BIOGEOCHEMICAL SURVEY

(Geochemical)

50 120NE & NW

AFTON GROUP 92I/9W

In the N.W. quadrent of the quadrilateral having Lat. 50°oo', Long. 120°00' as its south-east corner.

September 28/51 Dr. H.V. War

C
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P
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60

The University of British Columbia

Vancouver, B.C.

In account with,
KENNCO EXPLORATIONS (CANADA) LIMITED

Date: June 20, 1951

Invoice No.: 65-6000-508

Pothook

24 analyses for copper and zinc @ $1.25 — $ 30.00

Cheque received July 11/51

Date: July 4, 1951

Invoice No.: 65-6000-508

109 analyses for copper and zinc @ $1.25
(51AB25 to 51AB133 inclusive) — 136.25

Cheque received July 17/51

Date: September 15, 1951

Invoice No.:65-6000-000

114 analyses for copper and zinc @ $1.25
(51 AB 134 to 51 AB 247 inclusive) — 142.50

Cheque received October 3/51

THE UNIVERSITY OF BRITISH COLUMBIA
ACCOUNTANT

Expenses incurred by KENNCO EXPLORATIONS, (CANADA) LTD.

in making Biogeochemical Survey of Afton Claims (Pothook)

A. Salary (collecting, mapping)

J. Greenaway	1 week	$50.00
Oscar Schmidt	" "	60.00
E. Persson	" "	60.00
J. Noel (E.I.T.)	10 days	100.00
D. Barr (E.I.T.)	10 days	66.67
A. Berglund	10 days	83.33
		$420.00

B. Cost of Assaying

247 samples at $1.25 a sample	309.00

C. Supervision (H.V. Warren)

3 days at $35.00	105.00
	$834.00

Determination of copper and zinc in plants

Use at least one gram; for zinc only, 0.2 gram may be enough. If dry or rainy conditions are expected to be the same during collection of the whole batch of samples, it is possible to weigh the sample just as it comes from the tree; take a double weight (2 or 0.4 gram) and weigh within a few hours of collection. A safe way is to weigh at the same time two series of samples, as identical as possible, and keep one to dry leisurely, for calculating the ratio between fresh and dry weights.

Drying proceeds easily in a few hours around 200°F. in a drying oven, or in a few weeks in a warm dry place; samples dry well in paper bags, if they are loosely packed. Drying quickly in the field is the trickiest operation of the procedure. The weighed samples (approximately double weight, 2 grams or 0.4 gram) are packed separately in filter or towel paper; the small bundles are placed vertically in a glassbeaker, and heated gently on a corner of the camp stove, or on a piece of asbestos board, with a very small flame. The beaker must be hot enough, above 150°F., for the samples to dry in one hour or so; it must be too hot to be held in the hand. But the samples must only lose their humidity; any charred parts must be discarded; the paper usually warns by turning brown.

Ashing must proceed as far as possible at a dull red temperature, though the loss of copper or zinc is negligible at bright red heat. To prevent undue flaming, it is best to distill first most of the organic material on a small flame, or on a less hot region of the heating device. A mica sheet can be placed on top. Still, flaming has no significance when only the volatile constituents distilled from the samples burn at the mouth of the crucible.

In order to expose in succession all the parts of the sample to the direct influx of air, rotate slightly the crucible from time to time, holding it in the forceps. When this is being done, particles brought into contact with a richer atmosphere glower; when this phenomenon stops, it means usually that ashing is completed.

