8

SUMMARY REPORT

MCDAME PROJECT

CASSIAR AREA, B.C.

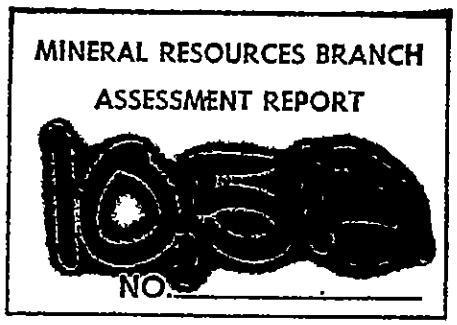
NTS 104P/5W
3191U

59°21'N
129°53'W

82 - 546 - 10512

Owner: Bill Kuhn
Operator: Shell Canada Resources Ltd.

Part 1 of 3



G. W. MOFFAT

FEBRUARY 1982

SUMMARY

The McDame W-Mo property is composed of 13 claims totalling 119 units situated 4 km by road north of the asbestos mining town of Cassiar in northern British Columbia.

Three metasomatic skarn zones have been discovered to date on the property within the Goodhope and Upper Atan (Proterozoic - L. Cambrian) carbonate formations which form part of an easterly dipping shelf sequence on the eastern edge of the Cassiar Batholith (L. Cretaceous).

In 1979 Shell Canada optioned the property from prospector Bill Kuhn and has since completed 337 m of trenching and drilled 17 holes totalling 1766 m.

The Kuhn Zone (North) Skarn, developed along the footwall contact of the Upper Atan carbonate formation, has been drill tested over a strike distance of 350 m and offers the best potential for hosting an economic W-Mo deposit.

The zone is composed of two parallel skarn bands referred to as the Upper 3A and Lower 3A, which range from 3.0 m to 22 m in true width and are separated by 12 m of barren dolomite and marble.

Disseminated scheelite and molybdenite occur in a massive garnet-diopside-(quartz)-(actinolite) skarn which locally contains lower grade chlorite-magnetite-pyrrhotite and pyrrhotite-pyrite skarn phases.

The Upper 3A band contains drill indicated and inferred reserves totalling 78,700 tonnes grading 0.50% WO_3 within a block 73.5 m long x 70 m wide (downdip) x 5 m in average true thickness.

The Lower 3A band contains 409,300 tonnes of drill indicated and inferred reserves grading 0.48% WO_3, 0.134% MoS_2 within a block 215 m long x 130 m wide (downdip) x 6 m in average true thickness.

Within this Lower 3A band is a high grade block containing 232,790 tonnes grading 0.61% WO_3, 0.24% MoS_2.

Both the Upper 3A and Lower 3A skarn bands dip at 38° to the east.

Excellent potential exists for proving up additional reserves downdip to the east since the Lower 3A skarn band thickens to +22 m in width in this direction.

Quartz ± molybdenite stockwork veining was encountered in several holes testing the footwall biotite-cordierite-quartz hornfels

beneath the Kuhn Zone (North) skarns. The stockwork may form the hood over a more deeply buried porphyry moly-(tungsten) system similar to The LogTung Deposit. No granitoid intrusives have as yet been intersected in drilling beneath the Kuhn Zone (North).

The Kuhn Zone (South) Skarn is developed along the Upper Atan carbonate - Lower Atan hornfels contact, 450 m south of the Kuhn Zone (North). It is 600 m in total strike length but averages only 1 - 3 m in true width. Massive pyrrhotite-actinolite-diopside skarn containing accessory sphalerite and scheelite is the dominant calc-silicate assemblage.

Assays of 3.44% Zn, 0.26% WO_3/2.0 m were obtained over a 160 m strike distance. No drilling has been done on this zone.

The Dead Goat Zone Skarn is developed within Goodhope Group marbles along the eastern edge of the Cassiar Stock. This contact lies approximately 1200 m west-southwest of the Kuhn Zone or 800 m stratigraphically beneath it.

A garnet-diopside-actinolite metasomatic skarn containing scheelite has been traced discontinuously on surface for a strike distance of 600 m averaging 1.0 to 5.5 m in thickness.

Five holes totalling 343.45 m have been drilled to date along the zone, testing the thickest northern segment over a strike distance of 380 m.

Drill indicated reserves are calculated at 100,900 tonnes grading 0.49% WO_3 contained within a block 116 m long x 45 m wide (downdip) x 6 m in average thickness.

A deeper skarn pod parallel to and 20 m below the main skarn contains an additional 27,600 tonnes grading 0.39% WO_3, 0.16% Cu.

The Contact Stock, a cupola on the edge of the larger Cassiar quartz monzonite stock, bounds the skarn both along strike to the north and at a depth of 70 m downdip below surface.

Although the zone is still open to the south the potential for developing higher grade reserves appears minimal.

Disseminated molybdenite was mapped in a sheared quartz vein near the Dead Goat Zone but no stockwork veining like that found beneath the Kuhn Zone is present.

A total of $410,893.00 has been spent to date by Shell on the McDame property.

TABLE OF CONTENTS

Page

Summary

Introduction

1. Property

2. Location and Access

3. General Geology

4. Detailed Property Geology

4.1 Goodhope Group

4.1.1 Banded Calc-silicate Hornfels
4.1.2 Marbles

4.2 Atan Group

4.2.1 Lower Atan Member
4.2.2 Upper Atan Member

4.3 Kechika Group

4.4 Mafic Intrusives

4.5 Granitoid Intrusives

4.5.1 Cassiar Stock
4.5.2 Contact Stock

4.6 Metasomatic Skarns

4.6.1 Dead Goat Zone
4.6.2 Kuhn Zone (North)
4.6.3 Kuhn Zone (South)
4.6.4 Upper Atan - Kechika Contact Skarns

4.7 Quartz Stockwork Veining

4.8 Contact Pb-Zn-Ag-Bi Skarn Vein

5. Geochemistry

6. Geophysics

TABLE OF CONTENTS (Cont'd)

Page

6.1 Magnetics

6.2 Electromagnetics

7. Diamond Drilling

8. Tonnage Potential

8.1 Dead Goat Zone
8.2 Kuhn Zone (North)
8.3 Kuhn Zone (South)

9. Discussion

9.1 Skarn Classification

9.2 Skarn Model

10. Summary of Expenditures - McDame Project

11. Recommendations

LIST OF FIGURES

		Page
FIGURE 1	Location Map - McDame Project	
FIGURE 2	Property Geology - McDame Project	
FIGURE 3	Claim Map - McDame Project	
FIGURE 4	Regional Geology, 1:250,000	
FIGURE 5	Total Field Magnetics & Geology Plan, 1:5000	
FIGURE 6	Kuhn Zone Geology, 1:2000	
FIGURE 7	Detailed Geology and Drill Plan - Kuhn Zone (North), 1:500	
FIGURE 8	Dead Goat Geology, 1:2000	
FIGURE 9	Detailed Geology and Drill Plan - Dead Goat Zone, 1:200	
FIGURE 10	Drill Section 0+00 - Kuhn Zone (North)	
FIGURE 11	Drill Section 1+00N - Kuhn Zone (North)	
FIGURE 12	Drill Section 1+62N - Kuhn Zone (North)	
FIGURE 13	Drill Section 2+00N - Kuhn Zone (North)	
FIGURE 14	Drill Section 3+10N - Kuhn Zone (North)	
FIGURE 15	Drill Section 6+90N - Kuhn Zone (North)	
FIGURE 16	Drill Section 10+05N - Kuhn Zone (North)	
FIGURE 17	Drill Section 2+65S - Dead Goat Zone	
FIGURE 18	Drill Section 3+25S - Dead Goat Zone	
FIGURE 19	Drill Section 3+75S - Dead Goat Zone	

LIST OF TABLES

TABLE 1	Schedule of Lands
TABLE 2a	Table of Formations - Regional Geology
TABLE 2b	Table of Formations - Property Geology
TABLE 3	Summary of Drill Results - McDame Project
TABLE 4	Summary of 1981 Drilling Costs - McDame Project
TABLE 3	Dead Goat Zone Mineralization
TABLE 4	Kuhn Zone (South) Mineralization
TABLE 5	Quartz Stockwork Vein Compositions Beneath the Kuhn Zone (North)
TABLE 6	Summary of Drill Results - McDame Project
TABLE 7	Summary of Drilling Costs - McDame Project
TABLE 8	Characteristics of W(Mo) Skarns (from Dick (1980) - Table 4.1 pg. 119)
TABLE 9	Characteristics of W(Mo) Stockwork Deposits (from Dick (1980) - Table 4.2 pg. 149)
TABLE 10	Summary of Expenditures - McDame Project

LIST OF APPENDICES

APPENDIX 1	W. Kuhn - Shell Canada Option Agreement
APPENDIX 2	Summary of Drill Core Assay Results
APPENDIX 3	Diamond Drill Logs - 1980 & 1981 Programs
APPENDIX 4	Assay Sheets
APPENDIX 5	Geology Plans - Kuhn Zone (North)
APPENDIX 6	Drill Sections - Kuhn Zone (North)
APPENDIX 7	Geology Plans - Dead Goat Zone
APPENDIX 8	Drill Sections - Dead Goat Zone

