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**EXPLORATION PROPOSAL  
MIDWAY GOLD PROJECT  
South-Central British Columbia**

by

**C.J. WESTERMAN, Ph.D.  
Consulting Geologist  
Vancouver, B.C.  
(604) 683-8617**

**November, 1990**

## CONTENTS

	<b>Page</b>
Executive Summary	1
Technical Summary	2
Project Information	4
Exploration Proposal	6
Budget Estimate	8
Appendix - Regional Information	

## **FIGURES**

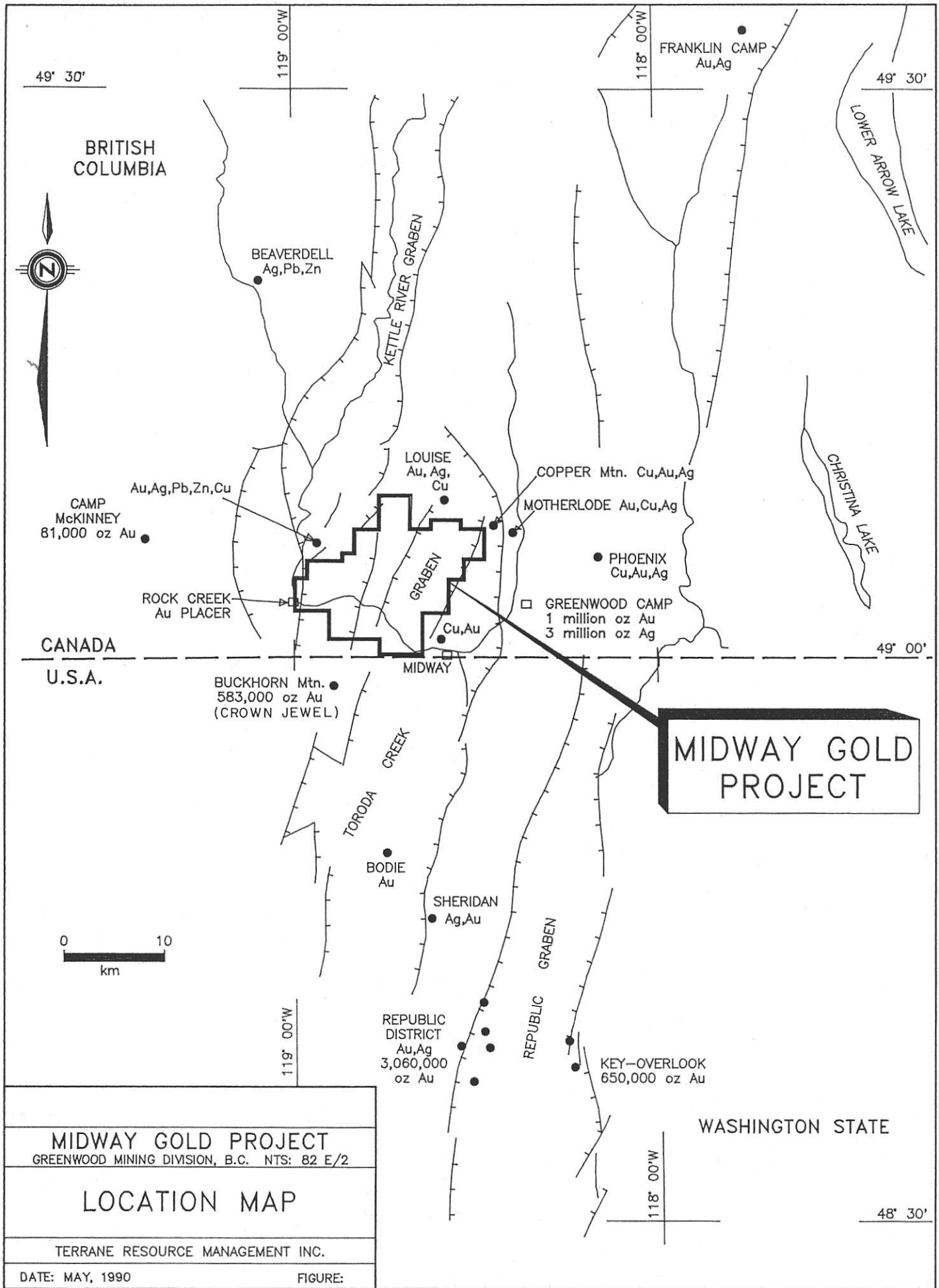
Location Map  
Exploration Model  
Claim Map  
Aeromagnetic Map  
Geology Map  
Geology Legend

## EXECUTIVE SUMMARY

Recent gold exploration successes in northeast Washington State have focused attention on a small area of south-central British Columbia located adjacent to the international border. In the past three years over two million ounces of new gold reserves have been discovered in geological environments related to the Republic and Turoda grabens. Republic type deposits are epithermal veins hosted by Tertiary volcanic rocks. The Key, Overlook and Crown Jewel deposits are in magnetite skarns in Permian or Triassic rocks. The **Midway Project** consists of 13,400 acres of mineral claims located to cover similar geologically favourable situations and aeromagnetic anomalies in southern B.C. This area, located west of the town of Midway and east of Rock Creek, has been the subject of very little precious metal exploration in the past. Its location at the north end of the Turoda graben and the south end of the Kettle River graben indicates considerable exploration potential. Battle Mountain Gold and Minnova Corp. both have large exploration programs underway in B.C. in this district. A brief prospecting program undertaken on the Midway Project lands has discovered a previously undocumented magnetite skarn related to one of the aeromagnetic anomalies. An integrated exploration program starting with a detailed airborne geophysical survey and progressing through to drill testing of defined targets is proposed at a total cost of \$1,000,000. The area is currently offered for option to interested parties prepared to fund the cost of this staged exploration program to earn a 100% working interest subject to option payments and a retained royalty to the current owner.

Contact:

James Robertson, P.Eng.  
Midas Management Inc.  
Vancouver, B.C.  
(604) 669-8988.



49° 30'

119° 00'W

118° 00'W

49° 30'

BRITISH COLUMBIA



BEAVERDELL  
Ag,Pb,Zn

FRANKLIN CAMP  
Au,Ag

LOWER ARROW LAKE

KETTLE RIVER GRABEN

Au,Ag,Pb,Zn,Cu

CAMP  
McKINNEY  
81,000 oz Au

LOUISE  
Au, Ag,  
Cu

COPPER Mtn. Cu,Au,Ag

MOTHERLODE Au,Cu,Ag

CHRISTINA LAKE

ROCK CREEK  
Au PLACER

GREENWOOD CAMP  
1 million oz Au  
3 million oz Ag

PHOENIX  
Cu,Au,Ag

CANADA

U.S.A.

