



Australian Laboratory Services Pty. Ltd.

32 Shand Street  
Stafford  
Brisbane QLD 4053  
Phone: +61 (7) 3243 7222 Fax: +61 (7) 3243 7218  
www.alsglobal.com/geochemistry

ALS Perth is a NATA Accredited Testing Laboratory. Corporate Accreditation  
No: 825, Corporate Site No: 23001.

## QC CERTIFICATE PH18255907

Project: THOMAS CREEK

This report is for 31 Soil samples submitted to our lab in Burnie, TAS, Australia on  
5-OCT-2018.

The following have access to data associated with this certificate:

PETER REID

ANDY RUST

## SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
PUL-311	Pulverize 250g soil to 85% < 75um
BAG-01	Bulk Master for Storage
SPL-21	Split sample - riffle splitter
LOG-22	Sample login - Rcd w/o BarCode
PUL-QC	Pulverizing QC Test

## ANALYTICAL PROCEDURES

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

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 \*\*\*\*\*

Comments: Samples (use the IDs provided in the issue) were damaged upon receipt, rebagged and client informed.

Signature:

Cameron Brosnan, Laboratory Manager, Perth



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## QC CERTIFICATE OF ANALYSIS PH18255907

Method Analyte Units LOD	Au-ICP21 Au ppm 0.001	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
Sample Description	STANDARDS														
AMIS0354	0.718														
Target Range - Lower Bound	0.666														
Upper Bound	0.754														
GBM908-10		2.97	7.05	57.3	1170	1.50	1.22	3.77	1.71	106.0	27.8	145	4.08	3730	5.62
Target Range - Lower Bound		2.60	6.40	50.2	930	1.27	1.12	3.33	1.53	99.0	24.0	125	3.44	3350	4.98
Upper Bound		3.20	7.84	61.8	1280	1.66	1.39	4.10	1.91	121.0	29.6	155	4.32	3850	6.10
GPP-14	0.893														
GPP-14	0.908														
GPP-14	0.902														
GPP-14	0.903														
Target Range - Lower Bound	0.853														
Upper Bound	0.965														
JK-17	2.00														
Target Range - Lower Bound	1.875														
Upper Bound	2.12														
MRGeo08		4.35	8.01	33.5	1200	3.48	0.73	2.75	2.29	80.6	20.6	92	12.45	663	4.20
Target Range - Lower Bound		4.00	6.64	29.5	920	2.98	0.60	2.35	2.00	66.2	17.7	81	11.20	587	3.55
Upper Bound		4.92	8.14	36.5	1270	3.76	0.76	2.90	2.48	81.0	21.9	102	13.80	675	4.37
OGGeo08		18.60	6.80	114.5	340	2.82	10.70	2.15	18.10	67.1	91.9	82	11.45	8160	5.13
Target Range - Lower Bound		18.15	6.07	106.0	700	2.59	9.44	1.98	16.70	64.8	87.2	78	9.85	7800	4.81
Upper Bound		22.2	7.44	130.0	980	3.27	11.55	2.44	20.5	79.2	107.0	98	12.15	8980	5.91
OREAS 24b		0.07	7.88	8.3	780	2.61	0.85	1.06	0.04	86.5	16.8	118	11.20	37.9	4.55
OREAS 24b		0.07	7.90	8.0	740	2.60	0.80	1.08	0.05	82.0	16.0	118	11.25	38.0	4.38
Target Range - Lower Bound		0.05	7.02	7.3	600	2.25	0.60	0.94	<0.02	76.8	14.3	105	9.58	35.1	3.94
Upper Bound		0.09	8.60	9.4	830	2.86	0.76	1.18	0.09	93.8	17.8	131	11.80	40.9	4.84
OREAS 601		46.9	6.42	325	170	2.01	20.3	1.33	7.70	59.5	5.6	62	7.24	1010	2.47
Target Range - Lower Bound		44.3	5.66	276	740	1.81	18.80	1.17	7.05	56.7	4.5	37	6.00	939	2.22
Upper Bound		54.1	6.94	338	1020	2.33	23.0	1.45	8.67	69.3	5.8	47	7.44	1080	2.74
PK03	5.08														
PK03	5.05														
Target Range - Lower Bound	4.73														
Upper Bound	5.34														
PMP-18	0.305														
PMP-18	0.298														
Target Range - Lower Bound	0.281														
Upper Bound	0.319														

