

CDN Resource Laboratories Ltd.

Certificate of Analysis

REFERENCE MATERIAL: CDN-PGMS-35

Recommended values and the "Between Lab" Two Standard Deviations

Precious Metals and Targeted Major Base Metals					
Gold	0.092 gpt	±	0.010 gpt	30 g Fire Assay, ICP or AA finish	Certified value
Platinum	0.82 gpt	±	0.08 gpt	30 g Fire Assay, ICP or AA finish	Certified value
Palladium	0.49 gpt	±	0.06 gpt	30 g Fire Assay, ICP or AA finish	Provisional value
Copper	2.741 %	±	0.181 %	4 Acid digestion / ICP finish	Certified value
Copper	2.727 %	±	0.153 %	Fusion / ICP finish	Certified value
Nickel	2.257 %	±	0.198 %	4 Acid digestion / ICP finish	Certified value
Nickel	2.248 %	±	0.176 %	Fusion / ICP finish	Certified value
Cobalt	900 ppm	±	90 ppm	4 Acid digestion / ICP finish	Certified value
Cobalt	843 ppm	±	191 ppm	Fusion / ICP finish	Provisional value
Specific Gravity	3.43	±	0.14	Gas pycnometer	Certified value

Major Oxides				
SiO ₂	32.51 %	±	0.40 %	Certified value
Al ₂ O ₃	8.10 %	±	0.28 %	Certified value
Fe ₂ O ₃	35.97 %	±	0.96 %	Certified value
Cr ₂ O ₃			0.03 %	Indicated Mean
Na ₂ O	1.92 %	±	0.26 %	Provisional value
CaO	3.10 %	±	0.06 %	Certified value
MnO	0.15 %	±	0.01 %	Certified value
MgO	2.08 %	±	0.16 %	Certified value
K ₂ O	1.40 %	±	0.04 %	Certified value
TiO ₂	0.48 %	±	0.02 %	Certified value
Total S	14.76 %	±	0.11 %	Certified value

Note 1: Standards with an RSD of near or less than 5% are certified; RSD's of between 5% and 15% are Provisional; RSD's over 15% are Indicated. Provisional and Indicated values cannot be used to monitor accuracy with a high degree of certainty.

PREPARED BY: AMIS African Mineral Standards
PRODUCTION AND QUALITY CONTROLLED BY: Mike McWha, BSc (Hons), FGSSA, MAusIMM, Pr.Sci.Nat
CERTIFIED BY: Ali Alizadeh, MSc, MBA, P Geo, FGC
INDEPENDENT GEOCHEMIST: Dr. Barry Smee., Ph.D., PGeo
DATE OF CERTIFICATION: June 29th, 2012

Note: Production of CDN-PGMS-35 was carried out by AMIS African Mineral Standards.
 All QAQC procedures and statistical analyses and lab results were reviewed and certified by Ali Alizadeh, MSc, MBA, PGeo, FGC, from CDN.

ORIGIN OF REFERENCE MATERIAL:

Standard CDN-PGMS-35 was prepared by AMIS African Mineral Standards, using material provided by Quandra FNX Mining Ltd. and SGS Minerals Services from FNX's project located in Sudbury, ON. Canada. The vast bulk

of sulfides in the Sudbury ores consist of varying proportions of pyrrhotite, chalcopyrite and pentlandite with varying amounts of other Cu-, Ni-, Co-, PGM-bearing minerals and gold.

METHOD OF PREPARATION:

The material was crushed, dry-milled and air-classified to <54um. Wet sieve particle size analysis of random samples confirmed the material was 98.5% <54um. It was then blended in a bi-conical mixer, systematically divided and then sealed into 1kg Laboratory Packs. Explorer Packs are subdivided from the Laboratory packs as required. Samples were randomly selected for homogeneity testing and third-party analysis. Statistical analysis of both homogeneity and the consensus test results were carried out by independent statisticians.

Assay Procedures:

- Au, Pt, Pd:** 30 gr. fire assay pre-concentration, AA or ICP finish.
- Cu, Ni, Co:** 4-acid digestion, AA or ICP finish and Fusion, ICP-MS or OES finish.
- TS:** LECO IR Combustion.
- Specific Gravity:** Gas pycnometer.
- Major Oxides:** Fusion, XRF Finish.


Statistical Procedures:

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 database. 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.

LEGAL NOTICE:

This certificate and the reference material described in it have been prepared with due care and attention. However, CDN Resource Laboratories Ltd. nor Barry Smee accept any liability for any decisions or actions taken following the use of the reference material. Our liability is limited solely to the cost of the reference material.

Certified by



Ali Alizadeh, MSc, MBA, P.Geo.

Geochemist



Dr. Barry Smee, PhD, FGC

APPENDIX I: Participating Laboratories: (not in same order as table of assays)

Activation Labs, Thunder Bay, Ontario, (Canada)	SGS Chelopech (Bulgaria)
ALS, Brisbane, (Australia)	SGS Durango (Mexico)
ALS, Johannesburg, (South Africa)	SGS Geosol Laboratories Ltda (Brazil)
ALS, Perth WA (Australia)	SGS Mineral Services Lakefield, Ontario (Canada)
ALS, Vancouver, BC (Canada)	SGS Mineral Services Callao (Peru)
Genalysis Laboratory Services WA (Australia P)	SGS South Africa (Pty) Ltd - Booyens JHB
Intertek Utama Services (Indonesia)	SGS Toronto, Ontario (Canada)
Set Point Laboratories (Isando) SA	SGS Townsville (Australia)
SGS Newburn WA (Australia)	Ultra Trace (Pty) Ltd WA (Australia)

