1705

KENNCO EXPLORATIONS, (WESTERN) LIMITED

Report on

Geological and Soil Geochemical Surveys

Kemess No. 1, 2, 3, Groups
(Kemess Mineral Claims 1 to 96)

Situated 5 miles east of north end of Thutade Lake
British Columbia

57° 126° SW

by

R.W. Stevenson, P. Eng.

June 24 to September 17, 1968

December 2, 1968

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Kemess No. 1, 2, 3, Groups

Kemess Mineral Claims No. 1 to 96 (incl.)

Group No. 1 (36)Claims

Claim No.	Rec. No.	Record Date	Geological Work Each Claim	Soil Geochem. Work Each Claim	Years Applied
1	56981	Dec.12/67	$50.00	$	
2	56982	"	50.00		
3	56983	"	50.00		
4	56984	"	50.00		
5	56985	"	50.00		
6	56986	"	50.00		
7	56987	"	50.00		
8	56988	"	50.00		
10	56990	"	50.00	79.88	
19	56999	"	50.00		1
21	57001	"	50.00		1
23	57003	"	50.00		1
25	57005	"	40.00		
26	57006	"	40.00		
27	57007	"	40.00		
28	57008	"	40.00		
29	57009	"	40.00		
30	57010	"	40.00		
31	57011	"	40.00		
32	57012	"	40.00		
33	57013	"	40.00		1
34	57014	"	40.00		1
35	57015	"	40.00		1
36	57016	"	50.00		1
37	57017	"	40.00		1
38	57018	"	40.00		1
39	57019	"	40.00		1
40	57020	"	40.00		1
41	57021	"	40.00		1
42	57022	"	50.00		1
43	57023	"	40.00		1
44	57024	"	50.00		1
45	57025	"	40.00		1
46	57026	"	50.00		1
95	57075	"	50.00		
96	57076	"	50.00		
Total for Kemess No. 1 Group			$1,620.00	$79.88	17 years

Group No. 2

Claim No.	Rec. No.	Record Date	Geological Work Each Claim	Soil Geochem Work Each Claim	Years Applied
9	56989	Dec.12/67	$50.00	$319.50	1
11	56991	"	50.00	177.50	1
12	56992	"	50.00	204.12	1
13	56993	"	50.00		
14	56994	"	50.00		1
15	56995	"	50.00		
16	56996	"	50.00		
17	56997	"	50.00		
18	56998	"	50.00		
20	57000	"	60.00		1
22	57002	"	50.00		1
24	57004	"	50.00		1
57	57037	"	60.00		
58	57038	"	60.00		
59	57039	"	60.00		
60	57040	"	60.00		
61	57041	"	60.00		
62	57042	"	60.00		
63	57043	"	60.00		
64	57044	"	60.00		
65	57045	"	60.00		1
66	57046	"	60.00		1
67	57047	"	50.00		1
68	57048	"	50.00		1
79	57059	"	50.00		1
80	57060	"	50.00		1
81	57061	"	50.00		1
82	57062	"	50.00		1
83	57063	"	50.00		1
84	57064	"	43.00		1
85	57065	"	40.00		1
86	57066	"	40.00		1
87	57067	"	40.00		1
88	57068	"	40.00		1
89	57069	"	40.00		1
90	57070	"	40.00		1
91	57071	"	40.00		1
92	57072	"	40.00		1
93	57073	"	40.00		1
94	57074	"	40.00		1
Total on Kemess No. 2 Group			$2,003.00	$701.12	27 years

Group No. 3

Claim No.	Rec. No.	Record Date	Geological Work Each Claim	Soil Geochem Work Each Claim	Years Applied
47	57027	Dec.12/67	$60.00	$	1
48	57028	"	60.00		1
49	57029	"	60.00	185.98	1
50	57030	"	60.00	46.50	1
51	57031	"	60.00	130.18	1
52	57032	"	60.00	83.68	1
53	57033	"	60.00		1
54	57034	"	60.00	362.66	1
55	57035	"	60.00		1
56	57036	"	60.00		1
69	57049	"	60.00		1
70	57050	"	60.00		1
71	57051	"	60.00		1
72	57052	"	60.00		1
73	57053	"	60.00		1
74	57054	"	60.00		1
75	57055	"	60.00		1
76	57056	"	60.00		1
77	57057	"	60.00		1
78	57058	"	60.00		1
Total on Kemess No. 3 Group			$1,200.00	$809.00	20 years

STATEMENT OF COSTS INCURRED

Geological Survey

A detailed explanation of how the geological survey expenditures were incurred is given under the section titled Geological Survey, Field Work.

The total cost of the geological survey on Kemess No. 1, 2, and 3 Groups is as follows:

Topographic map at 1" = 800'	$ 620
Air photo enlargements (2 at 1"=800')	32
Wages: R.W. Stevenson-June 24,26,28-30;July 1,3-6,9,11-13,24,30; Aug. 24,26-29,31; Sept.1,4,9-11,13,17 @ $35/d.	1015
J.H. Koo: June 24,26,28-30;July 1,3-6,9,11-13, 24,30;Aug.12-14; 24-29;31;Sept.1,4,9-11,13,17 @ $32.d.	1056
M. Murison-June 24,26,28-30;July 1,3,4-6,12,13, 24,30. @ $18/day.	252
M. Vreugde-June 26,28; July 9 @ $21/day	63
S.C. Gower- July 6 @ $24/day	24
A. R. Pudsey-July 12 @ $23/day	23
Helicopter set-out 12:25 hours @ $140/hour	1738
Total	$4823

The geological survey was distributed on the three claim groups as follows:

Kemess No. 1 claim group	$1,620
Kemess No. 2 claim group	2,003
Kemess No. 3 claim group	1,200
	$4823

The amount expended on each claim is shown on the list of claims.

Soil Geochemical Survey

A detailed explanation of how the soil geochemical survey expenditures were incurred is given under the section titled Geochemical Survey Field Work.

The total cost of the soil geochemical survey on the north soil grid on Kemess No. 1 and 2 Groups is as follows:

Chemical analysis of 88 samples-Cu,Mo,Zn,Pb	$ 352
Wages: R.W. Stevenson - July 28, 29 @ $35/day	70
J.H. Koo - July 28, 29 @ $32/day	64
A.R. Pudsey - July 28 @ $23/day	23
M. Murison - July 29 @ $18/day	18
M. Vreugde - August 21 @ $21/day	21
Helicopter set-out 1:40 hours @ $140/hour	233
	$781

The northern soil geochemical survey was distributed on the two claim groups as follows:

Kemess No. 1 claim group	$ 79.88
Kemess No. 2 claim group	701.12
	$781.00

The amount expended on each claim is shown on the list of claims.

The total cost of the soil geochemical survey on the south soil grid on Kemess No. 3 Group is as follows:

Chemical analyis of 87 samples - Cu, Mo, Zn, Pb.	$348
Wages: R.W. Stevenson - August 20,21,25 @ $35/day	105
M. Murison - August 20, 21 @ $18/day	36
S.C. Gower - August 20, 21 @ $24/day	48
I. McDougall - August 25 @ $20/day	20
B. Hanger - August 25 @ $19/day	19
Helicopter set-out 1:40 hours @ $140/hour	233
	$809

The expenditure on the southern soil geochemical survey was entirely on Kemess No. 3 claim group.