49° 00'

BUCKHORN Mtn.  
583,000 oz Au  
(CROWN JEWEL)

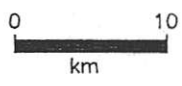
MIDWAY

**MIDWAY GOLD  
PROJECT**

TORODA  
CREEK

BODIE  
Au

SHERIDAN  
Ag,Au



119° 00'W

REPUBLIC DISTRICT  
Au,Ag  
3,060,000  
oz Au

REPUBLIC GRABEN

KEY-OVERLOOK  
650,000 oz Au

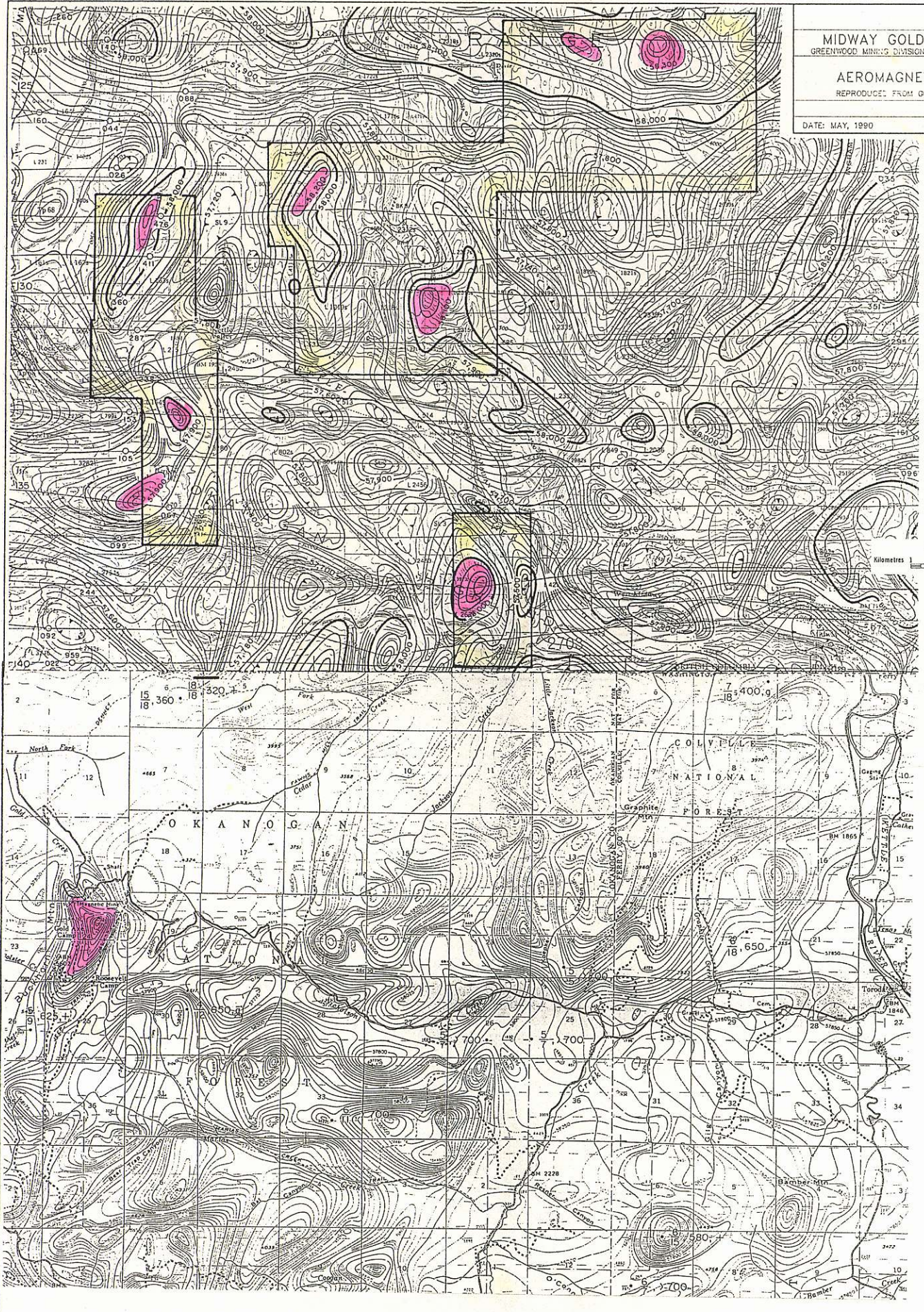
WASHINGTON STATE

118° 00'W

48° 30'

MIDWAY GOLD PROJECT  
GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2  
AEROMAGNETIC MAP  
REPRODUCED FROM GCS MAP 8497G

DATE: MAY, 1990 FIGURE:



## TECHNICAL SUMMARY

The Midway project located adjacent to the U.S. border west of Greenwood in south-central B.C. encompasses four claim blocks totalling 217 units (13,410 acres) which were staked to cover a conceptual target based on favourable government geology and aeromagnetic data.

The project area is considered to have significant potential for discovery of an economic gold deposit similar to the recently discovered Key-Overlook and Crown Jewel deposits located across the international border in Washington State. These deposits each contain between 500,000 and 700,000 ounces of gold associated with quartz-pyrrhotite vein swarms cutting massive magnetite skarns. There is also a spatial relationship to the famous epithermal vein deposits of Tertiary age in the Republic District which have produced over 2 million ounces of gold and 13.4 million ounces of silver in the past. Current reserves at Republic are over 1 million ounces of gold. Echo Bay placed the Key-Overlook deposits in production this year and Battle Mountain Gold Corp. has six drills defining additional reserves at the Crown Jewel deposit. Battle Mountain is also undertaking a major evaluation of the Phoenix camp at Greenwood where past production from copper-bearing magnetite skarn deposits has recovered over 1 million ounces of gold. All of these deposits lie within or adjacent to one of several regional Tertiary tensional structures. The Republic, Key-Overlook and Greenwood deposits are associated with the Republic Graben and the Crown Jewel deposit is marginal to the Turoda Graben.

The Midway project covers a portion of the north end of the Turoda Graben and the south end of the (en-echelon) Kettle River Graben. The area contains the same Permian-Triassic age rocks which host the magnetite skarns in Washington State and B.C. and these are overlain by Tertiary volcanic rocks similar to those which host the Republic deposits. Each of the four claim blocks was staked to include a significant Tertiary fault structure and each covers a bullseye type anomaly shown on government aeromagnetic maps. Little or no significant exploration work has been undertaken on these properties in recent years. However, exploration programs on lands immediately to the east were undertaken by Minnova and on lands to the south and southeast by Battle Mountain during 1990.

A very brief reconnaissance evaluation of the Midway Project lands undertaken in October 1990 discovered a previously undocumented magnetite skarn zone on the Gram 1 claim. This

lies at one end of a small aeromagnetic anomaly which is itself satellite to a much larger and more intense anomaly on the Gram 2. An extension of the large Gram 2 anomaly to the northeast is flanked by the iron-copper skarns of the old Copper Mountain occurrences. Silicified structures carrying locally high grade gold values are hosted by pyritized diorite intrusions on a claim group immediately north of the Gram claims.

Basement rocks outcropping on the Bar claims are extensively hornfelsed. An area of calc-silicate hornfels interbedded with chert breccias on the Bar 2 claim carries minor malachite staining indicating the local presence of previously undocumented copper mineralization.