APPENDIX II: Results from round-robin assaying:

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
Au by Fire Assay, 30g sample size and ICP or AA finish																		
PGMS-35	0.090	0.089	-	-	-	0.096	0.092	0.087	0.09	-	-	-	-	0.093	-	0.09	0.098	0.099
	0.082	0.087	-	-	-	0.097	0.090	0.087	0.09	-	-	-	-	0.087	-	0.10	0.099	0.089
	0.086	0.111	-	-	-	0.098	0.094	0.083	0.09	-	-	-	-	0.093	-	0.10	0.095	0.119
	0.086	0.086	-	-	-	0.096	0.091	0.088	0.09	-	-	-	-	0.095	-	0.10	0.094	0.099
	0.086	0.089	-	-	-	0.093	0.099	0.090	0.09	-	-	-	-	0.094	-	0.10	0.095	0.089
	0.088	0.089	-	-	-	0.096	0.095	0.087	0.09	-	-	-	-	0.095	-	0.09	0.099	0.103
	0.084	0.094	-	-	-	0.093	0.091	0.088	0.09	-	-	-	-	0.095	-	0.09	0.095	0.097
	0.087	0.093	-	-	-	0.099	0.090	0.087	0.09	-	-	-	-	0.093	-	0.10	0.098	0.051
Mean	0.086	0.092	-	-	-	0.096	0.093	0.087	0.09	-	-	-	-	0.093	-	0.10	0.097	0.093
Std. Devn.	0.00	0.01	-	-	-	0.00	0.00	0.00	0.00	-	-	-	-	0.00	-	0.01	0.00	0.02
% RSD	2.81	8.73	-	-	-	2.23	3.35	2.25	0.00	-	-	-	-	2.84	-	5.38	2.14	20.90
Pt (ppm) by Fire Assay, 30g sample size and ICP or AA finish																		
PGMS-35	0.820	0.787	-	-	-	0.81	0.792	0.598	0.83	-	-	-	-	0.782	-	0.89	0.86	0.671
	0.776	0.779	-	-	-	0.81	0.812	0.600	0.83	-	-	-	-	0.797	-	0.91	0.86	0.693
	0.782	0.780	-	-	-	0.83	0.841	0.633	0.81	-	-	-	-	0.809	-	0.91	0.86	0.812
	0.819	0.757	-	-	-	0.81	0.826	0.634	0.82	-	-	-	-	0.801	-	0.91	0.92	0.808
	0.829	0.789	-	-	-	0.83	0.814	0.649	0.82	-	-	-	-	0.819	-	0.91	0.89	0.698
	0.815	0.768	-	-	-	0.83	0.821	0.610	0.82	-	-	-	-	0.805	-	0.93	0.87	0.810
	0.755	0.812	-	-	-	0.82	0.821	0.633	0.82	-	-	-	-	0.814	-	0.91	0.85	0.747
	0.803	0.835	-	-	-	0.81	0.848	0.600	0.81	-	-	-	-	0.810	-	0.92	0.86	0.388
Mean	0.800	0.788	-	-	-	0.82	0.822	0.620	0.82	-	-	-	-	0.805	-	0.91	0.87	0.703
Std. Devn.	0.03	0.02	-	-	-	0.01	0.02	0.02	0.01	-	-	-	-	0.01	-	0.01	0.02	0.14
% RSD	3.26	3.14	-	-	-	1.21	2.12	3.20	0.92	-	-	-	-	1.43	-	1.24	2.63	19.87
Pd (ppm) by Fire Assay, 30g sample size and ICP or AA finish																		
PGMS-35	0.502	0.486	-	-	-	0.49	0.505	0.46	0.50	-	-	-	-	0.442	-	0.54	0.521	0.425
	0.475	0.483	-	-	-	0.48	0.511	0.47	0.50	-	-	-	-	0.442	-	0.55	0.519	0.431
	0.478	0.483	-	-	-	0.48	0.505	0.45	0.50	-	-	-	-	0.445	-	0.55	0.523	0.503
	0.498	0.466	-	-	-	0.49	0.497	0.47	0.50	-	-	-	-	0.445	-	0.55	0.551	0.473
	0.504	0.483	-	-	-	0.48	0.511	0.44	0.51	-	-	-	-	0.452	-	0.54	0.535	0.444
	0.494	0.475	-	-	-	0.50	0.512	0.47	0.51	-	-	-	-	0.446	-	0.55	0.517	0.505
	0.457	0.497	-	-	-	0.48	0.503	0.46	0.50	-	-	-	-	0.450	-	0.55	0.518	0.465
	0.493	0.503	-	-	-	0.48	0.522	0.47	0.49	-	-	-	-	0.447	-	0.55	0.521	0.233
Mean	0.488	0.485	-	-	-	0.49	0.508	0.46	0.50	-	-	-	-	0.446	-	0.55	0.526	0.435
Std. Devn.	0.02	0.01	-	-	-	0.01	0.01	0.01	0.01	-	-	-	-	0.00	-	0.00	0.01	0.09
% RSD	3.33	2.39	-	-	-	1.56	1.48	2.60	1.28	-	-	-	-	0.79	-	0.85	2.23	19.98

