African Mineral Standards
REFERENCE MATERIALS FOR AFRICAN ORES

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Merensky Reef (low grade) PGE Reference Material

AMIS0064

Certificate of Analysis

Recommended Concentrations and two "Between Laboratory" Standard Deviations

Certified Concentrations

Pt (NIS)	1.28	+-	0.14	g/t
Pt (Pb Collection)	1.24	+-	0.12	g/t
Pd (NIS)	0.59	+-	0.062	g/t
Pd (Pb Collection)	0.58	+-	0.06	g/t
Co (M/ICP)	84	+-	8	ppm
Cr (XRF)	5144	+-	326	ppm
Cu (P)	664	+-	49	ppm
Cu (XRF)	654	+-	58	ppm
Cu (M/ICP)	636	+-	66	ppm
Ni (M/ICP	1452	+-	134	ppm
Ni (P)	1046	+-	82	ppm
Ni (XRF)	1509	+-	126	ppm
Specific Gravity	3.09	+-	0.14	g/cc

Provisional Concentrations

Au (NIS)	0.10	+-	0.028	g/t
Au (Pb Collection)	0.11	+-	0.02	g/t
Co (P)	29.2	+-	3.6	ppm
Co (XRF)	90	+-	13	ppm
Ir (NiS)	0.023	+-	0.004	g/t
Rh (M/ICP)	0.063	+-	0.008	g/t
Ru (NiS)	0.123	+-	0.020	g/t

Indicated Means

Cr (M/ICP)	4477	ppm

4E = 2.056 g/t (Pt, Pd, Rh plus Au)

NB Additional uncertified major and trace element data is presented on p2 and as an appendix.

Intended Use: AMIS0064 is suitable for monitoring the accuracy of a single analysis of PGE, Cu and Ni ores hosted by Merensky Reef or similar other mafic rocks. The material can be used for routine quality control by inserting within a batch of samples.

The major and trace element composition of this material has also been determined but it has not been certified. The iterated statistics are set out below and as an appendix and this information may be useful for instrument calibration or method development.

Origin of Material: This standard was made using Merensky Reef Pt/Pd ore material supplied by Anglo Platinum Limited from the Western limb of the Bushveld Complex. This specific material is a blend of ore collected from the Turfontein Mine ore silo, and footwall material collected from the Boschfontein Shaft..

Mineral and Chemical Composition: The Merensky Reef comprises components of feldspathic pyroxenite, pyroxenite and anorthosite. Peak PGE values are associated with a thin chromitite stringer. Mineralization in this Merensky Reef comprises 2-5% disseminated or net textured magmatic sulphides, predominantly pyrrhotite, pentlandite, chalcopyrite and pyrite. The PGE's occur as micron-sized satellite grains around but rarely within the sulphides.

This major element chemistry (below) was determined from (predominantly) XRF data supplied by 19 of the laboratories

AMIS0064	%	2SD	RSD%	n
Al_2O_3	12.4	0.5	1.85	123
CaO	7.17	0.27	1.89	122
Cr_2O_3	0.75	0.06	3.78	125
Fe_2O_3	9.58	0.29	1.52	140
K_2O	0.19	0.01	2.42	92
LOI	0.36	0.155	21.48	84
MgO	16.86	0.32	0.96	122
MnO	0.16	0.01	3.21	117
Na_2O	1.01	0.06	2.82	93
P_2O_5	0.04	0.01	12.98	88
S	0.31	0.033	5.21	77
SiO_2	50.7	0.7	0.73	124
TiO_2	0.20	0.02	4.57	115
V_2O_5	0.02	0.002	5.68	23

Appearance: The material is a very fine Med Light Grey powder (Corstor colour chart - 10Y 6/2).

Method of preparation: The material was crushed, dry-milled and air-classified to 100% <54um. Wet sieve particle size analysis of random samples confirmed the material was 100% <54um. It was then blended in a bi-conical mixer, systematically divided and then sealed into 1kg Laboratory Packs. Samples were randomly selected for homogeneity testing and third party analysis. Statistical analysis for the consensus test results were carried out by an independent statistician. Explorer Packs are subdivided from the Laboratory packs as required.

Methods of analysis requested:

1. Pt, Pd and Au. Pb collection with Ag as a co-collector, ICP-OES or ICP-MS.
2. Pt, Pd, Au, Rh, Ru, Ir. NiS collection, ICP-OES or ICP-MS.
3. Multi element scan to include Co, Cu and Ni. Multi-acid total digestion, including HF, ICP-OES or ICP-MS.
4. Co, Cu and Ni. Aqua regia digestion with ICP-OES or ICP-MS.
5. Cr, Co, Cu and Ni. Pressed Pellet, XRF.
6. Majors (Al2O3, CaO, Cr2O3, Fe2O3, K2O, MgO, MnO, Na2O, SiO2, TiO2. LOI.) XRF fusion.
7. SG, gas pycnometer.