For copper and zinc, or copper alone:

Transfer the ash to a small beaker, 10 or 20 ml, moisten with water, attack with one half ml per gram of dry material of 3N hydrochloric acid, heating very gently, so that it takes about 30 minutes to evaporate just to dryness. Add two or three drops of 3N hydrochloric and two or three ml of water; leave a few minutes so that everything soluble is dissolved. Pass into a 50 ml graduated cylinder, with a ground stopper (preferably standard taper); rinse two times the beaker with 2 ml about each time. It is immaterial whether the silica precipitate goes into the cylinder or remains in the beaker. The solution must be strongly acid, between pH 4 and 2-3% hydrochloric, so that only precious metals and bismuth could be extracted with the copper. If the copper seems abnormally high on titrating, check the acidity at once, and unless it is very high, make sure by adding one drop of 3N hydrochloric. Before titrating, the solution must be adjusted to a known volume, in order to take eventually an aliquot, if copper is very high, or to titrate the zinc on an aliquot.

For titration, add one ml of dithizone solution (60 milligrams per litre) into the cylinder, and shake strongly. The green solution usually darkens, then turns to a more or less dark shade of purple. If it remained green, it would mean too much acid or too little copper. Test the pH with the paper, and try to raise it by adding acetate buffer drop by drop; if there is not enough copper, the sample was too small or too poor. Poor samples have no interest in prospecting applications. If they indicate a certain rock, they can just as well be listed as "poor".

If the dithizone solution turns purple, add more of it, gradually, and shaking gently a few seconds between each addition, until it is grey, neither green, nor purple. Then shake very strongly. Usually, it turns purple again, because all the copper had not been extracted. It is made grey again, and shaken strongly. By alterating additions of reagent and shaking, a moment comes when the dithizone solution remains grey on shaking. This nearly neutral grey color, neither greenish, nor purplish, just a little bluish if no oxidations products are present corresponds to the end-points of ordinary, one liquid titrimetry. The dithizone solution is standardized, using a known solution containing 0.1 milligram per ml, which is diluted before using to 0.004 milligram per ml. In our common experience, one ml of 60 milligram per litre dithizone solution is equivalent to about 0.004 mgr Cu or 0.002 mgr Zn with this end-point.

If there is oxidation of dithizone, the green reagent is transformed into a yellow compound, which will not turn the purple complex to grey, but to purplish brown. When making grey before shaking, the color is yellowish. The best thing to do is to ash again. Oxidation is due to a greater amount of iron than usual, or to calytic action of unburned carbon in the ash. For a few spots of charcoal, or iron, it is usually enough to add one decigram of hydroxylamine hydrochloride when evaporating after the attack. If there is much charcoal, filter, remembering to add each of the successive rinsings of the beaker, only when the preceding one has passed through.

For estimation of zinc, take an aliquot of the solution from which copper has been extracted. Add about the same volume of acetate buffer and titrate with dithizone as for copper. Extraction proceeds much more quickly, and shaking need not be so strong. But reagent must be added much more cautiously, as all zinc is often extracted after the first shaking; the beginner will do wisely to record each reading of the burette.

For zinc only, the whole amount of ash can be treated in the cylinder in the cold, by hydrochloric acid; add acetate buffer, about 4 times the volume of the 3 N hydrochloric acid used, thiosulfate solution, about one tenth of the total volume (to prevent copper from interfering). It works sometimes better to attack the ash as for copper, and treat an aliquot by its volume of acetate buffer and thiosulfate, one tenth of the volume titrated.

Practical details. Always close the cylinder with a wet stopper, otherwise, the carbon tetrachloride solution, which has a low surfact tension, would leak through it. If distilled water is scarce, the same cylinder may be used for zinc determinations without rinsing, as no more zinc is left in the solution when it is titrated. But never use it for copper without rinsing thoroughly, as small amounts of buffer would cause zinc to be extracted as copper. The same applies to thiosulfate solution: small amounts, insufficient to cause complete fixation of copper as complex, can decrease considerably the extraction of copper, and cause important errors, if the cylinder has not been thoroughly rinsed after use. The pipette used to take an aliquot of the solution for zinc extraction need not be rinsed with distilled water, unless an exceptionally high content is met. Otherwise, it is enough to shake it, wipe it outside, and rinse with a little of the solution to be pipetted, which should be done anyhow. Of course rinse everything when the work is finished, or before interrupting overnight. Do not use a brush to pass ash into the beakers, a strip of sized paper, as from a writing pad, will do; discard after using once. Crucible should just be wiped with towel or filter paper. Clean with hydrochloric after using ten times, or finding extremely rich (5-10 times the normal content) material.