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
	Cu (%) by 4Acid digestion ICP finish																	
PGMS-35	2.88	2.54	2.65	2.75	2.83	2.73	2.781	2.75	2.70	2.64	2.93	2.80	-	3.016	2.59	-	2.57	-
	2.86	2.83	2.78	2.65	2.79	2.76	2.749	2.75	2.69	2.62	2.88	2.78	-	2.954	2.42	-	2.58	-
	2.91	2.69	2.70	2.72	2.85	2.74	2.710	2.77	2.69	2.38	2.99	2.79	-	3.068	2.63	-	2.67	-
	2.82	2.81	2.69	2.72	2.84	2.70	2.727	2.71	2.69	2.35	2.96	2.81	-	2.939	2.62	-	2.49	-
	2.85	2.61	2.69	2.77	2.82	2.66	2.745	2.75	2.71	2.40	2.92	2.80	-	3.057	2.60	-	2.61	-
	2.92	2.71	2.75	2.79	2.87	2.73	2.716	2.74	2.71	2.50	2.88	2.78	-	3.007	2.61	-	2.69	-
	2.93	2.66	2.69	2.71	2.82	2.74	2.763	2.73	2.72	2.56	2.65	2.77	-	2.989	2.60	-	2.59	-
	2.86	2.85	2.69	2.65	2.85	2.78	2.736	2.73	2.69	2.76	2.81	2.85	-	2.908	2.58	-	2.60	-
Mean	2.88	2.71	2.71	2.72	2.83	2.73	2.74	2.74	2.70	2.53	2.88	2.80	-	2.992	2.58	-	2.60	-
Std. Devn.	0.04	0.11	0.04	0.05	0.02	0.04	0.02	0.02	0.01	0.14	0.11	0.02	-	0.06	0.07	-	0.06	-
% RSD	1.33	4.08	1.50	1.87	0.86	1.34	0.87	0.66	0.44	5.73	3.72	0.89	-	1.88	2.60	-	2.37	-
Cu (%) by Fusion ICP finish																		
PGMS-35	2.81	2.55	2.76	2.67	2.88	2.62	2.540	2.71	2.63	2.70	2.90	2.76	-	-	-	-	2.82	2.97
	2.80	2.58	2.76	2.68	2.89	2.65	2.555	2.73	2.61	2.70	2.76	2.81	-	-	-	-	2.72	2.95
	2.67	2.54	2.78	2.74	2.81	2.62	2.403	2.73	2.64	2.63	2.75	2.81	-	-	-	-	2.77	2.92
	2.80	2.63	2.72	2.76	2.83	2.66	2.489	2.73	2.63	2.60	2.84	2.80	-	-	-	-	2.76	2.92
	2.67	2.56	2.83	2.76	2.75	2.63	2.658	2.71	2.70	2.70	2.80	2.82	-	-	-	-	2.69	3.02
	2.71	2.80	2.75	2.73	2.82	2.49	2.504	2.71	2.65	2.63	2.86	2.80	-	-	-	-	2.67	2.91
	2.86	2.49	2.82	2.69	2.75	2.65	2.500	2.71	2.65	2.59	2.74	2.79	-	-	-	-	2.76	3.11
	2.68	2.70	2.81	2.79	2.76	2.65	2.463	2.73	2.69	2.69	2.74	2.82	-	-	-	-	2.76	2.91
Mean	2.75	2.61	2.78	2.73	2.81	2.62	2.514	2.72	2.65	2.66	2.80	2.80	-	-	-	-	2.74	2.96
Std. Devn.	0.08	0.10	0.04	0.04	0.06	0.06	0.07	0.01	0.03	0.05	0.06	0.02	-	-	-	-	0.05	0.07
% RSD	2.75	3.86	1.38	1.59	1.97	2.10	2.97	0.39	1.16	1.79	2.20	0.70	-	-	-	-	1.75	2.36
Ni (%) by 4Acid digestion ICP finish																		
PGMS-35	2.21	2.27	2.23	2.10	2.33	2.28	2.126	2.16	-	2.41	2.29	2.40	-	2.189	-	-	2.21	-
	2.18	2.51	2.26	2.03	2.30	2.30	2.238	2.19	-	2.41	2.21	2.43	-	2.198	-	-	2.28	-
	2.20	2.37	2.30	2.11	2.33	2.30	2.116	2.20	-	2.23	2.33	2.39	-	2.206	-	-	2.36	-
	2.28	2.47	2.28	2.04	2.36	2.28	2.173	2.16	-	2.23	2.32	2.42	-	2.220	-	-	2.17	-
	2.18	2.35	2.26	2.16	2.29	2.22	2.134	2.19	-	2.23	2.29	2.44	-	2.146	-	-	2.32	-
	2.28	2.45	2.30	2.21	2.37	2.31	2.106	2.20	-	2.29	2.29	2.45	-	2.161	-	-	2.40	-
	2.16	2.40	2.26	2.07	2.32	2.32	2.149	2.16	-	2.24	2.16	2.42	-	2.183	-	-	2.24	-
	2.15	2.56	2.26	2.07	2.34	2.30	2.131	2.18	-	2.62	2.20	2.44	-	2.149	-	-	2.29	-
Mean	2.21	2.42	2.27	2.10	2.33	2.29	2.147	2.18	-	2.33	2.26	2.42	-	2.182	-	-	2.28	-
Std. Devn.	0.05	0.09	0.02	0.06	0.03	0.03	0.04	0.02	-	0.14	0.06	0.02	-	0.03	-	-	0.08	-
% RSD	2.27	3.86	1.04	2.91	1.17	1.35	1.97	0.81	-	5.99	2.76	0.85	-	1.24	-	-	3.35	-
Ni (%) by Fusion ICP finish																		
PGMS-35	2.27	2.230	2.15	2.18	2.30	2.31	-	2.19	-	2.23	2.12	2.37	-	-	-	-	2.37	2.15
	2.22	2.250	2.15	2.19	2.31	2.33	-	2.21	-	2.15	2.07	2.40	-	-	-	-	2.34	2.18
	2.28	2.200	2.16	2.18	2.24	2.29	-	2.20	-	2.20	2.01	2.42	-	-	-	-	2.30	2.13
	2.29	2.360	2.12	2.24	2.25	2.32	-	2.22	-	2.22	2.08	2.42	-	-	-	-	2.33	2.16
	2.33	2.190	2.21	2.21	2.16	2.29	-	2.19	-	2.18	2.01	2.39	-	-	-	-	2.41	2.25
	2.23	2.430	2.12	2.24	2.25	2.31	-	2.19	-	2.15	2.17	2.41	-	-	-	-	2.31	2.22
	2.31	2.190	2.17	2.25	2.19	2.29	-	2.18	-	2.26	2.05	2.41	-	-	-	-	2.30	2.24
	2.28	2.360	2.18	2.28	2.22	2.31	-	2.19	-	2.24	2.04	2.42	-	-	-	-	2.36	2.04
Mean	2.28	2.28	2.16	2.22	2.24	2.31	-	2.20	-	2.20	2.07	2.41	-	-	-	-	2.34	2.17
Std. Devn.	0.04	0.09	0.03	0.04	0.05	0.02	-	0.01	-	0.04	0.05	0.02	-	-	-	-	0.04	0.07
% RSD	1.63	4.11	1.40	1.66	2.26	0.65	-	0.59	-	1.86	2.65	0.74	-	-	-	-	1.65	3.16