Information requested:

1. Aliquots used for all determinations.
2. Results for individual PGM's reported in ppb.
3. Results for base metals reported in ppm.
4. QC data, to include replicates, blanks and certified reference materials used.
5. Analytical techniques used.

Method of certification: Twenty seven laboratories were each given eight samples, comprising eight packages of sample scientifically selected from throughout the batch. All results were issued timeously and used for certification.

The final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean ±2 standard deviations was removed from the ensuing data base. The mean and standard deviations were again calculated using the remaining data.

This method is different from that used by Government agencies in that the actual “between-laboratory” standard deviation is used in the calculations. This produces upper and lower limits that reflect actual individual analyses rather than a grouped set of analyses. The limits can therefore be used to monitor accuracy from individual analyses, unlike the Confidence Limits published on other standards. Standards with an RSD of near or less than 5 % are certified, RSD’s of between near 5 % and 15 % are Provisional, and RSD’s over 15 % are Indicated.

Participating Laboratories: (Not in same order as in the table of assays)

1. ACME Analytical Laboratories Ltd., (Canada).
2. Activation Laboratories Ltd., (ActLabs, Ancaster, ON, Canada).
3. ALS Chemex South Africa (Pty) Ltd.
4. ALS Chemex, (Perth, Australia).
5. ALS Chemex, (Vancouver, Canada).
6. Ammtec Ltd., (Western Australia).
7. Anglo Platinum, Eastern Bushveld Regional Laboratory (South Africa).
8. Anglo Platinum, PPL Assay Laboratory (South Africa).
9. Anglo Research (Crown Campus, South Africa).
10. Anglo Research (Germiston Campus, South Africa)
11. Assayers Canada, (Vancouver).
12. Barplats Laboratory, (South Africa).
13. Becquerel Laboratories, (Canada).
14. Genalysis Laboratory Services (Pty) Ltd., (Australia).
15. Geoscience Laboratories, (Geo Labs, Sudbury, Canada).
16. Labtium Inc. (Finland)
17. Metchem Laboratories
18. Nkomati JV Laboratory

19. OMAC Laboratories (Ireland).
20. Pt Intertek Utama Services (Intertek, Indonesia)
21. Set Point Laboratories (Pty) Ltd (Mokopane, South Africa)
22. Set Point Laboratories (Pty) Ltd (South Africa)
23. SGS Lakefield Research (Canada)
24. SGS Lakefield Research Africa (Pty) Ltd. (Joburg, South Africa)
25. SGS Welshpool (Australia).
26. Ultra Trace (Pty) Ltd. (Australia)
27. Zimplats Assay Laboratory (Zimbabwe)

Assay Data: Data as received from the laboratories for the important certified elements listed on p1 is set out below. A proficiency report has been sent to the managers of the participating laboratories. Additional data from this round robin is available on request.