The total amount expended on both north and south grids was $781 + $809 = $1,590

INTRODUCTION

The mineral property discussed in this report is about five miles east of the north end of Thutade Lake, B.C. The exploration work done on these claims during the period June 24 to September 17, 1968, consisted of geologic mapping and soil sampling.

The work was done under the supervision of R.W. Stevenson, P. Eng. Part of the geological mapping was done by J. H. Koo, who has a Master of Science degree in geology from the University of British Columbia.

LOCATION & ACCESS

The property is situated at Latitude 57°04'N; Longitude 126°44'W. This is five miles east of Thutade Lake, and two miles south of Attycelley Creek. Elevations range from 4700' to 6490' above sea level. Much of the property is above tree line. Most of the forest cover is Alpine Fir. In general, the topography is only moderately rugged, but there is a line of north-facing cirque cliffs trending east-west across the center of the property, and sharp ridges extending north from this.

Access to this area is by fixed-wing aircraft from Smithers (i.e., Maclure Lake) to a long narrow lake just west of the property, a one-way distance of 165 miles. This lake is at 4200' elevation; and in 1968, the ice on it began to break up on June 11. Final access to the property is by helicopter. Access on foot is restricted somewhat because of the 2200' difference in elevation between the lake camp and the center of the property, and because the property is traversed by a series of high north-south ridges, and a series of east-west cirque cliffs.

The cost of flying supplies from Smithers is 18 cents per pound by Otter aircraft, and 20 cents per pound by Beaver aircraft.

GEOLOGICAL SURVEY

Geological Survey Field Work

In planning how to conduct the geologic mapping, the following factors were taken into consideration. (1) Conventional picket lines could not be used for ground control because of the rugged topography along the cirque cliffs and the north-south ridges. However, small, isolated grids were used for soil sampling flat, drift-covered areas. (2) Most of the claim area is above tree-line; outcrops are plentiful where the topography is rugged; and ground positions are easily identifiable on air photos. (3) Horizontal control would be required because of distortion on the photos due to elevation. (4) Vertical control would be required to record mineral zoning, and changes in apparent strike of flat-dipping contacts and structures.

B.C. Government Air photos on a scale of 1 inch = 2640' (approximately) were available and were employed as enlargements on a scale of 1 inch = 800 feet.

In order to obtain the necessary horizontal and vertical accuracy, a contour map was prepared by Lockwood Surveys on a scale of 1 inch = 800 feet with 50-foot contour intervals, and a black-line transparency was made from the manuscript map. Field mapping was done on the appropriate portions of two 1" = 800' photo enlargements which covered the claim area. The outcrop outlines were transferred to the topographic map by superimposing the drainage and contour lines on the appropriate part of the photo enlargement. This proved to be a rapid and accurate means of eliminating the distortion and local scale-change inherent in portions of the air photo enlargements. On the final geological map prepared for this report, only the 250-foot contours were drawn so as to avoid obscuring the geological information.

In order to spend the maximum time mapping, and the minimum time travelling, the mapping parties were set out and picked up by helicopter. The horizontal distance from camp to the map area is from ½ mile to 4 miles; the vertical range is from 1000 feet to 2300 feet. Helicopter set-out required flights of 10 to 20 minutes; whereas ground access would have required unproductive walking time of one to six hours each day. The helicopter was based at the camp on other work, and so there was no problem of daily minimum charges.

On the entire property, outcrop was found and mapped on 91 of the 96 claims. Subdividing this according to claim groups, outcrop was found and mapped on 35 of the 36 claims in Kemess No. 1 claim group; on 36 of the 40 claims in Kemess No. 2 claim group; and on all 20 of the claims in Kemess No. 3 claim group.

GEOLOGY

Regional Geology:

The property is on a northwest trending belt of Takla Group volcanics of intermediate composition, probably of Upper Triassic age. The volcanics are intruded by large stocks of granodiorite and diorite which are part of the Omineca intrusions.

Lithology:

Approximately half the property is underlain by volcanic rocks. These have been intruded by diorite, quartz monzonite porphyry, syenite porphyry, and leuco-granodiorite porphyry. Two basalt dykes were also observed.

The volcanic rocks are subdivided into three groups; fine to medium grained andesite, andesite porphyry, and pyroclastic andesite.

Fine-to medium-grained andesite is the most common type of volcanic rock, and occurs chiefly on the western half of the property. The colour is dark green. The contacts between fine-grained and medium grained phases are gradational. The ratio between the amounts of fine-grained and medium-grained phases is about 3 to 2. Both fine-grained and medium-grained phases are equigranular, but there are porphyritic phases with "medium-grained" phenocrysts and fine grained ground mass. The subhedral to euhedral, dark green, amphibole or pyroxene phenocrysts comprise up to 40% of the rock. The ground mass is a mixture of very fine-grained feldspar and mafics in approximately equal proportion. It is not as dark as the mafic phenocrysts.

Andesite porphyry occurs in the central part of the property. It comprises about one quarter of the volcanic rocks, but is transitional into the fine to medium-grained andesite. It is spectacularly porphyritic, with elongate, euhedral phenocrysts of light grey plagioclase ranging in size from 1/30" x 1/5" to 1/5" x 4/5", and in amount from 40% to 50% of the total volume. The groundmass is greenish black, and very fine grained.

Pyroclastics occur in two places on the property. The smaller body underlies part of claims 53 and 55 in the center of the property. The larger body comprises the northeastern part of the volcanic rocks, being approximately equal in areal extent to the andesite porphyry. The pyroclastic rocks are almost entirely eruptive breccias. A few small patches of agglomerate and tuff occur on claims 22, 24, and 65; but these are probably large boulders included in the breccia, because they tend to be equidimensional and are not more than ten feet across.

The tuff is a blue-grey fragmental rock, with appreciable free quartz. The agglomerate has a light - grey matrix containing sub-rounded fragments (up to 2") which are similar in texture to, but slightly darker than, the matrix. No bedding was observed. The mapped occurrences of tuff and agglomerate have a general east-west trend, but this may be only an apparent trend related to better rock exposure along a cliff rather than being the trend of a particular horizon.

The breccia on the northeastern part of the property has a matrix of dark-green, fine-grained andesite. Breccia fragments comprise up to two thirds of the rock. In places, these are entirely of the fine-to medium-grained andesite. But on claims 65, 22, and 42-44, approximately half the fragments are of andesite porphyry. The breccia fragments generally range in size from one quarter of an inch to four inches, are angular or sub-angular, and are randomly oriented. It appears to be an eruptive breccia in which lava has incorporated blocks of somewhat older volcanics which had been fractured by processes of cooling, or weathering. This interpretation is further substantiated by the presence of xenoliths of andesite breccia in the syenite porphyry on claim 45; this shows that brecciation of the andesite was certainly pre-intrusive in age. The contact between breccia and andesite porphyry on claim 65 is obscured by debris, but considering the frequency of andesite porphyry fragments in the breccia, it could be either a flow contact, or a volcanic-vent intrusive contact.

