Property File
104K 079

ECO copy

019958

GOLDEN BEAR MINE

SUMMARY OF EXPLORATION

1993 - 1996

ATLIN MINING DIVISION
NTS 104K/1W

Latutude 58°13' North
Longitude 132°17' West

Owned and Operated by:

NORTH AMERICAN METALS CORP.
1500 - 700 West Pender Street
Vancouver, B.C.

By:

Dunham Craig, BSc., P.Geo.
Andrew Hamilton, Bsc.
Christine McPhee, Bsc.

April 15, 1997

EXECUTIVE SUMMARY

From late 1993 to the end of 1996 North American Metals Corp. has carried out an aggressive program of exploration on it's Golden Bear property in northwestern British Columbia. During this period a total of 12.2 million dollars (Cdn.) has been spent exploring the property.

Gold mineralization is localized in breccia zones along northerly trending brittle failure fault structures. Two styles of gold mineralization are present: oxide mineralization which is hosted entirely in Permian carbonate rocks, and refractory mineralization which is hosted either within volcanic rocks or within carbonate rocks in fault contact with the volcanics.

North American Metals exploration program has successfully discovered and defined reserves totalling 1.5 million mineable tonnes of ore grading 5.1 grams per tonne gold in the Kodiak A, Kodiak B and Ursa deposits. These reserves, which contain a total of 214,000 recoverable ounces of gold have now been placed in a five year mining plan with production scheduled to start in May of 1997. A further 140,000 contained ounces of gold have been outlined by drilling in the Grizzly Zone and East Low Grade Stockpile. In addition, insitu gold mineralization has been discovered through trenching and diamond drilling in the Ridge, South, Limestone Creek Fault and C & C Zones, and several soil and rock geochemical anomalies have been identified.

Exploration staff feel that there is excellent potential to locate additional mineral resources on the Golden Bear property.

Recommendations for further work on the property are as follows:

Diamond drilling: drilling is proposed to further test the Grizzly, Kodiak C, Ridge and Limestone Creek Fault Zones. Programs will be designed to outline the potential for mineralization of economic grade and tonnage. It is also proposed that the strike potential of both the Ridge and Limestone Creek Faults be tested by wide spaced exploratory drill holes.

Trenching: additional trenching is recommended for the South and C & C Zones in order to better define drilling targets.

Prospecting\Geochemistry: several areas on the property have returned anomalous values from soil samples, rock float and rock grab samples. These areas should be assessed through additional prospecting, soil geochemistry and, if warranted, trenching.

Table of Contents

List of Tables

List of Figures

List of Plates

1.0 INTRODUCTION

The Golden Bear Mine property is located in the Tatsamenie gold camp, which lies approximately 140 kilometres west of Dease Lake in northwestern British Columbia. The property is 100% owned by North American Metals Corp (NAMC), an 82% owned subsidiary of Wheaton River Minerals Ltd.

The property includes a CIL gold mill rated at 500 tonnes per day which processed refractory ore from the Bear Main deposit from 1989 until exhaustion in late 1994. In total 6,781,698 grams (218,040 ounces) of gold were recovered from 535,277 tonnes (590,041 tons) of ore.

Since late in 1993 the property has been the focus of intensive exploration efforts aimed at locating and defining mineable gold reserves. The program has encountered considerable success in this regard over the course of three years, including the following:

- the discovery and definition of the Kodiak A and Ursa oxide gold deposits, both of which have been brought to mineable status.

- the definition drilling of the Kodiak B oxide gold deposit, bringing it to mineable status.

- the discovery and partial definition the Grizzly zone, an area of refractory gold mineralization averaging 22 grams per tonne.

- the definition drilling of the top third of the East Low Grade Stockpile.

- the discovery of in situ gold mineralization in the Ridge, South, Limestone Creek Fault and C&C zones, all of which are scheduled for additional exploration work in 1997.

Three oxide deposits, the Kodiak A, the Kodiak B and the Ursa, have been placed in a five year mine plan. Mineable reserves for the three deposits total 1,500,000 tonnes grading 5.1 grams per tonne gold. Production, scheduled to begin in May 1997, will utilize both open pit and underground mining methods, with the ore to be processed by using heap leaching technology. It is expected that 25,000 ounces of gold will be produced in 1997, rising to 50,000 ounces in subsequent years. Total gold production for the project will be 214,000 ounces, bringing the total for the property to 432,000 ounces.

Total exploration expenditures by North American Metals over the period from late1993 to the end of 1996 have been 12.2 million dollars (Cdn.). Based on these expenditures the 214,000 ounces scheduled to be produced from the Kodiak A, Kodiak B and Ursa deposits have been located at a cost of $57.00 Cdn. per ounce. If the resources outlined in the East Low Grade Stockpile and the Grizzly Zone are included, which total 38,800 ounces and 100,000 ounces respectively, a total of 352,800 ounces have been outlined for a cost per ounce of $34.60 Cdn.

1.1 SCOPE OF REPORT

This report serves to present the results of exploration programs carried out on the Golden Bear mine property between late 1993 and the end of 1996. Work completed during this time includes geochemical and geophysical surveys, geological mapping, prospecting, trenching, reverse circulation and diamond drilling, reserve calculation and pre-feasibility metallurgical test work.

1.2 LOCATION, PHYSIOGRAPHY AND ACCESS

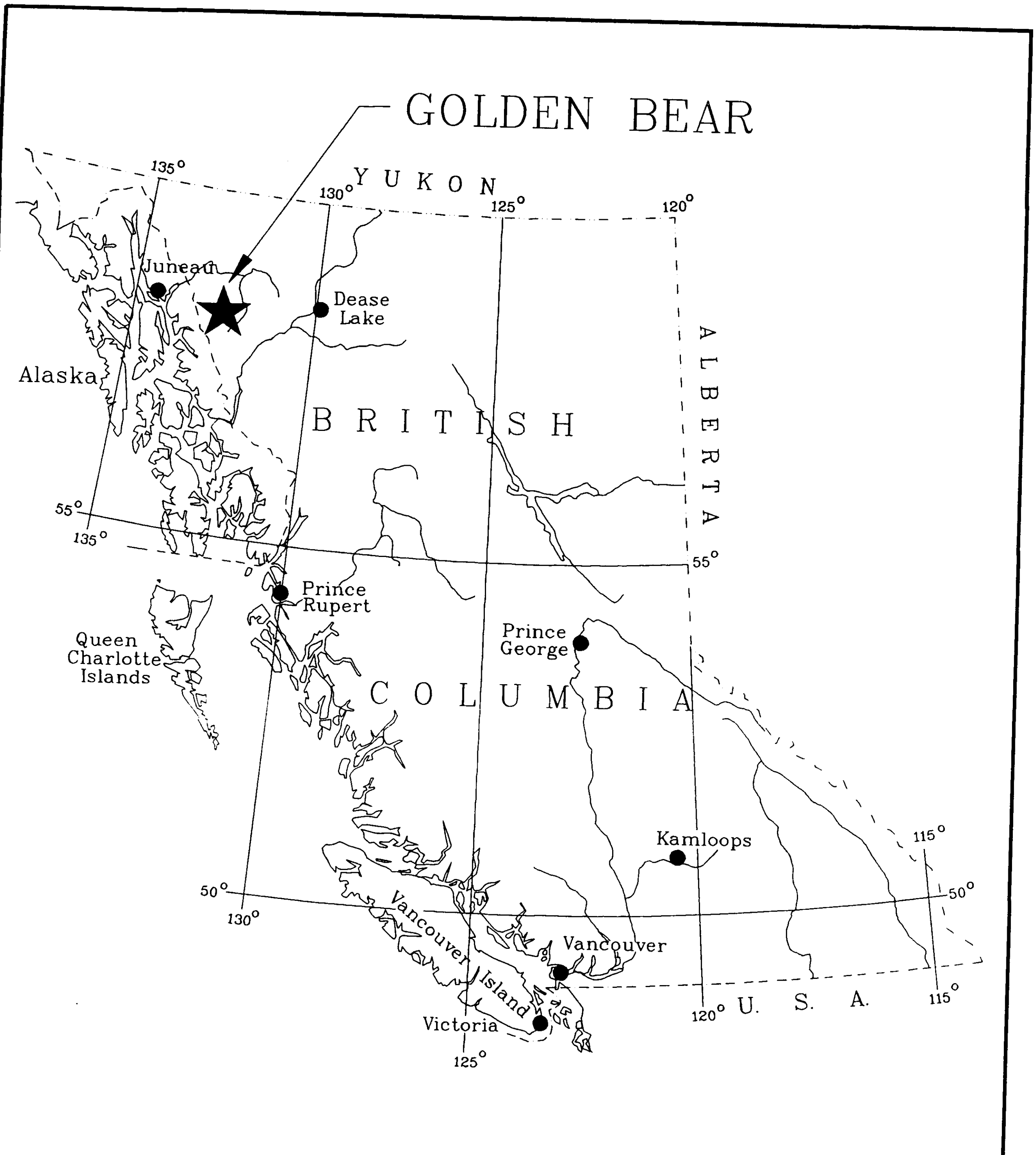
The Golden Bear Mine property is located in northwestern British Columbia in the Atlin Mining Division near 132°17' west and 58°13' north. The project area occurs on the Tulsequah (104K)and Bearskin Lake (104K/1) mapsheets. The town of Dease Lake lies 140 kilometres to the east and Juneau, Alaska is 100 kilometres to the west (see Figure 1.2-1).

The mine property lies within moderately rugged terrain on the east side of the Chechidla Range of the Coast Mountains, where elevations range from 600 to 2200 metres. Treeline is at roughly 1100 metres elevation with little or no vegetation other than grass occurring above this point. Lower slopes are forested with dense spruce, pine and alder. Glaciers and permanent snow are present but not abundant, however snow melts slowly on western and northern slopes where surface exploration can only be effectively conducted between July and mid-September.

Access to the Golden Bear Mine property can be gained by two-wheel drive road, fixed wing aircraft or helicopter. Access by road is gained by public road for 80 kilometres west from Dease Lake and then by an all weather private access road extending 155 kilometres northwest from Telegraph Creek. A 1500 metre gravel airstrip is present at the minesite to accommodate small fixed wing aircraft. Contract helicopter service is available based out of Dease Lake. For safety reasons use of both the mine access road and the airstrip is restricted. Once at the minesite the property can be accessed by a number of all weather gravel and four-wheel drive exploration roads.

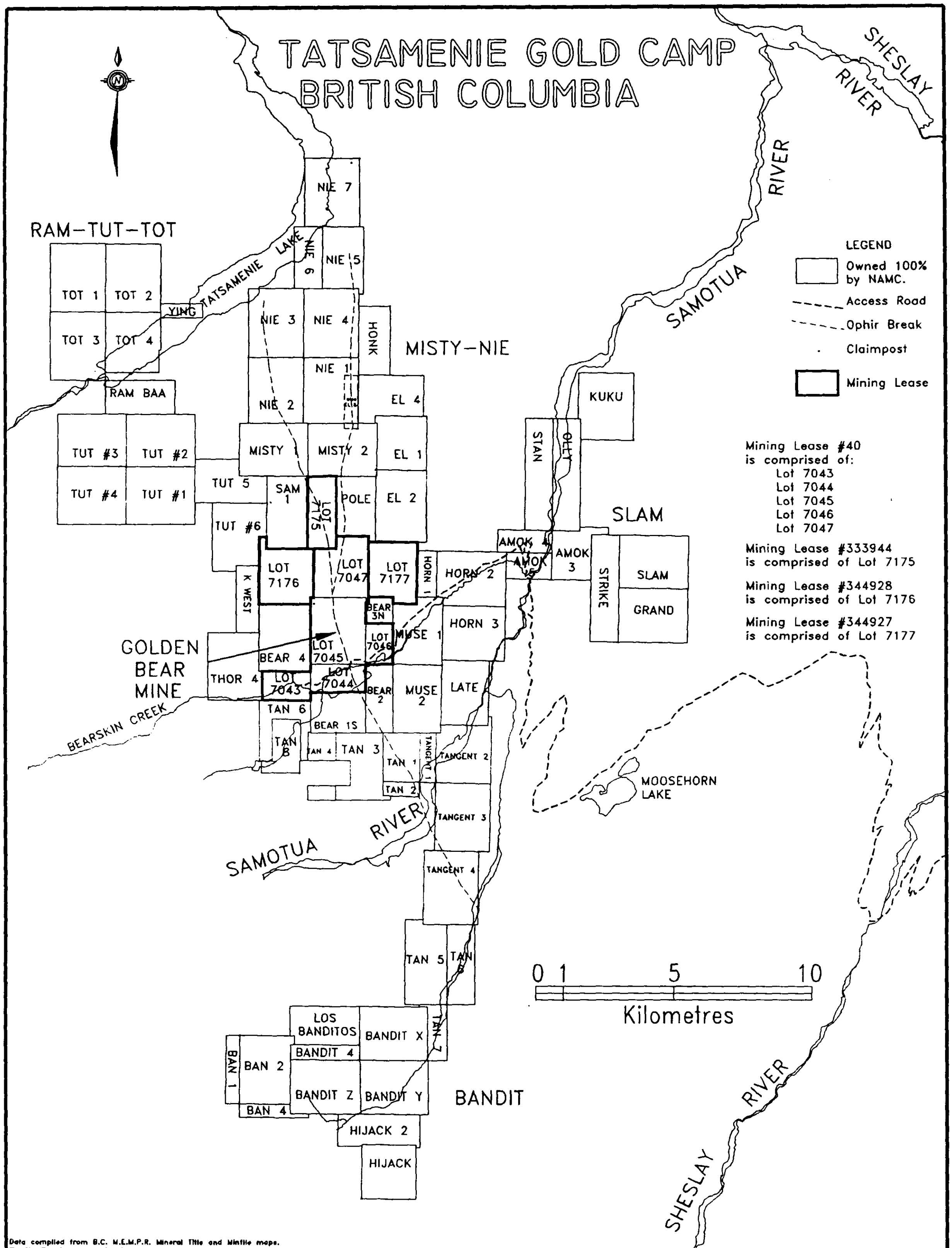
1.3 LAND TENURE

The Golden Bear Mine property consists of a total of 31,136.13 hectares of contiguous mineral claims and mining leases as shown in Figure 1.3-1. This land position comprises what is known as the Tatsamenie gold camp and includes the Bandit, Misty-Nie, Slam and Ram-Tut-Tot properties in addition to the central mine area. The mineral claims consist of 1130 modified grid claim units totalling 28,620.13 hectares. A majority of these claims are in good standing until the year 2000. The property also includes four mining leases totalling 2,516 hectares. Each lease has a primary term of 30 years and is subject to an annual rental fee.



NORTH AMERICAN METALS CORP.

GOLDEN BEAR	LOCATION MAP	
	N.T.S.: 104 K	Figure: 1.2-1



NORTH AMERICAN METALS CORP.

GOLDEN BEAR PROPERTY	CLAIM MAP	
	N.T.S.: 104 K	Figure 1.3-1

1.4 EXPLORATION HISTORY

Due to the remote and rugged nature of northwestern British Columbia little in the way of mineral exploration was carried out in the Golden Bear area until fixed wing aircraft and helicopters made access easier. The earliest reference to mineral claims in the Golden Bear area is from 1956 when a claim was staked to cover a copper showing.

J.G. Souther (1971) of the Geological Survey of Canada mapped the Tulsequah mapsheet (104K) thereby providing the main regional geologic framework for the area.

In 1979 and 1980 research was carried out by geologists working for Chevron Minerals Ltd. on the potential for bulk tonnage epithermal gold deposits in several areas in British Columbia. As a result of this work a small reconnaissance program was run on the Tulsequah mapsheet in 1980 by L.A. Dick, initially focussing on antimony and arsenic bearing alteration zones north of Tatsamenie Lake.

In 1981 Chevron staked 10 properties in the area, including one claim group over what became known as the Bear Main deposit. Earlier in the summer a reconnaissance soil sample taken at 300 metre spacing on the north side of Bearskin Creek valley returned a value of 700 ppb gold. A follow-up contour soil traverse at 100 metre spacing produced a high of 9200 ppb gold from directly below mineralized outcrop. Grab rock samples from this area assayed up to 24.0 grams per tonne gold.

In 1982 the Bear Main zone was mapped and trenched. Over a 13 metre width and 175 metre length gold values were found to average 9.3 grams per tonne.

From 1983 to 1985 work on the Golden Bear property consisted primarily of drilling the Bear Main zone and other mineralized zones further north on the property including the Kodiak A and B and Totem zones. A total of 119 surface diamond drill holes were completed during this period.

In 1986 North American Metals Corp. became a 50% joint venture partner with Chevron Minerals Ltd. and underground development of the Bear Main deposit started at this time. Over the course of 1986 and 1987, a total of 87 underground holes and 13 additional surface holes were drilled to further define the ore body.

A feasibility study was completed in 1987 by Wright Engineers for North American Metals Corp. that indicated that the Golden Bear project could successfully be brought into production. The study was based on a mineable ore reserve in the Bear Main deposit of 625,390 tonnes grading 18.6 grams per tonne.

Early in 1988 Homestake Mining (B.C.) Ltd. acquired a 73.3% interest in North American Metals and became an active participant in the mining project. Exploration efforts, which had experienced a two year hiatus from early 1987 to the end of

1989, were revived in 1990 with an 19 hole drilling program to the immediate north and south of the Bear Main deposit area. Drilling in these areas continued in 1991 with an additional 22 drill holes.

The focus of exploration was moved north on the property in 1992 to the Fleece Bowl and Totem areas. A total of 15 holes were drilled in Fleece Bowl, further defining the Kodiak B deposit. 15 holes were also drilled on exploration spacing on the Black Fault and West Wall Faults in the Totem area. These holes failed to intersect any significant gold mineralization.

In July of 1993 Wheaton River Minerals Ltd. acquired Homestake's interest in the Golden Bear property. The results of exploration work carried out since they became involved in the project are the subject of this report.

2.0 REGIONAL GEOLOGY

The regional geology and structure of the Golden Bear area, which lies along the western edge of the Intermontane Belt, was first described by Souther (1971). More recent mapping by Oliver (Oliver and Hodgson, 1989, 1990; Oliver 1993, 1995) and Bradford and Brown (1993a, 1993b) have further refined the understanding of the geologic setting of the area. The following discussion is largely summarized from these authors. A schematic stratigraphic column is shown on Figure 2.0-1.

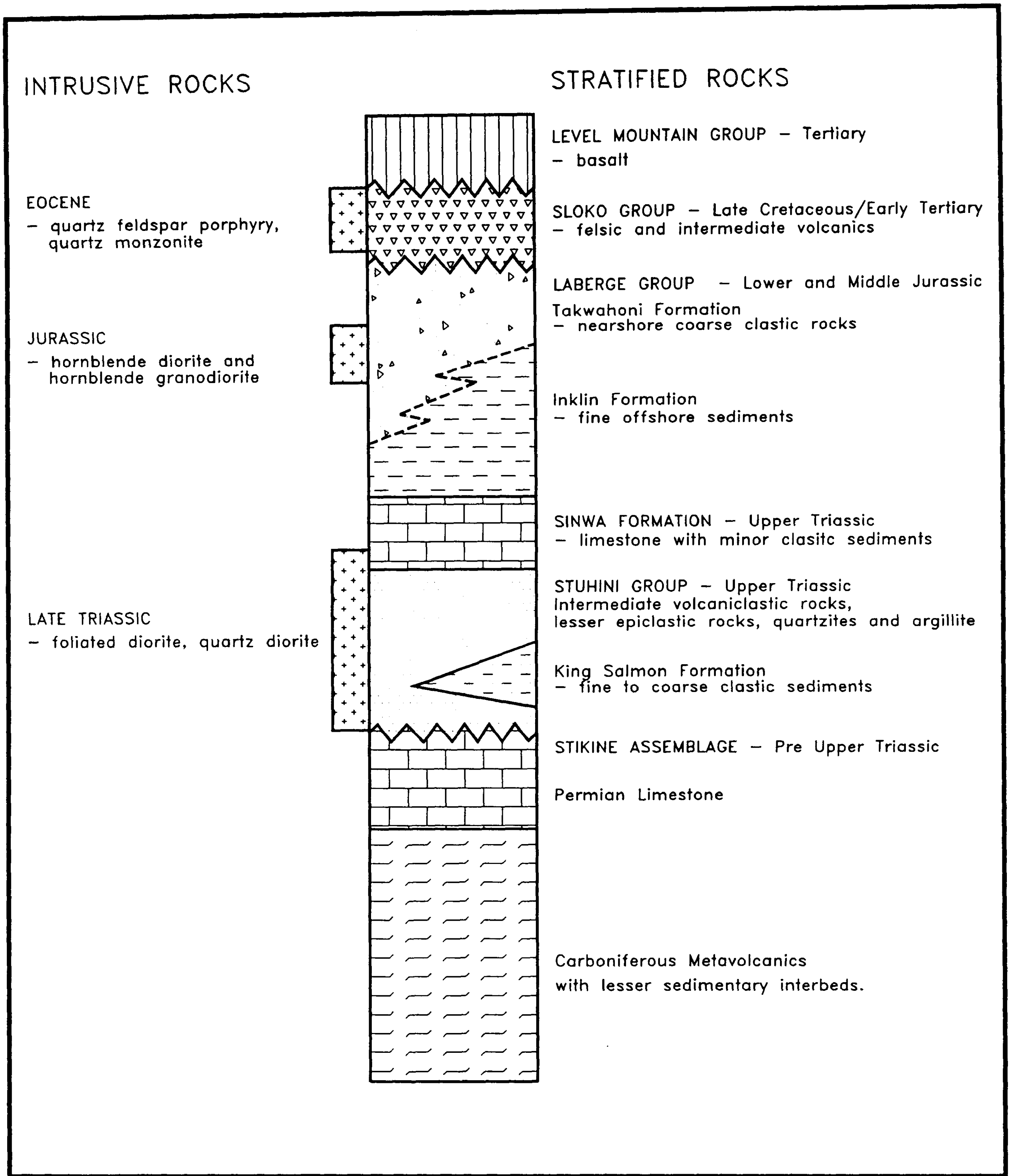
2.1 STRATIGRAPHY

The lowermost stratigraphic sequence exposed in the region consists of the of the Stikine Assemblage. The lowest exposed unit in the Stikine Assemblage is an unfossiliferous, presumed Carboniferous, massive to thin bedded, recrystallized limestone. The limestone is conformably overlain by a sequence of foliated, chloritic metavolcanic rocks. Dominant volcanic lithologies in this sequence include andesitic ash to lapilli tuff, feldspar and augite phyric tuffs and flows, massive andesitic flows, and rare pillow basalt. Lithologies that can be found interbedded with these units include argillites, conglomerate and limestone beds up to 25 metres thick. This sequence is in turn overlain by a heterogeneous section of foliated felsic to mafic volcanic rocks, argillaceous phyllite and limestone. Age dating from zircons in one of the felsic tuffs returned an Upper Carboniferous date (316 Ma).

A thick, fossiliferous, Permian limestone unit forms a distinctive package within the Stikine Assemblage. This unit varies from massive to thin bedded and includes both calcitic and dolomitic end members. McBean and Reddy (1993) estimate this unit has a total thickness of 200 metres. Poorly preserved fusilinids and rugosan corals confirm the Early Permian date for the unit (Souther, 1971; Monger and Ross, 1971; Bradford and Brown, 1993b). Detailed mapping by several geologists has further refined the internal stratigraphy of the Permian limestone unit (see section 3.1).

Unconformably overlying the Stikine Assemblage is a thick package of volcanic and sedimentary rocks that comprise the Upper Triassic Stuhini Group. The volcanic rocks consist mainly of red-brown weathering, plagioclase and augite bearing volcaniclastic rocks with lesser pillow basalts, epiclastic rocks, quartzites and argillites . A continuous section near the Bandit Claims, roughly 15 kilometres south of Bearskin Lake, has a thickness of 2000 metres. The Stuhini Group rocks typically have a much less deformed appearance than Stikine Assemblage rocks in which a pervasive chloritic foliation is typically only locally developed adjacent to major shear zones.

A distinct package of sedimentary rocks within the Stuhini Group is the King Salmon Formation, a locally mappable succession of well bedded greywackes, conglomerates, siltstones and shales occurring within the more voluminous Stuhini Group volcanics. The formation exhibits rapid lateral changes in thickness and



REGIONAL GEOLOGY – GOLDEN BEAR AREA

SCHEMATIC STRATIGRAPHIC SECTION

FIGURE 2.0–1

lithology, and is interfingered with the volcanic units.

The Stuhini Group is disconformably overlain by the Upper Triassic Sinwa Formation, a distinctive and regionally extensive gray, sparsely fossiliferous limestone. The formation, which varies from a few feet to 2000 feet in thickness, has served as a weak plane along which extensive thrust faulting and intense local folding have occurred.

Sedimentary rocks belonging to the Lower to Middle Jurassic Laberge Group outcrop extensively in a northwesterly trending belt 25 to 70 kilometres north of the Golden Bear property. The group is divided into two formations based on nearshore and offshore facies. The nearshore Takwahoni Formation consists of a thick succession of interbedded conglomerates, greywackes, siltstones and shales. The formation contains an abundance of well preserved fossils that indicate a Lower to Middle Jurassic date of deposition. The offshore, Inklin Formation consists of well bedded siltstones, shales and greywackes that have been deposited in deeper water. Fossils are scarce in Inklin rocks.

The Laberge Group and older rocks are unconformably overlain by the Upper Cretaceous to Early Tertiary Sloko Group. Felsic to intermediate pyroclastic units dominate with subordinate sedimentary rocks, primarily graded, waterlain tuffs. It is likely that Sloko Group rocks are derived from explosive eruptions accompanying intrusion of Coast Plutonic complex granodiorites and diorites.

Finally, the most recent stratigraphic unit in the Golden Bear area is the Tertiary Level Mountain Group. The rocks of this group consist of flat lying, columnar jointed basalt flows.

2.2 INTRUSIVE ROCKS

The intrusive rocks of the Golden Bear area fall into three broad age groups: Late Triassic, Jurassic and Eocene.

The Late Triassic intrusions are fine to medium grained diorites and quartz diorites. Characteristically they are foliated, and exhibit a high degree of alteration in their primary mineral constituents. They intrude both Stikine Assemblage and Stuhini Group rocks.

Jurassic intrusions in the area consist of medium grained, equigranular rocks of dioritic to granodioritic composition that occur as small stocks. Contacts with host rocks are often irregular and sheared, and alteration haloes consisting of bleaching, pyritization or hornfelsing are common. Pervasive foliations such as those noted in Triassic intrusions are not present.

Eocene quartz feldspar porphyry and quartz monzonite occur as large intrusions to the west and northwest of the Golden Bear property. They cut all rock types in the area except for late Tertiary volcanics and are felt to be genetically related to the Sloko Group volcanics (Souther, 1971).

2.3 STRUCTURE

Structural interpretation of the Golden Bear area is difficult due to the lack of control in the Stikine Assemblage rocks and the paucity of Jurassic or younger stratigraphy. The extensive foliation present in Stikine Assemblage rocks is consistent with at least one and perhaps two pre-Late Triassic phases of folding (see section 3.1) followed by and erosional period before deposition of Stuhini Group rocks. A third folding event, producing very broad open folds, is interpreted to have occurred in the Early Jurassic (Bradford and Brown, 1993; Cooley, 1996).

Faulting is dominated by a complex, northerly trending, strike slip regime that is felt to be of Early to Mid-Jurassic age (Bradford and Brown, 1993; Cooley, 1996) . In the Golden Bear area the Ophir Break is an economically important fault zone that extends for at least 20 kilometres and provides primary structural control for gold mineralization. It is comprised of several fault strands across a width of 50 to 100 metres. Movement on the structure is not well constrained and although measured fault grooves and slickensides having mainly shallow plunges suggest strike slip movement, there is evidence to indicate that significant normal (Oliver, 1995) and reverse (Lehrman and Caddey, 1989) displacements have occurred.

2.4 GOLD OCCURRENCES

Regionally, gold is present in a number of mineral occurrences. The most well known of these are the Tulsequah Chief and Polaris Taku mines that lie 95 kilometres to the northwest of Golden Bear. These properties have produced 94,000 and 225,000 ounces of gold, respectively, and aside from the Bear Main deposit, are the only properties regionally from which gold has been produced. Gold was the primary product from Polaris Taku, and one of a number of metals produced from the polymetallic Tulsequah deposit.

A majority of the other known gold occurrences in the area were discovered in the 1980's in the course of Chevron's Northern Gold project. A number of these occur in the Tatsamenie gold camp, which is centred on Golden Bear but extends roughly 15 kilometres to both the north and south and includes the Bandit, Slam, Misty-Nie and Ram-Tut-Tot properties. All mineralization on these properties is hosted in Stikine Assemblage or Stuhini Group rocks and may be the result of the same mineralizing event that formed the deposits on the Golden Bear property. Mineralization in Permian carbonates on the Slam and Ram-Tut claims exhibit similar alteration and mineralogy to those in the Bear Main, Ursa and Kodiak deposits. Mineralization in Stikine Assemblage volcanics on the Bandit and Tot claims occurs as silicified, pyritic shear zones. Exploration programs were carried out in 1994 on all of these properties, which are 100% owned by North American Metals Corp. in a contiguous north-south ground position. References for all of these properties are given in Section 2.5.

Several other gold occurrences discovered by Chevron; the Inlaw, Outlaw and Tardis properties, and one Cominco discovery; the Metla property, lie 30 to 45 kilometres to the north of the Golden Bear property. These properties were visited in 1996 by North American Metals staff for evaluation. Brief descriptions of their geology and mineralization are given below. More detailed information on these, and other gold properties in the northwest corner of British Columbia, is compiled in a series of binders stored at the Golden Bear minesite

Inlaw - Stuhini Group volcanics have been intruded by diorite, producing a large zone of carbonatization. Within this alteration zone are 2 to 5 centimetre quartz veins carrying galena, chalcopyrite and gold and pyritic, silicified rhyolite dykes that carry gold values. Samples of vein material has returned grades of up to 33 g/t gold. The veins however, were noted to be very wide spaced as well as narrow, and as such are of limited economic potential.

