SALES**
ATTN: ALS MINERALS

CANADA

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 *****

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Plus Appendix Pages
Finalized Date: 5-AUG-2016
Account: MICK

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
PUL-QC	Pulverizing QC Test
LOG-22	Sample login - Rcd w/o BarCode
CRU-21	Crush entire sample >70% -6 mm
PUL-31b	Pulv. Lg split to >80% -75um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au-TL43	Trace Level Au - 25g AR	ICP-MS
ME-MS61	48 element four acid ICP-MS	

Signature:

Shaun Kenny, Brisbane Laboratory Manager



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CERTIFICATE OF ANALYSIS BU16119577

Sample Description	Method Analyte Units LOR	WEI-21	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
		Recvd Wt.	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe
		kg	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%
		0.02	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2	0.01
50014		1.35	0.02	6.50	19.1	150	3.36	1.00	0.05	<0.02	22.7	3.3	48	7.24	22.0	8.97
50015		1.80	<0.01	7.17	20.9	50	2.43	0.88	0.05	0.04	83.8	20.5	165	2.20	46.7	5.41
50016		0.31	0.08	3.58	125.5	320	7.94	5.02	1.29	<0.02	67.3	37.5	106	1.94	52.2	35.4
50017		1.88	0.19	9.98	20.2	220	34.8	22.9	0.13	4.26	194.5	22.4	56	20.6	89.3	7.76
50018		3.54	0.03	3.35	1.8	270	2.05	0.10	22.5	0.14	39.3	4.8	26	7.09	7.7	1.20
50019		2.30	0.11	1.71	7.8	120	9.71	1.00	26.8	3.96	35.6	3.9	13	3.84	7.3	1.04
50020		4.48	0.15	1.66	2.2	130	5.89	0.14	27.8	2.32	28.4	2.8	13	7.16	4.9	0.77
50021		3.19	0.40	0.64	28.3	40	1.17	0.12	32.9	0.64	12.25	1.9	8	2.51	6.4	0.49
50022		2.06	0.21	0.58	23.6	20	1.06	0.04	27.7	0.50	10.45	4.8	8	3.28	16.0	7.42
50023		3.35	0.01	0.37	3.0	20	0.33	0.03	31.1	0.03	7.02	1.3	4	1.84	2.6	0.53
50024		1.59	0.04	0.76	72.8	40	1.89	0.19	32.5	0.35	14.85	4.6	9	4.50	3.3	0.85
50025		3.56	0.03	2.02	2.2	150	1.06	0.11	27.8	0.20	27.9	4.6	21	16.70	7.5	0.92
50026		3.47	0.01	0.80	3.2	50	0.73	0.06	26.0	0.02	12.35	2.1	7	3.95	3.1	0.89
50027		2.56	0.02	3.18	3.3	360	1.91	0.06	0.02	<0.02	170.0	3.9	882	10.55	14.7	5.42
50028		2.25	0.02	1.90	1.4	50	0.67	0.10	0.01	<0.02	40.6	2.6	710	2.28	6.2	1.33
50029		1.94	0.01	2.62	6.2	120	1.01	0.07	0.02	<0.02	52.3	3.7	207	5.63	7.8	1.62
50030		1.80	0.02	2.95	4.5	130	0.91	0.11	0.02	<0.02	62.4	4.0	274	5.01	8.7	1.57
50031		2.40	0.04	3.73	5.1	150	1.25	0.15	0.13	0.03	54.3	9.8	140	5.72	39.1	1.81
50032		2.36	0.02	3.71	6.7	150	1.08	0.16	1.72	0.03	81.9	12.5	163	3.83	20.3	2.08
50033		2.29	0.13	7.63	17.2	470	1.35	0.91	0.05	0.10	68.1	1.6	83	17.50	22.1	4.70
50034		1.66	0.30	7.87	69.8	170	0.80	0.39	0.08	0.08	63.4	2.1	74	19.40	125.5	4.54



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CERTIFICATE OF ANALYSIS BU16119577