Lab Code	Co ppm (M/ICP)	Cr ppm (M/ICP)	Cu ppm (M/ICP)	Ni ppm (M/ICP)	Au g/t (NiS)	Ir g/t (NiS)	Pd g/t (NiS)	Pt g/t (NiS)	Rh g/t (NiS)	Ru g/t (NiS)	Co ppm (P)	Cu ppm (P)	Ni ppm (P)	Au g/t (Pb Coll)	Pd g/t (Pb Coll)	Pt g/t (Pb Coll)	Co ppm (XRF)	Cr ppm (XRF)	Cu ppm (XRF)	Ni ppm (XRF)	SG g/cc
A	82	4366	649	1457	0.103	0.022	0.532	1.216	0.061	0.116	31	613	1019	0.096	0.558	1.176			616	1490	3.13
A	81	4343	663	1464	0.107	0.022	0.548	1.260	0.063	0.130	28	587	933	0.099	0.568	1.166			664	1513	3.14
A	82	4098	666	1486	0.099	0.023	0.551	1.251	0.062	0.123	30	618	990	0.100	0.569	1.158			634	1508	3.15
A	82	4071	650	1445	0.111	0.023	0.545	1.283	0.062	0.125	29	661	1006	0.102	0.578	1.272			642	1509	3.13
A	81	3727	657	1447	0.108	0.024	0.561	1.259	0.064	0.135	28	606	947	0.122	0.568	1.231			646	1501	3.15
A	82	3871	660	1425	0.107	0.022	0.548	1.251	0.063	0.126	30	624	1006	0.115	0.586	1.246			651	1562	3.15
A	81	3919	668	1456	0.105	0.024	0.551	1.254	0.063	0.128	31	636	992	0.095	0.576	1.186			670	2050	3.13
A	81	3933	657	1434	0.107	0.023	0.563	1.221	0.066	0.124	29	619	989	0.104	0.572	1.214			643	1683	3.14
B	88	4300	643	1460							26	597	892	0.126	0.590	1.220	100	100		1400	
B	88	4240	646	1470							27	597	906	0.111	0.590	1.240	100	100		1700	
B	87	3890	643	1450							27	591	902	0.117	0.590	1.270	100	100		1600	
B	85	4090	645	1420							27	601	906	0.115	0.580	1.290	100	100		1600	
B	89	4140	645	1460							27	599	900	0.113	0.568	1.210	100	100		1500	
B	83	3960	630	1410							26	589	890	0.113	0.580	1.240	100	100		1500	
B	85	4310	662	1400							27	585	887	0.106	0.580	1.220	100	100		1500	
B	89	3850	631	1460							26	596	907	0.112	0.580	1.230	100	100		1500	
C					0.112	0.020	0.600	1.400	0.062	0.100				0.113			89	89		1459	
C					0.126	0.022	0.570	1.400	0.058	0.130				0.115			88	88		1460	
C					0.163	0.021	0.550	1.400	0.056	0.110				0.111			88	88		1475	
C					0.125	0.022	0.610	1.400	0.062	0.120				0.165			87	87		1464	
C					0.111	0.020	0.570	1.400	0.059	0.100				0.117			88	88		1465	
C					0.108	0.019	0.540	1.200	0.055	0.100				0.110			89	89		1455	
C					0.119	0.022	0.610	1.400	0.064	0.130				0.113			89	89		1476	
C					0.116	0.020	0.550	1.300	0.056	0.110				0.112			89	89		1461	
D	81	3986	573	1335	0.074	0.021	0.504	1.050	0.054	0.119	34	661	1070	0.118	0.590	1.190			648	1538	
D	82	3664	576	1335	0.084	0.020	0.468	0.998	0.051	0.110	35	656	1070	0.125	0.591	1.180			646	1529	
D	82	3937	577	1308	0.073	0.022	0.525	1.110	0.057	0.122	35	659	1070	0.120	0.592	1.240			658	1536	
D	81	3911	575	1326	0.073	0.020	0.470	1.010	0.051	0.109	35	657	1070	0.116	0.588	1.200			658	1559	
D	82	3790	575	1323	0.079	0.021	0.514	1.090	0.057	0.118	34	659	1070	0.118	0.586	1.190			661	1551	
D	81	3854	585	1318	0.085	0.024	0.549	1.220	0.058	0.130	35	637	1040	0.116	0.582	1.190			658	1537	
D	82	3991	587	1319	0.086	0.022	0.517	1.120	0.057	0.120	35	657	1070	0.113	0.584	1.170			648	1548	
D	82	3965	583	1320	0.066	0.020	0.468	0.997		0.109	36	655	1060	0.113	0.586	1.170			645	1538	
E	110	5492		1620					0.020			630		0.050	0.620	1.190					
E	120	5150		1670					0.022			640		0.060	0.560	1.220					
E	110	5144		1650					0.023			640		0.078	0.530	1.130					
E	110	4945		1620					0.011			630		0.069	0.670	1.390					
E	120	4952		1650					0.028			630		0.064	0.550	1.150					
E	110	5014		1630					0.014			630		0.089	0.570	1.240					
E	120	5103		1660					0.028			640		0.094	0.650	1.080					
E	110	5109		1620					0.016			630		0.086	0.600	1.290					
F														0.116	0.542	1.162					
F														0.110	0.567	1.207					
F														0.114	0.557	1.185					
F														0.111	0.559	1.214					
F														0.104	0.543	1.154					
F														0.117	0.566	1.215					
F														0.119	0.599	1.271					
F														0.116	0.556	1.201					
G	77		582	1331							30	675	1045	0.120	0.570	1.260					2.89
G	90		619	1399							32	652	1077	0.110	0.590	1.290					2.88
G	82		614	1377							30	651	1056	0.110	0.570	1.250					2.81
G	89		624	1405							30	672	1057	0.110	0.580	1.310					2.91
G	81		630	1411							31	657	1071	0.110	0.560	1.240					2.90
G	86		609	1356							30	632	1041	0.110	0.580	1.270					2.96
G	86		619	1393							31	647	1033	0.100	0.560	1.210					3.05
G	83		622	1402							29	659	1051	0.120	0.570	1.220					2.95
H	164		3144	5396																	
H	173		3155	5569																	
H	149		3011	5293																	
H	174		2957	5097																	
H	177		3056	5394																	
H	156		3000	5230																	
H	159		3032	5347																	
H	159		3021	5280																	

