008794

GEOLOGICAL & GEOCHEMICAL ASSESSMENT REPORT

OF THE

MATHEW CLAIMS

WATSON LAKE MINING DISTRICT
NTS: 105F/7, 8, 9 and 10
132°30'W LONGITUDE, 61°30'N LATITUDE
YUKON TERRITORY

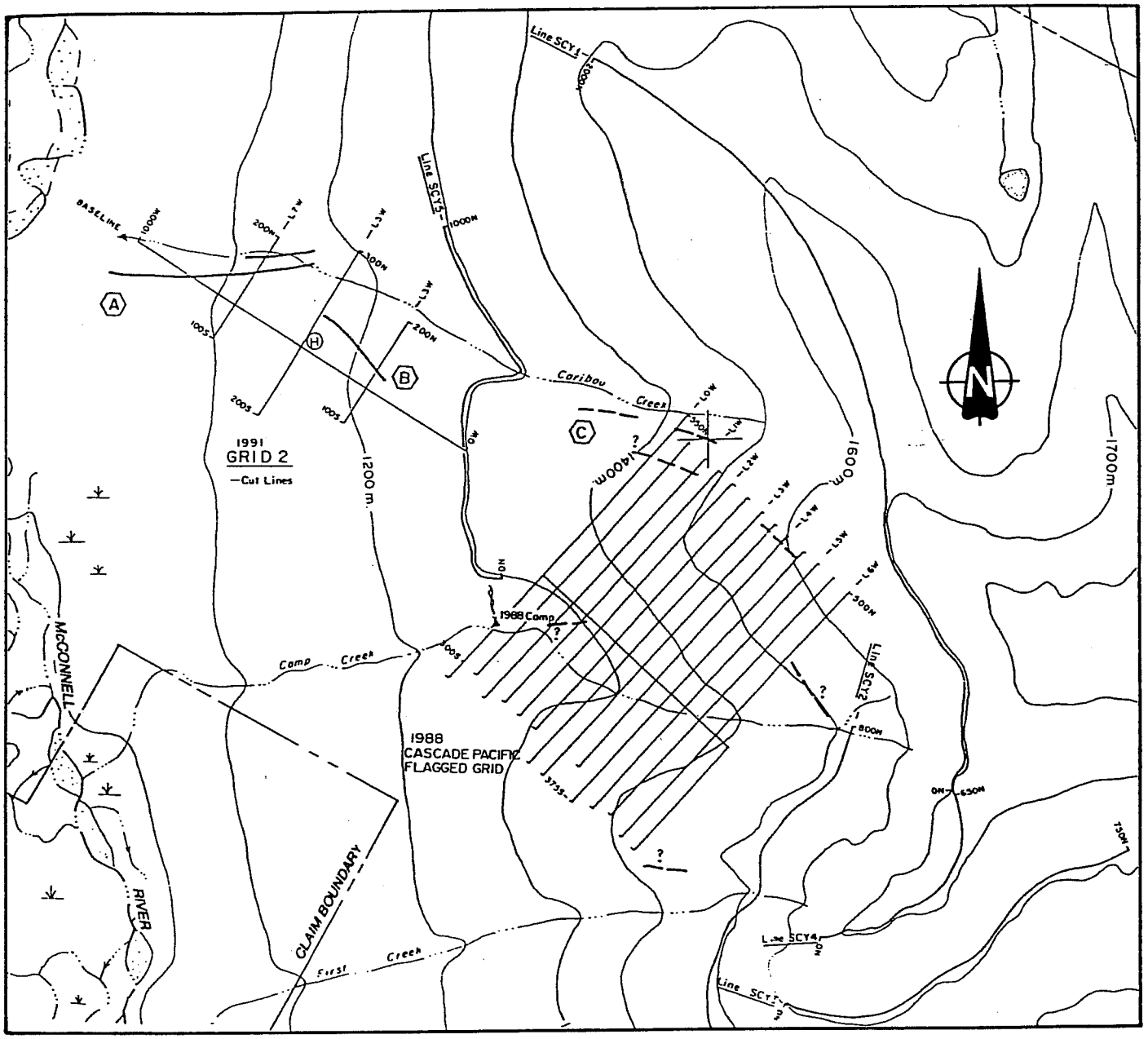
for

GRANGES INC.
2300 - 885 WEST GEORGIA STREET
VANCOUVER, BC
V6C 3E8

by

LAWRENCE R. SOLKOSKI, B.Sc.
CONSULTING GEOLOGIST

NOVEMBER 1991



LEGEND

(H) Helicopter Pad

(E) Airborne Electromagnetic Conductor

FIGURE No. 6

GRANGES INC.