Outlaw - Stikine Assemblage volcanics and sediments have been hornfelsed by a diorite intrusion. Mineralization is associated with a silicic stockwork within the hornfels that carries 1 to 2 % pyrite and minor amounts of chalcopyrite, pyrrhotite, arsenopyrite and stibnite. Gold values of greater than 20 g/t are reported.

Tardis - This property lies along the King Salmon Fault where rocks of the Sinwa and Inklin formation have been thrust over rocks of the Takwahoni formation. Rocks along the fault are hydrothermally altered and are strongly anomalous in mercury, arsenic, antimony and fluorine. A total of 25 of rock samples were collected when the property was examined in 1996, but no gold value were obtained.

Metla - A wedge of argillaceous sediments enclosed by massive crystal tuffs of the Stuhini Group have been preferentially silicified and mineralized. Gold values are associated with sulphides that occur as pods, lenses and strongly disseminated zones within the sediments. Pyrite, chalcopyrite and minor galena were noted. Selected grab samples have returned gold values of greater than 31 g/t. However, the field examination revealed that sulphide distribution is discontinuous and that the sulphide zones are too small to be of economic importance.

None of the properties examined is recommended for further work. The primary reason for this recommendation is that the properties did not exhibit the potential to host a gold deposit of significant size (500,000 contained ounces). This is a necessary requirement, particularly given the remote nature of this area and the associated expense of carrying out exploration work.

2.5 REFERENCES

Bradford, J.A. and Brown,D.A., 1993a. Geology, mineral occurrences and geochemistry of the Bearskin and Tatsamenie Lake area, northwestern B.C. NTS 104K/1, 104K/8. British Columbia Ministry of Energy Mines and Petroleum Resources, Geological Survey Branch, Open File 1993-1.

Bradford, J.A. and Brown,D.A., 1993b. Geology of the Bearskin and southern Tatsamenie Lake map areas, northwestern British Columbia (104K/1 and 8). In Grant, B. And Newell, J.M. (Editors) British Columbia Ministry of Energy Mines and Petroleum Resources, Geological Fieldwork 1992, Paper 1993-1, 159-176.

Cooley, M.A., 1996. Structural Geology and Gold Mineralization of the Golden Bear Property. Internal company report.

Hamilton, A.P., 1994a. Year End Report of Activities on the Ram-Tut-Tot Property. North American Metals Corp. internal company report.

Hamilton, A.P., 1994a. Year End Report of Activities on the Bandit Property. North American Metals Corp. internal company report.

Jaworski, K.M. and Reddy, D.G., 1993. Golden Bear Project, North American Metals Corp. 1992 Totem Area Exploration Report. Internal company report.

Lehrman, N.J. and Caddey, S.W., 1989. Golden Bear Project: Geologic Appraisal and Exploration Recommendations. Homestake Mining Company, Internal company report.

McBean, D.A. and Reddy, D.G., 1993. Golden Bear Project, North American Metals Corp. 1992 Fleece Bowl Exploration Report. Internal company report.

Oliver, J.L., 1993. Geology of the Bearskin (Muddy) Lake, Tatsamenie Lake District, northwestern BC. British Columbia Ministry of Energy, Mines and Petroleum Resources, Geologic Survey Branch, Open File 1993-11.

Oliver, J.L., 1995. Geology of the Bearskin Lake, Tatsamenie Lake District, northwestern BC. British Columbia Ministry of Energy, Mines and Petroleum Resources, Geologic Survey Branch, Open File 1995-21.

Oliver, J.L., 1996. Geology of Stikine Assemblage Rocks in the Bearskin (Muddy) and Tatsamenie Lake District, 104K/1 and 104K/8, Northwestern British Columbia, Canada and Characteristics of Gold Mineralization, Golden Bear

Mine, Northwestern British Columbia. Unpublished PhD thesis, Queen's University, Ontario, Canada.

Oliver, J.L., and Hodgson, C.J., 1989. Geology and Mineralization, Bearskin Muddy and Tatsamenie Lake District (south half), northwestern British Columbia (104K). British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1989-1, 443-453.

Souther, J.G., 1971, Geology and Mineral Deposits of the Tulsequah Map Area. Geological Survey of Canada, Memoir 362, 76 pages.

Zuran, R.J., 1994a, 1994 Year End Report on the Misty-Nie Property. North American Metals Corp. internal company report.

Zuran, R.J., 1994b, Geochemical Report on the Slam Property. British Columbia Assessment Report.

3.0 PROPERTY GEOLOGY

The geology of the Golden Bear property is dominated lithologically by rocks of the Stikine Assemblage and Stuhini Group, and structurally by the Ophir Break. Work by a number of geologists has refined the understanding of the property geology, particularly the internal stratigraphy of the Permian limestone unit (Oliver and Hodgson, 1989; McBean and Reddy, 1993; Jaworski and Reddy, 1993; Pigage, 1994).

More recently, Cooley (1996) has carried out a detailed structural analysis of the property. Work included remapping of geology along the Ophir Break, and mapping of new areas on the property in order to gain a property wide understanding of stratigraphy, structure and deformation history. His report is included in its entirety in Section 3.1 as it gives a full summary of property geology in addition to structural analysis. Property geology is shown on Figure 3.0-1.

3.1 STRATIGRAPHY AND STRUCTURAL ANALYSIS

See following report.

STRUCTURAL GEOLOGY AND GOLD MINERALIZATION OF THE GOLDEN BEAR MINE PROPERTY

Michael A. Cooley
November 2, 1996

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

The gold deposits of the Golden Bear Mine property lie within silicified dilatant zones along steeply dipping fault surfaces of the Ophir Break fault zone, a north trending, subvertical anastomosing fault system that has experienced more than one episode of faulting. Along the Ophir Break there are three deposits which appear to be regularly spaced, occurring at approximately 250 m intervals. These are the Kodiak A, B and C deposits (see Figure 1). A fourth deposit called the Ursa Zone occurs approximately 1000 m north of the Kodiak A deposit, along a splay of the Ophir Break called the Ursa Fault. The apparent regular spacing of the deposits may be an important clue for discovering additional mineralized zones if the deposits lie within a predictive geologic structure.

The main focus of this study was to determine if this apparent periodicity was structurally controlled by fold interference patterns cut by the Ophir Break, a possibility suggested by Lehrman and Caddey (1989). This study was accomplished by detailed remapping along the Ophir Break and mapping of new areas to elucidate the stratigraphy and structures and ultimately achieve a property-wide understanding of the deformation history in the rocks. This led to the completion of a property-wide compilation map, the determination of wavelengths and locations of fold hinges and the construction of cross sections through the mineralized zones.

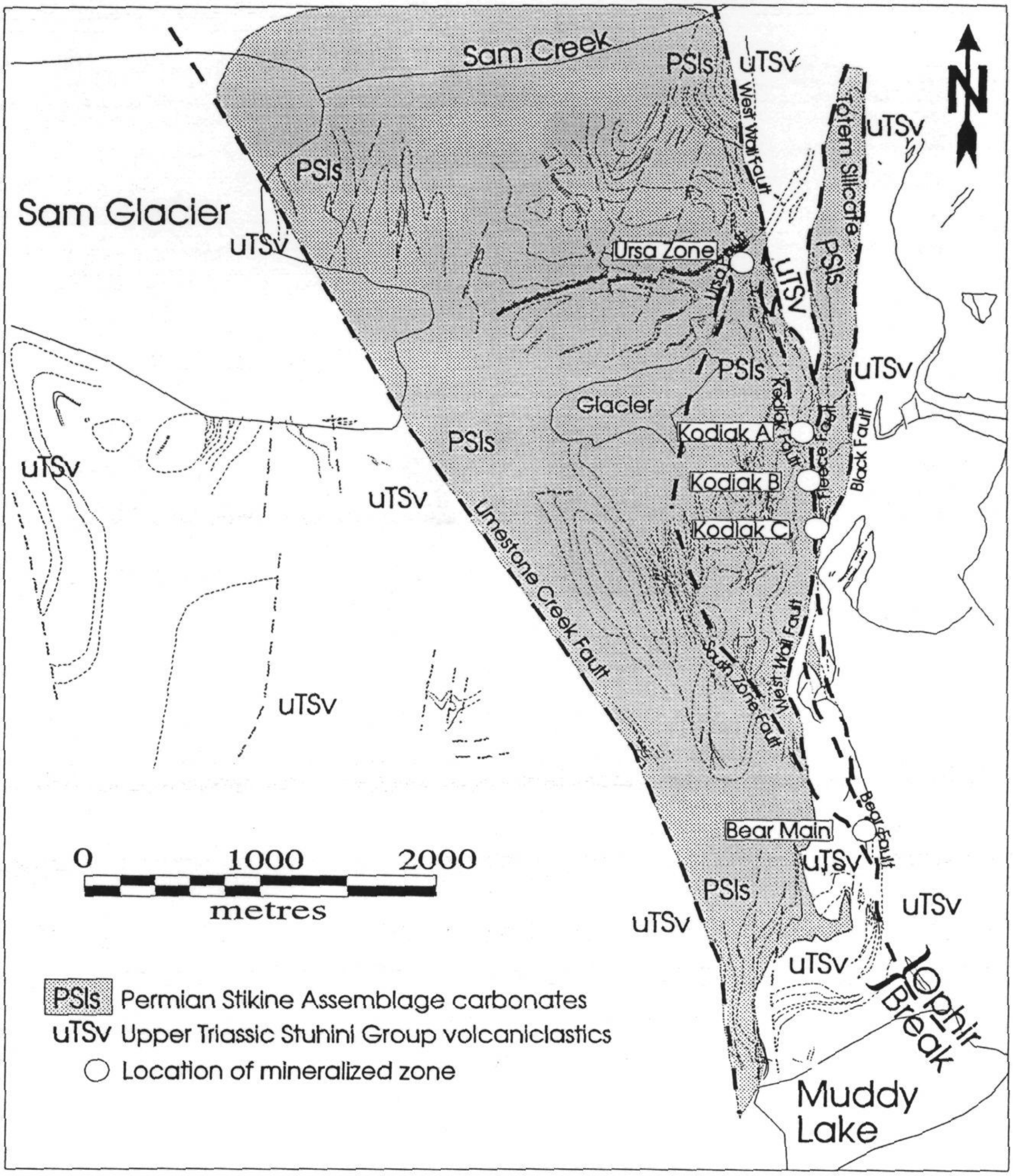


Figure 1. General geology and mineral deposits of the Golden Bear mine property.

REGIONAL GEOLOGIC SUMMARY

The general regional geology of the study area is outlined in Figure 1. Permian carbonates of the Stikine Assemblage are the oldest stratigraphic units in the map area. These occupy the central portion of the field area and on the map they encompass a south-tapering wedge bounded to the east and west by faults, to the north by a regional thrust fault (Oliver, 1996) and to the south by an unconformable contact with an overlying tuff-dominated unit. The Permian age of the carbonates has been constrained by correlation with regional Stikine Assemblage lithology and is supported by a biostratigraphy of rugosan corals and poorly preserved fusilinids (Souther, 1971). Rugosan corals are locally abundant in many of the units in the field area but fusilinids were not observed by this study. Most fine scale bedding features of the Permian rocks have been wiped out by a regional metamorphic event which recrystallized the calcitic and dolomitic carbonates to low-grade marbles.

Upper Triassic Stuhini Group rocks overlie the Permian carbonates across a distinct contact. Oliver (1996) suggested that this contact is a regional thrust fault which placed Stikine Assemblage volcanic rocks that stratigraphically underlie the carbonates up and over the carbonates. A thrust fault is unlikely as the overlying lithology most closely resembles the Stuhini Group, a stratigraphic package composed primarily of tuff with lesser tuffaceous carbonate, dolomite, argillite and quartzite. The tuffs have not undergone the greenschist-grade metamorphism or the structural deformation that is characteristic of the volcanic units which underlie the Permian carbonates. Stuhini Group rocks of the field area have experienced only minor alteration and deformation and do not appear to be significantly folded, much less thrusted. They unconformably overlie the Permian carbonates along an erosional surface. Contact relations of the unconformity are obscured by faulting of the Ophir Break along the eastern boundary and by overburden along the western boundary of the carbonate wedge but are well exposed on the south margin, just north of Muddy Lake.

STRATIGRAPHY

PERMIAN CARBONATE STRATIGRAPHY, STIKINE ASSEMBLAGE

The stratigraphy of the Stikine Assemblage carbonates has been reinterpreted by this study. A previous stratigraphic column and the one derived from this study are exhibited in figure 2. The main change from Pigage's 1995 stratigraphy resulted from the identification of two distinct LMGT units. LMGT(1) underlies the lowermost LMST(1) unit and forms the host rock for gold mineralization in the Ursa zone. The uppermost unit of the Permian package is LMGT(2). The two LMGT's are very similar and would be impossible to distinguish if not for the excellent exposure of these two units along the north-facing slope of Sam Creek, immediately north of the Ursa zone. The entire property-wide Permian stratigraphy is visible along this slope.

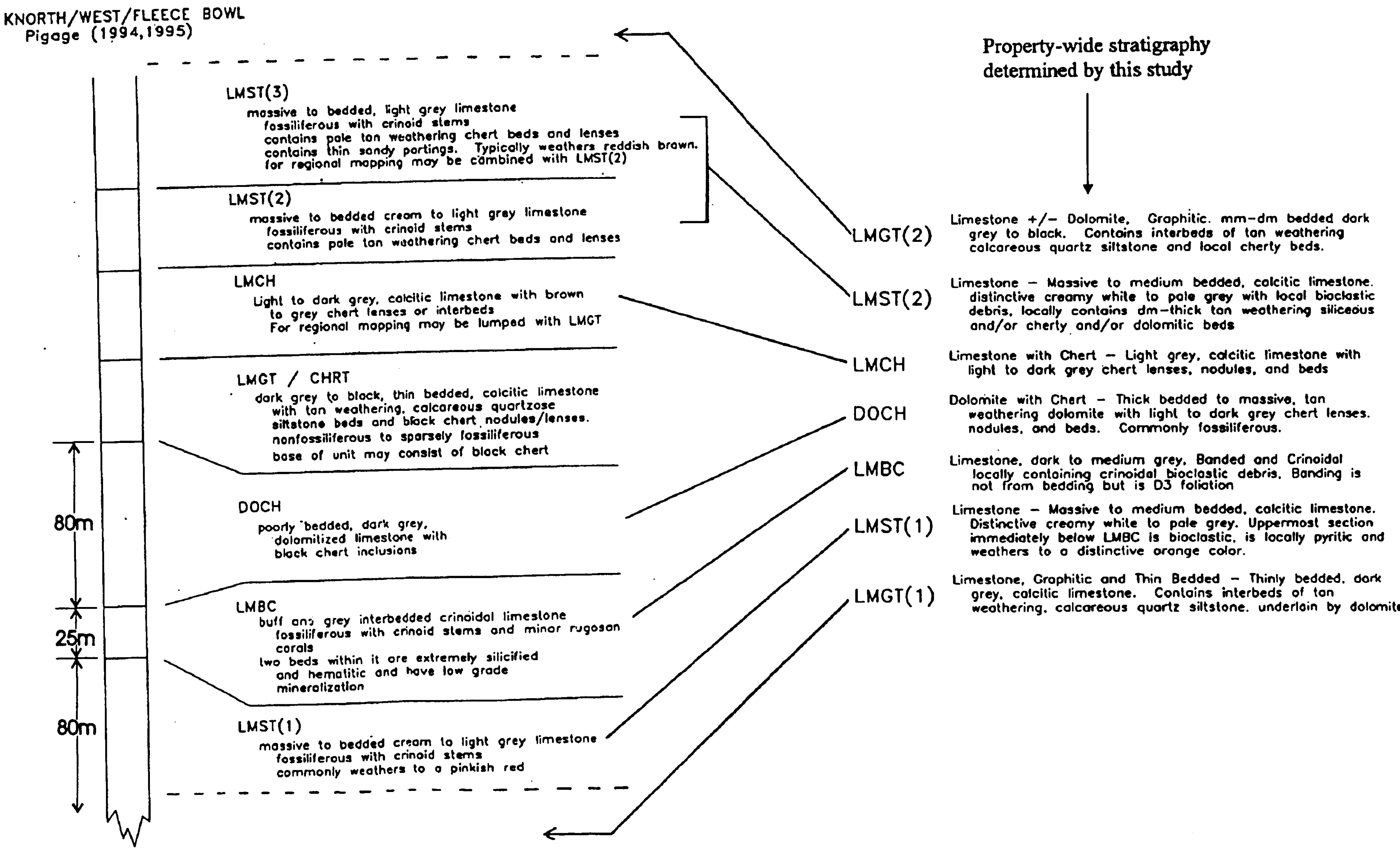


Figure 2. Permian Stikine Assemblage, carbonate stratigraphy of the Golden Bear Mine area.

From oldest to youngest the Permian units are described as follows:

LMGT(1) -Thinly bedded, medium-dark to dark grey, non-fossiliferous graphitic limestone. Graphite is finely disseminated within the limestone but is concentrated along millimetre-thick laminations which are parallel to bedding and cleave easily. Exposed surfaces weather to a ribbed appearance with recessive dark grey limestone bands and calcareous quartz siltstone layers forming resistive buff weathering ribs. Any soil which has formed from the weathering of this rock type is black and graphite-rich. Bedding is cm- to dm-thick and in the Ursa Area may actually be a foliation related to high temperature shearing during D2 deformation. Southwest of the Ursa Area this unit contains two limestone interbeds which are 1-2 metres thick. Immediately beneath this unit is a dolomitic limestone.

LMST(1) -Thick-bedded, cream to pale grey, locally fossiliferous calcitic limestone. The uppermost few metres of this unit has distinctive orange weathering beds from oxidized disseminated pyrite. LMST(1) generally contains abundant crinoid ossicles and weathers to hackley shards of felsenmere. Most beds are massive cream calcite but a few contain dm-thick layers of buff weathering siliceous or cherty, possibly dolomitic beds. Silicified examples of this unit are white with an almost bleached sugary appearance.

LMBC -Thick-bedded, light grey to dark grey, Banded and locally Crinoidal calcitic limestone. Contains dm-thick tan weathering siliceous beds, locally abundant crinoid ossicles and sparse rugose corals. The mm-cm wide faded or indistinct banding which is characteristic of this unit is not relict bedding but is actually D2 foliation. Silicified varieties of this unit are commonly a translucent pinkish-grey.

DOCH -Massive to thick-bedded, buff to medium grey dolomitic limestone. Usually contains black chert which ranges in occurrence from unbedded irregular pods to continuous dm-thick beds. The chert may also be light grey and is commonly fossiliferous with abundant crinoid ossicles. In the fault zones DOCH is invariably crackled and may be silicified or calcite-welded.

LMCH -Thick-bedded, light to medium grey, locally crinoidal calcitic limestone. This forms a discontinuous unit between the underlying DOCH and overlying LMST(2) and is mapped as LMST(2) where convenient. LMCH sometimes contains chert layers that are similar to those in the DOCH unit.

LMST(2) -Thick-bedded, cream to pale grey calcitic limestone. Most beds are massive cream coloured calcite and often contain dm-thick layers of buff weathering siliceous or cherty, possibly dolomitic beds. LMCH and LMST(1) are absent between DOCH and LMGT(2) at the toe of Sam Glacier. This can be explained simply as a lateral facies change where the LMCH and LMST(2) units taper out to the west.

LMGT(2) -Thinly bedded, medium-dark to dark grey, non-fossiliferous graphitic limestone.

with rare dolomitic beds and some cherty beds. Graphite is finely disseminated within the limestone and is usually concentrated along bedding plane contacts. Bedding is cm- to dm-thick and exposed surfaces weather to a ribbed appearance with recessive dark grey limestone bands and calcareous quartz siltstone layers forming resistive buff weathering ribs. Any soil which has formed from the weathering of this rock type is black and graphite-rich. Faults which cut this unit (and LMGT(1)) have a distinctive black graphitic fault gouge.

Other stratigraphic observations and implications of the Stikine Assemblage carbonates.

LMBC and LMST(1) become complexly mixed along a ductile fault zone which extends west of Ursa zone. Few clearly defined boundaries between these two units could be mapped in this area. Most of this area has been mapped as LMST(1).

Silicified LMGT identified on the margins of Totem Silicate supports previous studies identifying it as an anticlinal structure. This study interprets Totem Silicate as a silicified DOCH-LMCH-LMST(2)-LMGT(2) sequence. The apparently continuous stratigraphic sequence from the bottom of Fleece Bowl northwards into Totem Silicate indicates relatively minor horizontal offset along Fleece and Kodiak faults.

<u>UPPER TRIASSIC STUHINI GROUP VOLCANICLASTICS, SILICLASTICS AND CARBONATES</u>

The Stuhini Group does not have a defined stratigraphic sequence that is consistent across the field area. This is likely due to the effects of lateral facies changes and faulting along the Ophir Break and Limestone Creek Fault. Rock types do remain consistent across the property however and the following descriptions are in order of abundance from most abundant to least:

<u>Stuhini Group Lithologic descriptions:</u>

MFTF -Variably bedded, medium to dark green ash tuff. Bedding varies from massive unbedded very fine grained to dm-bedded and massive very coarse grained crystal-detrital tuff. Coarser varieties rarely exhibit graded bedding and scour surfaces at their bases suggesting a high energy, possibly turbiditic depositional environment for some beds. MFCA is a faulted and hydrothermally altered variety of this unit. MFCA weathers orange and fresh surfaces are commonly pale grey/green from alteration. MFCA often contains disseminated fine grained euhedral pyrite.

MFEP -Thinly bedded, very fine grained, brown to light grey epiclastic tuff. Bedding is generally mm- to cm-thick. The very fine grained nature of this reworked tuff unit gives it an almost translucent greasy appearance. MFEP commonly contains discontinuous bedding-parallel pods or 'sweats' of quartz +/- feldspar that are less than 5cm thick. MFEP also alters to MFCA where it is faulted and hydrothermally altered.

ARGI -Finely laminated, dark grey to black argillite. Argillite is fissile, is mm- to cm-bedded and weathers easily. It is commonly interbedded with shaley siltstone and thin black chert layers and less commonly with MFTF.

DOLO -Massive to poorly bedded light grey to cream dolomite. Generally occurs in contact with MFEP or ARGI.

QTZT -Thinly bedded dark grey to black quartzite. Commonly has a sugary quartz texture from silicification. Locally has thin argillaceous or possibly graphitic interbeds. Is commonly interbedded with ARGI.

LMST -Cm- to dm-bedded white to light grey calcitic limestone. Locally interbedded with MFEP and MFTF.

Location and stratigraphy of Stuhini Group lithology:
On the south-facing slope north of Muddy Lake, above the unconformity, the base of the Stuhini Group consists of ARGI with some QTZT, grading up into fine grained finely laminated MFTF and then into a thick plagioclase +/- pyroxene-detrital MFTF along Muddy Lake. A few flow basalts and rare pillows are present within this succession. The beds dip steeply to the south and a few graded beds near the base of the plagioclase +/- pyroxene-detrital unit indicate tops to the south.

On the east side of the map area, just west of Totem Silicate, the Stuhini Assemblage stratigraphy starts at the West Wall Fault contact with the Permian carbonates and consists of a brownish grey, extremely fine grained and finely laminated tuff that is considered to be reworked or epiclastic tuff (MFEP). This is overlain by fine grained finely laminated MFTF with some thin dm- to m-scale discontinuous beds of plagioclase +/- pyroxene-detrital MFTF. Some well exposed outcrops along Totem Creek show evidence of basal scour of some of these beds with tops to the east. Bedding dips gently to the east.

On the west side of the map area the lowermost observed Stuhini Group rocks are epiclastic tuff (MFEP) overlain by a thin wedge of MFTF. These occur on the west side of Limestone Creek Fault where it is exposed in the toe of Sam Glacier. Stratigraphically above this outcrop and approximately one kilometre southwest (immediately southwest of Sam Glacier) begins a thick package of interbedded LMST and MFEP overlain by DOLO interbedded with MFCA, then a wide zone of QTZT and then calcareous tuff, thinly bedded LMST, DOLO and ARGI. Above all this is more of the fine grained MFTF. The entire western tuffaceous package appears to dip uniformly and gently to the southeast.

STRUCTURAL HISTORY

The deformation history of the property is summarized in figure 3. The first three episodes of deformation (D1, D2, D3) outlined below only affected the Stikine Assemblage

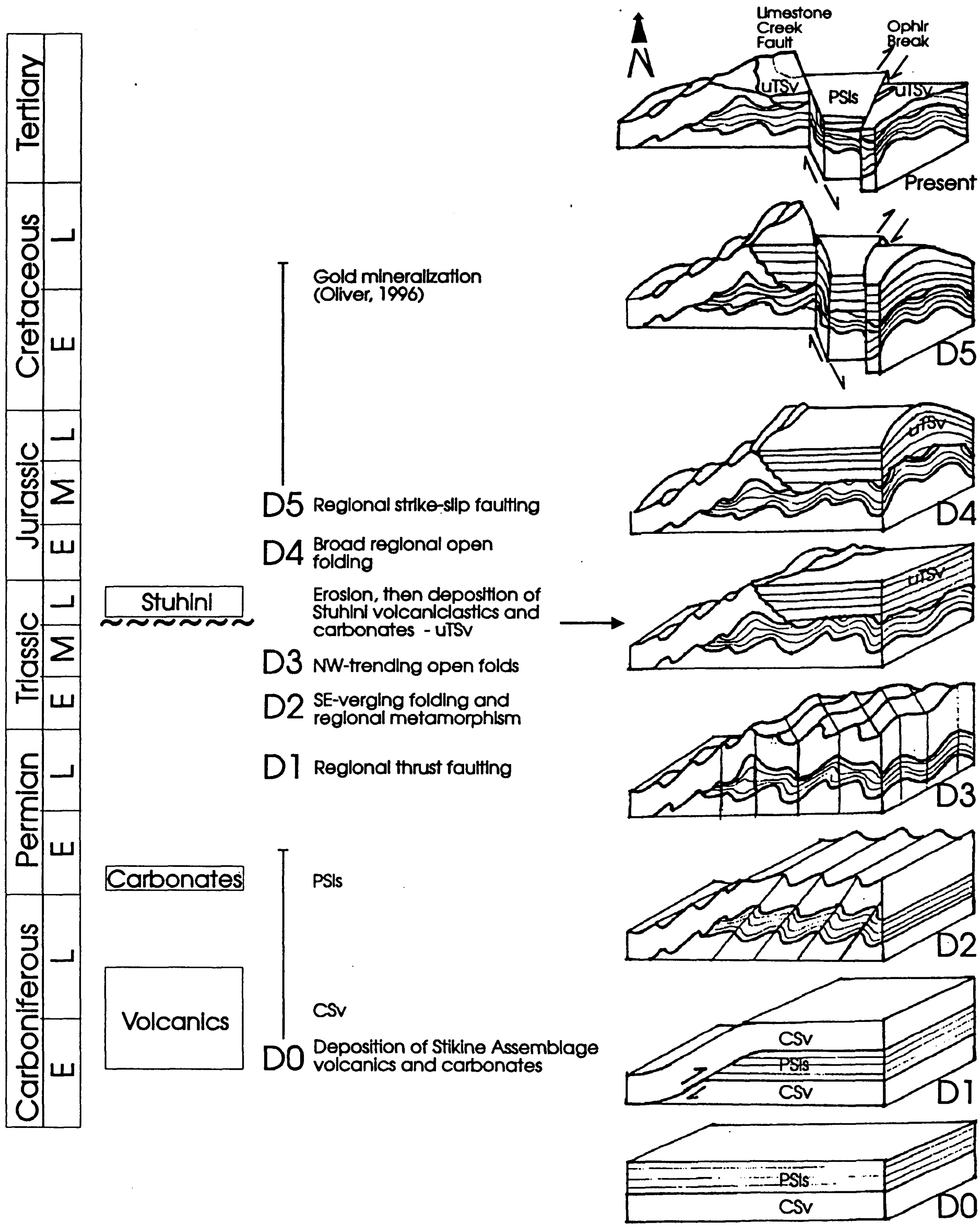


Figure 3. Age relations of stratigraphy, deformation and mineralization of the Golden Bear Property.

carbonates.

D0 Deposition and compaction of the Stikine Assemblage sediments.

D1 The first phase of deformation was a period of major thrust faulting that resulted in both the stacking of Paleozoic stratigraphy of the Stikine Assemblage and the formation of bedding-parallel metre-scale rootless isoclines (Bradford and Brown, 1993, Oliver, 1996) that were possibly related to flexural slip along bedding planes. No D1 structures were measured, mapped or directly observed by this study, however, subsequent deformation in the carbonates might have overprinted any earlier D1 structures. D1 thrust faulting may be related to the ensuing D2 deformation because of the strong vergence and apparent high temperatures associated with D2 structures. Thickening of the crust and continued contraction during late stages of thrusting would result in regional metamorphism and folding with a pronounced vergence. The SE-vergence of D2 structures does not necessarily mean that D1 thrusting was SE-vergent as well.

Thrust faulting might also explain the westward tapering of the LMCH and LMST(2) units observed in the field area but this can be simply explained as a lateral facies change.

Timing for this event has been constrained to late Permian and may be correlated with the Tahltan Orogeny (Oliver, 1996), a regional event with a similar deformation style.