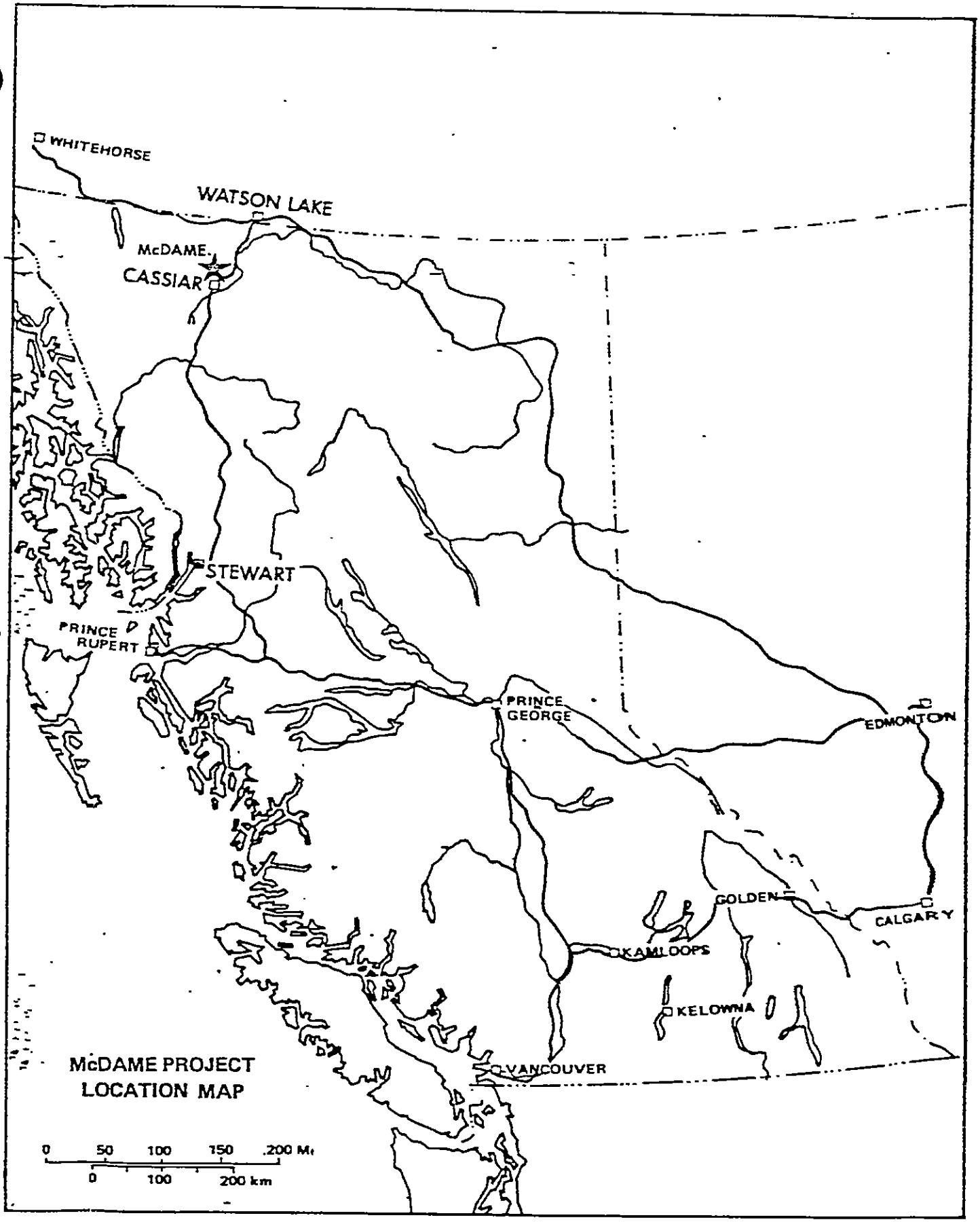
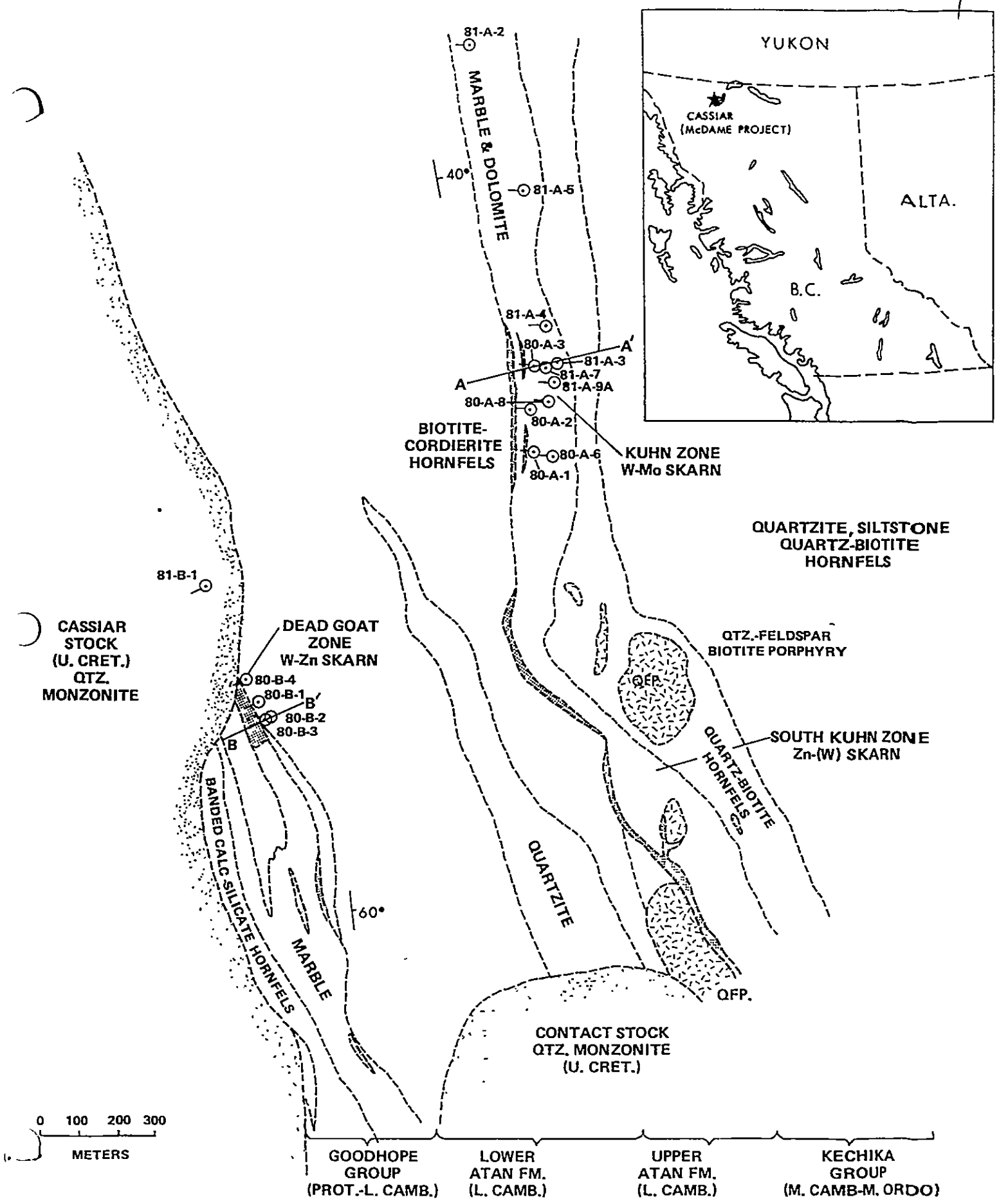


FIGURE 1

Location Map
McDame Project
Shell Canada Resources



PROPERTY GEOLOGY
& LOCATION PLAN
McDAME PROJECT
104 P/5W

FIG. 2

INTRODUCTION

The McDame W-Mo property was originally staked by prospector Bill Kuhn in 1978 to cover a scheelite-molybdenite bearing garnet-diopside skarn in Lower Cambrian Atan Group carbonates near the eastern edge of the Cassiar stock. This showing, termed the Kuhn Zone (North) returned assays of 0.67% WO_3/5.5 m from preliminary surface trenching.

A well exposed southern extension to this zone which has received attention in the past for its base metal potential also lies within the bounds of the property and is referred to as the Kuhn Zone (South).

Additional prospecting by Kuhn lead to the discovery of the Dead Goat Zone within older Goodhope Group carbonates exposed along the western side of the property.

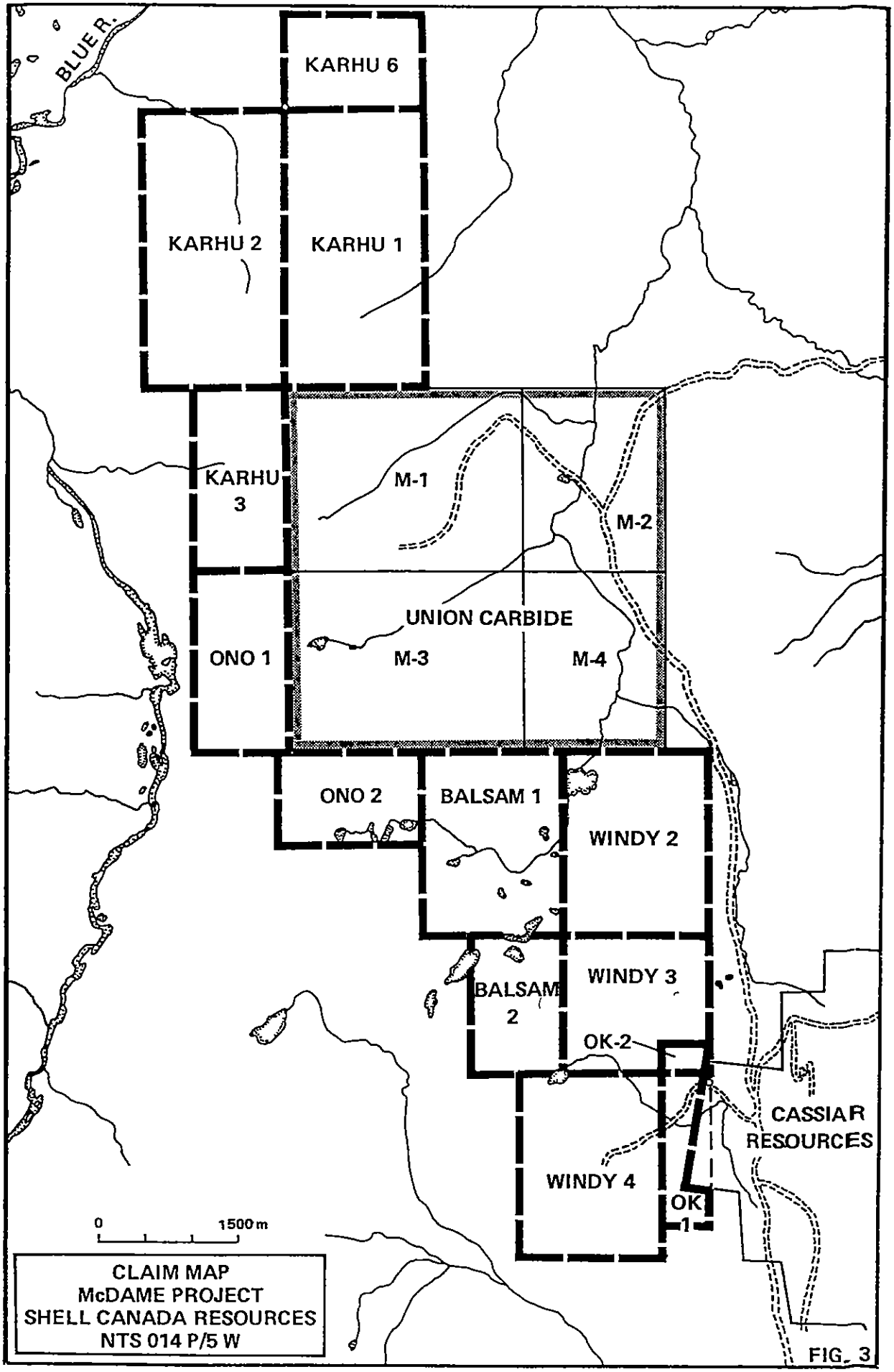
Shell Canada Resources optioned the ground in September of 1979 and completed preliminary mapping, geochemical and geophysical surveys over the Kuhn Zone (North) area during the fall of that year.

An expanded field program in 1980 included additional trenching, mapping, geochemical and magnetometer surveys and a 528 m seven hole drill program testing both Kuhn Zone (North) and Dead Goat Zone skarns.

In 1981, a ten hole, 1238.20 m drill program was carried out, nine of the ten holes being drilled on the Kuhn Zone (North) to more accurately define the extent of W-Mo mineralization.

Reconnaissance prospecting and geochemical surveys were also completed over extensions of the Goodhope and Atan carbonate formations at the north and south ends of the property.

A summary of the 1981 drill results and evaluation of the property is presented herein.


BLUE R.
KARHU 6
KARHU 2
KARHU 1
KARHU 3
M-1
M-2
UNION CARBIDE
ONO 1
M-3
M-4
ONO 2
BALSAM 1
WINDY 2
WINDY 3
BALSAM 2
OK-2
CASSIAR RESOURCES
WINDY 4
OK 1
0
1500 m
CLAIM MAP
McDAME PROJECT
SHELL CANADA RESOURCES
NTS 014 P/5 W
FIG. 3

1. PROPERTY

The McDame Property is composed of 119 units forming 13 contiguous claims, the centre of which lies approximately 4 km due north of the town of Cassiar in the Liard Mining Division of Northern B.C., NTS 104P/5W, Latitude 59°18'N, Longitude 129°53'W.

The group names, claim numbers and work assessment due dates are tabled below:

Table 1

Schedule of Lands - McDame Project

Record Number	Claim Name	Recording Date	Assessment Work Due Date	Units	Hectares
597	Windy 2	Aug. 1/78	Aug. 1/88	12	300
598	Windy 3	Aug. 1/78	Aug. 1/88	9	225
599	Windy 4	Aug. 1/78	Aug. 1/88	12	300
693	Balsam 1	Oct. 20/78	Oct. 20/84	12	300
694	Balsam 2	Oct. 20/78	Oct. 20/84	6	150
775	Karhu 1	June 6/79	June 6/83	18	450
776	Karhu 2	June 6/79	June 6/83	18	450
777	Karhu 3	June 6/79	June 6/83	8	200
1698	Ono 1	Nov. 10/80	Nov. 10/83	8	200
1699	Ono 2	Nov. 10/80	Nov. 10/83	6	150
1946	OK 1	June 30/81	June 30/83	3	75
2100	Karhu 6	Aug. 14/81	Aug. 14/82	6	150
2036	OK 2	Aug. 19/81	Aug. 19/82	1	25
Total				119	2975

The Ono 1 and Ono 2 claims cover ground previously staked as the Karhu 4 and Karhu 5 claims which inadvertently lapsed June 6, 1980.

Mineralized float found by B. Kuhn in 1981 prompted the staking of the Karhu 6 claims along the northeast corner of the property.

The OK 1 and OK 2 claims cover an extension of the Kuhn Zone (South) magnetic anomaly, which was delineated during 1981.

The OK 1, OK 2 and Karhu 6 claims are not considered part of the original agreement lands.

2. LOCATION AND ACCESS

The mining town of Cassiar lies 145 km by road south of Watson Lake, Y.T. on the Alaska Highway, and 470 km north of Stewart, B.C.