The breccia on claims 53 and 55 contains sub-angular fragments of medium-grained andesite and andesite porphyry, and sub-rounded fragments of syenite porphyry, in a fine-grained matrix. The contact with the adjacent andesite porphyry is sharp. The contact with the fine-to medium-grained andesite is obscured by debris. The syenite porphyry fragments indicate a post-intrusive age, and tectonic origin, for this breccia.

Diorite underlies the northwest corner of the property, intruding the older volcanics. Intrusive contacts between diorite and andesite were observed on claims 3 and 32. The diorite is a light-pinkish, medium-grained rock composed mainly of subhedral to anhedral feldspar (70%) and euhedral biotite (30%). At the chilled contact with andesite on claim 32 the diorite contains up to 15% fine-to medium-grained quartz.

Rock of similar appearance also occurs on claims 71 to 74 and 78 associated with, and gradational into, the quartz-monzonite porphyry described below. The largest body is on claim 78, and is

200 feet in diameter. The other bodies are several tens of feet across, and are too small to be mapped. This rock is weakly porphyritic, with occasional feldspar phenocrysts. It may be a differentiate of the same body of magma from which the quartz-monzonite porphyry solidified, or it may be a pre-existing diorite metasomatized by the quartz-monzonite porphyry.

Quartz-monzonite porphyry cuts across the volcanic rocks on the south side of the property, and underlies the southern slope adjacent to the upland south of the cirques. A chilled contact with the andesite was observed at several places. A fault contact with the andesite porphyry occurs on claim 66. The quartz-monzonite porphyry forms an elongate intrusive about 1600 to 2400 feet wide, and more than 13,000 feet long, with a trend of N 65°E. It is a grey porphyritic rock made up of 80% feldspar,10% amphibole, 7% quartz, and 3% biotite. The phenocrysts consist of grey, medium-grained (1/10" x 3/10") feldspar. They comprise 50% to 60% of the total rock volume. Occasionally, medium grained, dark-green amphibole grains form several scattered phenocrysts. However, most of the amphibile is a component of the groundmass with fine-grained feldspar. Quartz grains are grey, euhedral, and intermediate in size between the groundmass and the feldspar phenocrysts. They vary in volume up to 25%, with 7% as an average.

This rock also occurs as dykes cutting andesite on claims 47, 49, 51, 64, 69, 70, 84 and 86. They trend north-south or northeast, and are one foot to ten feet wide. The widest dyke is on claims 47-69-70. These dykes differ from the main intrusive only in their finer grain size.

Syenite porphyry intrudes the volcanics along the northern third of the east boundary of the property. Smaller bodies intrude the volcanics near the center of the property. The phenocrysts consist mainly of medium-grained, subhedral to euhedral, pink or white feldspar; although a few phenocrysts are dark-green, medium-grained, subhedral amphibole. The ground-mass is composed of pink, fine-grained feldspar. The volume ratio between phenocrysts and groundmass is usually about 1 to 1. The amount of mafics (mainly amphibole) ranges from 5% to 25%. The higher mafic content occurs in the syenite porphyry at the east end of the property.

Some of the smaller bodies of syenite porphyry have intruded up pre-existing faults; (on claim 20) although later faults also cut the syenite. One small body intrudes the diorite just north of claim 29, indicating that the syenite porphyry is younger than the diorite.

The age of the syenite porphyry relative to the quartz-monzonite porphyry is not known; however, some phases of the rock types are similar, and it is possible that they were derived from the same source.

Leuco-granodiorite porphyry occurs in three small bodies, ranging in size from 50' x 100' to 300' x 400', which intrude the andesite on claims 54 and 56. The rock is composed of 75% feldspar and 25% quartz, almost all of the quartz occurring as phenocrysts. The feldspar grains are light grey or white, euhedral to subhedral, and medium to coarse-grained. The quartz grains are up to 1/3" long, and are cloudy to glassy, euhedral, medium to coarse-grained, and noticeably fractured. The rock as a whole is coarse grained with conspicuous quartz eyes. It is somewhat similar to that phase of the quartz-monzonite porphyry which has a high quartz content; although it is deficient in mafics and has a coarser texture. Judging by the degree of fracturing, it appears to be similar in age to the quartz-monzonite porphyry and syenite porphyry.

Basalt dykes cut the volcanics at two places on the property. Near the south side of claim 14, fine-grained andesite is cut by a 2-foot wide dyke of fine-grained, grey-black basalt which strikes N 10° E and has a vertical dip. On the boundary between claims 20 and 22, andesite breccia is cut by a 6-foot wide dyke of similar basalt which strikes N 80° E and has a vertical dip.

These dykes are obviously much younger than the other rocks. They are unfractured; whereas the adjacent andesite is fairly well fractured; and they contain no pyrite, which is fairly common in the rocks on the property.

Structure:

The volcanic rocks have been subjected to intense structural disturbance. Numerous faults, shears, and fractures were found in the map area. The intrusive rocks show much less structural disturbance than the volcanics probably because they are younger than the major faulting. No primary structures could be recognized in the volcanics, and thus their present structural attitude is not known.

Faulting is most prominent in an east-west direction, roughly parallel with cirque cliffs on claims 51,53,55,57,14 &59, 16&61, 63, and 20&65. Field evidence and photo linears indicate that a major fault, or fault system, extends from claim 49 to claim 20, a distance of about 10,000 feet on a strike of N 70° E. It is nearly parallel to the trend of the quartz-monzonite porphyry intrusive which is situated about 2400' to the south. The dip of this fault varies from 20°N to 70°N, with approximately 30°N predominating. Because of the flatish dip and the steep topography, the trace of the fault on surface is often a curved line, as on claim 49 where the dip is about 20° N, and on claim 51 where the fault cuts across a small spur with a dip of 30°N; and on claim 53 where the fault cuts across a ridge with a dip of 40° N, and on claim 20 where the dip varies from 20° N at lower elevation to 70°N at higher elevation. It is assumed from air photo linears that this fault cuts across the center of claim 14. Where it was observed in outcrop, the fault contains about six inches of fault gouge, and is bordered on each side by intense shearing about one foot wide. Numerous smaller faults have developed parallel to the major fault. Most of them dip to the south, but dips vary from 60° S to 60° N. Two such faults which have a vertical dip were observed on the north part of claim 47. They are part of a photo linear along the adjacent gulley. Because of their N 85°W strike and vertical dip, they are probably not part of the major east-west fault, but they could be either minor faults parallel to a continuation of the major fault, or "horsetailing" at the west end of the major fault.

Many transverse faults occur along both sides of the major east-west fault. Most of the transverse faults were found on the south side of the major fault, but this is probably because they are more readily exposed on the cirque cliffs there. The transverse faults can be classed into three groups on the basis of strike. One group strikes north-south. The dips are mostly vertical, but range to 60° E. Another group has strikes ranging from N 25° E to N 45°E. The dips vary from 80° SE to 60° SE. The third group has strikes ranging from N 25° W to N 45° W. The dips vary from 70° NE to 50°NE on most of them, but a few dip to the southwest. The transverse faults are short; they have only been observed in the volcanics; and they are considered to be contemporaneous in age with the major east-west fault.