VANCOUVER, B.C.

1991

CASCADE PACIFIC OPTION

MATHEW CLAIMS, Y.T.

GRID 2 & CONTOUR LINES

SCALE 0 160 320 480 640 metres

1:16,000

N.T.S. 105F

Sept., 1991

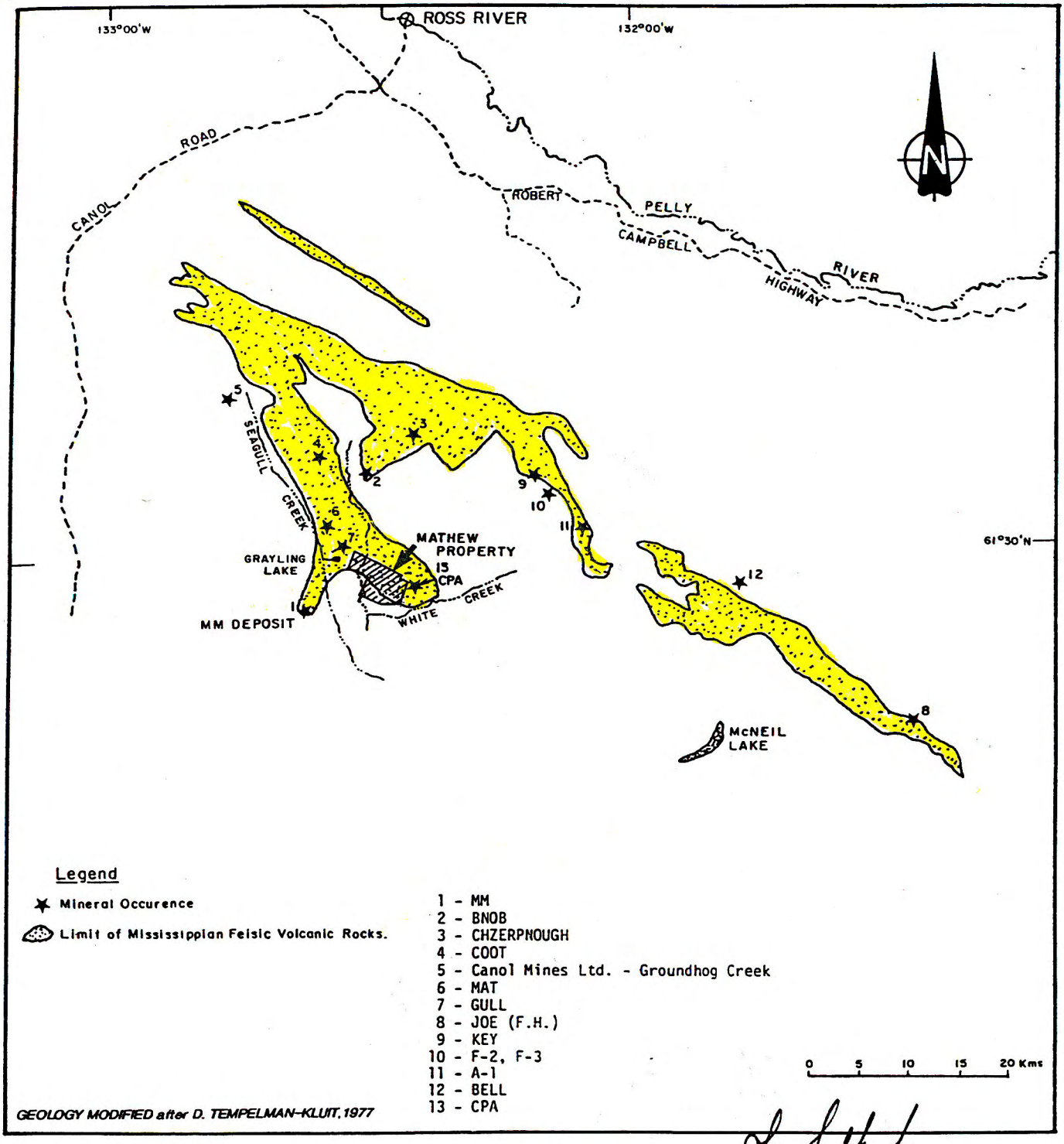
Mathew 103	B01524	March 4, 1995
Mathew 105	B01526	March 4, 1995
Mathew 106	B01527	March 4, 1995
Mathew 107	B01528	March 4, 1995
Mathew 108	B01529	March 4, 1995
Mathew 109	B01530	March 4, 1995
Mathew 123	B01544	March 4, 1995
Mathew 125	B01546	March 4, 1995

Watson lake Mining District, NTS 105F/7, 8, 9 and 10. Latitude 61°30'N, longitude 132°30'W.