Watson Lake Buslines offers daily transit service between Cassiar and Watson Lake. CP Air has scheduled 737 flights between Watson Lake and Whitehorse, Vancouver, Calgary and Edmonton.

The McDame property lies within rugged alpine terrain at elevations of between 1350 and 1950 metres.

The Kuhn and Dead Goat Skarn Zones located respectively on the Windy 2 and Balsam 2 claims are accessible by four-wheel drive vehicle from the Cassiar townsite via the Cassiar Mine Valley Road and McDame Property access road (Figure 3). This trip generally takes 30 minutes to complete (one way) if the roads are in good repair.

Due to late spring runoff, both the Cassiar Mine Valley Road and McDame access roads are difficult to travel until the first week of July.

3. GENERAL GEOLOGY

The property is underlain by a north-northwest trending 35 - 60° easterly dipping sequence of Proterozoic to Middle Ordovician carbonate and pelitic sediments, forming the western limb of the McDame syncline.

Lower Cretaceous quartz monzonites forming the eastern edge of the Cassiar Stock have intruded the stratigraphy along the western boundary of the property.

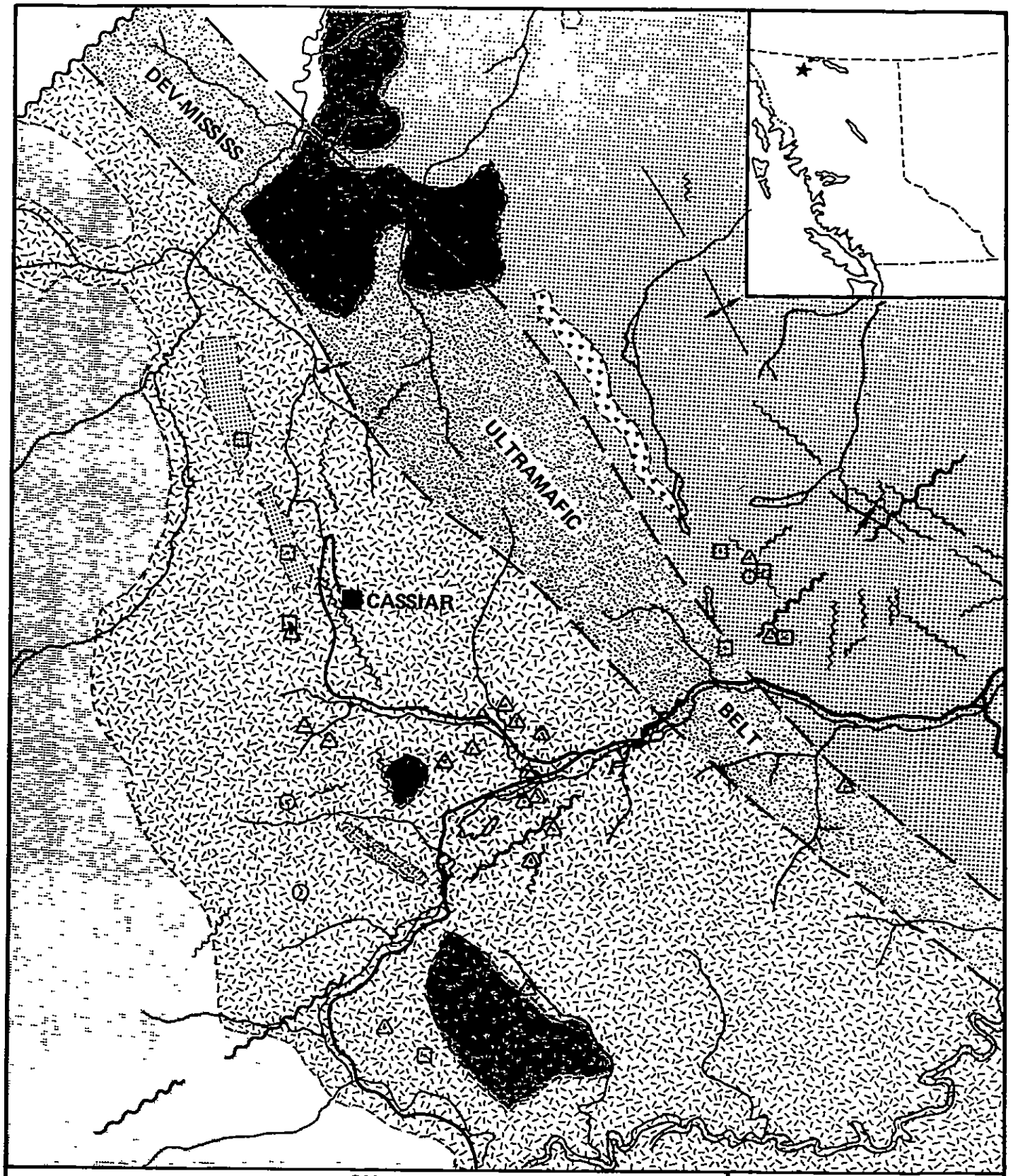
Two generations of late phase granitoid differentiates of the Cassiar Stock have also invaded the sediments in a series of cupolas paralleling the intrusive contact.

Thermal and metasomatic skarns, the latter containing W-Mo-(Zn)-(Cu) mineralization, have formed within carbonate members of the Goodhope Group (Dead Goat Zone) and Upper Atan Group (Kuhn Zone North and South).

Union Carbide's Lamb Mtn. W-Mo skarn, north of the McDame property also lies within Upper Atan carbonates.

The stratigraphy has been subdivided into the mappable units listed in Table 2 which have been used on the Kuhn Zone and Dead Goat Zone 1:2000 scale geological plans.

A slightly modified legend is used on the Kuhn Zone (North) drill sections (Appendix 6).



SKARN OCCURRENCES

QUARTZ - GOLD OCCURRENCES

PROPHYRY Mo

ATAN GROUP
LIMESTONE, DOLOMITE, QUARTZITE

SYLVESTER GROUP
LIMESTONE, DOLOMITE

CASSIAR BATHOLITH
BIOTITE-QUARTZ MONZONITE, GRANDIORITE

McDAME GROUP
DOLOMITIC SILTSTONE, QUARTZITE

BIG SALMON COMPLEX
SERPENTINITE, PERIDOTITE

CASSIAR STOCK
QUARTZ-MONZONITE, PORPHYRITIC BIOTITE

FIG. 4

REGIONAL GEOLOGY CASSIAR AREA

NTS. 104 - P

0 5 10km

Table of Formations

Era	*Period or epoch*	*Formation and thickness (feet)*	*Lithology*
Cenozoic	Pleistocene and Recent		Glacial and glacio-fluvial deposits, lacustrine deposits, stream deposits, felsenmeer, talus, soil
	Disconformable contact		
	Tertiary or Pleistocene		Vesicular basalt
	Relations unknown		
	Tertiary and (?) Earlier	Rapid Formation in part	Conglomerate, sandstone, shale; coal
Mesozoic	Rapid Formation in fault contact with, or overlying unconformably, Cambrian and Precambrian rocks		
	Jurassic or Cretaceous	Cassiar Intrusions	Quartz monzonite, granodiorite, granite, porphyritic granite; aplite, pegmatite
	Cassiar Intrusions not in contact with Nizi Formation are intrusive into Sylvester Group and older rocks		
Palaeozoic	Middle Mississippian	Nizi Formation 1,000±	Limestone, cherty limestone, greywacke, pebble-conglomerate; minor slate and quartzite
	Nizi Formation unconformably overlies Sylvester Group between Four Mile and Rapid Rivers and Kechika Group east of Solitary Lake; relations between Nizi Group and ultramafic rocks unknown		
	Mississippian (?)		Peridotite, dunite, pyroxenite, serpentinite
	Intrusive contact		
	Upper Devonian and Lower Mississippian	Sylvester Group 15,000+	Greenstone, chert-quartz arenite, chert, argillite, slate, quartzite; greywacke, limestone, conglomerate
	Conformable (?) contact		
	Middle and (?) Upper Devonian	McDame Group 375-560	Upper division: platy, grey limestone Lower division: grey and black, fetid dolomite
	Disconformable contact		
	Silurian and (?) Devonian	Sandpile Group (?) in part 1,160±	Upper division: laminated fine-grained dolomite Middle division: sandstone, quartzite, dolomitic sandstone, sandy dolomite, dolomite; dolomite breccia Lower division: laminated siltstone and dolomite
	Silurian and (?) Devonian strata overlie disconformably rocks of Kechika Group on limbs of the McDame synclinorium; may be in part or entirely, correlative to Sandpile Group		
	Upper Ordovician, Lower and Middle Silurian	Sandpile Group 1,500+	Dolomite, cherty dolomite, sandy dolomite, dolomitic sandstone, quartzite, chert
	Disconformable contact		
	Middle and (?) Upper Cambrian, Lower and Middle Ordovician	Kechika Group 1,000–2,500±	Upper division: black, laminated, pyritic and carbonaceous shale and slate, minor argillaceous limestone Lower division: limestone, argillaceous limestone, calcareous phyllite, phyllite, conglomerate
	Conformable contact		
	Lower Cambrian	Atan Group 3,000	Upper division: limestone, dolomite; minor shale Lower division: quartzite, argillite; slate, shale, siltstone, pebble-conglomerate
	Conformable contact		
	Late Precambrian	Good Hope Group 4,000±	Limestone, dolomite, quartzite, grit, siltstone, sandy limestone, argillite, slate, red and green slate, shale, limestone

(after Gabrielse, 1963)

TABLE 2b

TABLE OF FORMATIONS

6) SKARN (U. CRETACEOUS)

a) BANDED GARNET - DIOPSIDE
b) MASSIVE GARNET
c) MASSIVE PYROXENE
d) SULPHIDE (DOMINANTLY PYRRHOTITE MINOR PYRITE)
e) GOSSAN (SULPHIDES NOT DISTINGUISHABLE)
f) TALC
g) TREMOLITE
h) ACTINOLITE
i) QUARTZ
j) EPIDOTE
k) WOLLASTONITE

6) FELSIC INTRUSIVES (U. CRETACEOUS)

a) QUARTZ MONZONITE WITH MANTLED K-SPAR PHENOCRYSTS
b) QUARTZ MONZONITE WITH K-SPAR PHENOCRYSTS
c) QUARTZ MONZONITE - EQUIGRANULAR
d) QUARTZ - FELDSPAR PORPHYRY
e) APLITE DYKES
f) GRANODIORITE - EQUIGRANULAR

4) BASIC INTRUSIVES (U. DEV. - L. MISS)

ANDESITIC DYKES AND SILLS

3) KECHIKA GROUP
(M. CAMB. - M. ORDOV.)

2) ATAN GROUP
(L. CAMB.)

1) GOODHOPE GROUP
(PROTEROZOIC)

LIMESTONES
a) - MASSIVE & WEAKLY BANDED LIMESTONE/MARBLE
b) - MOTTLED & ZEBRA-TEXTURED LIMESTONE/MARBLE
c) - GRAPHITIC BANDED LIMESTONE/MARBLE
d) - GRANULAR RECRYSTALLIZED LIMESTONE
e) - SKARNIFIED LIMESTONE (CONTAINS CALC-SILICATE BANDS)

DOLOMITE
f) - MOTTLED & ZEBRA-TEXTURED DOLOMITE
g) - MASSIVE & WEAKLY BANDED DOLOMITE

HORNFELS
h) - BIOTITE (ARGILLACEOUS)
i) - CORDIERITE
j) - CHLORITE
k) - SERICITE
m) - QUARTZ (QUARTZITIC SILTSTONE)
n) - FERRUGINOUS

4. DETAILED PROPERTY GEOLOGY

4.1 Goodhope Group (Proterozoic - L. Cambrian)

The Goodhope Group is composed of the oldest stratified rocks in the Cassiar area and is exposed for a strike distance of 11.5 km along the western boundary of the McDame property in contact with the Contact Stock.

The Goodhope is divisible into 3 metasedimentary subunits. From west to east (oldest to youngest) they include:

1. Banded calc-silicate hornfels.
2. Banded graphitic and massive grey marbles.
3. Spotted cordierite-biotite hornfels.

Cooke (1981) has correlated these units with the red bed carbonate and clastic layers in the upper part of the Stelicuz Formation south of Cassiar.

4.1.1 Banded Calc-silicate Hornfels

A very distinctive banded calc-silicate hornfels unit varying from 2 m to 70 m in width occurs as a transition zone between the central marble band and footwall and hangingwall pelitic units to the east and west.