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Samples received from D.A. Barr, Kamloops, B.C.

(Artemisia Tridentata, 2nd year twigs)

SAMPLE	PPM Cu	% Cu in ash	PPM Zn	% Zn in ash	Cu/Zn ratio	% of ash
51AB1	15	.047	19	.059	.79	3.2
51AB2	8	.025	17	.053	.47	3.2
51AB3	7	.015	14	.033	.50	4.3
51AB4	8	.026	12	.042	.66	3.0
51AB5	9	.028	12	.039	.75	3.1
51AB6	9	.025	9	.025	1.0	3.4
51AB7	8	.027	14	.050	.57	2.9
51AB8	8	.025	13	.044	.62	3.0
51AB9	9	.031	14	.052	.61	2.8
51AB10	11	.032	13	.039	.81	3.3
51AB11	10	.029	13	.039	.77	3.3
51AB12	11	.041	12	.044	.95	2.6
51AB13	10	.027	9	.023	1.1	3.7
51AB14	10	.035	11	.037	.95	2.9
51AB15	9	.031	17	.059	.53	2.6
51AB16	11	.040	10	.036	1.1	2.6
51AB17	12	.046	15	.059	.79	2.6
51AB18	12	.042	9	.031	1.3	2.8
51AB19	12	.038	10	.031	1.2	3.1
51AB20	14	.043	12	.039	1.1	3.2
51AB21	9	.031	12	.039	.75	2.9
51AB22	11	.034	17	.052	.65	3.2
51AB23	12	.043	15	.053	.80	2.8
51AB24	11	.032	10	.030	1.1	3.3

Samples received from D.A. Barr, Kamloops, B.C.

(Artemisia Tridentata, 2nd year twigs)

SAMPLE (1951)	PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash	Color of Ash	PPM Fe	PPM (Mn)
AB25	10	.025	12	.030	.83	4.1			
AB26	17	.039	12	.028	1.36	4.4			
AB27	10	.029	15	.045	.65	3.4			
AB28	11	.030	18	.049	.61	3.7			
AB29	12	.036	14	.041	.86	3.5			
AB30	9	.027	18	.051	.53	3.5			
AB31	13	.036	13	.037	.96	3.6			
AB32	18	.048	13	.035	1.4	3.8			
AB33	12	.038	14	.045	.83	3.2			
AB34	13	~~.093?~~ .038	14	~~.10?~~ .041	.93	~~1.4?~~ 3.4			
AB35	18	.050	12	.033	1.5	3.7			
AB36	17	.050	14	.041	1.2	3.4			
AB37	~~18~~ 11	~~.055~~ .035	17	.052	~~1.1~~ .69	3.2			
AB38	14	.045	13	.041	1.1	3.2			
AB39	15	.044	10	.030	1.5	3.5			
AB40	14	.046	7	.023	2.0	3.0			
AB41	12	.050	4	.016	3.1	2.5			
AB42	13	.038	14	.043	.90	3.4			
AB43	16	.048	18	.056	.87	3.3			
AB44	16	.042	17	.046	.91	3.7			
AB45	13	.041	14	.044	.93	3.0			
AB46	13	.048	14	.052	.93	2.8			
AB47	14	.045	15	.048	.93	3.1			
AB48	12	.043	8	.029	1.5	2.8			
AB49	11	.034	12	.037	.92	3.3			