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
Co (ppm) by 4Acid digestion ICP finish																		
PGMS-35	-	810	950	930	960	980	994.7	884	856	875	-	890	-	773.9	883	-	872	849
	-	910	960	900	940	975	953.4	869	855	879	-	882	-	769.5	848	-	876	872
	-	870	950	920	960	980	962.9	867	854	856	-	874	-	771.6	869	-	874	879
	-	900	970	910	960	970	973.6	874	856	884	-	869	-	767.0	862	-	882	873
	-	830	950	940	950	955	954.1	872	855	887	-	871	-	758.6	830	-	858	819
	-	870	920	880	970	985	962.6	872	854	882	-	876	-	802.8	852	-	874	897
	-	860	950	920	950	980	1007.4	861	854	881	-	887	-	799.6	879	-	861	885
	-	920	960	890	950	975	1011.0	876	855	894	-	877	-	776.3	885	-	861	872
Mean	-	871	951	911	955	975	977.5	872	855	880	-	878	-	777.4	864	-	870	868
Std. Devn.	-	38.34	14.58	20.31	9.26	9.26	23.58	6.75	0.83	11.13	-	7.48	-	15.63	19.31	-	8.63	24.11
% RSD	-	4.40	1.53	2.23	0.97	0.95	2.41	0.77	0.10	1.27	-	0.85	-	2.01	2.24	-	0.99	2.78
Co (ppm) by 4Acid digestion ICP finish																		
PGMS-35	728	950	-	-	-	895	-	-	744	-	-	747	-	-	928	-	865	-
	725	930	-	-	-	907	-	-	742	-	-	743	-	-	922	-	898	-
	750	950	-	-	-	891	-	-	743	-	-	749	-	-	1010	-	868	-
	738	970	-	-	-	899	-	-	744	-	-	746	-	-	939	-	888	-
	717	950	-	-	-	893	-	-	744	-	-	743	-	-	943	-	869	-
	722	1050	-	-	-	856	-	-	742	-	-	747	-	-	979	-	889	-
	762	960	-	-	-	914	-	-	743	-	-	753	-	-	989	-	871	-
	739	990	-	-	-	914	-	-	745	-	-	757	-	-	962	-	886	-
Mean	735	969	-	-	-	896	-	-	743	-	-	748	-	-	959	-	879	-
Std. Devn.	15.22	37.20	-	-	-	18.57	-	-	1.06	-	-	4.82	-	-	31.39	-	12.37	-
% RSD	2.07	3.84	-	-	-	2.07	-	-	0.14	-	-	0.64	-	-	3.27	-	1.41	-
Total S (%) LECO																		
PGMS-35	-	-	-	-	-	14.9	-	-	10.1	14.1	15.2	14.85	15.02	15.6	-	14.6	13.8	14.7
	-	-	-	-	-	14.9	-	-	10.1	14.1	15.3	14.80	15.01	15.6	-	14.5	13.8	14.6
	-	-	-	-	-	14.9	-	-	10.2	14.1	15.4	14.85	15.14	15.7	-	14.5	13.5	14.4
	-	-	-	-	-	14.8	-	-	10.0	14.0	15.3	14.80	15.19	15.7	-	14.6	13.6	14.4
	-	-	-	-	-	14.7	-	-	10.1	14.0	15.0	14.85	15.22	15.8	-	14.5	13.8	14.4
	-	-	-	-	-	14.7	-	-	10.3	14.2	15.0	14.85	15.22	15.8	-	14.5	13.5	14.8
	-	-	-	-	-	14.8	-	-	10.2	14.1	15.0	14.95	15.15	15.5	-	14.6	13.7	14.7
	-	-	-	-	-	14.6	-	-	10.3	14.1	14.6	14.90	15.08	15.5	-	14.4	13.5	14.7
Mean	-	-	-	-	-	14.8	-	-	10.2	14.1	15.1	14.86	15.13	15.7	-	14.5	13.7	14.6
Std. Devn.	-	-	-	-	-	0.11	-	-	0.11	0.06	0.26	0.05	0.08	0.12	-	0.07	0.14	0.16
% RSD	-	-	-	-	-	0.76	-	-	1.04	0.45	1.70	0.33	0.55	0.76	-	0.49	1.04	1.13
Specific Gravity Pycnometer																		
PGMS-35	-	3.50	3.55	-	-	3.54	3.32	-	3.51	-	3.43	3.33	-	-	-	-	-	-
	-	3.49	3.42	-	-	3.54	3.38	-	3.45	-	3.44	3.32	-	-	-	-	-	-
	-	3.48	3.55	-	-	3.51	3.40	-	3.45	-	3.41	3.32	-	-	-	-	-	-
	-	3.46	3.41	-	-	3.49	3.53	-	3.47	-	3.43	3.35	-	-	-	-	-	-
	-	3.45	3.42	-	-	3.52	3.48	-	3.47	-	3.43	3.34	-	-	-	-	-	-
	-	3.45	3.41	-	-	3.55	3.22	-	3.43	-	3.42	3.33	-	-	-	-	-	-
	-	3.45	3.41	-	-	3.51	3.36	-	3.42	-	3.43	3.35	-	-	-	-	-	-
	-	3.41	3.41	-	-	3.50	3.30	-	3.46	-	3.39	3.32	-	-	-	-	-	-
Mean	-	3.46	3.45	-	-	3.52	3.37	-	3.458	-	3.423	3.333	-	-	-	-	-	-
Std. Devn.	-	0.03	0.06	-	-	0.02	0.10	-	0.03	-	0.02	0.01	-	-	-	-	-	-
% RSD	-	0.82	1.84	-	-	0.61	2.93	-	0.80	-	0.46	0.38	-	-	-	-	-	-