Thermal conditions setup by the emplacement of the Cassiar Stock caused calcium to be leached out of the marbles, reprecipitating along bedding planes of the footwall (Goodhope) and hangingwall (L. Atan) pelites. The resulting calc-silicate hornfels consists of cream colored diopside-plagioclase-(garnet) bands 1 - 2 cm in thickness alternating with light brown quartz-biotite-hornfels bands.

Pink grossular garnets occur as open space crystal aggregates along fracture cleavage planes in the core of the bands.

At greater distances from the carbonate contact the quartz-biotite bands are transitional into darker biotite hornfels bands alternating with much thinner diopside-plagioclase-(garnet) calc-silicate bands.

This unit can be traced from L3+00S on the Balsam 1 claims south to the west end of L26+00S on the Balsam 2 claims, adjacent the Cassiar Stock.

4.2.2 Marbles

The Goodhope marble unit hosts the Dead Goat skarn

and is virtually indistinguishable in outcrop from the Upper Atan carbonates exposed to the east.

The most extensive exposures of Goodhope marble are found on the Balsam 2 and Windy 3 claims where the unit varies from 100 m to 200 m in width and strikes 10°/75°E.

To the north, the marbles are less well defined, having been partially digested by quartz monzonite (Cassiar Stock) on Union Carbide's M-3 claims and lensing out as two 30 m to 40 m wide bands on Shell's Karhu 2 claims.

Massive, light grey to white, coarsely crystalline marble predominates on both the northern and southern claims. Graphitic banded, mottled and zebra-banded marbles interfinger with the more massive marbles.

Dark patches of zebra-textured dolomite and pods of concentrically banded stromatoporoid(?) structures up to 20 cm in diameter were also noted near the Dead Goat Zone.

4.2 Atan Group

4.2.1 Lower Atan Member (L. Cambrian)

The Goodhope pelitic sediments are conformably overlain to the east by an identical package of Lower Cambrian thermally metamorphosed shales and siltstones which form the lower member of the Atan Group.

Massive to banded biotite-cordierite hornfels, drab brown in color and with a well developed bedding cleavage is the most extensively exposed metapelite.

Disseminated pyrrhotite reaching concentrations of 1% have caused widespread rusting of surface exposures northeast of the Dead Goat Zone between L2S - L6S.

Cordierite porphyroblast forming up to 10% of the rock volume occur within the hornfels over widespread areas but appear to be most prevalent within a 500 m wide aureole bordering the intrusive.

The formation narrows from an exposed width of 1200 m on the Karhu claims at the north end of the property to 600 - 700 m on the Windy and Balsam claims to the south.

A silicious, fine grained, cream colored metapelite mapped as both quartzite and quartz hornfels outcrops over a strike distance of 1100 m and a width of 200 m in the centre of the Lower Atan Formation on the Windy 3 claim.

Further to the north where it is exposed along the boundary between the Karhu 1 and Karhu 2 claims the quartzite occurs as two 100 - 150 m wide beds, separated by a brown phyllitic interbed of a similar thickness. The stratigraphy in this area is less uniform than in the south, having been folded and offset by a northeast trending right lateral fault.

A quartzite fault breccia healed with carbonate and quartz is exposed at the bottom of the "blue ice glacier" on the Karhu 1 claim. Quartz-tourmaline veinlets have also permeated the breccia.

The Lower Atan was intersected in nine holes in the Kuhn Zone (North), where it forms the footwall beneath the Lower 3A skarn band.

The hornfels below the skarn contact has been bleached to a buff - pale green color through silicification, and is pervasive over widths of several meters.

Limey interbeds within the hornfels in this alteration zone, have been mildly skarnified to a diopside-plagioclase-garnet calc-silicate.

At increasing distances from the contact the hornfels becomes darker brown in color and randomly speckled with diffuse cordierite porphyroblasts up to 1 cm in size.

The hornfels also contains patches and irregular bands of chlorite and biotite, the biotite usually forming an outer alteration halo around the chlorite. Pyrite and pyrrhotite occur disseminated within the chlorite.

4.2.2 Upper Atan Member (L. Cambrian)

Conformably overlying the Lower Atan pelites to the east is the Upper Atan carbonate formation which hosts the most important tungsten bearing skarn deposits in the Cassiar area.

On the southern part of the McDame property, it is best exposed between L4S and L14S on the Windy 3 claims, averaging 100 - 200 m in width and dipping east at 38 - 45°.

Along its northern strike extension on Union Carbide's claims, (Windy W-Mo Showing) it is intruded by the Windy Stock but reappears on Shell's Karhu 1 claim, averaging 460 m in true width.

The carbonates are composed of interbanded dolomites and marbles, the relative proportions of which vary significantly from north to south across the area on both a regional and localized scale. Mappable subunits of each are identified below.

1. Massive white to buff colored marble/dolomite

   - generally forms the dominant subunit of both the marbles and dolomites found on the property.
   - rose colored dolomite discolored by finely disseminated hematite also occurs.

2. Massive coarsely crystalline (sucrosic) marble/dolomite

   - composed of white 2 - 3 mm calcite rhombs
   - it is the dominant carbonate found peripheral to the Windy Stock in the vicinity of Union Carbide's Windy W-Mo Showing.

3. Zebra-textured marble/dolomite

   - this phase is most extensively exposed in the Kuhn Zone trenches and is generally randomly interbanded with the more massive subunits.
   - dolomite usually forms grey to tan colored lenticular bands 2 mm to 2 cm in width interfingered with tan-white calcite rich bands. The dolomite-calcite is used to determine whether the subunit as a whole is termed a marble or dolomite.

4. Mottled grey-buff marble/dolomite

   - a mottled or patchy texture of browns and greys found in both the dolomites and marbles distinguishes this unit.

5. Banded or ribboned marble/dolomite

   - Is grey weathering with fairly distinct 1 - 2 mm graphitic bands throughout and may vary from weakly to strongly banded.

6. Skarnified marble/dolomite

   - This term is used when the carbonate has only been mildly skarnified, with narrow cream colored diopside-plagioclase calc-silicate clots having developed.

At the northern end of the property on the Karhu claims the Upper Atan is about equally composed of marble and dolomite. Massive to weakly wavy banded, dirty buff to rose colored dolomite and dolomitic marble locally interbedded with limey mudstone dominates in the eastern exposures in this area. A prominant ribboned marble, consisting of alternating black and grey beds 10 to 20 cm thick, intercalated with massive buff limestone beds forms the western part of the formation. The frequency of narrow shaly mudstone interbeds also increases as the Lower Atan contact is approached.

The composition of the Upper Atan on the Windy 2 claims is well defined from the extensive drilling done along the Kuhn Zone (North).

Between drill sections 0+00 and 10+05N the Upper Atan has a true width of 70 - 80 m, increasing to +175 m on section 6+90N.

In section 10+05N it is composed +95% of massive grey to rose dolomite underlain by mottled to weakly banded dolomites. The rose color is due to finely disseminated hematite.

The predominance of dolomite continues south through to section 3+10N, after which the percentage of marble in the section increases from 20% to 40%.

Between sections 2+00N and 0+00N, coarsely granular, massive white and weakly banded marbles form two to four 20 - 40 m wide bands, alternating with bands of massive buff white and mottled dolomites.

4.3 Kechika Group (M. Cambrian - M. Ordovician)

Conformably overlying the Upper Atan carbonates and forming the easternmost unit exposed on the McDame property is a massive sequence of shale and shaly siltstones containing calcareous interbeds.

Most of the unit has undergone thermal metamorphism to quartz-biotite hornfels and diopside-plagioclase calc-silicates.

In gross appearance the Kechika is very similar to the hornfels of the Lower Atan but contains more numerous cherty quartz hornfels and calc-silicate interbeds.

A silicious graphitic hornfels facies is locally developed along the Upper Atan - Kechika contact.

4.4 Mafic Intrusive Dykes (Devonian - Mississippian)

Several mafic dykes have been mapped crosscutting the older stratified rocks on the property, and have been intersected in drilling in section 0+00 and 1+00N in the Kuhn Zone, (North).

They are black-brown to green in color, weakly to well foliated with biotite porphyroblasts throughout. It is described as a foliated andesite or alternatively as a lamprophyre and generally strikes 40 - 60°/ 65 - 75° NW.

DDH 80-A-2 intersected two dykes over widths of 0.42 m and 0.99 m. The core angles suggest the dyke has been emplaced along an existing fault structure and subsidiary sills have conformably intruded the hornfels-carbonate contact.

A similar dyke outcrops in the pass at the southeast corner of the Karhu 2 claim and also appears to occupy a northeast trending fault structure.

4.5 Granitoid Intrusives (Upper Cretaceous - Lower Tertiary)

The Goodhope and Atan sediments underlying the McDame and Union Carbide claim groups are truncated to the west by the Cassiar Stock a differentiated quartz monzonite granitoid which hosts the Casmo porphyry-molybdenum deposit south of Cassiar.

Two peripheral cupolas, each 3 km x 1 km in exposed area have also invaded the sediments, separated from the Cassiar stock by a 100 - 200 m wide screen of sediments: the Contact Stock underlies the western part of the Balsam 1 & 2 claims and the Windy Stock outcrops in the center of Union Carbide's claims, 7 km north of the Contact Stock.

A porphyritic to megacrystic biotite quartz monzonite forms the dominant phase of all three intrusive bodies, suggesting that they are cogenetic. The cupolas do, however, contain more highly evolved silica enriched phases.

The petrology, mineralization and alteration of each is described separately below.

4.5.1 Cassiar Stock

All exposures of quartz monzonite along the west side of the Balsam 1 & 2 claims, west of the Goodhope carbonates are considered to form the margin of the Cassiar Stock.

4.5.2 Contact Stock

Only the western and northern portions of the Contact Stock are well exposed on the McDame grid, outcropping on the Windy 4 and Windy 3 claims respectively.

Megacrystic quartz monzonite is the predominant phase with k-spar phenocrysts averaging 1 x 2 cm in size composing 20 - 30% of the rock. The phenocrysts are generally subhedral with serated boundaries and are most densely packed in the vicinity of 25+50S 14+50W.

The rock matrix is composed of medium to coarse grained intergrowths of plagioclase 35%; quartz 15%; and biotite 10% with accessory magnetite and sphene 1%.

Magnetic susceptibility data (1980 Field Report) indicates that the intrusive is 17 - 20 times more magnetic than the intruded Goodhope and Atan sediments. Pyrrhotiferous skarns produced equivalent values.

Mantled porphyritic quartz monzonite is also a megacrystic phase similar to the above but with white oligioclase rims and patchy intergrowths replacing the perthitic k-spar phenocrysts.

The rapakivi texture is thought in part to be due to sodium metasomatism during the intrusive event. Basic hornfels inclusions occurring in a breccia phase between L25S and L27S also contain oligioclase phenocryst intergrowths.

There is usually an intermixing of both mantled and unmantled phenocrysts in any outcrop, only the relative proportions varying. Mantling, however, is noticeably more prevalent southwestward across the stock towards the southern limit of the map area (28+50S to 30+00S).

The porphyritic quartz monzonite breccia, previously mentioned, occurs over a 350 m x 250 m area between L25S and L27S, 10W to 14W.

It is composed of subangular to ovoid fragments and blocks of Lower Atan hornfels and calc-silicates which have been partially digested into a porphyritic quartz monzonite matrix.

The darker grey biotite-quartz hornfels fragments usually average 3 - 8 cm in size and were found to contain ovoid oligioclase porphyroblasts (?) growing within them.

Several examples of "mosaic breccia" were noted in which 10 - 20 cm hornfels xenoliths can be visually pieced back together indicating that emplacement was by passive magmatic stoping.

The contact is best observed along the walls of the Eiger and Hidden Cirques where screens of hornfelsic sediments alternate with 3 - 10 m wide concordant quartz monzonite sills. In two areas a flow banding of phenocrysts parallel to the contact was observed.

A mixture of equigranular and porphyritic biotite quartz monzonites form the two dominant phases which are light grey to greyish pink in color on weathered surface.

Localized areas of fracture controlled chloritization and quartz sericite alteration occur along the contact but no broad areas of pervasive alteration were noted.