Assay Data (cont):

Lab Code	Co ppm (M/ICP)	Cr ppm (M/ICP)	Cu ppm (M/ICP)	Ni ppm (M/ICP)	Au g/t (NiS)	Ir g/t (NiS)	Pd g/t (NiS)	Pt g/t (NiS)	Rh g/t (NiS)	Ru g/t (NiS)	Co ppm (P)	Cu ppm (P)	Ni ppm (P)	Au g/t (Pb Coll)	Pd g/t (Pb Coll)	Pt g/t (Pb Coll)	Co ppm (XRF)	Cr ppm (XRF)	Cu ppm (XRF)	Ni ppm (XRF)	SG g/cc
I	87		720	1500	0.100		0.610	1.270	0.080	0.090	30	720	1160	0.110	0.600	1.290	86	86	583	1451	3.13
I	84		860	1400	0.080		0.560	1.190	0.090	0.080	30	760	1230	0.110	0.600	1.250	89	89	592	1467	3.11
I	90		880	1700	0.090		0.600	1.310	0.090	0.090	30	750	1210	0.110	0.580	1.250	83	83	590	1468	3.12
I	88		870	1700	0.090		0.590	1.190	0.080	0.080	30	720	1180	0.110	0.590	1.240	83	83	588	1464	3.02
I	83		860	1700	0.100		0.600	1.250	0.070	0.080	40	830	1350	0.100	0.590	1.240	85	85	591	1465	3.12
I	87		860	1600	0.100		0.600	1.270	0.070	0.080	40	800	1320	0.120	0.600	1.200	89	89	582	1445	3.13
I	89		920	1700	0.100		0.620	1.260	0.070	0.080	30	730	1190	0.100	0.590	1.270	89	89	583	1450	3.12
I	86		820	1600	0.090		0.590	1.260	0.070	0.080	30	770	1230	0.100	0.610	1.290	86	86	589	1461	3.09
J	90	5300	680	1550	0.120	0.025	0.596	1.280	0.065	0.131	28	678	1080	0.119	0.605	1.260	100	100	660	1560	3.16
J	90	5350	675	1530	0.118	0.024	0.609	1.270	0.061	0.126	30	674	1120	0.123	0.595	1.260	100	100	660	1560	3.17
J	90	5400	685	1530	0.113	0.024	0.607	1.270	0.060	0.126	30	680	1090	0.122	0.605	1.270	100	100	660	1560	3.17
J	90	5300	680	1520	0.117	0.025	0.599	1.310	0.064	0.130	30	665	1080	0.110	0.595	1.240	100	100	660	1560	3.16
J	85	5500	670	1520	0.117	0.025	0.596	1.270	0.064	0.126	30	668	1060	0.120	0.595	1.260	100	100	660	1560	3.19
J	85	5350	680	1530	0.119	0.024	0.615	1.230	0.062	0.127	30	674	1090	0.112	0.595	1.230	110	110	660	1560	3.17
J	90	5650	675	1520	0.108	0.025	0.617	1.260	0.063	0.127	30	676	1090	0.113	0.595	1.250	100	100	660	1560	3.19
J	90	5400	665	1490	0.114	0.025	0.606	1.310	0.064	0.132	30	667	1090	0.112	0.600	1.270	100	100	660	1560	3.18
K	83	5960	629	1440	0.053	0.022	0.512	0.991	0.056	0.106	35	668	1140	0.088	0.591	1.310	88	88	655	1590	3.00
K	83	5950	625	1420	0.055	0.024	0.563	1.160	0.063	0.120	33	668	1130	0.085	0.593	1.280	81	81	649	1590	3.02
K	79	6040	621	1420	0.053	0.025	0.569	1.170	0.065	0.122	34	682	1130	0.084	0.583	1.250	86	86	650	1580	3.08
K	80	5810	611	1420	0.056	0.026	0.552	1.180	0.063	0.118	34	684	1140	0.097	0.584	1.250	84	84	649	1590	3.06
K	82	6030	656	1440	0.051	0.025	0.553	1.130	0.062	0.119	35	679	1140	0.079	0.556	1.210	88	88	653	1590	3.11
K	82	5880	633	1450	0.062	0.025	0.537	1.170	0.062	0.116	35	696	1160	0.092	0.590	1.300	87	87	649	1590	3.02
K	83	6020	630	1430	0.061	0.026	0.539	1.210	0.062	0.119	35	703	1170	0.084	0.580	1.230	86	86	656	1600	3.02
K	79	5910	590	1380	0.054	0.025	0.537	1.160	0.061	0.112	35	687	1170	0.091	0.598	1.310	85	85	655	1590	3.04
L			680	1500										0.132	0.522	1.053					
L			670	1500										0.129	0.544	1.118					
L			690	1510										0.126	0.558	1.097					
L			680	1490										0.117	0.563	1.135					
L			670	1500										0.118	0.535	1.090					
L			650	1500										0.105	0.514	1.051					
L			700	1500										0.117	0.570	1.266					
L			700	1490										0.120	0.611	1.312					
M	75		628	1584	0.132	0.023	0.606	1.323	0.065	0.132	27	593	942	0.125	0.606	1.289	96	96	712	1539	3.08
M	77		635	1471	0.120	0.023	0.623	1.319	0.064	0.128	29	638	1017	0.150	0.597	1.280	84	84	670	1478	3.13
M	78		647	1527	0.138	0.023	0.614	1.252	0.064	0.131	32	681	1077	0.126	0.600	1.299	85	85	665	1445	3.11
M	76		626	1558	0.117	0.023	0.578	1.316	0.065	0.132	30	646	1029	0.126	0.603	1.317	75	75	664	1463	3.12
M	80		656	1541	0.144	0.023	0.614	1.377	0.066	0.134	30	668	1052	0.140	0.604	1.326	81	81	671	1450	3.13