Sample Description	Method Analyte Units LOR	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	ME-MS61
		Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb
		ppm	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	0.5
50014		16.90	0.19	3.3	0.235	3.04	24.2	10.5	0.07	245	1.77	0.05	20.9	11.0	200	9.8
50015		22.6	0.26	5.3	0.142	0.28	21.4	24.6	0.31	706	1.99	0.04	36.9	118.5	290	12.3
50016		22.0	1.77	2.7	1.275	0.38	18.4	8.6	1.18	4570	7.82	0.37	20.9	97.1	930	15.2
50017		28.6	0.51	7.7	0.469	1.75	250	69.4	1.83	1440	1.28	0.04	30.4	68.2	420	99.5
50018		9.17	0.12	1.7	0.032	1.80	20.1	21.4	1.91	309	0.24	0.20	7.5	13.8	410	6.3
50019		3.90	0.11	1.2	0.036	0.95	32.9	12.8	0.60	1200	0.20	0.03	4.6	11.4	330	23.1
50020		4.18	0.10	0.9	0.018	0.92	20.9	17.3	1.46	628	0.19	0.09	3.8	8.1	260	10.5
50021		1.82	0.10	0.6	0.013	0.32	6.9	8.5	1.31	307	0.28	0.04	1.8	4.5	110	52.3
50022		3.65	0.16	0.7	0.451	0.21	5.6	4.7	2.39	1300	3.87	0.03	3.3	6.1	70	49.6
50023		0.96	0.07	0.3	0.007	0.19	3.7	3.6	2.50	151	0.73	0.02	1.1	3.5	60	3.6
50024		2.05	0.08	0.7	0.012	0.38	7.9	10.0	1.14	416	0.43	0.03	2.3	9.9	150	22.4
50025		5.20	0.10	1.6	0.020	1.24	14.1	10.0	1.00	167	0.22	0.24	5.4	12.7	150	7.7
50026		2.19	0.09	0.6	0.012	0.36	6.4	14.8	5.55	314	0.67	0.02	2.3	5.7	150	3.8
50027		10.15	0.43	3.0	0.020	1.12	282	30.4	0.15	129	0.41	0.07	6.9	22.5	650	27.1
50028		5.60	0.05	2.6	0.008	0.59	19.8	17.6	0.05	77	0.23	0.04	5.2	16.5	130	8.1
50029		7.69	0.07	2.0	0.020	1.05	23.1	17.1	0.15	50	0.51	0.04	2.7	22.3	230	10.7
50030		8.33	0.08	2.6	0.020	1.43	32.2	19.6	0.16	62	0.36	0.06	4.5	31.1	220	8.6
50031		10.25	0.07	3.4	0.040	1.60	24.2	26.6	0.31	166	1.09	0.09	13.6	36.9	380	16.8
50032		10.00	0.10	2.8	0.087	0.97	32.9	20.6	1.21	366	0.57	0.08	9.3	51.9	1350	9.5
50033		22.6	0.24	3.7	0.115	1.86	33.3	21.6	0.39	36	1.02	0.04	10.5	14.9	280	140.0
50034		17.05	0.32	3.2	0.081	0.50	22.1	31.1	0.15	113	1.60	0.04	9.4	14.5	490	273