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
SiO2 (%) XRF																		
PGMS-35	32.76	-	32.55	32.3	32.2	32.54	-	-	32.10	32.4	32.5	-	-	-	-	-	-	-
	32.85	-	32.61	32.2	32.7	32.56	-	-	32.43	32.2	32.7	-	-	-	-	-	-	-
	32.66	-	32.67	32.3	32.3	32.60	-	-	32.52	32.3	32.7	-	-	-	-	-	-	-
	32.77	-	32.55	32.3	33.3	32.55	-	-	32.56	32.3	32.6	-	-	-	-	-	-	-
	32.50	-	32.52	32.2	32.3	32.64	-	-	32.50	32.3	32.4	-	-	-	-	-	-	-
	32.69	-	32.75	32.3	33.5	32.62	-	-	32.74	32.2	32.5	-	-	-	-	-	-	-
	32.72	-	32.68	32.2	32.9	32.59	-	-	32.67	32.1	32.5	-	-	-	-	-	-	-
	32.65	-	32.69	32.3	32.7	32.55	-	-	32.86	32.6	32.5	-	-	-	-	-	-	-
Mean	32.70	-	32.63	32.3	32.7	32.58	-	-	32.55	32.3	32.6	-	-	-	-	-	-	-
Std. Devn.	0.10	-	0.08	0.05	0.48	0.04	-	-	0.23	0.15	0.11	-	-	-	-	-	-	-
% RSD	0.32	-	0.25	0.16	1.46	0.11	-	-	0.70	0.47	0.33	-	-	-	-	-	-	-
Al2O3 (%) XRF																		
PGMS-35	8.16	-	7.89	8.13	8.23	8.19	-	-	7.56	7.94	8.30	-	-	-	-	-	-	-
	8.31	-	7.86	8.08	8.15	8.21	-	-	7.69	7.97	8.17	-	-	-	-	-	-	-
	8.20	-	7.91	8.06	8.38	8.20	-	-	7.64	7.98	8.32	-	-	-	-	-	-	-
	8.22	-	7.88	8.11	8.08	8.22	-	-	7.41	7.99	8.18	-	-	-	-	-	-	-
	8.24	-	7.86	8.08	8.41	8.21	-	-	7.67	7.94	8.00	-	-	-	-	-	-	-
	8.25	-	7.89	8.06	8.24	8.20	-	-	7.58	7.94	8.06	-	-	-	-	-	-	-
	8.25	-	7.90	8.11	8.22	8.22	-	-	7.63	7.97	8.14	-	-	-	-	-	-	-
	8.23	-	7.88	8.09	8.23	8.20	-	-	7.57	7.97	8.15	-	-	-	-	-	-	-
Mean	0.04	-	0.02	0.03	0.12	0.01	-	-	0.11	0.03	0.12	-	-	-	-	-	-	-
Std. Devn.	0.54	-	0.22	0.32	1.42	0.17	-	-	1.45	0.33	1.43	-	-	-	-	-	-	-
% RSD	8.16	-	7.89	8.13	8.23	8.19	-	-	7.56	7.94	8.30	-	-	-	-	-	-	-
CaO (%) XRF																		
PGMS-35	3.06	-	3.11	3.09	3.06	3.12	-	-	3.13	3.11	3.07	-	-	-	-	-	-	-
	3.07	-	3.09	3.09	3.10	3.11	-	-	3.12	3.10	3.16	-	-	-	-	-	-	-
	3.08	-	3.10	3.09	3.05	3.12	-	-	3.15	3.11	3.11	-	-	-	-	-	-	-
	3.08	-	3.09	3.09	3.13	3.12	-	-	3.16	3.11	3.14	-	-	-	-	-	-	-
	3.08	-	3.11	3.09	3.05	3.12	-	-	3.17	3.11	3.12	-	-	-	-	-	-	-
	3.06	-	3.08	3.09	3.17	3.12	-	-	3.16	3.10	3.08	-	-	-	-	-	-	-
	3.08	-	3.10	3.08	3.10	3.12	-	-	3.15	3.11	3.07	-	-	-	-	-	-	-
	3.06	-	3.10	3.08	3.07	3.11	-	-	3.17	3.08	3.14	-	-	-	-	-	-	-
Mean	3.07	-	3.10	3.09	3.09	3.12	-	-	3.15	3.10	3.11	-	-	-	-	-	-	-
Std. Devn.	0.01	-	0.01	0.00	0.04	0.00	-	-	0.02	0.01	0.03	-	-	-	-	-	-	-
% RSD	0.32	-	0.33	0.15	1.38	0.15	-	-	0.57	0.34	1.12	-	-	-	-	-	-	-
Cr2O3 (%) XRF																		
PGMS-35	0.05	-	0.02	0.04	0.038	0.029	-	-	0.04	0.04	0.13	-	-	-	-	-	-	-
	0.04	-	0.02	0.03	0.035	0.029	-	-	0.03	0.03	0.03	-	-	-	-	-	-	-
	0.04	-	0.02	0.03	0.037	0.030	-	-	0.03	0.03	0.03	-	-	-	-	-	-	-
	0.04	-	0.02	0.03	0.029	0.028	-	-	0.03	0.04	0.04	-	-	-	-	-	-	-
	0.04	-	0.02	0.03	0.035	0.029	-	-	0.03	0.03	0.03	-	-	-	-	-	-	-
	0.05	-	0.02	0.03	0.034	0.028	-	-	0.03	0.04	0.04	-	-	-	-	-	-	-
	0.04	-	0.02	0.03	0.037	0.028	-	-	0.03	0.04	0.03	-	-	-	-	-	-	-
	0.05	-	0.02	0.04	0.036	0.029	-	-	0.04	0.03	0.02	-	-	-	-	-	-	-
Mean	0.04	-	0.02	0.03	0.035	0.029	-	-	0.03	0.04	0.04	-	-	-	-	-	-	-
Std. Devn.	0.01	-	0.00	0.00	0.00	0.00	-	-	0.00	0.01	0.04	-	-	-	-	-	-	-
% RSD	11.83	-	0.00	14.24	7.97	2.46	-	-	14.24	15.27	80.99	-	-	-	-	-	-	-

