

ARIS SUMMARY SHEET

District Geologist, Kamloops

Off Confidential: 94.12.07

ASSESSMENT REPORT 23309

MINING DIVISION: Osoyoos

PROPERTY: Vent
LOCATION: LAT 49 33 00 LONG 119 53 00
UTM 11 5492375 291444
NTS 082E12W
CLAIM(S): Vent 1-5
OPERATOR(S): Morrison, M.S.
AUTHOR(S): Morrison, M.S.
REPORT YEAR: 1994, 41 Pages
KEYWORDS: Tertiary, Eocene, Marron Formation, Andesites, Phonites, Trachytes
Tuffs, Kaolinization

WORK

DONE: Geological, Geophysical, Physical
GEOL 1400.0 ha
SCGR 18.0 km
Map(s) - 1; Scale(s) - 1:2500
TOPO 450.0 ha
Map(s) - 2; Scale(s) - 1:2500

LOG NO:	MAR 18 1994	RD.
ACTION:		
FILE NO:		

GEOLOGICAL
ASSESSMENT REPORT

on the

VENT CLAIM GROUP
SUMMERLAND AREA
OSOYOOS MINING DIVISION

by

MURRAY S. MORRISON, B.Sc.

CLAIMS: Vent 1-5 (34 units).
LOCATION: The Vent property is situated at Riddle Creek,
16 km southwest of Summerland, B.C.
Lat. 49° 33'; Long. 119° 53';
N.T.S. Map 82-E-12W.
OWNER: M. S. Morrison
OPERATOR: M. S. Morrison
DATE STARTED: September 10, 1993
DATE COMPLETED: September 26, 1993

GEOLOGICAL BRANCH
ASSESSMENT REPORT

Kelowna, B.C.

February 28, 1994

23,309

FILMED

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SUMMARY

The Vent property is situated at Riddle Creek, 16 km southwest of Summerland in the Osoyoos Mining Division of British Columbia. The property, consisting of the Vent 1-5 mineral claims (34 units) was staked by the writer in 1986 to cover an assemblage of volcanic and sedimentary rocks occurring within a Tertiary Basin lying 30 km northwest of the White Lake Basin at Okanagan Falls.

The silicified and altered Eocene pyroclastic rocks identified on the Vent property were recognized as favorable host rocks for epithermal precious metal deposits, particularly in light of the successful exploration programs conducted in the late 1980's on the Vault and Brett gold prospects of the Okanagan region which were also found to be hosted by Eocene volcanic rocks.

Geological and geochemical surveying on the Vent property, financed by Zygote Resources Ltd. of Vancouver, in 1987, were followed-up with the drilling of 8 Reverse Circulation Percussion Drill Holes, totalling 492 metres, in 1989. Although five of the 8 drill holes intercepted highly faulted, clay altered, and silicified Marron Formation trachytic flows and tuffs and four of these five drill holes also intersected considerable intercepts (33 to 43 metres) of pyrite enriched (5 to 10%) clay alteration zones, only negligible precious metal values were found and Zygote Resources returned the property to the writer.

The drilling did prove the existence of late faults cutting through the Marron Formation volcanics on the property. These faults are thought to be the conduits for the vast volumes of low temperature hydrothermal solutions which brought about the high degree of clay alteration and silicification of the volcanics on the south side of the property.

The silica replacement of the volcanics is recognized as low temperature silica (chalcedony) in most drill holes and vein quartz was found to be entirely lacking.

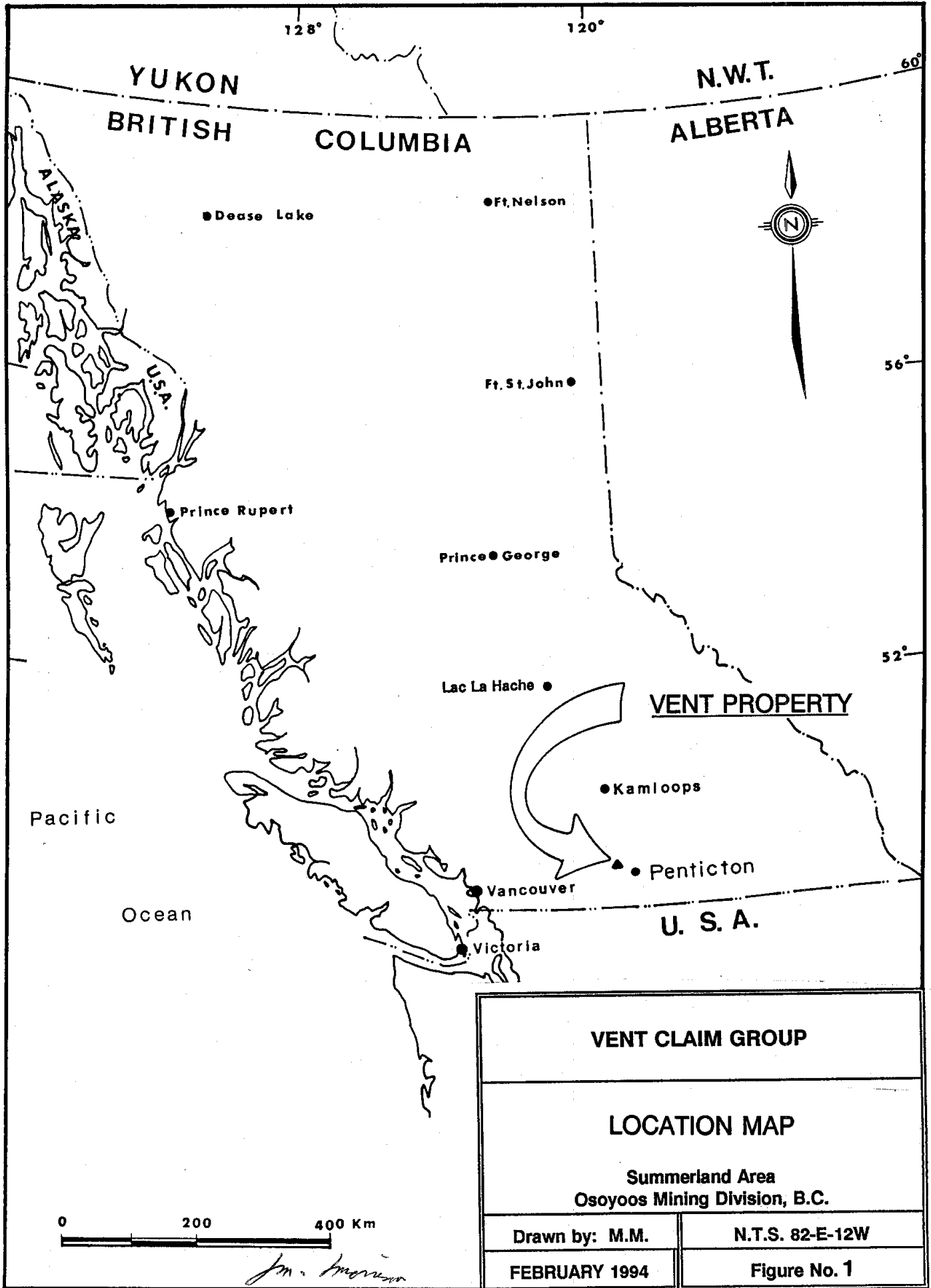
SUMMARY continued

The type of silicification indicates that only the uppermost horizons of strong epithermal systems on the Vent property have been penetrated by the 1989 drilling. Deeper drilling of these late fault structures is, therefore, highly recommended in order to seek out the higher temperature quartz stockworks that may form the "roots" of these large epithermal systems. If precious metal values exist on the property they would be expected to be associated with the quartz stockworks.

Magnetometer and VLF-EM surveys were conducted on the property by the writer in 1992. The results of the magnetometer survey indicated that the large alteration zone occurring near the boundary of the Vent 1, 2 & 5 mineral claims extends for at least 1100 metres across the property. One well-defined VLF-EM conductor was found to be coincident with the magnetic low on the western side of the property.

This year's (1993) geological mapping over 1.4 square kilometres, at a scale of 1:2500, in the Boundary Zone has provided a good geological base for future exploration.

An Induced Polarization Survey is recommended for the Boundary Zone. It is believed that the survey would be useful in delineating the large pyritic zones and clay alteration zones associated with the major faults crossing the property. Once traced, it is recommended that some of these fault zones be tested to depths of 150 to 300 metres by diamond drilling.



VENT CLAIM GROUP	
LOCATION MAP	
Summerland Area Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 1

J.M. Morrison

INTRODUCTION

This report, written for government assessment work requirements, discusses the results of geological, radiometric (scintillometer) and altimeter surveys conducted over portions of the Vent 1, 2 & 5 mineral claims by the writer during September - October, 1993.

The Vent Claim Group, owned by the writer, is comprised of the Vent 1-5 mineral claims, totalling 34 units. The property covers a small Tertiary basin located 16 km southwest of Summerland, B.C. The Tertiary basin was staked as an epithermal precious metal prospect in 1986, following the announcement of encouraging exploration results from the well-known Vault precious metal property. The Vault property (staked by the writer in 1982) is located within the White Lake Tertiary Basin at Okanagan Falls, 30 km southeast of the Vent property.

Preliminary geological and geochemical surveys conducted on the Vent property in 1987 (Morrison, 1987) were followed by a Reverse Circulation Percussion Drilling Program in 1989 (Morrison, 1990). Eight drill holes, totalling 492 metres, tested an area measuring 300 by 600 metres near the southeastern corner of the Vent 2 mineral claim. The work was financed by Zygote Resources Ltd. of Vancouver which had an option on the property.

Although all of the drill holes returned negligible precious metal values, five of the 8 drill holes of the 1989 season intercepted highly faulted, clay altered, and silicified Marron Formation trachytic flows and tuffs. Four of these five drill holes also intersected considerable intercepts (33 to 43 metres) of pyrite-enriched (5 to 15%) clay alteration.

It is thought that the 1989 drilling program tested the upper portions of a large epithermal system that could host a precious metal deposit at some moderate depth below surface.

INTRODUCTION continued

This year's (1993) geological mapping program at a scale of 1:2,500 was designed to obtain as much information as possible about the Boundary Zone on the Vent 1, 2 & 5 mineral claims. It was hoped that the new information would be useful in guiding future exploration programs on the property such as Induced Polarization surveying or diamond drilling.

The Altimeter survey was conducted to provide a better understanding of the three-dimensional aspects of the property geology. The survey results have allowed for the drawing of accurate Cross Section and a Longitudinal Section of the Boundary Zone geology.

The Scintillometer survey was conducted over this year's grid to gather "baseline" survey data. A portion of the Vent property lies within a zone covered by the "Exploration Regulations for Uranium and Thorium of British Columbia." Radiometric baseline surveys are required in such regions before work permits are issued.

All of the data collected this year is recorded on Maps or Cross Sections which accompany this report and are listed with the Table of Contents.