Both of the new discoveries were made within 50 metres of well used forestry roads which provide excellent access to the area. Further follow-up was frustrated by a heavy snowfall, but clearly there is considerable potential for future discoveries - particularly in those fairly extensive areas of shallow Tertiary and/or Pleistocene sediment cover. A systematic exploration program should commence with an airborne magnetic and EM survey to be followed up by prospecting, ground surveys and drilling of defined targets. Anticipated budget requirements are as follows:

Phase 1 - Airborne surveys	\$ 75,000
Phase 2 - Ground surveys	\$ 300,000
Phase 3 - Drilling	\$ 625,000

The project is offered for option under terms to be negotiated.

Contact:

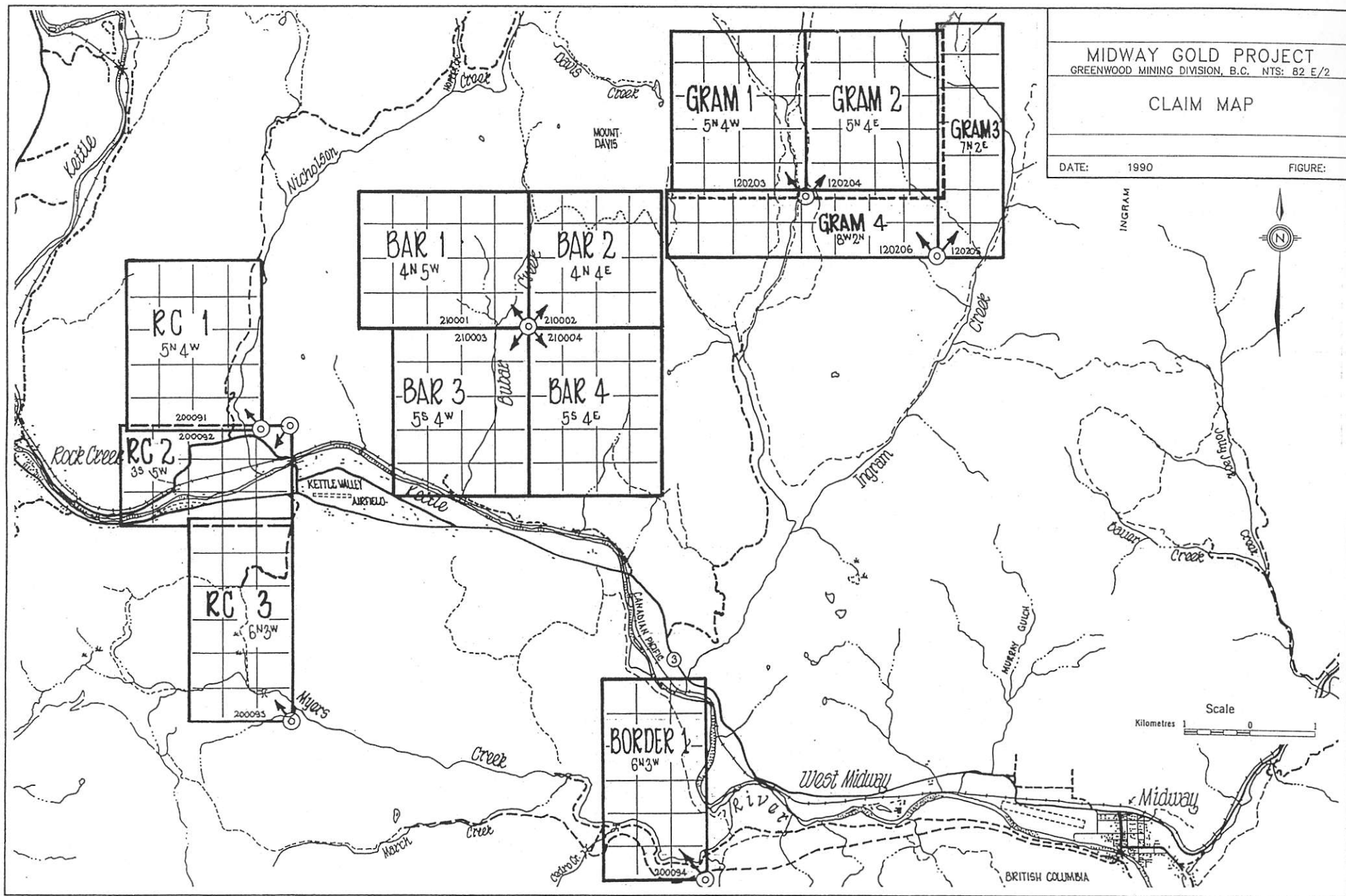
James Robertson, P.Eng.  
Midas Management Inc.  
306 - 850 West Hastings Street  
Vancouver, B.C.  
V6C 1E1  
(604) 669-8988

MIDWAY GOLD PROJECT  
GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2

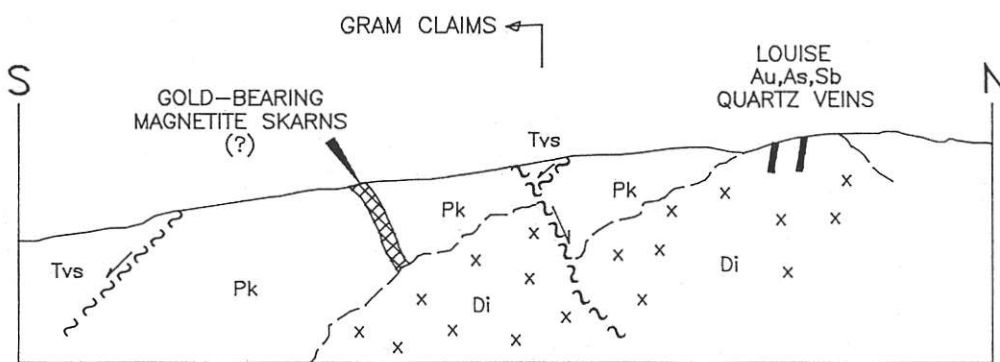
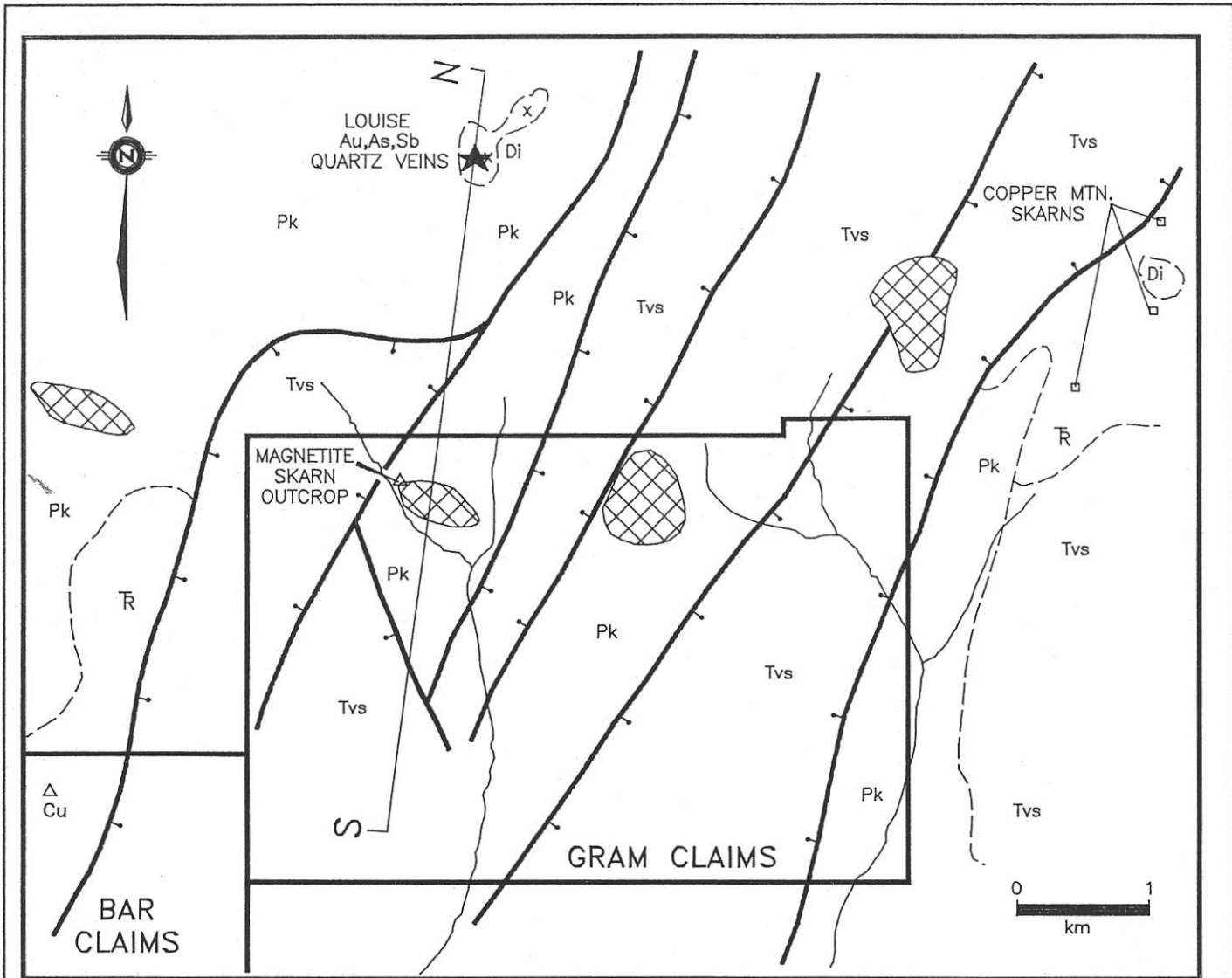
CLAIM MAP

