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EL 2928

ELLISTON

COMBINED FOURTH ANNUAL AND FINAL REPORT TO LICENCE EXPIRY/SURRENDER, FOR THE PERIOD 26/4/2002 TO 25/4/2006

Submitted by
Orogenic Exploration Pty Ltd
2008

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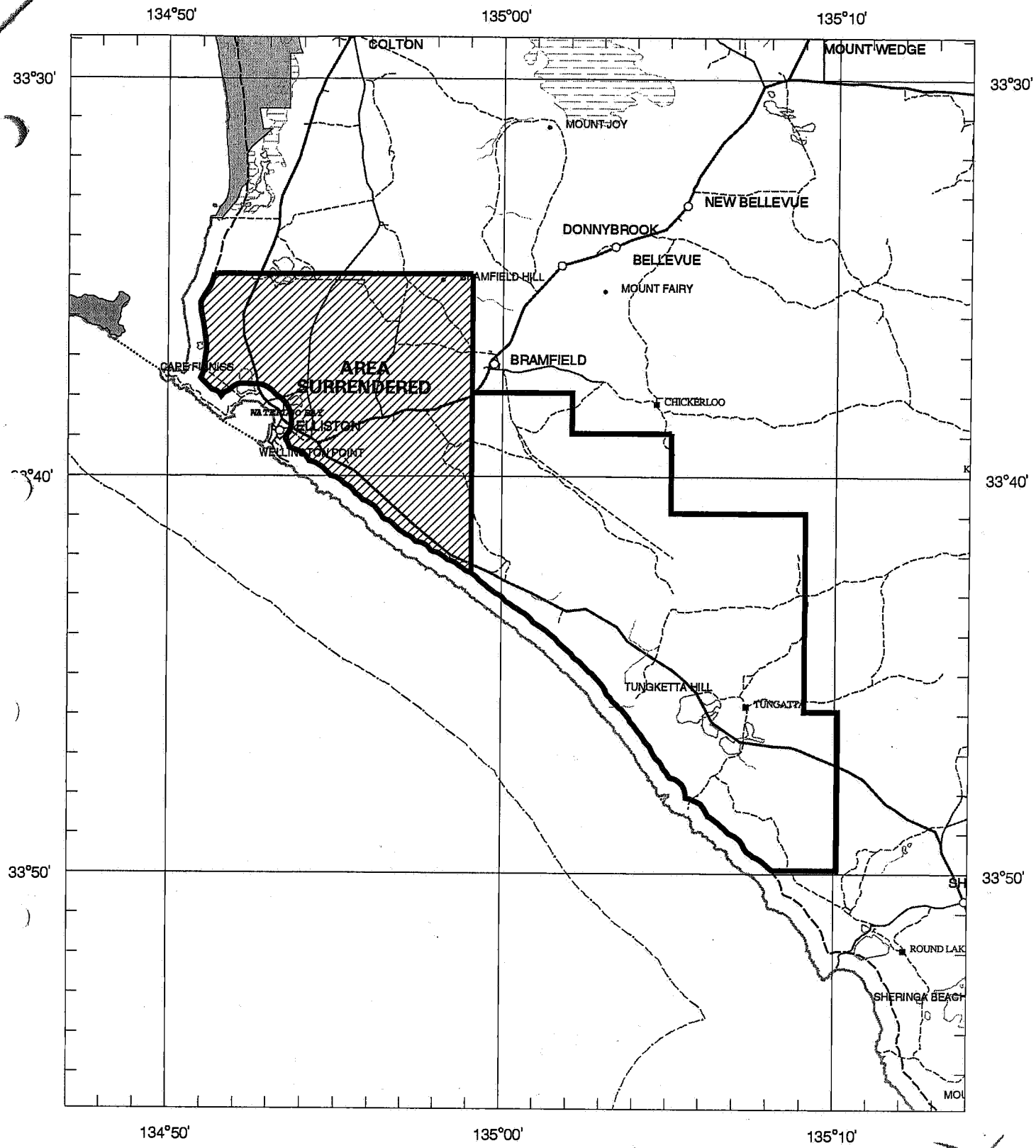
Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1 : 250 000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66

GDA GEOCENTRIC DATUM OF AUSTRALIA

APPLICANT : **OROGENIC EXPLORATION PTY LTD** & TAWANA RESOURCES NL

FILE REF : **97/01** TYPE : **MINERAL ONLY** AREA : **211** km² (approx.)

1:250000 MAPSHEETS : **ELLISTON KIMBA**

LOCALITY : **ELLISTON AREA - Immediately east of Elliston**

DATE GRANTED : **26-Apr-2002** DATE EXPIRED : **25-Apr-~~2004~~ 2005**

EL NO : **2928**

EXPLORATION LICENCE 2928
ANNUAL AND FINAL TECHNICAL REPORT
FOR PERIOD ENDING 25 APRIL 2006

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5. Detailed petrology on granite gneiss samples.

1. INTRODUCTION & SUMMARY

This report details the diamond exploration conducted within Exploration Licence 2928 located southeast of Elliston on the western Eyre Peninsula, for the annual period ending 25 April 2006. It is also the final report. The Licence was explored only for diamonds.

No active diamond exploration was conducted within EL2928 during the twelve months ending 25 April 2006. Continuing evaluation of all the regional data, has showed that EL2928 has lower prospectivity compared to Flinders Island and north Venus Bay areas, and thus the decision has been made to focus on these other areas and surrender EL2928.

All previous diamond exploration data has been reviewed for the Licence areas. It was concluded that due to wide spacing of previous historical surface sampling programs, large areas have not yet been effectively explored for diamonds. Limited heavy mineral loam surface sampling (13 samples) has been completed, but planned additional sampling during 2004 was hindered by wet conditions. A total of 71 grains have been microprobed from these samples. Detailed whole rock geochemical analyses, petrology, and zircon U-Pb dating has been completed on a granite gneiss outcrop near Bramfield.

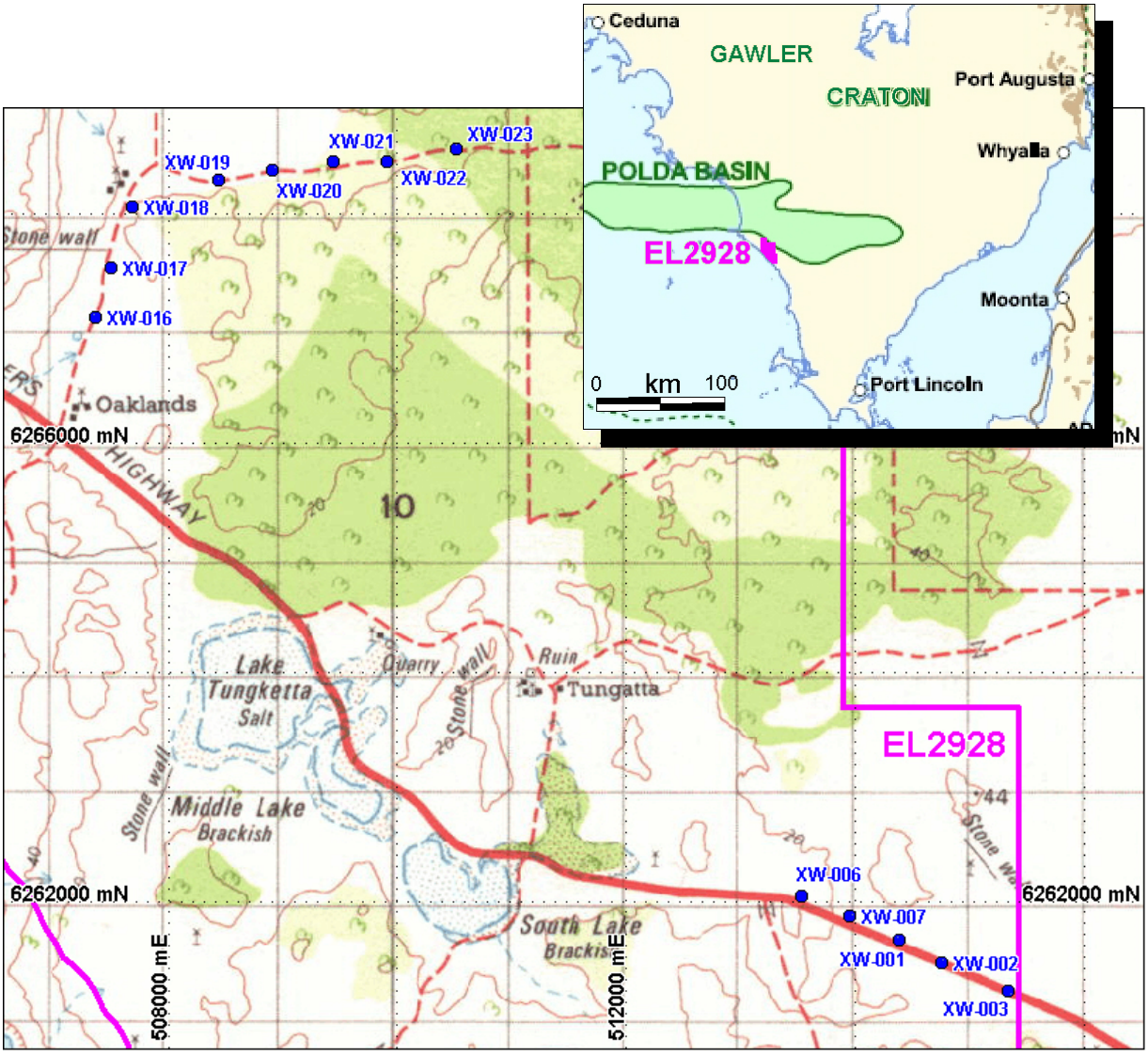

Figure 1. Location of heavy mineral samples collected within EL2928 during 2003. The position of EL2928 on the western side of the Eyre Peninsula is shown in the insert.