SAMPLE (1951)	PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash	Color of Ash	PPM Fe	PPM (Mn)
AB50	12	.046	16	.059	.78	2.7			
AB51	12	.042	10	.035	1.2	2.9			
AB52	10	.040	9	.038	1.1	2.6			
AB53	8	.027	8	.027	1.0	3.1			
AB54	11	.030	18	.050	.60	3.7			
AB55	11	.034	19	.058	.58	3.3			
AB56	15	.032	19	.041	.79	4.6			
AB57	~~16~~	~~.060~~ .043	14	.053	~~1.1~~ .83	2.7			
AB58	11	.034	13	.039	.88	3.3			
AB59	11	.037	12	.039	.96	3.2			
AB60	14	.035	10	.026	1.3	4.0			
AB61	14	.038	13	.035	1.1	3.7			
AB62	10	.046	8	.039	1.2	2.2			
AB63	~~13~~	~~.041~~	~~11~~ 13	~~.034~~	~~1.2~~ .77	3.2			
AB64	12	.034	10	.030	1.1	3.5			
AB65	8	.028	13	.046	.62	2.9			
AB66	7	.023	11	.035	.65	3.3			
AB67	14	.033	16	.038	.88	4.4			
AB68	13	.038	8	.025	1.5	3.4			
AB69	13	.037	21	.061	.60	3.5			
AB70	11	.034	13	.039	.88	3.3			
AB71	10	.030	13	.039	.77	3.3			
AB72	11	.026	10	.025	1.05	4.2			
AB73	13	.039	9	.026	1.5	3.5			

SAMPLES RECEIVED FROM GERRY NOEL, KAMLOOPS, B.C.

Artemisia tridentata, 2nd year twigs

SAMPLE (1951)	PPM Cu	% Cu IN ASH	PPM Zn	% Zn IN ASH	Ratio Cu/Zn	% of ASH
AB 74	16	.036	14	.031	1.1	4.5
AB 75	15	.039	13	.033	1.1	3.9
AB 76	14	.05	17	.061	.82	2.8
AB 77	10	.035	18	.061	.55	2.9
AB 78	14	.048	17	.057	.82	2.9
AB 79	16	.051	11	.037	1.5	3.0
AB 80	16	.050	15	.047	1.1	3.1
AB 81	14	.047	16	.053	.87	3.0
AB 82	13	.054	19	.078	.68	2.4
AB 83	18	.057	17	.054	1.1	2.1
AB 84	10	.043	13	.054	.80	2.3
AB 85	11	.046	12	.047	.95	2.4
AB 86	11	.039	12	.046	.82	2.7
AB 87	15	.046	14	.043	1.1	3.2
AB 88	14	.048	19	.065	.74	2.9
AB 89	12	~~.40~~ .040	18	.058	.69	3.0

SAMPLE			PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash
51AB43	Artemisia	tridentata			checked	well		
51AB44	"	"			"	"		
51AB56	"	"			"	"		
51AB57	"	"	12	.043	14	.053	.82	2.7
51AB60	"	"			checked	well		
51AB61	"	"			"	"		
51AB63	"	"	10	.029	13	.038	.77	3.5
51AB65	"	"			checked	well		
51AB67	"	"			"	"		
51AB74	"	"	13	.027	12	.024	1.1	4.9
51AB75	"	"	11	.020	14	.026	.79	5.4
51AB76	"	"	7	.019	16	.042	.47	3.8
51AB77	"	"	7	.019	15	.039	.50	3.8
51AB78	"	"	8	.020	17	.045	.46	3.9
51AB79	"	"	8	.021	10	.026	.80	3.8
51AB80	"	"	10	.024	15	.035	.69	4.2
51AB81	"	"	12	.024	19	.034	.86	4.1
51AB82	"	"	10	.027	16	.044	.63	3.6
51AB83	"	"	9	.023	20	.052	.45	3.8
51AB84	"	"	6	.021	15	.051	.41	2.8
51AB85	"	"	9	.026	16	.048	.53	3.1
51AB86	"	"	7	.021	14	.041	.50	3.4
51AB87	"	"	9	.022	13	.030	.72	4.1
51AB88	"	"	10	.032	15	.048	.67	3.1
51AB89	"	"	9	.023	16	.039	.58	4.0
51AB90	"	"	10	.033	14	.045	.74	3.0
51AB91	"	"	14	.054	10	.040	1.35	2.5
51AB92	"	"			checked	well		
51AB93	"	"	11	.037	13	.044	.85	3.0