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## QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10	ME-MS61 Pb ppm 0.5
STANDARDS																
AMIS0354																
Target Range - Lower Bound																
Upper Bound																
GBM908-10		22.2	0.21	4.1	0.073	2.15	52.7	10.5	1.84	830	68.1	2.17	10.9	2330	990	2140
Target Range - Lower Bound		18.65	0.13	3.3	0.064	1.87	49.0	9.8	1.61	715	57.9	1.93	9.5	2020	880	1845
Upper Bound		22.9	0.35	4.3	0.092	2.31	61.0	12.4	1.99	885	70.9	2.38	11.9	2470	1100	2250
GPP-14																
GPP-14																
GPP-14																
GPP-14																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		20.4	0.24	3.4	0.183	3.35	38.9	33.4	1.42	596	14.10	2.07	21.5	743	1100	1170
Target Range - Lower Bound		17.50	<0.05	2.8	0.155	2.79	31.1	29.5	1.17	497	13.65	1.76	19.0	622	930	971
Upper Bound		21.5	0.27	3.6	0.201	3.43	39.1	36.5	1.45	619	16.75	2.18	23.4	760	1160	1185
OGGeo08		17.80	0.21	2.9	1.365	2.88	33.8	30.5	1.23	492	881	1.75	17.2	8680	800	7270
Target Range - Lower Bound		16.05	0.25	2.5	1.320	2.59	31.0	29.7	1.11	447	841	1.62	15.4	8000	760	6520
Upper Bound		19.75	0.49	3.3	1.620	3.19	39.0	36.7	1.38	557	1030	2.00	19.0	9770	950	7970
OREAS 24b		21.8	0.25	4.2	0.069	2.94	42.1	52.1	1.59	460	3.71	0.85	14.7	60.1	710	21.9
OREAS 24b		21.8	0.34	4.1	0.073	2.83	41.6	52.3	1.60	439	4.09	0.81	14.6	60.1	690	22.6
Target Range - Lower Bound		18.05	<0.05	3.4	0.063	2.52	37.7	48.4	1.39	391	3.46	0.70	13.0	53.8	610	20.3
Upper Bound		22.2	0.26	4.4	0.091	3.10	47.1	59.6	1.72	489	4.34	0.88	16.2	66.2	770	25.9
OREAS 601		22.0	0.14	4.6	1.680	2.15	30.1	20.4	0.37	478	4.23	1.44	13.1	35.9	440	357
Target Range - Lower Bound		18.30	<0.05	4.0	1.550	1.88	27.3	18.3	0.34	427	3.43	1.30	11.2	21.7	410	296
Upper Bound		22.5	0.27	5.1	1.910	2.32	34.5	22.8	0.44	533	4.31	1.61	14.0	26.9	530	362
PK03																
PK03																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
PMP-18																
Target Range - Lower Bound																
Upper Bound																

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## QC CERTIFICATE OF ANALYSIS PH18255907