2. TITLE AND LOCATION

Exploration Licence 2928 (Elliston) was granted on the 26 April 2002 to Orogenic Exploration Pty Ltd. During 2003 Tawana Resources NL exercised an option to acquire 80% interest in the Licence. Exploration Licence 2928 located southeast of the township of Elliston originally covered 325 square kilometres, but this has been reduced to 164 square kilometres.

Exploration Licence 2928 lies on the Sheringa (5930) 1:100,000 and Kimba (SI53-07) 1:250,000 map sheets, on the western Eyre Peninsula within AMG66 Zone 53H (Figure 1). The main access to the area is Flinders Highway which proceeds southeast from Ceduna (further to the northwest) along the coast further southeast to Port Lincoln.

3. EXPLORATION ACTIVITY

No exploration was completed during the annual period ending 25 April 2006.

3.1 HISTORICAL DIAMOND EXPLORATION

A review of the historical diamond exploration for the region (Cooper, 2004) showed that the only previous active diamond exploration within the EL2928 area was by De Beers (under EL1694) and Diamond Ventures NL (under EL2151). De Beers collected 249 surface loam sample sites in the area of EL2928, but many were composited together (i.e. five separate sites became one sample). All were limited to along the Flinders Highway, and along major tracks (Mitchell, 1992). The work by Diamond Ventures NL was limited to drilling a couple magnetic anomalies (Cooper, 1998). This means large areas are under explored for diamonds by surface sampling.

3.2 HEAVY MINERAL SURFACE SAMPLING

Within EL2928 thirteen (13) heavy mineral loam samples were collected late in 2003. All loam samples were one bag each (around 13 kg), but not all were screened on site. The samples were collected in two areas, northeast of Oaklands homestead along Kappawanta Track, and east of South Lake along Flinders Highway (Figure 1). Both these areas contained high indicator grain counts based on open-file previous De Beers sampling results. The objective was to confirm the existence of the unusual grain counts, and if they exist, to obtain grains for morphological and microprobe study to ascertain their kimberlitic nature. The Kappawanta Track samples provided low counts of pyrope, with occasional picroilmenite and chromite. Two of the samples were negative. The Flinders Highway samples provided high counts of picroilmenite, and surprisingly, fresh olivine. Full sample details are provided in Appendix 1, and results were provided in Appendix 2.

3.3 INDICATOR GRAIN MICROPROBE

In January 2004, fourteen (14) grains from Kappawanta Track area and fifty (50) grains from Flinders Highway area were microprobed. In July 2004, six additional olivine grains, and one orthopyroxene grain from the Flinders Highway area were microprobed by Microbeam Services. The grains were from samples XW-001, XW-003, and XW-006, all collected in August 2003. Three of the chromites were microprobed both in the core (C) and on the rim (R) of the grain. All the microprobe data is provided in Appendix 3.

The olivine recovered in the samples are characterised by having high MgO (mean 49.8%), high MnO (mean 1.22%), and very low NiO (mean 0.01%). Based on chemistry it appears the olivine is from a thermally metamorphosed peridotite, or perhaps even a komatiite.

3.4 BRAMFIELD GRANITE GNEISS

Detailed petrology, whole rock geochemical analyses, and zircon Pb-U dating of two samples of the biotite-bearing granite gneiss outcropping near Bramfield (samples **FB-01**, 497358mE, 6277389mN and **FB-02,** 497360mE, 6277403mN). The aim is to enable comparison with granitic samples from the Investigator Group of Islands as part of a larger study being completed by Macquarie University.

The whole rock geochemical analysis was completed at Australian Laboratory Services Pty Ltd, Brisbane. Major oxides were analysed by ICP-AES, and the trace elements with ICP-MS. Elements included; SiO2, TiO2, Al2O3, Na2O, Fe2O3, MnO, MgO, CaO, K2O, Cr2O3, SrO, BaO, P2O5, LOI, Oxide Total, Ag, As, Ba, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, In, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta, Tb, Te, Th, Tl, Tm, U, V, W, Y, Yb, Zn, and Zr. All geochemical data is provided in Appendix 4.

Detailed petrology on the FB samples were provided in the technical report by Cooper (2004) and is also now provided in Appendix 5. The two Palaeoproterozoic granite gneiss samples are very similar.

Zircons were selected after crushing from the Bramfield granite gneiss sample FB-01, and mounted in an epoxy disk. After polishing they were analysed by a laser ablation microprobe attached to a ICP-MS at Macquarie University (Sydney). A regression line on a Pb-U Concordia plot for eighteen grains gives an age of 2440±14 Ma. This Palaeoproterozoic age is the same as the Sleaford Orogeny. Based on some other grains, there appears to be indication of an overprint by a latter metaphoric event.

4. CONCLUSIONS

It was concluded that due to wide spacing of previous surface sampling programs, large areas have not yet been effectively explored for diamonds in the region. Continuing evaluation of all the regional data, has showed that EL2928 has lower prospectivity compared to Flinders Island and north Venus Bay areas, and thus the decision has been made to focus on these other areas and surrender EL2928.

5. REFERENCES

Cooper, S.A., 1998. Exploration Licence 2151 Elliston, Western Eyre Peninsula, Third Annual and Final Report for Period Ending 23 December 1998. Unpublished report by Orogenic Exploration Pty Ltd for Diamond Ventures NL, (*PIRSA* R99/00073).

Cooper, S.A. 2004. Exploration Licences 2927, 2928, 2929 & 2930 Western Eyre Peninsula, Annual Technical Report for Period 26 April 2002 to 25 April 2004. Unpublished Orogenic Exploration Pty Ltd report. (*Submitted to PIRSA*)

Cooper, S.A., 2005. Exploration Licences 2927 & 2928 Annual Technical Report for Period Ending 25 April 2005. Unpublished Orogenic Exploration Pty Ltd report. (*Submitted to PIRSA*)

Mitchell, M.S., 1992. Progress and Final Reports for Exploration Licence 1672: Elliston, periods 31/8/90 to 15/7/92. Unpub. reports by Stockdale Prospecting Limited. (*MESA Env. 8527*).

Appendix 1

Appendix 1, EL2928 Annual and Final Report, April 2006

SAMPLE	mE_AMG66	mN_AMG66	Max_Size	Weight_kg	LOCATION	COMMENTS
XW-001	514385	6261669	3.2	10.0	Along Flinders Highway, E side next to fence	Thin medium brown silty-fine sandy soil, deflation material on flat calcrete
XW-002	514748	6261474	3.2	13.0	Along Flinders Highway, east side of road & fence	Thin medium brown silty-fine sandy soil, deflation material on flat calcrete
XW-003	515332	6261224	3.2	10.5	Along Flinders Highway, W of road, 40m W of fence	Thin medium brown silty-fine sandy soil, deflation material on flat calcrete
XW-006	513526	6262051	3.2	14.5	NE of Flinders Hwy & fence, near bend, high rise	Light tan-brown fine sandy soil, on flat calceret o/c
XW-007	513955	6261873	3.2	15.5	NE of fence & Flinders Highway on side low hill	Light tan-brown fine sandy soil on flat calcrete o/c
XW-016	507366	6267099	3.2	11.0	North side of Kappawanta Track, N of Oaklands	Medium dark brown slightly silty fine sandy soil over flat calcrete o/c
XW-017	507495	6267537	3.2	15.0	North side of Kappawanta Track	Medium brown slightly silty fine sandy soil over flat calcrete o/c
XW-018	507681	6268065	3.2	13.0	S side of Kappawanta Track, 200m W of building	Medium-dark brown silty fine sandy soil on flat calcree o/c
XW-019	508438	6268306	10	13.5	Flat area S side Kappawanta Track and fence	Dark grey-brownish silty soil, no sieve, scape of damp soil surface, no grass
XW-020	508910	6268385	3.2	13.0	South side Kappawanta Track and fence	Dark grey silty soil over/around flat calcrete o/c, some medium brown silty-fine sand
XW-021	509434	6268460	10	12.0	N of Kappawanta Track, 4m S of fence	Medium brown coarse sandy termite nest, round shield shape
XW-022	509912	6268467	10	15.0	South side of Kappawanta Track	Medium brown fine-medium sandy ant nest material, big sugar ants
XW-023	510512	6268579	3.2	12.5	South side of Kappawanta Track	Medium brown-grey silty fine sand soil around flat calcrete o/c