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
Fe2O3 (%) XRF																		
PGMS-35	36.49	-	36.71	35.7	35.1	35.91	-	-	35.36	36.2	35.7	-	-	-	-	-	-	-
	36.42	-	36.69	35.5	35.6	36.06	-	-	35.45	36.1	36.3	-	-	-	-	-	-	-
	36.27	-	36.75	35.6	34.3	35.95	-	-	35.44	36.2	36.4	-	-	-	-	-	-	-
	36.45	-	36.77	35.6	35.8	35.96	-	-	35.63	36.2	36.3	-	-	-	-	-	-	-
	36.24	-	36.94	35.5	35.1	35.98	-	-	35.50	36.2	35.6	-	-	-	-	-	-	-
	36.43	-	36.76	35.6	36.6	35.94	-	-	35.78	36.0	35.3	-	-	-	-	-	-	-
	36.42	-	36.71	35.5	35.3	35.98	-	-	35.53	36.1	35.3	-	-	-	-	-	-	-
36.41	-	36.78	35.6	35.2	35.97	-	-	35.50	35.8	36.0	-	-	-	-	-	-	-	
Mean	36.39	-	36.76	35.6	35.4	35.97	-	-	35.52	36.1	35.9	-	-	-	-	-	-	-
Std. Devn.	0.09	-	0.08	0.07	0.66	0.04	-	-	0.13	0.14	0.45	-	-	-	-	-	-	-
% RSD	0.24	-	0.21	0.20	1.87	0.12	-	-	0.36	0.39	1.26	-	-	-	-	-	-	-
K2O (%) XRF																		
PGMS-35	1.44	-	1.41	1.40	1.38	1.39	-	-	1.36	1.41	1.37	-	-	-	-	-	-	-
	1.42	-	1.39	1.38	1.40	1.39	-	-	1.36	1.39	1.42	-	-	-	-	-	-	-
	1.45	-	1.42	1.39	1.38	1.41	-	-	1.38	1.40	1.40	-	-	-	-	-	-	-
	1.42	-	1.41	1.40	1.42	1.40	-	-	1.39	1.40	1.44	-	-	-	-	-	-	-
	1.41	-	1.42	1.38	1.38	1.40	-	-	1.37	1.41	1.41	-	-	-	-	-	-	-
	1.43	-	1.41	1.38	1.44	1.40	-	-	1.39	1.40	1.37	-	-	-	-	-	-	-
	1.44	-	1.40	1.38	1.40	1.40	-	-	1.36	1.41	1.35	-	-	-	-	-	-	-
1.43	-	1.41	1.39	1.40	1.39	-	-	1.39	1.40	1.39	-	-	-	-	-	-	-	
Mean	1.43	-	1.41	1.39	1.40	1.40	-	-	1.38	1.40	1.39	-	-	-	-	-	-	-
Std. Devn.	0.01	-	0.01	0.01	0.02	0.01	-	-	0.01	0.01	0.03	-	-	-	-	-	-	-
% RSD	0.92	-	0.70	0.64	1.44	0.51	-	-	1.03	0.50	2.13	-	-	-	-	-	-	-
MgO (%) XRF																		
PGMS-35	1.90	-	2.03	2.06	2.05	2.13	-	-	2.22	2.10	2.06	-	-	-	-	-	-	-
	1.89	-	2.03	2.05	2.09	2.12	-	-	2.24	2.09	2.11	-	-	-	-	-	-	-
	1.90	-	2.03	2.07	2.06	2.13	-	-	2.24	2.09	2.08	-	-	-	-	-	-	-
	1.91	-	2.03	2.08	2.11	2.13	-	-	2.24	2.09	2.11	-	-	-	-	-	-	-
	1.88	-	2.05	2.06	2.05	2.13	-	-	2.20	2.10	2.07	-	-	-	-	-	-	-
	1.90	-	2.04	2.07	2.14	2.12	-	-	2.26	2.08	2.02	-	-	-	-	-	-	-
	1.87	-	2.03	2.06	2.08	2.13	-	-	2.26	2.09	2.04	-	-	-	-	-	-	-
1.87	-	2.04	2.06	2.07	2.12	-	-	2.25	2.08	2.07	-	-	-	-	-	-	-	
Mean	1.89	-	2.04	2.06	2.08	2.13	-	-	2.24	2.09	2.07	-	-	-	-	-	-	-
Std. Devn.	0.02	-	0.01	0.01	0.03	0.01	-	-	0.02	0.01	0.03	-	-	-	-	-	-	-
% RSD	0.80	-	0.37	0.44	1.51	0.24	-	-	0.91	0.36	1.51	-	-	-	-	-	-	-
MnO (%) XRF																		
PGMS-35	0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-
	0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-
	0.15	-	0.15	0.15	0.15	0.14	-	-	0.15	0.15	0.15	-	-	-	-	-	-	-
	0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.15	-	-	-	-	-	-	-
	0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-
	0.15	-	0.15	0.15	0.15	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-
	0.15	-	0.15	0.14	0.14	0.15	-	-	0.15	0.14	0.14	-	-	-	-	-	-	-
0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-	
Mean	0.15	-	0.15	0.15	0.14	0.14	-	-	0.15	0.15	0.14	-	-	-	-	-	-	-
Std. Devn.	0.00	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	-	-	-	-	-	-	-
% RSD	0.96	-	0.00	2.38	2.59	2.50	-	-	0.00	2.38	3.25	-	-	-	-	-	-	-