On claim 65, syenite porphyry has been intruded along part of the major east-west fault, showing that the fault is older than the porphyry intrusives. The east end of the syenite porphyry body narrows to a three-foot wide dyke intruding along the fault. For a short distance, there is a six-inch wide parallel dyke in the sheared volcanics. No evidence of post-intrusive movement on the fault was observed. If post intrusive movement did take place, it would probably be confined to the less competent volcanics, and evidence of it might be difficult to find. However, it seems certain that there was no large post-intrusive displacement at the east end of the major east-west fault. There is no evidence by which the age of the major fault can be related to the age of the diorite.

Several east-west trending photo linears on claims 4, 8, and 10 are assumed to represent other faults. Direct observations could not be made because of drift cover.

Several faults are clearly post-intrusive. Some of these cut syenite porphyry and extend into the volcanics near the east edge of the property, on claim 46. They dip 80° S.

A fault with strike N 40° E, and dip 70° NW, forms the boundary between quartz-monzonite porphyry and andesite porphyry on claim 66. This fault continues southwest into the quartz-monzonite porphyry. A surface linear indicates that it continues to the north-east across claim 24. From claim 66, one can observe a similar notch cutting the ridge just west of claim 23.

Shear zones are associated spatially with most of the faults. They develop up to about 10 feet wide parallel to the faults, most often within the volcanics. Where fracture systems are well developed, they are parallel to faults.

Alteration:

Silicification is widespread on the property. In places, intense silicification obscures the original features, and the rocks become white in colour. However, the original rock textures can be vaguely recognized by slight colour changes which correspond to the former mineral grain outlines.

Epidote is also widespread, occurring in veinlets along fractures as well as pervading the rock. In several places, small patches of andesite about 30' in diameter are intensely epidotized.

Laumontite is commonly present along fractures over most of the property area. It occurs in thin veinlets as aggregates of fine-grained, pink flakes. It does not pervade the wall rock. Although the hardness is 3½, it usually appears to be softer because of the friable nature of the mineral flakes. Laumontite is a monclinic zeolite; hydrous acid calcium-aluminum silicate $H_4CaAl_2(Si_2O_7)_2 \cdot 2H_2O$. Identification of the mineral was condirmed by Dr. J. A. Gower of the University of British Columbia, using x-ray diffraction.

Calcite is present in limited amounts in the central part of the property. It occurs in veinlets from hairline to 10 inches in width, but does not pervade the wallrock. The relatively thick veins usually consist solely of calcite. In the very thin veins, it was only recognized in association with other minerals such as laumontite, hematite, quartz, and/or epidote. Calcite is a minor component in these associations. Some laumontite-calcite veins cut epidote veins.

Specular hematite occurs in veins up to 10 inches wide in the transverse faults and fractures associated with the major east-west fault.

SOIL GEOCHEMICAL SURVEY

Geochemical Survey Field Work

Control Survey Lines

Two grids were established, the North Soil Grid on Kemess mineral claims No. 9 to 12, and the South Soil Grid on Kemess mineral claims Nos. 49 to 52 and 54. Each is on a relatively flat area surrounded by steeper topography; the North Grid area being a valley bottom, and the South Grid area being a small upland plateau. Both areas are above tree line, and no cutting of trees was necessary. Laths were used to mark the stations. The grid lines were run by chain and prismatic compass. This gave reasonably good control of the sample sites, with minimum expenditure.

On each grid, the baseline direction was N 10° W, and sample line direction was N 80° E. Crews were set out by helicopter so that virtually the entire day was spent on productive work. Elevation in the North Grid area is approximately 5400', and in the South Grid area is approximately 6000'. Base camp elevation was 4250'. A base map with scale 1" = 400' was compiled for use in plotting the sample results. Stations on the North Grid were numbered north from the zero point, and on the South Grid they were numbered south from the zero point, but the two grids are not related and could not be joined because of steep cliffs along the south boundary of claims 10 and 12.

Soil Sample Collection:

The samples were taken at 100-foot intervals along the grid lines. The location of the sample sites is shown on Plate No. 6. They were taken from the top of the "B" (rusty) horizon wherever possible. Exceptions to this occurred where the "A" (humus) horizon was the only horizon accessible, and in rocky places where sufficient soil could not be found to take a sample. Sample locations from which the "A" horizon was sampled are marked on the maps.

The samples were collected by digging a small hole with a trenching tool type of spade. By this means it was possible to see where the top of the "B" horizon was. The soil sample was then taken from the top of the "B" horizon, either with the tip of the spade, or with a small trowel.

A note was then made of the grid line location, the sample number, the depth to the top of the "B" horizon (or the depth of sample if only the "A" horizon could be reached), the direction of drainage, the type of vegatation (i.e., grass, or scrub forest) and the soil type.

Packaging:

The samples were placed in a 3" x 4½" brown paper envelope, on which the sample numbers had been marked. These were closed with a triangular triple fold. (The bags are not anomalous in trace metals).

Sample Preparation:

The samples were taken to the base camp, and were oven-dried at 80° C. They were then shipped to our laboratory in North Vancouver, where they were sieved through an 80 mesh size stainless steel screen. (These sieves do not show noticeable wear even after several thousand samples have been sifted.) The minus 80 mesh fraction was collected for all the analyses involved.

Analysis

The samples were analysed in the North Vancouver Laboratory of Kennco Explorations, (Western) Limited under the supervision of John Barakso.

A one gram sample is weighed to within ± 2 mgm. making a possible error of 2% at this stage. This is much more accurate than a volumetric scoop.

The sample is placed in a dry test tube, and 1 ml of reagent grade 70% nitric acid is added, or just enough to wet the sample. Four ml of reagent grade 70% perchloric acid ($H\ ClO_4.H_2O$) is added, and the sample is digested at 200° C on a hot plate for four hours. After cooling, the sample is diluted up to 50 ml with distilled water, agitated, and allowed to settle for two hours.

An aliquot of this solution is used for determination of copper, zinc, and lead by atomic absorption spectrophotometer.

An aliquot of this solution is also taken for determination of molybdenum. Ammonium thiocyanate, stannous chloride, and amyl acetate are added to the solution. Molybdenum forms a thiocyanate complex which is removed by solvent extraction in the amyl acetate. This is aspirated in the atomic absorption spectrophotometer to determine molybdenum.

Interpretation

Over most of the area, a good sample which was representative of the "B" horizon was obtained. The depth of overburden is probably about 15' to 30' over most of the areas sampled. Considering the type of soil, it would seem likely that soil geochemistry is a reliable technique on these parts of the property. The samples were analysed for total metal content in copper, molybdenum, zinc, and lead. Results from each grid area are discussed separately.

Sample stations that are considered to be background are uncoloured. Sample stations that are considered to be only weakly anomalous are coloured orange. The weakly anomalous levels are 150 ppm to 300 ppm for copper, 15 ppm to 30 ppm for molybdenum, 200 ppm to 400 ppm for zinc, and 100 ppm to 200 ppm for lead. Sample stations that are definitely anomalous are coloured red.