2.0 GEOLOGY AND MINERALIZATION

2.1 Regional Geology

The Quiet Lake map area (NTS 105G) and the Finlayson Lake map area (NTS 105G) straddle the Tintina Trench, a major transcurrent fault with the Quiet Lake map area comprising the northwest extremity of the Omineca crystalline belt where it coalesces into contrasting sequences of stratified rocks have been arched into two large northwest-trending anticlines exposed in the Pelly Mountains. On the northeast portion of the Quiet Lake map sheet, near the Tintina Trench, lies an autochthonous miogeoclinal succession ranging in age from late-Proterozoic. Towards the southwest, a late Paleozoic metamorphosed eugeoclinal assemblage lies as an autochthonous miogeoclinal succession (Templeman-Kluit, et al, 1976). The autochthonous miogeoclinal succession



DISTRIBUTION of FELSIC VOLCANIC ROCKS and ASSOCIATED MINERALIZATION.

GRANGES INC.
VANCOUVER, B.C.

FIGURE 4

has been imbricated by northeast directed thrust faults while the allochthonous eugeoclinal assemblage has been broken by steep faults.

The entire foreshortened assemblage has been intruded by mid-Cretaceous granitic rocks.

The area of interest (Mathew claims) is found within the shallow miogeoclinal sequence of the Pelly Mountains in a northwest-trending belt of platform carbonates and related rocks ranging in age from Cambrian through Mississipian, which are often referred to as the Pelly-Cassiar Platform. This platform has been internally repeated by folds and northeast directed thrust faults (Templeman-Kluit, 1977). The Mathew claims are located in an area where an orange weathered chert grades into acid-intermediate submarine explosive volcanic rocks intercalated with black slate (Templeman-Kluit, et al, 1976) with the upper unit of the black slate containing lenses of thinly laminated barite, locally as thick as 50 meters.

2.2 Property Structure

The stratigraphy underlying the Mathew claims has been deformed with evidence of intense sigmoidal folding and

shearing having taken place, probably due in part to the intrusion of a large syenite plug outcropping along the northern end of the claim group where large syenite dykes intrude the north end of the property.

There may be remnant bedding structures in the volcanics, but possible rotation of bedding plane structures makes bedding difficult to identify in outcrop. Possible first plane of cleavages are defined by 104° to 062°, with dips changing from east to west and vertical. Foliation strike directions of the syenite dykes and main body of syenite range from 130° to 050° to 062°. Fold evidence indicates that syenite dykes may have been emplaced along planes of weakness developed through shearing. Numerous gossan zones of varying degrees of alteration, along strongly sheared and foliated (NW-SE) trending volcanics on C.B.'s 1, 2, 3, 4, 5, 6, 9 and 11 appear to be pyritic chert exhalite horizons in contact with locally disseminated, altered mineralized disseminated sulphide horizons, well foliated, which strike 180°, 170°, 140°, 120°.

The structure on the Mathew claims appears to be quite complex, as evidenced by changes in strike direction on foliation of highly sheared, folded and faulted sediments

and volcanic rocks. Major faults outside the immediate claims are the Seagull, Tintina and the Porcupine faults.

Sedimentary and volcanic rocks within the claim area are in some areas relatively flat lying, and elsewhere they are steeply folded to vertical.

Stratigraphic relations within the property are at times difficult to interpret, as there are numerous intercalated zones of felsic to mafic tuffs, mafic flows and varied thickness barite horizons, at times strongly sheared and foliated. However, with the establishment of the two cut grids on the property, more detailed stratigraphic mapping helped to interpret stratigraphic relationships between various rock units.

2.3 Property Geology and Mineralization

The 1990 exploration program resulted in the identification of three kinds of mineralization on the Mathew claims:

a) disseminated sulphides of pyrite;

b) quartz veins and quartz breccia veins containing pyrite +/- sphalerite, +/- tetrahedrite, +/- galena, +/- chalcopyrite;

c) a massive pyrite zone.

The 1991 program expanded upon mineralized zones and located mineralized exhalite horizons containing polymetallic base metal mineralization in contact with rhyolitic pyritic exhalite zones which are stratabound, stratiform.

