

# CDN Resource Laboratories Ltd.

10945-B River Road, Delta, B.C., V4C 2R8, 604 596-2245, Fax: 604 588-3960

## PLATINUM GROUP ORE REFERENCE STANDARD: CDN-PGMS-1

Recommended values and 95% Confidence Intervals

Platinum concentration:  $2.30 \pm 0.18$  g/tonne  
Palladium concentration:  $10.35 \pm 0.74$  g/tonne  
Gold concentration:  $0.23 \pm 0.06$  g/tonne (*not certified*)

**PREPARED BY:** CDN Resource Laboratories Ltd.

**CERTIFIED BY:** Duncan Sanderson, B.Sc., Licensed Assayer of British Columbia

**INDEPENDENT GEOCHEMIST:** Dr. Barry Smee., Ph.D., P. Geo.

### **METHOD OF PREPARATION:**

Reject ore material was dried, crushed, pulverized and then passed through a 325 mesh screen. The +325 material was discarded. The -325 material was mixed for 10 days in a rotary mixer. After internal assaying to test for homogeneity, splits were taken and sent to 9 laboratories for round robin assaying (one laboratory ran the samples in duplicate).

### **ORIGIN OF REFERENCE MATERIAL:**

The ore was supplied by Stillwater Mining Corporation from the Stillwater Complex in Montana. The mineralogy of the Stillwater Pt/Pd ore consists of up to 1 % sulphides comprising chalcopyrite, pentlandite, pyrrhotite,  $\pm$  pyrite hosted by a chromite-rich ultramafic layer. The main platinum-bearing minerals are Braggite (Pt,Pd,Ni)S, Cooperite (Pt, Pd ,Ni)S as well as Isoferroplatinum (PtFe<sub>3</sub>) and Moncheite (Pt,Pd)(Te,Bi)<sub>2</sub>. The majority of the palladium is hosted as solid solution within the pentlandite ((Fe,Ni)<sub>9</sub>S<sub>8</sub>); less than 15 % as Vysotskite (Pd,Ni,Pt)S, Bragite, Cooperite and Moncheite.

### **Approximate chemical composition is as follows:**

	Percent			Percent
SiO <sub>2</sub>	43.7		MgO	9.2
Al <sub>2</sub> O <sub>3</sub>	20.8		K <sub>2</sub> O	0.2
Fe <sub>2</sub> O <sub>3</sub>	6.2		TiO <sub>2</sub>	0.1
CaO	12.6		LOI	5.0
Na <sub>2</sub> O	1.1			

### **Statistical Procedures:**

The mean and standard deviation for all data was calculated. Outliers were defined as samples beyond the mean  $\pm$  2 Standard Deviations from all data. These outliers were removed from the data and a new mean and standard deviation was determined. 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 Certified Limits published on other standards.