In the North Soil Grid area there appears to be a definite copper anomaly in the area shown by red cross-lining (Plate No. 2). The weakly anomalous stations east of the Base line on lines 16+00N and 20+00N may indicate underlying mineralization or may be the result of downhill seepage from the mineralization indicated under line 4+00N, 8+00N, and 12+00N. The molybdenum anomaly (Plate No. 3) is only partly co-extensive with the copper anomaly. Of particular interest is the fact that it extends further east than the copper, presumably indicating a change in the character of the underlying mineralization. Zinc (Plate No. 4), and lead (Plate No. 5) are only very weakly anomalous in restricted areas that tend to be on the periphery of the copper and molybdenum anomalies.

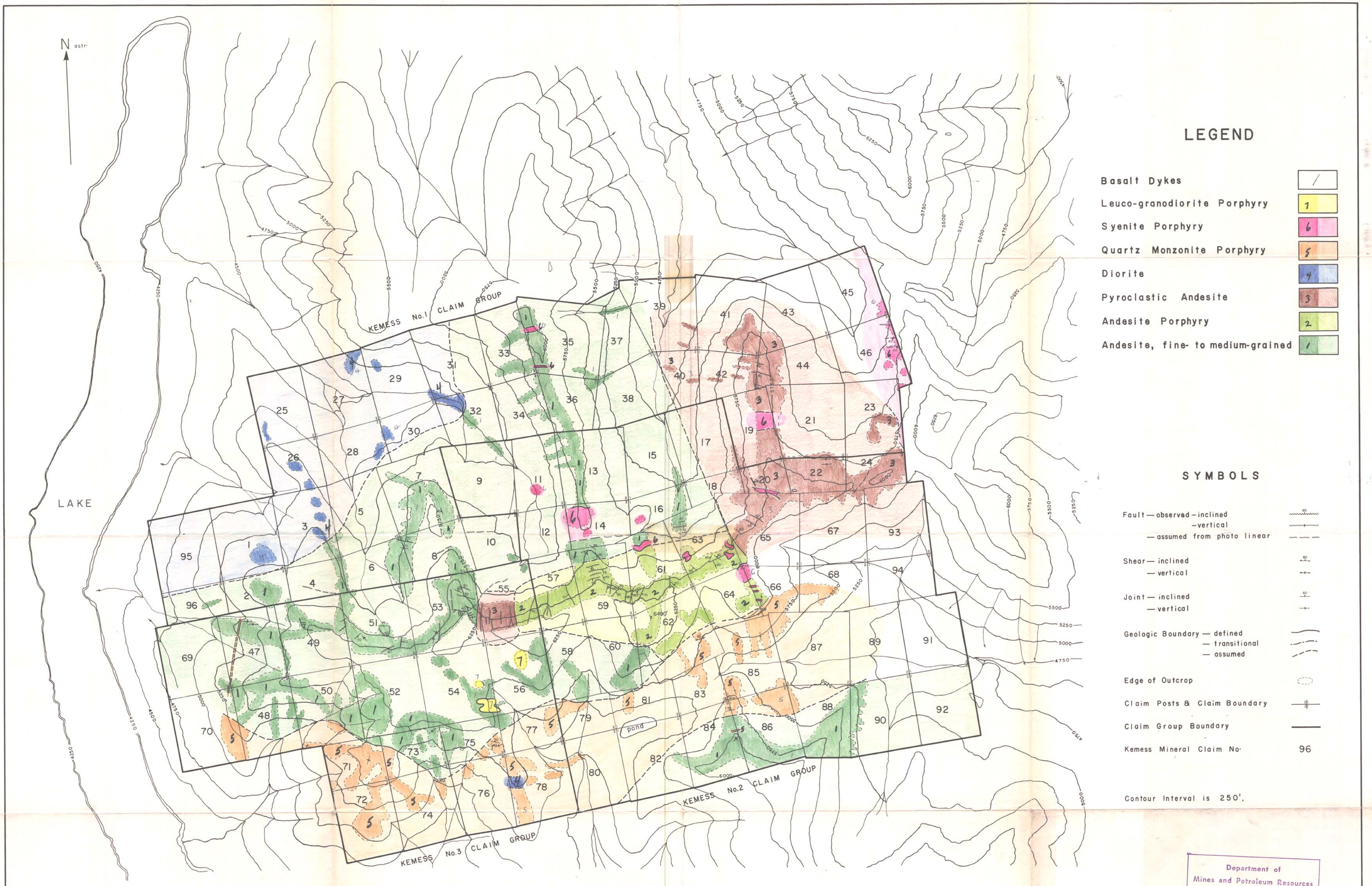
In the South Soil Grid area, there is a definite copper anomaly as shown by red cross-lining on lines 0+00S to 11+00S, and a separate anomaly on the west end of lines 16+00S and 20+00S. These anomalies are considered to be separate and different, even though the values in ppm copper are similar, because the anomaly patterns for other metals are different. Molybdenum is variably anomalous coincident with most of the northwestern copper anomaly, but is certainly not anomalous over the southeastern copper anomaly. Lead and zinc are not anomalous over the northwestern copper anomaly, and this corresponds with their behaviour (relative to copper and molybdenum) in the North Soil Grid area. Lead and zinc are anomalous coincident with the southeastern copper anomaly, and this indicates a change in the type of the underlying mineralization.

R. W. Stevenson

R. W. Stevenson.

Vancouver, B.C.