Rock outcrop exposures comprise less than 10% of the area of the Mathew claims below treeline; however, above treeline there is outcrop exposure of more than 10% where talus/felsenmeer glacial till is not obstructing exposure.

Local stratigraphy is best exposed above treeline. The stratigraphy mapped on the claims comprises three principal formations deposited during the Mississippian and Upper Devonian; two of which are intruded by an igneous body of Mississippian age.

The oldest rocks on the property are reported to be Upper and Middle Devonian dolomites, although the writer has not yet seen these rocks.

Overlying the Upper Devonian dolomites are Upper Devonian and Mississippian sedimentary rocks, barite and intercalated acid volcanic rocks.

Mississippian volcanic rocks are the younger in the stratigraphic sequence and units on the northern and north east end of the claim block are intruded by Mississippian resistant, massive, medium to fine grained syenite dykes from the main syenite stock bordering the northern part of the claim block.

Volcanic rocks on the claims traversed are volcaniclastic andesites (?), poorly layered to massive beds of tuff, tuff breccia and lapilli tuff. Good examples of outcrop of lapilli tuff and breccia tuff can be seen on C.B. 11. Lithic fragments are rounded to sub-angular, blocky shapes. Siderite, fine grained hematite appear to make up the matrix. Pillowed andesite lavas with well defined pillows also occur and can be seen on C.B. 109. Thin section work (by Vancouver Petrographics - John Payne, Ph.D) identified some rocks on the Mathew claims consist of hornfelsed andesites, altered hypabyssal diorites,

rhyodacite flows, ankerite quartz muscovite veins, ankerite-k-feldspar-barite veins, trachyte flows, carbonaceous latite/rhyodacite, rhyolite dykes (?), metamorphosed porphyritic and non-porphyritic andesite/basalt, felsic schists [(quartz-sericite-calcite-(chlorite)] schists, gneisses, latite/trachyte tuff. (See thin section description of rock types in Appendix). As can be seen, the majority of rocks identified by thin section were volcanic, from mafic/intermediate to intermediate and felsic composition with most in the intermediate to felsic range, and many of these volcanic rocks having undergone a certain degree of contact and regional metamorphism, due either/or to thrust faulting and folding and by the probable intrusion of the large syenite body along the north edge of the Mathew claims.

Intrusive igneous rocks are the syenite stock, syenite dykes, diorite dykes.

It appears that there are exhalites on the Mathew claims, with the most common being pyritic chert or pyritic chert rhyolite(?) zones. There are fewer recurring exhalite zones of barite, pyrite, barite fluorite, iron-type horizons.

The pyritic chert or pyritic chert rhyolite(?) exhalative zones appear to be in contact with mineralized exhalite alteration zones, or mineralized at times with quartz silica-rich exhalite zones of +/- barite.

Thin section work on three of these mineralized alteration (exhalites) zones revealed the following from samples LS-91-Y22 (13018), LS-91-Y29 (13025), LS-91-Y31 (13027):

C.B.9 Sample LS-91-Y22 (13018): was identified by thin section as an ankerite-(quartz-muscovite) vein with sulphide-rich replacement material of chalcopyrite/pyrrhotite. No galena was identified. Thirty-element ICP analysis of this sample gave readings for lead, zinc and silver - 5960 ppm Pb, 9572 ppm Zn and 21.1 ppm Ag. This mineralized material is from one of the altered, mineralized exhalite(?) horizons in contact with exhalite material of pyritic felsic schists. However, 65%-70% of the rock is made up of ankerite and only 3%-4% quartz, with late vein material within the vein made up of only 5%-7% quartz.

C.B.9 Sample LS-91-Y29 (13025): was also identified as vein material, but with the ankerite content from 70%-75% and quartz only 8%-10%. This sample recorded very low

values for all base/precious metals. This sample is also from an altered weakly mineralized zone in contact with an exhalite horizon.

C.B. 9/11(?) Sample LS-91-Y31 13027): identified by thin section as vein material with the ankerite content 50%-60%, k-feldspar 30%-35%, barite 5%-7%, minor sericite, but no primary or secondary quartz. Very low base/precious metal values were recorded in this sample under 30-element ICP.

These mineralized altered exhalite zones vary in thickness from less than 0.25 meters wide to less than 10 meters wide. Visually seen in the field, these zones contain pyrite, +/- iron, +/- fluorite, galena, sphalerite +/-, chalcopyrite +/-, tetrahedrite and at times mineralized quartz stringers with pyrite +/-, pyrrhotite +/-, chalcopyrite +/-, galena +/-.