DATE: 1990

FIGURE:







MIDWAY GOLD PROJECT  
 GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2

**GEOLOGY MAP**

TERRANE RESOURCE MANAGEMENT INC.

DATE: NOV., 1990      FIGURE:

- LEGEND:
- Tvs TERTIARY VOLCANICS AND SEDIMENTS
  - R TRIASSIC BROOKLYNN Fm.
  - Pk PERMIAN KNOB HILL GROUP
  - Di DIORITE INTRUSION
  - FAULT
  - ▨ AEROMAGNETIC ANOMALY

### PROJECT INFORMATION

The Midway project lies astride the north end of the Turoda Graben and the south end of the Kettle River Graben which is located en-echelon to the northwest. The Project is underlain by Permian and Triassic age metasediments which are locally intruded by Cretaceous felsic stocks and overlain unconformably by Tertiary volcanics and sediments. The latter are best preserved in graben structures and may locally aggregate thicknesses in excess of 300 metres. The older rocks are exposed at surface in adjacent upthrow fault blocks with local areas of thin Tertiary cover. Much of the area is covered by a mantle of glacial debris of highly variable thickness. A thin white volcanic ash horizon can be found in many parts of the project area just below recent soil horizons.

The Midway Project as currently configured consists of the following mineral claims totalling 13,400 acres located in NTS 82E/2 within the Greenwood Mining Division. The claims are registered in the name of James Robertson:

<u>Claim</u>	<u>Units</u>	<u>Record No.</u>	<u>Record Date</u>
BAR 1	20	5700	March 8, 1990
BAR 2	16	5701	March 4, 1990
BAR 3	20	5702	March 5, 1990
BAR 4	20	5703	March 4, 1990
GRAM 1	20	5696	March 7, 1990
GRAM 2	20	5697	March 8, 1990
GRAM 3	14	5698	March 8, 1990
GRAM 4	16	5699	March 7, 1990
RC 1	20	5693	March 9, 1990
RC 2	15	5694	March 11, 1990
RC 3	18	5695	March 11, 1990
BORDER 1	<u>18</u>	5692	March 12, 1990
<b>TOTAL</b>	<u><u>217</u></u>		

Very little exploration work has been documented in this area despite its location between the historic Greenwood and Rock Creek mining camps. There are no records of any work having been done on the area of the GRAM 1-4 claims. Radiometric and geologic surveys were undertaken on the BORDER claim area in 1977 by Harold Jones for Dolmage-Cambell & Associates. No anomalies were detected (MIDWAY 1-2 claims). About one-third of the area of the BAR 2 and 4 claims was covered by a wide spaced soil (400 samples) and Mag/VLF survey in 1983 by L. Sookochoff for Prominent Resources Corp. The report mentions the presence of Kettle River acid tuffs, north-south linear magnetic anomalies and five areas of significant geochemical anomalies. The data indicates the presence of erratic anomalous gold and arsenic values (Rock claim). A small area (500 metre square) of the BAR 3 claim was explored in 1984 by S.S. Tan for Rand Resources Inc. Geologic, VLF-EM and soil geochemical (158 samples) surveys were undertaken. The report mentions the presence of three areas of silica-pyrite boxworks in a "quartzite" unit situated between quartz-feldspar porphyry and altered granodiorite. Erratic anomalous gold values are reported (BETA claim). Approximately two-thirds of the RC 1 claim was explored briefly for uranium in 1977 by John Kerr for Wespas Resources Ltd. Grid based scintillometer and rock geochemical surveys revealed no significant anomalies.

A brief reconnaissance program of the Midway Project claims was undertaken in the fall of 1990, primarily to satisfy assessment requirements. The program was curtailed prematurely by an early snowfall and was almost exclusively restricted to areas immediately adjacent to forest access roads. Investigation of an aeromagnetic anomaly located on claim Gram 1 discovered a previously undocumented magnetite skarn occurrence. Outcrops of fine grained garnet - diopside - epidote skarn and hornfels carry abundant disseminated magnetite and traces of fine grained sulphide (pyrite and possibly chalcopyrite). Host rocks are probably of Permian age and can be correlated with the Knob Hill Group. (Equivalents in Washington State host both the Overlook and Crown Jewel deposits.) Original lithologies appear to have been calcareous siltstones andesitic tuffs and interbedded cherts. Several generations of fracture fillings are present ranging from earlier epidote - quartz to late calcite. This new discovery occurs on the margin of the aeromagnetic anomaly suggesting that something larger and

more significant may be discovered by more exploration. A much larger and more intense aeromagnetic anomaly to the east on claim Gram 3 has not been investigated. To the southwest on claim Bar 2 rocks of the Knob Hill (Permian) and Brooklynn (Triassic) formations have been extensively hornfelsed. Outcrops in the road bed on this claim consist of calc-silicate hornfels interbedded with chert breccias. Minor malachite staining is present indicating a previously undocumented copper occurrence. Further work in all of these areas is recommended.