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Sample Description	Method Analyte Units LOR	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	ME-MS61
		Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V
		ppm	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	1
50014		600	<0.002	0.01	2.24	4.4	1	42.7	8.7	1.85	<0.05	38.4	0.076	3.83	2.7	7
50015		16.6	<0.002	0.02	1.24	17.9	2	9.5	16.2	2.45	0.05	17.15	0.915	0.21	5.3	145
50016		16.8	<0.002	0.01	12.95	10.7	1	74.4	234	1.20	0.05	7.04	0.496	0.22	7.6	101
50017		75.3	0.002	0.02	7.35	21.0	3	26.0	96.6	2.28	0.24	29.2	0.628	1.15	13.6	89
50018		102.5	<0.002	0.21	0.25	6.4	<1	2.0	397	0.53	<0.05	8.30	0.171	7.10	1.3	36
50019		56.7	<0.002	0.02	0.67	3.6	<1	1.8	441	0.33	0.06	6.12	0.093	0.98	2.3	11
50020		53.7	<0.002	0.10	0.34	3.3	<1	1.0	595	0.26	<0.05	4.36	0.084	1.13	1.0	17
50021		18.5	<0.002	0.08	4.83	1.5	<1	0.7	385	0.12	<0.05	1.91	0.043	0.32	2.4	7
50022		25.3	<0.002	0.12	2.91	1.8	<1	23.1	315	0.22	<0.05	1.74	0.049	0.25	0.9	8
50023		14.2	<0.002	0.21	0.55	1.1	<1	0.3	436	0.07	<0.05	1.14	0.026	0.15	1.0	5
50024		22.6	<0.002	<0.01	3.55	1.8	<1	0.7	249	0.14	<0.05	2.44	0.054	0.61	2.5	10
50025		60.5	<0.002	0.31	0.28	4.5	<1	1.1	476	0.36	0.05	5.86	0.135	0.39	1.3	22
50026		19.9	<0.002	0.36	0.34	2.0	<1	0.5	437	0.16	<0.05	2.51	0.052	0.17	0.7	9
50027		127.5	0.002	0.01	0.72	7.1	5	2.5	107.0	0.56	0.06	33.3	0.192	0.50	7.3	44
50028		53.6	<0.002	0.01	0.75	2.3	1	1.2	19.9	0.47	<0.05	14.55	0.074	0.20	2.0	18
50029		67.6	<0.002	<0.01	2.19	6.0	<1	1.3	25.1	0.18	<0.05	7.50	0.149	0.36	2.6	41
50030		66.2	<0.002	0.01	1.67	6.4	1	1.1	25.3	0.34	0.05	9.75	0.192	0.33	2.5	42
50031		111.5	<0.002	0.05	1.54	5.7	1	2.0	30.8	1.73	0.07	14.05	0.194	0.48	3.1	37
50032		60.9	<0.002	0.09	2.85	8.5	1	2.8	56.6	0.72	0.07	11.80	0.299	0.27	2.7	47
50033		190.0	<0.002	0.04	1.21	13.8	2	3.3	17.9	0.74	0.06	13.40	0.346	0.87	3.3	144
50034		40.2	<0.002	0.10	2.22	16.2	5	2.3	24.8	0.66	0.10	12.15	0.338	0.59	7.0	100



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CERTIFICATE OF ANALYSIS BU16119577

Sample Description	Method Analyte Units LOR	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5	Au-TL43 Au ppm 0.001	PUL-QC Pass75um % 0.01
50014		16.8	29.7	69	81.1	0.001	
50015		6.9	15.0	151	191.5	0.001	
50016		14.5	18.7	739	107.5	0.001	
50017		10.6	280	1220	245	0.004	
50018		0.9	14.7	36	60.0	<0.001	
50019		1.3	40.6	165	41.3	0.001	
50020		0.6	22.2	67	32.5	0.001	
50021		1.1	6.3	128	25.3	<0.001	
50022		0.7	4.5	233	29.3	<0.001	
50023		0.2	3.1	15	10.6	<0.001	95.3
50024		1.2	7.7	125	27.9	<0.001	
50025		0.9	11.5	29	59.4	<0.001	
50026		0.4	5.0	8	23.0	<0.001	
50027		6.4	120.0	30	101.0	0.001	
50028		2.5	9.7	31	76.3	<0.001	
50029		3.1	8.8	19	71.5	0.001	
50030		1.7	11.0	20	88.2	0.001	
50031		1.1	10.8	26	96.1	0.001	
50032		0.8	31.9	33	95.9	0.001	
50033		1.8	14.2	39	136.5	0.001	
50034		1.5	23.3	86	118.0	0.003	



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CERTIFICATE OF ANALYSIS BU16119577

	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 Accredited. Corporate Accreditation No: 825, Corporate Site No: 818. The Technical Signatory is David Jones, ICPMS Supervising Chemist. Au-TL43 ME-MS61			
	LABORATORY ADDRESSES			
Applies to Method:	Processed at ALS Brisbane located at 32 Shand Street, Stafford, Brisbane, QLD, Australia. NATA Accreditation does not cover the performance of ALS Brisbane Sample Preparation which is processed at 116 Delta Street, Geebung, QLD 4034, Australia Au-TL43 ME-MS61			
Applies to Method:	Processed at ALS Burnie located at 39 River Road, Burnie, TAS, Australia. CRU-21 PUL-QC	LEV-01 WEI-21	LOG-22	PUL-31b