M	82		669	1569	0.126	0.024	0.633	1.379	0.067	0.133	29	646	1031	0.121	0.598	1.313	88	88	674	1453	3.16
M	80		657	1581	0.156	0.023	0.588	1.308	0.064	0.131	31	648	1020	0.129	0.611	1.337	92	92	677	1457	3.16
M	78		644	1470	0.120	0.023	0.593	1.313	0.064	0.132	28	634	1010	0.123	0.612	1.336	78	78	692	1476	3.16
N	85	3450	650	1410							28	686	1030	0.110	0.594	1.200					2.97
N	84	3330	636	1390							28	677	1040	0.117	0.593	1.165					3.01
N	84	3260	603	1300							28	684	1030	0.117	0.604	1.275					2.98
N	84	3630	630	1360							28	677	1030	0.124	0.605	1.190					2.99
N	83	3410	643	1420							28	691	1040	0.112	0.608	1.245					3.03
N	83	3370	615	1340							28	688	1030	0.112	0.609	1.310					3.04
N	83	3350	596	1310							28	685	1030	0.116	0.599	1.220					3.08
N	83	3440	601	1320							28	681	1010	0.122	0.610	1.310					2.99
O		5000	600	1400		0.030	0.630	1.370	0.070	0.210		630	980	0.130	0.590	1.310			710	1430	3.06
O		5100	620	1500		0.020	0.630	1.370	0.070	0.170		630	970	0.130	0.610	1.320			700	1440	3.06
O		5000	610	1400		0.020	0.660	1.410	0.070	0.170		630	970	0.150	0.620	1.370			600	1430	3.07
O		5000	610	1300		0.020	0.660	1.460	0.060	0.160		640	970	0.140	0.610	1.400			690	1360	3.05
O		5000	600	1400		0.020	0.670	1.450	0.070	0.180		660	970	0.160	0.600	1.350			680	1400	3.04
O		5000	580	1400		0.020	0.640	1.380	0.060	0.150		630	980	0.130	0.600	1.340			750	1410	3.08
O		4900	590	1400		0.020	0.630	1.360	0.070	0.150		640	960	0.130	0.610	1.330			650	1440	3.06
O		5000	610	1400		0.020	0.610	1.310	0.070	0.170		630	970	0.140	0.590	1.350			590	1460	3.05
P	81	4792	655	1507							32	651	1083	0.123	0.570	1.250					
P	80	4774	650	1471							32	649	1077	0.125	0.580	1.235					
P	79	4827	653	1484							33	660	1086	0.110	0.579	1.218					
P	80	4780	659	1491							32	653	1071	0.116	0.579	1.212					
P	82	4848	660	1502							32	658	1089	0.128	0.565	1.212					
P	82	4770	660	1489							32	658	1083	0.118	0.584	1.218					
P	80	4855	661	1475							32	655	1073	0.114	0.573	1.190					
P	79	4807	643	1476							32	656	1077	0.111	0.572	1.202					
Q	83	3530	693	1490							30	666	1010	0.104	0.560	1.230			750	1560	3.02
Q	86	3700	738	1590							31	710	1045	0.108	0.558	1.225			750	1570	3.00
Q	86	3480	737	1565							31	678	1010	0.102	0.540	1.195			760	1580	2.99
Q	88	3620	752	1600							31	761	1065	0.103	0.567	1.240			750	1570	2.98
Q	89	3700	750	1590							31	691	1020	0.124	0.602	1.315			750	1570	3.11
Q	86	3610	734	1565							31	720	1055	0.128	0.592	1.290			750	1570	3.06
Q	88	3600	732	1560							30	668	1020	0.114	0.593	1.295			750	1570	3.06
Q	84	3450	702	1510							30	700	1025	0.103	0.548	1.200			740	1560	3.08
R	70	3670	601								26	708	1050	0.125	0.603	1.320			700	1600	
R	74	4040	653								26	679	1010	0.124	0.570	1.250			700	1600	
R	71	3870	611								26	680	1010	0.133	0.618	1.370			700	1600	
R	72	3800	628								26	685	1020	0.124	0.570	1.210			700	1600	
R	71	3780	613								26	683	1010	0.131	0.618	1.300			700	1600	
R	70	3670	609								26	678	1010	0.127	0.623	1.330			700	1600	
R	70	3820	606								26	660	999	0.128	0.610	1.300			700	1600	
R	70	3900	606								26	679	1010	0.121	0.594	1.270			700	1600	
S	76	3940	680								28	686	1050	0.103	0.582	1.235				1460	3.01
S	75	3780	655								29	721	1110	0.106	0.582	1.230				1430	3.02
S	79	3780	675								28	698	1070	0.107	0.589	1.245				1450	3.02
S	75	4010	660								29	696	1070	0.106	0.594	1.165				1460	3.05
S	77	3980	669								29	701	1080	0.106	0.597	1.275				1440	3.00
S	78	3900	682								29	709	1090	0.109	0.586	1.150				1480	2.99
S	74	3720	649								29	701	1070	0.110	0.602	1.295				1440	3.00
S	76	3720	631								28	697	1060	0.107	0.600	1.265				1390	2.99