### EXPLORATION PROPOSAL

The current exploration program should be guided by the presence of two conceptual target types. (1) Gold-bearing magnetite skarns and (2) gold-bearing epithermal quartz vein stockworks. It was initially assumed that the area had received saturation prospecting in the past due to its proximity to the Greenwood Camp. A rapid evaluation of the forest access roads has, however, turned up two previously undocumented occurrences of some significance. One is left to speculate what may be discovered by actually walking away from the roads and prospecting in the bush. Primary emphasis should be placed on exploration for magnetite skarn occurrences because these will probably be easier to find.

The initial exploration phase should consist of a high resolution helicopter aeromagnetic survey on lines spaced at no more than 200 metres apart. Flight lines should be oriented east-west. A VLF-EM survey flown at the same time will provide data for structural interpretation which will be critical input in the search for epithermal stockwork deposits. Even relatively weak aeromagnetic anomalies will require follow-up because some of the skarn targets may be buried by several hundred feet of Eocene volcanics as at the Overlook deposit.

The ground follow-up phase should start with preparation of a suitable topographic base map. Existing GSC geological mapping is high quality on a broad scale but the recently completed reconnaissance survey indicates that detailed geologic mapping will be required to provide an adequate framework for further exploration. Ground follow-up of aeromagnetic anomalies will require construction of survey grids and

these should be tied to a common reference system. Ground mag-VLF EM surveys are relatively rapid and there should not be any need for extensive line cutting - most survey lines can be simply blazed and flagged. Selected parts of some magnetic anomalies may be subjected to IP surveys to define drill targets.

It is difficult to make a case for extensive systematic geochemical grid surveys of areas underlain by Tertiary volcanic rocks. It is highly unlikely that a significant gold in soil anomaly will be generated but it is possible that indicator elements (Cu, As, Hg) could be present as definable anomalies. Rock and soil geochemical surveys targeted on specific structures might provide some useful information.

Areas believed to be underlain by Pre-Tertiary rocks covered by a thin veneer of glacial debris should be tested by systematic grid geochemical soil surveys. Definable gold anomalies might be present and if correlated with magnetic anomalies would provide first priority drill targets. Bedrock geochemical response will undoubtedly be diluted by glacial cover and samples should, if possible, be taken from below the recent volcanic ash horizon.

It is anticipated that a minimum of six drill targets will be defined by ground survey work. Each will require testing by at least 3 holes to depths of at least 300 metres. The initial drilling phase should therefore be budgeted at about 6,000 metres. This could be RVC drilling since the target types are visually distinctive and could be recognized in chips.

BUDGET ESTIMATE

Phase 1

Helicopter magnetic-EM survey contract  
Area 10 km x 10 km at 200 m line spacing  
750 line km at \$100 per km

Total Phase 1 \$ 75,000

Phase 2

Base map, orthophoto \$ 10,000  
Geologic mapping 25,000  
Geochemistry - sampling 15,000  
Geochemistry - analyses 2,000 @ \$20 60,000  
Survey Grids 40,000  
Magnetic, VLF-EM surveys 15,000  
IP surveys 60,000  
Trenching (contingent) 10,000  
Drafting, office and communication 5,000  
Supplies and freight 2,500  
Reporting 10,000  
Government fees 12,500

\$ 265,000  
Contingency, management and administration 35,000

Total Phase 2 \$ 300,000

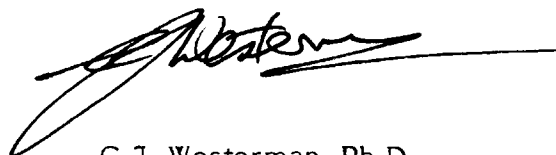
Phase 3

6,000 m RVC drilling at \$95/m \$ 570,000  
including assays, supervision and reporting  
Contingency, management and administration 55,000

Total Phase 3 \$ 625,000

Combined Total \$1,000,000

Vancouver, B.C.  
November 1990



C.J. Westerman, Ph.D.  
Consulting Geologist

## APPENDIX

### REGIONAL INFORMATION

Gold production from the **Republic District** of northeast Washington State dates back to the 1890s. Through 1985, about 2.4 million ounces of gold and 13.9 million ounces of silver were produced from Tertiary epithermal veins and stockworks yielding grades averaging 0.56 opt Au and 3.02 opt Ag. Modern exploration by Hecla Mining Co. has led to the definition of a new reserve in the Golden Promise system of about 1 million tons averaging about 1.0 opt Au. The Republic District lies on the west margin of the Republic Graben which is a major N-S trough filled with Tertiary age clastic sediments and volcanics which host the gold deposits. This major structure can be traced north through the Greenwood District in Canada which has produced about 1 million ounces of gold and 3.4 million ounces of silver from skarn and vein deposits.

Recent exploration activity in Washington by Crown Resources Corp. has discovered three significant gold deposits at the east margin of the Republic Graben at about the same latitude as the Republic District. These deposits were placed in production by Echo Bay Mines in February of 1990 at a rate of 1,500 tpd. The **Overlook deposit** contains 3.3 million tons grading 0.17 opt Au in four zones. Zone 4 is a flat lying magnetite replacement cut by a stockwork of pyrrhotite veins and has reserves of 850,000 tons at 0.30 opt Au. The zone averages 40 feet thick and has lateral dimensions of 700 feet by 350 feet. It is to be mined by modified room and pillar method with decline access. Above this are three flat lying zones of quartz-pyrrhotite vein swarms containing 2.5 million tons grading 0.13 opt Au. The largest of these (Zone 1) reaches a thickness of 120 feet and has lateral dimensions of 1,200 feet by 750 feet. The gold zones at Overlook are hosted by Permian clastic sediments and intercalated limestones within a flat laying cataclastic zone. There is no significant development of calc-silicate skarn minerals. Arsenic and bismuth are present in geochemically anomalous amounts. There is a probable genetic relationship to dykes and sills of Scatter Creek rhyodacite of Tertiary age (intrusive equivalents of the Sanpoil volcanics). The ore zones lie beneath 600 feet of Tertiary volcanic cover and have no surface expression. There is, however, a 500 gamma aeromagnetic anomaly at Overlook.

The **Key East and Key West deposits** contain a total of about 1 million tons grading 0.18 opt Au and are near surface with a waste to ore ratio of about 6.5 to 1. In general character they resemble the stockwork vein zones at Overlook but sufficient magnetite is present that they were mined for flux in the early 1900s. Bullseye aeromagnetic anomalies in the 10,000 gamma range correlate well with these deposits.