On claim blocks 9 and 11, the writer was able to identify possible 8 pyritic exhalite horizons, parallel to each other, over a chained width 350 meters. These pyritic exhalite zones within chert or schistose-looking rhyolites, are in contact with either altered volcaniclastics, pillow breccia(?) flow units or altered

barite(?)-rich mineralized exhalite zones with disseminated to semi-massive, narrow mineralized zones as discussed in the previous paragraph.

The non-mineralized exhalite horizons are for the most part, barren of polymetallic mineralization, except for disseminated to massive pyrite of 10% to 80%, hosted within fine grained siliceous rhyolite beds or fine grained siliceous pyritic schistose rhyolite tuffs, which are extremely gossanous due to intense weathering. The weathered pyritic exhalite gossan zones (see Colour Plates 8 and 9) appear stratabound, are orange-yellow to brownish-orange-yellow in colour and can be in contact with volcanic tuffs, pillow breccia(?) units, or mineralized exhalite units. The pyritic exhalite zones outcrop and subcrop for lengths of up to 200 meters along strike and are of varying thicknesses. One such pyritic exhalite felsic schistose zone along with its slightly mineralized alteration zone on C.B. 11 was chained out for a 25 meter total width. The pyritic felsic schistose (rhyolite tuff(?)) unit was approximately 21 meters wide and the unit appeared to contain stretched irregular zones or blocks of felsic pyritic rock (rhyolite?) within a groundmass of intermediate volcanic tuffs. In contact with this pyritic exhalite zone, is a 4 meter wide exhalite zone, weakly mineralized, with mineralization of

galena, sphalerite, minor tetrahedrite and samples 13017 and 13018 give values from 2207 ppm zinc to 9572 ppm zinc, 31.0 ppm silver to 21.0 ppm silver, and a high of 5960 ppm lead. Two rock samples from the adjacent pyritic felsic schistose tuff exhalite zone gave poor values for copper, lead, zinc and silver.

Another example of the stratabound-type exhalite lithology also occurs again on C.B. 11, where a 0.5 meter wide to 1.0+ meter wide exhalite zone is in contact with greenish-grey metavolcanic rocks of intermediate to felsic composition, of possibly andesite tuff composition. An altered, ankerite-rich exhalite zone with possible barite, plus quartz with visible mineralization of galena, chalcopyrite, tetrahedrite, sphalerite, was in contact with an apparent sphalerite-rich (10% to 20% brown sphalerite) zone of mineralization hosted within intermediate greenish-grey metavolcanic tuffs. Sample #13113 as a select grab rock gave a reading of 62964 ppm zinc and sample #13115 gave a value of 14,861 ppm zinc from the volcanic tuff unit. Lead and silver values were very low. Values from the altered, ankerite, barite, quartz-rich zone; however, gave interesting values for sample numbers 13110 and 13111.

Sample 13110 resulted in 11035 ppm zinc and 1.4 ppm silver. Sample 13111 resulted in 436 ppm copper, 108 ppm lead, 13,192 ppm zinc and 36.1 ppm silver.

2.4 Soil Geochemistry

Soil geochemistry results were achieved by the following:

a) Contour Soil Sampling

b) Flagged Soil Grids

c) Cut Soil Grids

Soil sampling was carried out over the following 33 claims: C.B. 2, 4, 6, 9-13, 20-25, 27-30, 34-35, 55-56, 58, 75, 82, 84, 94, 105-109 and 111.

A) Contour soil sampling was carried out over the northern part of the Mathew claims, with the longest contour soil traverse run for 2 kilometers. The shortest contour soil traverse was 600 meters. Contour soil traverses carried out were designated as SCY1, SCY2, SCY3, SCY4, SCY5 (See Figures 6 and 9) (S = Soil, C = Contour, Y = Yukon, 2 = Number).

Contour soil traverses were run close to and peripheral to the 1988 Cascade Pacific flagged, non-slope corrected soil grid in the Camp Creek area of C.B. 3, 4, 5 and 6, in order to further substantiate and/or enhance the data base of soil geochemical information obtained from the 1988 soil survey which resulted in a high, broad zinc anomaly. However, by contouring the zinc anomaly of 1988, it was found that any zinc values >1000 ppm, yielded a fairly strong N-W, S-E, anomaly some 50 to 80 meters in width. It was thought that perhaps contour soil lines in 1991 could lead to a better understanding as to the cause/origin of the high 1988 zinc anomaly and explain some of the values for the 1988 lead, barite and a few small gold anomalies.

