

# CDN Resource Laboratories Ltd.

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## REFERENCE MATERIAL: CDN-CM-34

Recommended values and the “Between Lab” Two Standard Deviations

<i>Silver</i>	<i>3.7 g/t ± 0.4 g/t</i>	<i>Certified value</i>	<i>4-acid / ICP or AA</i>
<i>Copper</i>	<i>0.578 % ± 0.022 %</i>	<i>Certified value</i>	<i>4-acid / ICP or AA</i>
<i>Copper</i>	<i>0.580 % ± 0.020 %</i>	<i>Certified value</i>	<i>Aqua regia / ICP or AA</i>
<i>Molybdenum</i>	<i>0.030 % ± 0.002 %</i>	<i>Certified value</i>	<i>4-acid / ICP or AA</i>
<i>Molybdenum</i>	<i>0.030% ± 0.003 %</i>	<i>Certified value</i>	<i>Aqua regia / ICP or AA</i>
<i>Sulphur</i>	<i>3.01% ± 0.15 %</i>	<i>Certified value</i>	<i>Leco</i>

**Note:** 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:** CDN Resource Laboratories Ltd.  
**CERTIFIED BY:** Duncan Sanderson, B.Sc., Licensed Assayer of British Columbia  
**INDEPENDENT GEOCHEMIST:** Dr. Barry Smee., Ph.D., P. Geo.  
**DATE OF CERTIFICATION:** August 31, 2013

### **METHOD OF PREPARATION:**

Reject ore material was dried, crushed, pulverized and then passed through a 270 mesh screen. The +270 material was discarded. The -270 material was mixed for 5 days in a double-cone mixer. Splits were taken and sent to 15 laboratories for round robin assaying.

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

Standard CDN-CM-34 was prepared using ore from a North American calc-alkalic copper-molybdenum porphyry deposit. It is derived from altered quartz monzonite porphyry intrusion, mafic to intermediate volcanic rocks and minor, immature sedimentary rocks. Mineralization is principally pyrite, chalcopyrite and molybdenite that occurs in veins, stockworks and disseminations.

**Approximate chemical composition (from whole rock analysis) is as follows:**

	Percent		Percent
SiO <sub>2</sub>	58.0	MgO	6.1
Al <sub>2</sub> O <sub>3</sub>	12.3	K <sub>2</sub> O	3.4
Fe <sub>2</sub> O <sub>3</sub>	7.1	TiO <sub>2</sub>	1.4
CaO	3.0	LOI	5.6
Na <sub>2</sub> O	1.0	S	3.0

### **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  $\pm 2$  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.