LOCATION AND ACCESS

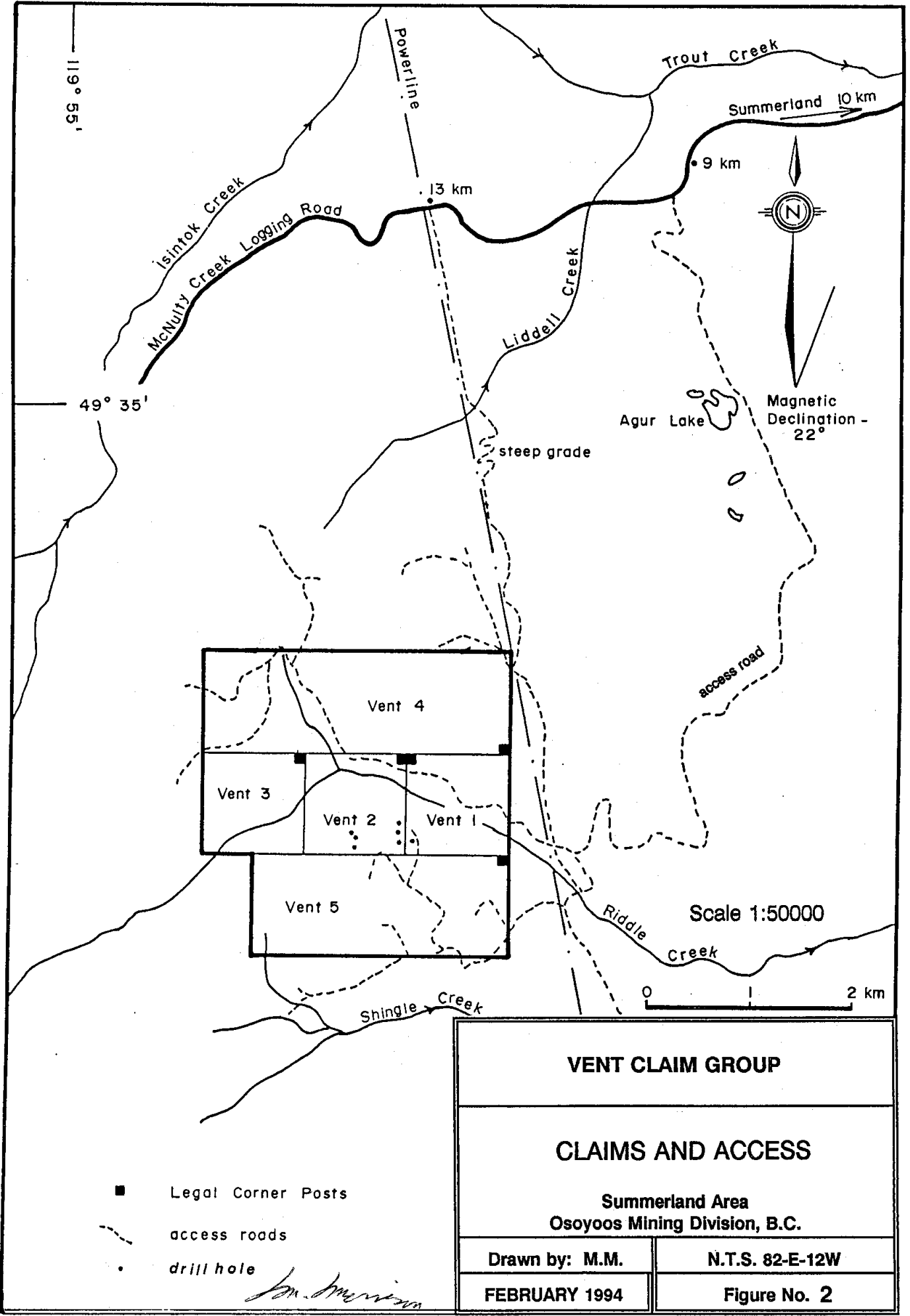
The Vent property is situated at Riddle Creek, 16 km southwest of Summerland, or 22 km northwest of Penticton, B.C. (Lat. 49° 31'; Long. 119° 53'; N.T.S. Map 82-E-12W). The property may be reached by logging roads from either community. Access from Penticton is via the Shingle Creek logging road (45 minute drive), while access from Summerland is by way of the McNulty Creek logging road, and hence, via a dirt, all-weather road which leaves the logging road at 9.4 km and passes near Agur Lake enroute to the property as shown on Figure 2. A shorter, but steeper, seasonal road follows the 500 kv powerline to the property. The Agur Lake route requires 45 minutes driving time from Summerland.

Recently built logging roads give access to most parts of the property as illustrated on Figure 2.

PHYSICAL FEATURES AND CLIMATE

The Vent property lies near the southern edge of the Thompson Plateau. The plateau with elevations ranging from 1300 to 1800 metres has been deeply incised towards the Okanagan Valley by drainage flowing into Okanagan Lake (elevation 340 metres). The entire region was glaciated during the Pleistocene resulting in rounded-off ridges and in-filled valleys.

The Vent property, centred over the upper drainage basin of Riddle Creek, 18 km west of Okanagan Lake, covers an area of subdued relief typical of the Thompson Plateau. Elevations on the property range from 1340 to 1680 metres. Rock exposures are restricted to the tops of ridges or steep creek banks. Elsewhere, there is a general cover of glacial till that reaches depths in excess of 30 metres on some portions of the property.



- Legal Corner Posts
- - - access roads
- drill hole

John M. Morrison

VENT CLAIM GROUP	
CLAIMS AND ACCESS	
Summerland Area Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 2

PHYSICAL FEATURES AND CLIMATE continued

The dominant forest cover on the property is lodgepole pine which ranges from a jungle of "bean-pole" second-growth in old burn areas near Riddle Creek to mature stands of timber elsewhere on the property. Several stands of the mature timber have been clear-cut-logged in recent years. Douglas fir is the more common forest species found on the upper rocky ridges on the northern half of the property.

Although the Okanagan Valley is semi-arid, the Thompson Plateau to the west receives upwards of 50 cm of precipitation annually; half of it in the form of snow. A winter snow pack of 1 to 2 metres begins to accumulate on the Vent property in November, and can be expected to last until mid-May on shaded slopes.

Riddle Creek flows year-round providing water for grazing cattle in the region.

CLAIM STATUS

The Vent property is made up of the Vent 1-5 mineral claims, totalling 34 units. The claims were staked by the writer, M. Morrison, of Kelowna, B.C. during November - December, 1986, and were recorded in the Osoyoos Mining Division.

The mineral claims making up the property are listed below:

<u>CLAIM NAME</u>	<u>UNITS</u>	<u>DATE OF RECORDING</u>	<u>TENURE NO.</u>	<u>EXPIRY DATE*</u>
Vent 1	4	Dec.11/86	246668	Dec.11/94
Vent 2	4	Dec.11/86	246669	Dec.11/94
Vent 3	4	Dec.11/86	246670	Dec.11/94
Vent 4	12	Dec.11/86	246671	Dec.11/94
Vent 5	10	Dec.11/86	246672	Dec.11/94

*The Expiry Date is based on the acceptance of this report for Assessment Work Credits.

The property is 100% owned by the writer, M. Morrison, of Kelowna, B.C.

HISTORY

The Riddle Creek Tertiary basin was staked by British Newfoundland Exploration Ltd. as an uranium-thorium prospect in 1977. During the 1977 season radiometric and reconnaissance silt and soil geochemical surveys were carried out in conjunction with preliminary geological mapping on the property, comprised of the Agur and Ash mineral claims. In 1978, seven diamond drill holes, totalling approximately 270 metres, were completed. Five of the holes were drilled directly into a syenite intrusive, while two of the holes penetrated ash flows and basal conglomerates up to 30 metres in thickness within the Tertiary basin (Church, 1981). No significant uranium or thorium was discovered and the claims were allowed to lapse.

HISTORY continued

The Vent property now includes ground formerly covered by the Ash 2 & 3 mineral claims.

The Vent property was optioned to Zygot Resources Ltd. of Kelowna, B.C. in August, 1987. Zygot Resources provided funds for the preliminary geological and geochemical surveys carried out in 1987 (Morrison, 1987), and for the Reverse Circulation Percussion Drill program of 1989. The property was returned to the writer following an appraisal of the geochemical results from the drilling program.

During 1992, magnetometer and VLF-EM surveys were conducted over portions of the Vent 1, 2 & 5 mineral claims by the writer (Morrison, 1993).

REGIONAL GEOLOGY AND MINERALIZATION

The regional geology of the Southern Okanagan is illustrated on Map 15-1961 entitled "Geology of the Kettle River (West Half)" by H.W. Little of the Geological Survey of Canada. The map outlines several basins or outliers of Eocene rock. The most notable basins in the immediate area of the Okanagan Valley are the White Lake, Westbank-Rutland, and Summerland Eocene basins. They are infilled with thick accumulations of poorly sorted sediments, pyroclastics and volcanic flows of trachyte, trachyandesite, dacite and rhyodacite composition. There is local evidence of volcanic venting in each basin.

A fourth, smaller, Tertiary basin, lying 13 km west of the Summerland basin, or 10 km northwest of the northernmost portion of the White Lake basin, is centred over Riddle Creek. This basin, referred to as the "Riddle Creek Tertiary Basin" in this report, also features a volcanic centre with a sequence of flow rocks and pyroclastics of suspected local origin. (Although the rocks are believed to be of local origin, they do correlate with the Eocene Marron Formation of the White Lake basin (Church, 1981).

The Riddle Creek Eocene Volcanic Centre has many characteristics in common with the gold-bearing Eocene volcanic centres recently discovered at Okanagan Falls (Vault property), 30 km to the southeast, and at Whiteman Creek (Gold Star and Brett properties), 77 km to the northeast. Gold-bearing silica solutions, emanating from late fissures (which cut the volcanic piles at both Okanagan Falls and Whiteman Creek), flood out into thick, porous, sedimentary and tuffaceous horizons that are capped by impermeable flow rocks. The loosely consolidated sediments and tuffs exceed 100 metres in thickness on the Vault property and 30 metres on the Whiteman Creek properties. The best gold values also occur within the porous rock units for some distance from the shear zones. Alteration of the porous rock extends hundreds of metres from the hydrothermal conduits.

REGIONAL GEOLOGY AND MINERALIZATION continued

During the late 1980's, aggressive exploration programs were carried out on at least five Tertiary epithermal gold properties in the Okanagan region. Some of the results are listed below:

- (1) In 1989, Inco Gold Co. announced reserves of 150,000 tons of 14 g/tonne gold for the "North Vein" on the Vault property.
- (2) Corona Corp., working on the Whiteman Creek Brett property, reported 26 g/tonne gold over 5 metres in 1987 from a mineralized shear zone. This discovery prompted ambitious drill programs during 1988 and 1989 by Corona Corp. (This property is presently undergoing further exploration and evaluation by Huntington Resources and Liquid Gold Resources of Vancouver).
- (3) Brican Resources Ltd. carried on extensive exploration programs on the Gold Star property, adjacent the Brett property, at Whiteman Creek in 1987-88. Alteration zones are extensive on the property, but good gold values eluded the drills in the late '80's programs. (Huntington Resources has just optioned this property and plans some exploratory drilling in 1994).
- (4) Minnova Incomp. carried out work on the Dusty Mac property at Okanagan Falls, drilling deep holes on the old gold producing property.
- (5) Inco Gold Co. also drilled the Venner Meadows Tigris property, 22 km southeast of Okanagan Falls in 1989.

The Riddle Creek Tertiary Basin contains a thick (up to 30 m) tuffaceous unit that is intensely hydrothermally altered like the tuffaceous rocks at the Vault and Whiteman Creek properties. This faulted, altered tuffaceous unit was the target for the 1989 drilling program on the Vent property. The altered tuffaceous unit continues to be the prime exploration target on the property.

PROPERTY GEOLOGY

Grid

The 1992 flagged grid lines were used wherever possible for the 1993 surveys. In wooded areas, the flagged stations had survived the year, but in the clear-cut regions many of the 1992 flags were destroyed by weathering and had to be re-established with new measurements. Two and one-half kilometers of addition grid were also established for this year's surveys.