Appendix 2

DYNAMIC MINERALOGICAL SERVICES
Diamond Indicator Specialist
3 Scott Street, Willetton WA 6155 ♦ Mobile: 0407 986 670 ♦ Telephone/Facsimile: (08) 9457 1339
ABN: 89 961 296 610

LABORATORY

REPORT

December 1, 2003

XW01-XW46

report HARDCOPY

D2534

Sample	Initial Weight (kg)	After Sieve -2+0.25 mm (g)	+2 mm Weight (g)	Heavies (g)
XW01	10.0	2390.5	16.7	10.33
XW02	13.0	4059.2	10.5	17.57
XW03	10.5	1736.6	0	11.12
XW04	13.0	5097.4	0	8.45
XW05	11.0	3421.8	0	14.46
XW06	14.5	9053.7	0	6.49
XW07	15.5	6242.9	0	2.36
XW08	11.5	1552.0	1123.6	8.14
XW09	15.0	2743.3	863.0	24.29
XW10	16.0	5163.4	0	15.48
XW11	13.0	2853.0	651.1	17.21
XW12	14.0	4493.2	34.6	23.76
XW13	12.0	3735.1	0	23.15
XW14	17.5	14336.0	0	29.59
XW15	14.0	9915.9	0	10.78
XW16	11.0	1388.3	0	2.99
XW17	15.0	1713.2	0	6.98
XW18	13.0	1704.4	0	3.31
XW19	13.5	487.6	90.4	0.14
XW20	13.0	2360.9	0	5.05
XW21	12.0	2263.6	441.6	19.71
XW22	15.0	2194.7	1019.9	39.89
XW23	12.5	1663.7	0	11.52
XW24	17.5	14714.5	0	13.97
XW25	15.0	5756.0	0	3.39
XW26	16.0	3382.6	0	0.72
XW27	14.5	6852.7	0	69.76
XW28	15.5	7505.0	0	36.16
XW29	13.0	4855.2	0	0.49
XW30	15.5	10609.0	0	0.62
XW31	15.0	2759.4	0	0.29
XW32	14..5	7092.5	0	3.92
XW33	16.5	3548.7	0	4.98
XW34	15.0	5034.3	0	9.78
XW35	16.0	4038.3	0	14.06
XW36	13.0	4382.6	0	4.82
XW37	17.0	2912.6	0	2.28
XW38	14.0	6773.6	0	101.15
XW39	14.5	5594.4	0	48.45
XW40	15.0	5286.8	2	20.90
XW41	16.0	2676.5	0	55.70
XW42	13.0	3636.3	0	6.90
XW43	14.5	6237.1	0	9.76
XW44	15.0	3161.1	0	19.34
XW45	16.0	4955.2	0	18.66
XW46	15.0	1645.1	0	11.18

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW01
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 30/09/03
Notes/To Probe:

Weight: 10.33 g
Time: 4.75 hr Recheck 0.75 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE		1	3	2	7	5		FW-W	POSS	ANHEDRAL
PYROPE						1		F	KIMB	ANHEDRAL
OLIVINE						5		F-VF	POSS	ANHEDRAL-SUBHEDRAL

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Dull, submetallic	Anhedral irregular. Subangular to subrounded edges. Multiple dull worn conchoidal fractures. Rarely with small iron stained, pitted leucoxene
			remnants. Dull edge chipping and impact marks. Need probing to confirm.
Pyrope	Vitreous	Vitreous	Anhedral. Subangular. Striations and triangular protrusions observed. Purple-pink.
Olivine	Vitreous	Vitreous	Anhedral or subhedral. Rounded primary shapes. Ribbed and frosted. Very pale yellow. Traces of brownish clay coating.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE
				TR

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	30%	GAHNITE		SHELL	1%	AMPHIBOLE	25%	MUSCOVITE	TR
ANDRADITE	TR	MAGNETITE		CHLORITE	TR	ANATASE	TR	PREHNITE	
GROSSULAR		PICOTITE	R	CARBONATE	TR	ANDALUSITE	R	QUARTZ	R
SPESSARTINE	TR	PLEONASTE				APATITE	R	SILLIMANITE	10%
UVAROVITE		SPINEL	TR			BARITE		SPHENE	R
						BIOTITE	<1%	STAUROLITE	R
CLINOPYROXENE	TR	HEMATITE	R			BROOKITE		TOPAZ	TR
DIOPSIDE		ILMENITE	R			CORUNDUM	TR	TOURMALINE	20%
OLIVINE		LIMONITE	10%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	R	PYRITE				GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE			
		RUTILE	TR			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW02
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 1/10/03
Notes/To Probe:

Weight: 17.57 g
Time: 4.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE					3	3		FW-W	POSS	ANHEDRAL
PYROPE				1	1			F-VF	PROB	ANHEDRAL
OLIVINE						2		F-VF	POSS	ANHEDRAL

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Dull, submetallic	Anhedral. Subangular to rounded. Worn edge frosting /chipping. Dull scratched primary surfaces. Two grains have worn pitting with brownish
			clay (secondary). Multiple dull conchoidal fractures. Leucoxene rind absent. Need probing to confirm.
Pyrope	Vitreous	Vitreous	Anhedral, irregular broken slivers. Angular to subangular. Hint of weak edge rounding. Small frosted and/or orange peel remnant. Purple-pink.
Olivine	Vitreous	Vitreous	Anhedral. Subangular. Frosted. Ribbed. Irregular with fragile protrusions and rock adhesion. Insipient fractures.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE
				R

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	30%	GAHNITE		SHELL	R	AMPHIBOLE	20%	MUSCOVITE	TR
ANDRADITE	TR	MAGNETITE	R	COLLOPHANE	TR	ANATASE	TR	PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	R
SPESSARTINE	TR	PLEONASTE				APATITE	R	SILLIMANITE	10%
UVAROVITE		SPINEL	R			BARITE		SPHENE	R
						BIOTITE	R	STAUROLITE	<1%
CLINOPYROXENE	TR	HEMATITE	R			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R			CORUNDUM		TOURMALINE	20%
OLIVINE		LIMONITE	10%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	R	PYRITE				GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	<1%		
		PYROLUSITE				LEUCOXENE			
		RUTILE	R			MAGNESITE		ROCK FRAGMENTS	10%

Positive: (Kimberlite Indicators) ☒ Sample: XW03

Positive: (Economic Minerals) ☐ Comment: -2+0.3

Negative: ☐

Mineralogist/Observer: LHS/LHS Weight: 11.12 g
Date Observed: 1/10/03 Time: 5.25 hr
Notes/To Probe: Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE					2			FW	PROB	ANHEDRAL-SUBHEDRAL
PHLOGOPITE										
PICROILMENITE				1	7	10		FW-W	POSS	ANHEDRAL
PYROPE										
OLIVINE					1	10		F-VF	POSS	ANHEDRAL

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Chromite	Dull	Submetallic	Subhedral. Subrounded. Distorted. Hint of bevelled edge. Weak sheen. 1 grain may be andradite.
Picroilmenite	Dull	Dull	Anhedral, irregular. Subangular to subrounded. Most lack primary surface. Multiple dull fractures. Dull rounded frosted edges. A few have worn pitted
			primary surface with small patches of leucoxene. Pits are often filled with light brown clay. Need probing to confirm.
Olivine	Vitreous	Vitreous	Anhedral, irregular or ellipsoidal. Subangular edges. Dull, ribbed, frosted. Very pale yellow. Traces of rock adhesion and brownish clay.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE
				TR

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	25%	GAHNITE		CARBONATE	TR	AMPHIBOLE	20%	MUSCOVITE	TR
ANDRADITE	R	MAGNETITE	TR	SHELL	<1%	ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	R
SPESSARTINE	TR	PLEONASTE				APATITE	R	SILLIMANITE	25%
UVAROVITE		SPINEL	R			BARITE		SPHENE	R
						BIOTITE	R	STAUROLITE	R
CLINOPYROXENE	TR	HEMATITE	R			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	<1%			CORUNDUM		TOURMALINE	15%
OLIVINE		LIMONITE	5%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	R	PYRITE				GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE			
		RUTILE	R			MAGNESITE		ROCK FRAGMENTS	10%