**Results from round-robin assaying are presented on the following page:**

	Lab. 1	Lab. 2	Lab. 3	Lab. 4	Lab. 5	Lab. 6	Lab. 7	Lab. 8	Lab. 9	Lab. 10	Overall
	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	<b>Au</b>	
	0.24	0.26	0.19	0.21	0.21	0.15	0.26	0.29	0.23		
	0.22	0.23	0.20	0.21	0.18	0.15	0.26	0.30	0.25	0.24	
	0.24	0.23	0.17	0.22	0.17	0.20	0.23	0.27	0.22	0.23	
	0.27	0.24	0.19	0.22	0.24	0.20	0.28	0.24	0.24	0.22	
	0.32	0.23	0.23	0.20	0.17	0.20	0.24	0.24	0.25		
	0.26	0.27	0.21	0.20	0.21	0.20	0.33	0.25	0.24	0.23	
	0.23	0.25	0.22	0.19	0.21	0.25	0.39	0.30	0.24	0.21	
	0.26	0.23	0.20	0.19	0.24	0.25	0.26	0.26	0.22	0.23	
	0.24	0.22	0.18	0.25	0.22	0.25	0.34	0.29	0.25	0.22	
	0.25	0.23	0.17	0.19	0.18	0.20	0.28	0.28	0.23	0.21	
	0.23	0.28	0.21	0.22	0.22	0.25	0.28	0.27	0.37		
Mean	0.251	0.243	0.197	0.209	0.205	0.209	0.286	0.272	0.249	0.224	0.216
Std. Dev.	0.027	0.020	0.020	0.018	0.026	0.038	0.048	0.022	0.042	0.011	0.041
%RSD	10.90	8.04	9.92	8.68	12.60	17.96	16.79	8.19	16.70	4.74	18.89
	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	<b>Pt</b>	
	2.36	2.29	2.00	2.30	2.30	2.10	2.45	2.20	2.18	2.29	
	2.36	2.30	2.24	2.26	2.26	2.20	2.44	2.36	2.28	2.30	
	2.25	2.38	2.12	2.33	2.45	2.35	2.19	2.30	2.42	2.25	
	2.38	2.34	2.26	2.34	2.29	2.30	2.10	2.17	2.27	2.26	
	2.38	2.39	2.13	2.33	2.24	2.35	2.02	2.31	2.27	2.20	
	2.32	2.38	2.22	2.32	2.27	2.25	2.18	2.34	2.22	2.25	
	2.58	2.47	2.10	2.33	2.16	2.30	2.23	2.24	2.35	2.30	
	2.53	2.35	2.00	2.31	2.21	2.40	2.17	2.34	2.18	2.37	
	2.50	2.43	2.30	2.44	2.40	2.30	2.31	2.29	2.26	2.39	
	2.44	2.35	2.21	2.36	2.25	2.40	2.31	2.11	2.35	2.32	
	2.48	2.42	2.20	2.37	2.20	2.25	2.21	2.34	2.34	2.32	
Mean	2.416	2.373	2.162	2.335	2.275	2.291	2.237	2.273	2.284	2.295	2.294
Std. Dev.	0.099	0.054	0.100	0.045	0.085	0.089	0.132	0.082	0.076	0.055	0.106
%RSD	4.08	2.29	4.65	1.95	3.74	3.88	5.89	3.60	3.31	2.40	4.61
	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	<b>Pd</b>	
	10.70	10.57	9.49	11.00	10.5	9.65	10.46	9.94	10.20		
	10.60	10.53	10.08	10.95	10.3	10.35	10.73	9.94	10.10	10.45	
	10.62	10.82	9.72	10.70	10.4	10.50	10.42	9.80	10.10	10.27	
	11.00	10.80	9.73	10.70	10.5	10.50	10.25	9.61	10.20	10.41	
	10.60	10.72	10.15	10.95	10.1	10.60	10.49	9.84	10.10		
	10.45	10.83	9.92	10.85	10.3	10.25	9.91	9.85	10.10	10.87	
	10.62	10.97	9.97	10.80	10.0	10.30	10.08	9.98	10.10	10.52	
	10.81	10.23	9.72	10.65	10.5	10.30	10.05	9.94	10.10	10.55	
	11.16	10.87	9.96	10.95	10.5	10.10	10.15	9.86	10.20	10.58	
	10.95	10.57	9.97	10.95	10.5	10.45	10.11	9.75	10.20	10.42	
	10.86	10.61	10.03	10.95	10.5	9.75		9.81	10.30		
Mean	10.76	10.68	9.89	10.86	10.37	10.25	10.26	9.85	10.15	10.51	10.36
Std. Dev.	0.214	0.208	0.196	0.126	0.179	0.306	0.252	0.106	0.069	0.175	0.385
%RSD	1.99	1.95	1.98	1.16	1.73	2.98	2.46	1.08	0.68	1.67	3.71

**Platinum Group Ore Reference Standard: CDN-PGMS-1**

**Participating Laboratories:**

(not in same order as listed in table of results)


Acme Analytical Laboratories Ltd.  
American Assay Laboratories, Nevada  
Assayers Canada Ltd., Vancouver  
ALS Chemex Laboratories, North Vancouver  
Florin Analytical Services LLC, Nevada  
Intertek Testing Services Bondar Clegg, Vancouver  
International Plasma Laboratories Ltd., Vancouver  
Lakefield Research Ltd., Ontario  
Stillwater Mining Corporation, Montana

Availability: Lots of 100g, 500g, 1 kg, 2 kg, or as per request.  
Minimum order: 1 kg.


Legal Notice:

This certificate and the reference material described in it have been prepared with due care and attention. However CDN Resource Laboratories Ltd. or Barry Smee accept no 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

  
Duncan Sanderson, Certified Assayer of B.C.

Geochemist

  
Dr. Barry Smee, Ph.D., P. Geo.