The 1991 soil contour survey did in fact establish good evidence and reasons for the broad and high soil zinc anomaly of 1988 over C.B. 3 and 4.

Soil contour traverses SCY1-4 were carried out over C.B. 2, 6, 8-12, 25-26, 75 and 85, at 25 meter stations, using a lightweight soil auger rather than a mattock. Contour intervals during

traverses were recorded with a metric altimeter and chaining was carried out with a hip chain.

It was necessary in many sample locations to try and retrieve a sample to at least 8 auger tries for 1 sample. The reasons for this being that a thin volcanic ash layer, at times, two layers of ash, could be encountered close to surface or at depths of up to 0.5 meters. As a result, sample results for contour sampling and grid sampling, may be low due to the fact that at times, the auger was unable to reach and penetrate volcanic ash layers due to thick depths of the overburden. In order to obtain a sample, the till horizon had to be augured through and below the ash layer(s). The highest zinc sample obtained from the contour sampling gave a reading of 3714 ppm zinc.

After examining the soil geochemical results, it was found that the five contour soil traverses resulted in several parallel zones of weak to moderately strong zinc mineralization (Zones A, B, C, D, E, F and G) which could be interpreted from the plotted results (Figure 10). Corresponding copper and silver values were relatively low, whereas there were some high lead

and arsenic values. Barite values could not be used in association with the zinc-lead values, as analysis for barite was done by partial leach and therefore could not be used as a true value for associated metal zoning.

A value of more than 200 ppm zinc in soils was used for contouring purposes and several rough zones of fairly high zinc values were plotted at 1:2500 scale.

The evident zone of zinc (Anomaly A) is approximately 150 meters wide and runs in a N-W-SE direction for approximately 650 +/- meters. The weak zinc zone starts from the northwest corner of C.B.12 and continues through the southeast corner of C.B.9 and strikes towards Upper Camp Creek. This zone of zinc mineralization is the widest zone of the 5 possible parallel zones A, B, C, D and E. The A Zone or Anomaly A, is the farthest south from the syenite contact at 1.0 to 1.5 kilometers south. The Zones B, C, D and E are north of Zone A and much closer to the syenite/volcanic contact. Anomalous zinc zones G and F are somewhat west and south of Anomaly A.

Rock types underlying soil Anomaly A are intermediate volcanic tuffs, rhyolite/rhyodacite flows. Anomaly A appears coincident with rock geochemistry values, where zinc values ranged as high as 62,964 ppm, in associated exhalite-type rocks with visible sphalerite, galena, traces of chalcopyrite and tetrahedrite.

The remaining six anomalous zinc zones (B, C, D, E, F and G) are narrower at times, ranging in width from 10 meters to 75+ meters, and are closer to the syenite intrusion, except for Zone F and G. The Zones B, C, D, E, F and G are also relatively low in copper, lead, silver and barite, but appear to be coincident with the underlying mineralized exhalite horizons discovered while prospect mapping, especially for Zone B and C. Intensive prospect mapping over areas D, E, F and G was not carried out. Interesting arsenic values were associated with zinc values for anomalies F and G, although corresponding gold values were low.

Contour soil line SCY5 was carried out in the vicinity of C.B. 27, 28 and 30. Only a weakly anomalous zinc anomaly could be outlined from

that survey, with over a 100 meter width. The highest zinc value was 422 ppm associated with low copper, lead, silver, gold and barite.

Good contour soil sampling results were hampered by:

i) talus slopes and bare outcrop;

ii) sphagnum moss, roots, vegetation systems;

iii) volcanic ash layers near surface or deep below surface. In many instances, the soil auger did not penetrate the volcanic ash layer due to the layer:

a) being too deep for effective auger control, and

b) the volcanic ash layer may not have been present at some soil stations, having been eroded away at some time, before or after glaciation.

The 1991 contour soil anomalies C, D and E resulting from the contour soil traverses SCY1, 2, 3 and 4 appear to present data which shows a merging of the high zinc soil anomaly from the 1988 soil survey by Cascade Pacific (See Figures 9 and 10; 1:2,500).