December 2, 1968

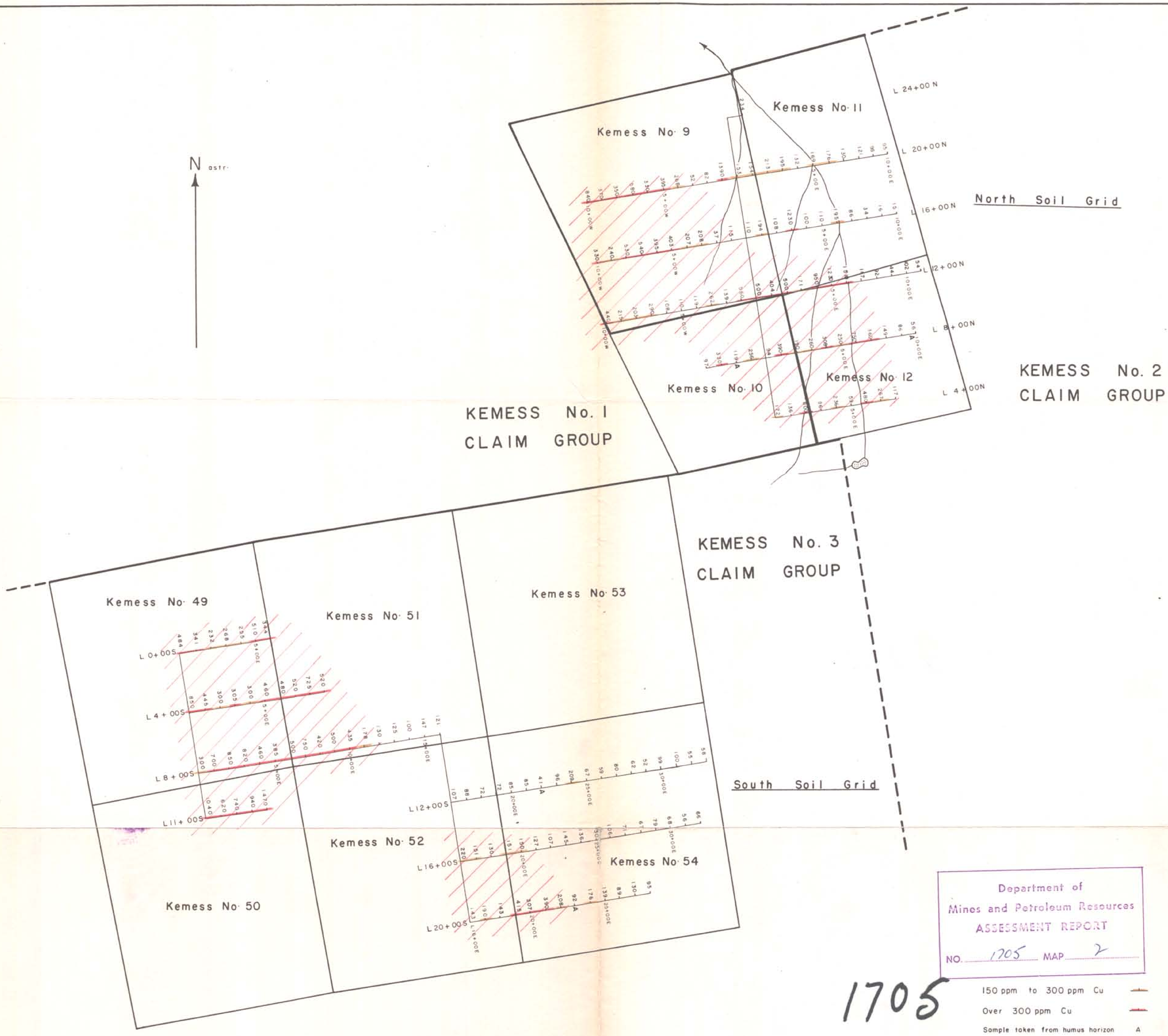


To accompany geological report by R. W. Stevenson, P. Eng., on the Kemess No. 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

1705

R. W. Stevenson

KENNCO EXPLORATIONS (WESTERN) LIMITED		
Kemess No 1, 2, and 3 Groups Kemess Mineral Claims No 1 to 96 Omineca M. D., B. C.		
GEOLOGICAL MAP		
DATE: Nov. 29	DRAWN BY: J.H.K.	PLATE NO.: 1
REVISED BY	DATE	SCALE: 1 inch = 800 feet



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1705 MAP 2

1705

150 ppm to 300 ppm Cu

Over 300 ppm Cu

Sample taken from humus horizon A

To accompany soil geochemical survey report by R. W. Stevenson, P. Eng., on the Kemess No 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

R.W. Stevenson

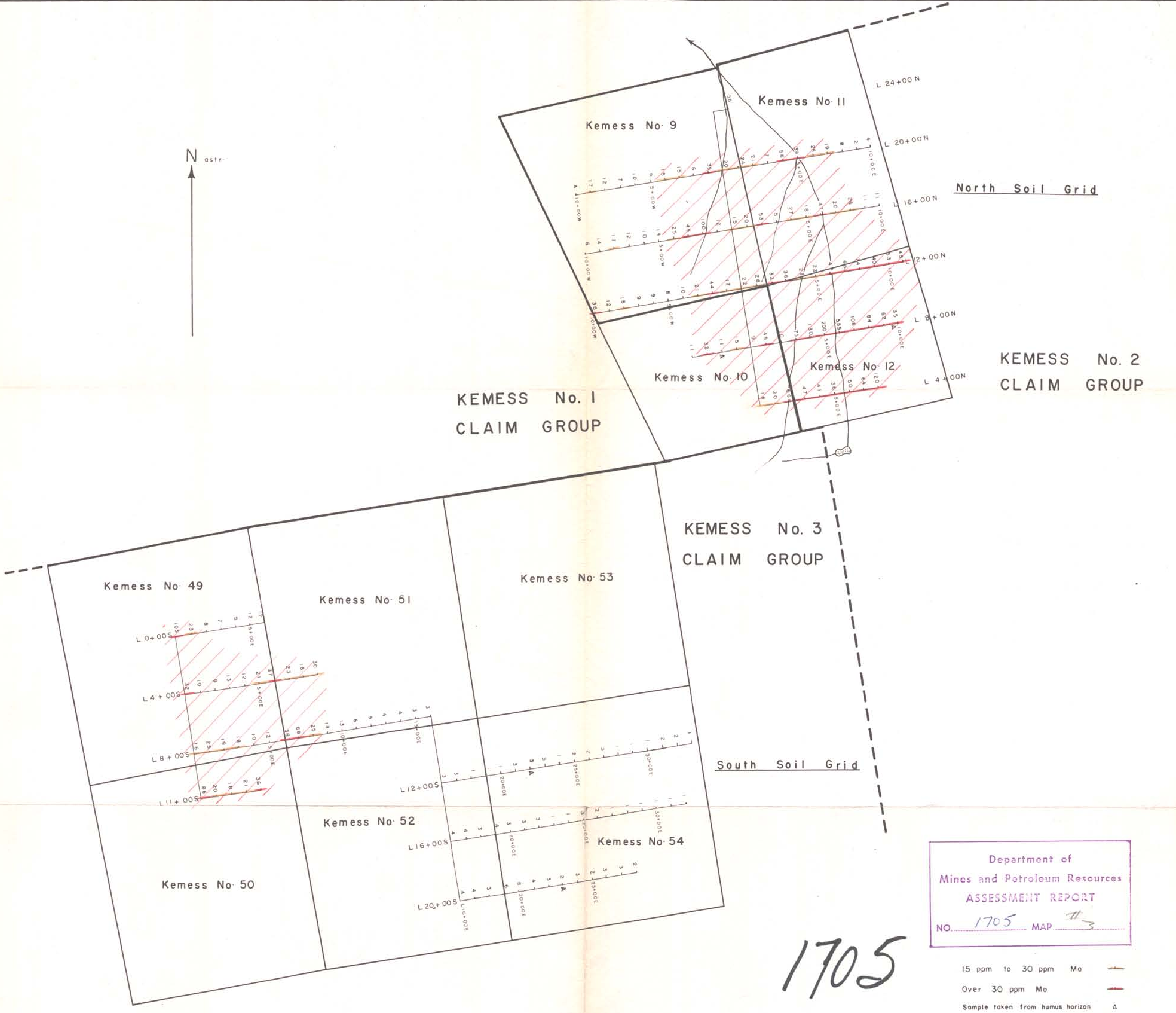
KENNCO EXPLORATIONS (WESTERN) LIMITED

Kemess No 1, 2, and 3 Groups
Kemess Mineral Claims No 1 to 96
Omineca M. D., B. C.