The grid is made up of an 1100 metre Baseline measured-out along a portion of the Northern boundary of the Vent 5 mineral claim in a true west direction (270 degrees azimuth). Twelve grid lines of variable length were then measured for distances of 350 metres north of the Baseline and 650 to 1000 metres south of the Baseline at 100 metre intervals. Intermediate grid lines of variable length were added at intervals of 50 metres on key areas of the property. In total, 18 km of grid line have been established on the property with a Silva Ranger compass and a Topolite belt chain. Stations were marked at each 25 metre measure along the grid lines (see Map V-94-3).

Summary of Property Geology

The Tertiary basin at Riddle Creek, like others in the district, is infilled with an assemblage of sediments, and volcanic flows and pyroclastics. A basal conglomerate directly overlies granodiorite of the Nelson Intrusions (Cretaceous?). The conglomerate is in part covered by a series of andesite flows, which are in turn covered by widespread phonolite flows. The phonolite flows are covered by a thick sequence of Eocene Marron Formation trachyte flows, and at least one thick tuff unit lies interbedded within the trachyte flows near the top of the volcanic pile. A syenite plug at the southwestern margin of the Riddle Creek basin is thought to be contemporaneous with the extrusive rocks.

PROPERTY GEOLOGY continued**Summary of Property Geology** continued

The Tertiary rocks have been folded into asymmetrical folds which are reflected in the present topography of rounded ridges and valleys. The North Fork of Riddle Creek and Riddle Creek proper are subparallel to the axes of Tertiary plunging synclines striking southeast and east-southeast, respectively.

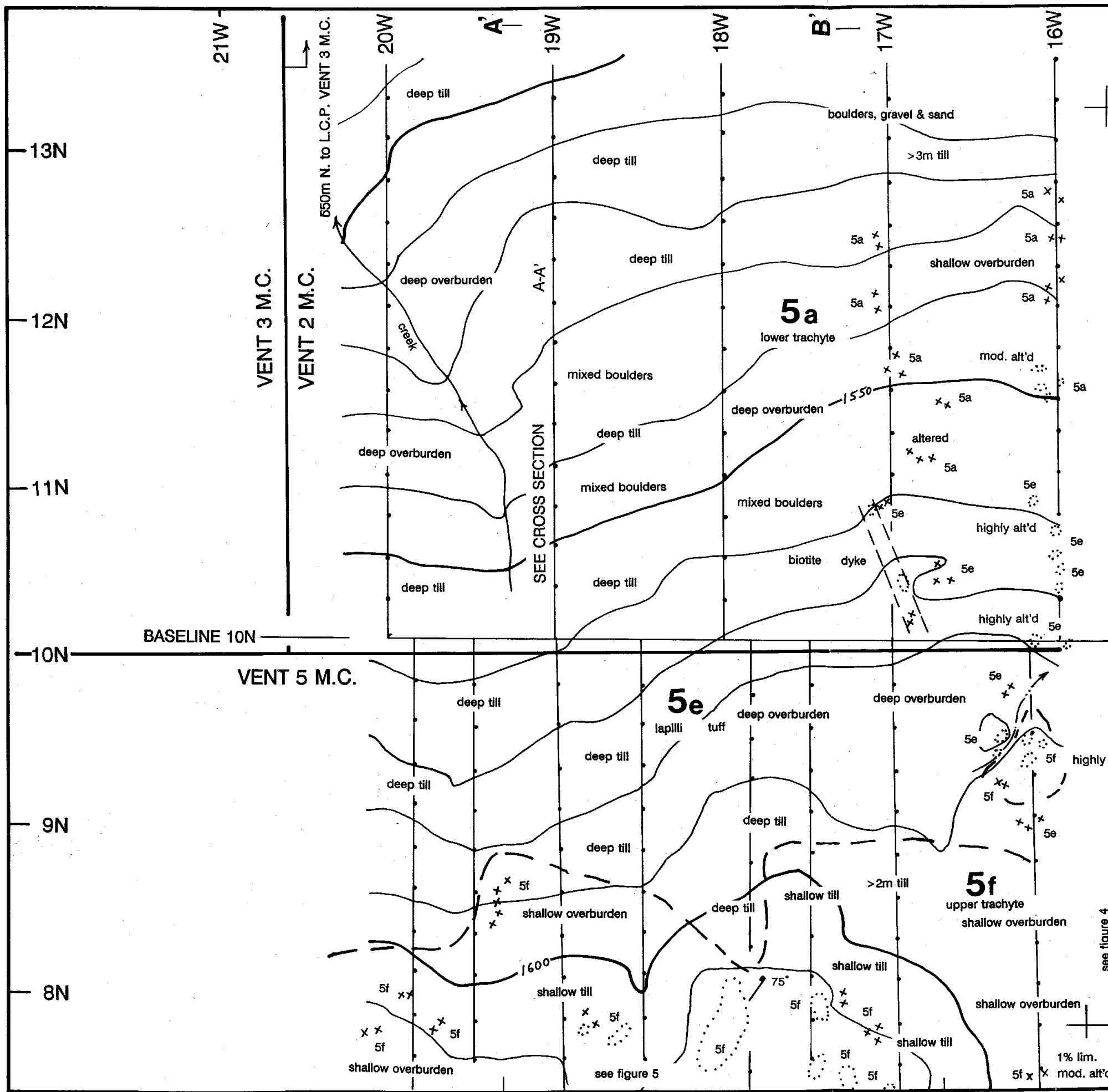
Hydrothermal solutions have ascended late fault zones cutting the Marron Formation on the south half of the Vent property resulting in widespread clay alteration and silicification of the tuff unit.

It is in the Boundary Area of the Vent 1, 2 & 5 mineral claims where the clay alteration and silicification of the tuff unit is best exposed and where the 1989 drilling program was conducted. The Boundary Area was also the focus for this year's detailed mapping program.

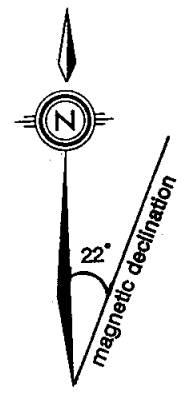
Results

Figures 3-6 accompanying this report fit together to form Map V-94-1, titled "Geology - Boundary Zone, Vent 1, 2 & 5 Mineral Claims." The large map was broken into quadrants for easier handling in the field. The geology was mapped at a scale of 1:2500 and the following discussion refers to the geology as if it were on a single map sheet.

Only three major units of the Eocene Marron Formation occur on Map V-94-1. These include: lower trachyte flows, trachytic tuffs, and upper trachyte flows. A syenite intrusive located at the extreme southwest corner of the map has been called a Coryell Intrusion, although it is thought to be contemporaneous with the extrusive trachytes of the Marron Formation.



- LEGEND -**
- TERTIARY - EOCENE**
CORYELL INTRUSIONS
 6 Syenite
MARRON FORMATION
 5f Upper trachyte flows
 5e Lapilli tuff
 5d Crystal tuff
 5c Tuffaceous Lahar
 5b Tuffaceous Conglomerate
 5a Lower trachyte flows
 4 Mafic Phonolite
 3 Andesite
SPRINGBROOK FORMATION
 2 Conglomerate
- CRETACEOUS (?)**
NELSON INTRUSIONS
 1 Granodiorite



- Symbols**
- outcrop
 - ✕ talus, angular float
 - shears, joints
 - bedding/banding
 - - - inferred fault
 - - - contacts, assumed
 - fault surface

ABBREVIATIONS

- alt'd altered
 - fr'd fractured
 - lim. limonite
 - mod. moderate
 - sli. slight
- contour intervals 10 metres

