

CDN Resource Laboratories Ltd.

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REFERENCE MATERIAL: CDN-ME-1803

Recommended values and the “Between Lab” Two Standard Deviations

Gold	1.308 gt	± 0.068 gt	30 g FA, instrumental	Certified value
Silver	46.0 ppm	± 3.0 ppm	4-Acid / ICP	Certified value
Copper	0.381 %	± 0.014 %	4 Acid / ICP	Certified value
Lead	1.21 %	± 0.04 %	4 Acid / ICP	Certified value
Zinc	2.82 %	± 0.12 %	4 Acid / ICP	Certified value
Iron	36.76 %	± 1.57 %	4 Acid / ICP	Certified value

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: June 6, 2018

ORIGIN OF REFERENCE MATERIAL:

Standard CDN-ME-1803 was prepared from ore received from Trevali's Caribou deposit. The Caribou deposit is an advanced stage lead-zinc deposit is located 50 kilometres west of Bathurst, New Brunswick, Canada.

The Caribou deposit is a volcanic hosted massive sulphide deposit (VMS). The VMS deposits typically form lenses of polymetallic massive sulphide. Most deposits are zoned vertically and laterally from a high-temperature, vent-proximal, Cu-Co-Bi-rich veined and brecciated core to vent-distal Zn-Pb-Ag-rich hydrothermal sediments. The vent complex is commonly underlain by a highly deformed sulphide stringer zone that extends hundreds of metres beneath deposits and consists of veins and impregnations of sulphides, silicates, and carbonates that cut chloritized and sericitized volcanic and sedimentary rocks.

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 commercial laboratories for round robin assaying.

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

	Percent		Percent
SiO ₂	10.6	Na ₂ O	<0.1
Al ₂ O ₃	1.5	MgO	1.5
Fe ₂ O ₃	52.4	K ₂ O	0.3
CaO	1.4	TiO ₂	<0.1
MnO	0.3	LOI	26.4
S	36.7	C	0.9

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 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.

Assay Procedures:

Au: 30 gr. fire assay pre-concentration, AA or ICP finish.
Ag, Cu, Pb, Zn, Fe: 4-acid digestion, AA or ICP finish.

Results from round-robin assaying:

Fire Assay	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
	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t
ME-1803-1	1.31	1.23	1.315	1.370	1.30	1.15	1.225	1.303	1.521	1.323	1.300	1.319	1.251	1.32	1.265
ME-1803-2	1.31	1.26	1.305	1.385	1.23	1.17	1.406	1.350	1.468	1.332	1.340	1.306	1.260	1.31	1.275
ME-1803-3	1.29	1.19	1.310	1.310	1.31	1.29	1.252	1.314	1.468	1.328	1.354	1.342	1.334	1.31	1.310
ME-1803-4	1.32	1.23	1.310	1.315	1.27	1.25	1.422	1.305	1.467	1.307	1.335	1.338	1.280	1.33	1.315
ME-1803-5	1.21	1.20	1.310	1.330	1.26	1.17	1.298	1.286	1.468	1.318	1.333	1.338	1.255	1.32	1.305
ME-1803-6	1.32	1.13	1.320	1.350	1.33	1.25	1.249	1.324	1.503	1.332	1.355	1.336	1.271	1.31	1.370
ME-1803-7	1.33	1.28	1.325	1.305	1.29	1.26	1.295	1.336	1.550	1.317	1.336	1.312	1.258	1.30	1.310
ME-1803-8	1.34	1.28	1.335	1.350	1.30	1.20	1.321	1.332	1.567	1.329	1.328	1.367	1.266	1.30	1.335
ME-1803-9	1.32	1.32	1.335	1.265	1.32	1.15	1.334	1.324	1.528	1.332	1.328	1.321	1.236	1.31	1.340
ME-1803-10	1.340	1.31	1.315	1.345	1.28	1.28	1.262	1.326	1.545	1.317	1.338	1.362	1.261	1.31	1.285
Mean	1.31	1.24	1.319	1.333	1.289	1.217	1.306	1.320	1.509	1.324	1.335	1.334	1.267	1.31	1.311
Std. Dev.	0.038	0.059	0.011	0.035	0.030	0.055	0.066	0.018	0.039	0.009	0.015	0.020	0.026	0.009	0.032
% RSD	2.89	4.74	0.80	2.63	2.33	4.50	5.06	1.40	2.59	0.64	1.15	1.51	2.07	0.70	2.42