Soil Geochemical Survey

ppm COPPER IN SOIL

DATE: Nov. 29	DRAWN BY: J.H.K.	PLATE NO. 2
REVISED BY	DATE	SCALE: 1 inch = 400 feet



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1705 MAP #3

1705

15 ppm to 30 ppm Mo	
Over 30 ppm Mo	
Sample taken from humus horizon	A

To accompany soil geochemical survey report by R. W. Stevenson, P. Eng., on the Kemess No 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

R. W. Stevenson

KENNCO EXPLORATIONS (WESTERN) LIMITED

Kemess No 1, 2, and 3 Groups

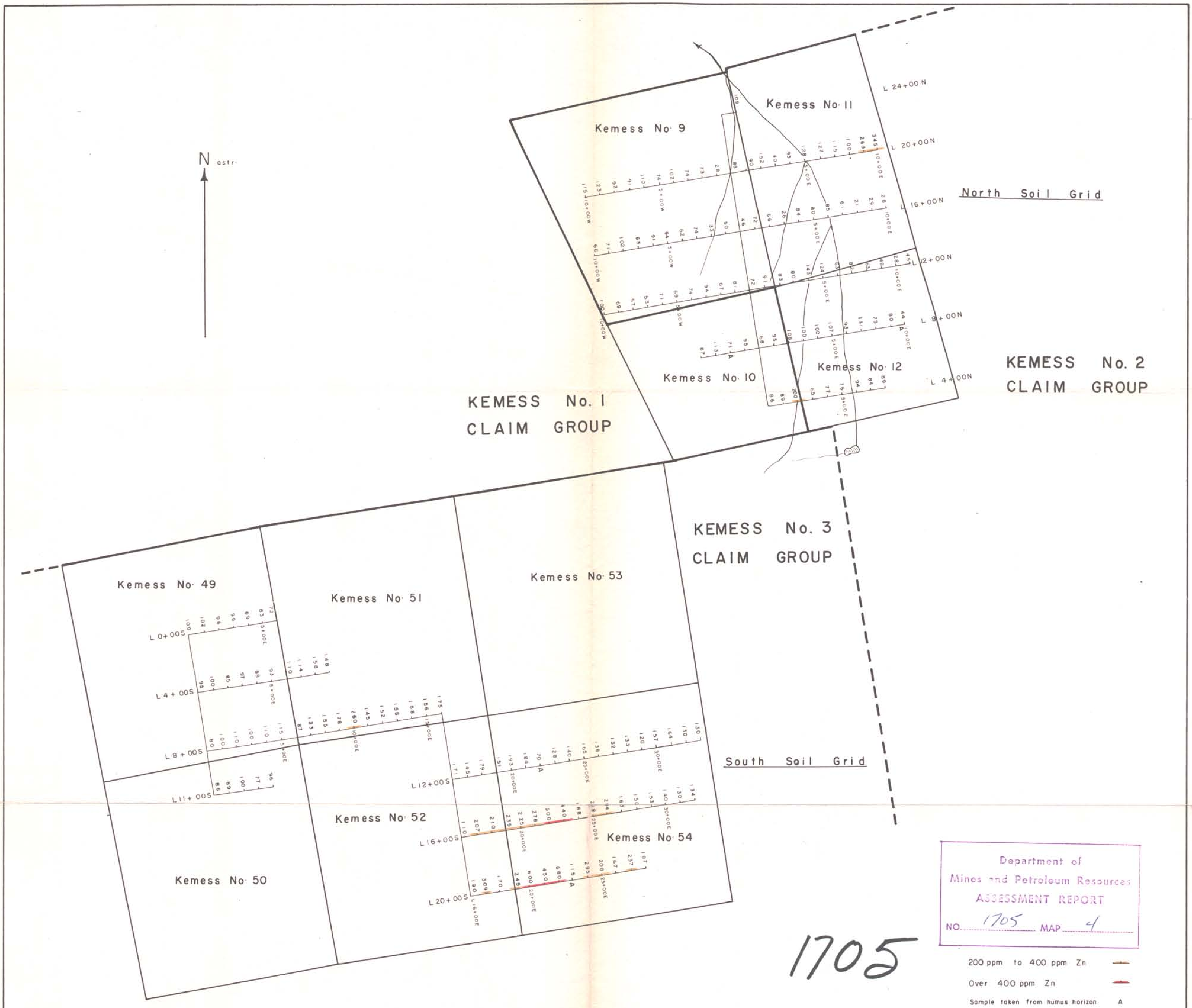
Kemess Mineral Claims No 1 to 96

Omineca M. D., B. C.

Soil Geochemical Survey

ppm MOLYBDENUM IN SOIL

DATE: Nov. 29	DRAWN BY: J. H. K.	PLATE NO. 3
REVISED BY	DATE	SCALE: 1 inch = 400 feet



To accompany soil geochemical survey report by R. W. Stevenson, P. Eng., on the Kemess No 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

KENNCO EXPLORATIONS (WESTERN) LIMITED

Kemess No. 1, 2, and 3 Groups

Kemess Mineral Claims No. 1 to 96

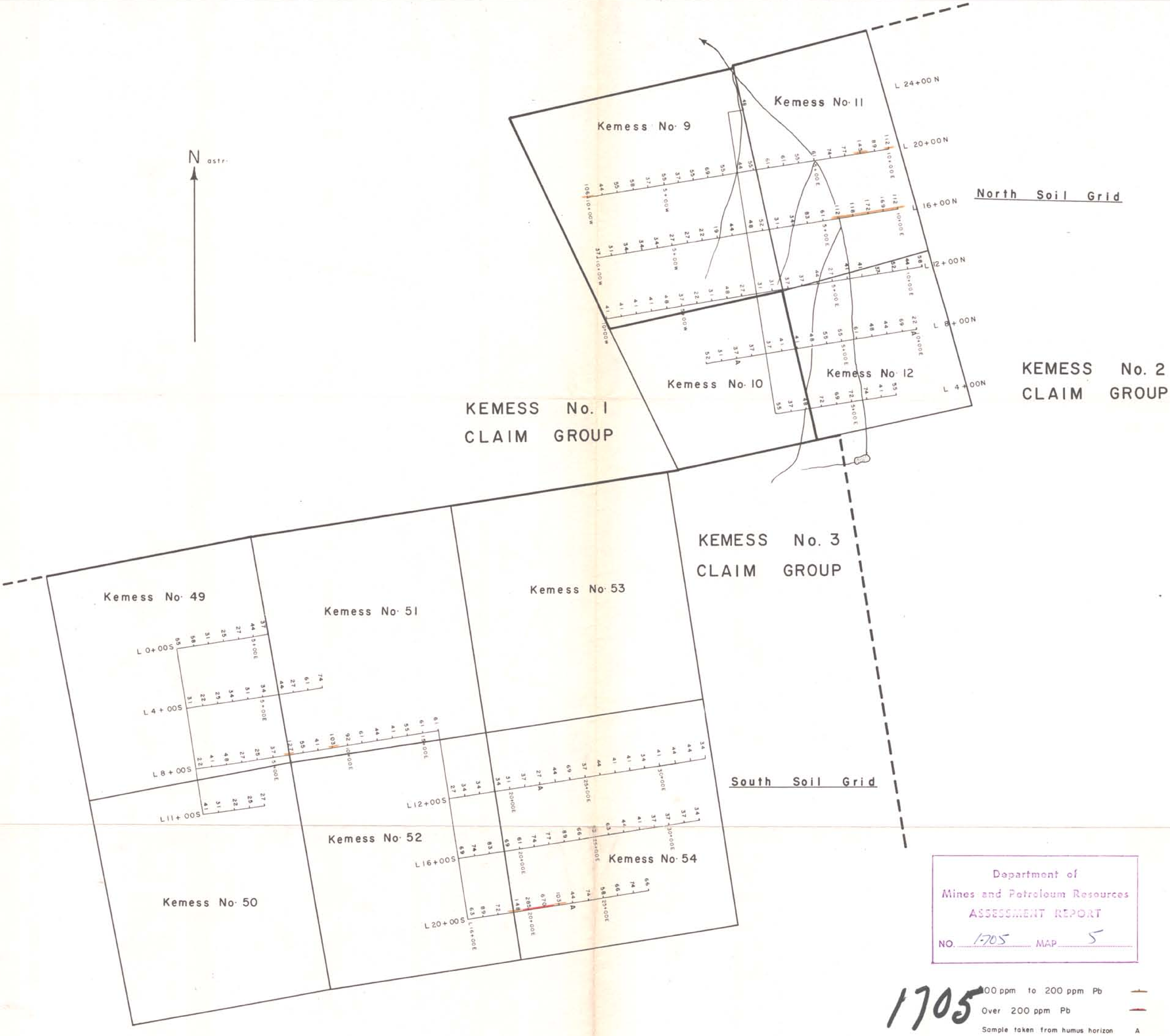
Omineca M. D., B. C.