D2 The second phase of deformation was a contractional event that was concurrent with regional metamorphism. The Permian carbonates of the property are low grade marbles, and most fine scale bedding features have been wiped out by recrystallization. This event produced tight north- to northeast-trending E- to SE-verging overturned folds with locally well developed foliation. Crinoid ossicles and rugose corals are elliptical parallel to the foliation that is strongly developed in D2 fold hinges. Stereoplots of D2 foliations from the Kodiak deposits area (Fleece Bowl) have a mean orientation of 219/55 (Figure 4-C). Foliation is defined by transposition of bedding and recrystallization and is visible as faint to distinct mm to cm bands or layers in the calcitic carbonates but not in the dolomitic DOCH unit. Felsenmere of foliated carbonates weathers into flat shards.

Wavelengths of most D2 folds range from 25 to 150 metres. However, there are two zones of large scale D2 structures that are separated by about 1.5 kilometres. These correspond to the Ursa Zone and Kodiak deposits area. A large scale SE-verging overturned anticline-syncline pair is present at the Kodiak area and a D2 ductile detachment exists at the Ursa zone (Figure 5).

West of the Ursa Zone D2 deformation is associated with boudins, stretching lineations and strongly transposed bedding that is parallel to D2 foliation. These observations suggest that during D2 a SE-verging zone of ductile delamination propagated from a large-scale D2 anticline. The Permian carbonates may have been the root of a thrust structure with faults propagating from the large overturned folds. The ductile thrust fault at Ursa likely resulted from the more competent DOCH unit buckling and failing by delamination while underlying limestones folded easily and smeared beneath the DOCH. The graphite-rich LMGT(2) forms the core of the anticline which failed by delamination.

From a regional perspective, D2 of Oliver (1996) forms the dominant north-south structural grain of the region. D2 is associated with a strongly developed foliation and north-to northeast- trending fold axes and axial planes which dip an average of 65° to the west. Bradford and Brown (1993) describe a D2 that is associated in some areas with tight north-to northeast-trending chevron folds which have an eastward-verging asymmetry. Other D2 folds observed by Bradford and Brown trend east-northeast. Their D2 includes the formation of mullions, mineral lineations and stretched clasts, features which could have developed during regional metamorphism.

The similar descriptions of D2 structures reported by Oliver (1996), Bradford and Brown (1993) and this study indicate that D2 represents the same event for all authors.

D3 The third phase of deformation observed in the Permian carbonates was a second compressional event which produced upright open folds with northwest trends and shallow plunges. Wavelengths of these folds range from 50 to 250 metres, with no wider spaced larger scale folding evident. Stereoplots of poles to D2 foliations indicate folding about NW-trending D3 fold axes (Figure 4-A, C, E). The D3 fold axis in the Kodiak Deposits area is approximately 55--->290. The interaction between D3 and D2 folds produces outcrop scale interference patterns in some exposures. The shapes of some mapped lithologic contacts in the Kodiak Deposits area roughly resemble the idealized type 1-2 dome and saddle interference patterns depicted in figure 6. The actual pattern will vary depending on the thickness of bedding, degree of overturning, fold wavelength and amplitude, and angle at which the erosion surface cuts through the structures.

NW-trending folds have not been documented by other authors, but perhaps the regional NW-trending Tatsamenie Antiform of Oliver (1996) is related to this phase of deformation.

Between D3 and D4 the area experienced erosion, then deposition of the overlying Upper Triassic Stuhini Group tuff, quartzite and carbonate.

D4 D4 deformation is only obvious in the Stuhini Group rocks and includes a broad open fold which formed steep south-dipping bedding orientations on the south slope facing Muddy Lake and gentle SE- and E-dipping attitudes of tuff west of Limestone Creek Fault and east of Ophir Break respectively. Stereoplots of all Stuhini Group bedding measurements suggest an approximate ESE-trending D4 fold axis of 38 -->107 (Figure 4-I, K, M). This is not parallel to a strongly developed intersection lineation which trends SSE, but they may have developed during the same event. There are no visible small scale folds parallel to the lineation.

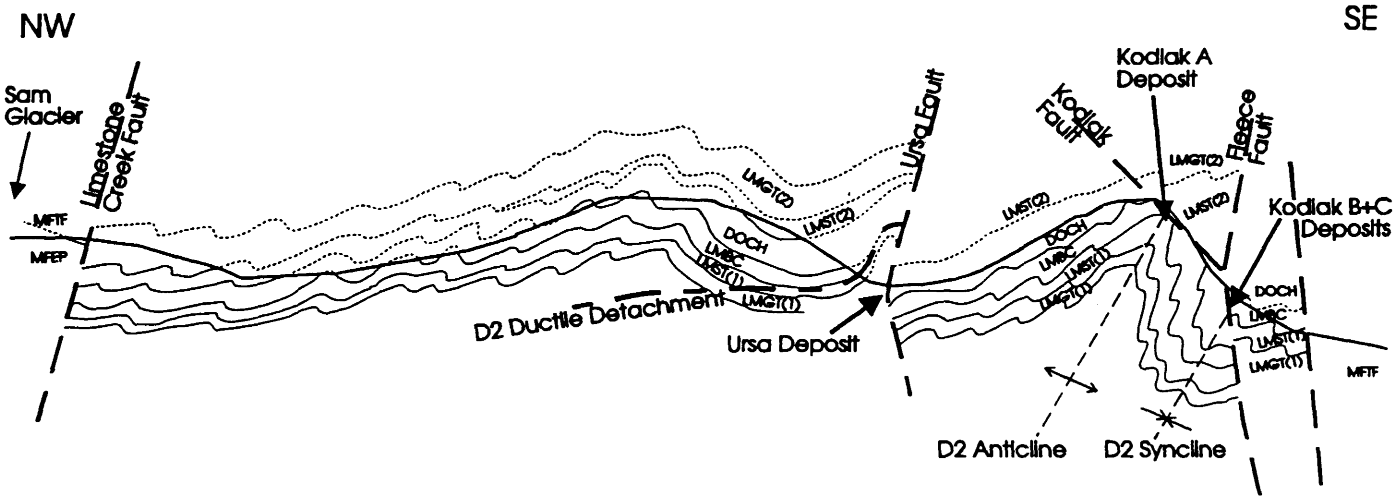


FIGURE 5 Schematic cross section through the property. Gold deposits occur where faults cut the large D2 structures. The Kodiak deposits occur where faults (D5) cut the large scale D2 overturned folds. The Ursa deposit occurs where the Ursa Fault cuts the D2 ductile detachment.

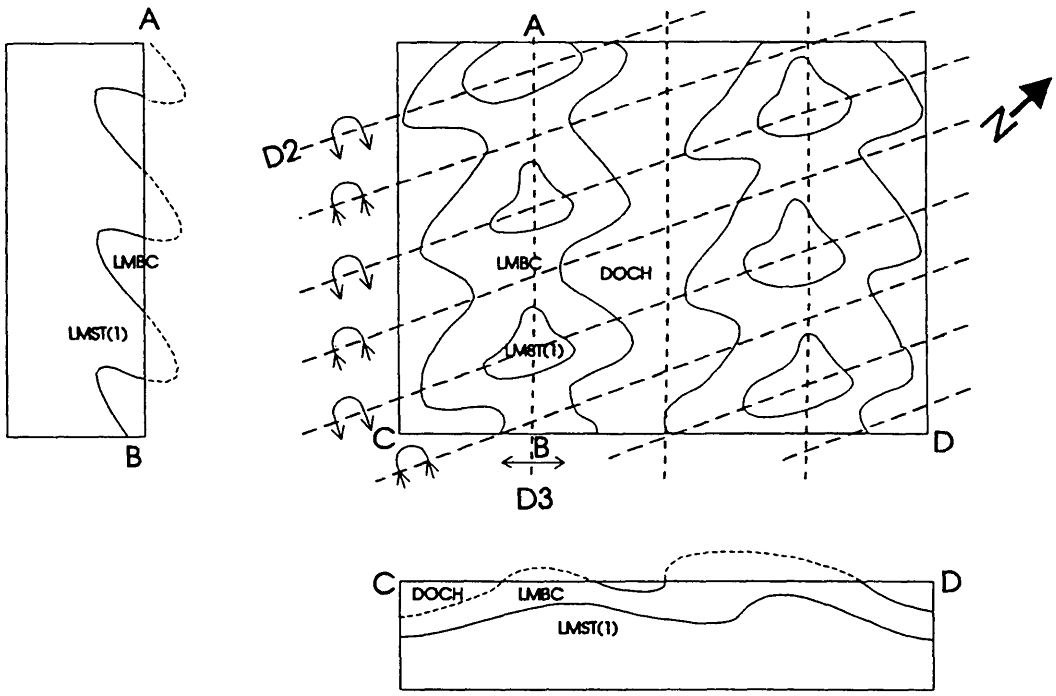


FIGURE 6 Idealized outcrop pattern that results from D3/D2 fold interference. Lithologic contacts with patterns similar to to this diagram were mapped on the slope above the Kodiak Deposits area.

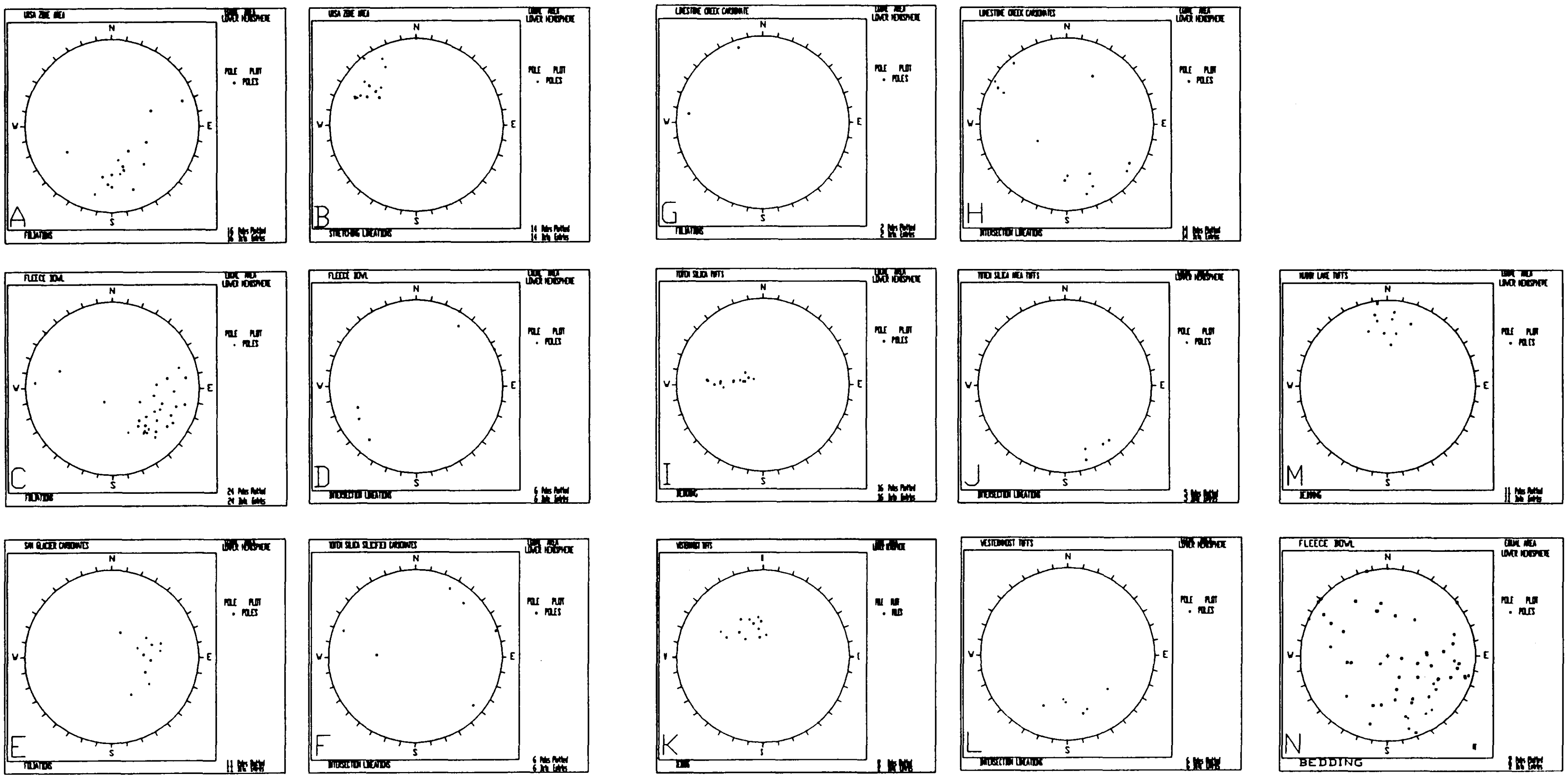


Figure 4 Stereoplots of Golden Bear Property Structural Data
Bedding and foliation plotted as poles to planes

D4 deformation was not directly observed in the Stikine Assemblage carbonates due to the complex deformation prior to D4. Stereoplots of poles to D2 foliations in the Stikine Assemblage (Figure 4-A, C, E) do show some scatter which might be interpreted as D4 folding but this is not conclusive.

D4 deformation of this study may correlate with D3 of Oliver (1996). However, folds identified as D3 by Oliver (1996) are NE-trending open folds instead of SE-trending as indicated by this study. D3 of Oliver includes the Sam Creek Antiform, a broad open fold that deforms the Permian carbonates, the overlying thrust faulted Stikine Assemblage volcanics as well as the Stuhini Group rocks. Oliver (1996) gives D3 deformation a lower Jurassic to upper Cretaceous age.

The stereoplot of poles to bedding for the Stuhini Group in the Totem Silicate area (Figure 4-I) does suggest subtle open folding about a north-trending fold axis, but this may be local deformation related to faulting along the Ophir Break (D5).

D5 This phase of deformation is a regional faulting event which in the Golden Bear Mine area involves the development of the Ophir break and Limestone Creek Fault systems.

The Ophir Break in the vicinity of the deposits occurs as a steeply dipping anastomosing fault network where it cuts through the carbonates. The fault exhibits brittle deformation and typically involves brecciation which does not preserve kinematics well. Of the few fault surfaces that do retain slickensides, most have two sets of prominent slickensides, one set which is subhorizontal and a second set that is steeply plunging. The steeply plunging set usually cuts across the horizontal slickensides indicating strike-slip followed by dip slip-motion. The strike-slip slickensides are generally associated with silicification along the fault planes. The dip-slip slickensides are often associated with calcite shear steps and calcite-welded breccia, although faults with sinistral offset also occur associated with calcite shear steps and brecciation. Calcite-welded breccias sometimes contain clasts of silica-welded breccia fragments, confirming that at least two periods of faulting have occurred and that silicification occurred before calcite-welding.

? RIDGE ZONE

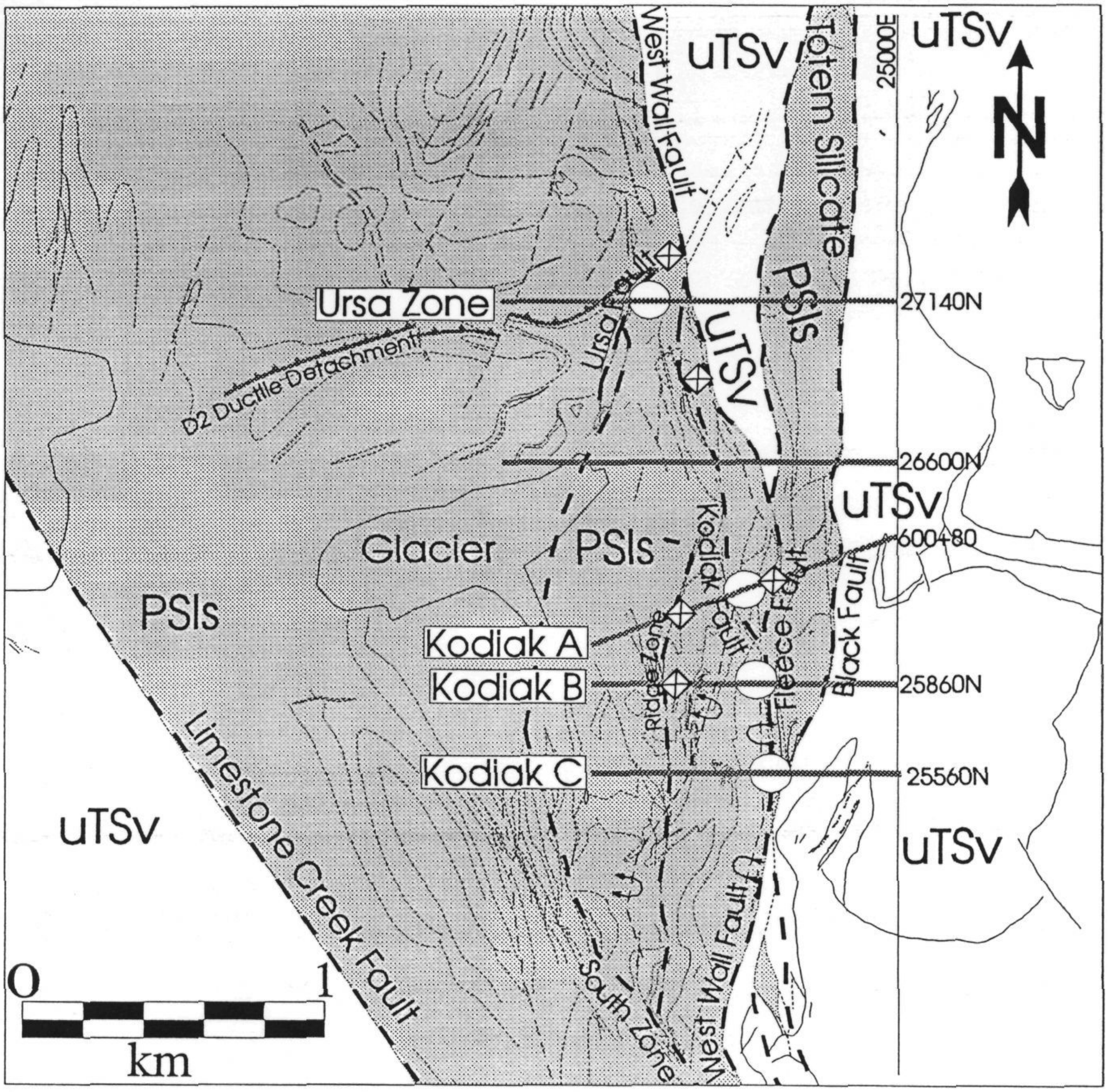
Cross sections through the deposits (Figures 8-12) show the along-strike variation in fault geometries and stratigraphic offsets (see figure 7 for location of cross sections). The main sense of offset is apparently reverse or east side up as suggested by offsets across the Fleece Fault. This apparent displacement could be the result of dextral oblique motion or pure strike-slip followed by dip-slip. Net slip along the Fleece Fault is probably less than 500 metres since the same stratigraphy is present on both sides of the fault. Some evidence of dextral movement is present by the approximately 50 metres of offset of an LMGT bed on the south end of the South Zone fault.

Limestone Creek Fault is a NW-trending structure that is defined by the contact between Permian Stikine Assemblage carbonates to the east and Stuhini Group volcaniclastics, carbonates and siliciclastics to the west. Strike-slip faulting of dextral sense is indicated by stratigraphic offsets and drag folds along fault splays in the Stuhini Group rocks. Fault splays appear to be N- to NNE-trending, steeply dipping structures that become rarer farther west of the main fault. One fault plane has well developed slickenside lineations which plunge 38 degrees NNE, indicating dextral-oblique displacement. Some silicification along these fault planes is evident by silica-welded limestone breccia and drusy quartz in voids.

The Limestone Creek Fault appears to have experienced more displacement than Ophir Break. The fault contact at the break in slope where it goes down to the south to Muddy Lake has the DOCH unit in contact with a tuff unit that is at least 1km up-section from the visible base of the tuff unit (assuming an average dip of 25 degrees for the bedding attitude in the tuff and assuming that the tuff outcrop at the toe of Sam Glacier is in fact the base). Offset along this fault is likely much greater.

A phase of folding visible in the tuffs is a rarely developed centimetre-spaced crenulation or kink banding of irregular orientation which may have formed during D5 strike-slip deformation or during later normal faulting along E-W trending normal faults. D5 folds in the carbonates were seen only as weakly developed kink folds in LMBC immediately west of Kodiak pit in Fleece Bowl.

Silicification of the Totem Silica zone may be related to the influx of siliceous fluids along D5 fault surfaces. The shape of the Totem Silica outcrop may reflect the original topography prior to deposition of Stuhini Group tuff. The tuff may have blanketed the Totem Silica and caused the carbonates to stew in the siliceous fluids, resulting in intense silicification.



PSls Permian Stikine Assemblage carbonates
uTSv Upper Triassic Stuhini Group volcaniclastics
Location of Deposit
Cross Section Location
Location of Exploration Target

FIGURE 7 Location of cross sections and potential targets for further exploration.

FIGURE 8. Cross Section Ursa 27140N

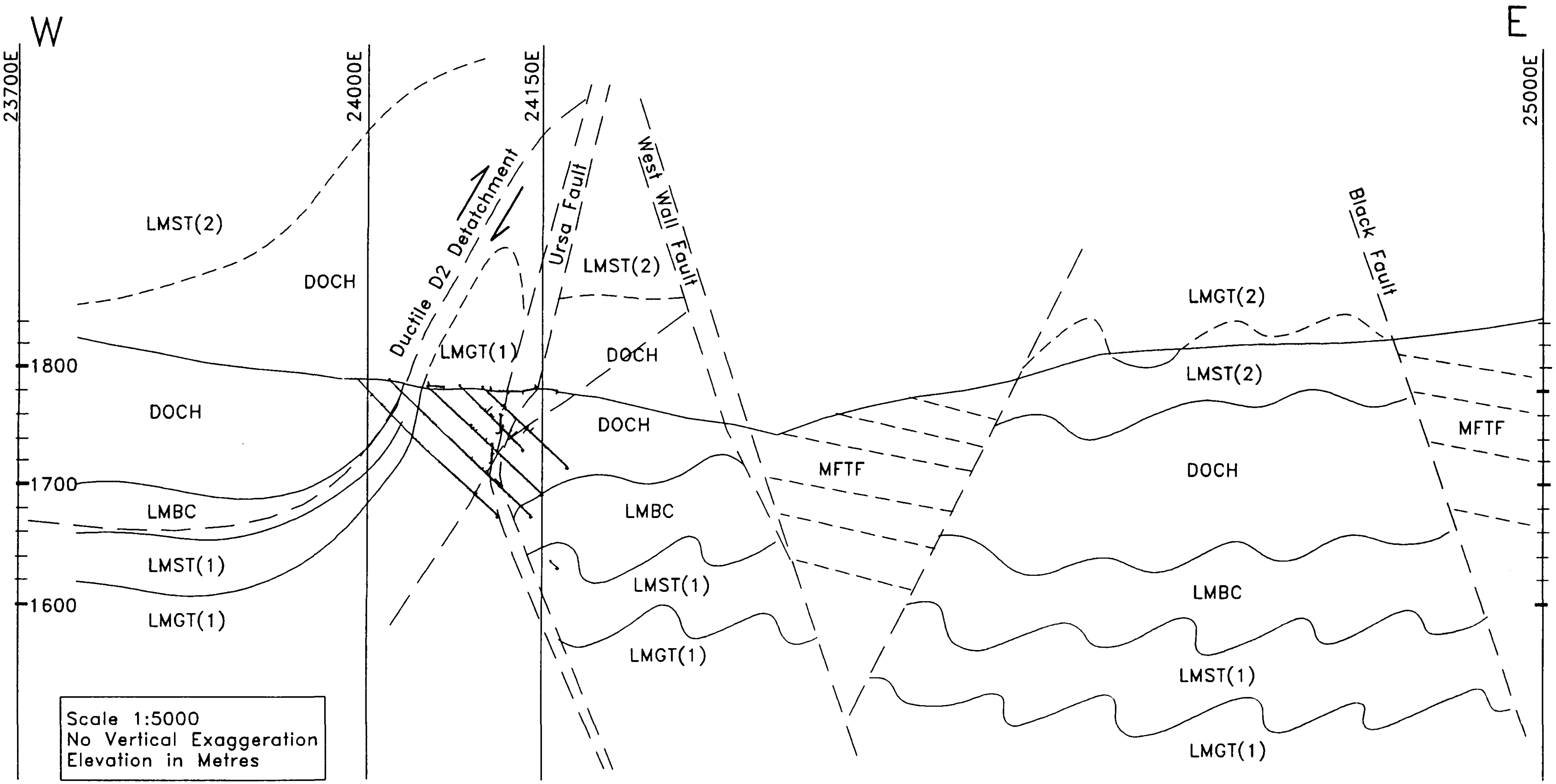


FIGURE 9. Cross Section at 26600N

(See Figure 7 for section location)