The 1988 Cascade Pacific soil zinc anomaly existed at the north end of the 1988 flagged soil grid (north of Camp Creek) with an anomaly of more than 1000 ppm zinc up to 12,889 ppm zinc, trending in an E-W direction for 600+ meters, with the zinc anomaly approximately 30 meters to 80 meters wide. This zinc anomaly may be due in part to the hornfelsing influence, i.e. contact metamorphism due to the intrusion of the syenite body in contact with the volcanic rocks hosting an already pre-existing disseminated stratiform zinc horizon in the intermediate volcanic tuffs(?). There was insufficient prospecting time carried out over this area to identify field evidence for outcropping of mineralized zones which could give more evidence for this high 1988 zinc anomaly in soils. All gossans examined appear to be stratabound, and gossans are due to

oxidation of minor to heavy anomalies of pyrite. However, could these be just pyrite halos next to the syenite?

The 1991 zinc soil anomaly "A" based on soil contour lines, is south of Camp Creek and trends towards an area of Camp Creek where the 1988 Cascade Pacific soil grid gave readings of generally more than 200 ppm zinc to less than 1000 ppm zinc. The 1991 soil anomaly "A" is approximately 1.0 to 1.5 kilometers south of the syenite-volcanic contact, which overlies one or more narrow exhalitive horizons, where zinc values can be as high as 62,964 ppm from rock samples, and the zinc soil anomaly is probably the result of a stratiform, stratabound, disseminated sulphide zone with much less hornfelsing (overprinting) influence on it from the syenite intrusion to the north(?). Pleistocene glaciation has probably tended to smear out zinc values plus other metal values in till in the region of the 1988 Cascade Pacific flagged soil grid on C.B. 3, 4, 5 and 6, as the area of Camp Creek and First Creek appear to be an old cirque.

1.8 Claims Worked and Claim Status

On August 24, 1990, the Mathew claims were transferred to the ownership of Granges Inc., Vancouver, BC.

During 1991, work was carried out on the following 42 claims:

Claim Name	Grant No.	Expiry Date
Mathew 1	YB01271	March 4, 1993
Mathew 2	YB01272	March 4, 1993
Mathew 3	YB01273	March 4, 1993
Mathew 4	YB01274	March 4, 1993
Mathew 5	YB01275	March 4, 1993
Mathew 6	YB01276	March 4, 1993
Mathew 8	YB01278	March 4, 1993
Mathew 9	YB01279	March 4, 1993
Mathew 10	YB01280	March 4, 1993
Mathew 11	YB01281	March 4, 1993
Mathew 12	YB01282	March 4, 1993
Mathew 13	YB01283	March 4, 1993
Mathew 16	YB01286	March 4, 1993
Mathew 17	YB01287	March 4, 1993
Mathew 19	YB01288	March 4, 1993
Mathew 20	YB01289	March 4, 1993
Mathew 21	YB01290	March 4, 1993
Mathew 22	YB01291	March 4, 1993
Mathew 23	YB01292	March 4, 1993
Mathew 24	YB01293	March 4, 1993
Mathew 25	YB01294	March 4, 1993
Mathew 26	YB01295	March 4, 1993
Mathew 27	YB01296	March 4, 1993
Mathew 28	YB01297	March 4, 1993
Mathew 29	YB01298	March 4, 1993
Mathew 30	YB01299	March 4, 1993
Mathew 34	YB01457	March 4, 1995
Mathew 35	YB01458	March 4, 1995
Mathew 41	YB01464	March 4, 1995
Mathew 56	YB01479	March 4, 1995
Mathew 58	YB01481	March 4, 1995
Mathew 75	YB01496	March 4, 1995
Mathew 85	YB01506	March 4, 1995
Mathew 94	YB01515	March 4, 1995

Mathew 103	B01524	March 4, 1995
Mathew 105	B01526	March 4, 1995
Mathew 106	B01527	March 4, 1995
Mathew 107	B01528	March 4, 1995
Mathew 108	B01529	March 4, 1995
Mathew 109	B01530	March 4, 1995
Mathew 123	B01544	March 4, 1995
Mathew 125	B01546	March 4, 1995

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105 F/10
105 F/7
105 F/9
105 F/8
MATHEW
RIVER
McCONNELL
GRAY
WHITE
PS
LP
SP
61° 30'
132° 30'
4500
4000
5000
3500
5500
N