## REFERENCE MATERIAL CDN-CM-34

### Results from round-robin assaying:

	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
Total	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm	Ag ppm
CM-34-1	3.7	4.1	3.6	3.5	3.6	3.7	3.7	4	2.90	3.8		3.5	3.5	3.7	3.3
CM-34-2	3.9	3.7	3.6	3.6	3.6	3.5	3.3	4	3.10	3.7		4.0	3.5	3.6	3.7
CM-34-3	4.2	3.3	3.5	3.7	3.5	3.7	3.6	4	3.10	3.6		3.5	3.8	3.5	3.4
CM-34-4	4.1	3.7	3.8	3.4	3.6	3.5	3.5	4	2.90	3.6		3.5	3.7	3.9	3.4
CM-34-5	4.1	4.0	3.7	3.5	3.6	3.6	3.7	4	3.00	3.7		4.0	3.8	3.5	3.5
CM-34-6	4.1	3.8	3.6	3.8	4.9	3.5	3.4	4	3.00	3.6		4.0	3.8	3.6	3.1
CM-34-7	4.0	4.1	3.7	3.3	3.7	3.7	3.5	4	3.00	3.7		4.0	3.7	3.6	3.9
CM-34-8	3.9	3.8	3.6	3.6	3.6	3.6	3.6	4	3.00	3.7		4.0	3.4	3.5	3.8
CM-34-9	4.2	3.9	3.8	3.5	3.6	3.5	3.6	4	3.00	3.8		3.5	3.4	3.8	2.9
CM-34-10	4.3	3.8	3.6	3.6	3.7	3.4	3.4	4	3.00	3.7		3.5	3.4	3.5	3.1
Mean	4.1	3.8	3.7	3.6	3.7	3.6	3.5	4.0	3.0	3.7		3.8	3.6	3.6	3.4
Std. Devn.	0.1780	0.2348	0.0972	0.1434	0.4115	0.1059	0.1337	0.0000	0.0667	0.0738		0.2635	0.1764	0.1398	0.3247
% RSD	4.39	6.15	2.66	4.04	11.00	2.97	3.79	0.00	2.22	2.00		7.03	4.90	3.86	9.52
Total	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu
CM-34-1	0.577	0.572	0.563	0.582	0.579	0.571	0.564	0.540	0.59	0.575		0.587	0.607	0.587	0.57
CM-34-2	0.575	0.587	0.577	0.584	0.587	0.562	0.556	0.544	0.59	0.572		0.591	0.614	0.591	0.57
CM-34-3	0.569	0.564	0.530	0.584	0.580	0.572	0.551	0.536	0.59	0.570		0.588	0.616	0.588	0.58
CM-34-4	0.582	0.581	0.572	0.581	0.571	0.577	0.573	0.535	0.59	0.570		0.579	0.613	0.579	0.57
CM-34-5	0.586	0.588	0.590	0.580	0.586	0.570	0.575	0.525	0.57	0.574		0.562	0.589	0.562	0.58
CM-34-6	0.578	0.594	0.557	0.573	0.584	0.569	0.541	0.543	0.58	0.568		0.576	0.598	0.576	0.58
CM-34-7	0.572	0.575	0.577	0.579	0.588	0.577	0.553	0.541	0.58	0.568		0.580	0.606	0.580	0.58
CM-34-8	0.574	0.585	0.555	0.585	0.585	0.576	0.549	0.515	0.58	0.554		0.600	0.598	0.600	0.58
CM-34-9	0.579	0.584	0.575	0.583	0.595	0.568	0.550	0.531	0.58	0.570		0.594	0.622	0.594	0.58
CM-34-10	0.590	0.581	0.570	0.577	0.590	0.576	0.545	0.526	0.58	0.570		0.578	0.611	0.578	0.58
Mean	0.578	0.581	0.567	0.581	0.584	0.572	0.556	0.534	0.583	0.569		0.583	0.607	0.583	0.577
Std. Devn.	0.0064	0.0087	0.0165	0.0037	0.0065	0.0048	0.0114	0.0093	0.0067	0.0057		0.0108	0.0100	0.0108	0.0048
% RSD	1.11	1.50	2.91	0.64	1.11	0.85	2.06	1.75	1.16	1.01		1.85	1.64	1.85	0.84
Total	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %
CM-34-1	0.031	0.030	0.032	0.031	0.029	0.032	0.031	0.030	0.03	0.030		0.029	0.030	0.029	0.028
CM-34-2	0.030	0.032	0.033	0.030	0.030	0.032	0.029	0.030	0.03	0.030		0.030	0.030	0.030	0.029
CM-34-3	0.031	0.030	0.030	0.030	0.030	0.032	0.030	0.029	0.03	0.030		0.029	0.030	0.029	0.030
CM-34-4	0.031	0.031	0.033	0.031	0.030	0.033	0.030	0.029	0.03	0.030		0.029	0.031	0.029	0.030
CM-34-5	0.031	0.032	0.034	0.031	0.030	0.031	0.031	0.029	0.03	0.030		0.029	0.031	0.029	0.030
CM-34-6	0.030	0.031	0.032	0.031	0.030	0.033	0.032	0.029	0.03	0.030		0.029	0.029	0.029	0.030
CM-34-7	0.031	0.030	0.034	0.031	0.030	0.033	0.031	0.029	0.03	0.029		0.030	0.030	0.030	0.029
CM-34-8	0.031	0.031	0.033	0.031	0.030	0.033	0.032	0.028	0.03	0.030		0.030	0.030	0.030	0.030
CM-34-9	0.031	0.032	0.033	0.030	0.030	0.032	0.032	0.029	0.03	0.030		0.030	0.030	0.030	0.030
CM-34-10	0.030	0.031	0.034	0.030	0.030	0.032	0.031	0.029	0.03	0.030		0.029	0.029	0.029	0.028
Mean	0.031	0.031	0.033	0.031	0.030	0.032	0.031	0.029	0.030	0.030		0.029	0.030	0.029	0.029
Std. Devn.	0.0005	0.0008	0.0012	0.0005	0.0004	0.0007	0.0010	0.0004	0.0004	0.0004		0.0004	0.0007	0.0004	0.0007
% RSD	1.57	2.63	3.75	1.69	1.29	2.09	3.22	1.29	1.41	1.23		1.53	2.22	1.53	2.44