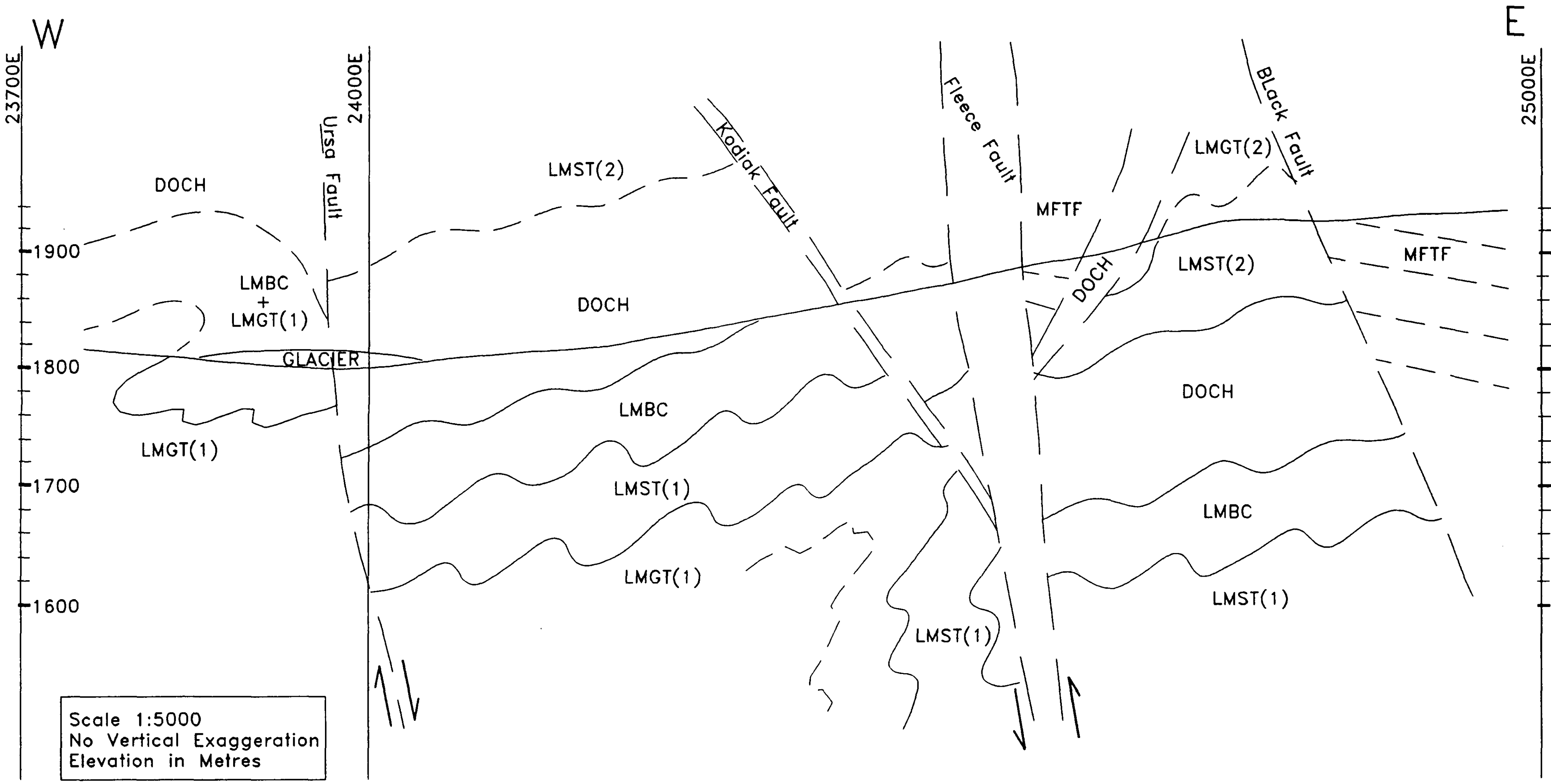


FIGURE 10. Cross Section Kodiak A 600+80

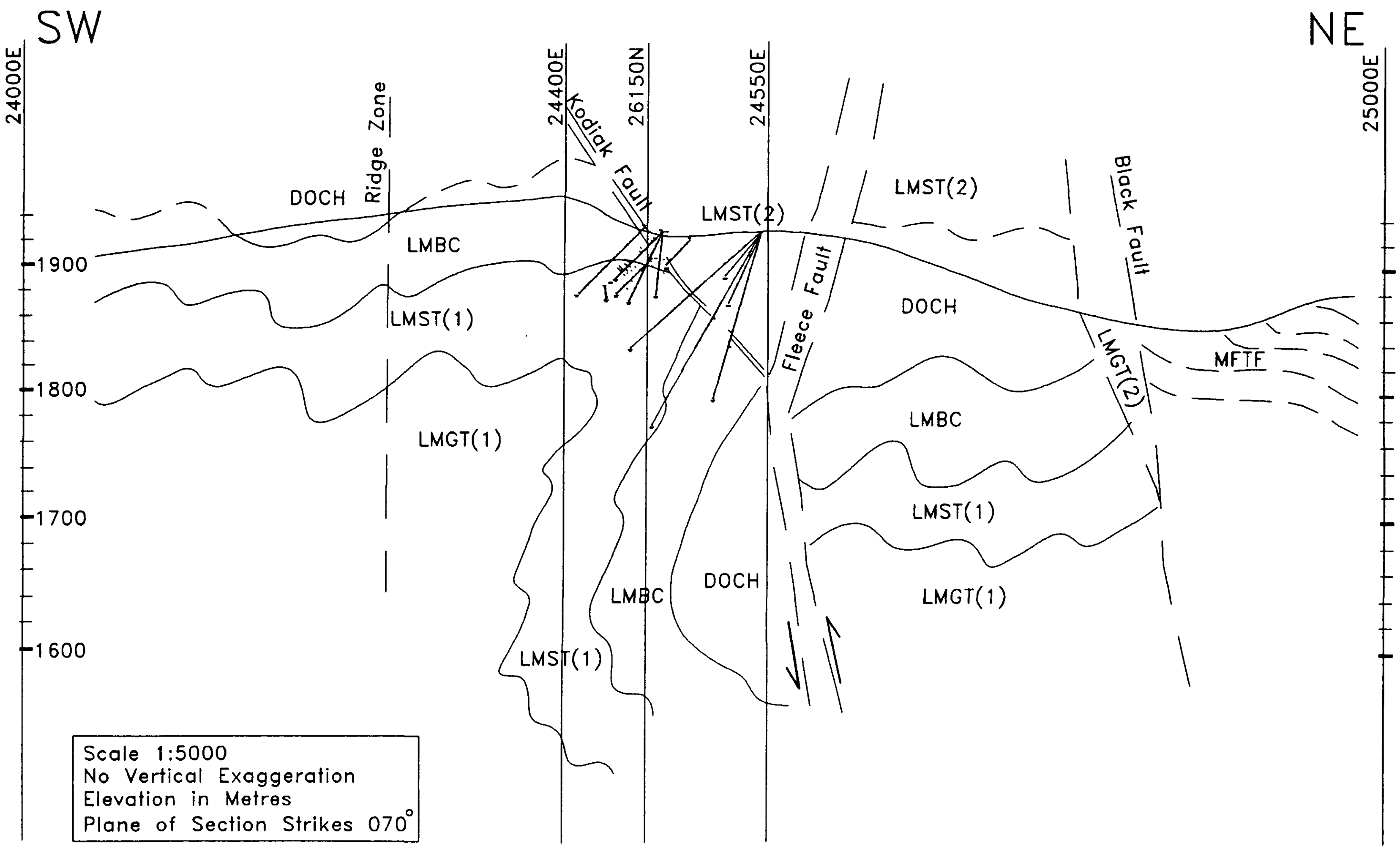


FIGURE 11. Cross Section Kodiak B 25860N

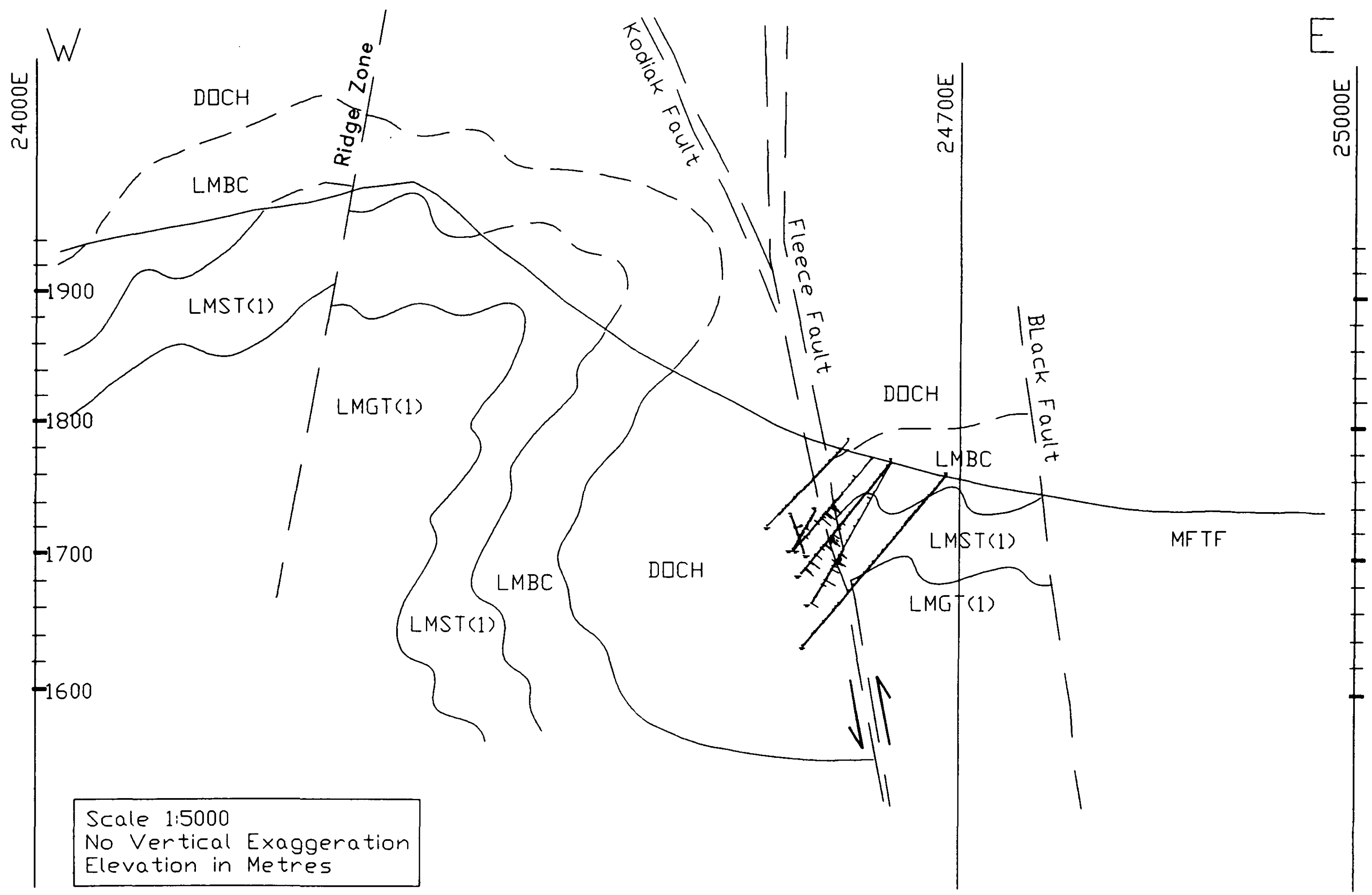
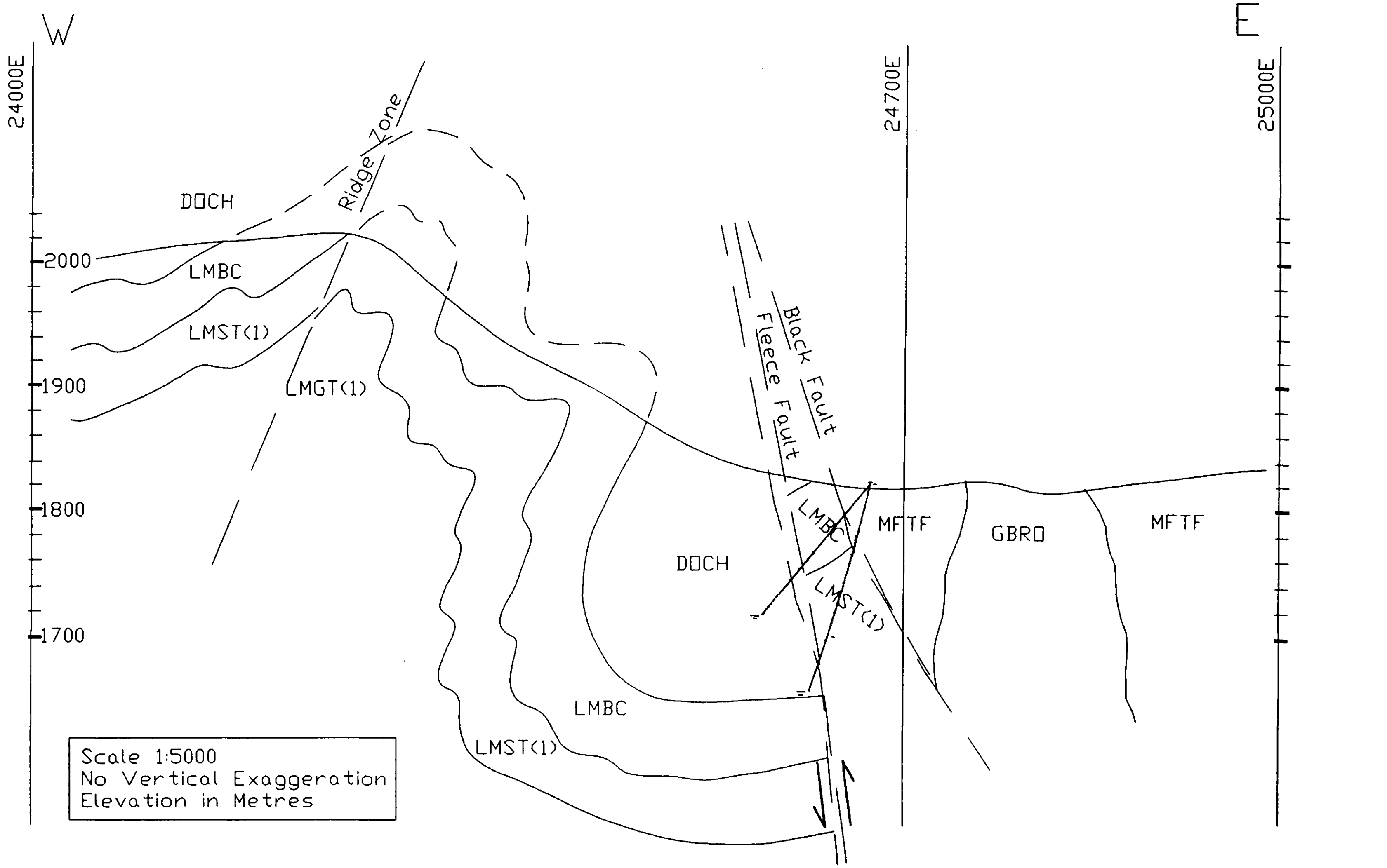


FIGURE 12. Cross Section Kodiak C 25560N



CONCLUSIONS

INTERPRETATION OF STRUCTURES IN TERMS OF GOLD MINERALIZATION

Transport of the gold-bearing fluids of the Golden Bear property occurred along the D5 brittle fault surfaces. Mineralization occurred where the fluids encountered the proper structural and chemical conditions. From a structural perspective the Ursa, Kodiak A, Kodiak B and Kodiak C deposits appear to exist where faults intersect the large D2 structures (Figure 5).

The Ursa deposit occurs where the Ursa Fault cuts the D2 ductile delamination zone. The Ursa fault is spoon shaped where the high grade zone occurs. This shape would form a dilatant zone regardless of sense of slip. However, a SE-side down sense of displacement may be inferred from the shape of the high grade zone which is concentrated near the top of the 'spoon' (Figure 8).

The Kodiak A deposit occurs where the Kodiak Fault cuts the large scale D2 anticline. The high grade zone seems to be mainly in the footwall and coincides with the core of the fold, possibly where there is a change in rock type between LMBC and LMST(1) (Figure 10).

The Kodiak B and C deposits are virtually identical, occurring where the Fleece Fault cuts along the D2 syncline. This zone lies completely within the DOCH and mineralization may be related to appropriate ground preparation in the tight synclinal core (Figures 11 and 12). If this simple explanation were valid then the entire core of the syncline should be mineralized as the Fleece Fault appears to cut subparallel to the fold axis. Since mineralization is discontinuous between Kodiak C and B there must be some other control of mineralization. One possibility is the effects of polyphase folding. The spacing of Kodiak B and C could be related to D2/D3 interference patterns being cut by the fault.

RECOMMENDATIONS FOR FURTHER EXPLORATION

Further exploration should concentrate along faults which cut the large D2 fold axes. Potential targets that meet these requirements are as follows:

One target for further exploration is where the Fleece Fault cuts the large D2 syncline beneath the Kodiak A deposit (Figure 10). The syncline core continues to the north from the Kodiak B deposit and intersects the fault at approximately 1700m elevation. The distance to this target from Kodiak B is approximately the same as the distance between Kodiak B and C, so this should be in the right spot if there is a second structural control of mineralization that is periodic.

A second zone of potential mineralization is where the Fleece and Kodiak faults appear to intersect near the core of the D2 anticline approximately 500 metres north of the Kodiak A deposit (Figure 9). This may cut the LMGT(1) unit in the core of the anticline, the same unit that is the host for mineralization in the Ursa Deposit.

A third target exists where the Ridge Zone Fault cuts the large D2 anticline at depth as seen on Figures 10, 11 and 12. This target may not be as lucrative because the Ridge Zone fault is not as large a structure as the Kodiak and Fleece Faults and involves relatively minor displacement.

It is interesting to note that the mineralization associated with the South Zone Fault occurs approximately where the large D2 anticline of the Kodiak A deposit intersects the South Zone fault. There could be more mineralization at depth where the fault cuts across the anticlinal core (Figure 7). This target might also be less desirable as this fault appears to involve minor offset and is quite narrow.

As dextral offsets are indicated for the faulting event preceding or synchronous with mineralization, further exploration along the Ophir Break should concentrate on likely dilatant zone areas that form on appropriately oriented fault deviations. One likely area is the Ursa Fault where it curves to the northeast and joins the West Wall Fault. Another fault deviation occurs where the northern extent of the Kodiak Fault takes a jog to the east where it's surface trace rejoins the Fleece Fault (Figure 7).

The Limestone Creek Fault and its splay faults with drag folds and brittle deformation features represents a potential target area for further exploration. Preliminary trenching and drilling has outlined gold occurrences along the Limestone Creek Fault and associated splays, however, the source for the strong geochemical anomaly in the area has yet to be found.

REFERENCES

Bradford, J. A. and Brown, D. A., 1993. Geology of the Bearskin Lake and southern Tatsamenie Lake map areas, northwestern British Columbia (104K/1 and 8); in Geological Fieldwork 1992, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1993-1, pages 159-176.

Lehrman, N. J. and Caddey, S. W., 1989. Golden Bear Project, Geologic Appraisal and Exploration Recommendations; Homestake Mining Company, Internal Company Report, 42 pages.

Oliver, J. L., 1996. Geology of Stikine Assemblage rocks in the Bearskin (Muddy) and Tatsamenie Lake district, 104k/1 and 104k/8, northwestern British Columbia, Canada and characteristics of gold mineralization, Golden Bear Mine: northwestern British Columbia. Unpublished Ph.D. thesis, Queen's University, Kingston, Ontario, Canada.

Souther, J. G., 1971. Geology and mineral deposits of Tulsequah Map-area, British Columbia, *Geological Survey of Canada*, Memoir 362 and Map 1262A.

3.2 GOLD MINERALIZATION

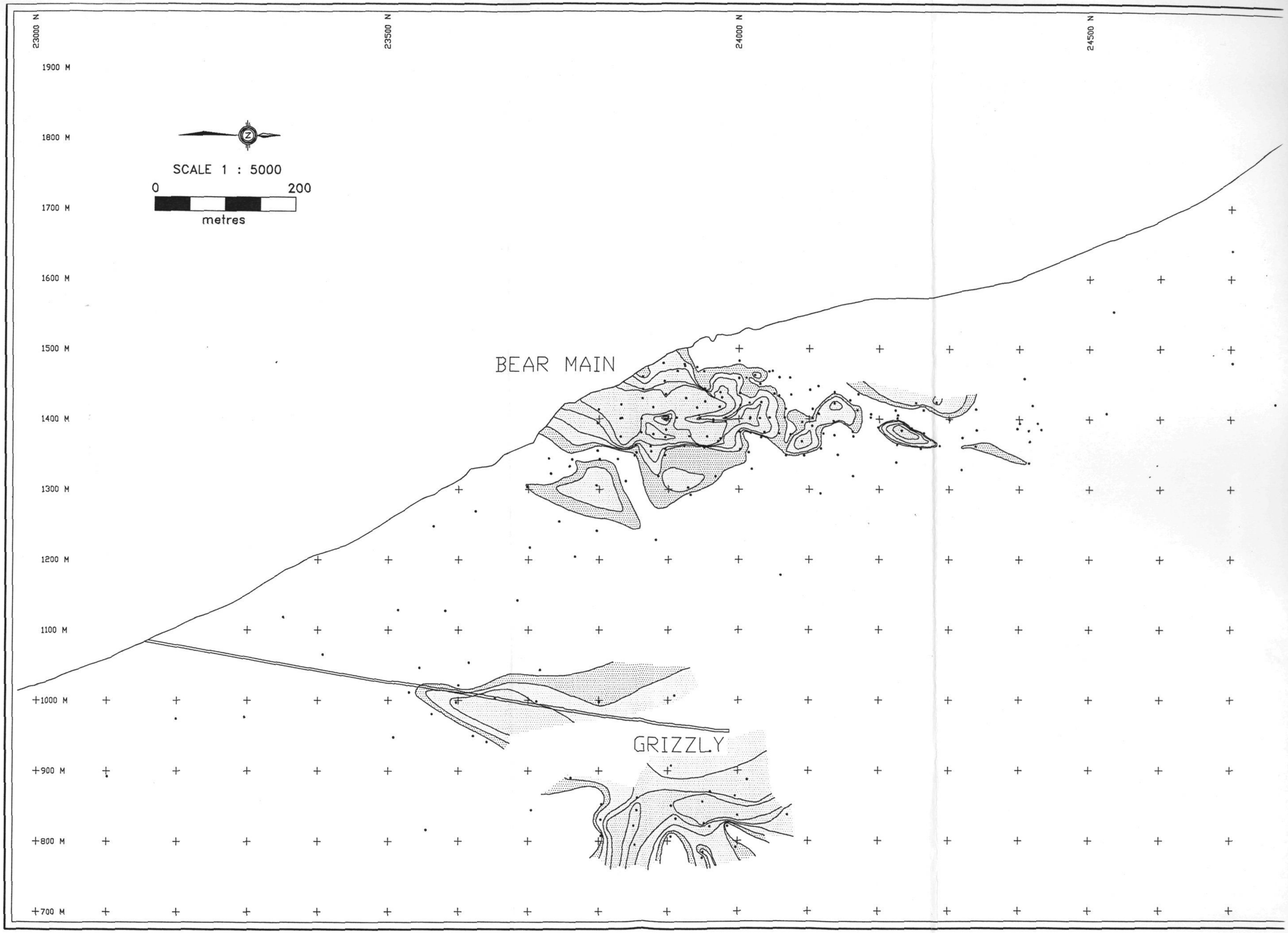
3.2.1 STRUCTURE

Gold mineralization on the Golden Bear property is hosted in dilatant zones that occur along brittle failure fault structures. The Ophir Break, the anastomosing fault system which hosts the Bear Main, Grizzly, Kodiak C and Kodiak B deposits, is the primary mineralized structure, however major splays from this multi-strand fault system also host gold mineralization, including the Kodiak and Ursa faults which host the Kodiak A and Ursa deposits, respectively. In addition, recent exploration work has identified several other gold bearing fault structures. Two of these, the Ridge and South faults, are sub-parallel to, and lie a few hundred metres to the west of the Ophir Break. The Limestone Creek Fault, which bounds the western edge of the Permian carbonate and forms a mirror image of the Ophir Break, was discovered to host gold mineralization in 1996. The location of these fault structures is shown on Figure 3.2-1 and the Ophir Break zones are shown on a grade times thickness long section (Figure 3.2-2).

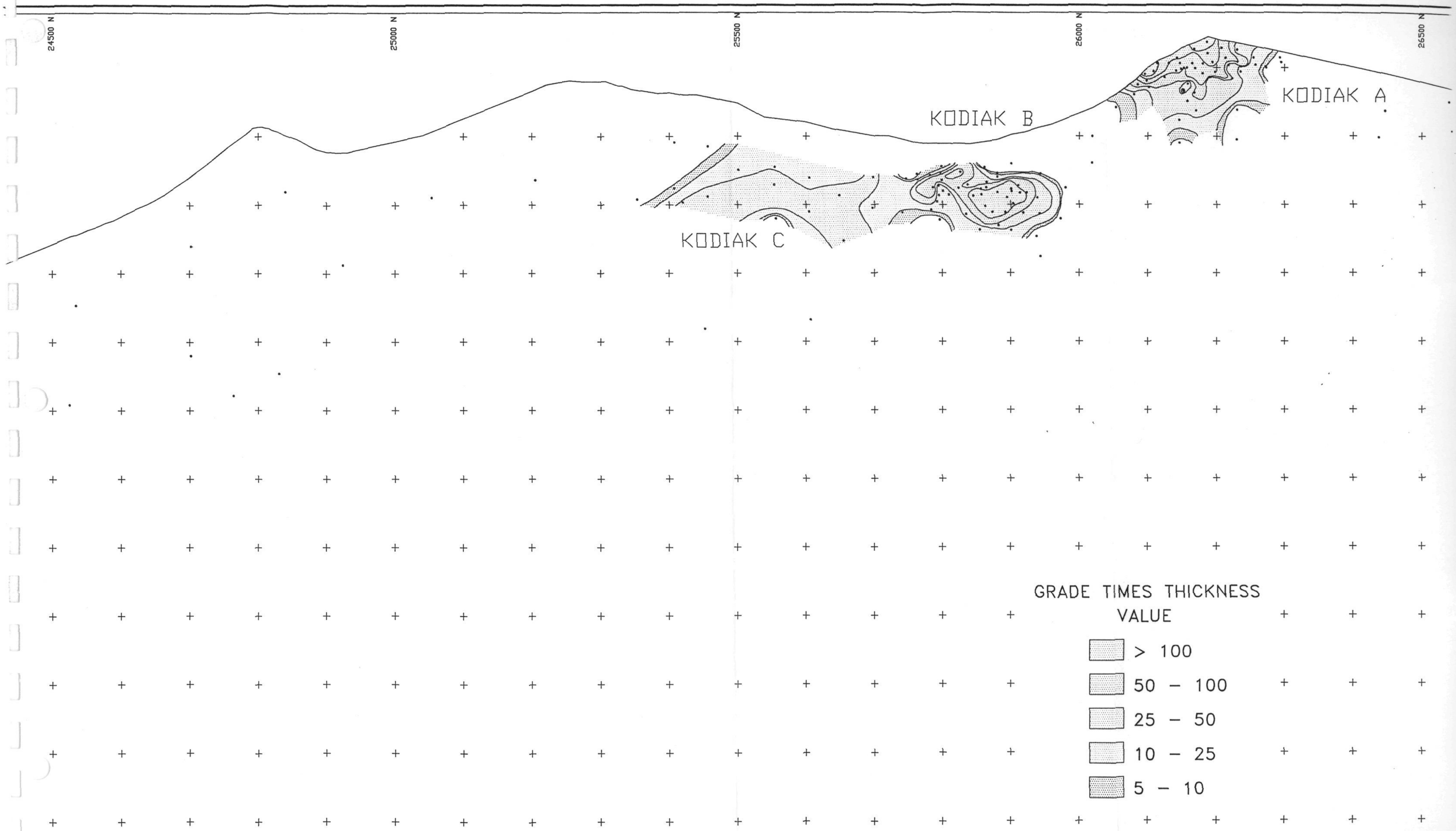
Several theories have been advanced to explain the development and location of mineralized dilatant zones along the Ophir Break fault system. Lehrman and Caddey (1989) have proposed that there is a spatial periodicity to mineralization based on the presence of a regularly spaced fold interference pattern, that has one set of axial planes that is parallel to the Ophir Break. Movement on the fault system would then create dilatant zones on the flanks of the interference domes. Cooley (1996) has suggested that a number of the known mineralized zones occur where the largest of the northeast trending D2 folds in the Permian carbonates intersect the Ophir Break, implying that fold cores provided structurally receptive areas for mineralizing fluids. It is the opinion of the author (Hamilton) that it is unlikely that either of these structural elements provided primary control for development of mineralized dilatant zones.

Firstly, detailed mapping of the Permian carbonate package in 1995 and 1996 did not reveal the presence of a regular fold interference pattern, although such interference patterns or domes are present on the property. Furthermore, it is improbable that a fold interference dome or pattern would be preserved in an anastomosing fault system such as the Ophir Break. This is particularly the case with the Bear Main and Grizzly carbonate lenses where faulting has not only detached a lens of carbonate from the main carbonate wedge, thereby destroying any periodicity, but the lenses have also been internally faulted, with displacements of enough sufficient magnitude to emplace volcanic wedges of significant size within the carbonate lens.

Similarly, the geometry and orientation of the mineralized zones does not



23000 N
23500 N
24000 N
24500 N
1900 M
1800 M
1700 M
1600 M
1500 M
1400 M
1300 M
1200 M
1100 M
1000 M
900 M
800 M
700 M
SCALE 1 : 5000
0
200
metres
BEAR MAIN
GRIZZLY



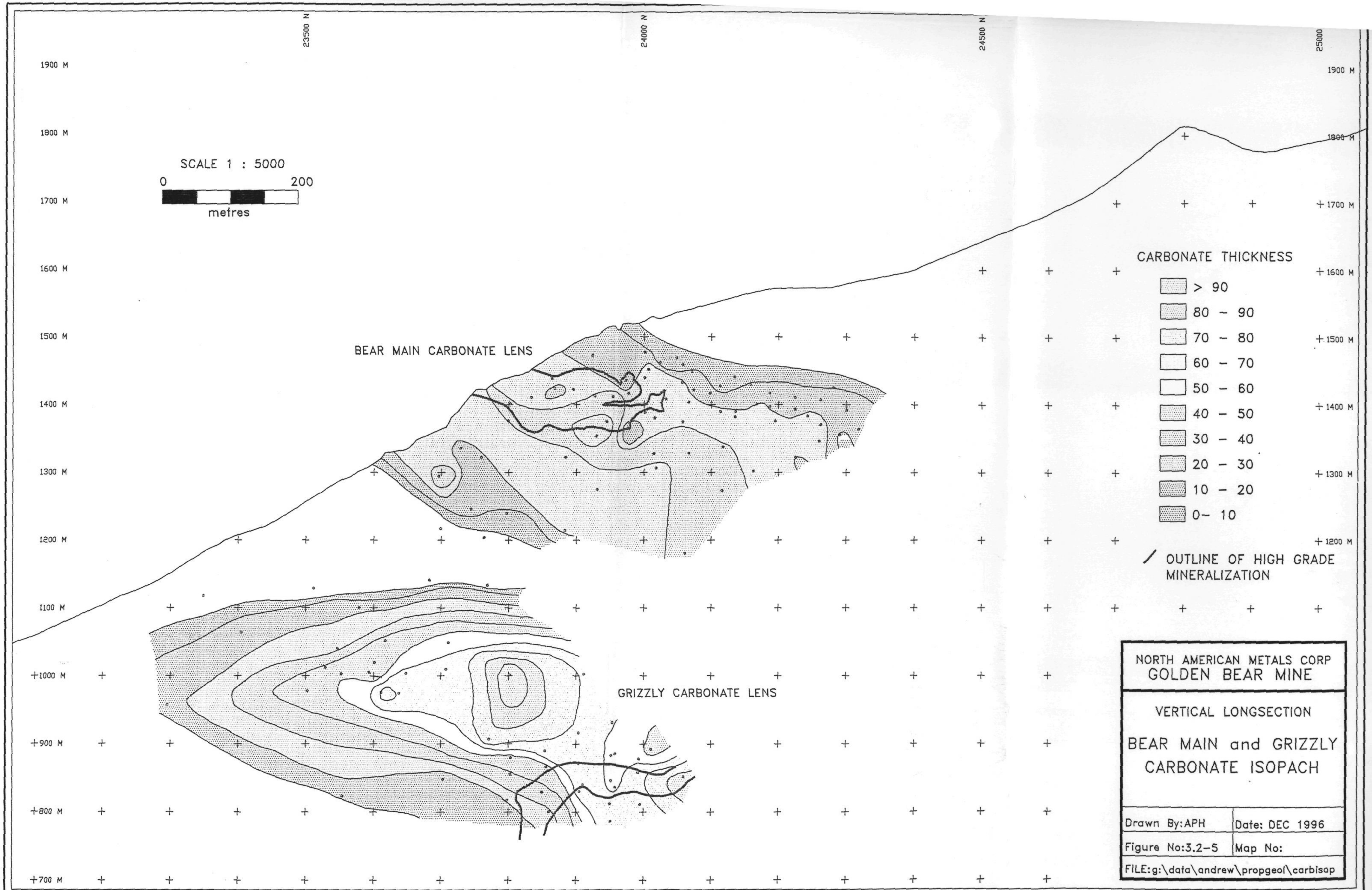
24500 N
25000 N
25500 N
26000 N
26500 N
KODIAK A
KODIAK B
KODIAK C
GRADE TIMES THICKNESS VALUE
> 100
50 – 100
25 – 50
10 – 25
5 – 10

appear to concur with the orientation of D2 folds. All of the mineralized zones are basically tabular or lozenge shaped and lie parallel to generally north-south trending faults, while the D2 fold axes trend 030°. The Kodiak A, Kodiak B and Ursa deposits do occur where D2 structures intersect fault structures of the Ophir Break, but diamond drilling on these zones does not indicate that gold mineralization extends to the southwest along the cores of these folds, which would be expected if they are providing structural control for mineralization. Their location with respect to mineralization may be coincidental.

The development of dilatant zones on the Golden Bear property is most likely due to a number of movements along brittle failure fault surfaces. Dilatancies would occur wherever strike and dip irregularities or flexures are present on major fault planes, or where rheological differences exist between rock units that come into fault contact with one another. Fault movement would then cause intense fracturing and breccia development in the vicinity of flexures or irregularities, or in the least competent unit, thereby providing dilatant, open space for mineralizing fluids. Examples would include the rheological differences between the DOCH (massive, hard) and the LMGT (bedded, fissile) in the Ursa deposit, and the differences between the volcanic (plastic) and carbonate (brittle) rocks in the Bear Main and Grizzly deposits.