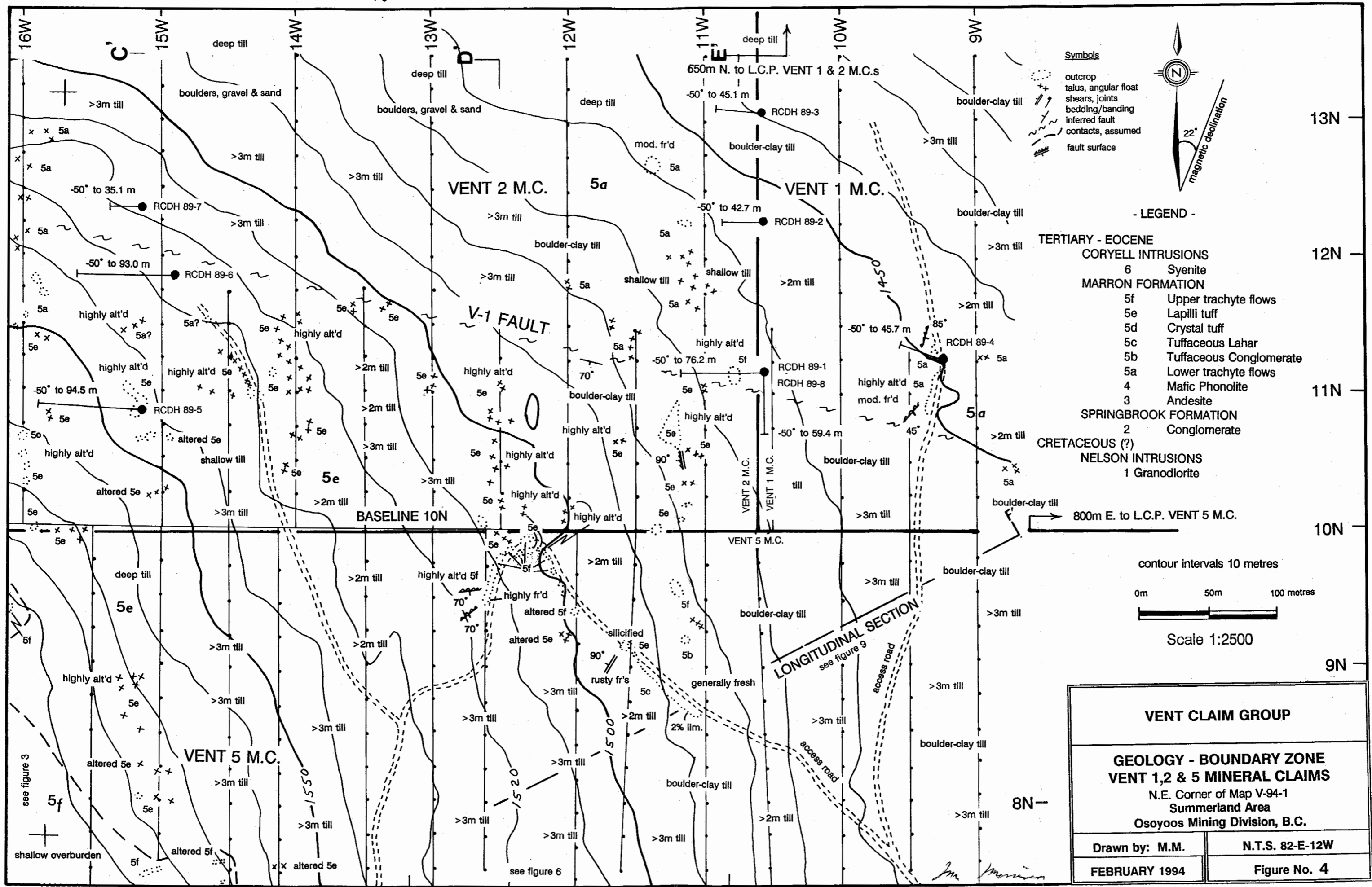
0m 50m 100 metres

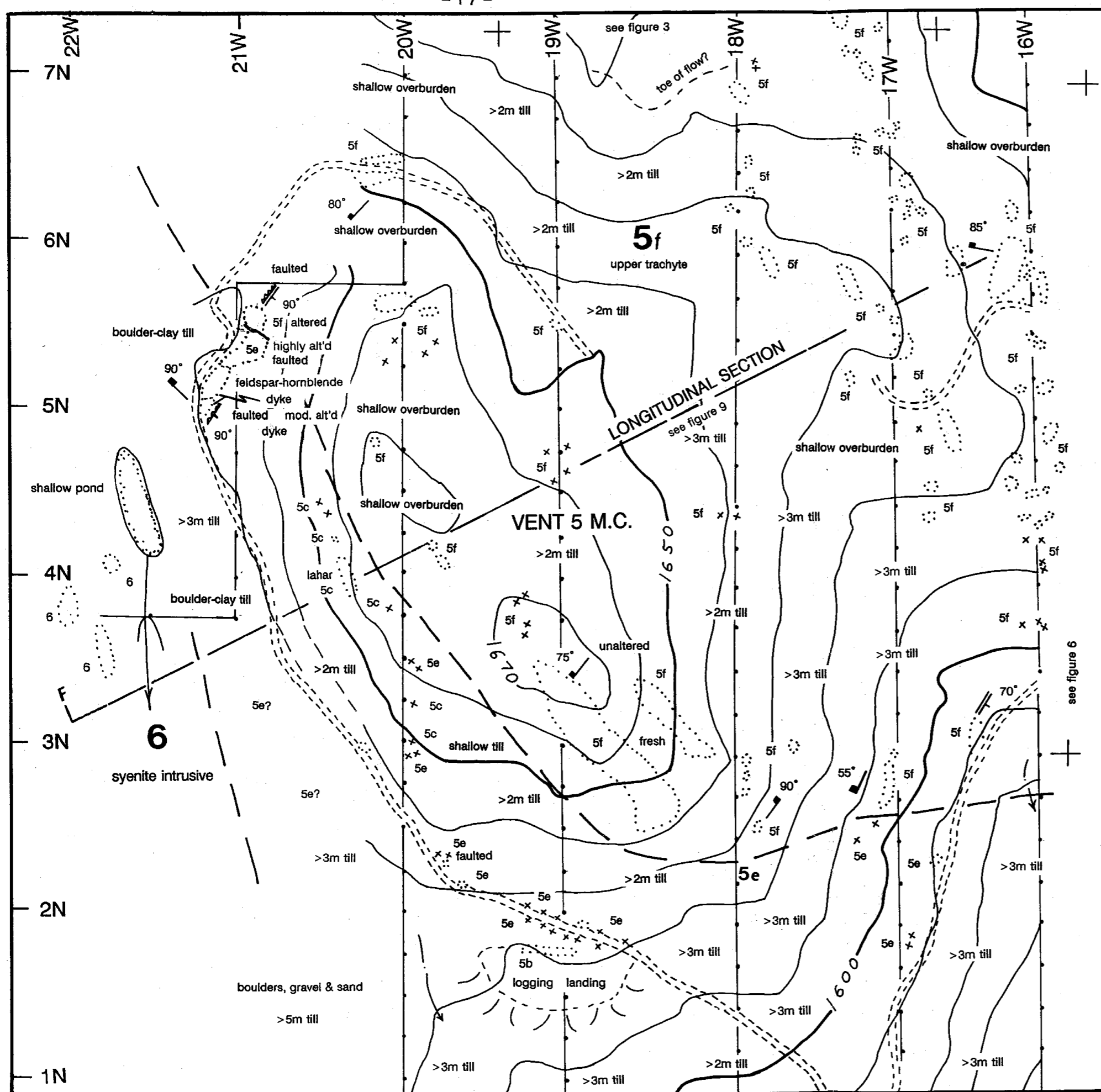


Scale 1:2500

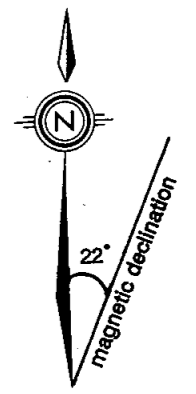
VENT CLAIM GROUP	
GEOLOGY - BOUNDARY ZONE	
VENT 1,2 & 5 MINERAL CLAIMS	
N.W. Corner of Map V-94-1	
Summerland Area	
Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 3

M. Morrison



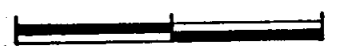


- LEGEND -
- TERTIARY - EOCENE
 CORYELL INTRUSIONS
 6 Syenite
 MARRON FORMATION
 5f Upper trachyte flows
 5e Lapilli tuff
 5d Crystal tuff
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 4 Mafic Phonolite
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 SPRINGBROOK FORMATION
 2 Conglomerate
 CRETACEOUS (?)
 NELSON INTRUSIONS
 1 Granodiorite



- Symbols
- outcrop
 - talus, angular float
 - shears, joints
 - bedding/banding
 - inferred fault
 - contacts, assumed
 - fault surface

0m 50m 100 metres



Scale 1:2500

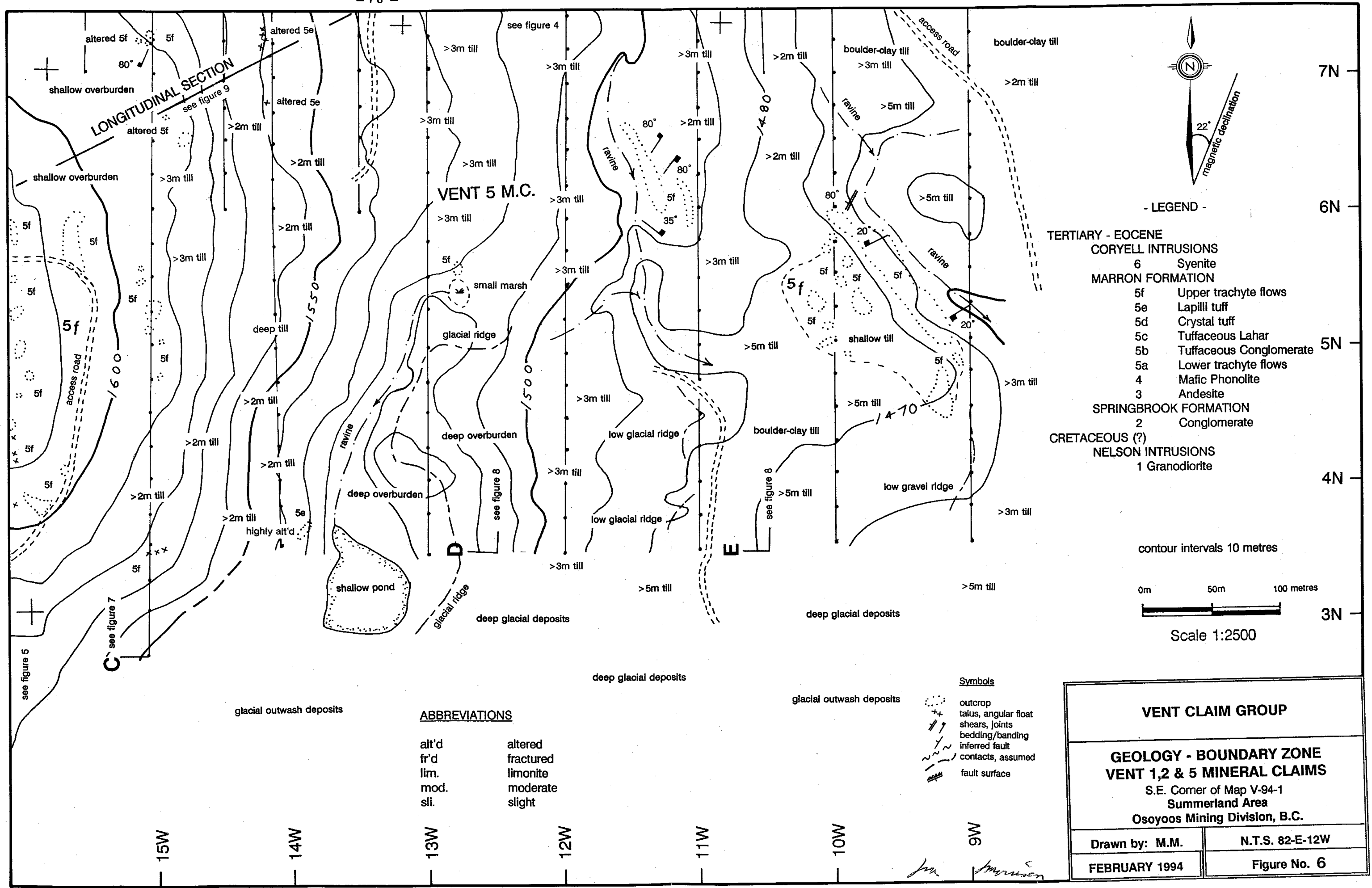
contour intervals 10 metres

ABBREVIATIONS

- | | |
|-------|-----------|
| alt'd | altered |
| fr'd | fractured |
| lim. | limonite |
| mod. | moderate |
| sli. | slight |

Jan Morrison

VENT CLAIM GROUP	
GEOLOGY - BOUNDARY ZONE	
VENT 1,2 & 5 MINERAL CLAIMS	
S.W. Corner of Map V-94-1	
Summerland Area	
Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 5



- LEGEND**
- TERTIARY - EOCENE**
- CORYELL INTRUSIONS**
 - 6 Syenite
 - MARRON FORMATION**
 - 5f Upper trachyte flows
 - 5e Lapilli tuff
 - 5d Crystal tuff
 - 5c Tuffaceous Lahar
 - 5b Tuffaceous Conglomerate
 - 5a Lower trachyte flows
 - SPRINGBROOK FORMATION**
 - 4 Mafic Phonolite
 - 3 Andesite
 - CRETACEOUS (?)**
 - NELSON INTRUSIONS**
 - 1 Granodiorite
 - 2 Conglomerate