September traverse
July traverse

CASCADE PACIFIC OPTION
MATHEW PROPERTY

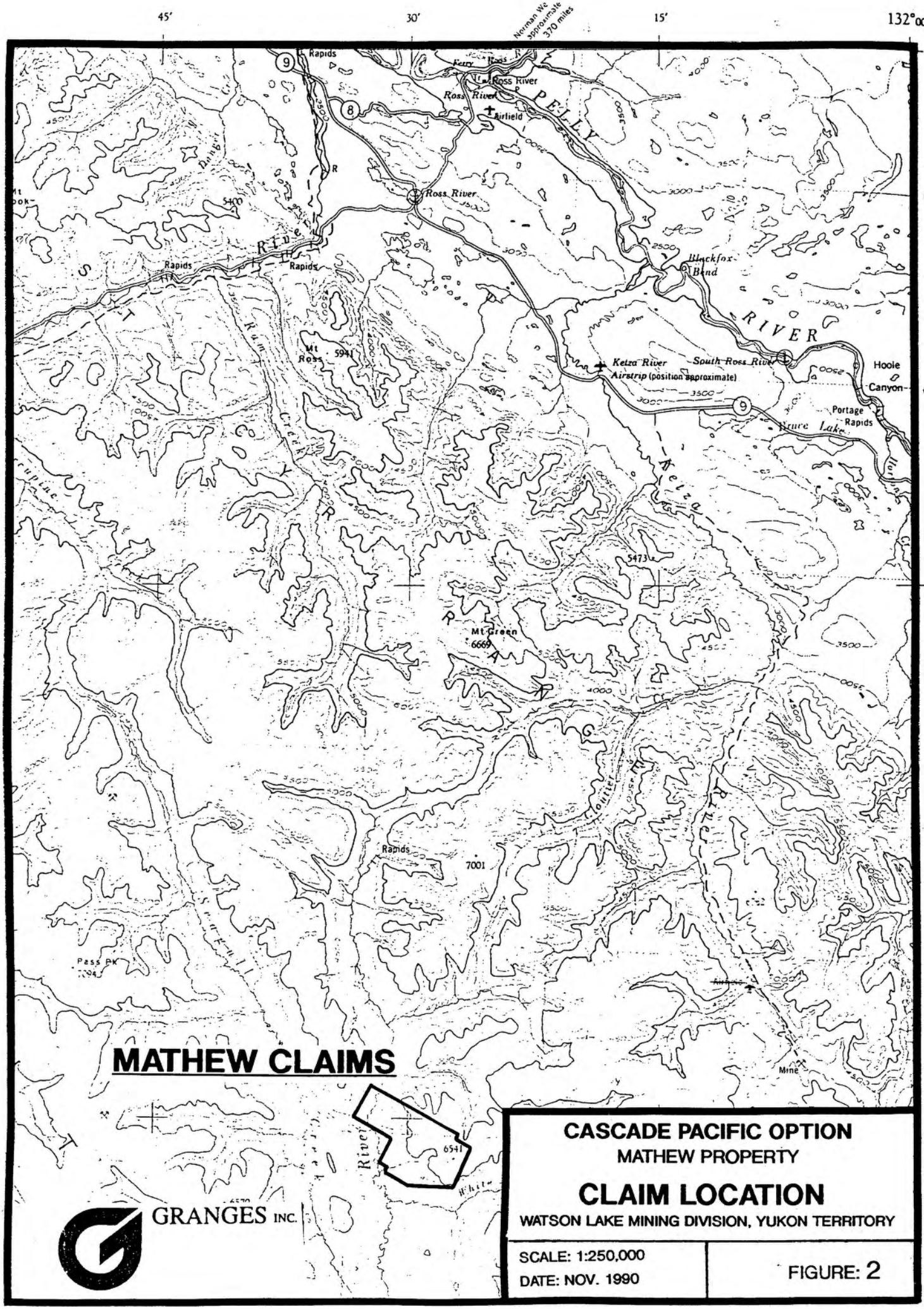
CLAIM MAP

WATSON LAKE MINING DIVISION, YUKON TERRITORY

SCALE: 1:31,680 (1"=1/2 mi.)	NTS: 105F/7,8,9,10
DATE: SEP.,1990	PROJ.NO.: YT1

GRANGES INC.

FIGURE:


45'
30'
15'
132°00'
Norman Wells approximate 370 miles
Rapids
Ross River
Ross River
Airfield
PELLY
Ross River
Rapids
Rapids
Blackfox Bend
RIVER
Mt Ross 5941
Kelza River Airstrip (position approximate)
South Ross River
Hoole Canyon
Portage Rapids
Bruce Lake
Kelza
5473
Mt Green 6669
Rapids
7001
Pass Pk
Mine
MATHEW CLAIMS
6541
GRANGES INC.
CASCADE PACIFIC OPTION
MATHEW PROPERTY
CLAIM LOCATION
WATSON LAKE MINING DIVISION, YUKON TERRITORY
SCALE: 1:250,000
DATE: NOV. 1990
FIGURE: 2