Assay Data (cont):

Lab Code	Co ppm (M/ICP)	Cr ppm (M/ICP)	Cu ppm (M/ICP)	Ni ppm (M/ICP)	Au g/t (NiS)	Ir g/t (NiS)	Pd g/t (NiS)	Pt g/t (NiS)	Rh g/t (NiS)	Ru g/t (NiS)	Co ppm (P)	Cu ppm (P)	Ni ppm (P)	Au g/t (Pb Coll)	Pd g/t (Pb Coll)	Pt g/t (Pb Coll)	Co ppm (XRF)	Cr ppm (XRF)	Cu ppm (XRF)	Ni ppm (XRF)	SG g/cc
T	88		613	1501	0.107	0.023	0.196	1.241	0.038	0.118	31		1038	0.103	0.525	1.190	87	87	635	1426	
T	84		606	1482	0.102	0.023	0.581	1.247	0.064	0.127	29		1047	0.100	0.502	1.138	86	86	635	1437	
T	86		613	1491	0.105	0.023	0.589	1.281	0.065	0.129	30		1032	0.122	0.526	1.185	85	85	642	1408	
T	80		570	1426	0.123	0.023	0.587	1.271	0.065	0.131	29		988	0.102	0.526	1.193	87	87	629	1419	
T	82		596	1454	0.105	0.023	0.582	1.260	0.064	0.129	32		1058	0.109	0.540	1.207	87	87	643	1440	
T	84		610	1506	0.102	0.024	0.585	1.273	0.064	0.133	30		1055	0.105	0.554	1.253	84	84	641	1407	
T	82		598	1442	0.104	0.023	0.591	1.278	0.065	0.131	30		1054	0.092	0.476	1.114	87	87	643	1415	
T	83		585	1431	0.101	0.023	0.584	1.263	0.064	0.130	30		1031	0.104	0.530	1.209	85	85	631	1415	
U	101	5780	657	1422										0.130	0.630	1.330					
U	88	5180	623	1388										0.120	0.630	1.310					
U	96	5354	652	1493										0.120	0.640	1.320					
U	100	5265	645	1485										0.130	0.630	1.360					
U	93	5468	648	1490										0.120	0.630	1.340					
U	92	5360	652	1460										0.120	0.620	1.300					
U	86	5635	654	1468										0.120	0.630	1.310					
U	86	5650	647	1459										0.130	0.620	1.320					
V														0.102	0.588	1.240			641	1510	3.28
V														0.116	0.588	1.220			641	1510	3.23
V														0.100	0.581	1.220			638	1500	3.25
V														0.108	0.591	1.260			645	1500	3.27
V														0.108	0.600	1.240			640	1500	3.27
V														0.106	0.582	1.250			638	1500	3.26
V														0.107	0.603	1.240			651	1510	3.30
V														0.108	0.601	1.220			646	1500	3.27
W	92	5355	680	1448	0.098	0.023	0.607	1.244	0.066	0.131				0.103	0.569	1.150					
W	91	5308	673	1443	0.100	0.023	0.603	1.235	0.066	0.129				0.101	0.545	1.120					
W	88	5319	686	1468	0.106	0.023	0.602	1.238	0.066	0.129				0.094	0.557	1.100					
W	90	5307	677	1435	0.095	0.023	0.602	1.235	0.066	0.129				0.100	0.540	1.090					
W	91	5337	679	1450	0.098	0.023	0.607	1.235	0.066	0.130				0.102	0.538	1.140					
W	90	5333	684	1267	0.098	0.023	0.600	1.225	0.065	0.128				0.101	0.515	1.090					