ABBREVIATIONS

alt'd	altered
fr'd	fractured
lim.	limonite
mod.	moderate
sli.	slight

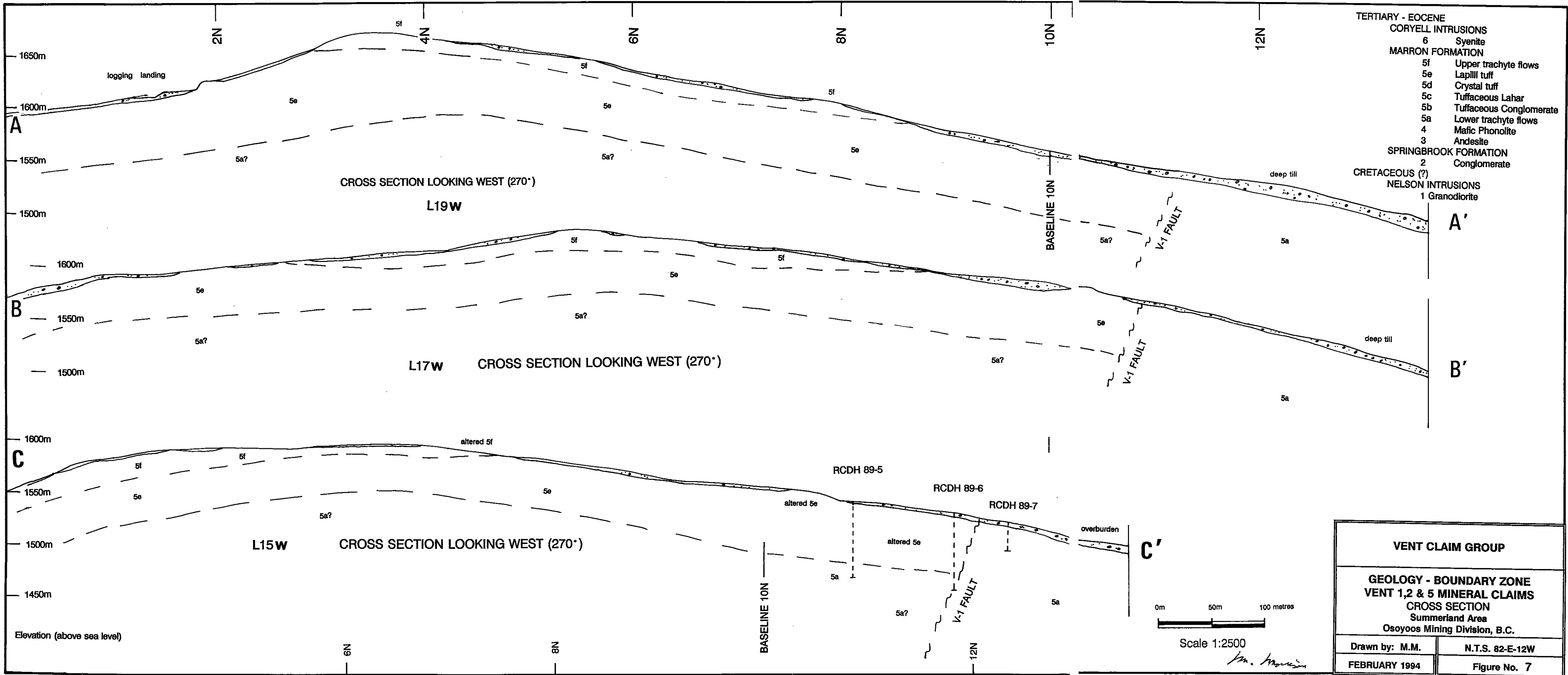
Symbols

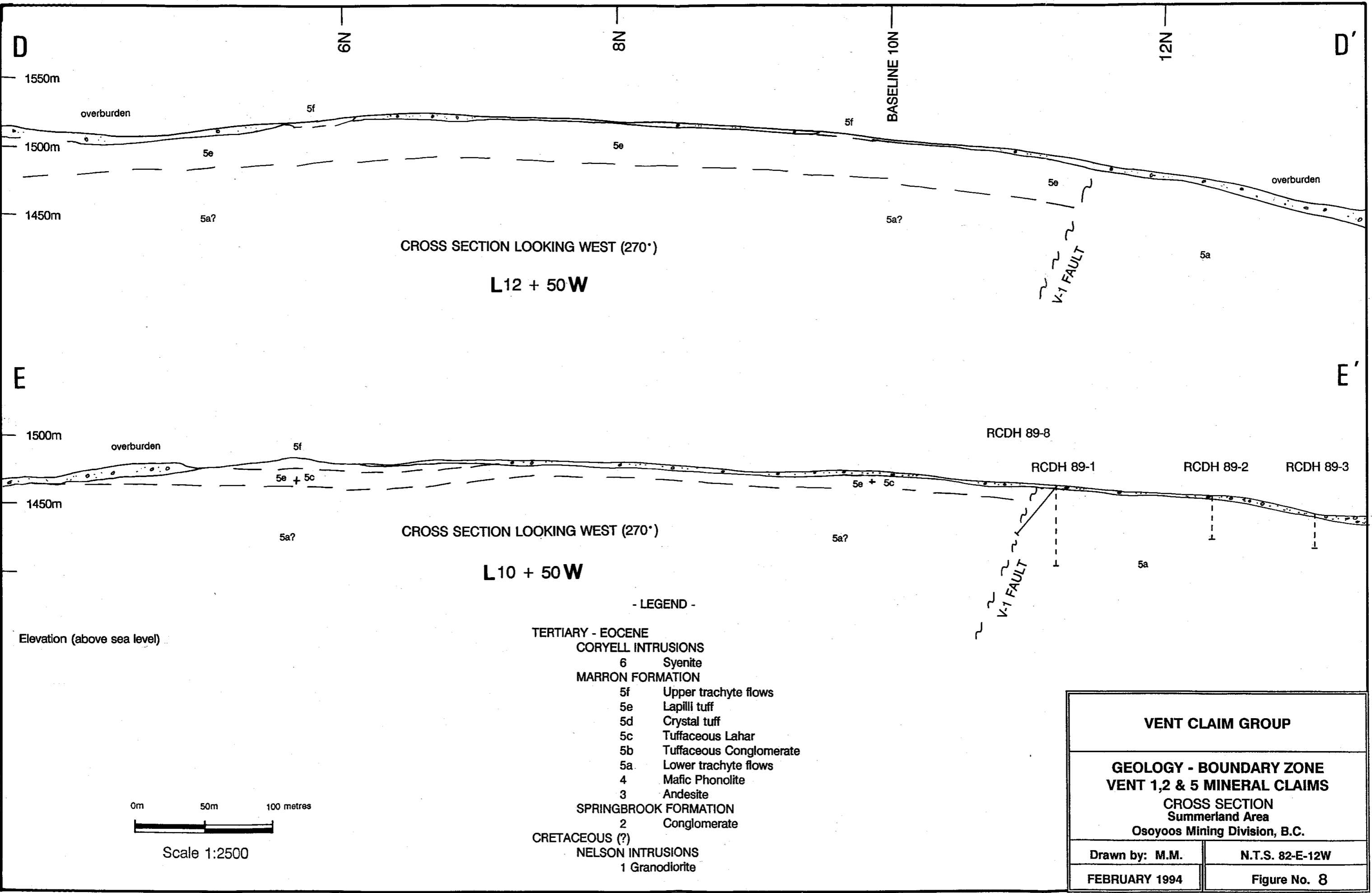
- outcrop
- talus, angular float
- shears, joints
- bedding/banding
- inferred fault
- contacts, assumed
- fault surface

VENT CLAIM GROUP

GEOLOGY - BOUNDARY ZONE
VENT 1,2 & 5 MINERAL CLAIMS
 S.E. Corner of Map V-94-1
 Summerland Area
 Osoyoos Mining Division, B.C.

Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 6





CROSS SECTION LOOKING WEST (270°)

L12 + 50W

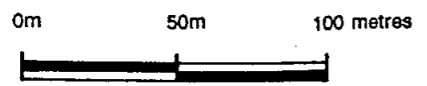
CROSS SECTION LOOKING WEST (270°)

L10 + 50W

- LEGEND -

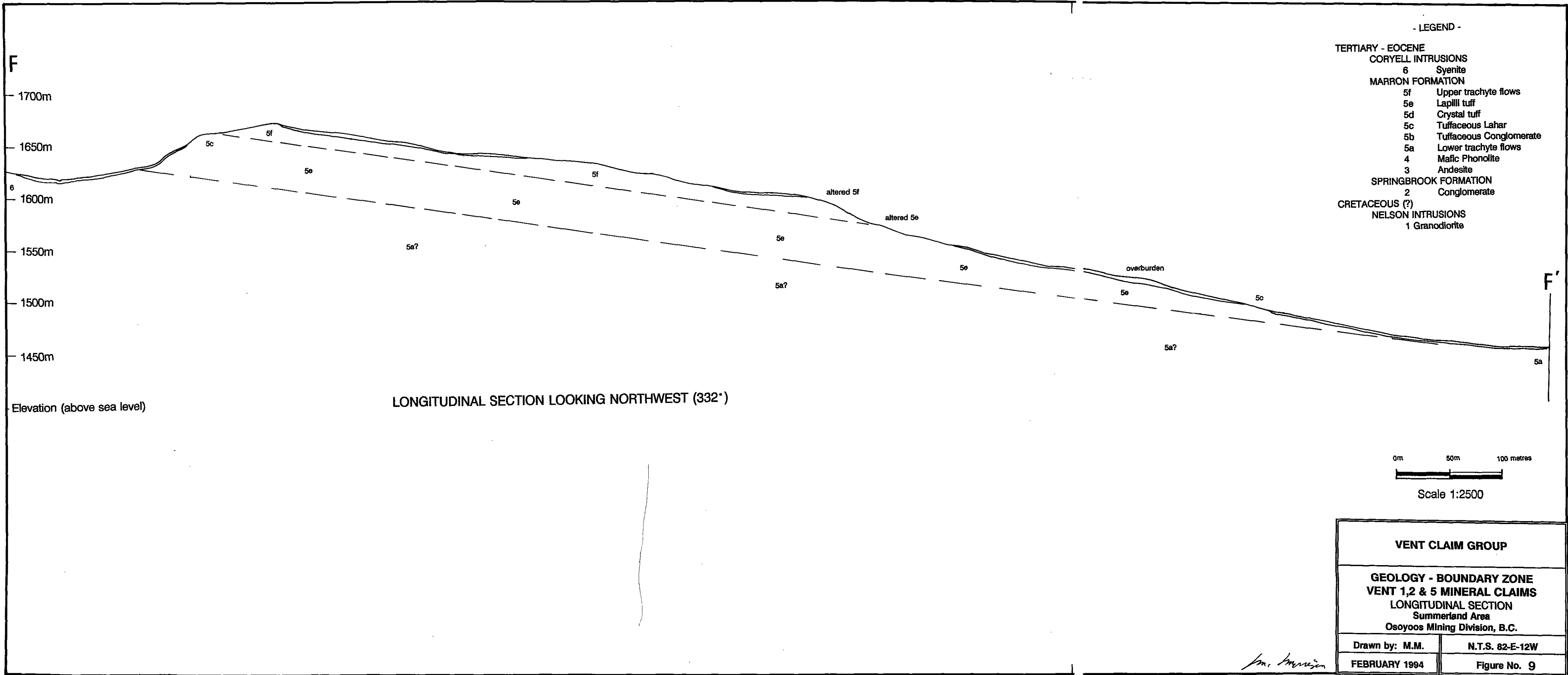
- TERTIARY - EOCENE
- CORYELL INTRUSIONS
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- 4 Mafic Phonolite
- 3 Andesite
- SPRINGBROOK FORMATION
- 2 Conglomerate
- CRETACEOUS (?)
- NELSON INTRUSIONS
- 1 Granodiorite

Elevation (above sea level)



Scale 1:2500

VENT CLAIM GROUP	
GEOLOGY - BOUNDARY ZONE	
VENT 1,2 & 5 MINERAL CLAIMS	
CROSS SECTION	
Summerland Area	
Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 8



- LEGEND -
- TERTIARY - EOCENE
 - CORYELL INTRUSIONS
 - 6 Syenite
 - MARRON FORMATION
 - 5f Upper trachyte flows
 - 5e Lapilli tuff
 - 5d Crystal tuff
 - 5c Tuffaceous Lahar
 - 5b Tuffaceous Conglomerate
 - 5a Lower trachyte flows
 - 4 Mafic Phonolite
 - 3 Andesite
 - SPRINGBROOK FORMATION
 - 2 Conglomerate
 - CRETACEOUS (?)
 - NELSON INTRUSIONS
 - 1 Granodiorite

LONGITUDINAL SECTION LOOKING NORTHWEST (332°)

0m 50m 100 metres
 Scale 1:2500

VENT CLAIM GROUP	
GEOLOGY - BOUNDARY ZONE	
VENT 1,2 & 5 MINERAL CLAIMS	
LONGITUDINAL SECTION	
Summerland Area	
Osoyoos Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 82-E-12W
FEBRUARY 1994	Figure No. 9

M. Morrison

PROPERTY GEOLOGY continued**Results** continued**Upper Trachyte Flows (Unit 5f)**

The upper trachytic flows (unit 5f) cover much of the 1670 metre high knoll between grid 3N & 4N and 19W & 20W. The upper trachyte flow rocks are believed to extend down the slope to the northeast to grid 7N, 15W at the 1590 metre elevation. The upper trachyte also occurs as outliers between grid 4N & 6N and 9W & 12W. Smaller remnants of outliers of the trachyte also occur near Baseline 10N at 12W, and at 9 + 50N, 11 + 20W.