Instrumental	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
	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t	Ag g/t
ME-1803-1	42	45	47	44	47	45.5	44.8	48	47	47	46.0	47.6	44	45	45
ME-1803-2	43	45	46	46	47	48.0	43.9	48	47	45	46.0	48.5	45	45	45
ME-1803-3	44	45	46	46	47	45.0	44.2	50	46	47	45.2	48.4	45	47	45
ME-1803-4	42	45	47	46	46	46.0	44.3	48	49	45	45.5	48.5	45	47	44
ME-1803-5	42	45	45	45	47	46.0	43.5	49	48	46	44.9	48.3	43	46	44
ME-1803-6	43	45	45	45	47	42.5	43.8	48	47	48	44.7	47.5	44	47	44
ME-1803-7	45	45	46	47	47	47.5	43.2	49	48	47	44.6	47.8	44	47	44
ME-1803-8	43	45	45	47	46	46.0	43.4	49	46	45	44.8	48.9	44	47	45
ME-1803-9	43	46	45	45	46	49.0	42.6	48	47	47	45.9	48.0	45	46	45
ME-1803-10	43	45	47	45	47	46.0	42.9	49	46	46	45.5	48.5	44	45	45
Mean	43	45	46	46	47	46.1	43.66	49	47	46	45.3	48.2	44	46	45
Std. Dev.	0.943	0.316	0.876	0.966	0.483	1.780	0.674	0.699	0.994	1.059	0.547	0.455	0.675	0.919	0.516
% RSD	2.19	0.70	1.91	2.12	1.03	3.86	1.54	1.44	2.11	2.29	1.21	0.94	1.52	1.99	1.16

Notes: Au results from Lab 9 were removed for failing the t test.
 Ag results from Lab 1 were removed for failing the t test.

Results from round-robin assaying-Continue:

Instrumental	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
	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu	% Cu
ME-1803-1	0.372	0.382	0.373	0.378	0.397	0.367	0.39	0.400	0.380	0.385	0.390	0.382	0.379	0.37	0.371
ME-1803-2	0.374	0.388	0.372	0.379	0.393	0.362	0.39	0.395	0.379	0.386	0.393	0.385	0.384	0.37	0.381
ME-1803-3	0.381	0.380	0.371	0.385	0.384	0.368	0.39	0.405	0.381	0.389	0.387	0.382	0.383	0.38	0.374
ME-1803-4	0.366	0.386	0.370	0.378	0.379	0.370	0.39	0.401	0.380	0.389	0.389	0.386	0.380	0.38	0.374
ME-1803-5	0.379	0.390	0.365	0.374	0.388	0.374	0.39	0.404	0.382	0.382	0.385	0.384	0.381	0.36	0.377
ME-1803-6	0.382	0.380	0.367	0.374	0.390	0.374	0.39	0.400	0.381	0.382	0.387	0.381	0.380	0.37	0.375
ME-1803-7	0.393	0.384	0.373	0.385	0.385	0.374	0.39	0.400	0.378	0.383	0.386	0.384	0.380	0.37	0.375
ME-1803-8	0.385	0.383	0.372	0.387	0.388	0.375	0.38	0.400	0.378	0.385	0.387	0.376	0.380	0.38	0.375
ME-1803-9	0.390	0.382	0.375	0.379	0.378	0.387	0.39	0.401	0.378	0.389	0.392	0.377	0.384	0.37	0.378
ME-1803-10	0.377	0.391	0.369	0.372	0.388	0.366	0.39	0.399	0.380	0.389	0.388	0.379	0.381	0.39	0.380
Mean	0.380	0.385	0.371	0.379	0.387	0.372	0.39	0.401	0.380	0.386	0.388	0.382	0.381	0.37	0.376
Std. Dev.	0.008	0.004	0.003	0.005	0.006	0.007	0.003	0.003	0.001	0.003	0.003	0.003	0.002	0.008	0.003
% RSD	2.16	1.03	0.81	1.35	1.51	1.85	0.81	0.68	0.37	0.77	0.67	0.88	0.48	2.25	0.80
Instrumental	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
	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb	% Pb
ME-1803-1	1.19	1.29	1.180	1.140	1.230	1.14	1.22	1.23	1.24	1.22	1.214	1.20	1.21	1.19	1.195
ME-1803-2	1.20	1.33	1.180	1.160	1.235	1.23	1.23	1.22	1.24	1.20	1.219	1.19	1.22	1.20	1.205
ME-1803-3	1.23	1.30	1.175	1.175	1.210	1.17	1.22	1.26	1.22	1.21	1.203	1.20	1.22	1.21	1.180
ME-1803-4	1.18	1.30	1.175	1.155	1.185	1.21	1.22	1.24	1.23	1.21	1.209	1.18	1.20	1.21	1.175
ME-1803-5	1.20	1.30	1.160	1.145	1.210	1.20	1.23	1.23	1.24	1.21	1.189	1.20	1.20	1.17	1.190
ME-1803-6	1.20	1.29	1.170	1.160	1.220	1.18	1.22	1.24	1.23	1.21	1.198	1.17	1.20	1.21	1.180
ME-1803-7	1.24	1.30	1.185	1.185	1.210	1.21	1.23	1.22	1.24	1.20	1.184	1.18	1.21	1.21	1.180
ME-1803-8	1.21	1.29	1.185	1.190	1.210	1.21	1.21	1.23	1.24	1.21	1.197	1.16	1.21	1.19	1.195
ME-1803-9	1.22	1.29	1.180	1.145	1.190	1.26	1.22	1.24	1.23	1.22	1.218	1.15	1.22	1.20	1.190
ME-1803-10	1.19	1.30	1.195	1.125	1.210	1.22	1.22	1.22	1.22	1.21	1.199	1.17	1.22	1.21	1.190
Mean	1.21	1.3	1.179	1.158	1.211	1.20	1.22	1.23	1.23	1.21	1.203	1.18	1.21	1.20	1.188
Std. Dev.	0.019	0.012	0.009	0.021	0.015	0.033	0.006	0.013	0.008	0.007	0.012	0.018	0.009	0.013	0.009
% RSD	1.57	0.92	0.80	1.78	1.27	2.77	0.52	1.02	0.67	0.55	0.98	1.49	0.72	1.11	0.77
Instrumental	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
	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn	% Zn
ME-1803-1	2.73	2.80	2.80	2.86	2.94	2.77	2.92	2.83	2.69	2.91	2.78	2.83	2.91	2.76	2.77
ME-1803-2	2.73	2.82	2.81	2.86	2.91	2.74	2.88	2.82	2.72	2.82	2.81	2.90	2.82	2.74	2.79
ME-1803-3	2.75	2.78	2.79	2.91	2.84	2.74	2.90	2.88	2.72	2.83	2.77	2.85	2.83	2.84	2.73
ME-1803-4	2.69	2.80	2.80	2.87	2.80	2.73	2.90	2.89	2.71	2.90	2.78	2.86	2.89	2.84	2.74
ME-1803-5	2.73	2.82	2.75	2.82	2.86	2.77	2.89	2.87	2.77	2.87	2.72	2.84	2.85	2.84	2.77
ME-1803-6	2.75	2.81	2.77	2.82	2.89	2.80	2.94	2.86	2.71	2.91	2.75	2.83	2.91	2.79	2.74
ME-1803-7	2.80	2.82	2.82	2.91	2.86	2.72	2.94	2.88	2.72	2.88	2.76	2.88	2.84	2.83	2.75
ME-1803-8	2.76	2.78	2.81	2.92	2.87	2.75	2.86	2.85	2.70	2.86	2.77	2.81	2.89	2.84	2.74
ME-1803-9	2.80	2.79	2.81	2.86	2.80	2.82	2.87	2.88	2.71	2.96	2.80	2.82	2.88	2.81	2.77
ME-1803-10	2.75	2.79	2.79	2.80	2.87	2.79	2.89	2.85	2.72	2.88	2.75	2.84	2.85	2.87	2.77
Mean	2.75	2.80	2.79	2.86	2.86	2.76	2.90	2.86	2.72	2.88	2.77	2.85	2.87	2.82	2.76
Std. Dev.	0.033	0.016	0.021	0.041	0.044	0.033	0.027	0.023	0.021	0.041	0.025	0.028	0.033	0.041	0.019
% RSD	1.21	0.57	0.76	1.45	1.54	1.18	0.94	0.81	0.78	1.42	0.91	0.97	1.15	1.45	0.71