SAMPLE	PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash
51AB94 Artemisia tridentata	9	.029	13	.038	.76	3.2
51AB94a Pinus ponderosa			checked well			
51AB95 Artemisia tridentata	14	.037	11	.029	1.29	3.6
51AB96 " "	15	.060	11	.044	1.36	2.5
51AB97 " "	17	.067	14	.053	1.26	2.6
51AB98 " "	7	.026	12	.046	.56	2.7
51AB99 " "	15	.050	12	.042	1.20	3.0
51AB100 " "	16	.055	17	.059	.94	2.8
51AB101 " "	17	.058	21	.072	.81	2.9
51AB102 " "	16	.057	13	.045	1.28	2.8
51AB103 " "	8	.027	11	.038	.70	3.0
51AB104 " "	10	.031	13	.041	.77	3.2
51AB105 " "	14	.048	14	.048	1.0	2.9
51AB106 " "	13	.038	6	.017	2.2	3.5
51AB107 " "	11	.037	19	.068	.55	2.8
51AB108 " "	13	.036	15	.042	.86	3.5
51AB109 " "			checked well			
51AB109a Pinus ponderosa			"	"		
51AB110 ARTEMISIA TRIDENTATA			"	"		
51AB111 " "			"	"		
51AB112 " "			"	"		
51AB113 " "	? 16	.046	12	.035	1.33	3.5
51AB114 " "	12	.040	14	.047	.86	3.0
51AB115 " "	? 19	.058	15	.044	1.31	3.3
51AB116 " "	? 16	.059	10	.037	1.6	2.7
51AB117 " "	? 17	.059	13	.043	1.36	2.9
51AB118 " "	? 17	.065	10	.037	1.95	2.6
51AB119 " "	? 21	.074	8	.026	2.80	2.9
51AB120 " "	? 19	.069	9	.026	2.1	3.0

SAMPLE		PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash
51AB121	Pinus ponderosa	9	.026	15	.043	.60	3.5
51AB122	" "	14	.046	14	.046	1.0	3.1
51AB123	" "	16	.043	17	.047	.90	3.6
51AB124	Artemisia tridentata	9	.026	22	.061	.24	3.5
51AB125	" "	9	.032	15	.051	.63	3.0
51AB126	" "	14	.044	16	.052	.85	3.1
51AB127	" "	10	.035	11	.037	.95	3.0
51AB128	" "	15	.040	14	.037	1.1	3.9
51AB129	" "	15	.036	13	.031	1.1	4.2
51AB130	" "	13	.043	12	.038	1.1	3.0
51AB131	" "	13	.036	17	.049	.74	3.5
51AB132	" "	15	.045	10	.030	1.53	3.2
51AB133	" "			checked well			
51AC3	Pseudotsuga taxifolia			"	"		
51AC4	" "			"	"		
51AC6	" "			"	"		
51AC8	" "			"	"		
51AC10	Pinus ponderosa			"	"		
51AC15	" "			"	"		

Apparently some of the copper results previously sent were high, perhaps owing to some slight changes in the asking procedure necessitated by mass production. Samples repeated at the same time checked fairly well, but were lower when repeated recently.

Results on the present list checked well when repeated several times recently, and also conform better with results obtained for similar plants in previous years. Therefore I feel these are much more reliable. Any figures on this repeat list are to be used instead of those formerly sent.

As the trouble occurred mainly in groups of ashings it is safe to assume that if all the samples repeated from one ashing agree, the first results from the entire ashing are correct.

The sage samples, especially above AB150, are also presenting difficulties as it is almost impossible to tell which years growth we are dealing with. The trace element content of sage, especially in a positive area, would likely be affected by the seasons rainfall more than that of trees such as pine or fir, because the sage roots might not penetrate as deeply. Results for any one year would be comparable with each other, but not with those of different years.