There is also evidence to suggest that fault movements have produced several series of closely spaced Reidel shears that have acted as receptive zones for mineralization. This appears to be the case in both the Kodiak A and Kodiak B deposits. When level plans of these deposits are contoured by gold grade, areas of higher grade corresponding to low angle Reidel shears can be noted to extend into the footwall areas of the Kodiak and Fleece faults, which would be considered principle shears (see Figure 3.2-3). Fluid infiltration would have been greatest along the Reidel shears so they are the most strongly mineralized, with lower fluid flow along fractures into intervening rock producing a mineralized, but lower grade envelope. A schematic level plan is shown in Figure 3.2-4.

It is likely that there have been several tectonic events that have caused movement on the fault structures of the Ophir Break, but the direction and magnitude of these movements is unclear. Both Lehrman and Caddey (1989) and Oliver (1995) suggest that the most recent movement is right-lateral reverse oblique slip. This explains the location of the Bear Main deposit which lies on the upper, east side of the Bear Main carbonate lens (see carbonate isopach long section, Figure 3.2-5). A change in the dip of the hanging wall contact of the carbonate lens created a dilatant zone for mineralization when the hanging wall volcanics were moved upwards. In the vicinity of the Kodiak B deposit mapping by Cooley (1996), indicates a right-



23500 N
24000 N
24500 N
25000
1900 M
1800 M
1700 M
1600 M
1500 M
1400 M
1300 M
1200 M
1100 M
1000 M
900 M
800 M
700 M
SCALE 1 : 5000
0
200
metres
BEAR MAIN CARBONATE LENS
GRIZZLY CARBONATE LENS
CARBONATE THICKNESS
> 90
80 - 90
70 - 80
60 - 70
50 - 60
40 - 50
30 - 40
20 - 30
10 - 20
0- 10
OUTLINE OF HIGH GRADE MINERALIZATION
NORTH AMERICAN METALS CORP
GOLDEN BEAR MINE
VERTICAL LONGSECTION
BEAR MAIN and GRIZZLY CARBONATE ISOPACH
Drawn By:APH
Date: DEC 1996
Figure No:3.2-5
Map No:
FILE:g:\data\andrew\propgeol\carbisop

lateral strike slip movement of 500 metres. These senses of movement however, are apparent and in all probability only represent the the final product of a number of fault movements. Evidence to date suggests substantially smaller fault movements on the Ridge and South faults.

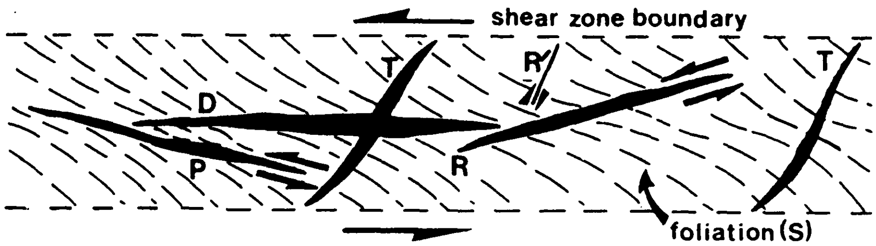


Figure 5 *The orientation of shear fractures and extension fractures in a brittle-ductile shear zone. The fractures are shown occupied by veins.* **R**, *low-angle Riedel shear fractures, 15 degrees to shear zone boundary;* **R'**, *high-angle Riedel shear fractures, 75 degrees to SZB;* **P**, *shear fractures or reverse fractures, 15 degrees to SZB;* **D**, *principal shear fractures, parallel to SZB;* **T**, *extension fractures, form in YZ plane of the strain ellipse, perpendicular to the S foliation.*

Figure 3.2-3: Reidel Shear Fracture System

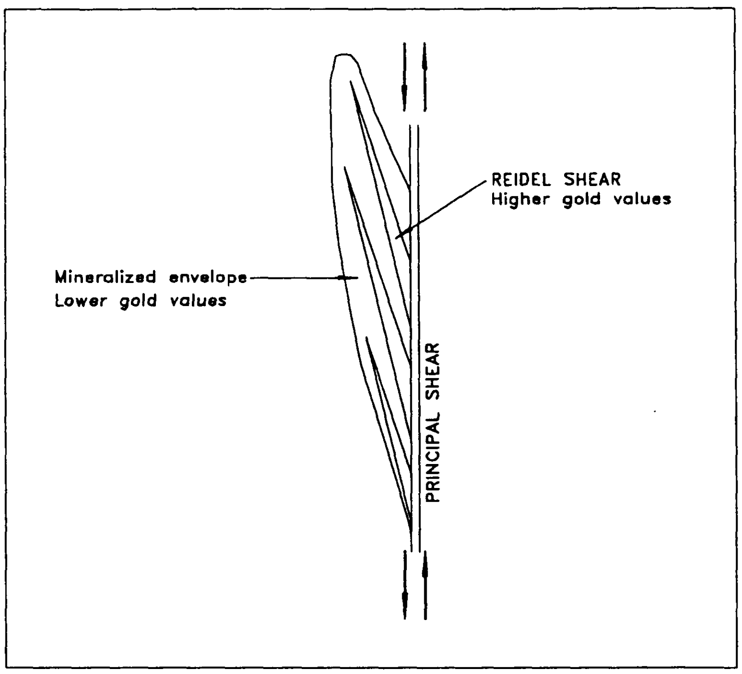


Figure 3.2-4: Schematic Level Plan of the Kodiak A & B Deposits

3.3.2 ALTERATION

Alteration on the Golden Bear property occurs as two distinct assemblages. One is associated with the Stuhini group volcanics and is similar to alteration most commonly associated with mesothermal deposits. The other is associated with the Permian carbonate rocks and is similar, if not identical, to that found associated with Carlin style disseminated gold deposits.

Alteration of Stuhini Group rocks occurs in envelopes around fault structures of the Ophir Break where they cut through the volcanics on the southern portions of the property, and in the wedges of volcanic rocks that are fault bound within carbonate on northern portions of the property. The altered rocks, which may extend for 30 to 40 metres away from major faults, vary in colour from light green to light tan in colour depending on alteration intensity. A prograde alteration assemblage is dominated by sericite and chlorite with minor quartz and k-feldspar (Oliver, 1995). An apple green mica, similar to fuchsite but chromium deficient, is also present locally. Opaque minerals present include pyrite, which occurs as disseminations and irregular microveinlets, and hematite. This assemblage has been overprinted by late stage, anastomosing calcite-ankerite veinlets and very coarse grained euhedral pyrite. These carbonate veinlets may comprise up to 30 or 40% of rock volume (Oliver, 1995).

Alteration in the carbonate rocks is characterized by removal of carbonate, addition of silica and alteration of non-carbonate mineral grains to sericite, illite and lesser chlorite. Of these, silicification is most closely related to gold mineralization and seems to be a necessary condition for it's presence. Silicification may be pervasive, resulting in a jasperiod, or silica may occur as microveinlets. The removal of carbonate, which manifests itself either as a "sanded" texture or a porous, vuggy texture, is not noted in all mineralized zones but where present is often associated with illite and high grade gold values. The extent of alteration in the carbonate rocks is much more limited than in the volcanic rocks, rarely extending beyond the limit of anomalous gold values (0.5 g/t Au).

3.2.3 MINERALIZATION

On the Golden Bear property gold mineralization occurs in two distinct styles. Refractory gold mineralization occurs in the Bear Main and Grizzly deposits and also in portions of the Kodiak B deposit. The Kodiak A and Ursa deposits, the Ridge, South and Kodiak C Zones, and much of the Kodiak B deposit all contain oxide gold mineralization.

The refractory mineralization is characterized by the presence of up to 7 or 8% fine grained dark gray pyrite, with much lesser amounts of sphalerite, tetrahedrite, chalcopyrite and arsenopyrite. A few grains of electrum, from 5 to 20 microns in size, have been detected by SEM analysis in a sample of Grizzly Zone mineralization (Cannon, 1996), but none has been noted in work performed on samples of Bear Main material. Trace amounts of a mercury telluride, coloradoite, has also been detected by microprobe work (Oliver, 1995).

At least two populations of pyrite have been identified: an early framboidal pyrite, and a slightly later euhedral pyrite. Both of these pyrite populations may be zoned, with zonation correlating strongly to arsenic content. Arsenic content increases toward the edges of the framboids or euhedral grains, reaching concentrations of 4 to 7% (Cannon, 1996). Microprobe analysis by Oliver (1995) of these arsenian pyrite grains indicates that many, but not all, contain significant amounts of gold and in quantities that increase with arsenic content. The rims of several grains that were probed contained greater than 100 grams per tonne, and up to 200 grams per tonne.

The refractory mineralization occurs in both volcanic and carbonate rocks. Most of the economic gold mineralization mined from the Bear Main deposit was hosted in sheared pyritic tuffs and in volcanic derived pyritic gouge along the hanging wall contact of the Bear Main carbonate lens. Similar refractory mineralization has been encountered in a fault bound wedge of volcanic rocks in the Kodiak B deposit.

Within carbonate rocks, refractory, pyritic mineralization occurs as fine disseminations in the siliceous matrix of tectonic breccias, and as microveinlets and fracture coatings. *It is only developed in close proximity to volcanic rocks.* Gold mineralization hosted in carbonate rocks more than 10 metres from volcanic rocks is generally of the oxide variety, as discussed below.

Oxide gold mineralization is developed in silicified crackle and breccia zones that occur wholly within carbonate rocks. It is characterized by the presence of variable quantities of hematite, goethite and iron hydroxides which generally occur with quartz, sericite and illite as breccia matrix. In the Kodiak A deposit hematite is also present as a pervasive flooding in very strongly silicified limestones. In both the Kodiak A and Ursa deposits Cannon (1996) has detected gold grains of a high fineness. Those from the Kodiak A deposit are from 5 to 20 microns in size, while gold grains have been observed in samples from the Ursa deposit ranging from 5 microns to 2.0 millimetres in size. Other metallic phases that have been identified include arsenopyrite, stibnite and bismuth and silver tellurides (Cannon, 1996), however the oxide zones are very poor in these minerals, and they are so fine grained that SEM analysis is required to identify them.

3.2.4 DEPOSIT MODEL

The classification of the Golden Bear gold mineralization has always been difficult as it does not fit cleanly onto any one ore deposits model. Lehrman and Caddey (1989) decribed the property as a shear-zone hosted, epithermal gold-silver telluride deposit, primarily based on an epithermal geochemical signature, as the multi-stage quartz veins and alteration assemblage characterisitc of epithermal deposits are absent. At the same time they did recognize, as did Wober and Shannon (1985) and Schroeter (1986), that the Golden Bear property has many characteristics, primarily alteration features, of a gold-silver mesothermal deposit. At the time of their reports however, they were unaware of the presence of the oxide deposits that have been discovered in the past three years.

The gold mineralization on the Golden Bear property can best be viewed as occurring in structurally hosted deposits that can be classified as belonging to one of two ore deposit models, depending on the host rocks, alteration and ore mineralogy. As noted by earlier authors, the alteration and refractory mineralization associated with the volcanic rocks closely resembles the features of mesothermal gold deposits. The Bear Main and Grizzly mineralization fall into this classification, the notable difference with type deposits being the presence of silicified carbonate rather than quartz veins. The oxide gold zones can be classified as Carlin style disseminated gold deposits. The structural control, silicification, de-calcification and occurrence of gold grains with iilite, are all well documented features of the gold deposits in the Carlin trend, Nevada.

3.3 AGE DATING

Between 1984 and 1996 a number of samples have been collected from the Golden Bear property for age dating by Ar/Ar, K/Ar and trace lead methods, in order to constrain the age of mineralization. The materials tested include one sample of a basaltic dyke from the Bear Main deposit, six samples of sericite altered volcanics from several locations on the property (on the assumption that the sericite analysed represents the age of alteration and mineralization), and three samples of gold bearing, pyritic mineralization from the Grizzly Zone. The results of this testwork and the constraints placed on age of mineralization are discussed below.

The basaltic dyke material was collected from the Bear Main deposit by Oliver (1996). Such dykes have been observed in both the Bear Main deposit and the Grizzly Zone sealing fault structures. They are unaltered and postdate mineralization, thereby setting an upper limit on the date of mineralization. Dated using the $^{40}Ar/^{39}Ar$ method, the sample returned an age of 14.9 ± 2.27 Ma, consistent with the age of the basalts of the Level Mountain Group.

Of the six samples collected for sericite analysis, 5 were subjected to the K/Ar method and one was subjected to the $^{40}Ar/^{39}Ar$ method. The five K/Ar samples, collected from several locations on the property including the Totem Silica Zone, the Black Fault and the Bear Main deposit. The samples returned results ranging from 177 to 205 Ma ± 7 Ma (Schroeter, 1986), indicating a Lower to Middle Jurassic date. This date suggests that the mineralizing event was synchronous with the development of large strike slip faults in the area (Ophir Break) and perhaps related to emplacement of Jurassic diorite intrusions.

The single $^{40}Ar/^{39}Ar$ sample collected by Oliver (1996) from intensely altered footwall volcanics in the Bear Main pit, returned a date of 83.88 Ma ± 1.2 Ma. This result indicates a Mid to Upper Cretaceous date that is some 110 Ma younger than the K/Ar dates. Oliver concluded that his younger date represents the mineralizing date on the basis that the earlier K/Ar dates were from samples that were not intimately associated with economic mineralization, and that the samples were screened to a fraction size that allowed grains of coarser metamorphic sericite to mix with very fine grained hydrothermal sericite.

In an effort to date gold mineralization more directly, three samples of pyritic, gold bearing material from the Grizzly Zone were submitted to the geochronology laboratory at the University of British Columbia for analysis using trace isotopic lead from sulphide. All samples were found to be extremely radiogenic, exhibited considerable scatter and could not be correlated with the substantial lead isotope database that has been compiled for the Iskut area further south. Interpretation of the results is difficult due to the paucity of lead isotope data in the immediate Golden Bear area, particularly with respect to igneous units.

In summary, the age of Golden Bear mineralization remains poorly constrained. Current data indicates the age of mineralization is between 205 Ma and 15 Ma, the lower limit being constrained by dating of presumed hydrothermal sericite and the upper limit being constrained by post mineral basalt dykes. A Lower to Mid Jurassic date seems to be the best fit with the structural and igneous framework, however this assumes that the sericite tested correlates directly with gold mineralization. In addition, the disparate sericites dates could indicate more than one alteration or mineralization episode. Further testwork, consisting of dating of hydrothermal sericite that is Known to be intimately related to gold mineralization could be undertaken in order to better constrain the age of the mineralizing event. Such work would probably not enhance exploration on the Golden Bear property, but if correlated to a specific igneous event could provide focus for regional exploration.

3.4 REFERENCES

Cannon, B., 1996. Electron Microprobe and Scanning Electron Microscope Analysis of Drill Core. Report for North American Metals Corp.

Cooley, M.A., 1996. Structural Geology and Gold Mineralization of the Golden Bear Property. Internal company report.

Jaworski, K.M. and Reddy, D.G., 1993. Golden Bear Project, North American Metals Corp. 1992 Totem Area Exploration Report. Internal company report.

Lehrman, N.J. and Caddey, S.W., 1989. Golden Bear Project: Geologic Appraisal and Exploration Recommendations. Homestake Mining Company, Internal company report.

McBean, D.A. and Reddy, D.G., 1993. Golden Bear Project, North American Metals Corp. 1992 Fleece Bowl Exploration Report. Internal company report.

Oliver, J.L., 1996. Geology of Stikine Assemblage Rocks in the Bearskin (Muddy) and Tatsamenie Lake District, 104K/1 and 104K/8, Northwestern British Columbia, Canada and Characteristics of Gold Mineralization, Golden Bear Mine, Northwestern British Columbia. Unpublished PhD thesis, Queen's University, Ontario, Canada.

Oliver, J.L., and Hodgson, C.J., 1989. Geology and Mineralization, Bearskin Muddy and Tatsamenie Lake District (south half), northwestern British Columbia (104K). British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1989-1, 443-453.

Pigage, L.C., 1994. Geochemistry, Geology, Geophysics, Trenching and Diamond Drilling Report on the Kodiak North Project. British Columbia Assessment Report.

Schroeter, T.G., 1985. Muddy Lake Prospect (104K/1W). In Geological Fieldwork, 1984, British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1985-1, 352-358.

Schroeter, T.G., 1986. Muddy Lake Prospect (104K/1). In Geological Fieldwork, 1985, British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1986-1, 175-184.

Schroeter, T.G., 1987. Golden Bear Project (104K/1). In Geological Fieldwork, 1986, British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1987-1, 103-109.

Wober, H.H. and Shannon, K.R., 1985. Bear-Totem Status Report. Chevron Minerals Canada Resources Limited, internal company report, 127 pages.

4.0 REMOTE SENSING AND COLOUR IMAGERY

4.1 INTRODUCTION

During the spring of 1996, remote sensing on the the Golden Bear Property was examined for the potential use of colour as an useful tool for the diagnostics of structure, geology and mineralization. Two approaches were taken; scanning 1:16,000 scale colour air photographs and satellite imagery. Vin Campbell of ERSI (Earth Resource Surveys Inc.) Suite 311A, 255 West First St. North Vancouver, B.C. V7M 3G8 was engaged as a consultant to advise and electronically manipulate the data as per NAMC's objectives.

4.2 COLOUR SCANNING

Scanning of the Golden Bear air photo #40074, R.261, #080 proved to be the most useful as it covered the area of all the known surface occurrences of economic mineralization on the Golden Bear property. (See figure 4.2-1)

Subsequent Root stretches (brightening) on both original and IHS transform (see Figures 4.2-2 and 4.2-3) assisted in highlighting structure and to a minor extent geology when viewing the carbonate units. As is to be expected, it was definitive when comparing volcanics versus carbonate lithology and structure.

Principle component analysis (see Figure 4.2-4) did not yield any new information that would assist in mineral exploration. Following this test, the computer was asked to do a colour diagnostic analysis of the Kodiak A Zone, remember this data as a model and then search the area for any pixel response that was identical. The result is displayed on Figure 4.2-5 and shows a great degree of scatter with increasing intensity in the area of the Totem Silica Zone. Results of this classification trial do not correlate with on site investigation for mineralization and the classification test can be considered to be only occasionally co-incident with mineralization that is known.

Performing a decorrelation stretch on principle components proved to be the most useful. This routine (see Figure 4.2-6) uses the original components and transforms them back into Red-Green-Blue colour space. It exaggerates the colour differences and increases colour saturation (or the % of white light). When enlarged to 1:5000 scale, this process was most useful for identifying structural and geological features that should be followed up by field examination. Northwesterly trending splays and horst and graben style fault blocks were particularly well displayed using this technique.

In conclusion, decorrelation stretching proved to be the most useful for examining structures and geological changes within the carbonate stratigraphy on the Ophir Break near the main zones. This was useful however only in the sense that a great deal was known about the study area before hand and "footprints" over known structures could be used to interpretate over unknown areas. If this work was to be projected over an unknown area its reliability would be strongly hampered. Landsat TM 1,2,3 bands are slightly different to the eye than Kodak aerial film in that the colour range is broader in film (.375µm-.7µm) than TM 1,2,3 (.45µm-.69µm) and therefore utilising these colours Kodak film is better in two ways: resolution is much higher and colour definition is more refined.

Kodak film does not have the bands 4,5, and 7 offered by TM and therefore areal film is not a complete test of remote spectral imagery. As a next step a ¼ TM image was acquired of the region for testing of combinations of Bands 1,2,3,4,5 &7.

4.3 LANDSAT TM

Satellite spectral imagery was obtained from a Landsat TM cloud free image on September 4, 1993. The purpose of the study was to investigate the possibility of any similar images or structural regions that may be resembling characteristics approximating the Ophir Break. As this was a regional study, it was considered best to allow Vin Campbell to analyse data by his own methods and not to interfere with bias imposed by the regional knowledge of NAMC staff. This first pass approach was the mandate of ERSI.

In the structural interpretation by ERSI, a 1:50,000 scale image was overlain by a mylar tracing of structural lineaments hand drawn by Vin Campbell. Two composites were made using TM 1,4 &7 and TM 3,4 & 5. The study area is largely forested and these images give a good rendition of the vegetative species variation - important in the recognition of subtle topographic features that may indicate control by bedrock fractures.

The image maps also included composites of TM 1,2 & 3 and the shortwave infrared bands TM 5 and 7. These were composited with TM 4, a process that places emphasis on the overall intensity of reflection within a selection of wavebands.

These images are stored in NAMC's data repository.

4.4 REMOTE SENSING CONCLUSIONS

The remote sensing work that was done in 1996 was a simple first pass approach to attempt to see if remote sensing could be used as a indicative tool for predicting areas to explore with ground follow up.

Air photo colour enhancement and manipulation provided no useful information without the previous knowledge of geology in the area. It was of minor use for interpretation of structures in areas of advanced (1:10,000 scale) mapping. It is our conclusion that the same work could be accomplished by a competent geomorphologist or geologist doing routine air photo interpretation. Air photos have a unique advantage for colour enhancement work. Firstly, the resolution is very high with a pixel resolution of 1-2 metres. This allows for a very detailed computer manipulation within the range of .37µm. to .7 m. compared to a resolution of ± 20 metres (at best) from a satellite. This is disappointing as Golden Bear has full colour air photo coverage available but not surprising given the lack of visible surface alteration associated with the 5 known deposits on the Ophir Break.

The size of the deposits at Golden Bear work against satellite spectral imagery. As the target can be 100 to 150 metres in strike length, the resolution of satellite imagery may only have one to four 20 metre pixel squares to work with to identify an unusual characteristic. It is for this reason that the work did not extend into alteration target manipulation of satellite derived data.

Satellite data was primarily concerned with looking at structural features that were worthy of investigation due to similarities to the Ophir Break. The consultant was given no local information to "test" the method without bias.

The Ophir break was incorrectly mapped at 1:50;000 scale as were other major structural features known regionally. This is not to be construed as a deficiency of the consultant: it only displays that the structural features in these areas of glaciated terrain do not respond well to the methods employed. Major features such as the contact of the Moosehorn Batholith to the south were diagrammed well but the gold bearing Ram Reef structure on the Bandit Claim 1 km away is not noticed. This Ram Reef structure is *very* pronounced on the air photos. Again more use is probably gained by using detailed air photo interpretation than spectral imagery.

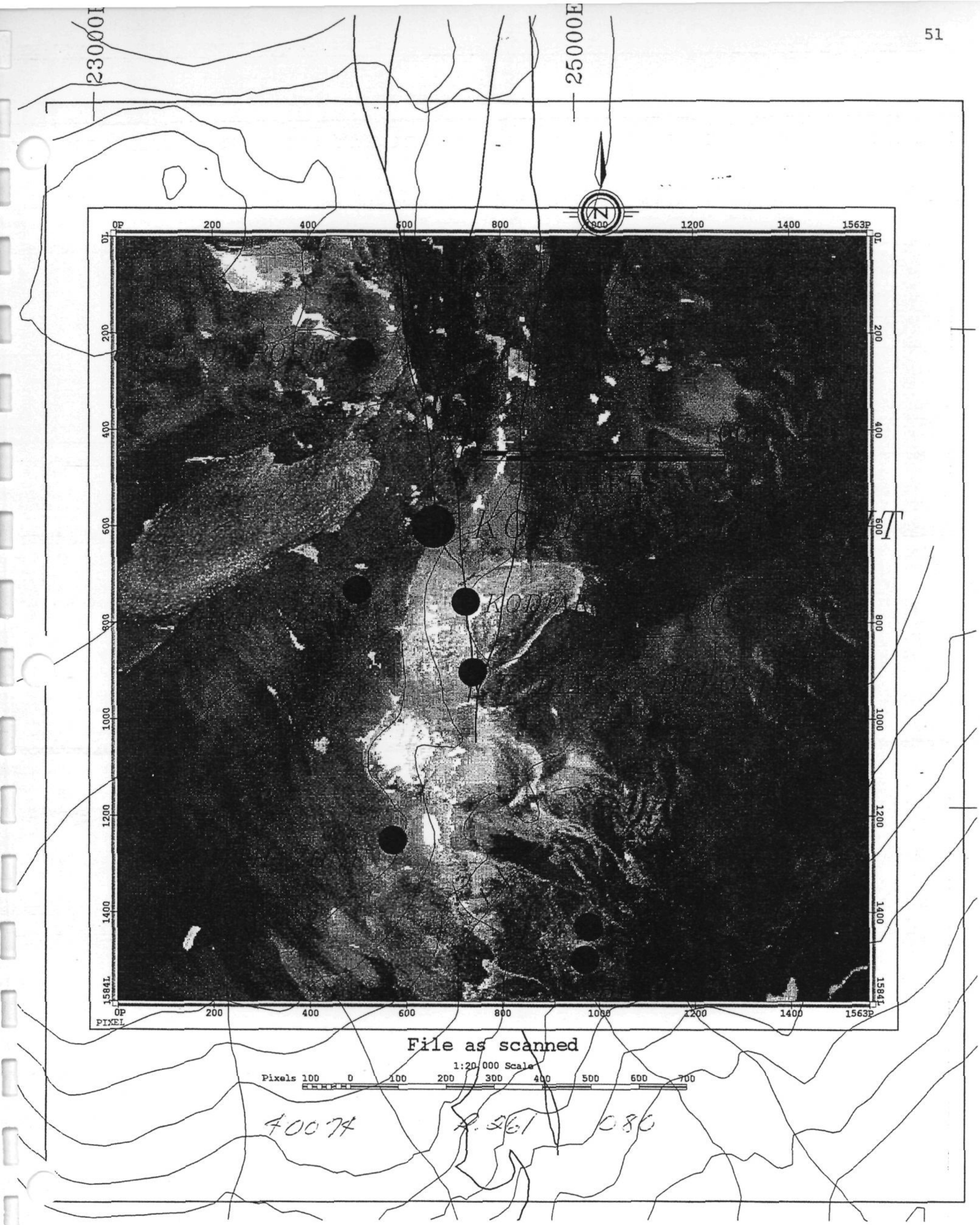
Spectral alteration mapping was not attempted as it was felt that rock specimens of ore should be spectrally analysed to define the "footprint" rather than randomly searched for by the computer. After investigation of the area during the summer of 1996, it was felt that this would lead to little benefit and the approach was dropped from further consideration for the following reasons:

- deposit size is too small to be defined by pixel resolution
- deposit alteration does not have a significant alteration from host rock
- deposits do not form a discernable "halo" alteration effect
- deposits do not reside in a structural environment that is detectable by satellite resolution

It should be expressed that this method has not been pushed to it's limits and that the work was considered a low cost (<$3000) first pass investigation. It is our conclusion however that further work is best done by air photo interpretation both regionally and locally if in search of Golden Bear type shear zone hosted gold mineralization

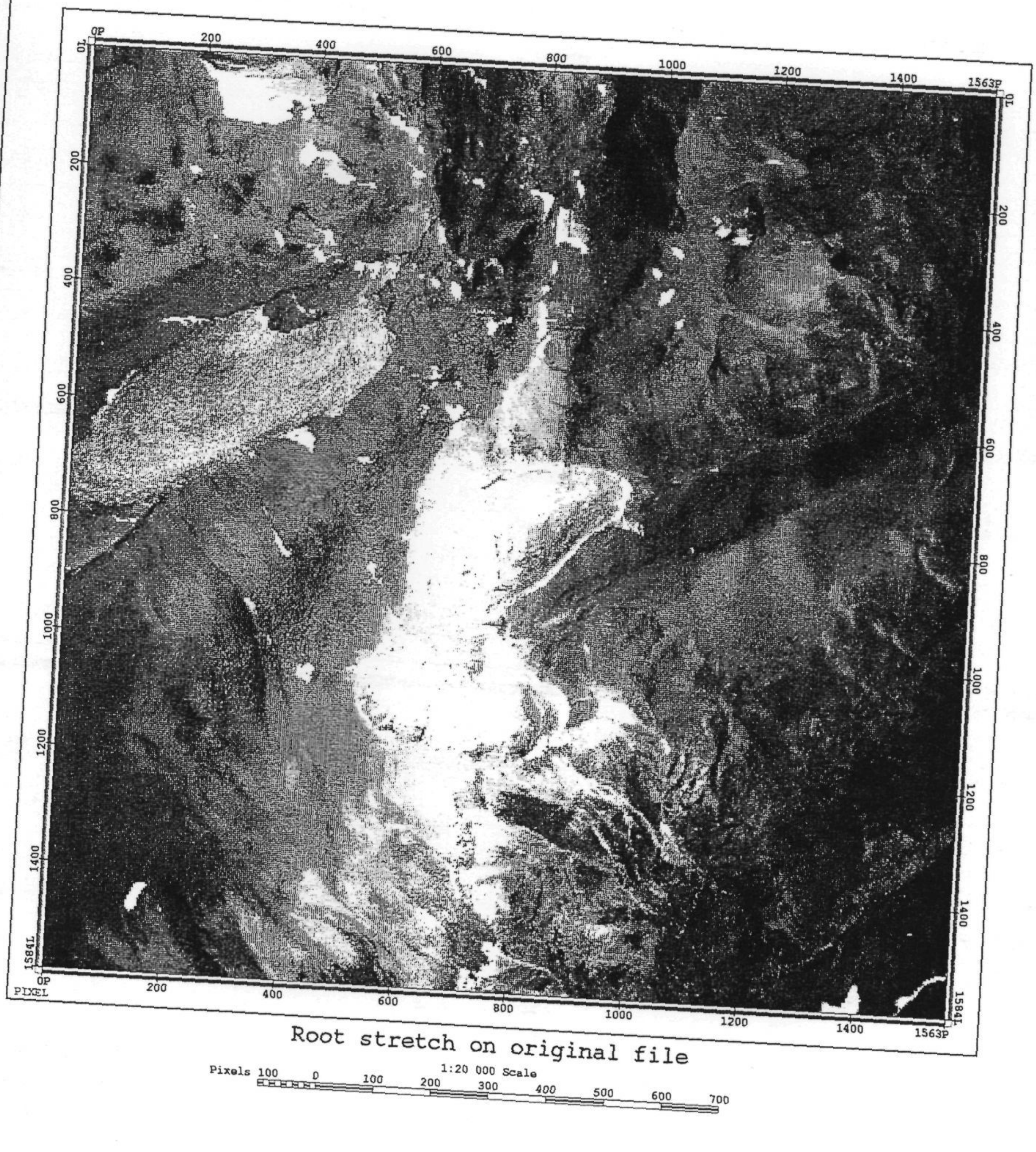
4.5 DATA

Maps are stored in the hanging or rolled map repository.