The upper trachyte is generally massive and fresh with widely spaced, ^vcurving, cooling joints. The trachyte appears to reach thicknesses of up to 25 metres according to Cross Sections A-A' to E-E' and Longitudinal Section F-F' (see Figures 7, 8, & 9). The trachyte wedges out to nothing on many parts of the property, exposing the underlying highly altered tuffaceous rocks. The lowermost 3 metres of the upper trachyte is itself often moderately clay altered and limonite stained.

The upper trachyte is a light grey colored rock with 15 to 20%, distinctly stubby, 1-15mm, anorthoclase and sanidine phenocrysts. The phenocrysts are often pink to white and chalky. Hornblende (3%) and biotite (3%) microphenocrysts range up to 3mm in size. The biotite is generally fresh, while the hornblende is often altered to a green mineral or weathered out of the rock entirely. The light grey groundmass equals 80% of the rock and is microcrystalline.

PROPERTY GEOLOGY continued**Results** continued**Trachytic Tuff (Units 5e, d, c & b)**

Trachytic tuffaceous rocks underlie the upper trachyte and are exposed over much of the central region of the map area. The trachytic tuff does not stand up well to erosion and many of the rock exposures have been provided by road building and other operations related to logging activities. Lapilli tuff (unit 5e) predominates and reaches up to 57 metres in thickness in drill holes 89-5 & 6. A tuffaceous lahar (unit 5c) is in evidence at two widely separated areas on the property at 4N, 20 + 25W and at 9N, 11W. A conglomerate with a tuffaceous matrix occurs at 1 + 75N, 19W. Just above the conglomerate on L19W the tuff is semi-welded and contains large lapilli and volcanic bombs.

The trachytic tuff is compositionally very similar to the trachytic flow rocks, but at many sites on the property it has undergone clay alteration and silica replacement. The mafic minerals show all degrees of alteration - even total destruction. Often the hornblende is the first mineral to alter. The feldspars are kaolinized and the entire rock is sometimes totally replaced by kaolinite and/or silica. Only ghost textures of lapilli and crystals remain.

In outcrop, the altered tuff is chalky white or weakly stained with limonite or hematite. The highly silicified tuff stands up to erosion and forms small ridges in the glaciated terrane.

Unit 4b is a crystal tuff. It is difficult to distinguish from the other altered tuffaceous rocks on Map V-94-1, but it does occur on a local scale.

PROPERTY GEOLOGY continued**Results** continued**Lower Trachyte Flows (Unit 5a)**

The lower trachyte (unit 5a) is believed to underlie the other units of the Marron Formation on Map V-94-1. The lower trachyte is exposed across much of the northern map area north of grid 11N. The lower trachyte is also exposed to the east of grid line 9 + 50 west.

The lower trachyte is similar to the upper trachyte in all aspects, and it is, therefore, very difficult to distinguish in the field. The lower trachyte is often a darker grey than the upper trachyte. It tends to weather more blocky, whereas the upper trachyte is more resistant to erosion and massive. The feldspar phenocrysts of the lower trachyte, on average, are slightly smaller than those of the upper trachyte. All in all, the differences are very subtle, and in hand specimen it is almost impossible to tell the two trachytes apart. Usually the lower trachyte is more vesicular, but this feature is probably not a dependable criteria for distinguishing the two rock types.

The description of the components of a hand specimen of the upper trachyte (see above) applies equally well for the lower trachyte, and there is no need to repeat it here.

Syenite (Unit 6)

A syenite intrusive (unit 6) has been mapped at the extreme southwest corner of the map area. The syenite is pink and massive with widely spaced cooling joints.

PROPERTY GEOLOGY continued**Results** continued**Syenite (Unit 6)** continued

The syenite has a felted texture with loose euhedral to subhedral radiating orthoclase crystals up to 15mm in size making up 85% of the rock. There is 10% open space in the rock between the mesh of radiating crystals. Hornblende crystals up to 3mm size equal 5%. There is little alteration.

Structural Geology and Faulting

The Marron Formation appears to be folded into a gently northeasterly plunging anticline with asymmetrical limbs. The axis of the anticline is coincident with Longitudinal Section F-F' on Map V-94-1. The southeasterly dipping limb is the steeper limb, while the northwesterly dipping limb is more gentle, but truncated by the steeply dipping V-1 Fault. The northern side of the fault has been uplifted, bringing the lower trachyte into direct contact with the upper trachyte (see Cross Sections on Figures 7 & 8).

Alteration and Mineralization

One of the more interesting features on the Vent property is the intensity of the clay alteration and silicification of the lapilli tuff unit. This is particularly notable between 10N & 11N from 10 + 50W to 16W. In places, the trachytic lapilli tuff is entirely altered to kaolinite and/or replaced by silica with only ghost textures of lapilli and mineral crystals remaining.

PROPERTY GEOLOGY continued**Results** continued**Alteration and Mineralization** continued

Drill holes 89-1, 5, 6 & 8 encountered up to 60 metres of strong clay alteration and up to 80 metres of silica replacement, which included minor chalcedony veinlets. Pyrite in amounts of 5 to 15% over intercepts of 33 to 43 metres accompanies clay alteration zones in the drill holes.

The strong clay alteration and silica replacement was not restricted to the lapilli tuff in the 1989 drill holes. In the vicinity of the V-1 Fault the clay alteration and silicification also involved the well fractured upper and lower trachytic flow rocks (Morrison, 1990).

A good distance from the 1989 drill sites, at grid 3 + 50N, 13 + 90W, the lapilli tuff is also notably chalky and kaolinite altered.

The ICP chemical analysis of drill intercepts from the 1989 program revealed elevated barium levels (up to 500 parts per million) in some of the altered tuff. Copper showed moderately elevated levels (up to 391 ppm). However, arsenic (up to 50 ppm) and antimony (2 ppm) values, generally indicators of epithermal systems, were notably low in the drill intercepts. Precious metal values were also negligible.

Although chalcedony veinlets were intercepted by the 1989 drill holes true quartz veins were not, and in retrospect it is thought that the deposition of higher temperature silica with possible associated precious metal values may lie at some moderate depth below the 1989 drill intercepts.

PROPERTY GEOLOGY continued**Discussion**

The intense clay alteration and silicification of the Marron Formation volcanics of the Boundary Zone prove that large amounts of hydrothermal solutions have passed through the rocks. The 1989 drilling program further confirmed the intensity of the clay alteration and silicification to depths of 80 metres. At 80 metres depth, the silica was found to be low temperature chalcedony and it is now felt that there is a need to drill deeper to reach the higher temperature "roots" of the epithermal system. At some moderate depth there should be a stockwork of quartz veining, and it is with this stockwork that precious metals might be expected to occur.

An Induced Polarization Survey should be conducted over grid lines 10W to 20W from 7N to 12N. The I.P. survey should work well to delineate the strong pyritic halo zones associated with the faulting on the property. The I.P. survey (with luck) might even outline quartz stockwork systems as distinct ^{resistivity} ~~receptivity~~ highs centred within the pyritic halos. Such a geophysical pattern would be a very attractive target for testing for precious metals by diamond drilling to depths of 150 to 300 metres.

ALTIMETER SURVEY

Introduction

The lay of the land in the Boundary Zone of the Vent 1, 2 & 5 mineral claims closely approximates the configuration of the asymmetrical anticline of the Marron Formation underlying the area. It is, therefore, necessary to have good topographical control for geological mapping. The fact that the upper and lower trachytes of the anticline are almost identical and very hard to differentiate in the field makes good topographic control all the more necessary. It was for these reasons that the altimeter survey was conducted on the property.

The Program

The geological grid was used for the altimeter survey which covered 16.2 km and required 5 man days to complete. A Swiss made Thommen altimeter was used for the survey. Altimeter readings were read at each measured grid station and at intermediate points between grid stations to increase the accuracy of the survey. To further increase the detail of the survey estimated elevations were recorded for points 25 metres to the west and east of each grid station.

Readings were taken at Baseline stations on several occasions and corrected for diurnal variation. Looped traverses were then made along pairs of grid lines, starting and ending with known elevations at Baseline stations. All readings of each loop were then corrected for diurnal variation. The corrected elevations for each station have been plotted on Map V-94-2 accompanying this report.

The density of station values would allow for contouring at 2 metre intervals, however, it was considered that contours at 10 metre intervals would be suffice for geological purposes. Map V-94-2, has therefore, been contoured at 10 metre intervals. The 10

ALTIMETER SURVEY continued**Introduction** continued

metre contour lines, minus the individual altimeter values, have been drawn on Topographic Map V-94-3 which also accompanies this report. The Topographic Map was used as a base map for geological mapping.

SCINTILLOMETER SURVEY**Introduction**

A portion of the Vent property lies within a zone covered by the "Exploration Regulations for Uranium and Thorium of British Columbia." Radiometric "baseline surveys" are required in such regions before a work permit is issued. The scintillometer survey was conducted over this year's grid on the Vent property to gather baseline radiometric survey data to satisfy the regulations.

Instrumentation and Theory

A Scintrex Model BGS-IS broadband gamma ray spectrometer was used for the survey. The BGS-IS responds to gamma rays of any energy greater than about 80 KeV. The instrument is therefore useful in the detection of potassium (K^{40}), uranium (U^{238} and daughter products) and thorium (Th^{232} and daughter products). The instrument does not differentiate between the three radiometric sources.

The scintillometer measures gamma rays per second which strike a sensor and the instrumentation of the scintillometer gives the values in recordable counts per second (cps). The radioactivity in one area can therefore be read in counts per second relative

SCINTILLOMETER SURVEY continued**Instrumentation and Theory** continued

to another area. Background measurements for the BGS-IS scintillometer are generally 30 to 40 cps.

Although it is recognized that the instrument measures radioactivity from several isotopes a uranium equivalent in parts per million (Ue(ppm)) has been worked out where:

Ue(ppm) equals 1.2 times the cps at a station minus background, or:

$Ue(ppm) = 1.2 (\text{station cps} - \text{background cps})$ therefore: a station reading of 140 cps minus a background of 40 cps would equal a 120 ppm Ue value, or

$Ue(ppm) = 1.2 (140 \text{ cps} - 40 \text{ cps}) = 1.2 (100) = 120.$

The equation works for a large source area only, and does not work with hand specimens.

The Program

A Scintillometer reading in counts per second (cps) was recorded for each station of the geological grid. The instrument was held at a standard one metre distance above the ground for each reading. A total of 4 man days were required to complete the 18 km survey.

The values in counts per second have been plotted on Map V-94-4 and contoured at 20 cps intervals. The 140 cps contour, which is believed to represent a threshold value, has been drawn in heavier ink for emphasis.

SCINTILLOMETER SURVEY continued**Results**

The scintillometer values on Map V-94-4 range from 40 to 230 cps. The values are generally greater than 80 cps, or twice the normal background for Southern British Columbia. The higher than normal background is expected considering that all of the survey area is underlain by either trachytic or syenitic rocks which typically have a higher than normal potassium and thorium content.