Positive: (Kimberlite Indicators) ☒ Sample: XW06

Positive: (Economic Minerals) ☐ Comment: -2+0.3

Negative: ☐

Mineralogist/Observer: LHS/LHS Weight: 6.49 g
Date Observed: 6/10/03 Time: 3 hr
Notes/To Probe: Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE				1	1	6		FW	POSS	ANHEDRAL
PYROPE										
OLIVINE						5		F-FW	POSS	ANHEDRAL

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Submetallic, dull	Anhedral, irregular, subangular to subrounded broken slivers with dull abraded edges and multiple, slightly dull fractures.
Olivine	Dull	Vitreous	Anhedral. Subrounded to rounded. Dull frosted primary surface. Translucent pale yellow or pale greenish. Traces of brownish clay in pits.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE
				TR

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	20%	GAHNITE		SHELL	R	AMPHIBOLE	30%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	R	CARBONATE	TR	ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	
SPESSARTINE	TR	PLEONASTE	TR			APATITE	<1%	SILLIMANITE	15%
UVAROVITE		SPINEL				BARITE		SPHENE	R
						BIOTITE	R	STAUROLITE	R
CLINOPYROXENE	<1%	HEMATITE	R			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R			CORUNDUM	TR	TOURMALINE	10%
OLIVINE		LIMONITE	20%			EPIDOTE	<1%	XENOTIME	
ORTHOPYROXENE	<1%	PYRITE				GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE			
		RUTILE	TR			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒ Sample: XW07

Positive: (Economic Minerals) ☐ Comment: -2+0.3

Negative: ☐

Mineralogist/Observer: LHS/LHS Weight: 2.36 g
Date Observed: 6/10/03 Time: 1.25 hr
Notes/To Probe: Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE						1		F	POSS	ANHEDRAL
PYROPE						1		VF-F	KIMB	ANHEDRAL
OLIVINE						1		F	POSS	ANHEDRAL

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Submetallic	Anhedral. Subangular. Broken slivers. Multiple fresh fractures. Weak edge abrasions. Small primary remnant.
Pyrope	Vitreous	Vitreous	Anhedral. Angular. Frosted. Sharp sculpted primary surface. Pale pink-purple.
Olivine	Dull	Vitreous	Anhedral. Subangular. Irregular. Sculpted. Very pale yellow. Fe stained.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	25%	GAHNITE		SHELL	5%	AMPHIBOLE	15%	MUSCOVITE	
ANDRADITE		MAGNETITE	TR	CHLORITE	TR	ANATASE		PREHNITE	
GROSSULAR		PICOTITE		CARBONATE	R	ANDALUSITE	R	QUARTZ	R
SPESSARTINE		PLEONASTE				APATITE	<1%	SILLIMANITE	20%
UVAROVITE		SPINEL	TR			BARITE		SPHENE	R
						BIOTITE	R	STAUROLITE	TR
CLINOPYROXENE	R	HEMATITE	TR			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R			CORUNDUM		TOURMALINE	15%
OLIVINE		LIMONITE	10%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	<1%	PYRITE				GORCEIXITE		ZIRCON	
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE	TR		
		RUTILE				MAGNESITE		ROCK FRAGMENTS	10%

Positive: (Kimberlite Indicators) ☐

Positive: (Economic Minerals) ☐

Negative: ☒

Mineralogist/Observer: LHS/LHS
Date Observed: 22/10/03
Notes/To Probe:

Sample: XW16

Comment: -2+0.3

Weight: 2.99 g
Time: 1.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE										
PYROPE										
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	10%	GAHNITE		CARBONATE	TR	AMPHIBOLE	20%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	TR	SHELL	TR	ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	TR
SPESSARTINE	TR	PLEONASTE				APATITE	TR	SILLIMANITE	10%
UVAROVITE		SPINEL	R			BARITE		SPHENE	R
						BIOTITE		STAUROLITE	TR
CLINOPYROXENE	TR	HEMATITE	R			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R			CORUNDUM	TR	TOURMALINE	25%
OLIVINE		LIMONITE	40%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	R	PYRITE				GORCEIXITE		ZIRCON	
		PYRITE (Pseudo)				KYANITE	TR		
		PYROLUSITE				LEUCOXENE	TR		
		RUTILE	TR			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW17
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 23/10/03
Notes/To Probe:

Weight: 6.98 g
Time: 1.5 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE										
PYROPE						1		F	POSS	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Pyrope ?	Vitreous	Vitreous	Anhedral, irregular, subrounded. No primary remnant. Smooth polished surfaces. Pale pink. Dark opaque inclusions. RI~1.77.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	<1%	GAHNITE		SHELL	TR	AMPHIBOLE	5%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	TR			ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	R
SPESSARTINE	TR	PLEONASTE				APATITE	R	SILLIMANITE	5%
UVAROVITE		SPINEL	TR			BARITE		SPHENE	<1%
						BIOTITE		STAUROLITE	R
CLINOPYROXENE		HEMATITE	R			BROOKITE		TOPAZ	<1%
DIOPSIDE		ILMENITE	R			CORUNDUM		TOURMALINE	5%
OLIVINE		LIMONITE	80%			EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	TR	PYRITE				GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE			
		RUTILE	R			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒ Sample: XW18

Positive: (Economic Minerals) ☐ Comment: -2+0.3

Negative: ☐

Mineralogist/Observer: LHS/LHS Weight: 3.31 g
Date Observed: 23/10/03 Time: 1 hr
Notes/To Probe: Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE						1		FW-W	POSS	ANHEDRAL
PHLOGOPITE										
PICROILMENITE										
PYROPE						1		VF-F	KIMB	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Dull	Anhedral. Irregular. Dull fracture. Subrounded edges. Dull worn pitted primary surface with Fe clay in pits.
Pyrope	Frosted	Vitreous	Anhedral, irregular. Patches of frosted remnant primary surface. Fe stained. Purple. Brownish clay in crevices.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	<1%	GAHNITE			AMPHIBOLE	10%	MUSCOVITE	
ANDRADITE		MAGNETITE	R		ANATASE		PREHNITE	
GROSSULAR		PICOTITE			ANDALUSITE	<1%	QUARTZ	R
SPESSARTINE	TR	PLEONASTE			APATITE	R	SILLIMANITE	10%
UVAROVITE		SPINEL	TR		BARITE		SPHENE	R
					BIOTITE		STAUROLITE	R
CLINOPYROXENE	TR	HEMATITE	R		BROOKITE		TOPAZ	<1%
DIOPSIDE		ILMENITE	R		CORUNDUM		TOURMALINE	10%
OLIVINE		LIMONITE	65%		EPIDOTE	R	XENOTIME	
ORTHOPYROXENE	TR	PYRITE			GORCEIXITE		ZIRCON	
		PYRITE (Pseudo)			KYANITE	R		
		PYROLUSITE			LEUCOXENE	TR		
		RUTILE	TR		MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☐

Positive: (Economic Minerals) ☐

Negative: ☒

Mineralogist/Observer: LHS/LHS
Date Observed: 23/10/03
Notes/To Probe:

Sample: XW19

Comment: -2+0.3

Weight: 0.14 g
Time: 0.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE										
PYROPE										
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	10%	GAHNITE		SHELL	TR	AMPHIBOLE	15%	MUSCOVITE	
ANDRADITE		MAGNETITE	TR	FELDSPAR	R	ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	<1%	QUARTZ	<1%
SPESSARTINE		PLEONASTE				APATITE		SILLIMANITE	10%
UVAROVITE		SPINEL	TR			BARITE		SPHENE	<1%
						BIOTITE	TR	STAUROLITE	TR
CLINOPYROXENE		HEMATITE				BROOKITE		TOPAZ	<1%
DIOPSIDE		ILMENITE	TR			CORUNDUM	TR	TOURMALINE	30%
OLIVINE		LIMONITE	30%			EPIDOTE	TR	XENOTIME	
ORTHOPYROXENE	TR	PYRITE	TR			GORCEIXITE		ZIRCON	TR
		PYRITE (Pseudo)				KYANITE	<1%		
		PYROLUSITE				LEUCOXENE			
		RUTILE	<1%			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW20
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 23/10/03
Notes/To Probe:

Weight: 5.05 g
Time: 2 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE						1		F-FW	POSS	ANHEDRAL
PHLOGOPITE										
PICROILMENITE					1	1		FW	POSS	ANHEDRAL
PYROPE				1				F-FW	KIMB	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Chromite	Dull	Dull, submetallic	Anhedral. Subrounded. Dull scratched primary surface. Relatively fresh fracture. Frosted edges. Indented.
Picroilmenite	Dull, frosted	Submetallic, dull	Anhedral. One rounded with frosted primary surface and dull fracture. Other has primary pitting with small patches of leucoxene, subrounded
			edges.
Pyrope	Dull, frosted	Vitreous	Anhedral, subrounded to subangular fracture edges. Relatively fresh fracture. Large frosted remnant. Violet.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	<1%	GAHNITE		SHELL	TR	AMPHIBOLE	5%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	R			ANATASE		PREHNITE	
GROSSULAR	TR	PICOTITE				ANDALUSITE	<1%	QUARTZ	R
SPESSARTINE	R	PLEONASTE				APATITE	TR	SILLIMANITE	10%
UVAROVITE		SPINEL	R			BARITE		SPHENE	R
						BIOTITE		STAUROLITE	
CLINOPYROXENE	TR	HEMATITE	R			BROOKITE	TR	TOPAZ	<1%
DIOPSIDE		ILMENITE	R			CORUNDUM	R	TOURMALINE	10%
OLIVINE		LIMONITE	70%			EPIDOTE		XENOTIME	
ORTHOPYROXENE	TR	PYRITE				GORCEIXITE		ZIRCON	<1%
		PYRITE (Pseudo)				KYANITE	<1%		
		PYROLUSITE				LEUCOXENE	TR		
		RUTILE	<1%			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW21
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 24/10/03
Notes/To Probe:

Weight: 19.71 g
Time: 2.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE										
PYROPE			1					FW	KIMB	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Pyrope	Dull, frosted	Dull	Anhedral. Subrounded to rounded. Dull worn chip marks and scratches. Some relatively fresh chipping. Trace of brownish clay in crevices. Purple
			with red fire.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	<1%	GAHNITE				AMPHIBOLE	<1%	MUSCOVITE			
ANDRADITE	TR	MAGNETITE	R			ANATASE		PREHNITE			
GROSSULAR	TR	PICOTITE				ANDALUSITE	R	QUARTZ	R		
SPESSARTINE	R	PLEONASTE				APATITE		SILLIMANITE	<1%		
UVAROVITE		SPINEL	R			BARITE		SPHENE	TR		
						BIOTITE		STAUROLITE	R		
CLINOPYROXENE		HEMATITE	R			BROOKITE		TOPAZ	<1%		
DIOPSIDE		ILMENITE	R			CORUNDUM	TR	TOURMALINE	<1%		
OLIVINE		LIMONITE	95%			EPIDOTE	R	XENOTIME			
ORTHOPYROXENE	TR	PYRITE				GORCEIXITE		ZIRCON	R		
		PYRITE (Pseudo)				KYANITE	<1%				
		PYROLUSITE				LEUCOXENE					
		RUTILE	R			MAGNESITE		ROCK FRAGMENTS	5%		

Positive: (Kimberlite Indicators) ☒
Positive: (Economic Minerals) ☐
Negative: ☐

Sample: XW22
Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 4/11/03
Notes/To Probe:

Weight: 39.89 g
Time: 3.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE										
PYROPE						1		FW	KIMB	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Pyrope	Dull	Dull	Anhedral, subangular to subrounded. Small rough uneven remnant primary surface. Traces of brownish clay (secondary). Purple.

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	R	GAHNITE		FELDSPAR	TR	AMPHIBOLE	<1%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	TR	CARBONATE	TR	ANATASE		PREHNITE	
GROSSULAR		PICOTITE		SHELL	TR	ANDALUSITE	R	QUARTZ	TR
SPESSARTINE		PLEONASTE				APATITE		SILLIMANITE	R
UVAROVITE		SPINEL	R			BARITE		SPHENE	TR
						BIOTITE	TR	STAUROLITE	R
CLINOPYROXENE		HEMATITE	R			BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R			CORUNDUM	TR	TOURMALINE	<1%
OLIVINE		LIMONITE	95%			EPIDOTE	TR	XENOTIME	
ORTHOPYROXENE	TR	PYRITE				GORCEIXITE		ZIRCON	R
		PYRITE (Pseudo)				KYANITE	R		
		PYROLUSITE				LEUCOXENE	TR		
		RUTILE	R			MAGNESITE		ROCK FRAGMENTS	5%

Positive: (Kimberlite Indicators) ☒

Positive: (Economic Minerals) ☐

Negative: ☐

Sample: XW23

Comment: -2+0.3

Mineralogist/Observer: LHS/LHS
Date Observed: 28/10/03
Notes/To Probe:

Weight: 11.52 g
Time: 2.25 hr
Probe Sent on:

OBSERVED FRACTIONS

KIMBERLITE/LAMPROITE INDICATORS	+2	+1	+0.8	+0.5	+0.4	+0.3	+0.25	WEAR	KIMB?	FORM
DIAMOND										
CHROME DIOPSIDE										
CHROMITE										
PHLOGOPITE										
PICROILMENITE					1			FW	POSS	ANHEDRAL
PYROPE					1	2		F-FW	KIMB	ANHEDRAL
OLIVINE										

DETAILED DESCRIPTIONS

MINERAL	LUSTRE (Primary Surface)	LUSTRE (Fresh Fracture)	OTHER
Picroilmenite	Dull	Dull, metallic	Anhedral. Subrounded to rounded. Dull chip marks. Dull fracture. Small pitted remnant with patches of leucoxene.
Pyrope	Vitreous	Vitreous	Anhedral. Subangular to subrounded. Remnant orange peel surface. Frosted edges. 1 deep purple, 1 purple-pink, 1 orange with red fire (Ti pyrope)

ECONOMIC MINERALS (Wt. % of Initial Wt.)

CASSITERITE	CU-CARBONATES	GOLD	SCHEELITE	MONAZITE

OTHER MINERALS (Vol. % after TBE; Trace 1-3 grains; Rare 4-30 grains)

ALMANDINE	R	GAHNITE			AMPHIBOLE	<1%	MUSCOVITE	
ANDRADITE	TR	MAGNETITE	TR		ANATASE		PREHNITE	
GROSSULAR		PICOTITE			ANDALUSITE	R	QUARTZ	<1%
SPESSARTINE		PLEONASTE			APATITE	TR	SILLIMANITE	R
UVAROVITE		SPINEL	R		BARITE		SPHENE	R
					BIOTITE		STAUROLITE	TR
CLINOPYROXENE	TR	HEMATITE	R		BROOKITE		TOPAZ	R
DIOPSIDE		ILMENITE	R		CORUNDUM		TOURMALINE	<1%
OLIVINE		LIMONITE	95%		EPIDOTE	TR	XENOTIME	
ORTHOPYROXENE		PYRITE			GORCEIXITE		ZIRCON	R
		PYRITE (Pseudo)			KYANITE	R		
		PYROLUSITE			LEUCOXENE	TR		
		RUTILE	R		MAGNESITE		ROCK FRAGMENTS	5%