*Notes: Total Ag results from laboratory 9 were removed for failing the t test.  
Total Cu results from laboratory 8 were removed for failing the t test.  
Laboratory 11 could not supply 4-acid results.*

## REFERENCE MATERIAL CDN-CM-34

### Results from round-robin assaying:

	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
Aqua regia	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu
CM-34-1	0.572	0.541	0.596	0.580	0.5715	0.599	0.578	0.528	0.58	0.572	0.567	0.585	0.610	0.585	0.58
CM-34-2	0.570	0.548	0.544	0.576	0.5808	0.601	0.567	0.535	0.54	0.577	0.579	0.589	0.594	0.589	0.59
CM-34-3	0.579	0.549	0.573	0.584	0.5717	0.600	0.572	0.529	0.57	0.544	0.573	0.578	0.608	0.578	0.58
CM-34-4	0.573	0.549	0.584	0.583	0.5969	0.592	0.566	0.543	0.59	0.565	0.570	0.580	0.617	0.580	0.58
CM-34-5	0.577	0.534	0.571	0.576	0.5797	0.581	0.580	0.532	0.58	0.583	0.569	0.576	0.610	0.576	0.58
CM-34-6	0.569	0.530	0.578	0.584	0.5949	0.578	0.580	0.526	0.55	0.570	0.576	0.569	0.612	0.569	0.58
CM-34-7	0.563	0.542	0.571	0.581	0.5979	0.590	0.567	0.548	0.57	0.570	0.571	0.608	0.617	0.608	0.58
CM-34-8	0.565	0.528	0.579	0.575	0.5929	0.586	0.571	0.531	0.58	0.590	0.571	0.570	0.599	0.570	0.58
CM-34-9	0.561	0.557	0.565	0.545	0.5747	0.584	0.549	0.542	0.58	0.567	0.579	0.583	0.593	0.583	0.59
CM-34-10	0.568	0.543	0.593	0.601	0.5787	0.571	0.575	0.531	0.59	0.564	0.579	0.585	0.617	0.585	0.58
Mean	0.570	0.542	0.575	0.579	0.584	0.588	0.571	0.535	0.573	0.570	0.573	0.582	0.608	0.582	0.582
Std. Devn.	0.0058	0.0092	0.0148	0.0139	0.0106	0.0101	0.0092	0.0074	0.0164	0.0124	0.0045	0.0111	0.0092	0.0111	0.0042
% RSD	1.02	1.70	2.57	2.41	1.81	1.71	1.62	1.38	2.86	2.17	0.79	1.91	1.52	1.91	0.72
Aqua regia	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %	Mo %
CM-34-1	0.031	0.031	0.028	0.030	0.028	0.030	0.032	0.030	0.027	0.032	0.028	0.028	0.030	0.028	0.03
CM-34-2	0.031	0.030	0.031	0.030	0.029	0.030	0.029	0.032	0.026	0.032	0.029	0.027	0.031	0.027	0.02
CM-34-3	0.031	0.030	0.033	0.030	0.029	0.030	0.028	0.030	0.026	0.029	0.028	0.029	0.032	0.029	0.02
CM-34-4	0.031	0.031	0.033	0.030	0.029	0.031	0.029	0.031	0.027	0.030	0.029	0.026	0.030	0.026	0.02
CM-34-5	0.032	0.030	0.032	0.030	0.029	0.030	0.032	0.031	0.027	0.031	0.028	0.027	0.031	0.027	0.03
CM-34-6	0.031	0.029	0.033	0.030	0.030	0.031	0.030	0.030	0.027	0.031	0.029	0.027	0.031	0.027	0.03
CM-34-7	0.030	0.031	0.033	0.029	0.030	0.031	0.031	0.031	0.027	0.031	0.028	0.028	0.032	0.028	0.03
CM-34-8	0.030	0.028	0.036	0.030	0.030	0.030	0.033	0.030	0.026	0.032	0.029	0.028	0.031	0.028	0.03
CM-34-9	0.031	0.030	0.029	0.028	0.029	0.031	0.028	0.030	0.027	0.031	0.029	0.029	0.029	0.029	0.03