A few corrections on O.D.E. samples will follow. All W samples have checked very well for both copper and zinc.

SAMPLES RECEIVED FROM GERRY NOEL, KAMLOOPS, B.C.

2nd YEAR TWIGS (ARTEMISIA TRIDENTATA)

SAMPLE (1951)		PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash
51-AB-90	A.Tridentata	25	.1	10	.04	2.5	2.5
91	" "	17	.072	10	.043	1.65	2.3
92	" "	15	.07	10	.046	1.5	2.2
93	" "	23	.09	11	.043	2.1	2.6
94	" "	25	.079	10	.032	2.5	3.2
94(a)	Pinus Ponderosa	7½	.033	8½	.038	.88	2.3
95	A. Tridentata	22	.075	10	.033	2.3	2.9
96	" "	24	.096	9	.037	2.6	2.5
97	" "	21	.093	13	.057	1.6	2.2
98	" "	30	.11	14	.049	2.2	2.8
99	" "	24	.102	8	.035	2.9	2.3
100	" "	27	.106	14	.056	1.9	2.5
101	" "	20	.07	13	.046	1.5	2.9
102	" "	19	.073	9	.035	2.1	2.6
103	" "	12	.040	8	.028	1.4	2.9
104	" "	16	.058	8	.029	2.0	2.8
105	" "	14	.051	9	.033	1.6	2.8
106	" "	16	.059	5	.019	3.1	2.7
107	" "	18	.070	11	.042	1.7	2.5
108	" "	17	.067	12	.045	1.5	2.6
109	" "	12	.032	17	.046	.71	3.7
109(a)	Pinus Ponderosa	7½	.033	19	.080	.41	2.3
110	A. Tridentata	12	.043	14	.053	.82	2.7
111	" "	15	.045	16	.050	.91	3.2
112	" "	8½	.032	10	.038	.85	2.7
113	" "	22	.069	14	.044	1.6	3.2
114	" "	26	.093	12	.043	2.2	2.8

2nd YEAR TWIGS (ARTEMISIA TRIDENTATA)

SAMPLE (1951)	PPM Cu	% Cu in Ash	PPM Zn	% Zn in Ash	Ratio Cu/Zn	% of Ash
51-AB-115 A. Tridentata	27	.090	14	.047	1.9	3.0
116 " "	23	.090	11	.043	2.1	2.6
117 " "	25	.086	15	.053	1.6	2.9
118 " "	18	.069	11	.042	1.6	2.6
119 " "	25	.089	9	.033	2.7	2.8
120 " "	23	.072	10	.031	2.3	3.2
121 " "	14	.041	13	.038	1.1	3.4
122 " "	16	.055	11	.038	1.5	2.9
123 " "	21	.070	20	.068	1.0	3.0
124 " "	18	.059	20	.068	0.87	3.0
125 " "	15	.049	14 1/2	.048	1.0	3.1
126 " "	18	.056	17	.053	1.1	3.1
127 " "	16	.056	11	.039	1.5	2.9
128 " "	21	.056	15	.039	1.5	3.8
129 " "	16	.042	12	.033	1.3	3.7
130 " "	16	.051	15	.045	1.1	3.3
131 " "	15	.045	16	.046	.97	3.4
132 " "	20	.067	11	.038	1.8	2.9
133 " "	10	.030	17	.051	.59	3.4

SAMPLES RECEIVED FROM G. NOEL, KAMLOOPS, B.C.