The Turoda Graben lies en-echelon to the northwest of the Republic Graben and extends across the international border in the area of Midway. At the west margin of the Turoda Graben and three miles south of the border, Crown Resources has rediscovered a significant gold skarn system at Buckhorn Mountain. Gold production here dates back to the 1920s. Current proven/probable mineable reserves in the **Crown Jewel deposit** are 5.5 million tons at 0.106 opt Au with a 7:1 waste to ore ratio. Battle Mountain Gold Corp. is earning a 51% interest and has six drills defining additional reserves. Gold is hosted by flat lying clastic sediments and limestones of inferred Permian age which are intruded by a diorite sill complex and a granodiorite pluton. Clinopyroxene-garnet skarn is present but gold is primarily related to pyrrhotite net veining and replacement of magnetite skarn and magnetite matrix breccias. Late stage quartz-epidote-calcite veins carry gold values in excess of 2.0 opt Au. Surface surveys at the Crown Jewel deposit outlined an 8,000 foot by 2,000 foot gold soil anomaly coincident with several coalescing "bullseye" magnetic anomalies peripheral to a major magnetic anomaly. There is a minor bismuth and copper association with gold but there is no arsenic association.

The **Greenwood District** in B.C. hosts a number of copper-gold magnetite skarns from which over one million ounces of gold have been produced. These garnet-diopside skarns are preferentially developed in the Upper Brooklynn Limestone of Triassic age and occur at or close to an unconformable contact with Eocene volcanoclastic rocks. There is some association of gold with pyrrhotite and a spatial association with chalcopyrite but gold:copper grade correlation is poor. The principal past producers in the district have been:



Phoenix	25.0 million tons	1.14% Cu	0.044 opt Au
Motherlode - Greyhound	3.8 million tons	1.00% Cu	0.043 opt Au

The grades quoted are calculated from recovered values. Old records indicate that portions of both of these deposits had gold grades up to 0.3 opt Au across significant widths. Battle Mountain Gold Corp. is currently undertaking a thorough re-evaluation of the Phoenix property area and Corona Corp. has recently completed a similar exercise on its holdings in the Motherlode - Greyhound camp.

Several small copper-gold skarns are located adjacent to the northeast corner of the Midway Project on the east slopes of **Copper Mountain**. These massive hematite bodies in the Brooklynn Limestone carry chalcocite and native copper and were possibly oxidized during a late Tertiary deep weathering event. The King Solomon and Copper Queen occurrences produced 1,375 tons grading 4.7% Cu and 0.183 opt Au. Several relatively small drilling campaigns indicate the presence of a large area of skarn and hornfelsing, some of which lies beneath Tertiary volcanic cover. There is a spatial relationship between mineralization and Tertiary felsic dikes.

The **Louise occurrences** are located 2 km north of the Midway Project boundary and 4 km west of Copper Mountain. Narrow silicified zones strike E-W and carry multiple phases of quartz with pyrite, pyrrhotite and arsenopyrite. Selected samples assay up to 0.869 opt Au. A variably silicified and pyritized medium grained diorite hosts these occurrences and this has been mapped by Little (1983) as a Tertiary intrusive equivalent of the Marron volcanics. Fyles (1990) correlates the diorite with Nelson Plutonic Rocks of Jurassic / Cretaceous age which are present at the Crown Jewel deposit and also underlie parts of the Greenwood Camp. Aeromagnetic maps show this occurrence as an isolated high in a broad low zone trending E-W. The low zone flanks and mirrors an aeromagnetic high zone which trends from Copper Mountain through the north part of the Midway Project. At least one of these highs is a magnetite skarn.

A large Cretaceous intrusion on the southeast margin of the Midway Project has several gold-silver vein associated occurrences and a wide area of skarn alteration. This area was explored in 1990 by Minnova Corp. under option from Dentonia Resources and Kettle River Resources (Rainbow Project) and also by Battle Mountain Gold Corp.

Basic geologic mapping of the area of interest at a scale of 1:50,000 is provided by H.W. Little (1983) in Geology of the Greenwood Map Area - G.S.C. Paper 79-29. Basic aeromagnetic data is provided by GSC Map 8497G at a scale of 1:63,360 with flight lines spaced one-half mile apart at a survey altitude of 1,000 feet. The B.C.G.S. has also just released compilation geologic mapping of the area by Jim Fyles in Open File 1990-25.

A handwritten signature in black ink, appearing to read 'C.J. Westerman', with a long horizontal flourish extending to the right.

Vancouver, B.C.  
November, 1990

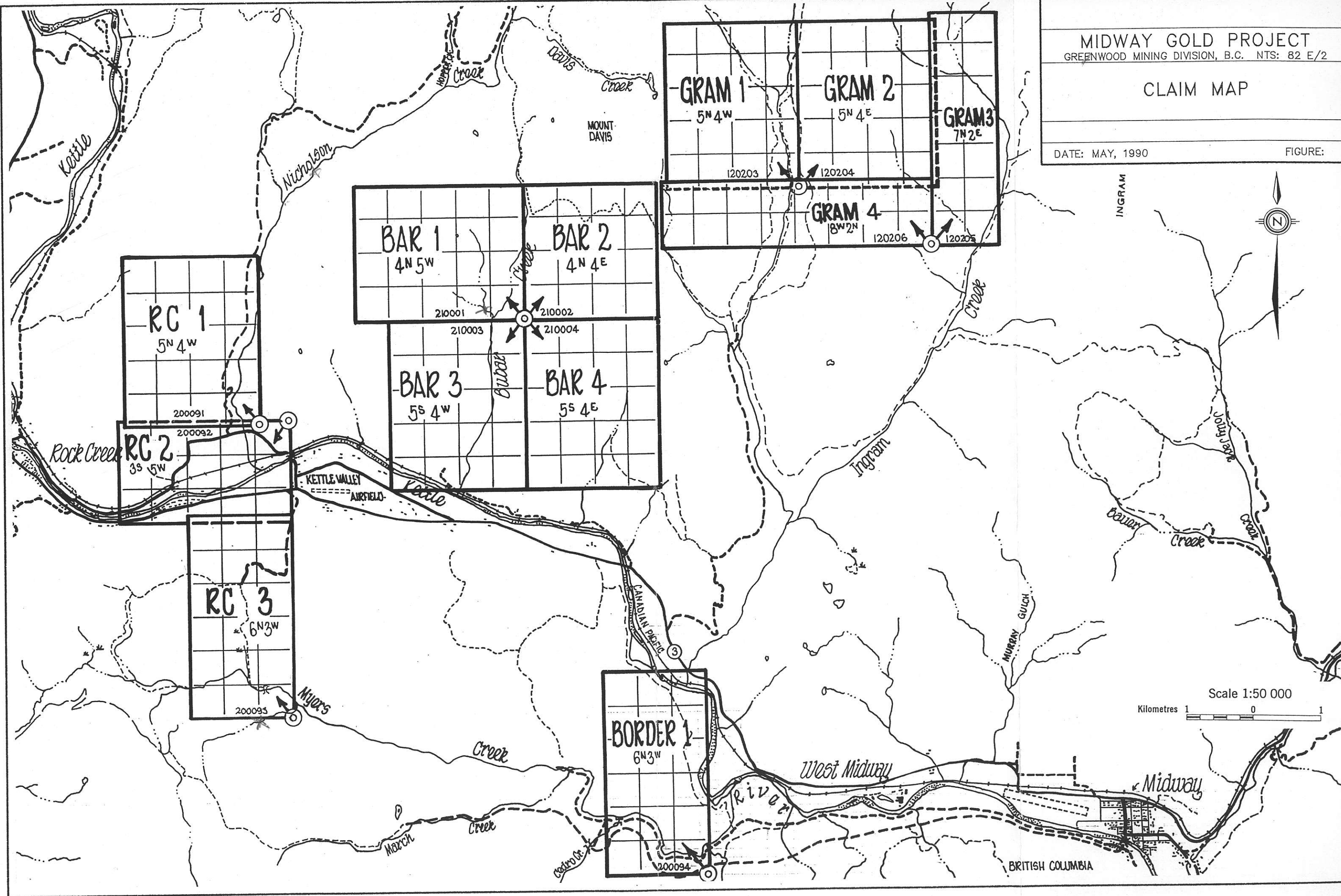
C.J. Westerman, Ph.D.  
Consulting Geologist