The following areas were of specific interest:

Dead Goat Zone

i) Drill Hole 80-B-4 (2+67S 9+52W) - intersected 58.95 m of porphyritic quartz monzonite containing disseminated pyrite, hematite and minor magnetite grains. Limited sections of pervasive hematization and saussaruitization also occur. A 1.85 m thick leuco quartz monzonite aplite dyke intersected between 55.10-56.95 m in DDH 80-B-4 contained disseminated grains of MoS_2.

ii) Drill Hole 80-B-3 (3+75S 9+66W) - intersected 6.10 m of extensively kaolinized, sericitic pasty textured quartz monzonite containing disseminate hematite grains. No associate molybdenite or scheelite was noted.

iii) Drill Hole 80-B-3 (3+75S 9+65W) - intersected 6.10 m of extensively kaolinized, sericitic, pasty textured quartz monzonite which immediately underlies massive garnet skarn of the Dead Goat Zone.

Other Areas

iv) L12+16S 12+85W - fractures coated with chlorite, sericite and pyrite.

v) L7+00S 12+75W (Eigner Cirque) - the intrusive is cut by two greissenized quartz veins 10 - 75 cm in width containing disseminations and rosettes of molybdenite. A north trending sericitized fault zone in the same area also contains disseminated molybdenite. No scheelite was found within the quartz-greisen veins.

The skarn has also been extensively altered to an earthy brown gouge over a 4.39 m thickness above the contact. This alteration appears to have been produced by circulating meteoric waters as the intrusive was cooling.

No anomalous MoS_2 or WO_3 concentrations were noted in this altered zone.

A typical outcrop of the breccia phase could be subdivided into the following components:

20% dark grey biotite hornfels xenoliths
2% light grey-cream calc-silicate xenoliths
25% perthitic k-spar phenocrysts
15% mantled k-spar phenocrysts
30% matrix biotite, plagioclase, quartz and k-spar

Quartz feldspar-(biotite) porphyry is exposed in several outcrops over a 1200 x 200 m area at the north end of the Contact Stock between L14S and L2S.

On fresh surface the rock is grey to bleached white in color and typically unaltered. It is composed of:

30% euhedral plagioclase phenocrysts (1 x 2 cm)
5% subhedral quartz phenocrysts (2 x 2 mm)
5% biotite as 2 x 2 mm clots
1% hornblende as 2 x 5 mm crystals
59% aphanitic quartz-feldspar matrix

The contact relationships of this phase with the porphyritic quartz monzonite are not known but thought to be intrusive rather than gradational.

Disseminated pyrite, pyrrhotite and rarely chalcopyrite occur throughout the QFP, reaching concentrations of 5% (total sulphides).

No disseminated molybdenite or scheelite has as yet been found in the quartz-feldspar porphyry however the presence of pyrite and the close proximity of the W-Zn-Cu metasomatic skarns suggest it was the source magma for the mineralized metasomatic fluids.

A similar QFP phase containing jet-black quartz and greisen phases, composes parts of the windy stock, exposed on Union Carbide's ground to the north.

Leuco aplite sills and dykes form a second crosscutting intrusive phase on the McDame property which also may be associated with the mineralizing event.

North trending white granophyric dykes 25 - 50 cm in width were noted at L11+96S 13+25W, L10+00S 12+00W and L6+15S 11+10W sharply cross-cutting the host quartz monzonites.

Disseminated pyrite and molybdenite occur at the first location.

DDH 80-B-3 and 80-B-4 each intersected three concordant leuco aplite sills ranging from 0.15 - 0.95 m in width. Thin sericitic envelopes are developed along the sill margins and often contain random MoS_2 grains.

4.6 Metasomatic Skarns

Calc-silicate skarn mineralized with varying concentrations of pyrrhotite, pyrite, scheelite, molybdenite, and to a lesser degree, chalcopyrite, and sphalerite, have formed within the carbonate members of the Goodhope and Upper Atan Group rocks in three areas of the McDame property: These are referred to as the:

1. Dead Goat Zone,
2. Kuhn Zone (North),
3. Kuhn Zone (South).

The mineralogy and structure of each is described in detail below:

4.6.1 Dead Goat Zone

The most significant metasomatic skarn found to date within Goodhope Group rocks occurs along the eastern (hangingwall) contact at a distance of 100 m from the eastern edge to the Cassiar Stock.

Garnet-diopside-actinolite skarn, dark brown in color and containing accessory scheelite forms the thickest, northern segment of the zone, over a strike distance of 116 m. Here, it averages 30 - 35 m in width and is composed 70% of zoned garnet crystals 1 cm to 5 cm in diameter with diopside, actinolite, calcite and magnetite filling the crystal interstices.

Scheelite occurs as erratic coarse crystals, some up to 3 cm in size.

Within the massive garnet skarn are lenses of pyrrhotite-actinolite-(diopside)-(garnet) skarn containing accessory pyrite, sphalerite, chalcopyrite, scheelite and fluorite. These lenses are generally less than 2.0 m in true width and fairly limited in strike continuity.

The best exposure occurs on the eastern rim of the Eiger Cirque between L3+00S and L4+00S, 10+00W, which sits within the core of the Dead Goat garnet-diopside skarn.

Other narrow lenses of pyrrhotite-actinolite skarn are exposed along the eastern (hangingwall) contact for an additional 500 m further south between L4S - L7S.

In addition to pyrrhotite, pyrite and magnetite also occur as accessories, the sulphides often replacing the cores of magnetite grains in the more diopside-rich skarn sections.

Sphalerite generally dominantes over chalcopyrite as the most important base metal sulphide in the pyrrhotite-actinolite skarns.

No molybdenite has been found in any of the Dead Goat Zone Skarns.

A summary of the surface and drill hole assay results traversing from north to south across the Dead Goat Zone are presented in Table 5 below.

Table 3

DEAD GOAT ZONE MINERALIZATION

Trench/DDH	Location	Assay Results (True Width)
DDH 81-B-1	-	Skarn not intersected
DDH 80-B-4	2+67S 9+52W	No mineralization
Trench B-2	3+15S 10+00W	0.37% WO_3/4.4 m
DDH 80-B-1	3+25S 9+63W	0.95% WO_3, 0.06% Cu/2.5 m
Trench B-1	3+40S 10+00W	0.27% WO_3/3.5 m
DDH 80-B-3	3+83S 9+64W	0.39% WO_3, 0.16% Cu/3.5 m
DDH 80-B-2	3+83S 9+64W	0.53% WO_3/5.7 m
Samples #B21-23	4+32S 9+59W	0.23% WO_3, 0.34% Zn/3.0 m
Sample #B12	7+25S 10+00W	0.02% WO_3, 0.34% Zn/3.0 m
Sample #B15	7+40S 10+00W	0.03% WO_3, 0.38% Cu/0.4 m
Sample #B17	7+70S 10+22W	0.26% WO_3, 3.97% Zn/0.9 m
Sample #B20	7+75S 10+25W	0.18% WO_3, 2.18% Zn, 0.14 Cu/1.1 m

4.6.2 Kuhn Zone (North)

This zone refers to a 1000 m segment of Upper Atan carbonates, lying between sections 0+00 and 10+05N. Three bands of skarn mineralization have been defined within this zone:

a) Lower 3A Skarn Band - is the most extensive of the three and offers the best potential for developing into an economic sized W-Mo deposit with further drilling.

It is developed along the Upper Atan carbonate - Lower Atan hornfels contact, which from the results to date, appears to be singularily the most important structure controlling W-Mo skarn development

on the McDame property.

This skarn band outcrops in the A-Main, A-1 and A-3 trenches and was intersected in holes 80-A-1, 81-A-6 (Sect. 0+00); 80-A-2 & 81-A-8 (Sect. 1+00N); 81-A-9A (Sect. 1+62N); 80-A-3, 81-A-3, 81-A-7 (Sect. 2+00N); 81-A-4 (Sect. 3+10N), covering a strike distance of 350 m.

It is continuous for most of its explored length, ranging between 3.5 - 22.0 m in true width, the thickest sections occurring between DDH 81-A-3 (Sect. 2+00) and 81-A-8 (Sect. 1+00N).

In all sections the Lower 3A skarn is composed dominantly of massive garnet and diopside (75%) with interstitial quartz, actinolite, calcite, and/or chlorite formed the remaining 25%.

There appears to be no major variation in the skarn composition proceeding from north to south along the contact. Garnets occur as intergrown crystal aggregates, pink to olive in color and often displaying zoned textures. Individual garnet crystals range from 5 mm to 1.0 cm in size.

Interstitial calcite usually is associated with magnetite. Disseminated Py and Po were also noted in the skarn matrix of DDH 80-A-3, but is generally not extensive. Fluorite occurs in one section of 81-A-9A but is rare.

Scheelite in discrete disseminate grains often rimmed in molybdoscheelite is consistently higher grade at the contacts. In DDH 81-A-9A and 80-A-1, garnet or actinolite-diopside rich sections appeared to be preferentially higher in scheelite.

Molybdenite shows an increase in the centre or lower half of the skarn band and along the contacts.

The most encouraging intersections were encountered between 1+62N and 3+10N where the Lower 3A skarn also shows the most significant increase in width:

Section 1+62N 0.45% WO_3. 0.20% MoS_2/2.4 m T.W.
2+00N 0.60% WO_3, 0.14% MoS_2/3.75 m T.W.
3+10N 0.49% WO_3, 0.33% MoS_2/4.20 m T.W.

b) Upper 3A Skarn Band - is developed within the core of the Upper Atan carbonates approximately 12 m above the Lower 3A skarn band.

This zone is developed within the core of the Upper Atan carbonate formation, approximately 12 m above the Lower 3A skarn band and averages 5 - 12 m in true width.

It is exposed on surface in trench A-East (Section 0+00) and intersected in holes 81-A-6, 80-A-3 and 81-A-3 (Section 2+00N), but is discontinuous over this 200 m strike distance.

Dolomite forms the dominant host carbonate for this skarn band in all sections.

In section 0+00 skarn is composed of 3.4 m of diopside-pyrrhotite-garnet skarn, transitional with stratigraphic depth into 5.4 m of an iron sulphide deficient massive garnet-diopside skarn, followed by 2.2 m of a banded calc-silicate hornfels.

The upper sulphide-rich skarn is composed of diopside with patches of actinolite and pyrrhotite filling the interstices. Pyrrhotite also occurs in massive concordant seams up to 3 cm in width. Only minor disseminated grains of scheelite were noted and no MoS_2.

The lower garnet-diopside skarn is pale pinkish green in color and composed of massive intergrown garnet and diopside. Actinolite and calcite occur and fill the interstices.

Iron sulphides are virtually absent from this lower skarn, however molybdenite and minor scheelite occur as disseminations within parts of the skarn. Neither mineral shows any preference for any specific calc-silicate assemblage.

Holes DDH 80-A-2 and 81-A-8 drilled on Section 1+00N may have been collared too far west to have intersected the Upper 3A skarn, extrapoliated to lie about 60 m above the Upper Atan - Lower Atan contact in this section.

In DDH 80-A-3 (Section 2+00N) the Upper 3A, skarn is composed of garnet and/or diopside containing thick seams and patches of pyrrhotite 3 cm to 30 cm in thickness. Subhedral pyrite crystals up to 1 cm in size occur in the interior of the pyrrhotite bands and discrete scheelite grains along the edges of the band.

Graphite also occurs in a contorted silicious actinolite-sulphide skarn near the lower contact.

In the same section at depth, the skarn zone is composed of a massive pale pink garnet-magnetite skarn. The magnetite occurs as interstitial filling and is replaced by pyrite and quartz near the bottom of the zone.

c) Convoluted "Wrigglite"-textured Vein Skarn

A finely laminated chlorite-pyrite-magnetite vein skarn occurs as a fracture filling in Upper Atan dolomites underlying section 3+10N (DDH 81-A-4) and section 10+05N (DDH 81-A-2).

The form of this mineralization is similar to the "Wrigglite" skarns of the Moina deposit, New Zealand and have also been reported in the skarns on the Mt. Reed property east of Cassiar (Canadian Superior).

An inward zoning of magnetite --> chlorite + pyrrhotite --> powellite is developed from the edge of the fracture vein towards the core. The powellite usually forms a fine thread within the centre of the pyrrhotite.

Fractures containing a core of chlorite sheathed in an envelope of calcite and magnetite are also common.

The best developed vein skarn usually occurs within 10 m of the more pervasive garnet-diopside and pyrrhotite-diopside actinolite skarns. Fracture density in these zones often reaches 50 fractures/meter.