Method Analyte Units LOD	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.01	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1	ME-MS61 V ppm 1
Sample Description															
STANDARDS															
AMIS0354															
Target Range - Lower Bound															
Upper Bound															
GBM908-10	171.5	<0.002	0.38	1.77	19.3	<1	3.3	295	0.87	<0.05	17.55	0.662	1.37	2.4	144
Target Range - Lower Bound	153.0	<0.002	0.33	1.40	17.0	<1	2.7	258	0.68	<0.05	16.55	0.591	1.00	2.0	123
Upper Bound	187.0	0.006	0.43	2.01	21.0	3	3.9	316	0.97	0.16	20.3	0.733	1.40	2.6	153
GPP-14															
GPP-14															
GPP-14															
GPP-14															
Target Range - Lower Bound															
Upper Bound															
JK-17															
Target Range - Lower Bound															
Upper Bound															
MRGeo08	220	0.008	0.32	4.89	13.3	1	4.2	325	1.78	<0.05	21.3	0.514	1.23	6.1	117
Target Range - Lower Bound	173.5	0.005	0.27	3.89	11.1	<1	3.5	277	1.39	<0.05	17.90	0.443	0.89	4.9	97
Upper Bound	212	0.013	0.35	5.39	13.7	4	4.7	339	1.81	0.14	21.9	0.553	1.25	6.2	121
OGGeo08	181.0	1.330	2.71	26.7	10.0	9	13.9	244	1.45	0.15	17.70	0.385	1.78	5.4	84
Target Range - Lower Bound	164.5	1.285	2.51	22.8	9.2	8	12.5	224	1.19	0.09	16.90	0.353	1.43	4.5	77
Upper Bound	201	1.575	3.09	31.0	11.4	14	15.7	274	1.57	0.31	20.7	0.443	1.98	5.8	97
OREAS 24b	168.0	<0.002	0.20	1.01	15.6	<1	4.5	125.5	1.24	<0.05	16.25	0.445	0.95	3.1	112
OREAS 24b	163.0	<0.002	0.20	0.96	15.8	<1	4.3	122.0	1.27	<0.05	16.05	0.439	0.91	3.2	108
Target Range - Lower Bound	147.5	<0.002	0.17	0.76	13.7	<1	3.6	111.5	0.99	<0.05	14.75	0.387	0.71	2.7	96
Upper Bound	180.5	0.006	0.23	1.15	16.9	3	4.9	136.5	1.33	0.10	18.05	0.484	1.01	3.5	120
OREAS 601	92.2	<0.002	1.04	32.3	5.0	12	4.4	230	1.10	14.55	10.70	0.185	1.28	4.2	27
Target Range - Lower Bound	87.2	<0.002	0.95	25.8	4.3	9	3.5	207	0.89	14.35	9.80	0.157	1.01	3.5	22
Upper Bound	107.0	0.004	1.19	35.0	5.4	15	4.8	253	1.19	17.65	12.00	0.203	1.41	4.5	29
PK03															
PK03															
Target Range - Lower Bound															
Upper Bound															
PMP-18															
PMP-18															
Target Range - Lower Bound															
Upper Bound															

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## QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5
STANDARDS					
AMIS0354					
Target Range - Lower Bound					
Upper Bound					
GBM908-10		4.2	38.3	1060	143.0
Target Range - Lower Bound		2.9	35.2	939	117.5
Upper Bound		4.1	43.2	1150	160.5
GPP-14					
GPP-14					
GPP-14					
GPP-14					
Target Range - Lower Bound					
Upper Bound					
JK-17					
Target Range - Lower Bound					
Upper Bound					
MRGeo08		5.0	28.2	827	107.5
Target Range - Lower Bound		4.1	23.8	722	92.2
Upper Bound		5.8	29.3	886	126.0
OGGeo08		4.9	23.2	6900	91.8
Target Range - Lower Bound		3.9	21.1	6500	78.6
Upper Bound		5.4	26.0	7950	107.5
OREAS 24b		3.5	20.4	108	135.5
OREAS 24b		4.4	19.6	107	135.0
Target Range - Lower Bound		3.0	18.3	93	113.5
Upper Bound		4.3	22.5	118	154.5
OREAS 601		6.3	11.6	1380	163.0
Target Range - Lower Bound		4.8	10.0	1195	131.5
Upper Bound		6.8	12.4	1465	179.0
PK03					
PK03					
Target Range - Lower Bound					
Upper Bound					
PMP-18					
PMP-18					
Target Range - Lower Bound					
Upper Bound					