MIDWAY GOLD PROJECT  
GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2

CLAIM MAP

DATE: MAY, 1990

FIGURE:

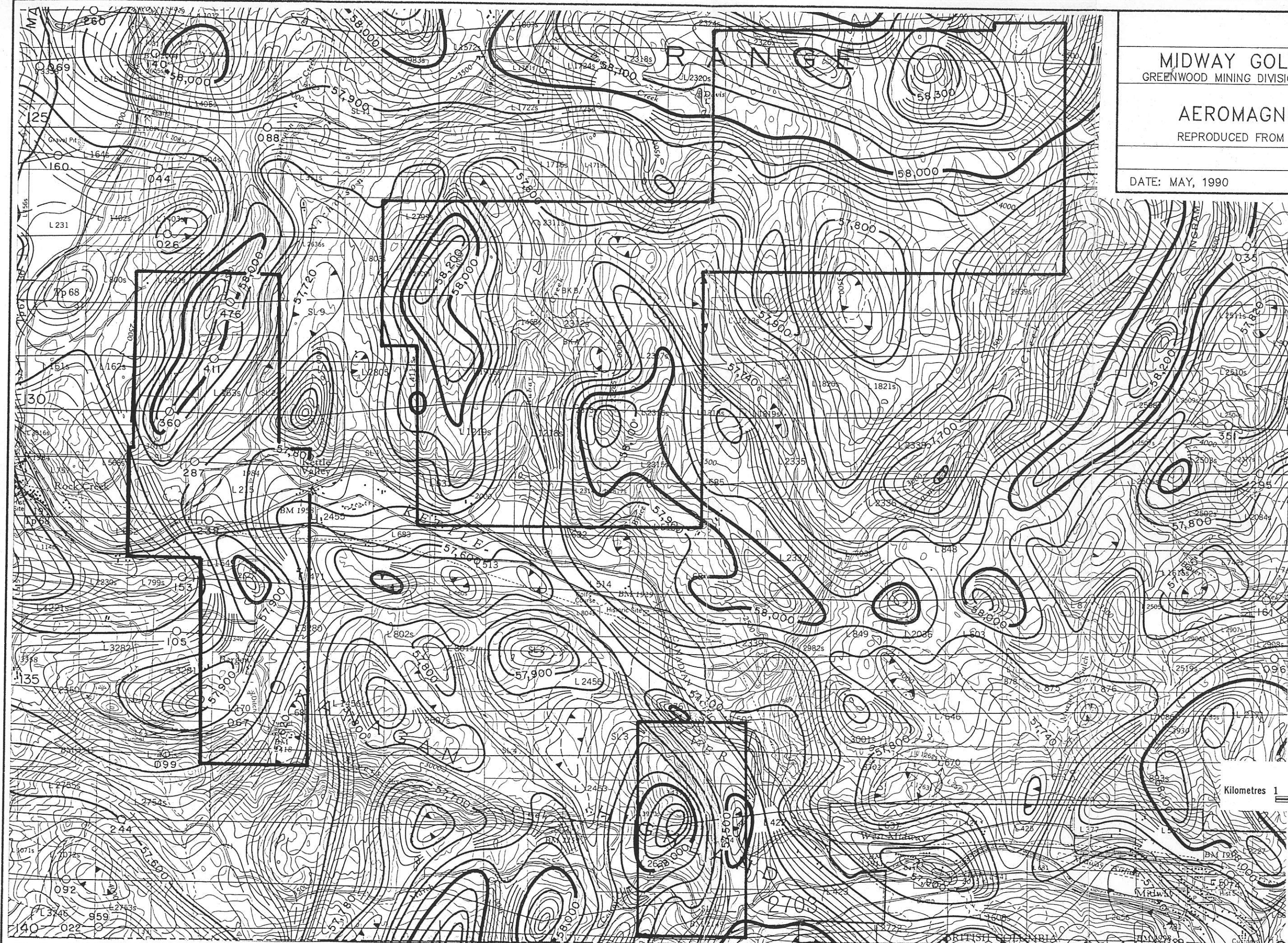


MIDWAY GOLD PROJECT  
GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2

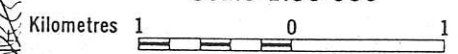
AEROMAGNETIC MAP  
REPRODUCED FROM GCS MAP 8497G

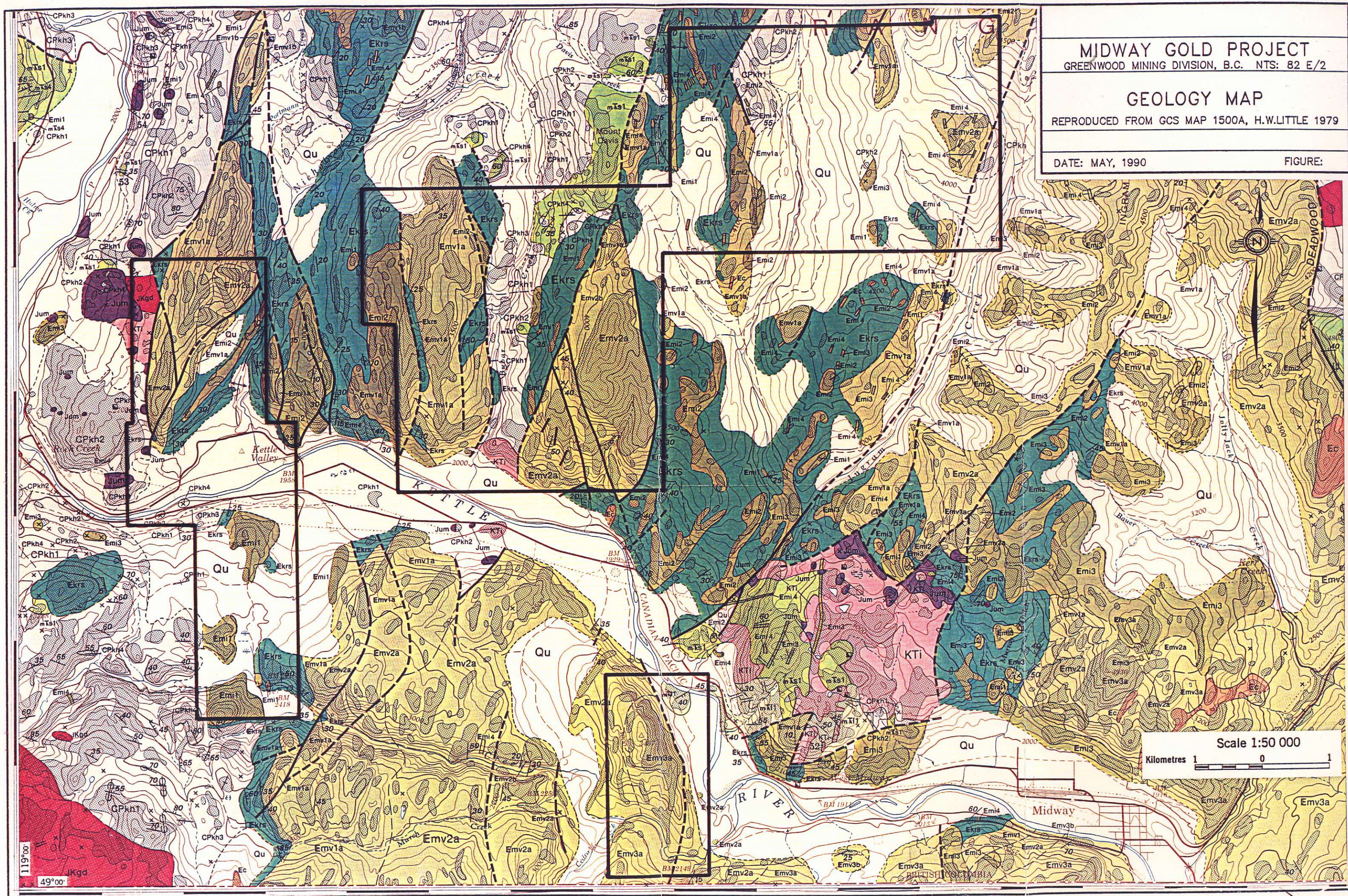
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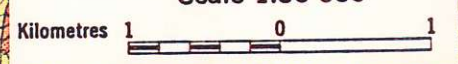