Thicker seams and knots of finely laminated, convoluted skarn up to 26 cm in width have also formed in more extensively fractured ground. In these, the magnetite-chlorite-pyrrhotite-powellite banding is repeated several times over.

No molybdenite and only minor amounts of scheelite were found in the vein skarns. Tungsten assays over selected 0.5 metre intervals generally averaged 0.1 - 0.2% WO_3.

Minor amounts of chalcopyrite and sphalerite in the range of 250 - 1100 ppm are also present.

A series of bulls-eye magnetic anomalies outlined over the centre of the Upper Atan Formation are produced by areas of concentrated vein skarn development, as was intersected in DDH 81-A-2 and DDH 81-A-4.

4.6.4 Upper Atan - Kechika Contact Skarns

A banded silicious calc-silicate skarn containing pods of massive pyrrhotite was uncovered during the construction of the switch-back between holes 81-A-4 and 81-A-5, along the Upper Atan - Kechika contact.

The showing is approximately 15 m in exposed length and has an average true width of 2.5 m.

Diopside and plagioclase form the light colored bands and biotite-quartz hornfels, the darker bands.

Non-magnetic (monoclinic) pyrrhotite containing disseminated chalcopyrite, pyrite and scheelite forms pods and thin lenses within the banded skarn.

Chip samples returned assays of 0.25% WO_3, 0.26% Cu, over a true width of 2.0 m. No drilling has been done to date on this showing.

4.6.5 Kuhn Zone (South)

Massive pyrrhotite-actinolite-diopside-sphalerite-(chalcopyrite)-(scheelite) skarn is exposed along the southern extension of the Upper Atan - Lower Atan contact between L8S-L14S on the Windy 3 claims.

Over the 600 meter strike distance the skarn averages 1 - 3 meters in true width and dips 65° easterly.

Sphalerite, which is not found in notable quantities in the Kuhn Zone (North) skarns, is the most prevalent base metal sulphide averaging 1 - 4% by volume.

Four channel samples collected over a 160 m strike distance averaged 3.44% Zn 0.26% WO_3 0.03% Cu/2.0m. A summary of individual assay results are tabulated below.

TABLE 4

KUHN ZONE (SOUTH) MINERALIZATION

Sample No.	Location	Assay Results
7014	8+50S 1+35W	0.51% WO_3, 3.36% Zn, 0.20% Cu/1.0m
7015	8+70S 1+35W	0.09% WO_3, 3.82% Zn, 0.04% Cu/2.0m
7016	8+80S 1+35W	0.24% WO_3, 2.43% Zn, 0.04% Cu/Grab
7017	10+10S 1+25W	0.21% WO_3, 4.17% Zn, 0.20% Cu/ 3.0m

To date no exploratory drilling has been done in this zone to test the mineralization at depth.

4.7 Quartz Stockwork Veining

Seven of eight holes drilled between Sections 1+00N and 6+90N intersected quartz stockwork veinlets within the footwall Lower Atan biotite hornfels unit.

The veinlets vary from 1 - 5 mm in width and are composed of milky white quartz, high temperature clear quartz, pyrite and molybdenite.

The quartz veinlets all appear to fall within a series of planes dipping at 75° to 125° with respect to the horizontal.

In all holes the MoS_2 bearing quartz veinlets were found to crosscut only the footwall hornfels and not the overlying skarn or marble/dolomite units.

From the cross sections, 81-A-5 DDH 81-A-5 (6+90N) appears to have penetrated to the greatest vertical depth with respect to the other Kuhn Zone holes, however, DDH 81-A-4 (3+10N) and 81-A-7 (2+00N) intersected the greatest widths of quartz-MoS_2 stockwork veining, 48 m in both cases.

The following observations can be made about the mineral relationships:

1. Milky white quartz is the most common vein material occurring in 94% of the veinlets.
2. Clear quartz is also quite common but in 93% of the veinlets observed was accompanied by milky white quartz.
3. 94% of the pyrite observed is accompanied by white quartz.
4. MoS_2 occurs 94% of the time with white quartz and 71% of the time, with clear quartz.

The high temperature clear quartz appears to have precipitated in fractures first since it invariably forms and outer envelope around a core of milky white quartz.

Molybdenite was precipitated either contemporaneous or slightly before the white quartz since it occurs as disseminated blebs along the borders of the veinlet and rarely within the vein core.

Pyrite occurs most commonly with white quartz (94%) and to a lesser extent (64%) with clear quartz, usually as blebs and veinlets neither of which is spatially associated with the molybdenite.

It is interesting to note that DDH 81-A-4 and 81-A-7 which contained the most extensive quartz-MoS_2 stockwork veining, also contained the richest MoS_2 skarn intersections in the overlying Upper Atan carbonates.

This can be regarded as evidence that both were the product of the same mineralizing event.

Deep drilling between sections 2+00N and 3+10N should be considered to test for a buried porphyry-MoS_2 system at depth.

Table 5
Quartz Stockwork Vein Compositions
Beneath the Kuhn Zone (North)

DDH 81-A-4		CORRELATION COEFFICIENTS			
No. of Fractures	Fracture Filling	Milky Quartz	Clear Quartz	MoS_2	Pyrite
85	Milky Quartz	1.00	0.50	0.43	0.22
47	Clear Quartz	0.91	1.00	0.45	0.28
39	MoS_2	0.95	0.54	1.00	0.20
21	Pyrite	0.90	0.62	0.38	1.00
DDH 81-A-7					
77	Milky Quartz	1.00	0.64	0.56	0.18
52	Clear Quartz	0.96	1.00	0.67	0.27
45	MoS_2	0.95	0.67	1.00	0.15
15	Pyrite	0.93	0.80	0.47	1.00
DDDH 81-A-8					
19	Milky Quartz	1.00	0.68	0.52	0.21
14	Clear Quartz	0.93	1.00	0.71	0.14
11	MoS_2	0.91	0.91	1.00	0.18
4	Pyrite	1.00	0.50	0.50	1.00

As was previously mentioned in Section 4.5.1, molybdenite has been found in a young intrusive aplite dyke phase of the Cassiar stock, underlying the Dead-Goat-Skarn Zone. Molybdenite rosettes have also been found in a quartz-sericite greisen vein just west of the Skarn Zone, however neither showing is as extensive as the Kuhn Zone (North) quartz-molybdenite vein stockwork.

4.8 Contact Pb-Zn-Ag-Bi Skarn Vein

The contact showing occurs within a north trending screen of Proterozoic Goodhope marbles lying between the contact and cassiar stocks on the Windy 4 claim.

It is composed of two 70 - 80° striking fissure veins up to 1.2 m in width which crosscut the marbles. Manganiferous magnetite, galena, sphalerite and pyrite are the dominant minerals present. Molybdenite, pyrrhotite, arsenopyrite, alabandite, chalcopyrite, tetrahedrite, bismuthite, native Ag and Bi occur as accessory minerals.

The gangue material in the vein consists of calcite, quartz and rhodonite.

An irregular body of pyrrhotite-garnet-(scapolite?)-(chalcopyrite) skarn is also exposed within the showing area near the fissure veins.

Reliance Minerals (1961-62) attempted to hi-grade thicker sections of the vein for its silver content, however no deep drilling was carried out by the company.

Shell has not carried out any detailed exploration or drilling in the vicinity of the fissure veins.

Similar Pb-Zn-Ag-(Cu, Sn, Bi) fissure and replacement veins are known in the vicinity of the Cassiar Stock south of the McDame property, most of which are also associated with east to northeast striking structures.

5. GEOCHEMISTRY

Detailed soil geochemistry was completed over all accessible areas on the Windy 2, 3, 4; Balsam 1 and 2 and OK 1 claims covering the Kuhn Zone (North and South) and Dead Goat Zones, during 1980 and 1981.

Reconnaissance sampling at 50 to 100 m intervals was also completed along the 5000' contour interval on the Karhu 1, 2, 3 and Ono 1 and 2 claims during 1981 to locate other Skarn Zones buried by talus cover.

A summary of the results are presented below.

1. Most of the metasomatic Skarns known to exist within both the Goodhope and Upper Atan carbonate formations produced W, Cu, Mo or Zn soil dispersion anomalies.
2. Correlation coefficients calculated for the various metal combinations indicate W-Mo followed by Cu-Zn and Cu-W show the most consistent association.
3. The Dead Goat Zone was delineated by a coincident W-Cu-Zn anomaly.
4. The Upper Atan-Lower Atan contact is overlain by the strongest and most persistent tungsten anomalies as was expected.
5. The quartz-feldspar porphyry cupolas exposed at the south end of the Kuhn Zone (South) and considered to be the youngest intrusive phase on the property, produced W-Cu-Zn anomalies but were not anomalous in Mo.
6. An unexplained Mo anomaly outlined at the northeast corner of the Karhu 1 claim still requires follow-up prospecting.

6. GEOPHYSICS

6.1 Magnetics

Total field magnetometer surveys were completed over the Windy 2, 3, 4; Balsam 1 and 2 and OK 1 and 2 claims during 1980 and 1981 as a method to delineated Skarn Zones.

The program had limited success in outlining the anomalies which led to the discovery of the Kuhn Zone Upper 3B pyrrhotite-bearing Skarn band. The Kuhn Zone (South) was also well defined by magnetics although this zone is exposed on surface for most of its length.

The most significant W-Mo intersections completed to date on the property have been from a massive garnet-diopside-actinolite Skarn which produced a flat or very weak magnetic response. The usefulness of magnetics in finding extensions to these zones would appear limited.

6.2 Electromagnetics

Several test lines of Shootback EM were completed over the Kuhn Zone (North) trench areas during 1980.

No recognizable anomalies could be detected because of the erratic and lean nature of the iron sulphide mineralization.

No electromagnetic surveys were carried out in 1981.

6.3 Other Surveys

Physical property measurements were carried out in 1980 on a suite of samples from the various carbonate, skarn, hornfels and intrusive units outcropping on the property.

Results of the test suggest that IP/Resistivity techniques could be used in the search for pyrrhotite associated skarn types but would have limited success with the garnet-diopside, iron sulphide deficient varieties.

A more complete account of the geophysical programs is summarized in the 1980 Summary Report.

7. DIAMOND DRILLING

Ten BQ holes totalling 1,238.20 meters were drilled on the McDame property during 1981, bringing the cumulative total drilled by Shell to 17 holes and 1766.20 meters.

Kuhn Zone (North)	11 holes -	1402.22 m
Dead Goat Zone	5 holes -	243.25 m
Magnetic Anomaly (Kuhn Zone (North) Extension)	1 hole -	20.73 m (abandoned)

Hole 81-A-1 was drilled to test a broad subtle magnetic anomaly near the northern boundary of the Windy 4 claim. The anomaly (Figure 5) is similar to that produced by the contact stock and may be the expression of a buried cupola.

An artesian spring was intersected in overburden causing the casing to sand. The hole was abandoned.

Both the 1980 and 1981 programs were completed by D.W. Coates Enterprises Ltd. of Kamloops, B.C. The 1980 cost was $51,793.00 or $98.09/m and the 1981 costs $110,860.00 or $93.46/m.

A drill plan of the hole locations, and summary of hole parameters and intersected mineralization are presented on Figure 2 and Table 3 respectively.

A summary of individual hole costs for the 1981 program are presented in Table 4.

Chemex Labs (Vancouver) Ltd. completed all assay and geochemical analytical work on drill core, rock and soil samples from the property during the 1979, 1980 and 1981 field seasons.

All drill core from the 1980 and 1981 programs is presently in storage at Grant Stewart Construction's trailer camp in Cassiar, B.C.