25000E
File as scanned
1:20 000 Scale
Pixels 100 0 100 200 300 400 500 600 700
PIXEL
4007+
2.961
080

FIGURE 4.2.1



Root stretch on original file

FIGURE 4.2.2

Root stretch on IHS transform

1:20 000 Scale

Pixels 100 0 100 200 300 400 500 600 700

FIGURE 4.2.3

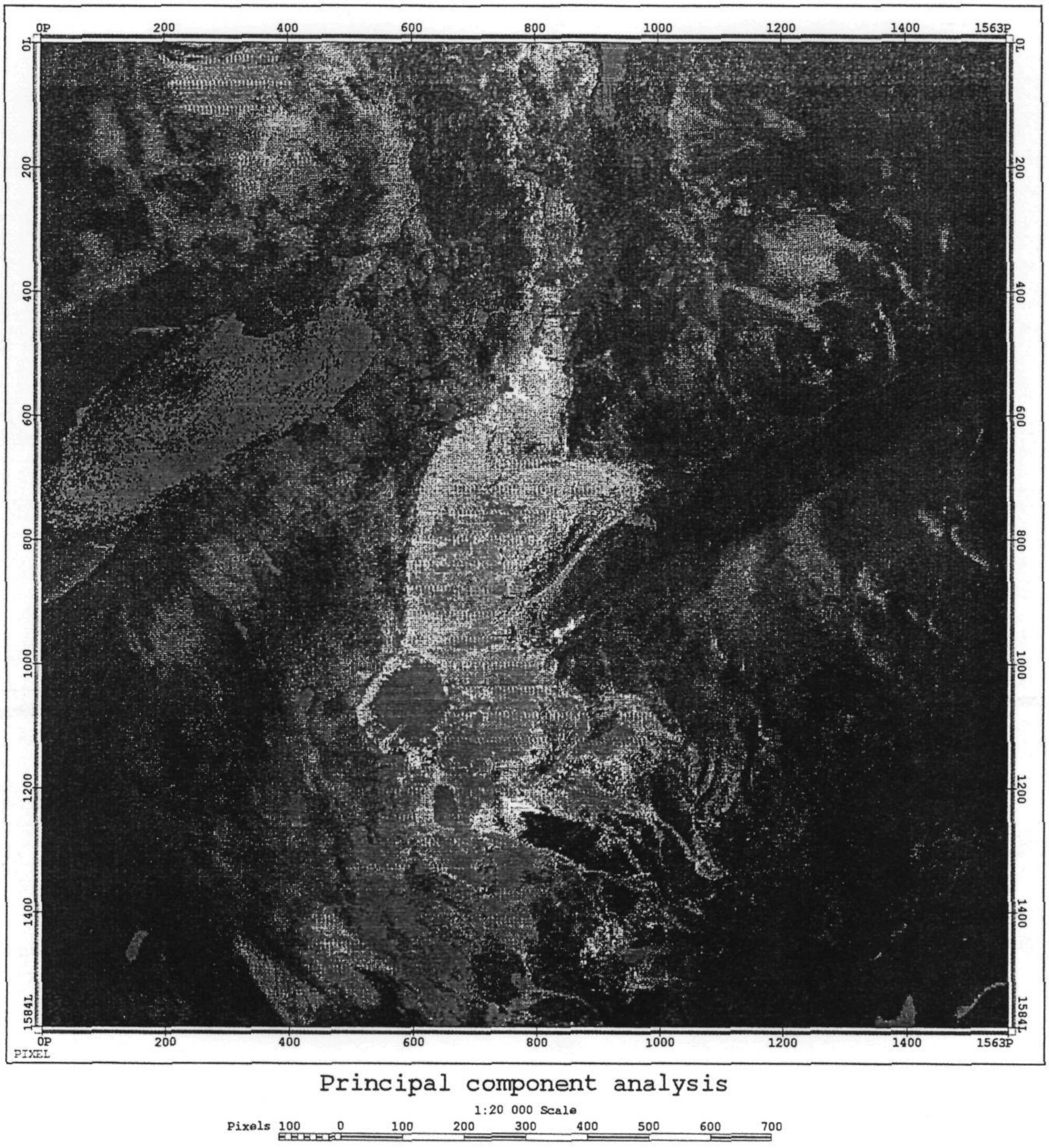

0P
200
400
600
800
1000
1200
1400
1563P
0L
1584L
PIXEL
Principal component analysis
1:20 000 Scale
Pixels 100 0 100 200 300 400 500 600 700

FIGURE 4.2.4

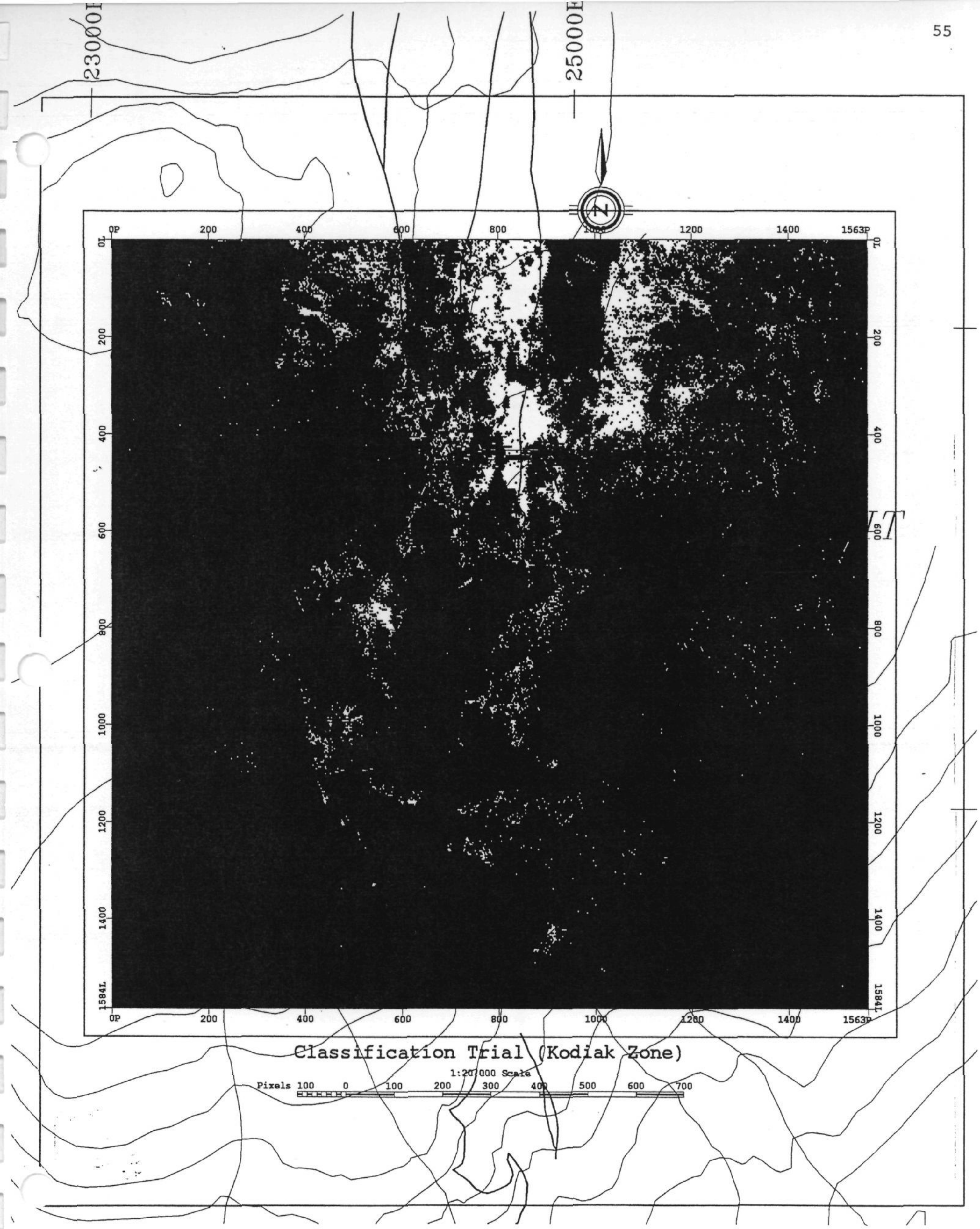

23000E
25000E
0P
200
400
600
800
1000
1200
1400
1563P
0L
1584L
Classification Trial (Kodiak Zone)
1:20,000 Scale
Pixels 100 0 100 200 300 400 500 600 700

FIGURE 4.2.5

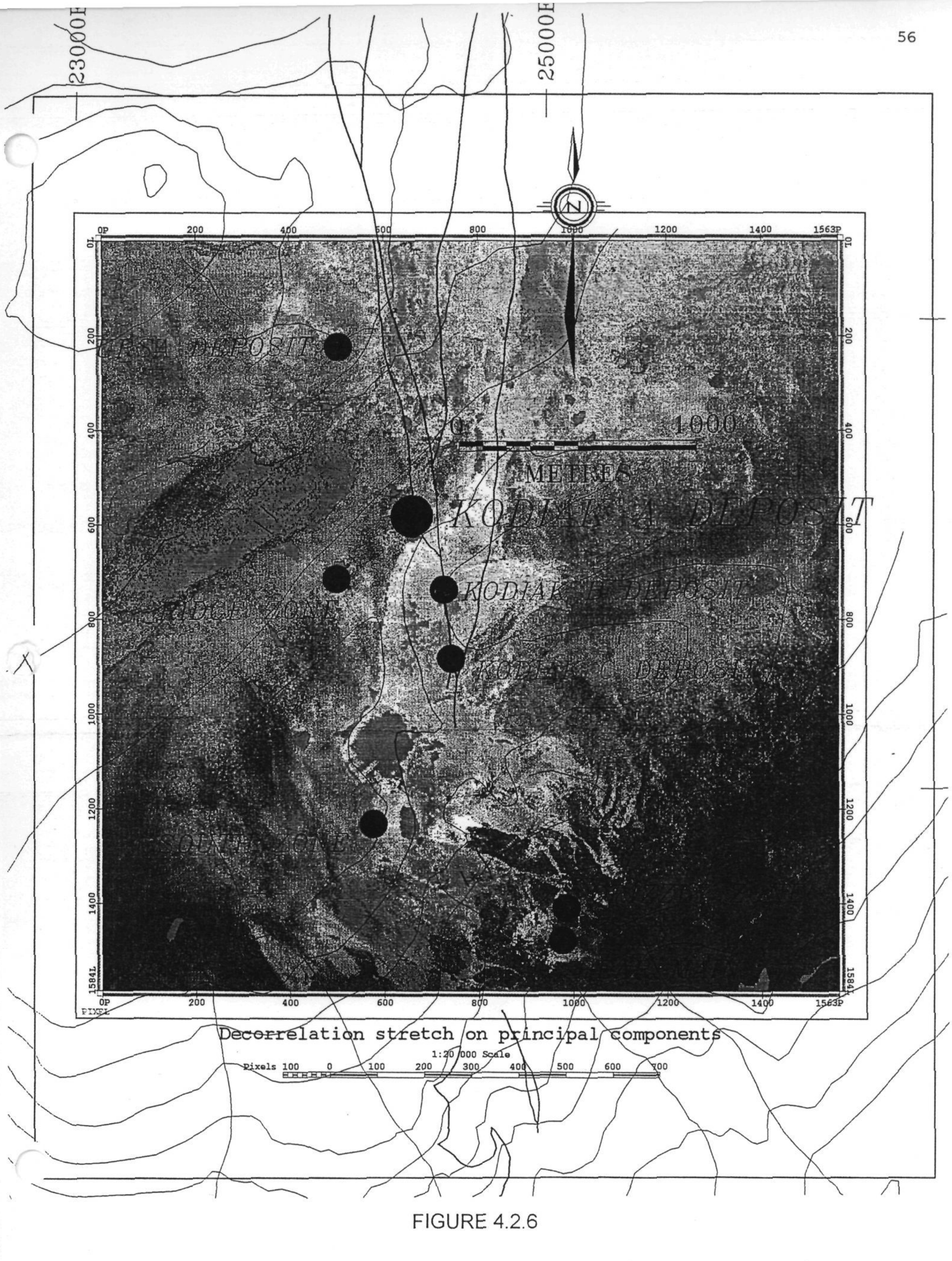

23000E
25000E
N
0
1000
METRES
KODIAK A DEPOSIT
KODIAK B DEPOSIT
KODIAK C DEPOSIT
RIDGE ZONE
SOUTH ZONE
PIXEL
Decorrelation stretch on principal components
1:20 000 Scale
Pixels 100 0 100 200 300 400 500 600 700

FIGURE 4.2.6

5.0 GEOPHYSICS

Geophysical data has been collected on the Golden Bear property by several operators from 1985 to present. Several different types of surveys have been carried out, including VLF, magnetometer, IP and Maxmin HLEM. Early in 1996 all Golden Bear geophysical data was compiled and assessed for NAMC by Jerry Roth, a senior consulting geophysicist with Stratagex Geophysical Consulting Ltd. of Toronto, Ontario. His report is given here in full as it thoroughly describes and evaluates the property geophysics.

The results of Mr. Roth's geophysical compilation are shown on Figure 5.0-1. Data obtained from the 1996 extension of the Maxmin HLEM grid is included.

STRATAGEX

Integrated Evaluation

of

Ground Geophysical Surveys

Golden Bear Property

Northern B.C.

for

NORTH AMERICAN METALS CORP.

Vancouver, B.C.

by

Jerry Roth

STRATAGEX LTD

Toronto, Ont.

May 1996

STRATAGEX

Integrated Evaluation
of
Ground Geophysical Surveys
Golden Bear Property
Northern B.C.

Table of Contents

List of Figures
(at rear)

Table of Maps
(in rear pocket)

Integrated Evaluation of Ground Geophysical Data Golden Bear Property

1.0 Introduction

This report addresses and evaluates the various geophysical surveys completed on the Golden Bear property of North American Metals bordering Bearskin Lake in northern B.C. This study was undertaken at the request of Dunham Craig, exploration manager, following initial discussions with Peter Tredger, V.P. Finance and Randy Smallwood, Development Mgr. The bulk of the review was completed during an intensive (but enjoyable) visit to North American's Vancouver office in the latter part of April.

The Golden Bear property was originally explored and placed into limited production by Chevron Minerals in the mid-1980s. It was subsequently acquired and further explored by Homestake Mining. In turn, Homestake optioned the property to North American Metals three years ago.

As seen in the attached Figures 1-6 kindly provided by Dunham Craig, on the Golden Bear property a number of mainly oxide gold deposits occur along or close to the Ophir Break, a major, complex deformation zone which strikes north-south.

These deposits comprise the Kodiak A, B and C zones and the Ursa and Ridge gold zones, along with the originally discovered Bear/Main deposit, which are almost entirely oxides. All the known zones are quasi-tabular and fairly short in strike, and tend to have steep dips (Figs. 4 & 5). Only the deep, blind Grizzly deposit has a significant sulphide content (Fig. 6); the presence of sulphides suggests that any deeper deposits will likely be accompanied by disseminated sulphides, either due to Eh/pH conditions at the time of deposition or due to subsequent oxidation.

2.0 Geological Setting

As noted above, the Golden Bear property is transected by the N-S multi-strand Ophir Break or deformation zone. The sector west of the DZ is predominantly underlain by a thick sequence of carbonates, while volcanics predominate east of the DZ. The extreme western portion of the property is also underlain by volcanics, which are inferred to extend NW beneath the previously mentioned glacier. An additional sliver of volcanics is mapped SE of the Limestone Creek Fault.

Within the fault-dissected DZ are several complexly deformed narrow lithologic units, including volcanics, sediments, cherty dolomite, and sericitic schist. There is geologic evidence, supported by the geophysical data, of fold closures (to the south) within these fault-bounded slivers, suggesting that these are strike-slip faults which developed parallel to (and ultimately breached) norht-south fold axes.

Gold mineralization is confined to very restricted sectors along the through-going structures; although a common deep source of heat and volatiles may be reasonably surmised, there is no clear indication of the local structural, lithologic or intrusive factors which have controlled mineralization.

The various gold deposits, while within or very close to the overall deformation zone, in detail display significant differences in that the deposits are found on several of the faults which collectively define the DZ, or lie on splay faults outside the DZ (Ridge Zone), or are affected by (and possibly linked to) an unusual flat fault (Ursa Zone), or bear a spatial correlation with a mineralized rhyolite dike (see Figs 4, 5 & 6).

Details of the geology of each gold zone may be found in various company geological reports and will not be recapitulated here. However, it is worth mentioning that the mineralized sectors of faults or fault breccias cannot be readily distinguished from unmineralized portions except by assay.

3.0 Prior Exploration & Surveys

Most of the prior exploration undertaken by Chevron and Homestake was directed at one particular deposit environment or sub-type, and thus tended to overlook the multiplicity of environments in which gold mineralization can be found on the Golden Bear property.

Prior exploration also employed a variety of geophysical techniques for to map features believed to be associated with gold deposition. The early surveys included:

1) An extensive VLF survey for Chevron along the main DZ from line 23000N to 28500N. These data are available only in plotted form as a contoured Fraser filter map, so that full assessment of anomaly characteristics was not achievable.

2) A Maxmin survey by Delta Geoscience for Chevron in a limited area around the Main and Grizzly zones; the results of this survey were not available for scrutiny in Vancouver;

Additional geophysical surveys conducted recently for North American Metals following its acquisition of the property included:

3) a time-domain IP survey by Pacific Geophysics in 1992, covering the sector of the main DZ from 25000N (just north of the Kodiak B zone) to 28100N, using both gradient and pole-dipole arrays; the pole-dipole array, which extended further to the north, employed a dipole spacing of 50m, reading separations N = 1 - 5. The results of the two surveys are generally comparable, but with several significant differences.

4) A combined VLF and magnetic survey on the Kodiak North grid by SJV Geophysics in 1994, on a substantial E-W grid with lines generally 100m apart. This survey slightly overlapped prior VLF coverage by Chevron; the results, where overlapping, show reasonable concordance.

5) A MaxMin HLEM survey in 1995 on a substantial E-W grid over an area west of the main Ophir DZ, where prior exploration had been minimal but where patchy gold soil geochem anomalies had been recorded; this survey employed a 150m coil separation, measuring in-phase and quadrature values at frequencies ranging from 220 to 33,000 Hz.

In addition to the geophysical surveys, North American Metals has carried out extensive detailed multi-element geochemical surveys west of the main DZ. These have recorded a series of weak but significant gold anomalies as well as an unexpected, fairly strong multi-element Zn-As-Sb anomaly from morainal material at the southeastern toe of a retreating glacier.

Glaciological studies have also been completed, in an effort to better understand the probable dispersion of gold and other elements in this sector (thought to be generally from west to east), leading to the recognition of a number of glacial boulder trains with gold whose provenance is as yet undetermined.

Detailed prospecting and tracing of mineralized boulder trains, coupled with astute geological hunches, have led to the discovery of several additional gold deposits since North American renewed concerted exploration on the property.

4.0 Discussion of Compiled Results

4.1 Deposit Responses

Despite the considerable number and extent of geophysical surveys on the Golden Bear property, surprisingly few of these surveys actually covered one or more of the various known gold zones. Consequently, the geophysical responses (if any) of the gold zones cannot be determined with full specificity and confidence.

Based on geological descriptions and scrutiny of selected core, the friable, vuggy nature of the mineralized setting and the associated minor clay content strongly suggest that some deposits may be expected to be weakly conductive. However, except for the rarer sulphide zones, no significant IP response would be anticipated.

Based on the surveys which do cover known deposits, it is seen that:

1) W/re/to IP: neither of the deposits (Kodiak A and B) which were covered or partially covered by IP showed any discernible IP response;

2) W/re/to EM: the Bear Main deposit lies on a strong, persistent VLF conductor which correlates with one of the faults within the DZ, while the Kodiak B and C to the north are very close to but slightly displaced from a separate strong, persistent VLF conductor corresponding to another fault within the DZ. Kodiak A was not covered by VLF. The Ursa deposit, on the other hand, was covered in the 1994 VLF survey, but shows only a very negligible VLF anomaly. The MaxMin survey covered only the small Ridge zone; no discernible response was recorded.

Hence, it may be concluded that in the Golden Bear setting geophysics is a very uncertain guide to detecting and delineating zones of gold mineralization, and at best forms a secondary element in exploration programs primarily guided by geology and geochemistry.

Nonetheless, because of the substantial extent of existing geophysical data, careful consideration of all conductive and/or polarizable sources vis-a-vis available geology and geochemical information is merited, so as to identify those features with enhanced potential and added interest.

4.2 General Evaluation

Consequently, a detailed interpretation of the various survey data has been undertaken, and compiled in a comprehensive 1:5000 scale interpretive overlay, which was left in the Vancouver office.

Each of the various geophysical surveys has been previously evaluated in a partial and isolated fashion by the respective contractor and/or other consultants. Their assessments are presented in several reports which were reviewed in this study. The present effort has sought to derive an integrated appraisal of the ensemble of geophysical data.

4.2.1 MaxMin Results

As shown in the overlay legend, the better MaxMin anomalies have been evaluated as to definite, probable or possible discrete bedrock sources, with a further category (X) identifying those very weak, suspect responses which likely reflect overburden or very minor fractures. Similarly, the inferred continuity of the conductive features between survey lines is rated as definite, probable or possible/questionable.

Parenthetically, it is noted that most of the known gold zones have a strike extent of less than 200m; hence line spacing for geophysical surveys should be no greater than 100m for full delineation of features of potential interest.

The 1995 MaxMin data is interpreted as outlining 19 conductors of possible to definite bedrock origin, designated H-1 to H-19. These generally strike NW to NNW; their continuity is similar to that inferred previously by Sid Visser, although locally, there are significant departures, mainly where data was acquired on lines 200m apart.

Four of these MaxMin conductors are seen to have a significant degree of correlation with areas of anomalous gold geochemistry; these have been selected as higher priority targets. These are MaxMin zones H-6, south of the Ridge zone; zone H-7, SW of the Ridge zone; zone H-11, immediately south of the glacier; and zone H-18, near the western margin of the survey coverage.

A further two MaxMin conductors which exhibit a weaker degree of correlation with weaker and/or more restricted gold geochemical anomalies are considered less promising but still interesting targets. These are zones H-8 and H-16.

Finally, a further four unexplained discrete MaxMIn conductors of probable to definite bedrock origin which are located within the dominantly carbonate terrane but which lack any evident geochemical encouragement (quite possibly because they lie under shallow lacustrine sediments from a paleo-lake) have been designated as still lower priority but meriting further investigation. These are zones H-1, which is quite strong and distinct; zone H-2, to its south; zone H-4, 400m to its west; and zone H-9, 500m to its SW.

4.2.2 VLF Results

The 1994 VLF-EM data has been similarly interpreted in terms of strong/definite, probable and weak/suspect responses, and the inferred continuity of conductive features indicated in a manner similar to MaxMin.

As noted above, the early and recent VLF surveys display reasonable agreement in their area of overlap. Note further that the recent VLF-EM and MaxMin surveys were intentionally overlapped on lines 26500N and 26600N. Weak anomalies were detected by both techniques near 23500E, although the inferred orientation of the two weak conductors differs somewhat between the two surveys.

The 1994 VLF-EM survey detected nine significant conductive zones, designated V-1 thru V-9, in the sector surveyed west of the main deformation zone. Of these zones V-3 and V-9 are seen to have a significant degree of correlation with gold geochemical anomalies of restricted size, and hence are designated as third priority targets. In addition, VLF zone V-8, which lies approximately 150m north of the Ursa Zone, is regarded as a third priority target.

A further two VLF conductors are located in an interesting area mapped as predominantly carbonate, but lack any indicated geochemical encouragement. These are V-1 and V-6, west of the Ursa deposit; they may merit a detailed field check, to determine if any mineralized boulders are present or if lacustrine sediments have obscured or concealed any geochemical signature.

4.2.3 IP Results

The 1992 IP/resistivity data was viewed in both pseudo-section and plan form, and is judged to be of reasonably good quality, enabling weak polarizable sources to be recognized with confidence.

Comparison of the gradient and dipole-dipole IP data, using the compiled plan maps and interpreted IP sources, showed reasonable correlation, especially for shallow, linear sources. The gradient data, as expected, display somewhat better spatial resolution, while the pole-dipole data provides greater interpretability as to source depths.

Within the sector along the main DZ covered by the 1992 IP survey, the chargeability results obtained with the gradient array defined eleven narrow, linear, generally discrete polarizable zones, designated P-1 thru P-11, all trending N-S to NNW. Many of these have correlating resistivity lows, and hence, not surprisingly, also correlate with portions of persistent VLF conductors. (Note that the IP source widths assigned in the prior interpretation are excessively wide.)

Comparison with the detailed geology mapped in the fault-bounded slices caught up in the main DZ and with the locations of prior trenches and drilling in this sector indicates a number of interesting IP zones which are substantially or entirely untested.

Apparently untested chargeability zones judged of particular exploration interest include zone P-3, detected on a single line immediately east of the Black fault, with a correlating VLF conductor; zones P-5 and P-6, isolated chargeability sources within or at the margins of the cherty dolomite unit; zone P-9, which is primarily resolved on line 27700N near the western limit of the IP coverage and which probably consists of multiple sources; and zone P-12, located along the northern continuation of the Black fault.

Limited prior drilling and/or trenching carried out in this sector of the DZ may have partially tested several IP zones of potential interest. It is important to note that the drilling and trenching was done some years before the IP survey, so that it may well be worth re-examining pertinent core and trench data, in particular any intervals of relic or actual disseminated sulphides, to determine if further evaluation of these IP sources is merited. Four IP zones in this category merit special mention: zone P-1, a persistent narrow IP source extending along the eastern faulted contact of the DZ with the volcanics; zone P-4, a discrete zone; zone P-7, which persists over several hundred meters and which correlates with a strong VLF anomaly along the Fleece fault; and zone P-8, an isolated IP source further to the north along the continuation of the Fleece fault near 27100N.

As noted earlier, the pole-dipole IP data are generally consistent with the interpreted gradient IP sources, particularly for simple linear sources. However, there are several IP sources discerned in the pole-dipole data for which no correlating response can be seen in the gradient data, as indicated in the separate interpretation of the pole-dipole data left in the Vancouver office.

Finally, the associated resistivity data readily demarcate significant lithologic units within and adjoining the main DZ, as indicated in the interpretive overlay, in close conformity with the geologically mapped units. Note, however, that the resistivity data divides the cherty dolomite into a more resistive unit to the east and a less resistive (less silicic?) unit to the west.

4.2.4 Magnetic Results

The compiled magnetic data display little relief in the sector covered, consistent with a non-magnetic sequence of carbonates. The smoothly varying increase towards the NW and NNW points to a large moderately magnetic source off the property, either a large accumulation of volcanics or an intermediate intrusive (or its gneissic equivalent).

The fault-bounded slice of volcanics is readily distinguished by the number of small-scale, shallow magnetic sources.

Several local anomalies of weak to moderate amplitude are readily isolatable within the gentle gradients which characterize the carbonates. These are attributed to known and probable late mafic dikes.

Thus the magnetic data is seen to contribute in only a minor way to delineating the geologic units and structural features; nonetheless, since magnetic data can be readily collected at the same time as a VLF survey, it would be useful to continue collecting both in any future VLF surveying.

5.0 Comments on Other Techniques

A variety of other geophysical techniques of possible relevancy were discussed during my stay in Vancouver. While none of these are judged to be of compelling and immediate utility, it is worth briefly recapitulating the discussion:

1) **Drill hole logging:** Determination of relevant electrical and seismic velocity properties via in situ measurements in selected key drill holes would be useful in determining any subsequent geophysical efforts, particularly techniques that might be used in support of deep drilling ; current drill hole logging instrumentation is very portable and can be readily transported and used by a single operator.

2) **DH IP surveys:** Potentially of interest, in support of deep exploration drilling pursuing sulphide zones, in view of its inherent capability to detect polarizable zones away from a hole; DH IP would likely require casing drill holes with perforated sectional plastic pipe to stabilize and preserve hole access in an unstable, faulted environment.

3) **Seismic reflection:** Primarily applicable to layered or gently dipping geological environments; very expensive, particularly in rough terrain. A complex variant in which seismic measurements are made in drill holes may be of interest in terms of mapping quasi-vertical faults, particularly if mineralized sectors of these faults can be differentiated from unmineralized sectors.

4) **CSAMT (Controlled Source Audio Frequency Magnetotellurics)** Effective in terms of mapping resistivities (particularly in layered situations) and in detecting deep conductors; at Golden Bear the absence of a strong vertical (or lateral) resistivity contrast, or a target or target environment with moderately high conductivity tends to preclude utilization.

5) **Airborne surveys:** The Golden Bear property has reached a fairly mature stage; hence, while detailed aeromagnetic and airborne EM data would have been of distinct interest at an early stage in exploration of this property, little advantage is foreseen in doing so now, particularly in view of the extensive ground coverage.