Standard	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15	Lab 16	Lab 17	Lab 18
Na₂O (%) XRF																		
PGMS-35	1.65	-	2.01	1.85	2.04	-	-	-	2.82	1.95	1.91	-	-	-	-	-	-	-
	1.69	-	2.01	1.82	2.07	-	-	-	2.84	1.94	1.95	-	-	-	-	-	-	-
	1.66	-	2.00	1.83	2.03	-	-	-	2.81	1.95	1.90	-	-	-	-	-	-	-
	1.74	-	1.99	1.82	2.09	-	-	-	2.86	1.97	2.15	-	-	-	-	-	-	-
	1.64	-	2.02	1.91	2.03	-	-	-	2.84	1.95	1.92	-	-	-	-	-	-	-
	1.69	-	2.03	1.80	2.13	-	-	-	2.86	1.95	1.93	-	-	-	-	-	-	-
	1.71	-	2.01	1.82	2.08	-	-	-	2.86	1.95	1.91	-	-	-	-	-	-	-
	1.66	-	2.03	1.81	2.07	-	-	-	2.86	1.95	1.96	-	-	-	-	-	-	-
Mean	1.68	-	2.01	0.14	0.14	-	-	-	2.84	1.95	1.95	-	-	-	-	-	-	-
Std. Devn.	0.03	-	0.01	0.00	0.00	-	-	-	0.02	0.01	0.08	-	-	-	-	-	-	-
% RSD	2.01	-	0.69	2.59	2.59	-	-	-	0.70	0.43	4.19	-	-	-	-	-	-	-
TiO₂ (%) XRF																		
PGMS-35	-	-	0.47	0.48	0.47	0.48	-	-	0.48	0.48	0.46	-	-	-	-	-	-	-
	-	-	0.46	0.49	0.48	0.48	-	-	0.48	0.48	0.48	-	-	-	-	-	-	-
	-	-	0.46	0.47	0.46	0.49	-	-	0.48	0.47	0.48	-	-	-	-	-	-	-
	-	-	0.46	0.47	0.48	0.48	-	-	0.48	0.48	0.47	-	-	-	-	-	-	-
	-	-	0.46	0.49	0.47	0.49	-	-	0.47	0.48	0.48	-	-	-	-	-	-	-
	-	-	0.47	0.47	0.49	0.49	-	-	0.49	0.48	0.48	-	-	-	-	-	-	-
	-	-	0.47	0.48	0.47	0.48	-	-	0.48	0.49	0.46	-	-	-	-	-	-	-
	-	-	0.47	0.47	0.47	0.48	-	-	0.49	0.49	0.47	-	-	-	-	-	-	-
Mean	-	-	0.47	0.48	0.47	0.48	-	-	0.48	0.48	0.47	-	-	-	-	-	-	-
Std. Devn.	-	-	0.01	0.01	0.01	0.01	-	-	0.01	0.01	0.01	-	-	-	-	-	-	-
% RSD	-	-	1.15	1.86	1.93	1.07	-	-	1.33	1.33	1.88	-	-	-	-	-	-	-
LOI (%) XRF																		
PGMS-35	7.00	-	6.40	6.35	-	6.86	-	-	5.09	6.43	7.17	-	-	-	-	-	-	-
	6.98	-	6.42	6.57	-	6.85	-	-	5.31	6.54	7.19	-	-	-	-	-	-	-
	6.96	-	6.40	6.17	-	6.87	-	-	5.36	6.57	7.21	-	-	-	-	-	-	-
	6.95	-	6.32	6.27	-	6.89	-	-	5.44	6.52	7.22	-	-	-	-	-	-	-
	6.97	-	6.29	6.72	-	6.85	-	-	5.25	6.64	7.18	-	-	-	-	-	-	-
	7.01	-	6.25	6.31	-	6.87	-	-	5.53	6.60	7.21	-	-	-	-	-	-	-
	6.96	-	6.50	6.07	-	6.87	-	-	5.49	6.68	7.24	-	-	-	-	-	-	-
	6.95	-	6.53	6.04	-	6.85	-	-	5.32	6.63	7.22	-	-	-	-	-	-	-
Mean	6.97	-	6.39	6.31	-	6.86	-	-	5.35	6.58	7.21	-	-	-	-	-	-	-
Std. Devn.	0.02	-	0.10	0.24	-	0.01	-	-	0.14	0.08	0.02	-	-	-	-	-	-	-
% RSD	0.32	-	1.53	3.73	-	0.21	-	-	2.65	1.21	0.32	-	-	-	-	-	-	-