The 140 cps contour that has been visually selected as the threshold value on Map V-94-4 generally separates areas of good rock exposure from those of poor rock exposure when Map V-94-4 is overlain with the geology Map V-94-1. There is a good correlation of higher cps values with areas of abundant outcrop. The following is a list of examples of high cps values which are coincident with exposed bedrock:

- values of 180 - 200 cps occur near grid 3N on lines 17, 18, 19 & 20N coincident with good exposures of upper trachyte;
- values of 160 - 180 cps occur on grid line 16W at 3 + 50N to 4 + 00N and 5 + 00N to 6 + 00N coincident with large exposures of upper trachyte;
- values of 170 cps occur on L 17 + 50W at 7 + 70N coincident with upper trachyte;
- values of 190 cps occur on L 16W at 9N coincident with upper trachyte;
- values of 210 cps occur on L 10W at 5N coincident with upper trachyte;
- values of 140 - 180 cps occur just north of Baseline 10N from 15W to 17W coincident with altered lapilli tuff;
- a very large zone of 140 - 160 cps readings occurs from 9N to 12 + 50N between lines 10W and 12 + 50W where outcroppings of upper trachyte, altered lapilli tuff, and lower trachyte are numerous (drill holes RCDH 1, 2 & 8 occur within this area);
- another zone of 140 - 170 cps occurs from 11N to 12N on L9W (drill hole RCDH 4 was drilled in this area);

SCINTILLOMETER SURVEY continued**Results**

- a value of 230 cps occurs coincident with abundant outcroppings of welded lapilli tuff at the road at 1 + 75N, 19W; and
- a value of 160 cps was recorded over syenite outcrop at 3 + 75N, 22W.

Just as the higher cps values are coincident with exposed rock on Map V-94-4 the lower cps values occur where regions of the property are covered by deep till. One such area of low values (40 - 80 cps) occurs in the vicinity of lines 19 & 20W from 8N to 13 + 50N. Lower trachyte and trachytic tuff are thought to underlie the deep till in this region. A second large area of low values (65 - 100 cps) occurs south of the Baseline from 10N to 6N on L 14W and extends over to L 9W from 8N to 6N. Very few outcroppings occur in this area which is believed to be underlain by lapilli tuff and/or upper trachyte.

Discussion

In general, the four main rock units underlying the survey area, upper trachyte, trachytic tuff, lower trachyte and syenite, all give similar scintillometer readings (140 - 200 cps) if well exposed, and the survey results reflect the nearness of bedrock to surface more than anything else on Map V-94-4. No radioactive anomalies were discovered. In fact, the property is uranium-poor according to the ICP chemical analysis of 492 metres of sample obtained from the 1989 drilling program. The uranium content of the samples was found to be less than 10 parts per million (ppm) in most samples. The thorium content in samples ranged from 80 to 110 ppm in unaltered trachytes and from 15 to 20 ppm in well altered tuffaceous rocks (Morrison, 1990).

SCINTILLOMETER SURVEY continued**Discussion** continued

This year's scintillometer survey in conjunction with the 1989 analysis of 492 metres of drill chip samples would suggest that the concentrations of uranium and thorium on the Vent property do not present a health hazard to workers on the property.

CONCLUSIONS AND RECOMMENDATIONS


This year's geological mapping at a scale of 1:2500 over the Boundary Zone on the Vent 1, 2 & 5 mineral claims, coupled with the altimeter survey, provides good basic data for future exploration programs on the property.

This year's mapping and the 1989 drilling program have demonstrated that large fault systems occur on the Vent property, and that vast volumes of low temperature hydrothermal solutions have passed through these fault systems. The lack of precious metal values in the drill intercepts of 1989 is attributed to the fact that only the uppermost, low temperature, horizons of the strong epithermal systems were penetrated during the drill program. Exploration efforts should now be directed towards finding the quartz-stockwork "roots" of these large epithermal systems. It is believed that economic precious metal values might be found with these "roots".

An Induced Polarization survey should be conducted over an area bounded by grid 7N to 12N and 10W to 20W in an effort to delineate the strong pyritic halos associated with possible quartz-stockworks related to the Tertiary fault-controlled epithermal systems.

The I.P. anomalies should then be drill tested to depths of 150 to 300 metres and samples should be analyzed for precious metal values.

February 28, 1994
Kelowna, B.C.


Murray Morrison, B.Sc.

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Morrison, M.S.

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- 1990: Percussion Drilling Assessment Report, Vent Group of Mineral Claims, Summerland Area, Osoyoos Mining Division.*
- 1993: Geophysical Assessment Report, Vent Claim Group, Summerland Area, Osoyoos Mining Division.*

* Assessment Reports on file with the British Columbia Ministry of Mines, Energy and Petroleum Resources.

G.S.C. = Geological Survey of Canada.

APPENDIX ASTATEMENT OF QUALIFICATIONS

I, Murray Morrison, of the City of Kelowna, in the Province of British Columbia, do hereby state that:

1. I graduated from the University of British Columbia in 1969 with a B.Sc. Degree in Geology.
2. I have been working in all phases of mining exploration in Canada for the past twenty-three years.
3. During the past twenty-three years, I have intermittently held responsible positions as a geologist with various mineral exploration companies in Canada.
4. I have conducted several geological, geochemical, and geophysical surveys on mineral properties in Southern British Columbia during the past twenty-three years.
5. I conducted the geological, radiometric, and altimeter surveys outlined in this report.
6. I own 100% interest in the Vent 1-5 mineral claims.

February 28, 1994
Kelowna, B.C.


Murray Morrison - B.Sc.

APPENDIX B**STATEMENT OF EXPENDITURES - ON THE VENT CLAIM GROUP**

Statement of Expenditures in connection with Geological, Altimeter and Scintillometer Surveys carried out on the Vent Claim Group, located 16 km southwest of Summerland, B.C. (N.T.S. Map 82-E-12W) for the year 1993.

GEOLOGICAL MAPPING PROGRAM (1.4 sq. km)

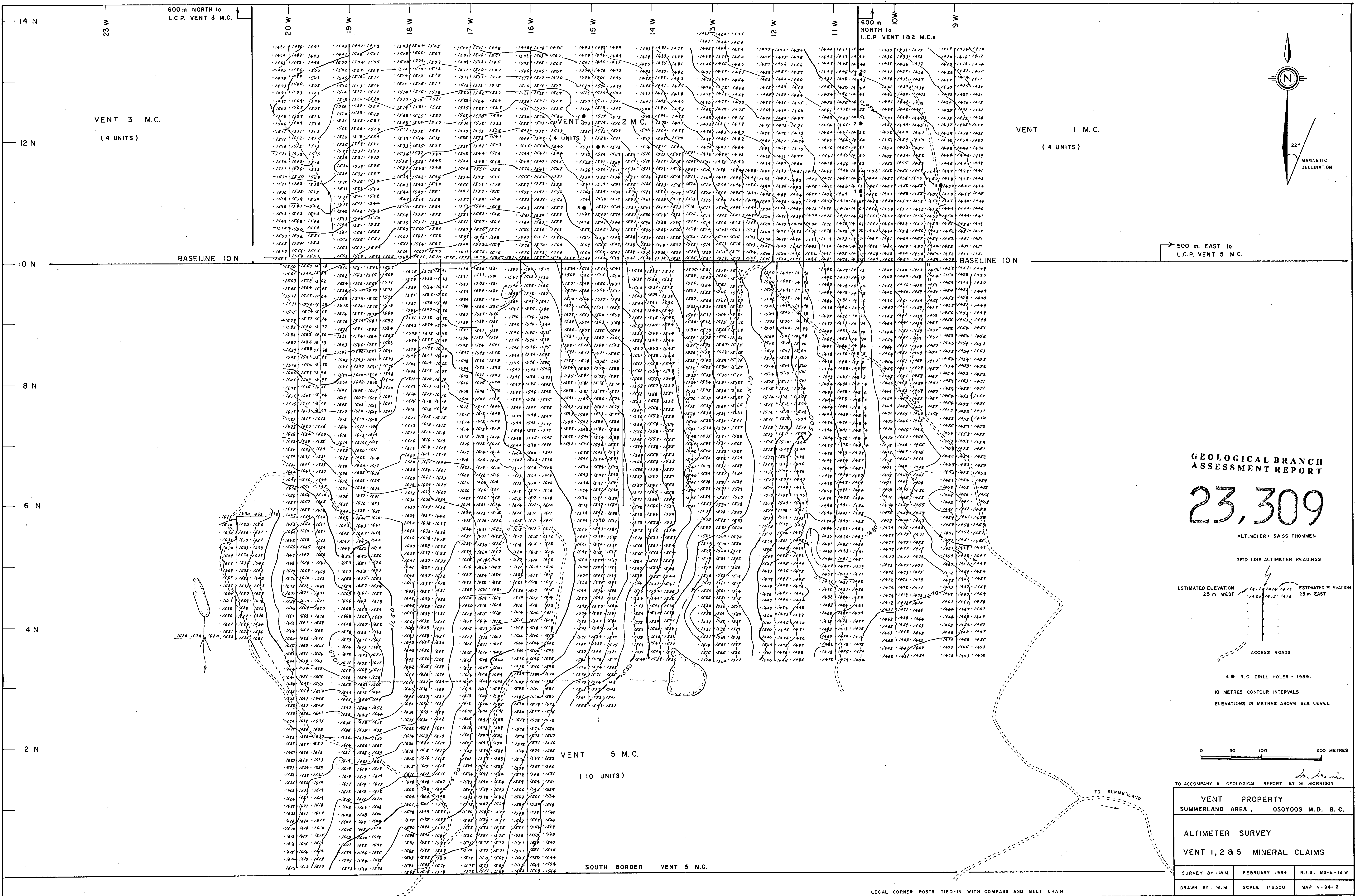
M. Morrison, geologist	8 days @ \$250.00/day	\$ 2,000
Truck, 4 x 4 (including gasoline and insurance)	8 days @ \$75.00/day	600
Meals and Lodging	no cost	-
Flagging and belt chain thread		<u>30</u>
	Sub-total:	\$ 2,630

ALTIMETER SURVEY (16.2 km)

M. Morrison, geologist	5 days @ \$250.00/day	\$ 1,250
Truck, 4 x 4 (including gasoline and insurance)	5 days @ \$75.00/day	375
Meals and Lodging	no cost	<u>0</u>
	Sub-total:	\$ 1,625

SCINTILLOMETER SURVEY (18 km)

M. Morrison, geologist	4 days @ \$250.00/day	\$ 1,000
Truck, 4 x 4 (including gasoline and insurance)	4 days @ \$75.00/day	300
Meals and Lodging	no cost	0
Instrument Rental	4 days @ \$25.00/day	<u>100</u>
	Sub-total:	\$ 1,400



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

23,309

ALTIMETER - SWISS THOMMEN

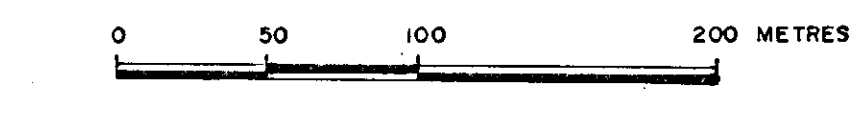
GRID LINE ALTIMETER READINGS

ESTIMATED ELEVATION
25 m WEST ESTIMATED ELEVATION
25 m EAST

ACCESS ROADS

4 ● R.C. DRILL HOLES - 1989.