Appendix 3

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SAMPLE	MinCode	Mount	Sequence	Position	SiO2	TiO2	Na2O	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	Nb2O5	V2O3	NiO	K2O	ZnO	Fe2O3	SumOxide
XW-001	ILM	OR160104A	1	C	0.01	47.39	0.01	0.35	31.34	0.22	6.11	0	0	0	0.34	0	0.01	0.1	15.24	101.14
XW-001	ILM	OR160104A	2	C	0.03	48.9	0	0.79	28.84	0.17	8.3	0.02	0.02	0.04	0.34	0.06	0.01	0.17	12.85	100.53
XW-001	ILM	OR160104A	3	C	0.1	47.8	0.02	0.56	29.98	0.22	7.19	0.02	0	0.17	0.31	0.08	0	0.08	13.24	99.78
XW-001	ILM	OR160104A	4	C	0.01	48.02	0.01	0.47	30.98	0.24	6.76	0.02	0.03	0.17	0.33	0.06	0	0	13.68	100.77
XW-001	ILM	OR160104A	5	C	0	48.51	0.01	0.46	30.86	0.25	7.01	0.03	0.04	0.19	0.45	0.01	0.01	0.11	12.89	100.82
XW-001	ILM	OR160104A	6	C	0.01	44.04	0.01	0.21	28.77	0.25	6	0	0	0.23	0.52	0	0	0.12	20.08	100.24
XW-001	ILM	OR160104A	7	C	0.02	49.05	0.03	0.47	29.14	0.25	8.25	0.04	0	0.14	0.41	0.02	0	0	12.83	100.65
XW-001	ILM	OR160104A	8	C	0	49.18	0.04	0.77	27.96	0.27	8.91	0.02	0.07	0.13	0.4	0	0.02	0	12.2	99.96
XW-001	ILM	OR160104A	9	C	0	46.37	0	0.29	29.54	0.26	6.78	0.03	1.19	0.31	0.31	0.12	0	0	15.61	100.82
XW-001	ILM	OR160104A	10	C	0.03	47.26	0.02	0.55	28.92	0.3	7.49	0	0.27	0.16	0.28	0.03	0	0	14.69	100
XW-001	GNT	OR160104A	11	C	40.97	0.13	0.03	21.56	6.13	0.48	19.94	5.3	2.91	0.07	0.04	0.06	0.01	0.02	2.76	100.41
XW-001	OL	OR160104A	12	C	38.69	0	0	0	15.98	1.39	43.97	0	0.01	0	0.01	0	0.01	0		100.06
XW-001	OL	OR160104A	13	C	39.96	0.01	0	0.02	10.21	1.2	49.33	0.01	0	0	0	0.06	0	0		100.81
XW-001	OL	OR280704A	103	C	38.65	0.01	0.01	0.01	12.22	1.79	47.22	0.02	0	0	0.05	0	0	0		99.98
XW-002	ILM	OR160104A	14	C	0.01	46.45	0.02	0.33	31.19	0.2	5.8	0.02	0.03	0.11	0.28	0.03	0	0.03	15.59	100.11
XW-002	ILM	OR160104A	15	C	0.01	48.65	0	0.8	27.84	0.21	8.71	0.05	0.08	0	0.41	0.06	0	0.04	13.28	100.15
XW-002	ILM	OR160104A	16	C	0	52.3	0.03	0	44.78	1.91	0.16	0	0	0.12	0.19	0	0	0	0.42	99.91
XW-002	ILM	OR160104A	17	C	0.05	49.9	0.03	0.57	27.51	0.31	9.46	0.07	0.06	0	0.26	0.03	0	0	12.02	100.26
XW-002	ILM	OR160104A	18	C	0.05	49.1	0.05	0.61	29.53	0.25	7.88	0.06	0.08	0	0.27	0	0.02	0.01	12.71	100.61
XW-002	ILM	OR160104A	19	C	0.03	48.86	0.02	0.51	28.91	0.3	8.19	0.05	0.11	0.04	0.31	0.05	0	0.02	12.93	100.3
XW-002	GNT	OR160104A	20	C	36.85	0	0.01	21.24	32.37	1.22	4.26	2.07	0	0	0	0.03	0	0.14	2.62	100.82
XW-002	GNT	OR160104A	21	C	40.62	0.04	0.02	21.86	5.64	0.38	19.67	5.78	2.53	0.06	0.04	0.01	0.02	0.03	3.14	99.81
XW-002	OL	OR160104A	22	C	38.91	0	0.01	0	15.71	1.22	44.75	0.04	0	0	0.01	0.01	0	0		100.67
XW-002	OL	OR160104A	23	C	41.12	0	0	0	5.15	1.12	53.25	0.02	0	0.09	0.01	0	0	0		100.76
XW-003	CHR	OR160104A	24	C	0.36	0.23	0.01	28.98	14.28	0.12	14.82	0.01	38.08	0.04	0.08	0.2	0	0.09	2.99	100.28
XW-003	CHR	OR160104A	24	R	0.38	0.24	0.02	28.68	13.62	0.14	14.81	0.02	37.3	0	0.09	0.25	0	0.07	3.15	98.78
XW-003	CHR	OR160104A	25	C	0.06	0	0	21.52	14.4	0.04	13.64	0	48.42	0	0.15	0.05	0	0.12	1.42	99.8
XW-003	CHR	OR160104A	25	R	0.03	0.04	0.01	22.7	13.9	0.16	13.9	0.01	47.05	0	0.2	0.05	0	0.18	1.37	99.59
XW-003	ILM	OR160104A	26	C	0	48.95	0.01	0.81	27.42	0.27	9.1	0.03	0.09	0.07	0.37	0.1	0	0	12.62	99.84
XW-003	ILM	OR160104A	27	C	0.01	48.95	0	0.68	28.47	0.26	8.56	0.05	0.05	0.14	0.35	0.08	0.01	0.05	12.97	100.62
XW-003	ILM	OR160104A	28	C	0.03	49.55	0	0.83	27.58	0.22	9.38	0.02	0.11	0.03	0.35	0.02	0	0.08	11.59	99.78
XW-003	ILM	OR160104A	29	C	0.05	47.89	0.01	0.66	28.47	0.26	8.05	0.03	0.18	0.07	0.38	0	0	0.01	13.99	100.05
XW-003	ILM	OR160104A	30	C	0	49.8	0.01	0.74	29.46	0.27	8.38	0.01	0.13	0	0.35	0	0.01	0.05	11.27	100.47
XW-003	ILM	OR160104A	31	C	0.02	49.32	0.04	0.7	28.26	0.28	8.74	0.02	0.1	0.08	0.26	0.02	0	0.11	12.41	100.36

XW-003	ILM	OR160104A	32	C	0	50.16	0.01	0.79	26.63	0.27	10.14	0.04	0.12	0	0.42	0.06	0	0	11.42	100.04
XW-003	ILM	OR160104A	33	C	0.02	50.61	0.01	0.78	28.29	0.24	9.5	0.01	0.05	0	0.39	0	0.01	0	11.06	100.97
XW-003	OL	OR160104A	34	C	40.57	0.01	0	0	6.66	1.03	52.03	0	0	0.08	0.02	0	0	0		100.41
XW-003	OL	OR160104A	35	C	39.12	0.04	0	0	13.25	1.15	46.37	0.02	0	0	0.02	0.01	0	0.07		100.04
XW-003	OL	OR280704A	104	C	39.3	0.02	0	0.01	10.98	1.63	48.17	0.01	0	0.04	0	0	0	0.01		100.16
XW-003	OL	OR280704A	105	C	38.57	0.02	0	0	13.19	1.23	46.78	0.02	0	0	0.04	0	0	0.04		99.89
XW-003	OL	OR280704A	106	C	40.28	0	0	0.01	7.05	1.35	51.56	0	0.01	0.05	0	0	0	0.04		100.36
XW-003	OL	OR280704A	107	C	39.99	0.01	0	0	8.47	1.06	50.79	0.01	0	0	0.02	0.03	0	0.06		100.43
XW-006	ILM	OR160104A	57	C	0.02	48.59	0.01	0.56	31.05	0.15	7.01	0	0.07	0.09	0.32	0.09	0	0	12.1	100.04
XW-006	ILM	OR160104A	58	C	0.05	48.62	0.04	0.65	28.57	0.26	8.25	0.03	0.09	0.02	0.31	0.03	0	0.01	13.76	100.69
XW-006	ILM	OR160104A	59	C	0.01	49.04	0.01	0.7	28.37	0.26	8.64	0.02	0.08	0.11	0.36	0.05	0.01	0.08	11.89	99.62
XW-006	ILM	OR160104A	60	C	0.04	49.66	0	0.75	28.72	0.23	8.79	0.02	0.08	0.08	0.32	0.08	0	0.07	11.73	100.55
XW-006	ILM	OR160104A	61	C	0.04	46.68	0.01	0.29	30.92	0.23	6.08	0.04	0.07	0.11	0.39	0	0.02	0	15.36	100.23
XW-006	ILM	OR160104A	62	C	0.01	45.39	0.01	0.24	30.09	0.18	5.91	0.01	0.02	0.05	0.48	0	0	0	17.85	100.25
XW-006	ILM	OR160104A	63	C	0.02	47.28	0.01	0.43	26.16	0.23	9.04	0.04	0.73	0.17	0.44	0.09	0	0.03	15.5	100.17
XW-006	ILM	OR160104A	64	C	0	48.42	0	0.56	28.55	0.29	8.23	0.03	0.01	0.09	0.34	0.06	0	0	13.47	100.05
XW-006	OL	OR160104A	65	C	40.32	0	0.01	0.01	7.49	1.22	51.26	0.02	0.01	0	0.04	0.02	0.01	0.06		100.47
XW-006	OL	OR160104A	66	C	40.19	0	0	0	7	1.13	51.3	0.01	0	0	0.02	0.01	0	0		99.65
XW-006	OL	OR280704B	3	C	38.87	0	0	0	11.79	1.65	47.72	0	0.02	0	0	0.01	0.01	0		100.08
XW-006	OPX	OR280704B	4	C	53.04	0.07	0.2	1.03	0	0.55	17.51	25.66	0.02	0	0	0	0	0.02	2.17	100.27
XW-007	OL	OR160104A	67	C	40.12	0.01	0.02	0	7.83	0.95	51.29	0.01	0	0.01	0	0.02	0.01	0		100.25
XW-007	ILM	OR160104A	68	C	0	45.64	0	0.27	31.05	0.26	5.47	0.03	0.01	0.07	0.44	0	0	0	16.8	100.06
XW-007	GNT	OR160104A	69	C	40.75	0.1	0.02	22.19	6.46	0.46	19.89	4.93	2.04	0	0.01	0.01	0	0.02	3.06	99.93
XW-017	GNT	OR160104B	45	C	38.94	0.02	0	22.69	21.12	0.36	13.35	0.97	0.08	0	0.03	0.02	0.01	0	3.46	101.05
XW-018	ILM	OR160104B	46	C	0.01	48.41	0.02	0.24	27.49	0.26	8.87	0.02	3.95	0.26	0.48	0.08	0.01	0.04	11.23	101.38
XW-018	GNT	OR160104B	47	C	40.68	0.16	0.02	19.85	4.44	0.4	20.1	6.26	5.21	0.06	0.06	0.01	0.01	0.05	3.68	100.99
XW-020	CHR	OR160104B	48	R	0.02	0.16	0	27.34	15.6	0.09	13.57	0	37.76	0	0.16	0.14	0	0.35	6.18	101.39
XW-020	CHR	OR160104B	48	C	0	0.12	0.03	25.96	15.39	0.1	13.23	0	38.16	0.06	0.23	0.15	0	0.24	6.28	99.94
XW-020	GNT	OR160104B	49	C	41.2	0.18	0.03	21.87	6.26	0.47	20.16	5.13	2.55	0	0.04	0.02	0	0	3.28	101.21
XW-020	ILM	OR160104B	50	C	0.03	52.77	0.02	0.61	27.66	0.24	10.98	0.01	0.29	0.08	0.47	0.01	0	0	7.76	100.93
XW-020	ILM	OR160104B	51	C	0.03	48.3	0	0.3	26.12	0.27	9.58	0.03	3.94	0.23	0.35	0.2	0	0	11.89	101.26
XW-021	GNT	OR160104B	52	C	40.9	0.18	0.03	21.79	6.5	0.48	19.8	5.18	2.84	0	0.06	0	0.01	0	3	100.76
XW-022	GNT	OR160104B	53	C	41.07	0.03	0.02	21.79	5.42	0.54	20.5	5.1	3.21	0.02	0	0.01	0	0	3.25	100.97
XW-023	ILM	OR160104B	54	C	0	55.72	0.01	0.06	27.82	0.41	12.21	0.01	0.45	0.13	0.43	0.1	0	0.13	3.67	101.15
XW-023	GNT	OR160104B	55	C	40.77	0.18	0.04	19.6	5.68	0.44	18.98	6.82	5.62	0	0.04	0	0	0.06	3.07	101.31
XW-023	GNT	OR160104B	56	C	40.63	0.17	0.03	21.25	5.44	0.47	19.85	5.7	3.29	0.05	0.04	0	0	0.02	3.45	100.41
XW-023	GNT	OR160104B	57	C	41.42	0.69	0.08	21.68	6.07	0.37	20.71	4.97	1.74	0	0.08	0.02	0	0.01	3.25	101.1