SAMPLE(1951)		PPM Cu	% Cu in ash	PPM Zn	% Zn in ash	Ratio Cu/Zn	% of ash
51-AB-134	Artemisia tridentata	12	.038	14	.043	.90	3.2
135	"	11	.040	12	.044	.92	2.8
136	"	14	.041	15	.044	.93	3.4
137	"	11	.036	10	.032	1.1	3.1
138	"	11	.036	15	.047	.77	3.2
139	"	14	.042	14	.041	1.0	3.4
140	"	17	.050	26	.074	.67	3.5
141	"	11	.028	14	.034	.82	4.1
142	"	13	.038	19	.055	.69	3.4
143	"	11	.033	16	.046	.72	3.5
144	"	12	.036	16	.048	.75	3.3
145	"	5	.014	21	.058	.24	3.6
146	"	9	.025	16	.046	.54	3.4
147	"	9	.027	21	.068	.41	3.1
148	"	10	.022	19	.042	.51	4.4
149	"	10	.024	19	.044	.54	4.2
150	"	12	.033	15	.042	.80	3.6
151	"	9	.025	16	.043	.59	3.7
152	"	12	.033	18	.054	.62	3.5
153	"	9	.032	16	.052	.61	3.0
154	"	10	.031	15	.043	.70	3.5
155	"	13	.031	8	.019	1.62	4.1
156	"	10	.029	16	.047	.63	3.4
157	"	11	.036	18	.057	.63	3.1
158	"	12	.036	19	.057	.63	3.4
159	"	14	.043	17	.052	.82	3.3
160	"	14	.047	18	.060	.78	3.0

SAMPLES RECEIVED FROM G. NOEL, KAMLOOPS, B.C.

SAMPLE(1951)		PPM Cu	% Cu in Ash	PPM Zn	% Zn in ash	Ratio Cu/Zn	% of ash
51-AB-161	Artemisia tridentata	17	.048	18	.049	.97	3.6
162	"	16	.056	17	.058	.97	3.0
163	"	16	.045	18	.051	.89	3.5
164	"	11	.029	15	.039	.73	3.8
165	"	18	.051	14	.040	1.28	3.5
166	"	13	.037	20	.059	.63	3.4
167	"	13	.040	18	.056	.71	3.2
168	"	14	.040	15	.045	.90	3.4
169	"	12	.033	21	.058	.57	3.7
"	"	12	.030 ?	16	.042	.72	3.8
170	"	11	.032	15	.046	.70	3.3
171	"	15	.045	16	.049	.91	3.3
172	"	12	.032	18	.047	.67	3.8
173	"	14	.037	16	.042	.88	3.8
174	"	15	.039	14	.038	1.04	3.7
175	"	13	.037	14	.039	.93	3.5
176	"	12	.035	14	.041	.86	3.4
177	"	14	.033	17	.043	.77	4.0
178	"	12	.035	19	.054	.65	3.4
179	"	12	.038	11	.033	1.10	3.3
180	"	12	.033	15	.043	.77	3.7
181	"	10	.027	18	.044	.56	3.7
182	"	11	.033	15	.044	.74	3.5
183	"	12	.031	11	.030	1.04	3.8
184	"	12	.030	15	.035	.86	4.2
185	"	8	.023	15	.042	.53	3.5
186	"	10	.027	17	.044	.62	3.8

SAMPLES RECEIVED FROM G. NOEL, KAMLOOPS, B.C.

SAMPLE (1951)		PPM Cu	% Cu in Ash	PPM Zn	% Zn in ash	Ratio Cu/Zn	% of ash
51-AB-187	Artemisia tridentata	8	.021	17	.045	.47	3.7
188	"	8	.024	18	.051	.47	3.5
189	"	9	.023	22	.054	.42	3.1
190	"	8	.023	22	.061	.37	3.5
191	"	8	.023	18	.051	.44	3.5
192	"	7	.020	18	.049	.40	3.6
193	"	9	.025	14	.038	.64	3.6
194	"	11	.026	13	.031	.84	4.0
195	"	9	.024	14	.037	.64	3.8
196	"	7½	.021	20	.056	.37	3.6
197	"	9	.021	20	.046	.46	4.2
198	"	9	.020	18	.038	.51	4.5
199	"	10	.026	16	.042	.63	3.8
200	"	9	.023	15	.039	.60	3.8
201	"	12	.034	24	.069	.50	3.5
202	"	11	.031	16	.046	.69	3.5
203	"	9	.023	16	.040	.59	4.0
204	"	10	.029	16	.046	.63	3.5
205	"	11	.030	20	.052	.57	3.8
206	"	9	.024	15	.040	.60	3.8
207	"	8	.019	16	.039	.47	4.1
208	"	10	.032	11	.035	.91	3.1
209	"	10	.031	15	.046	.67	3.2
210	"	13	.041	15	.045	.90	3.2
211	"	12	.040	15	.048	.83	3.1
212	"	12	.041	14	.048	.86	2.9
213	"	11	.03	11	.03	1.0	3.7
214	"	15	.046	15	.047	.99	3.2