W	90	5319	674	1479	0.100	0.022	0.600	1.233	0.064	0.126				0.105	0.541	1.160					
W	89	5367	678	1472	0.098	0.022	0.600	1.244	0.064	0.128				0.100	0.516	1.110					
X									0.076						0.558	1.341			1566	1566	3.18
X									0.059						0.541	1.209			1560	1560	3.20
X									0.062						0.524	1.292			1570	1570	3.24
X									0.063						0.538	1.207			1560	1560	3.22
X									0.067						0.530	1.245			1560	1560	3.24
X									0.059						0.517	1.315			1560	1560	3.20
X									0.062						0.542	1.318			1570	1570	3.20
X									0.057						0.540	1.284			1570	1570	3.20
Y					0.110	0.060	0.610	1.310	0.060	0.140							174	174	790	1870	
Y					0.110	0.040	0.610	1.300	0.064	0.130							174	174	770	1840	
Y					0.110	0.083	0.590	1.280	0.063	0.130							174	174	780	1850	
Y					0.097	0.050	0.560	1.240	0.058	0.120							174	174	770	1840	
Y					0.100	0.032	0.600	1.280	0.063	0.130							174	174	760	1840	
Y					0.110	0.047	0.570	1.230	0.061	0.120							173	173	770	1850	
Y					0.110	0.050	0.600	1.280	0.063	0.130							175	175	770	1850	
Y					0.095	0.040	0.570	1.210	0.062	0.120							171	171	770	1840	
Z	83	3107	581											0.103	0.521	1.150					
Z	81	3447	559											0.121	0.537	1.140					
Z	85	3273	603											0.118	0.547	1.190					
Z	83	3289	595											0.112	0.540	1.180					
Z	89	3500	592											0.115	0.543	1.210					
Z	84	2458	613											0.105	0.530	1.150					
Z	85	2997	598											0.105	0.524	1.140					
Z	88	3060	599											0.112	0.541	1.180					
ZA					0.070		0.686	1.184	0.040	0.111				0.106	0.505	1.179					
ZA					0.117		0.565	1.317	0.132	0.113				0.103	0.499	1.167					
ZA					0.074		0.381	1.074	0.115	0.047				0.108	0.481	1.125					
ZA					0.078		0.249	1.172	0.032	0.113				0.096	0.460	1.104					
ZA					0.082		0.662	1.567	0.091	0.072				0.108	0.476	1.131					
ZA					0.112		0.444	1.233	0.053	0.048				0.097	0.447	1.128					
ZA					0.087		0.415	1.117	0.070	0.151				0.111	0.479	1.178					
ZA					0.077		0.207	1.186	0.076	0.067				0.098	0.475	1.160					

Availability: This product is available in Laboratory Packs containing 1kg of material and Explorer Packs containing custom weights (of <250g) of material. The Laboratory Packs are sealed bottles delivered in sealed foil pouches. The Explorer Packs contain material in standard geochem envelopes, nitrogen flushed and vacuum sealed in foil pouches.