TABLE 6

SUMMARY OF DRILL RESULTS - MCDAME PROJECT - 3191U

KUHN ZONE

Drill Section	Hole Number	Collar Location	Attitude	Final Depth (m)	Core Interval (m)	Assay Results (%)	Skarn Band	Total True Width of Skarn Band (m)	Distance Between Upper & Lower Skarn Band (m)
0+28S	81-A-6	0+55S 0+68E	270°/70°	130.49 m	8.64 - 16.64 18.17 - 21.17 101.65 - 104.85 106.75 - 107.75	0.10% WO_3/8.0 m (6.4 TW) 0.18% WO_3/3.0 m (2.4 TW) 0.05% WO_3/3.2 m (2.5 TW) 0.12% WO_3/1.0 m (0.8 TW)	Upper Upper Lower Lower	13.0 m 20.0 m (Total of 3 separate bands)	60 m
0+00	80-A-1	0+16S 0+35E	270°/45°	68.59 m	48.19 - 55.19	0.24% WO_3, 0.033% MoS_2/ 7.0 m (TW)	Lower	6.5 m	0
1+00N	80-A-2	0+78N 0+75E	270°/45°	68.23 m	47.12 - 48.76	0.09% WO_3/1.64 m (1.5 TW) *Lower skarn band not intersected.	Upper	0.27 m	0
1+20N	81-A-8	0+92N 1+00E	270°/85°	117.96 m	85.00 - 94.00	0.06% WO_3/9.0 m (7.6 TW) *Upper skarn band not intersected.	Lower	12.0 m	0
1+62N	81-A-9A	1+25N 1+50E	270°/85°	148.44 m	103.05 - 111.05 (103.05 - 106.05)	0.30% WO_3, 0.15% MoS_2/ 8.0 m (6.4 TW) 0.45% WO_3, 0.20% MoS_2/ 3.0 m (2.4 TW) *Upper skarn band not intersected.	Lower	21.0 m	0
2+00N	81-A-7	1+68N 1+52E	270°/85°	129.85 m	65.40 - 78.40 (65.40 - 71.40) (72.40 - 77.40) (74.40 - 78.40)	0.55% WO_3/13.0 m (9.75 TW) 0.58% WO_3/6.0 m (4.5 TW) 0.60% WO_3, 0.14% MoS_2/ 5.0 m (3.75 TW) 0.76% WO_3/4.0 m (3.0 TW) *Upper skarn band not intersected.	Lower	17.0 m	0
2+15N	80-A-3	1+70N 1+35E	270°/45°	77.12 m	20.10 - 26.50 (20.10 - 24.50) 37.55 - 48.85 (43.85 - 47.85)	0.56% WO_3/6.4 m (5.5 TW) 0.73% WO_3, 0.17% MoS_2/ 4.4 m (3.75 TW) 0.59% WO_3/11.3 m (TW) 1.32% WO_3, 0.26% MoS_2/ 4.0 m (TW)	Upper Upper Lower Lower	6.5 m 11.5 m	11 m
	81-A-3	1+47N 1+89E	270°/55°	111.55 m	70.80 - 76.93 80.70 - 82.45 93.00 - 97.00 (95.00 - 97.00)	0.44% WO_3/6.13 m (4.0 TW) 0.34% WO_3/1.75 m (1.5 TW) 0.63% WO_3, 0.18% MoS_2/ 4.0 m (TW) 0.34% MoS_2/2.0 m (TW)	Upper Middle Lower Lower	4.8 m 4.8 m	16 m
3+10N	81-A-4	2+62N 2+20E	270°/60°	167.98 m	49.75 - 50.55 107.00 - 111.65	0.105% WO_3/0.80 m (0.5 TW) 0.49% WO_3, 0.33% MoS_2/ 4.65 m (4.2 TW)	Upper Lower	0.7 m 6.0 m	53 m
6+90N	81-A-5	6+00N 3+50E	270°/60°	224.39 m	No significant skarn intersections 119.15 - 122.35	0.12% WO_3/3.2 m (2.7 TW)	?	0	0
-	81-A-2	10+00N 3+50E	270°/60°	101.83 m	No significant mineralized skarn intersections				
-	81-A-1	17+84N 6+20E	270°/70°	20.73 m	Hole abandoned in overburden.				
					DEAD GOAT ZONE				
3+83S	80-B-2	3+83S 9+64W	245°/60°	76.52 m	21.30 - 33.75 (21.30 - 29.30)	0.41% WO_3/12.45 m (9.0 TW) 0.53% WO_3/8.0 m (5.7 TW)			30 m
	80-B-3	3+83S 9+64W	245°/85°	87.19 m	38.30 - 53.15 60.40 - 76.70 (64.30 - 76.70)	0.20% WO_3/14.85 m (6.0 TW) 0.26% WO_3/16.30 m (6.5 TW) 0.39% WO_3, 0.16% Cu/ 12.40 m (3.5 TW)			30 m
3+25S	80-B-1	3+25S 9+63W	245°/60°	76.51 m	38.20 - 38.95 49.50 - 52.30	0.52% WO_3/0.75 m (0.7 TW) 0.95% WO_3/2.8 m (2.5 TW)			34 m
2+67S	80-B-4	2+67S 9+52W	245°/60°	70.23 m	No skarn intersections - hole collared in quartz monzonite.				0
0+00	81-B-1	0+00 9+25W	245°/50°	32.80 m	No skarn intersections - hole collared in quartz monzonite.				0

TABLE 7
SUMMARY OF DRILLING COSTS - MCDAME PROJECT
JULY 12 - AUGUST 11, 1981

No. Holes Started: 10
No. Holes Completed: 9 (81-A-9 abandoned)
Total Meterage Drilled: 1238.20 m (10 holes); 1186.08 m (9 holes)
Dates Drilled: July 12 - August 11, 1981 (31 days)
Drilling Company: D. W. Coates
Contractor Coring Cost/m: $70.00/m (0-150 m, 60°-90°)
Overburden Drilling Cost/m: $70.00/m (0-30 m)
Labour Cost/Hr.: $23.20

	Drill Hole									
	81-A-1	81-A-2	81-A-3	81-A-4	81-A-5	81-A-6	81-A-7	81-A-8	81-A-9 81-A-9A	81-B-1
Drilling	1436.40	7140.36	7490.10	11373.60	15343.60	8760.00	8716.20	7918.90	13457.50	2138.98
Moving	1113.60	162.40	69.60	46.40	139.20	116.00	324.80	69.60	23.20	626.40
Tractor (Lab.)	800.00	440.00	320.00	240.00	200.00	320.00	360.00	116.00	120.00	360.00
(Rent.)	405.00	405.00	540.00	540.00	540.00	540.00	405.00	405.00	405.00	405.00
Reaming	611.20	Ø	229.20	2796.80	Ø	Ø	Ø	Ø	993.20	Ø
Materials Lost	167.00	Ø	220.64	1037.12	125.58	Ø	Ø	Ø	1944.56	Ø
Testing	Ø	Ø	67.00	71.00	71.00	67.00	67.00	67.00	67.00	Ø
Travel Time	124.40	124.40	164.20	290.00	185.60	142.60	112.80	112.80	169.20	159.20
Core Boxes	Ø	230.00	230.00	230.00	230.00	230.00	230.00	230.00	230.00	230.00
Totals	4657.60	8502.16	9330.74	16624.92	16834.98	10175.60	10215.80	8919.30	17409.66	3919.58
Hole Depths	20.73	101.83	111.56	167.98	224.39	130.49	129.85	117.98	148.47 (52.13)	32.80
Drilling Cost/m	$224.67	$ 83.49	$ 83.64	$ 98.97	$ 75.02	$ 77.98	$ 78.67	$.75.60	$117.26	$119.50

Mobilization: $2,746.13 (lump sum divided between 3 projects)
Demobilization: $1,125.00 (lump sum divided between 3 projects)
Misc. Shipping Costs: $398.40
Total Drilling Cost: $110,860.00
Total Drilling Cost/Meter: $93.46/m ($28.49/ft.)

8. TONNAGE POTENTIAL

8.1 Dead Goat Zone

From the 343.45 m of drilling (5 holes) completed to date, drill indicated reserves are calculated at 100,900 tonnes grading 0.49% WO_3. These are contained within a block 116 m long x 45 m wide (downdip) x 6 m in average thickness.

A deeper skarn pod situated 20 m below the main skarn zone contains an additional 27,600 tonnes grading 0.39% WO_3, 0.16% Cu.

The potential for increasing reserves in the Dead Goat Zone appears limited. The Cassiar Stock truncates the zone at a depth of 70 m downdip from surface, restricting further tonnage development in this direction.

The Cassiar Stock also appears to have truncated the Goodhope carbonates north of L3+00N.

The southern extension of the zone has not been drill tested, but appears quite limited from narrow widths of the skarn lenses outcropping.

8.2 Kuhn Zone (North)

The Upper 3A skarn band contains drill indicated and inferred reserves totalling 78,700 tonnes grading 0.50% WO_3 within a block 73.5 m long x 70 m wide (downdip) x 5 m in average true thickness, situated between Section 2+00N and 3+10N.

The Lower 3A skarn band contains 409,300 tonnes of drill indicated and inferred reserves grading 0.48% WO_3, 0.134% MoS_2, within a block 215 m long x 130 m wide (downdip) x 6 m in average true thickness. These reserves lie between Section 1+60N and 3+75N.

Within this Lower 3A skarn is a high grade block containing 232,790 tonnes grading 0.61% WO_3, 0.24% Mo_2.

8.3 Kuhn Zone (South)

The Kuhn Zone (South) has been traced in outcrop for a distance of 600 m between L8S - L14S, but it is of limited width, reaching only 2 metres over the most heavily mineralized sections.

The skarn is a pyrrhotite-actinolite type, similar to that found at Cantung and Mactung, however tungsten grades are generally low

averaging less than 0.25% WO_3. Zinc grades of 3.5% to 4.0% are also too low to be of economic interest.

The proximity of several quartz-feldspar porphyry cusps on both the east and west sides of the skarn band suggests the zone may have a limited downdip extension.

The zone should be drill tested in at least one location for confirmation.

9. DISCUSSION

9.1 Skarn Classfication

The McDame skarns can be broadly subdivided into three main types, based upon mineralogy.

Type 1 - Garnet-diopside-actinolite-quartz skarn

This is the most pervasive skarn found in both the Dead Goat and Kuhn Zone (North) zones, and contains the most significant concentrations of scheelite $\pm$ molybdenite.

The calc-silicate is noticeably deficient in iron sulphide minerals such as pyrite and pyrrhotite compared to the Type 2 and Type 3 varieties.

Intergrown brownish pink garnets with interstitial diopside, actinolite, calcite and magnetite is the diagnostic mineral assemblage.

Scheelite ($CaWO_4$) occurs generally as medium to coarse grained 1 - 5 mm interstitial crystals, showing no preference for any specific calc-silicate mineral.

Molybdenite (MoS_2) and molybdo-scheelite ($CaMoO_4$-$CaWO_4$) are generally concentrated in the same sections as the scheelite but show no small scale spatial association.

Type 2 - Pyrrhotite-diopside-actinolite skarn

This is the dominant skarn found in the Kuhn Zone (South) and also occurs as narrow stratiform lenses within the Type 1 skarns in the Kuhn Zone (North) and Dead Goat Zones.

These iron sulphide rich skarns often contain accessory pyrite, sphalerite, chalcopyrite, stibnite, plus scheelite but is noticeably lacking in molybdenite.

Fluorite, quartz and garnet also occur as minor accessories.

These skarns are typical of those found in the Mactung and Cantung deposits but are not as massive in form nor as enriched in scheelite as the latter deposits.

The two best intersections of tungsten on the McDame property were:

0.73% WO_3, 0.17% Cu/4.0 m T.W. (Kuhn Zone North)
0.95% WO_3/2.5 m T.W. (Dead Goat Zone).

Type 3 - Quartz-biotite-pyrite-epidote-magnetite-sericite skarn

This "cherty skarn" intersected at the hornfels - carbonate contact in DDH 81-A-4 (Kuhn Zone North) and within quartz-biotite hornfels in DDH 81-A-9A (Kuhn Zone North) may be analogous to the low grade cherty ore found in the Mactung and Cantung deposits.

Scheelite occurs as discrete disseminated grains grading 0.22% WO_3/7.0m T.W.

The quartz-biotite-sericite-pyrite skarn found in the bottom of DDH 81-A-9A may also represent the outer shell of a deeper greisen zone overlying a W-Mo mineralized cupola similar to the Windy Stock exposed at Lamb Mtn.

The significance of this Skarn type was not realized when DDH 81-A-9A was in progress and was terminated prematurely. This should be considered a prime area for future deep drilling.

Type 4 - Chlorite-pyrite-pyrrhotite-magnetite vein skarn

This convoluted fracture controlled skarn type may be the precursor to the Type 2 sulphide rich skarn.

The mineral zoning of the fracture veins suggest magnetite was initially precipitated, followed by chlorite pyrrhotite and powellite.

It's spatial extent within the Kuhn Zone (North) has not been clearly defined.

No vein skarn has been found in the Kuhn Zone (South) or Dead Goat Zones.