Appendix 4

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CERTIFICATE BR04025900

Project:

P.O. No.: OR050402

This report is for 15 Rock samples submitted to our lab in Brisbane, Queensland, Australia on 7-MAY-2004.

The following have access to data associated with this certificate:

STEVEN COOPER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
LOG-22	Sample login - Rcd w/o BarCode
PUL-21	Pulverize entire sample
CRU-21	Crush entire sample >70% -6 mm
WSH-21	"Wash" crushers
WSH-22	"Wash" pulverizers

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-MS81	38 element fusion ICP-MS	ICP-MS
ME-MS62s	Up to 54 elements by ICP-MS	ICP-MS
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES

To: **OROGENIC EXPLORATION PTY LTD**
ATTN: STEVEN COOPER
5 GLENGARRY AVENUE
BURWOOD VIC 3125

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.

Signature: 

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CERTIFICATE OF ANALYSIS BR04025900

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	ME-ICP06 SiO2 % 0.1	ME-ICP06 Al2O3 % 0.01	ME-ICP06 Fe2O3 % 0.01	ME-ICP06 CaO % 0.01	ME-ICP06 MgO % 0.01	ME-ICP06 Na2O % 0.01	ME-ICP06 K2O % 0.01	ME-ICP06 Cr2O3 % 0.01	ME-ICP06 TiO2 % 0.01	ME-ICP06 MnO % 0.01	ME-ICP06 P2O5 % 0.01	ME-ICP06 SrO % 0.01	ME-ICP06 BaO % 0.01	ME-ICP06 LOI % 0.01
FB-01		0.13	72.0	14.00	2.79	1.69	0.51	3.55	4.71	<0.01	0.28	0.03	<0.01	0.01	0.08	0.29
FB-02		0.17	74.4	13.15	1.28	1.03	0.27	3.02	6.34	<0.01	0.10	0.01	0.03	0.01	0.11	0.19
				13.45	2.15	0.26	0.16	4.71	5.46	<0.01	0.33	0.04	0.02	<0.01	0.02	0.33
					2.32	0.43	0.34	4.71	5.82	<0.01	0.36	0.09	0.04	<0.01	0.02	0.42
						2.25	0.91	5.02	4.37	<0.01	0.47	0.06	0.15	0.07	0.21	0.59
		0.21					1.72	4.67	2.08	<0.01	0.49	0.14	0.07	0.04	0.08	0.46
		0.18	75.9					3.57	6.25	<0.01	0.11	0.01	0.01	<0.01	0.01	0.21
		0.24	75.1	12.65					5.84	<0.01	0.16	0.03	0.01	0.01	0.05	0.39
		0.13	71.8	13.05	2.57					<0.01	0.39	0.05	0.08	0.02	0.12	0.52
		0.17	53.5	12.75	6.07						0.79	0.08	0.15	<0.01	0.04	9.01
		0.20	55.8	14.25	7.82	2.24	5.96					0.04	0.16	<0.01	0.03	6.45
		0.19	26.4	2.23	11.50	14.15	14.65	3.29					1.92	0.06	0.30	22.8
		0.18	20.3	1.28	7.96	17.70	18.20	3.26	0.55					0.06	0.14	27.9
		0.10	39.2	7.26	18.45	3.19	13.60	1.65	0.60	0.43					0.21	10.20
		0.25	24.2	1.91	7.46	12.35	25.0	0.78	0.73	0.23	1.12					25.6

Other samples not from EL2927/2928

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CERTIFICATE OF ANALYSIS BR04025900

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	0.5	10	0.1	5	0.1	0.1	0.1	1	0.1	1	0.1	0.5	0.1
FB-01		712	54.8	4.5	20	1.2	<5	0.9	0.3	0.8	18	2.2	6	0.1	21.1	<0.1
FB-02		927	41.0	2.1	20	1.3	49	0.6	0.3	0.8	16	1.6	2	0.1	26.8	<0.1
		203	142.0	0.8	10	2.1	5	6.1	3.3	1.2	21	7.7	10	1.1	72.8	0.6
		212	169.0	1.6	<10	3.0	<5	9.6	5.5	1.4	22	10.4	11	1.8	95.8	0.9
		1825	98.6	5.7	<10	3.5	<5	4.6	2.5	1.5	20	6.1	7	0.8	48.2	0.4
		712	79.3	4.7	10	6.0	13	4.0	2.3	1.1	18	5.0	5	0.8	45.1	0.3
		45.3	76.4	<0.5	<10	2.8	<5	2.8	2.0	0.3	16	3.6	4	0.6	42.6	0.3
		431	83.1	1.3	10	6.6	<5	3.6	2.1	0.6	14	4.4	3	0.7	48.4	0.3
		1020	175.5	5.0	10	3.8	5	3.2	1.6	1.2	14	6.3	9	0.5	93.3	0.2
		317	110.5	44.8	80	3.8	589	6.2	3.5	1.5	18	7.4	8	1.2	58.7	0.5
		223	87.9	17.8	110	5.0	40	5.1	2.8	1.2	19	5.9	8	0.9	46.0	0.5
		2470	427	62.9	1400	0.7	24	7.2	2.5	5.1	9	15.8	6	1.0	263	0.2
		1150	290	65.8	1120	0.8	18	4.4	1.6	3.4	6	10.4	4	0.6	176.5	0.1
		1620	422	148.5	2420	3.1	90	7.3	2.6	5.4	13	17.2	9	1.0	296	0.2
		939	169.0	72.9	1460	0.8	25	2.3	0.8	1.9	5	5.8	3	0.3	108.5	0.1

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CERTIFICATE OF ANALYSIS BR04025900