Notes: Highlighted assay results were removed for failing the t test.

APPENDIX IV: Uncertified trace element statistics- 4Acid digestion ICP finish

Analyte	Unit	Mean	RSD%	No. of assays
Ag	ppm	14.3	5.41	87
Al	%	4.18	6.08	90
As	ppm	885	4.09	88
Ba	ppm	204	61.6	73
Be	ppm	0.85	18.3	67
Bi	ppm	39.8	19.1	80
Ca	%	2.17	3.85	90
Cd	ppm	4.14	52.6	87
Ce	ppm	63.4	9.49	38
Cr	ppm	168	13	90
Cs	ppm	0.93	23.2	32
Dy	ppm	2.36	7.42	24
Er	ppm	1.28	13.8	24
Eu	ppm	1	10.2	24
Fe	%	25.3	2.45	75
Ga	ppm	11.1	14.3	45
Gd	ppm	3.49	7.09	24
Ge	ppm	1.22	34.7	16
Hf	ppm	1.34	11.6	37
Ho	ppm	0.44	7.69	24
In	ppm	0.9	14.7	40
K	%	1.15	6.18	93
La	ppm	31.7	7.26	66
Li	ppm	8.23	11.1	80
Lu	ppm	0.13	18.3	32
Mg	%	1.19	5.72	91
Mn	ppm	1084	3.53	88
Mo	ppm	2.06	56	48
Na	%	1.47	7.2	90
Nb	ppm	4.44	17.1	47
Nd	ppm	26.5	7.52	24
P	ppm	653	23	72
Pb	ppm	198	6.22	107
Pr	ppm	7.6	8.15	24
Rb	ppm	42.9	10.9	41
Re	ppm	0.05	26.8	16

Analyte	Unit	Mean	RSD%	No. of assays
S	%	13.6	8.67	32
Sb	ppm	38.5	20.7	70
Sc	ppm	9.91	28.4	88
Se	ppm	32.4	21.2	40
Si	%	15.4	0.59	8
Sm	ppm	4.44	9.95	24
Sn	ppm	42.3	13.7	76
Sr	ppm	250	10.8	96
Ta	ppm	0.25	40.3	36
Tb	ppm	0.41	16	32
Te	ppm	5.09	19.8	39
Th	ppm	6.02	4.23	38
Ti	%	0.28	4.56	67
Tl	ppm	1.14	3.93	37
Tm	ppm	0.18	11.1	24
U	ppm	1.24	6.35	38
V	ppm	93.5	5.3	90
W	ppm	1.43	23.1	40
Y	ppm	11	6.66	79
Yb	ppm	0.99	7.21	30
Zn	ppm	450	4.78	100
Zr	ppm	40.3	26.7	77

APPENDIX V: General Notes

Intended Use

This Certified Reference Material, fit for use as a control sample in routine assay laboratory quality control when inserted within runs of test samples and measured in parallel to test samples. This material can also be used for method development, use as independent calibration verification check standard or for validation of accuracy in a method validation exercise.

This CRM can also be used to assess inter-laboratory or instrument bias and establish within-laboratory precision and within-laboratory reproducibility. The certified concentrations and expanded uncertainty for this material are property values based on an inter-laboratory measurement campaign and reflect consensus results from the laboratories that took part in the exercise.

Handling

Do not use if the seal is broken or there are any signs of contamination.

The material is packaged in either Tin Tie envelopes, foil envelopes or jars that must be shaken before use.

Storage information

The material should be stored in a dry place, in such a way that it does not compromise the integrity of the CRM. The material should be stored in conditions which will ensure it does not absorb moisture.

Certificate is not valid if re-packaged by a third party.

Metrological Traceability

The values quoted herein are based on the consensus values derived from statistical analysis of the data from an inter-laboratory measurement program. Traceability to SI units is via the standards used by the individual laboratories majority of which are accredited to the ISO17025 general requirements for the competence of testing and calibration laboratories and who have maintained measurement traceability during the analytical process.

Period of Validity

The certified values are valid for this product, while still sealed in its original packaging, until notification to the contrary. The material's stability will undergo regular testing every five years throughout its inventory duration. Should product stability become an issue, all customers will be notified and notification to that effect will be placed on the <http://www.cdnlabs.com/> website.

Minimum Sample Size

Most of the laboratory's reporting used a 0.5g sample size for the ICP and a 30g sample size for the fire assay. Our certified gold values are based on 30 g Fire Assay determinations. For optimal results, we strongly recommend you assay our standards with similar methods using "at least" 30 g of material. Using a smaller sample weight may result in erratic values. These are the recommended minimum sample sizes for the use of this material.