Results from round-robin assaying-Continue:

Instrumental	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
	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe	% Fe
ME-1803-1	35.2	36.0	35.5		38.1	35.8	39.13	36.96	>30.0	37.93	37.26	42.91	37.7	>30.0	36.9
ME-1803-2	35.4	36.4	35.5		38.2	35.3	39.49	36.46	>30.0	37.75	37.30	42.70	37.2	>30.0	37.4
ME-1803-3	35.9	35.9	35.4		37.4	35.7	39.07	37.48	>30.0	37.92	37.01	42.61	37.2	>30.0	36.8
ME-1803-4	34.9	36.2	35.4		36.7	36.6	39.31	37.21	>30.0	37.79	37.36	42.36	37.7	>30.0	36.6
ME-1803-5	36.0	36.2	35.0		37.4	35.6	39.20	37.41	>30.0	37.66	36.79	42.83	37.0	>30.0	37.0
ME-1803-6	35.7	35.9	35.0		38.0	36.6	39.35	37.04	>30.0	37.70	36.95	42.05	37.7	>30.0	36.6
ME-1803-7	36.6	36.2	35.6		37.6	36.5	39.62	37.06	>30.0	37.63	36.89	42.58	37.1	>30.0	36.5
ME-1803-8	36.1	36.0	35.4		37.5	36.1	38.93	37.05	>30.0	37.90	37.08	41.91	37.3	>30.0	37.1
ME-1803-9	36.2	36.0	35.5		36.9	36.5	39.26	37.19	>30.0	37.83	37.33	42.14	37.1	>30.0	36.9
ME-1803-10	35.7	36.4	35.7		37.6	35.9	39.36	36.99	>30.0	37.61	36.87	42.50	37.4	>30.0	37.0
Mean	35.77	36.12	35.40		37.54	36.06	39.27	37.08		37.77	37.08	42.46	37.3		36.88
Std. Dev.	0.503	0.187	0.231		0.486	0.470	0.202	0.280		0.121	0.213	0.336	0.272		0.270
% RSD	1.41	0.52	0.65		1.29	1.30	0.51	0.76		0.32	0.57	0.79	0.73		0.73

Notes: Cu results from Lab 8 were removed for failing the t test.
 Fe results from Lab 7 and Lab 12 were removed for failing the t test.
 Fe values were higher than Lab 9 and Lab 14 detection limit.
 Lab 4 did not report Fe values.

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

Activation Laboratories, Ancaster, Ontario, Canada	Bureau Veritas, Vancouver, BC, Canada
Activation Laboratories, Thunder Bay, Ontario, Canada	Certimin S.A., Lima, Peru
ALS Canada, North Vancouver, BC, Canada	MS Analytical, Langley, BC, Canada
ALS, Loughrea, Ireland	SGS, Vancouver, BC, Canada
ALS, Lima, Peru	SGS, Lima, Peru
ALS, Perth Australia	SGS, Lakefield, Ontario, Canada
Bureau Veritas, Perth, Australia	TSL Laboratories Ltd., Saskatoon, SK, Canada
Skyline Assayers & Laboratories, AZ, USA	


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Certified by


 Duncan Sanderson, Certified Assayer of B.C.

Geochemist


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