Scale 1:50 000





Scale 1:50 000



119°00'  
49°00'

LEGEND

**MIDWAY GOLD PROJECT**  
GREENWOOD MINING DIVISION, B.C. NTS: 82 E/2

**GEOLOGY LEGEND**  
REPRODUCED FROM GCS MAP 1500A, H.W.LITTLE 1979

DATE: MAY, 1990 FIGURE:

- QUATERNARY**
- Qu *Unconsolidated sediments; till, sand, gravel and silt*
- TERTIARY**
- EOCENE**
- MIDDLE EOCENE**
- EkM *KLONDIKE MOUNTAIN FORMATION: heterogeneous non-volcanic epiclastic breccia*
- Ec *CORYELL INTRUSIONS: syenite, quartz monzonite; minor granite and pulaskite*
- MARRON FORMATION: INTRUSIVE ROCKS;**
- Emi *Emi4, undivided dykes, largely intrusive equivalents of divisions Emv1, 2 and 3 but some of unknown affinity; Emi3, diorite and diorite porphyry (equivalent to lavas of division Emv1); Emi2, syenite and diorite (equivalent to lavas of division Emv2); Emi1, alkaline syenite, largely rhomb-porphyry (equivalent to lavas of division Emv1)*
- Emv *LAYERED ROCKS (largely extrusive)*  
Division Emv3; Emv3a, andesite; Emv3b, tuff  
Division Emv2; Emv2a, andesite and trachyandesite; Emv2b, tuff  
Division Emv1; Emv1a, sodic trachyte in part undersaturated and minor phonolite; Emv1b related rocks characterized by flow breccias and intercalated pyroclastics; Emv1c, related (?) trachyte
- Ekrs *KETTLE RIVER FORMATION: feldspathic and lithic tuffaceous sandstone and siltstone; shale and conglomerate; minor acidic and intermediate pyroclastic and flow rocks*
- CRETACEOUS OR TERTIARY**
- KTi *Quartz-feldspar and quartz porphyry; minor porphyritic quartz diorite; KTi1, felsite*
- CRETACEOUS (?)**
- Kvqm *VALHALLA INTRUSIONS: granite and quartz monzonite, mainly porphyritic, some pegmatitic; Kvqm1, mainly pegmatite*
- JURASSIC AND/OR CRETACEOUS**
- JKgd *NELSON INTRUSIONS: granodiorite; minor quartz diorite and diorite*
- JURASSIC (?)**
- Jum *Peridotite, pyroxenite, dunite, serpentinite; Jum1, pyroxenite*
- Js *Siltstone; minor phyllite, sandstone and conglomerate*
- Jph *Black phyllite*
- Jv *Flow breccia and massive greenstone; Jv1, basal (?) conglomerate with limestone clasts; Jv2, flow breccia, locally with some interbedded limestone*

CENOZOIC

MESOZOIC

- TRIASSIC**
- UPPER TRIASSIC**
- uTsv *White limestone, black limestone, grey, black, and buff shale, limestone breccia, purple or maroon agglomerate, commonly with limestone clasts; uTsv1, mainly limestone; uTsv2, mainly agglomerate; uTsv3, green cherty argillite*
- MIDDLE AND (?) LOWER TRIASSIC**
- mTl *BROOKLYN FORMATION (mTs-mTl)*  
mTl1, limestone, mainly with some chert grains; skarn, minor chert sharpstone conglomerate, siltstone, and shale; mTl2, mainly skarn
- mTs *mTs1, sharpstone conglomerate with mainly chert clasts; local chert sandstone, and minor black argillite; mTs2, mainly buff chert sandstone with beds of sharpstone conglomerate and chert grit; mTs3, green argillite; mTs4, black argillite; mTs5, limestone conglomerate*
- CARBONIFEROUS OR PERMIAN**
- CPkh *KNOB HILL GROUP: massive chert, greenstone, and amphibolite; minor limestone or marble; locally tan or black argillite, fine-grained quartzite, conglomerate; CPkh1, mainly chert; CPkh2, mainly greenstone; CPkh3, mainly amphibolite; CPkh4, limestone or marble; CPkh5, quartzite; CPkh6, tan to green shale and metasiltstone*
- CPal *ATTWOOD GROUP (CPas-CPal)*  
Limestone, some with thin chert interbeds
- CPas *Black to grey bedded argillite; locally some grey chert and cherty siltstone; minor chert sharpstone conglomerate*
- PRE-CARBONIFEROUS**
- Pm *Pm1, quartz-chlorite schist, quartz-biotite-muscovite schist, greenstone, bedded chert with argillaceous partings; minor limestone; Pm2, quartz-biotite schist, hornfels, amphibolite, minor marble. May not be equivalent to unit Pm1. Both Pm1 and Pm2 probably include some metamorphosed unit CPkh*
- Pa *Amphibolite; minor greenstone and bedded chert*
- AGE UNKNOWN**
- Pm *Paragneiss, migmatite; Pm1, layered granitoid gneiss; Pm2, granitoid gneiss; Pm3, amphibolite with pegmatite or aplite; Pm4, mafic layered gneiss; Pm5, layered amphibole-bearing gneiss, silicified, locally graphitic*

PALEOZOIC

PROTEROZOIC (?)

mTr *RAWHIDE FORMATION: black siltstone; minor black argillite and chert sharpstone conglomerate*