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Sample Description	Method Analyte Units LOD	Au-ICP21 Au ppm 0.001	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
BLANKS																
BLANK		<0.001														
BLANK		<0.001														
BLANK		<0.001														
BLANK		<0.001														
Target Range - Lower Bound		<0.001														
Upper Bound		0.002														
BLANK			<0.01	<0.01	<0.2	<10	<0.05	<0.01	<0.01	<0.02	0.01	<0.1	1	<0.05	0.3	<0.01
BLANK			<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
Target Range - Lower Bound			<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
Upper Bound			0.02	0.02	0.4	20	0.10	0.02	0.02	0.04	0.02	0.2	2	0.10	0.4	0.02
DUPLICATES																
ORIGINAL		0.006														
DUP		0.006														
Target Range - Lower Bound		0.005														
Upper Bound		0.007														
ORIGINAL		0.005														
DUP		0.005														
Target Range - Lower Bound		0.004														
Upper Bound		0.006														
ORIGINAL		0.001														
DUP		0.001														
Target Range - Lower Bound		<0.001														
Upper Bound		0.002														
ORIGINAL			0.11	5.01	0.3	10	0.22	0.26	4.38	0.09	6.85	111.5	783	0.42	410	8.64
DUP			0.12	4.84	<0.2	10	0.22	0.27	4.14	0.10	6.97	108.5	747	0.43	386	8.37
Target Range - Lower Bound			0.10	4.67	<0.2	<10	0.16	0.24	4.04	0.07	6.55	104.5	726	0.35	384	8.07
Upper Bound			0.13	5.18	0.4	20	0.28	0.29	4.48	0.12	7.27	115.5	804	0.50	412	8.94
ORIGINAL		0.004														
DUP		0.004														
Target Range - Lower Bound		0.003														
Upper Bound		0.005														

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Sample Description	Method Analyte Units LOD	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10	ME-MS61 Pb ppm 0.5
BLANK BLANK BLANK BLANK Target Range - Lower Bound Upper Bound		BLANKS														
BLANK BLANK Target Range - Lower Bound Upper Bound		<0.05 <0.05	<0.05 <0.05	<0.1 <0.1	<0.005 <0.005	<0.01 <0.01	<0.5 <0.5	<0.2 <0.2	<0.01 <0.01	<5 <5	<0.05 <0.05	<0.01 <0.01	<0.1 <0.1	<0.2 0.2	<10 <10	<0.5 <0.5
		<0.05 0.10	<0.05 0.10	<0.1 0.2	<0.005 0.010	<0.01 0.02	<0.5 1.0	<0.2 0.4	<0.01 0.02	<5 10	<0.05 0.10	<0.01 0.02	<0.1 0.2	<0.2 0.4	<10 20	<0.5 1.0
ORIGINAL DUP Target Range - Lower Bound Upper Bound		DUPLICATES														
ORIGINAL DUP Target Range - Lower Bound Upper Bound																
ORIGINAL DUP Target Range - Lower Bound Upper Bound																
ORIGINAL DUP Target Range - Lower Bound Upper Bound		9.95 9.88 9.37 10.45	0.42 0.44 0.36 0.50	0.8 0.8 0.7 0.9	0.026 0.025 0.019 0.032	0.08 0.08 0.07 0.09	3.2 3.3 2.6 3.9	7.9 7.9 7.3 8.5	14.05 13.35 13.00 14.40	1180 1120 1090 1215	0.49 0.50 0.42 0.57	0.69 0.67 0.64 0.72	0.7 0.7 0.6 0.8	743 718 694 767	270 260 240 290	2.9 3.1 2.4 3.7
ORIGINAL DUP Target Range - Lower Bound Upper Bound																

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QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.01	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1	ME-MS61 V ppm 1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<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
BLANK		<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
Target Range - Lower Bound		<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
Upper Bound		0.2	0.004	0.02	0.10	0.2	2	0.4	0.4	0.10	0.10	0.02	0.010	0.04	0.2	2
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.9	0.002	0.55	0.09	17.0	1	0.4	77.8	0.05	0.11	0.49	0.294	0.38	0.1	148
DUP		1.0	0.002	0.52	0.09	17.0	1	0.4	76.9	0.05	0.10	0.49	0.284	0.38	0.1	141
Target Range - Lower Bound		0.8	<0.002	0.50	<0.05	16.1	<1	<0.2	73.3	<0.05	<0.05	0.46	0.270	0.33	<0.1	136
Upper Bound		1.1	0.004	0.57	0.10	18.0	2	0.6	81.4	0.10	0.16	0.52	0.308	0.43	0.2	153
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Samples (use the IDs provided in the issue) were damaged upon receipt, rebagged and client informed.