6.0 Conclusions

The review and re-appraisal of available ground geophysical data for the Golden Bear gold property in northern B.C. has generated the following conclusions and recommendations:

1) The MaxMin, VLF-EM, magnetic and IP/resistivity surveys carried out over the past several years were all well executed, although incomplete interpretation and integration with other data has hitherto restricted their usefulness;

2) The narrow, relatively short, oxide gold zones do not have any consistent geophysical response, although several appear to be lie within or very close to weakly conductive faults;

3) The oxide gold zones are generally not amenable to detection by IP, although the deeper gold zones such as Grizzly are anticipated to have a weak but discernible IP response;

4) Despite the poor correlation of known gold zones and identifiable geophysical anomalies, it is recommended that the favourable MaxMin, VLF and IP features selected in this interpretation be further investigated by detailed prospecting, sampling, drilling and trenching, as appropriate.

5) When combined with geology, soil geochemical data and compiled prior exploration, four MaxMin conductive zones and four IP features have been judged to particularly merit additional investigation. A further six MaxMin conductors four IP zones and six VLF zones are judged of lesser priority.

6) No other geophysical technique holds out any immediate promise of significant assistance in this difficult setting; however, determining in-situ physical properties of mineralization and host rocks via DH logging would help determine if other, less common geophysical techniques would prove useful in support of future deep drilling.

7.0 Recommendations

Based on the preceding discussion and conclusions, it is a general recommendation that the identified geophysical targets be carefully inspected in terms of soil geochemistry and geology, and, where advisable, that additional detailed prospecting and sampling be undertaken in close proximity to the interpreted conductor axes.

Drilling and/or trenching should then be undertaken primarily of those conductors and/or IP features for which a convincing correlaion with gold anomalies can be established, and secondarily of those targets with only a weak or negligible geochemical correlation but with no evident geological explanation.

With respect to additional geophysical surveys on the Golden Bear property, the absence of any consistent geophysical response from typical gold mineralization precludes routine, systematic deployment of geophysics. However, it is judged useful to fill in the gaps in present survey coverage, both where existing survey data is on 200m spaced lines and where favorable geology and geochemistry were not previously surveyed. In particular, VLF and magnetic coverage could be usefully extended into the area of carbonates lying south of line 25500N and immediately west of the main DZ; and MaxMin coverage carried out on fill-in lines within the existing coverage. Additional IP surveys may be merited, if investigation of the existing IP anomalies lends support to the utility of this technique, particularly for deeper sulphide mineralization.

When retrieved, the MaxMin survey data acquired for Chevron should be re-evaluated and integrated with the present compilation; additional targets may emerge from this data set, as well as from a more complete version of their VLF data, if available.

Finally, and more generally, the existing interpretation should be periodically updated, as new geologic and/or geophysical data is obtained.

Respectfully submitted,

Jerry Roth

Jerry Roth, M.A.

Senior Consulting Geophysicist

NAMV96E1.rpt

References

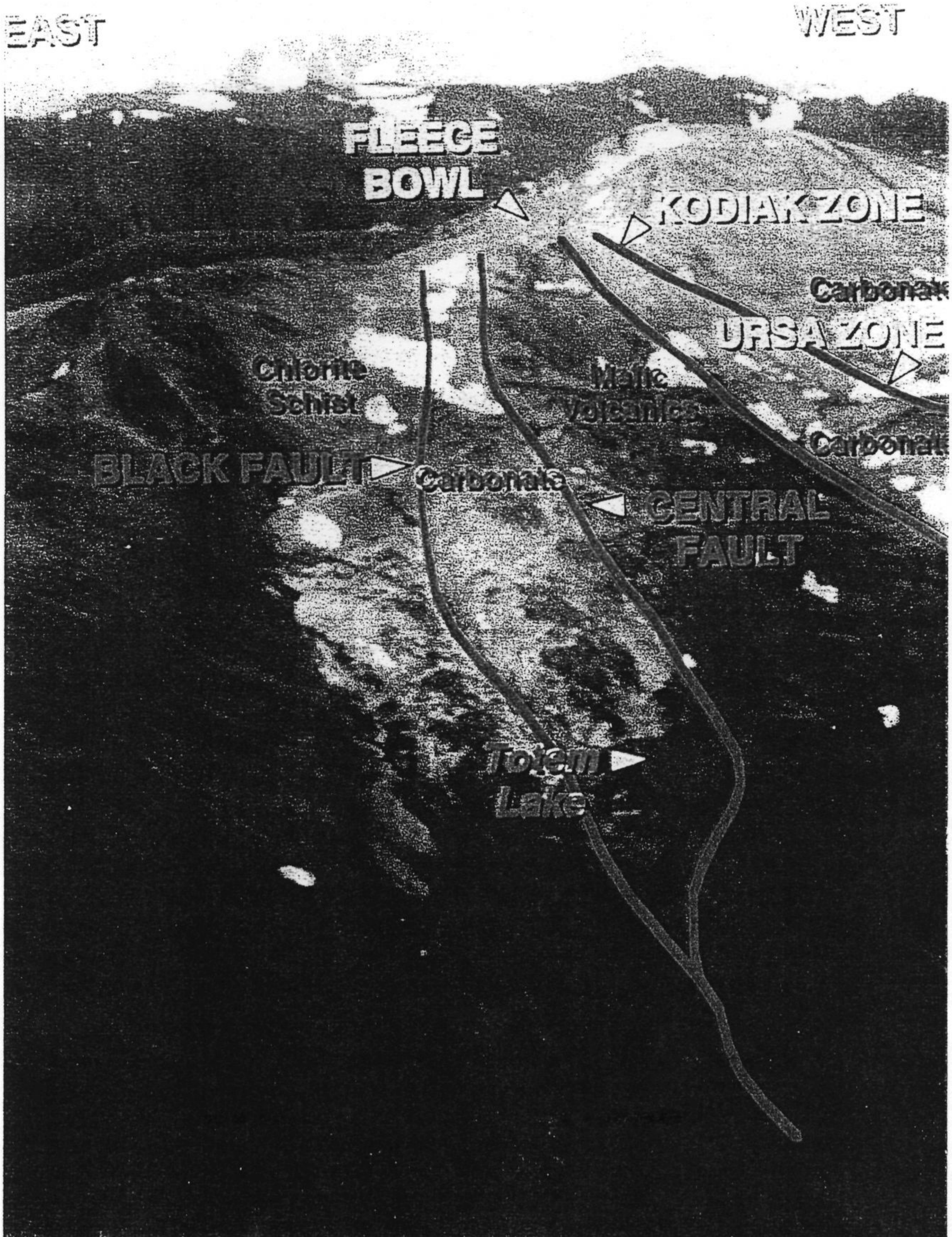
Visser, S., July 1994, Report on VLF & Magnetic Surveys, Kodiak N. Grid, SJV Geophysics

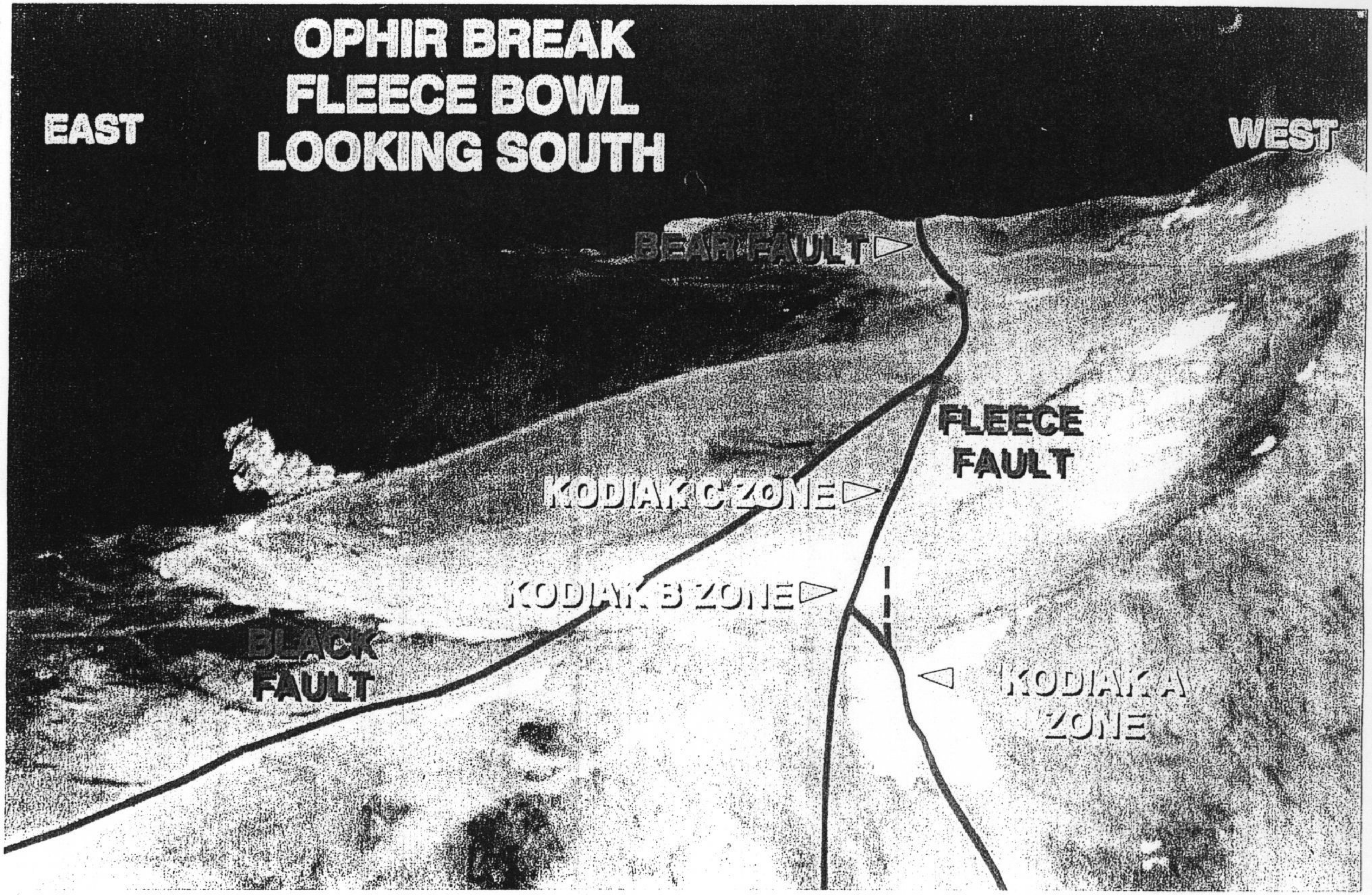
Visser, S., Jan. 1996, Report on MaxMin Surveys, Kodiak Zone, SJV Geophysics

Rockel, E., 1995, Re-interpretation of IP and VLF-EM over the Kodiak Zone, Interpretex

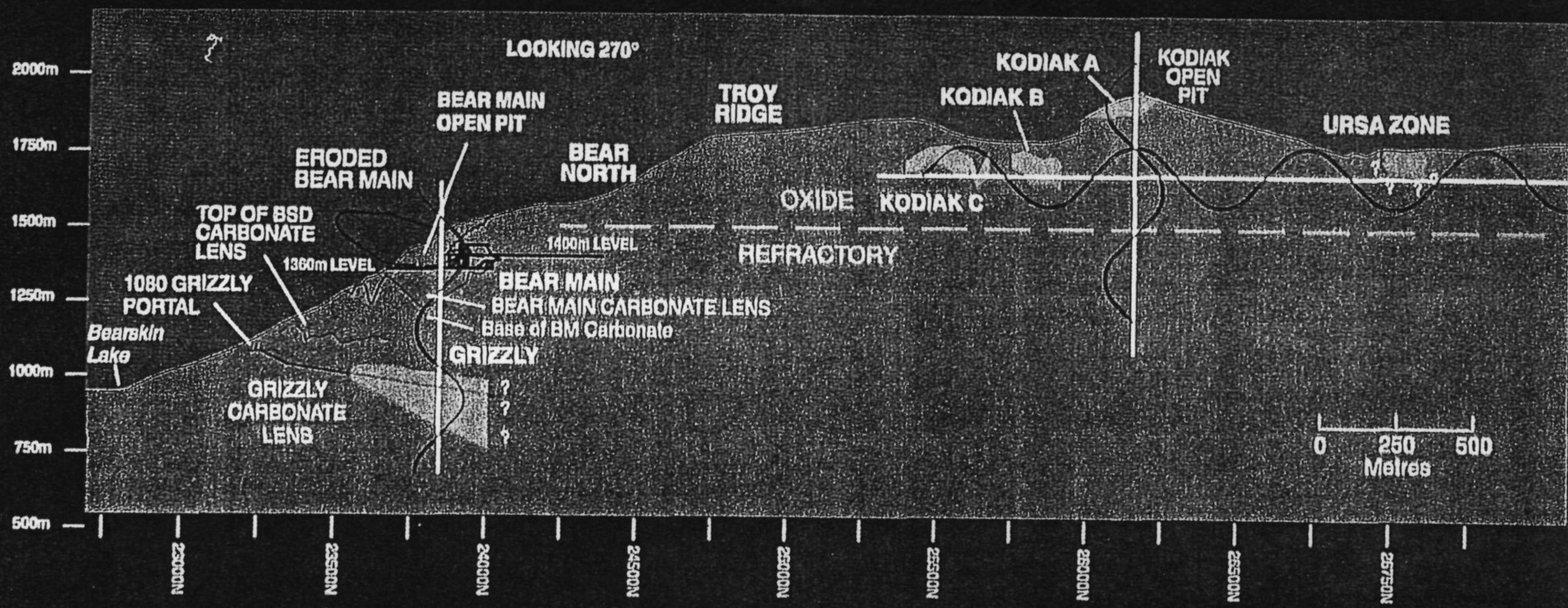

WEST
FLEECE
BOWL
KODIAK
EAST
BEAR
PIT
OPHIR
BREAK
GRIZZLY
PORTAL
OPHIR BREAK
LOOKING NORTH

OPHIR BREAK LOOKING SOUTH



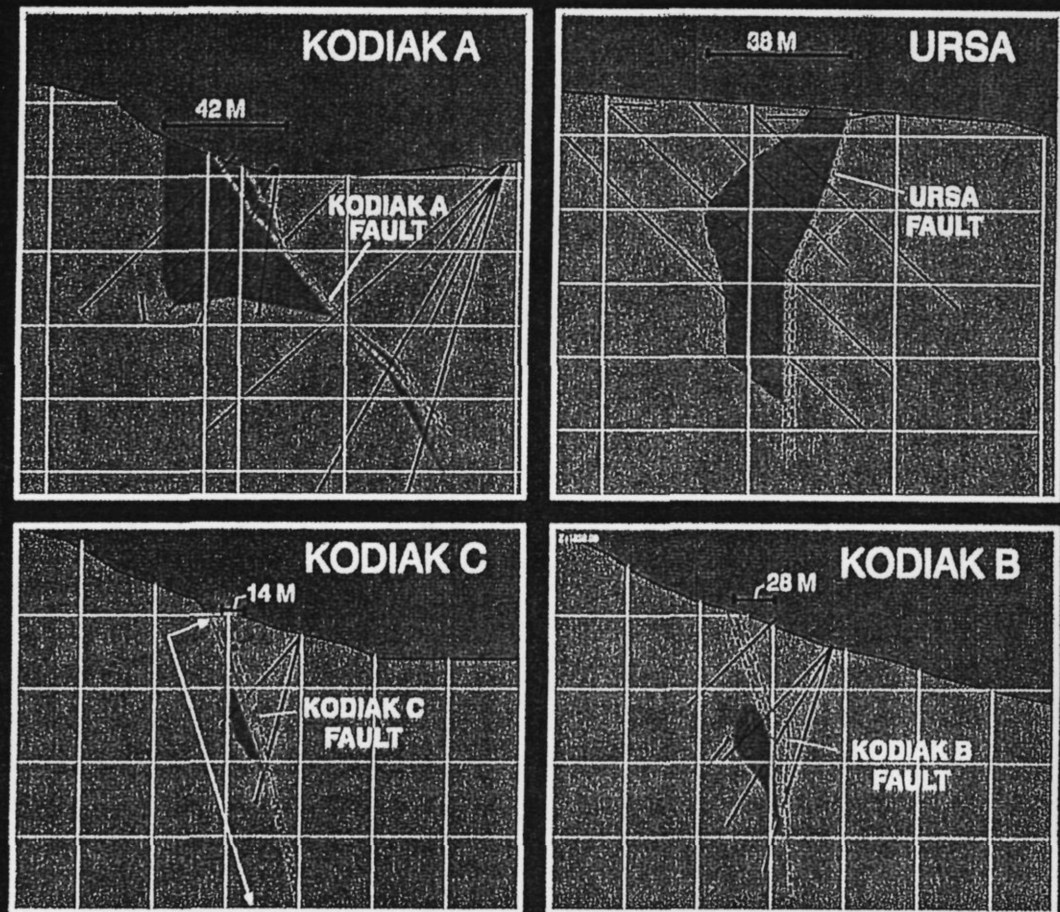

OPHIR BREAK
FLEECE BOWL
LOOKING SOUTH
EAST
WEST
BEAR FAULT
FLEECE FAULT
KODIAK C ZONE
KODIAK B ZONE
BLACK FAULT
KODIAK A ZONE

Ophir Break Long Section Looking West



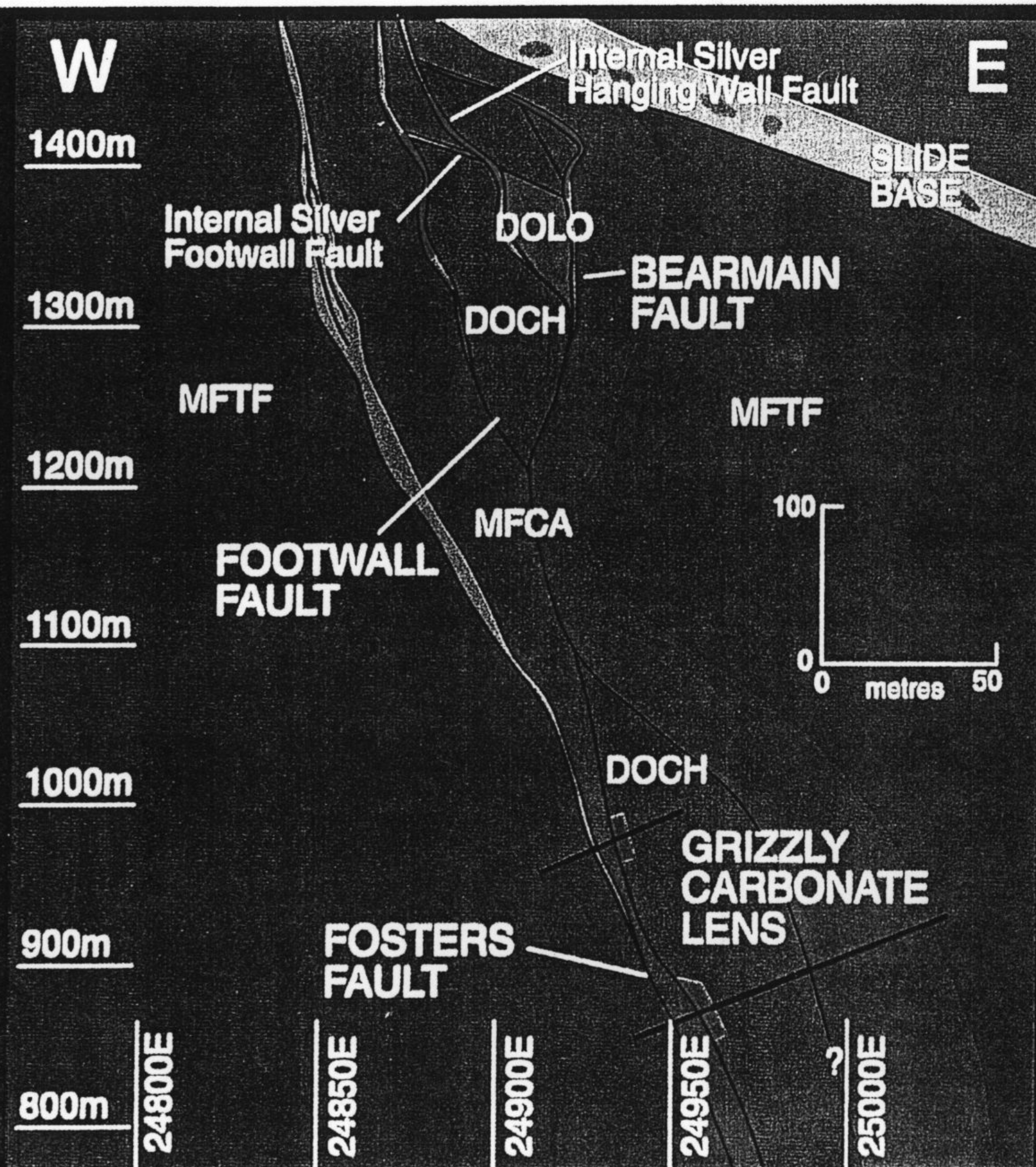
GOLDEN BEAR MINE

Kodiak A, B, C and Ursa Cross Sections



GOLDEN BEAR MINE

Cross-Section of the Bear Main Fault and Associated Structures



GOLDEN BEAR MINE

6.0 GEOCHEMISTRY

6.1 INTRODUCTION

Soil geochemistry

Historically, geochemistry has played a relatively minor role in the development of the Golden Bear property. Although the Bear Main deposit was initially located by a soil sample taken on a reconnaissance contour soil traverse, very little additional geochemical sampling was carried out until 1993, when the discovery of the Kodiak A deposit by trenching resulted in an orientation survey being run over the over the area. The results of the orientation survey indicated that it would have been easily discovered by systematic grid soil geochemistry.

The Kodiak A deposit was instrumental in the remodelling gold mineralization on the Golden Bear property as it was on a splay of the main Ophir Break system and wholly hosted in carbonate rocks. As a result it was evident that the large area underlain by carbonate to the west was highly prospective for gold mineralization. In 1994 a soil grid was installed over the Kodiak A and the area to the north and west. The grid was extended in 1995 and again in 1996. Data from a small grid to the north of Totem Lake was added to the database in 1996. This section incorporates the compilation of all the above data.

Deposit Modelling

In the fall of 1995, diamond drill hole, multi-element deposit modelling was initiated to search for a geochemical signature that could vector exploration efforts towards gold mineralization. Five drill holes were selected from each of the Grizzly, Bear Main, Kodiak A, Kodiak B and Ursa deposits in order to examine the spatial distribution of the 32 element ICP analysis. Flourine and tellurium were also included in the suite.

Consultants & Quality Control

Barry Smee of Smee and Associates was commissioned in the spring of 1996 to examine all geochemical procedures used at the Golden Bear Mine as well as give a staff seminar on quality control. During 1989-1994, mining of the Bear Main was averaging $\pm$ 14 g/t Au. With a change of processing method from milling to heap leaching, 1 g/t Au was set as production cut off. This required a very significant tightening of the margin of analytical error and as such a quality control program was instituted. Mr. Smee examined all soil, diamond drill hole, rock and deposit modelling data and made recommendations after a three day visit to the minesite.

6.2 SAMPLE PREPARATION AND PROCESSING

Between 1993 and present, all soil and rock samples collected on the Golden Bear property for geochemical analysis have been prepared and processed at one of two laboratories: the onsite assay lab at Golden Bear, or Chemex Labs in North Vancouver, B.C.

All soil samples have been processed at Chemex Labs. Standard sample preparation has been to dry and sieve to -80 mesh. Analysis has consisted of 32 element ICP, mercury analysis by cold vapour and gold analysis by a 30 gram fire assay with AA finish.

Rock or diamond drill core samples have been analysed at both the onsite lab and Chemex Labs. Sample preparation and processing are the same at both labs. The sample is crushed to >60% -10 mesh and a representative 200 gram split is collected. The split is then pulverized using a chrome steel ring mill to >90% -150 mesh. A 30 gram (1 assay ton) split is then analysed by standard fire assay with a gravimetric finish.

6.3 SOIL GEOCHEMISTRY

A total of 3912 soil samples have been collected on the property between 1994 and 1996. 1994 samples were collected on a 50 x 50 metre grid spacing, with sampling in subsequent years being done on a 25 x 100 metre spacing in order to better test for narrow mineralized structures.The location of the samples and the sample numbers are shown on Figure 6.3-1. Plots of Ag, As, Au, Bi, Co, Cr, Cu, Fe, Hg, Ni, Pb, Sb, Sr, and Zn values are shown on Figures 6.3-2 to 6.3-15 respectively. Colour contour plots generated in Surfer of As, Au, Ca, Co, Cu, Fe, Hg, K, Mg, Ni, P, Pb, Sb, Sr, W and Zn are given at the back of this section in alphabetic order.

The results clearly show that several geochemical domains are present. A strongly glaciated domain is evident from a smear pattern that aligns well with the maximum Wisconsinan ice advance outlined by Savigny (1996, see Section 7.0). Further east, areas that are underlain by carbonate rocks are easily distinguishable geochemically, from areas underlain by volcanic rocks, particularly when the contour plots of Cu, Fe and Ni are examined. These areas do not have extensive or thick till cover and thin soil profiles developed due to periglacial weathering. This is also the case with the Stuhini volcanics that lie to the west of the Limestone Creek fault on the extreme west end of the soil grid.

Correlation matrices of the entire data set failed to show any correlation between gold and the other elements. Similar results were obtained from correlation matrices when a reduced data set, containing values only from areas underlain by carbonate rocks, was used.

Geochemical correlations with gold are only evident when the data from samples taken over known mineralized zones, such as the Kodiak A, Ridge and South Zones, is examined. When this is done gold is found to be coincident with weak to moderate As, Hg and Sb values, moderate Fe values, and, interestingly, with depleted levels of Ca, Mg, and Sr. This signature is consistent with Carlin style, disseminated gold deposits. A geochemical signature is not apparent over the Ursa deposit, however this area has undergone glaciation.

Just north of Helen Bowl, at 25400N, 24050E the above geochemical signature is present but without gold. A fault structure is visible in the north wall of Helen Bowl immediately south of this coordinate but there is no surface expression near the sample site. The anomaly may represent a halo effect to a mineralized zone. Additional rock sampling and deep soil pits are recommended for this target in 1997.

Within the glaciated domain, correlations with gold are not consistent. A strong As, Hg, Sb anomaly is present that seems to originate from the glacial moraine at the toe of Sam Glacier, with the intensity of values tapering off with increasing distance from this area. Generally only widespread single sample gold values were obtained from this region. Antimony values also look as if they could be originating from portions of the Limestone Creek Fault as they increase in intensity markedly at the fault trace and are then are apparently smeared eastward towards the Ursa deposit.

To the west of the Limestone Creek Fault there are two significant gold anomalies. One of these extends from the Limestone Creek Fault trace northwesterly for roughly 500 metres. This anomaly is now known to be coincident with the C & C Zone boulder train mineralization (see Section 8.8). None of the pathfinder elements are coincident with gold values. The second anomaly lies further west at 21,250E and is north-south trending over 200 metres and does have coincident As and Hg values. Several rock samples collected in the area in 1996 failed to return gold values, however the anomaly requires further investigation.

6.4 SOIL PROFILES

In addition to regular soil geochemistry, samples were taken from several trench walls and deep pits in glacial overburden in order to compare surface geochemistry to deep till geochemistry. Samples were collected from four trenches in the Ursa Zone, two pits on the Limestone Creek fault, and one trench in the C & C Zone. Locations and geochemical values for the profiles are shown on Figure 6.4-1.

The soil profile results are both site specific and in some cases inconclusive. In the Ursa Zone, profiles from two weakly to unmineralized trenchs at the north and south ends of the zone, displayed essentially no geochemical trends at different depths. Two profiles in trench KN94TRA, the highest grade trench in the zone, showed increases in gold and mercury with depth, the highest values being associated with fractured bedrock in the lower portions of the profile. This suggests that till cover, although of variable thickness in this area, geochemically masks the Ursa deposit.

The fourth trench profiled in the area is roughly 300 metres west of the Ursa mineralization, placed in order to attempt to trace an antimony bearing boulder train. This profile, taken above a silicified shear with malachite and azurite staining and drusy quartz, shows strong increases with depth in Au, As, Sb, Cu, Pb and Zn, but only below a 25 centimetre layer of fine, clay rich till. This layer is clearly inhibiting a more widespread geochemical expression from developing.

The two pits dug near the Limestone Creek fault both encountered 4.0 metres of homogeneous, multilithic boulder clay till. Gold was found to be elevated at the base of one pit but generally geochemical values in the profiles do not vary appreciably, and no ditinct trends are present.

The C & C Zone profile was collected from within the mineralized section of KN96TR53 (2.70 g/t over 6.0 metres). Increasing values with depth were returned for Au, As and Sb, with the greatest increases occuring at the till bedrock interface.

Overall, the results of the soil profiles indicate that glacial till is masking the geochemistry of the local subsurface geology. Where appreciable thicknesses of till are present soil values do not increase with depth until local, fractured bedrock appears as a component of the sample. Therefore, geochemical amnomalies in glacial material will often need to be evaluated as transported.

6.5 DIAMOND DRILLHOLE DEPOSIT MODELLING

In order to see if known mineralized zone on the Golden Bear property have a common geochemical signature, regularly spaced samples from five drill holes in each of the Grizzly, Bear Main, Kodiak B, Kodiak A and Ursa deposits were submitted for multi-element analysis. The drill holes were chosen such that both strike and dip extent of mineralization were represented. Drill hole plots for each element were generated that showed rock type and gold values on one side of the drillhole trace and histograms of the geochemical values on the other. Correlation matrices for each zone and basic statistics for each element were generated in GB-STAT.