Legal Notice: This certificate and the reference material described in it have been prepared with due care and attention. However AMIS, Set Point Technology (Pty) Ltd, Mike McWha, Dr Barry Smee and Smee and Associates Ltd; accept no liability for any decisions or actions taken following the use of the reference material.

30 April 2008

Certifying Officers:

African Mineral Standards:_____

Mike McWha
BSc (Hons), FGSSA, MAusIMM, Pr.Sci.Nat

Geochemist:_____

Barry W. Smee
BSc, PhD, P.Geo, (B.C.)

N.B. This certificate was amended 22 Sept 2009; the Pt Pb figures had been incorrectly repeated in the Pt NiS column in the original certificate.

APPENDIX

Additional useful data collected during the round robin exercise includes these iterated but uncertified certified trace element statistics:

AMIS0064	Method	unit	value	2SD	RSD%	n
Ag	M/ICP	ppm	0.332	0.07	10.8	24
Al	M/ICP	%	6.56	0.75	5.7	87
As	M/ICP	ppm	2.04	1.60	39.2	32
Ba	M/ICP	ppm	60.7	8.45	7.0	87
Be	M/ICP	ppm	0.187	0.12	31.5	39
Bi	M/ICP	ppm	0.218	0.04	8.0	38
Ca	M/ICP	%	5.07	0.32	3.1	76
Cd	M/ICP	ppm	0.148	0.07	22.4	24
Ce	M/ICP	ppm	6.91	1.33	9.6	46
Cs	M/ICP	ppm	0.223	0.05	10.9	32
Dy	M/ICP	ppm	0.832	0.10	6.1	32
Er	M/ICP	ppm	0.546	0.08	7.4	32
Eu	M/ICP	ppm	0.256	0.03	5.7	32
Fe	M/ICP	%	6.68	0.20	1.5	69
Ga	M/ICP	ppm	11.1	1.66	7.5	61
Gd	M/ICP	ppm	0.769	0.08	5.3	28
Ge	M/ICP	ppm	0.224	0.19	41.8	22
Hf	M/ICP	ppm	0.398	0.01	1.9	39
Ho	M/ICP	ppm	0.189	0.01	3.4	31
In	M/ICP	ppm	0.032	0.01	16.4	30
K	M/ICP	%	0.157	0.02	6.2	79
La	M/ICP	ppm	3.31	0.86	13.0	62
Li	M/ICP	ppm	3.87	0.56	7.2	59
Lu	M/ICP	ppm	0.095	0.02	8.3	16
Mg	M/ICP	%	10.0	0.55	2.7	82
Mn	M/ICP	ppm	1138	111	4.9	102
Mo	M/ICP	ppm	1.02	0.14	7.0	38
Na	M/ICP	%	0.751	0.10	7.0	96
Nb	M/ICP	ppm	1.03	0.72	34.8	54
Nd	M/ICP	ppm	3.08	0.36	5.9	30
Os	M/ICP	ppb	17.4	3.99	11.5	16
P	M/ICP	ppm	144	39.0	13.5	83
Pb	M/ICP	ppm	7.55	3.50	23.2	58
Pr	M/ICP	ppm	0.794	0.09	5.4	30
Rb	M/ICP	ppm	6.10	0.78	6.4	44
Re	M/ICP	ppm	0.004	0.001	14.0	22
Sb	M/ICP	ppm	11.5	1.89	8.2	61
Sc	M/ICP	ppm	19.8	2.74	6.9	84
Se	M/ICP	ppm	2.50	1.03	20.7	16
Sm	M/ICP	ppm	0.670	0.08	5.7	30
Sn	M/ICP	ppm	0.879	0.12	6.6	38
Sr	M/ICP	ppm	173	13.7	4.0	79
Tb	M/ICP	ppm	0.128	0.01	4.9	31
Te	M/ICP	ppm	0.399	0.11	13.2	37
Th	M/ICP	ppm	0.778	0.08	5.3	46
Ti	M/ICP	%	0.113	0.01	6.0	103
Tl	M/ICP	ppm	0.058	0.01	12.0	24
Tm	M/ICP	ppm	0.098	0.03	13.4	32
U	M/ICP	ppm	0.668	0.12	9.2	38
V	M/ICP	ppm	112	19.0	8.5	78
W	M/ICP	ppm	0.218	0.11	24.8	44
Y	M/ICP	ppm	5.01	0.36	3.6	61
Yb	M/ICP	ppm	0.590	0.03	2.9	30
Zn	M/ICP	ppm	289	20.2	3.5	67
Zr	M/ICP	ppm	12.7	2.71	10.6	54