SAMPLES RECEIVED FROM G. NOEL, KAMLOOPS, B.C.

SAMPLES (1951)		PPM Cu	% Cu in Ash	PPM Zn	% Zn in ash	Ratio Cu/Zn	% of ash
51-AB-215	Artemisia tridentata	15	.038	10	.026	1.50	3.8
216	"	13	.034	20	.051	.67	3.8
217	"	12	.035	16	.046	.75	3.5
218	"	14	.036	17	.045	.80	3.7
219	"	11	.032	11	.032	1.0	3.5
220	"	11	.029	13	.035	.80	3.5
221	"	14	.044	10	.033	1.40	3.2
222	"	16	.043	25	.067	.65	3.7
223	"	15	.045	24	.071	.62	3.4
224	"	12	.038	10	.032	1.20	3.0
225	"	16	.049	13	.039	1.20	3.3
226	"	15	.043	11	.032	1.30	3.4
227	"	20	.047	19	.045	1.05	4.2
228	"	15	.044	17	.047	.91	3.6
229	"	15	.042	18	.051	.83	3.6
230	"	16	.069	14	.052	1.20	2.6
231	"	17	.052	19	.059	.90	3.2
232	"	17	.046	20	.054	.85	3.6
233	"	18	.052	15	.044	1.20	3.5
234	"	20	.061	14	.044	1.4	3.2
235	"	20	.059	17	.050	1.2	3.5
236	"	12	.041	7	.023	1.8	3.1
237	"	20	.049	15	.038	1.3	4.0
238	"	17	.046	18	.051	.95	3.5
239	Pseud. taxifolia	12	.029	54	.13	.22	4.1
240	Populus premuloids	15	.043	42	.12	.36	3.5
241	Pseudo. taxifolia	10	.039	31	.15	.34	2.7

SAMPLES RECEIVED FROM G. NOEL, KAMLOOPS, B.C.

SAMPLE(1951)	PPM Cu	% Cu in ash	PPM Zn	% Zn in ash	Ratio Cu/Zn	% of ash
51-AB-242 Pinus ponderosa	5	.027	29	.14	.19	2.0
243 Amel. alnifolia	12	.045	53	.10	.45	2.7
244 Pinus ponderosa	9	.037	41	.18	.21	2.3
245 Pseud. taxifolia	15	.063	59	.26	.25	2.3
246 Populus tremuloids	7	.023	17	.059	.39	2.8
247 Amel. alnifolia	9	.039	20	.089	.43	2.3
51AB Dean 2						
Pseudotsuga taxifolia *	10	.040	29	.12	.35	2.5

* This sample was repeated. Both copper and zinc checked well.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 60 MAP #1

KENNCO EXPLORATIONS LTD		
Date August 1/51	POTHOOK GROUP KAMLOOPS MINING DIVISION BRITISH COLUMBIA	Drawn by GAN RTP
Scale 1 inch - 100 ft.		Revised


Alton No 7 MC
Alton No 5 MC
Alton Fraction MC
Alton No 1 MC
Alton No 3 MC
Alton No 4 MC
Alton No 2 MC
Alton No 6 MC