CM-34-10	0.031	0.030	0.026	0.031	0.030	0.030	0.030	0.031	0.027	0.032	0.029	0.029	0.031	0.029	0.02
Mean	0.031	0.030	0.031	0.030	0.029	0.030	0.030	0.031	0.027	0.031	0.029	0.028	0.031	0.028	0.026
Std. Devn.	0.0006	0.0009	0.0030	0.0008	0.0004	0.0005	0.0018	0.0005	0.0005	0.0008	0.0001	0.0008	0.0009	0.0008	0.0052
% RSD	1.84	3.14	9.40	2.65	1.48	1.70	5.80	1.65	1.81	2.64	0.44	2.93	2.98	2.93	19.86
Leco	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %	S %
CM-34-1	3.06	3.11	3.09	2.87	3.04	3.00	2.95	3.06	2.94	2.83	3.03	3.05	3.09	3.00	3.01
CM-34-2	3.04	3.09	3.07	2.85	3.10	3.03	2.95	3.03	2.99	2.92	3.05	3.09	3.09	2.90	2.99
CM-34-3	3.00	3.09	3.04	2.88	3.12	2.99	2.95	3.06	2.88	2.89	3.03	3.07	3.09	3.00	3.01
CM-34-4	3.09	3.07	3.07	2.86	3.09	3.01	2.93	3.06	2.92	2.85	3.02	3.05	3.09	3.00	3.01
CM-34-5	3.09	3.11	3.06	2.89	3.17	2.99	2.90	3.03	2.88	2.88	2.99	3.06	3.10	2.90	3.02
CM-34-6	3.06	3.04	3.04	2.86	3.12	2.97	2.91	3.03	2.84	2.86	3.01	3.08	3.07	3.00	3.00
CM-34-7	3.00	3.09	3.09	2.91	3.07	2.94	2.92	3.02	2.89	2.85	3.03	3.08	3.09	3.00	3.00
CM-34-8	3.10	3.09	3.09	2.93	3.12	3.02	2.96	3.01	2.93	2.83	3.01	3.08	3.06	3.00	2.98
CM-34-9	3.00	3.05	3.08	2.91	3.25	2.96	2.93	3.07	2.89	2.82	3.03	3.12	3.09	2.90	3.02
CM-34-10	2.96	3.07	3.04	2.90	3.18	2.95	2.94	2.99	2.80	2.88	3.04	3.08	3.07	2.80	3.00
Mean	3.04	3.08	3.07	2.89	3.13	2.99	2.93	3.04	2.90	2.86	3.02	3.08	3.08	2.95	3.00
Std. Devn.	0.0478	0.0233	0.0211	0.0263	0.0604	0.0303	0.0196	0.0259	0.0532	0.0314	0.0171	0.0207	0.0126	0.0707	0.0126
% RSD	1.57	0.76	0.69	0.91	1.93	1.01	0.67	0.85	1.84	1.10	0.57	0.67	0.41	2.40	0.42

Notes: Aqua regia Cu results from laboratories 2 and 8 were removed for failing the t test.

**REFERENCE MATERIAL CDN-CM-34**

**Participating Laboratories:**

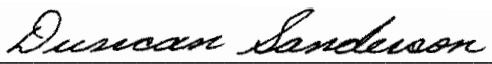
(not in same order as listed in table of results)

Acme Analytical Laboratories Ltd., Vancouver, BC, Canada  
Actlabs-Ancaster, Ontario, Canada  
Actlabs-Kamloops, BC, Canada  
Actlabs-Thunder Bay, Ontario, Canada  
ALS Canada, North Vancouver, BC, Canada  
ALS, Loughrea, Ireland  
American Assay Laboratory, Nevada, USA  
Certimin, Lima, Peru  
Intertek Genalysis, Perth, Australia  
Labtium, Finland  
SGS Lakefield, Lakefield, Ontario, Canada  
SGS – Lima, Peru  
Skyline Laboratories, Tucson, Arizona, USA  
TSL Laboratories Ltd., Saskatoon, Saskatchewan, Canada  
Ultra Trace, Perth, Australia


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Certified by

  
Duncan Sanderson, Certified Assayer of B.C.

Geochemist

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