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





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QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5
BLANK BLANK BLANK BLANK Target Range - Lower Bound Upper Bound		BLANKS			
BLANK BLANK Target Range - Lower Bound Upper Bound					
ORIGINAL DUP Target Range - Lower Bound Upper Bound		DUPLICATES			
ORIGINAL DUP Target Range - Lower Bound Upper Bound					
ORIGINAL DUP Target Range - Lower Bound Upper Bound					
ORIGINAL DUP Target Range - Lower Bound Upper Bound					

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## QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	Au-ICP21 Au ppm 0.001	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
DUPLICATES																
TC72			0.30	9.31	8.3	560	0.84	0.24	0.09	<0.02	11.50	43.4	90	2.35	298	3.24
DUP			0.27	8.93	7.9	540	0.80	0.23	0.09	<0.02	11.05	40.4	86	2.25	284	3.11
Target Range - Lower Bound			0.26	8.65	7.5	500	0.73	0.21	0.08	<0.02	10.70	39.7	83	2.14	281	3.01
Upper Bound			0.31	9.59	8.7	600	0.91	0.26	0.10	0.04	11.85	44.1	93	2.47	301	3.34
TC83		0.005														
DUP		0.005														
Target Range - Lower Bound		0.004														
Upper Bound		0.006														
TC86			0.01	6.48	9.6	110	0.27	0.32	0.04	0.02	18.30	5.6	82	1.75	51.7	7.62
DUP			0.04	6.51	9.6	110	0.27	0.33	0.05	0.02	18.55	5.6	77	1.75	57.8	7.64
Target Range - Lower Bound			<0.01	6.16	8.9	90	0.21	0.30	0.03	<0.02	17.50	5.2	75	1.61	52.6	7.24
Upper Bound			0.04	6.83	10.3	130	0.33	0.35	0.06	0.04	19.35	6.0	84	1.89	56.9	8.02
ORIGINAL		0.072														
DUP		0.077														
Target Range - Lower Bound		0.070														
Upper Bound		0.079														
ORIGINAL		0.025														
DUP		0.028														
Target Range - Lower Bound		0.024														
Upper Bound		0.029														
ORIGINAL			0.01	0.04	<0.2	10	0.06	0.01	<0.01	<0.02	1.32	0.1	1	0.08	0.9	0.15
DUP			0.02	0.05	0.2	<10	0.07	0.01	<0.01	<0.02	1.38	0.1	2	0.08	2.4	0.17
Target Range - Lower Bound			<0.01	0.03	<0.2	<10	<0.05	<0.01	<0.01	<0.02	1.27	<0.1	<1	<0.05	1.4	0.14
Upper Bound			0.02	0.06	0.4	20	0.10	0.02	0.02	0.04	1.43	0.2	2	0.10	1.9	0.18

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## QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10	ME-MS61 Pb ppm 0.5
DUPLICATES																
TC72		21.3	0.22	5.2	0.051	2.74	5.7	40.6	2.30	578	0.61	0.75	8.1	90.9	120	11.5
DUP		20.0	0.08	4.8	0.046	2.61	5.7	37.7	2.17	549	0.56	0.72	7.5	84.2	110	10.6
Target Range - Lower Bound		19.55	0.09	4.7	0.041	2.53	4.9	37.0	2.11	530	0.51	0.69	7.3	83.0	100	10.0
Upper Bound		21.7	0.21	5.4	0.056	2.82	6.5	41.3	2.36	597	0.66	0.78	8.3	92.1	130	12.1
TC83																
DUP																
Target Range - Lower Bound																
Upper Bound																
TC86		16.90	0.14	3.5	0.043	0.39	9.5	13.0	0.39	77	1.11	0.05	11.2	23.0	190	5.2
DUP		16.55	0.15	3.7	0.045	0.40	9.8	13.0	0.39	75	1.87	0.05	11.3	28.4	180	10.2
Target Range - Lower Bound		15.85	0.09	3.3	0.037	0.37	8.7	12.2	0.36	67	1.37	0.04	10.6	24.2	170	6.8
Upper Bound		17.60	0.20	3.9	0.051	0.42	10.6	13.9	0.42	85	1.61	0.06	11.9	27.2	200	8.6
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.13	<0.05	0.2	<0.005	<0.01	0.6	14.6	<0.01	15	0.09	<0.01	0.3	0.5	10	0.8
DUP		0.17	<0.05	0.2	<0.005	<0.01	0.7	15.8	<0.01	16	0.40	<0.01	0.4	2.7	10	2.2
Target Range - Lower Bound		0.09	<0.05	<0.1	<0.005	<0.01	<0.5	14.2	<0.01	10	0.18	<0.01	0.2	1.3	<10	0.9
Upper Bound		0.21	0.10	0.3	0.010	0.02	1.0	16.2	0.02	21	0.31	0.02	0.5	1.9	20	2.1