9.2 Skarn Model

A review of Larry Dick's classification of Cordilleran skarns (1980) suggests that the McDame occurrences are most comparable to other W-Mo skarns associated with Cretaceous quartz monzonite intrusives.

These have been further subdivided by Dick into 1) W-Mo skarns without associated stockworks (Stormy, Woah, Tai, Mid and Nite occurrences), and 2) W-Mo skarns without associated stockworks (Mt. Haskings, Logtung deposits).

Characteristics of each group are summarized in Table 7 and Table 8, borrowed from Dick (1980).

Both the Dead Goat and Kuhn Zones have geological settings similar to the Stormy deposit, formed within L. Cambrian limestones

100 m in thickness; generally restricted to the basal carbonate contact. The Dead Goat and Stormy deposits are in direct contact with the quartz monzonite while the Kuhn Zone is slightly more distant from it (1.2 km).

In terms of skarn mineralogy, the McDame prospects are composed of a garnet-pyroxene-actinolite assemblage very similar to the Stormy skarns, which contains more quartz as a dominant constituent. In both, scheelite and molybdenite are the most important economic minerals, occurring within the garnet skarn.

In the Logtung and Mt. Haskin deposits scheelite and molybdenite occur primarily in fractures crosscutting both the skarn and intrusive. The quartz + molybdenite stockwork found in the footwall hornfels of the Kuhn Zone (North) does not crosscut the overlying skarn zones and has not found to be mineralized with scheelite. However, this may change as the intrusive is approached at greater depths.

The zoning of minerals away from the intrusive in the pattern Mo(W) --> W(Mo) --> Zn(Pb,Ag) present in both the Mt. Haskin and Logtung deposits is also evident on the McDame property.

From the quartz-molybdenite stockwork veining intersected beneath the Kuhn Zone (North) it is conceivable that a Mo(W) porphyry system may exist at depth. The Kuhn Zone (North) Skarns would then represent the W(Mo) mineralization peripheral to this system and the Zn(Cu,W) enriched Kuhn Zone (South) Skarns are consistent with the outer-most mineralized zone.

The chlorite-pyrrhotite-pyrite-magnetite vein skarns described as "wrigglite textured" in the Kuhn Zone (North) have also been noted in the Mt. Reed skarns, south of Mt. Haskins.

TABLE 8

Table 4.1. Characteristics of W(Mo) skarns

	Major Ore Assemblage	Minor Elements	Host Rocks	Host Age	Intrusive Rock	Mineralization in Intrusive	Alteration of Intrusive
2.	W-Mo skarn	none	massive, coarsely crystalline limestone (33,7,8) Interbedded limestone/biotite schist (20)	Upper Proterozoic (7,8,20) Lower Cambrian (33)	Even textured granodiorite (7,8,20) Porphyritic quartz monzonite (33)	Rosettes of coarse molybdenite, minor scheelite (33) None observed at (7), (8) (20)	Intense greisen at (33). Minor pyroxene + epidote endoskarn (7)

Skarn Minerals		Ore Minerals	Form
major	minor		
garnet (grossular-andradite) hedenbergite anorthite quartz	actinolite (7,8,33) magnetite (7,8) wollastonite (7,8,20)	scheelite molybdenite	Xenoliths in granodiorite batholith (7,8) Broadly stratiform (20,33)

Comments: Low sulphur skarn bodies which lack iron sulphides. Skarns are garnet and plagioclase rich. Silicate assemblage more homogeneous throughout skarn than W-Cu group. Molybdenite is a very minor component and is generally restricted to quartz veinlets (20), quartz-magnetite-actinolite veins (7,8) but can be heavily disseminated (33).

* Numbers in brackets refer to deposits listed in Table 1.1.

- From Dick (1980), pg. 119 -

TABLE 9

Table 4.2. Characteristics of W(Mo) stockwork deposits

	Major Ore Assemblage	Minor Elements	Host Rocks	Host Age	Intrusive Rock	Mineralization in Intrusive	Alteration of Intrusive
3.	vein stockwork overprint on skarn	peripheral Pb/Zn skarn (30) peripheral Zn skarn (28)	light/dark green skarn, calc-hornfels	Lower Cambrian (28)	diorite, porphyritic quartz monzonite, quartz porphyry (28) granite porphyry (30)	molybdenite and minor scheelite locally at both localities	quartz porphyry locally greisen altered with minor pyrite at both localities

Skarn Minerals		
major	Ore Minerals	Form
wollastonite (28) vesuvianite (28) garnet (28) pyroxene (28,30) quartz (28,30) actinolite (28,30) (vein) pyrite (28) (vein) fluorite (28,30) (vein)	molybdenite scheelite	vein stockwork overprinting skarn

Comments: W-Mo mainly restricted to quartz-molybdenite-scheelite veinlets which overprint fine-grained, iron and sulphur-poor skarn. Additional vein mineralogy at (30) include pyroxene-anorthite-fluorite-amphibole-calcite. Pyrite occurs in veinlets at (28). Veinlets at both localities can develop dark-green amphibole selvages.

* Numbers in brackets refer to deposits listed in Table 1.1.

- From Dick (1980), pg. 149 -

TABLE 10

SUMMARY OF EXPENDITURES - McDAME PROJECT

1979-1980-1981

Expenditure	1979	1980	1981	Cumulative Expenditures
1. Company Labour (Students)	Ø	29,534.00	15,638.00	45,172.00
2. Non-Company Labour (Cooks)	Ø	275.00	2,092.00	2,367.00
3. Materials				
General	Ø	1,924.00	2,753.00	4,677.00
Maps and Reports	31.00	19.00	391.00	441.00
Camp Supplies	174.00	18,274.00	8.966.00	27,414.00
Fuel and Lubricants	205.00	123.00	3,255.00	3,588.00
4. Contract Services				
Catering	275.00	3,439.00	Ø	3,714.00
Analytical	676.00	12,316.00	10,158.00	23,150.00
Bulldozing	Ø	13,332.00	14,810.00	53,495.00
Core Drilling	Ø	51,793.00	110,062.00	161,853.00
Geophysical	Ø	2,281.00	Ø	2,281.00
Bus and Air Freight	Ø	14,499.00	6,045.00	6,045.00
Express	Ø	2,212.00	1,447.00	3,659.00
5. Contract Transportation				
Truck Rental	804.00	5,016.00	4,642.00	10,462.00
Helicopter	Ø	44,714.00	1,392.00	46,106.00
Aircraft	Ø	2,805.00	Ø	2,805.00
6. Communications	Ø	718.00	244.00	964.00
7. Rental Equipment				
Trailers and Light Plant	298.00	5,000.00	5,475.00	10,773.00
8. Staff Costs				
Travel and Sundry	744.00	8,109.00	2,869.00	11,722.00
9. Miscellaneous Expenses	2,900.00	10,660.00	542.00	14,102.00
TOTALS	$6,107.00	$227,048.00	$190,781.00	$423,936.00

11. RECOMMENDATIONS

Kuhn Zone (North)

1. Additional drilling should be carried out between Section 1+00N and 3+30N to more clearly define the Upper 3A and Lower 3A Skarn bands.
   Fill in drilling on fences spaced at 25 m intervals is required for meaningful tonnage estimates.

2. Provision should be made to drill at least three deep (+400 m) holes along the Kuhn Zone (North). Between 2+00N and 6+00N, to test the extent and grade of porphyry-moly stockwork mineralization at depth.

3. An effort should be made to re-drill DDH 81-A-1 which was abandoned in overburden because of excessive artesian water flow. The hole was originally intended to test a broad magnetic structure thought to be a buried granitoid cupola.

Kuhn Zone (South)

1. At least one hole should be drilled to test the downdip extension of this zone. The east location would be 9+00S 0+80W, drilled at 245°/-45° for a distance of at least 80 m.

Dead Goat Zone

1. No additional work is recommended on this zone because of the restricted nature of the skarn.

Contact Showing

1. Detailed mapping should be completed over the Skarn Zone. Due to the rugged topography in this area, followup drilling may be difficult to carry out.

REFERENCES

Cooke, B.J., Godwin, C.I.
1981: Geology of the McDame Tungsten Skarn Prospect, unpublished paper - University of British Columbia.

Dawson, K.M., Dick, L.A.
1978: Regional Metallogeny of the Northern Cordillera: Tungsten and Base Metal Bearing Skarns in the Southeastern Yukon and Southwestern MacKenzie GSC Paper 78-1A, pg. 287 - 292.

Dick, L.A.
1980: A Comparative Study of the Geology, Mineralogy and Conditions of Formation of Contact Metasomatic Mineral Deposits in the Northwestern Canadian Cordillera, unpublished Ph.D. Thesis - Queen's University, Kingston, Ontario, September 1980.

Gabrielse, H.
1963: McDame Map Area, Cassiar District, British Columbia GSC Memoir 319.

Kuhn, W.
1979: Prospecting Report on the Windy 2, 3 and 4 Mineral Claims 104P/5W, BCDOM Assessment File #7520.

Moffat, G.W.
1979: Geological and Geochemical Results - 1979 Field Program McDame Project, (Internal Shell Canada Report).

Moffat, G.W.
1980: Assessment Report - Geological, Geochemical and Geophysical Surveys by Shell Canada Resources Ltd. on the Windy 2 Claims.

Moffat, G.W.
1980: Assessment Report - Geological and Geophysical Surveys by Shell Canada Resources Ltd. on the Balsam 1 and 2 and Windy 2, 3 and 4 Claims.

Moffat, G.W.
1980: Summary Report - 1980 Field Program, McDame Project (Internal Shell Canada Report)

Moffat, G.W.
Assessment Report - Physical Surface Work and Diamond Drilling by Shell Canada Resources Ltd. on the Windy 2, 3 and 4 Claims.

Moffat, G.W.
1981: Assessment Report - Drilling and Geochemistry by Shell Canada Resources Ltd. on the Balsam 1 and Karhu 1 Claims.

Panteleyev, A.
1979: Cassiar Map Area, Summary of Field Work - 1978, BCDOM, pg. 51 - 68.

UNION CARBIDE
M1 CLAIM

UNION CARBIDE
M2 CLAIM

ONO 2

BALSAM 1

BALSAM 2

WINDY 1

WINDY 2

WINDY 4

OK 1

OK 2

L.C.P.

DDH 81-A-1 (ABANDONED)

KUHN LAKE

UPPER ATAN FORMATION

DDH 81-A-2

UPPER ATAN LIMESTONE

DDH 81-A-5

LOWER ATAN FORMATION

KECHIKA GROUP

GARNET DIOPSIDE SKARN

DDH 81-A-4

DDH 80-4-3

DDH81-A-7

DDH 81-A-3

KUHN ZONE (NORTH)

DDH 81-A-9A

DDH81-A-8

DDH 80-A-2

GARNET DIOPSIDE SKARN

DDH 80-A-1

DDH81-A-6

CALC-SILICATE HORNFELS

BIOTITE HORNFELS

INTERBEDDED

DDH 81-B-1

DEAD GOAT ZONE

GARNET DIOPSIDE SKARN

DDH 80-A-4

DDH 80-A-1

DDH 80-A-2

DDH 80-A-3

PYRRHOTITE DIOPSIDE SKARN

HORNFELS

QFP

KUHN ZONE (SOUTH)

QUARTZ FELDSPAR PORPHRY

QUARTZITE

BANDED HORNFELS

QTZ HORNFELS

CASSIAR STOCK

PORPHYRITIC QTZ. MONZONITE

LIMESTONE

SKARN

GARNET DIOPSIDE SKARN

GOODHOPE GROUP

QUARTZ FELDSPAR PORPHYRY

CONTACT STOCK

PORPHYRITIC QTZ. MONZONITE

BANDED SKARN & HORNFELS

BANDED HORNFELS

LIMESTONE

LEGEND

SKARN MINERALIZATION

QUARTZ FELDSPAR PORPHYRY & PORPHYRITIC QUARTZ MONZONITE

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 10,850

Part 1
of 3

SCALE 1:5000

0 150 300 m

SHELL CANADA RESOURCES LIMITED
EXPLORATION - MINERALS

3191 U
McDAME PROJECT - B.C.
TOTAL FIELD MAGNETIC CONTOUR MAP
AND GEOLOGY
CONTOUR INT. = 100 GAMMAS

FIG. 5

AUTHOR G. MOFFAT, S. SAYDAM	SCALE 1:5000	DRAWING No.	
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To Accompany			