10 METRES CONTOUR INTERVALS
ELEVATIONS IN METRES ABOVE SEA LEVEL



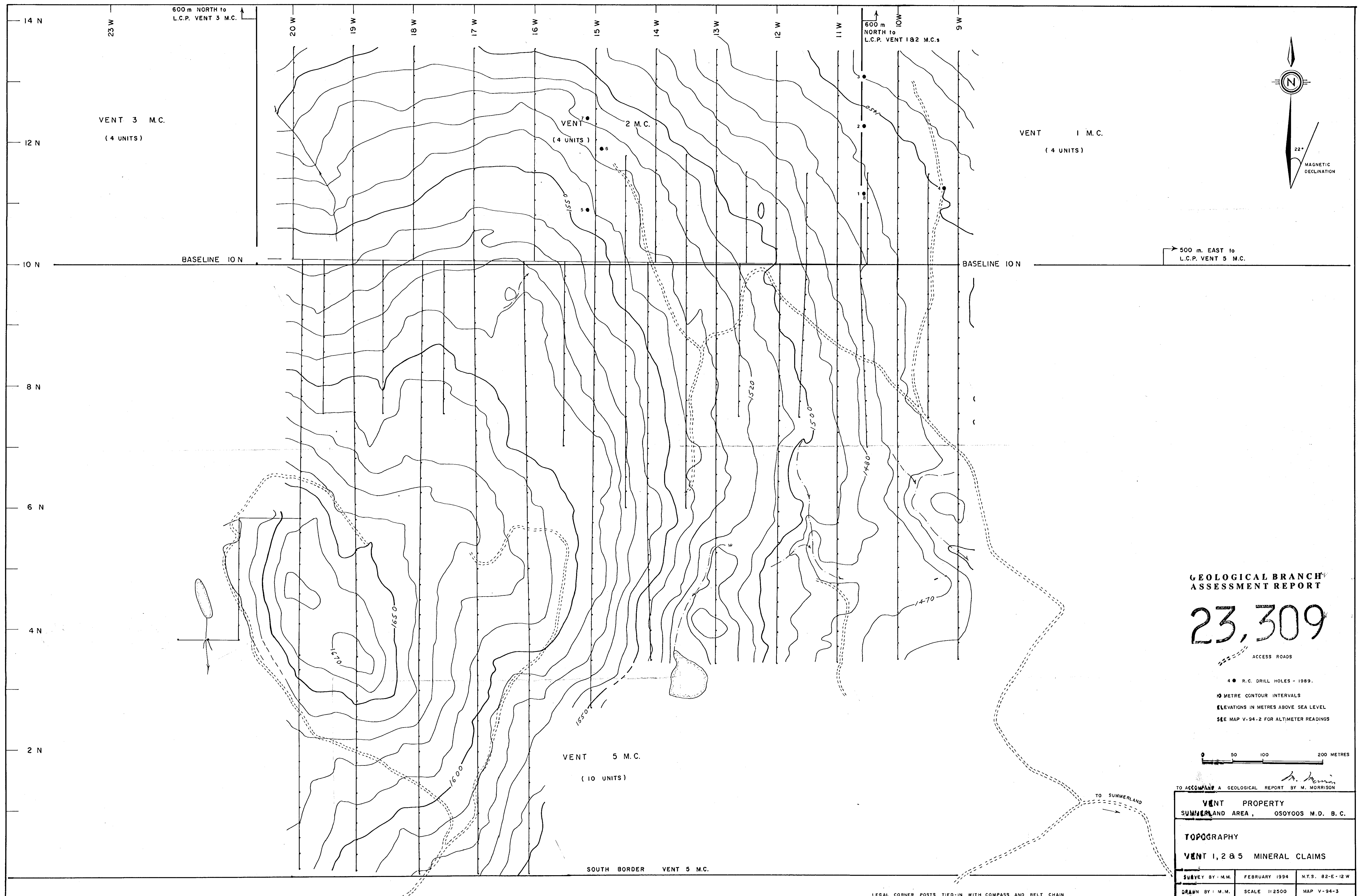
TO ACCOMPANY A GEOLOGICAL REPORT BY M. MORRISON

**VENT PROPERTY
SUMMERLAND AREA, OSOYOOS M.D. B.C.**

**ALTIMETER SURVEY
VENT 1, 2 & 5 MINERAL CLAIMS**

SURVEY BY: M.M.	FEBRUARY 1994	N.T.S. 82-E-12W
DRAWN BY: M.M.	SCALE 1:2500	MAP V-94-2

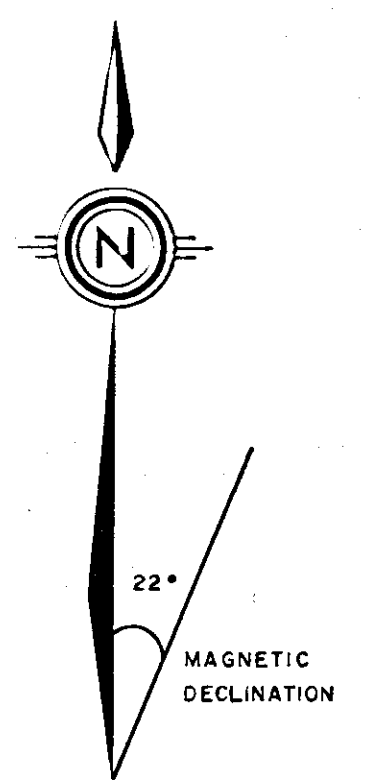
LEGAL CORNER POSTS TIED-IN WITH COMPASS AND BELT CHAIN



600 m NORTH to
L.C.P. VENT 3 M.C.

600 m
NORTH to
L.C.P. VENT 1 & 2 M.C.s

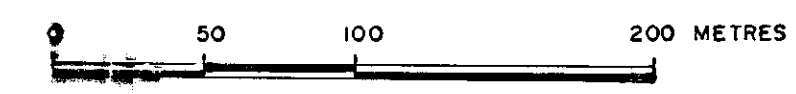
500 m. EAST to
L.C.P. VENT 5 M.C.



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

23,309

- ACCESS ROADS
- R.C. DRILL HOLES - 1989.
- 10 METRE CONTOUR INTERVALS
- ELEVATIONS IN METRES ABOVE SEA LEVEL
- SEE MAP V-94-2 FOR ALTIMETER READINGS



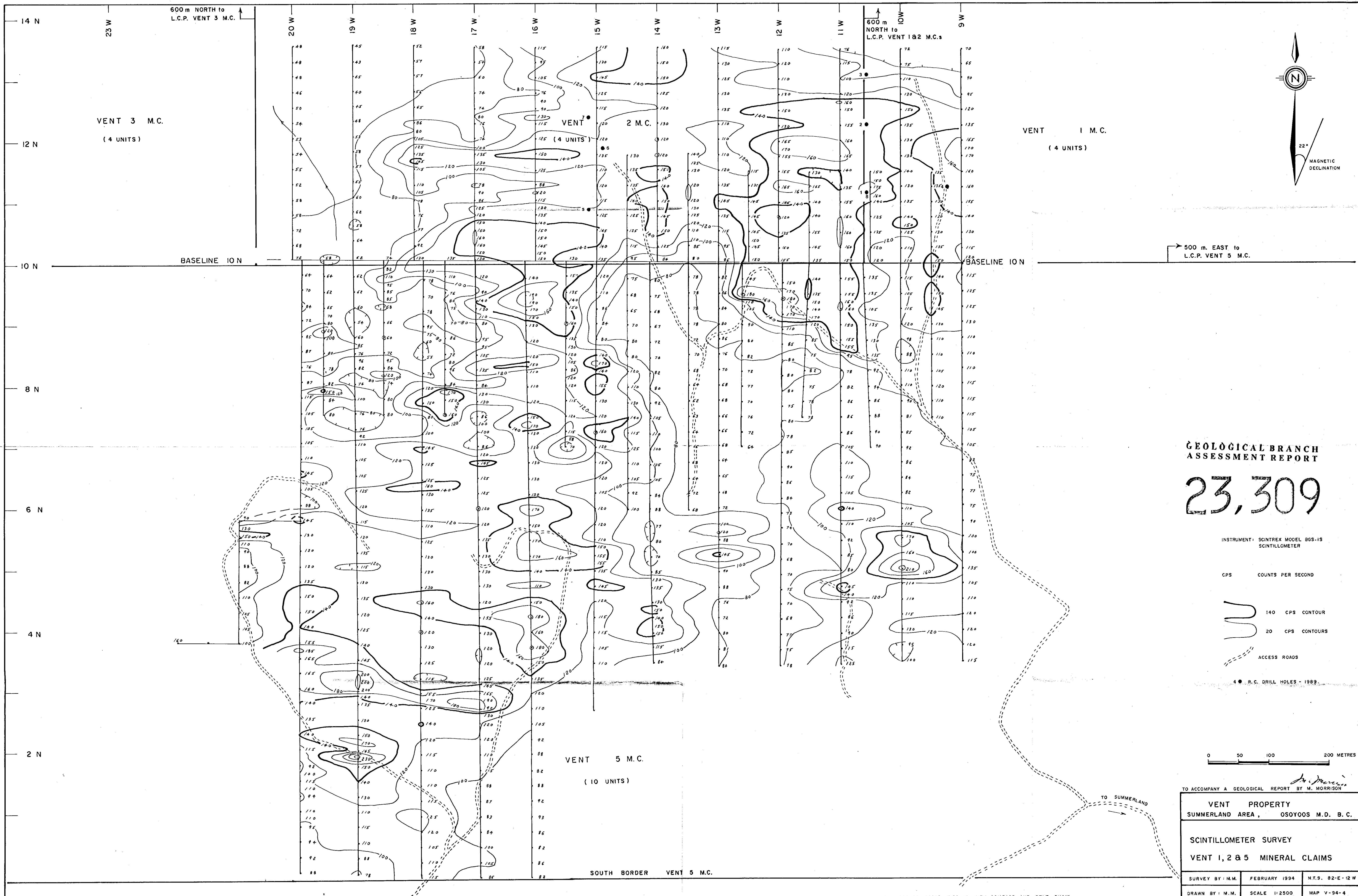
TO ACCOMPANY A GEOLOGICAL REPORT BY M. MORRISON

VENT PROPERTY
SUMMERLAND AREA, OSOYOOS M.D. B.C.

TOPOGRAPHY
VENT 1, 2 & 5 MINERAL CLAIMS

SURVEY BY: M.M.	FEBRUARY 1994	N.T.S. 82-E-12 W
DRAWN BY: M.M.	SCALE 1:2500	MAP V-94-3

LEGAL CORNER POSTS TIED-IN WITH COMPASS AND BELT CHAIN



GEOLOGICAL BRANCH
ASSESSMENT REPORT

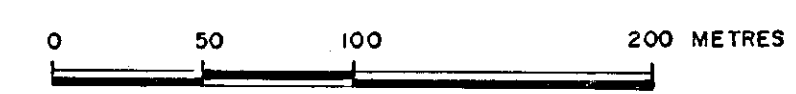
23,309

INSTRUMENT: SCINTREX MODEL BGS-13
SCINTILLOMETER

CPS COUNTS PER SECOND

140 CPS CONTOUR
20 CPS CONTOURS
ACCESS ROADS

4 R.C. DRILL HOLES - 1989



TO ACCOMPANY A GEOLOGICAL REPORT BY M. MORRISON

VENT PROPERTY
SUMMERLAND AREA, OSOYOOS M.D. B.C.

SCINTILLOMETER SURVEY
VENT 1, 2 & 5 MINERAL CLAIMS

SURVEY BY: M.M.	FEBRUARY 1994	N.T.S. 82-E-12W
DRAWN BY: M.M.	SCALE 1:2500	MAP V-94-4

LEGAL CORNER POSTS TIED-IN WITH COMPASS AND BELT CHAIN