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## QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.01	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1	ME-MS61 V ppm 1
DUPLICATES																
TC72		175.5	<0.002	0.22	1.86	24.2	1	1.9	88.1	0.73	0.08	12.20	0.452	0.50	5.7	338
DUP		172.5	<0.002	0.20	1.70	22.2	1	1.8	82.7	0.68	0.09	11.60	0.420	0.46	5.1	330
Target Range - Lower Bound		165.0	<0.002	0.19	1.60	21.9	<1	1.6	80.9	0.62	<0.05	11.30	0.409	0.42	5.0	316
Upper Bound		183.0	0.004	0.23	1.96	24.5	2	2.1	89.9	0.79	0.10	12.50	0.463	0.54	5.8	352
TC83																
DUP																
Target Range - Lower Bound																
Upper Bound																
TC86		24.6	<0.002	0.04	3.69	18.9	2	2.4	16.3	0.74	<0.05	8.12	0.548	0.08	2.5	251
DUP		24.5	<0.002	0.04	3.70	19.1	3	2.3	16.4	0.77	0.05	8.61	0.567	0.08	2.6	249
Target Range - Lower Bound		23.2	<0.002	0.03	3.37	18.0	<1	2.0	15.3	0.67	<0.05	7.94	0.525	0.05	2.3	237
Upper Bound		25.9	0.004	0.05	4.02	20.1	4	2.7	17.4	0.84	0.10	8.79	0.590	0.11	2.8	264
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.2	<0.002	<0.01	0.11	0.1	<1	<0.2	0.5	<0.05	<0.05	0.51	0.015	<0.02	0.1	1
DUP		0.3	<0.002	<0.01	0.14	0.1	<1	<0.2	0.6	<0.05	<0.05	0.52	0.016	<0.02	0.1	1
Target Range - Lower Bound		<0.1	<0.002	<0.01	0.07	<0.1	<1	<0.2	0.3	<0.05	<0.05	0.48	0.010	<0.02	<0.1	<1
Upper Bound		0.4	0.004	0.02	0.18	0.2	2	0.4	0.8	0.10	0.10	0.55	0.021	0.04	0.2	2

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QC CERTIFICATE OF ANALYSIS PH18255907

Sample Description	Method Analyte Units LOD	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5
DUPLICATES					
TC72		2.4	8.9	73	171.5
DUP		2.3	8.4	68	161.0
Target Range - Lower Bound		2.1	8.1	65	153.5
Upper Bound		2.6	9.2	76	179.0
TC83					
DUP					
Target Range - Lower Bound					
Upper Bound					
TC86		6.9	8.1	11	127.0
DUP		7.4	8.2	18	130.0
Target Range - Lower Bound		6.5	7.6	12	118.5
Upper Bound		7.8	8.7	17	138.5
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					
ORIGINAL		0.1	0.5	<2	4.9
DUP		0.1	0.5	2	5.5
Target Range - Lower Bound		<0.1	0.4	<2	4.3
Upper Bound		0.2	0.6	4	6.1

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**QC CERTIFICATE OF ANALYSIS PH18255907**

**CERTIFICATE COMMENTS**

**ANALYTICAL COMMENTS**

Applies to Method: NSS is non-sufficient sample.  
ALL METHODS

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	BAG-01	LEV-01	LOG-22
ME-MS61	PUL-31I	PUL-QC	SPL-21
WEI-21			