Sample Description	Method Analyte Units LOR	ME-MS81 Nb ppm 1	ME-MS81 Nd ppm 0.5	ME-MS81 Ni ppm 5	ME-MS81 Pb ppm 5	ME-MS81 Pr ppm 0.1	ME-MS81 Rb ppm 0.2	ME-MS81 Sm ppm 0.1	ME-MS81 Sr ppm 0.1	ME-MS81 Ta ppm 0.5	ME-MS81 Tb ppm 0.1	ME-MS81 Th ppm 1	ME-MS81 U ppm 0.5	ME-MS81 V ppm 5	ME-MS81 Y ppm 0.5	ME-MS81 Yb ppm 0.1
FB-01		3	16.0	22	21	5.0	122.0	2.9	193.5	<0.5	0.1	39	5.1	16	3.5	0.4
FB-02		1	14.2	14	24	4.8	147.5	2.2	186.5	<0.5	<0.1	20	2.9	7	2.7	0.2
		15	51.7	<5	29	16.2	239	9.6	47.1	1.2	1.0	22	3.5	<5	27.3	3.9
		16	63.5	7	32	20.1	263	11.8	40.2	1.3	1.5	20	3.9	13	52.3	5.4
		10	39.6	11	24	12.0	154.5	7.6	651	0.9	0.8	9	1.4	46	22.2	2.7
		9	29.0	<5	30	9.0	131.5	5.4	409	0.9	0.6	22	3.5	68	23.0	2.1
		5	24.0	<5	33	8.6	196.0	3.9	18.2	<0.5	0.4	27	1.4	<5	17.7	2.0
		8	28.0	6	40	9.3	203	4.8	144.5	1.0	0.5	24	6.0	15	21.0	2.1
		11	56.7	9	31	19.8	242	8.3	254	0.5	0.6	24	3.1	30	14.9	1.5
		15	42.3	35	6	13.2	174.0	8.4	28.9	1.2	1.1	20	3.1	120	33.4	3.4
		15	35.2	38	6	10.6	171.0	7.0	39.1	1.2	0.8	19	2.4	138	25.9	2.9
		243	136.5	1315	15	45.7	19.0	20.0	544	11.2	1.5	42	5.1	74	26.4	1.4
		176	91.9	784	11	31.5	13.6	12.8	448	8.0	1.0	29	4.8	68	17.1	0.8
		360	150.0	1605	29	51.6	18.7	22.0	278	19.0	1.6	67	2.8	82	25.7	1.6
		136	53.2	1075	9	18.0	30.0	7.6	458	7.3	0.5	18	3.2	22	8.8	0.5

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CERTIFICATE OF ANALYSIS BR04025900

Sample Description	Method / Analyte / Units / LOR	ME-MS81 Zn ppm 5	ME-MS81 Zr ppm 0.5	ME-MS62s Li ppm 0.2	ME-MS62s Sc ppm 1
FB-01		24	195.0	12.8	2
FB-02		12	64.8	6.5	1
		25	321	11.6	5
		87	396	16.2	6
		43	275	14.1	8
		67	151.5	28.1	11
		10	86.2	6.5	2
		14	91.5	10.2	2
		38	278	14.2	4
		11	267	84.2	13
		12	275	70.3	14
		131	257	25.3	18
		66	162.5	19.8	13
		190	346	49.7	30
		56	134.0	12.2	11

Appendix 5

DR B.J. BARRON
Petrologist
ABN: 49 121 890 594

7 Fairview Avenue
ST IVES NSW 2075
AUSTRALIA
Tel/Fax: (02) 9449.5839

Our ref: 01/98/1339
Your ref: Letter of 20 October 2003; OR100307

Petrological examination of six samples, FB-01; FB-02;
XK-01; 03 CDDH 006 189.1m; FSD-08 12.3m; FSE-27 11.6m.

Report No: 01/98/1339

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For: Orogenic Exploration Pty Ltd

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Sample No. FB-01

Rock Type Distinctly foliated, partly recrystallised biotite-bearing granitic gneiss with sparse narrow quartz veinlets parallel to the conspicuous wavy foliation.

Hand Specimen A fine to medium grained, pale pink-brown feldspathic granitic sample that is distinctly foliated. The foliation is marked by abundant dark green-grey material that has an uneven patchy distribution. The sample is not magnetic. K-feldspar staining gave strong positive results and shows that this phase forms augen shaped patches in part of the rock. K-feldspar is intergrown with quartz.

Thin Section This sample is a recrystallised, strongly foliated granitic gneiss, with a variable grain size from less than 0.01 mm up to 1.3 mm in the present section. It now comprises granular granitic-textured augen-shaped domains comprising mainly K-feldspar and quartz with subordinate plagioclase, with a variable grain size from 0.2 mm up to about 1 mm. Some of these lensed domains are set in finely recrystallised host material that contains variable proportions of metamorphic biotite defining the somewhat irregular wavy subparallel foliation. Here, the average grain size rarely exceeds 0.02 mm.

A very approximate overall modal mineralogy is as follows: quartz 30%; K-feldspar 35%; plagioclase 20%; biotite 15%; and accessory zircon, altered titanian oxides, opaque oxides and altered oxidised sites that once could have been allanite. The sample also contains traces of epidote.

Quartz grains in this sample mainly are polygonised or finely recrystallised. Throughout the rock quartz forms elongate narrow wavy 'stringers' with a granular texture and average grain size of about 0.2 mm. Accessory grains are myrmekitic intergrowths of quartz with sodic plagioclase. Elsewhere are sparse veins up to 1 mm across, of monomineralic quartz with an average grain size of 0.2 mm. The veins are subparallel to the wavy foliation. K-feldspar is strained microcline that is weakly perthitic. Large relict grains (up to 1 mm across), have highly irregular shapes and commonly are set in recrystallised felsic domains in which the grain size now is less than 0.02 mm. Similarly, relict plagioclase grains show strain

shadows but lack recognisable relict igneous zoning. These grains, together with relict K-feldspar grains show strongly sutured (recrystallised) grain boundaries and are set in a mat of fine recrystallised felsic grains.

Rare biotite flakes that are inclusions in K-feldspar could represent relict primary igneous grains. Mostly, however, biotite in this sample is strongly recrystallised and fine grained (mainly flakes are less than 0.1 mm long). These define the wavy foliation. The biotite is strongly pleochroic dark brown (almost opaque) to pale yellow. Biotite shows minor alteration to chlorite.

Accessory grains are zircon, oxides (opaque oxides, and titanian oxides now converted to translucent sphene-leucoxene), rare grains of sphene, zircon grains up to 0.1 mm long, rare altered and oxidised crystal sites that are degraded and once could have been allanite, and also present are traces of epidote.

This sample may be identified as a distinctly foliated, partly recrystallised biotite-bearing granitic gneiss with sparse narrow quartz veinlets parallel to the conspicuous wavy foliation.

Sample No. FB-02

Rock Type Deformed and recrystallised, quartz- veined biotite-bearing granitic gneiss.

Hand Specimen A medium to quite coarse grained, distinctly foliated granitic gneiss that is mottled dark red-brown and pale grey, with patchy dark green-grey domains that define a rather poor wavy foliation direction. The sample is not magnetic. K-feldspar staining gave strong positive results for patchy elongate irregular domains rich in this phase. The sample is weakly magnetic.

Thin Section This sample is a granitic gneiss that is deformed and partly recrystallised. It has a granular texture marked by irregular- and augen- shaped domains, mainly less than 1 cm across, of medium and coarse grain size that are set in finely recrystallised felsic domains that host fine grained metamorphic biotite, partly defining a poor wavy foliation. Grain size in relatively coarse domains varies mainly

within the range 0.6 mm up to 3.5 mm while finely recrystallised domains have an average grain size of only about 0.02 mm. Some metamorphic biotite flakes reach 0.1 mm long.

The sample has the following approximate overall modal mineralogy: quartz 35%; K-feldspar 30%; plagioclase 30%; and biotite 5%-7%. Accessory phases are opaque oxides, zircon, degraded sites of previous ?allanite, apatite.

Quartz is present as granular recrystallised patches and discontinuous ?veins in which the average quartz grain size is about 0.25 mm. Unlike quartz, K-feldspar commonly forms coarse anhedral grains with sutured grain boundaries. The K-feldspar is distinctly perthitic and some grains retain microcline twinning. K-feldspar commonly encloses small rounded inclusions of quartz and sparse biotite flakes that reach 0.35 mm long. Also included are albitised plagioclase grains that are heavily clouded with fine dusty 'sericite'. K-feldspar commonly is intergrown with equally coarse relict plagioclase crystals that now have irregular shapes and sutured grain boundaries due to recrystallisation. In some grains polysynthetic multiple twins are deformed and strain shadows are present. Elsewhere are plagioclase grains that are distinctly compositionally zoned. This may be relict primary magmatic compositional zoning. The sample contains small patches of myrmekitic intergrowths that are mainly adjacent to or within K-feldspar grains.

The sample has undergone partial brittle fracture and recrystallisation affecting about 40% of the present section area. Many branching, narrow, finely recrystallised felsic domains are characteristic. Within these are developed irregular patches and trails of fine grained biotite flakes that partly define a wavy foliation. The finely recrystallised domains, including biotite, enclose and bend around the coarse relict granitic grains. Accessory opaque oxides comprise ?magnetite ± titanian magnetite (partly sphene altered) and sparse small zircon crystals. Apatite grains are anhedral and rarely reach 0.3 mm grain size. No allanite occurs as such but degraded sites of this phase contain yellow low birefringent clay and limonitic oxides. Biotite locally is converted to chlorite.

This sample may be described as a deformed and recrystallised quartz veined biotite-bearing granitic gneiss.