Soil Geochemical Survey

ppm ZINC IN SOIL

DATE: Nov. 29	DRAWN BY: J.H.K.	PLATE NO. 4
REVISED BY	DATE	SCALE: 1 inch = 400 feet

R. W. Stevenson



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1705 MAP 5

1705

00 ppm to 200 ppm Pb
Over 200 ppm Pb
Sample taken from humus horizon A

To accompany soil geochemical survey report by R. W. Stevenson, P. Eng., on the Kemess No 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

R. W. Stevenson

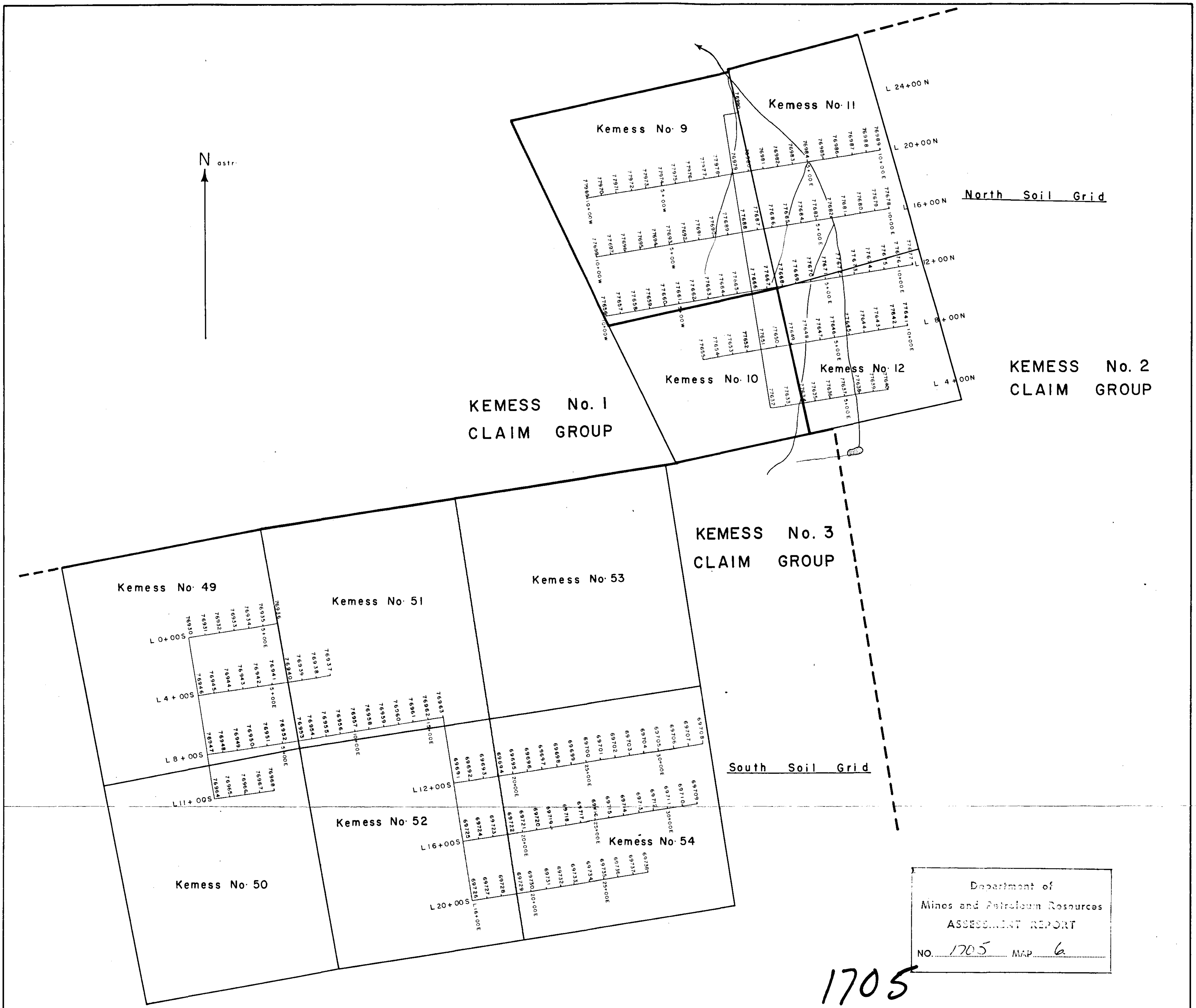
KENNCO EXPLORATIONS (WESTERN) LIMITED

Kemess No. 1, 2, and 3 Groups
Kemess Mineral Claims No. 1 to 96
Omineca M. D., B. C.

Soil Geochemical Survey

ppm LEAD IN SOIL

DATE: Nov. 29	DRAWN BY: J.H.K.	PLATE NO. 5
REVISED BY	DATE	SCALE: 1 inch = 400 feet



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1705 MAP 6

1705

To accompany soil geochemical survey report by R. W. Stevenson, P. Eng., on the Kemess No 1, 2, and 3 Groups, five miles east of Thutade Lake, Omineca Mining Division, dated December 2, 1968.

R. W. Stevenson

KENNCO EXPLORATIONS (WESTERN) LIMITED		
Kemess No 1, 2, and 3 Groups Kemess Mineral Claims No 1 to 96 Omineca M. D., B. C. Soil Geochemical Survey **SAMPLE SITE LOCATIONS**		
DATE: Nov. 29	DRAWN BY: J.H.K.	PLATE NO. 6
REVISED BY	DATE	SCALE: 1 inch = 400 feet