Examination of the correlation matrices indicated that only a few elements showed a correlation with gold in any of the deposits. Te in the Ursa, Ag and Sb in the Bear Main and Fe, Fl, Ag and As in the Kodiak B were the only elements to have R values of greater than 0.5. This data is shown in Table 6.5-1 and correlation coefficients of greater than 0.5 for other elements are shown in Tables 6.5-2 and 6.5-3.

A visual examination of the drillhole histogram plots was then completed to see which elements were coincident with gold mineralization or with alteration envelopes. The results of this examination are shown in Table 6.5-4. A suite of elements including Ag, As, Hg, Sb and Te were noted to associated with gold values in each of the deposits. Several other elements were found in anomalous levels in only some of the zones and/or rocks types. Ca depletion, a feature noticed in the soil geochemistry, is evident in the Bear Main, Kodiak A and Ursa deposits. Fluorine is present in strongly anomalous amounts, in volcanic rocks only, in the Bear Main, Grizzly and Kodiak B deposits. Elements normally associated with volcanic, and not carbonate, rocks such as Cr, Cu, and Ni are also present in the carbonate hosted Kodiak A and Ursa deposits.

It should be noted that while the above trends are noticeable, several gaps are present in sample coverage down the drillholes and that often the hangingwall was not tested, therefore geochemical halo's or envelopes in this area may not have been detected.

Element	Bear Main Au g/t	Grizzly Au g/t	Kodiak B Au g/t	Kodiak A Au g/t	Kodiak A >1 g/t	Ursa Au g/t
FE%	0.20	0.03	0.64	0.12	-0.01	0.15
FL	0.35	0.31	0.51	0.25	0.16	0.09
AU	1.00	1.00	1.00	1.00	1.00	1.00
AG	0.55	0.41	0.61	0.32	0.09	0.23
AS	0.34	-0.00	0.59	0.08	-0.00	0.31
CA	-0.13	-0.13	-0.19	-0.26	-0.10	-0.15
CO	0.07	0.02	0.42	0.06	0.01	0.18
CR	0.04	0.15	-0.05	0.39	0.11	0.23
CU	0.08	0.00	0.42	0.14	0.02	0.17
HG	-0.02	0.24	0.16	0.10	-0.04	0.06
MG	-0.27	-0.22	-0.20	-0.17	-0.09	-0.08
MN	-0.29	-0.17	0.18	-0.20	-0.14	-0.05
NI	0.22	0.03	0.27	0.20	0.04	0.30
SB	0.55	0.33	0.48	0.12	-0.04	0.15
SC	-0.12	-0.09	0.35	-0.10	-0.10	-0.08
TE	0.44	0.24	0.13	0.47	0.25	0.51
SR	-0.22	-0.07	-0.00	-0.32	-0.16	-0.17
ZN	-0.04	-0.01	0.31	0.14	0.04	0.01

Table 6.5-1: Correlation coefficient (R) values for gold in Golden Bear deposits

Zone	Ag	As	Hg	Sb	Te	Mn	Ca	Other Anomalous Elements
Grizzly	X	X	X	X	W			Fl (volcanics only)
Bear Main	X	X	X	X	W	D	D	Fl (volcanics only)
Kodiak B	X	X	X	X	W	X		Ni, Fe, Fl (volcanics only)
Kodiak A	X	X		X	W	D	D	Cr, Sr(D)
Ursa	X	X	X	X	W		D	Cu, Ni, Cr, Fe, Sr(D)

X - anomalous W - weakly anomalous D - depleted

Table 6.5-4: Drillhole Geochemistry - elements associated with gold mineralization

#1	#2	Bear Main	Grizzly	Kodiak B	Kodiak A	Ursa
Ag	As			0.73		
Ag	Au		0.41	0.81		
Ag	Co					0.9
Ag	Sb			0.77		
Ag	Te			0.59		
As	Co	0.69		0.62	0.54	
As	Hg			0.59		
As	Ni	0.69		0.83	0.71	
As	Sc			0.51		
Au	Ag					
Au	As			0.64		
Au	Sb		0.71	0.59		
Au	Te			0.56		
Ca	Sr				0.5	
Co	Cu		0.93	0.81	0.81	
Co	Mn	0.57				
Co	Ni			0.78	0.72	
Co	Sb	0.87		0.92	0.81	
Co	Sc			0.51		
Cu	Ag	0.76	0.73	0.75	0.76	0.89
Cu	Ni				0.65	
Cu	Sb		0.61			
Cu	Sc		0.56			
Cu	Te	0.58	0.55	0.85	0.81	
Cu	Zn	0.75		0.58	0.68	
Fe	Ag	0.58		0.57		
Fe	As	0.61		0.92		
Fe	Au	0.68			0.5	
Fe	Co	0.59		0.56		
Fe	Cr	0.55				
Fe	Cu			0.67		
Fe	Fl	0.86		0.72	0.55	0.55
Fe	Mn	0.74	0.59		0.66	
Fe	Ni	0.6		0.63		0.56
Fe	Sb	0.74		0.82	0.76	
Fe	Sc			0.91	0.58	
Fe	Zn				0.56	
Fl	Ag	0.68		0.84	0.55	
Fl	As		0.68		0.63	
Fl	Co		0.87	0.92	0.73	
Fl	Cu			0.55		
Fl	Ni	0.75	0.89	0.79	0.76	
Fl	Sb	0.78				
Fl	Zn	0.8				
Fl	Au				0.69	
Fl	Sc					
Hg	Te					
Mn	Sr		0.55			
Ni	Sb	0.44			0.47	0.51
Ni	Sc					0.53
Ni	Zn	0.72		0.56		
Ni	Sr	0.57	0.85			0.57
Sb	Sc		0.53	0.57	0.52	
Sb	Sr				0.67	0.8
Sb	Te					0.5
Sc	Sr	0.58			0.72	

Table 6.5-2: Drillhole Correlation Coefficients R>0.50

#2	#1	Bear Main	Grizzly	Kodiak B	Kodiak A	Ursa
Fl	Ag			0.73		
Au	Ag		0.41	0.81		
Cu	Ag					0.9
Fe	Ag			0.77		
Ag	As			0.59		
Fl	As	0.69		0.62	0.54	
Au	As			0.59		
Fe	As	0.69		0.83	0.71	
Fl	Au			0.51		
Ag	Au					
Fe	Au			0.64		
Fl	Co		0.71	0.59		
Ag	Co			0.56		
As	Co				0.5	
Fe	Co		0.93	0.81	0.81	
Fe	Cr	0.57				
Fe	Cu			0.78	0.72	
Co	Cu	0.87		0.92	0.81	
Fl	Cu			0.51		
Fe	Fl	0.76	0.73	0.75	0.76	0.89
As	Hg				0.65	
Fe	Mn		0.61			
Co	Mn		0.56			
Co	Ni	0.58	0.55	0.85	0.81	
Fe	Ni	0.75		0.58	0.68	
As	Ni	0.58		0.57		
Cu	Ni	0.61		0.92		
Fl	Ni	0.68			0.5	
Ni	Sb	0.59		0.56		
Au	Sb	0.55				
Co	Sb			0.67		
Cu	Sb	0.86		0.72	0.55	0.55
Fl	Sb	0.74	0.59		0.66	
Ag	Sb	0.6		0.63		0.56
Fe	Sb	0.74		0.82	0.76	
Cu	Sc			0.91	0.58	
Sb	Sc				0.56	
Ni	Sc	0.68		0.84	0.55	
Fl	Sc		0.68		0.63	
Co	Sc		0.87	0.92	0.73	
As	Sc			0.55		
Fe	Sc	0.75	0.89	0.79	0.76	
Sc	Sr	0.78				
Mn	Sr	0.8				
Ca	Sr				0.69	
Ni	Sr					
Sb	Sr					
Sb	Te		0.55			
Au	Te	0.44			0.47	0.51
Cu	Te					0.53
Hg	Te	0.72		0.56		
Ag	Te	0.57	0.85			0.57
Fe	Zn		0.53	0.57	0.52	
Cu	Zn				0.67	0.8
Fl	Zn					0.5
Ni	Zn	0.58			0.72	

Table 6.5-3: Drillhole Correlation Coefficients R>0.50

Samples from a single drillhole on the Limestone Creek Fault were also submitted for multi-element analysis. Visual inspection of the data show that gold is correlated with As, Sb, P and mild Pb values. Anomalous levels of Cr and W, and more strongly anomalous Sb values are present within the Limestone Creek Fault Zone, but not intimately associated with gold values. It should be noted that these observations are based on a single gold intersection of limited length (4.57 metres) and therefore should be considered as preliminary for this part of the property.

6.6 GEOCHEMISTRY - CONCLUSIONS

Compilation and analysis of geochemical data from soil, soil profile and drillhole sampling has outlined a coincident suite of elements that may be useful as a guide to locating gold mineralization on the Golden Bear property. The elements that comprise this signature include anomalously high quantities of Ag, As, Hg, Sb and Te, and anomalously low quantities of Ca, Mg and Sr. Additional elements that may be anomalous locally, often based on rock type, include Fe, Fl, Cr, Cu and Ni.

While this suite of elements will help focus exploration efforts, it should be kept in mind that the single best indicator of gold mineralization on the Golden Bear property has been the presence of anomalous quantities of gold itself. The prospecting of areas anomalous in gold has led directly to the discovery of both the South and C & C Zones. These zones are not necessarily anomalous in all elements of the core suite listed above. In particular, the C & C Zone is only anomalous in gold. This may be an indication of glacial transportation. In addition some elements, while showing up well in the drill hole geochemistry, do not appear in anomalous quantities in soil. Ag would be an example of this.

This is not meant to underestimate the usefulness of soil geochemistry in defining exploration targets. In particular the pathfinder elements, As, Hg and Sb, are useful for this purpose. The Limestone Creek Fault drilling, which encountered gold mineralization in one hole, was proposed based on a pathfinder element anomal;y and a coincident geophysical conductor.

6.7 GOLDEN BEAR ASSAY LAB QUALITY CONTROL PROGRAM

In 1996 North American Metals instituted a quality control program for samples processed in the on site assay lab at Golden Bear. The goal of this program was to continually monitor the quality of lab results for all exploration and definition drilling samples and to remedy any problems as they occurred. The program consisted of running standards, blanks and duplicates through the lab with frequencies dependent on the nature of the samples. All standards were prepared on site from available materials and sent out to four additional laboratories for initial grade determination. The program ran successfully and is intended to continue in the next season. The following report contains some suggestions for an improved program in the coming years.

6.7.1 GOLDEN BEAR MINE ASSAY LAB - ANALYTICAL PROCEDURES

All rock samples assayed at the mine site assay lab were assayed for gold using standard fire assay techniques:

- samples are dried, crushed and ring milled to 85% -200 mesh,
- one assay ton is fused at 1980°C and the resulting lead button is cupelled at 1760°C
- dore bead is then parted in 20% HNO_3,
- parted bead is washed, dried, annealed and weighed,
- final weight is recorded, multiplied by 34.286, and reported as grams per tonne.

Assays are not considered accurate if they are below 0.17 grams per tonne.

6.7.2 PREPARATION OF STANDARDS

Three standards of different grades, blank, 1g/t and 3g/t, were prepared. Preparation of these standards took place on site. Kodiak A reject material of known grade was gathered to create the 1g and 3g standards. This material was homogenized thoroughly, pulverized and then screened. The resulting standard consisted of material which passed -140 mesh and was then subject to additional homogenization. The blank was made from barren carbonate, collected near Limestone Creek, which was crushed in the jaw crusher to 1.5". All other processing was done at time of assaying.

A round robin analysis was conducted at five laboratories, Chemex, Acme, Bondar Clegg, Min-En and the on site lab at Golden Bear. Five samples of each standard were sent to each lab and the results are summarized in the following graphs.

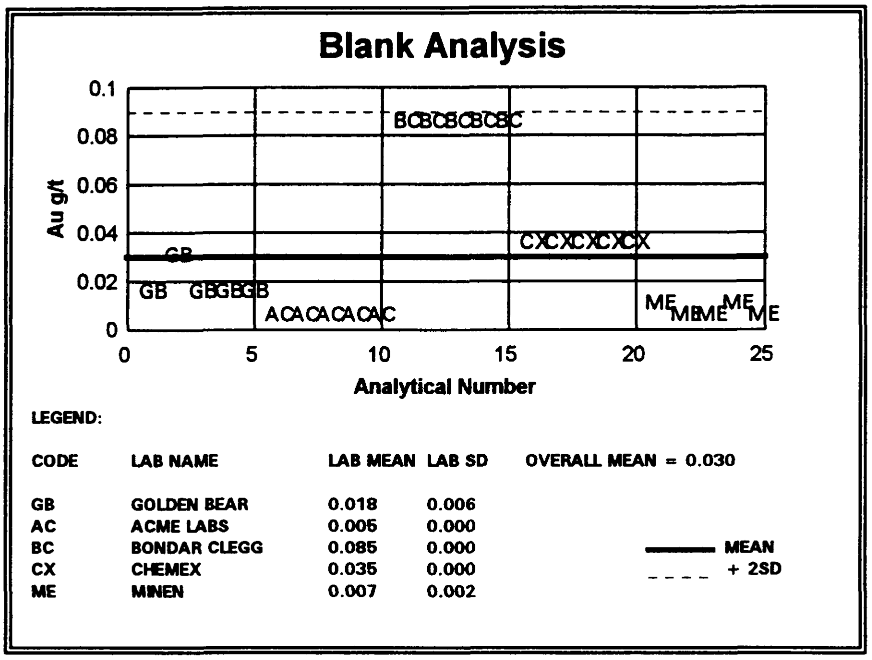
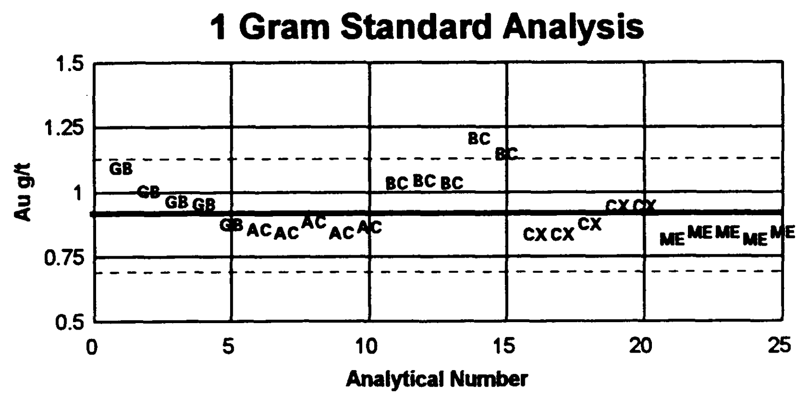


Figure 6.7-1: Round Robin Blank Analysis

The variance seen between labs for the blank analysis is a result of the different detection limits used. All samples from Chemex, Acme and Bondar Clegg came back below their respective detection limits, which accounts for the lack of variation (sd = 0.000). For graphing purposes any result below detection limit was entered as one half detection value. The following table contains detection limits used by each of the labs. No anomalous gold values were returned by any of the labs for this blank material.

LAB	DETECTION LIMIT	GRAPHED VALUE
GOLDEN BEAR	0.03	0.015
CHEMEX	0.07	0.035
ACME	0.01	0.005
MINEN	0.01	0.005
BONDAR CLEGG	0.17	0.085

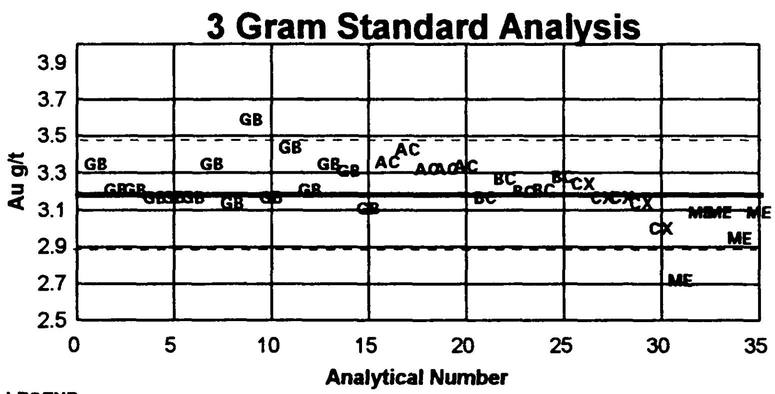
Table 6.7-1: Detection Limits (g/t)



LEGEND:

CODE	LAB NAME	LAB MEAN	LAB SD	OVERALL MEAN = 0.9152
GB	GOLDEN BEAR	0.964	0.072	
AC	ACME	0.844	0.015	
BC	BONDAR CLEGG	1.078	0.070	—— MEAN
CX	CHEMEX	0.872	0.050	- - - - +/- 2SD
ME	MINEN	0.818	0.015	

Figure 6.7-2: One Gram Standard Round Robin Analysis



LEGEND:

CODE	LAB NAME	LAB MEAN	LAB SD	OVERALL MEAN = 3.190
GB	GOLDEN BEAR	3.240	0.128	
AC	ACME	3.330	0.040	
BC	BONDAR CLEGG	3.260	0.070	—— MEAN
CX	CHEMEX	3.124	0.079	- - - +/- 2 SD
ME	MINEN	2.968	0.145	

Figure 6.7-3: Three Gram Standard Round Robin Analysis

Results from this analysis demonstrate the variability between labs. The following table provides a summary comparison between the different labs.

	3 Gram	1 Gram
High Lab Au g/t	Acme = 3.33	Bondar Clegg = 1.08
Low Lab Au g/t	MinEn = 2.97	MinEn = 0.82
Percent Difference	10.8%	24.1%

Table 6.7-2: Round Robin Analysis Results Summary

This information is important to consider when choosing a lab. A greater varience is expected for lower assay values but even the difference in the three gram standard demonstrates the potential for a 10% difference in ore reserve estimation.

The on site lab at Golden Bear sits in the middle of the five labs for the three gram standard at only 1.5% above the overall average. For the one gram analysis Golden Bear was 5% higher than the overall average and the second highest of the five labs. For more details see the summaries below graphs 6.7-2 and 6.7-3.

6.7.3 QUALITY CONTROL PROGRAM

Slightly different programs were run for the Kodiak B definition drilling, the East Low Grade stock pile definition drilling and exploration drilling.

6.7.3.1 KODIAK B

One blank, one three-gram standard and one duplicate sample were included in every twenty samples. This ensured that there was a measure of quality in every lab charge. The duplicates were randomly chosen by pre-labelling the sample tags. Check assays were also run by the lab for all assays greater than 3 g/t. Also one reject sample in five which ran greater than 4.5 grams per tonne was sent to Chemex for an external check for ore reserve estimation. The cut off grade being used for this deposit is 4.5g/t. The following graph contains only internal duplicate and check assays. External checks are summarized in the following table.

Sample Number	Au g/t Golden Bear	Au g/t Chemex
26969	7.95	7.37
30168	4.59	4.66
30251	14.13	17.21
30258	5.90	5.76
30295	21.74	24.07

Sample Number	Au g/t Golden Bear	Au g/t Chemex
30303	35.55	21.63
30363	31.95	29.90
30396	4.56	4.46
30436	13.17	10.32
30465	5.21	4.87
30507	8.19	9.81
30625	6.38	4.15
30784	15.4	13.23

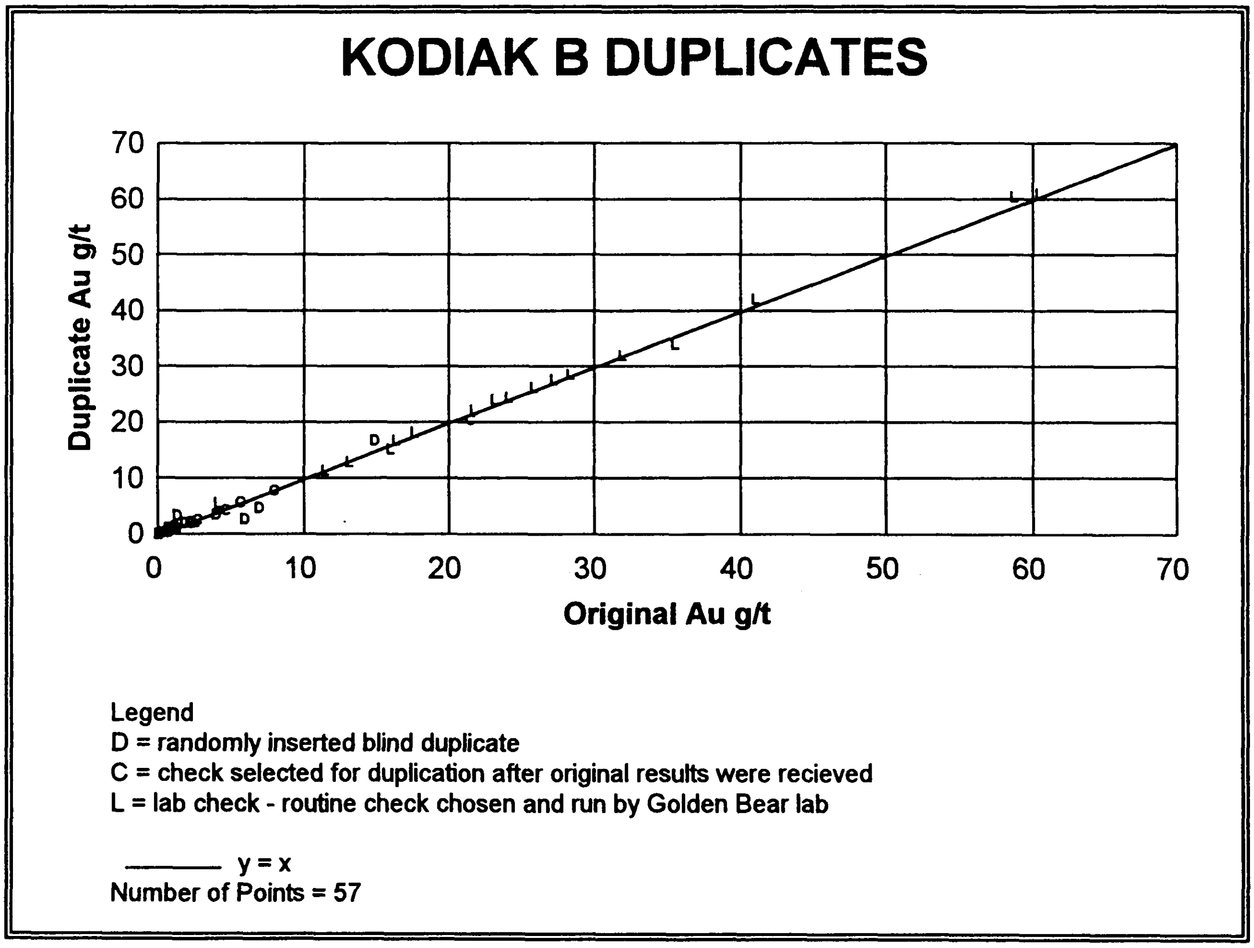


Figure 6.7-4: Kodiak B Duplicate Analysis

6.7.3.2 EAST LOW GRADE STOCKPILE

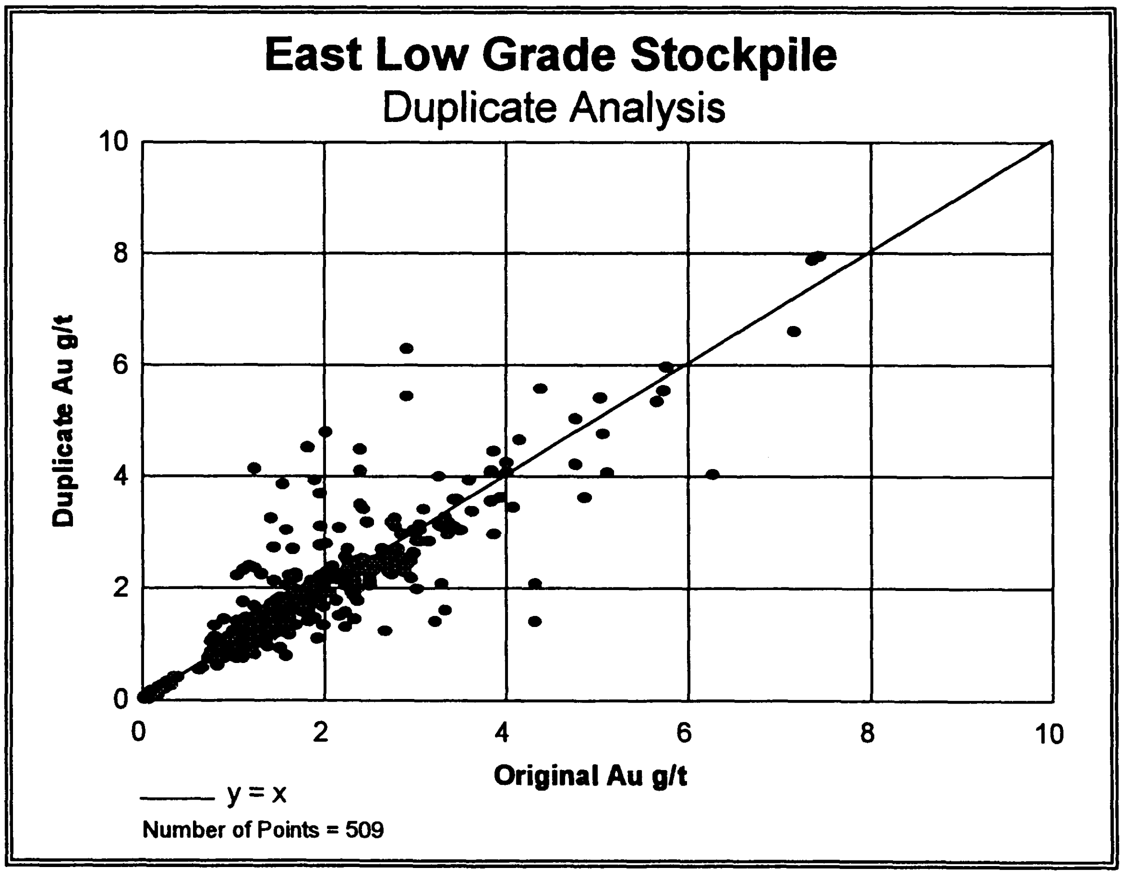
One blank and one gram standard were included in every twenty samples. Every sample grading more than 0.75 g/t was duplicated from reject material and one in five samples grading over 0.75 g/t were sent to Chemex for an external check. The following graph contains only internal data. External check data is summarized in the following table.

Golden Bear (original, fire assay)		Chemex (duplicate, AA)	
Sample Number	Gold (g/t)	Sample	Gold (g/t)
33801	1.06	36150	1.20
33826	1.78	36151	2.55
33845	1.75	36152	1.65
33902	1.75	36153	1.90
33963	0.75	36154	1.00
33990	3.84	36155	7.50
34002	0.99	36156	1.65
34012	2.67	36157	1.25
34051	1.41	36158	2.05
34066	1.27	36159	1.4
36930	3.29	36161	3.10
36944	0.75	36163	1.00
36969	1.71	36164	2.10
37002	0.86	36165	1.20
37075	0.93	36166	1.05
37133	1.06	36169	1.10
37170	1.03	36170	0.31
35908	2.54	36171	3.20
35925	0.82	36172	1.00
35986	5.76	36173	7.80
35997	1.95	36174	1.90
Average:	1.81	Average:	2.19
Percent Difference:		17%	

Chemex results were higher than Golden Bear for 76% of the samples. Chemex also had an average value 17% higher than Golden Bear's. This may be due in part to the use of AA verses fire assay for gold. In the round robin analysis conducted for the standards Chemex had a lower average value than Golden Bear. Details of this round robin analysis are contained in section 6.7.2.

In holes EG-1 to EG-7, every sample was duplicated. From this information we noticed considerable scatter appeared for values grading 0.75 or higher. After experimenting with several methods we determined that this scatter was effectively reduced by pulverizing the samples twice (doubling the pulverizing time did not have the same effect), or by crushing to one tenth inch before splitting and pulverizing once. Each of these processes seemedto effectively free up the gold and gave reasonably repeatable results. The gold assay values in ore from the Bear Main deposit were nuggety and a similar case in this low grade stockpile was to be expected.

All samples from holes EG-8 to EG-61 were crushed to one tenth inch, split using the Jones splitter and then pulverized in a ring mill for 60 seconds. Every sample in holes EG-8 and EG-9 was duplicated and in holes EG-10 to EG-61 every sample grading over 0.75g/t was duplicated. It is the data from holes EG-8 to EG-61 that is presented in the following graph (Figure 6.7-5) .



A two-tailed, paired sample T-test was run to test the null hypothesis that the difference between the two sets of data, original and duplicate gold values, was equal to zero.

HO: $\mu d = 0$

HA: $\mu d \neq 0$

n = 509 v = 508 $\bar{d} = -0.033$ $S_d = 0.528$

$S_{\bar{d}} = 0.0234$

$t = \bar{d}/S_{\bar{d}} = -0.033/0.0234 = -1.41$

$t_{(0.05),500} = 2.820$*

$0.005<P(|t|\geq 2.820)<0.01$

therefore do not reject the null hypothesis

*d_i is the set of values corresponding to the differences between original and duplicate gold assay values for each duplicate pair.
*$\bar{d}$ is the average of the differences.
*n is the number of datapoints.
*v is the degrees of freedom = n-1.
*S_d is the standard deviation for the set of d_i values.
*$S_{\bar{d}}$ is the standard error for the set of d_i values.
*$t_{(0.05),500}$ is the critical t value for a 95% confidence interval and 500 degrees of freedom.
* the critical t value for v=508 is not listed in the table of critical values used (Zar, 1984). However, the $t_{(0.05),500}$ value is more conservative than the value for v=508 and therfore if the critical t value for v=508 were available the test conclusion would be the same)

The absolute value of the resulting t value is less than the critical value. This result means the null hypothesis is not rejected and supports the hypothesis that the two data sets are equal.

The data for this T-test is located in the Quality control qpro spreadsheet (G:\data\qpro\quality.wb2, page ELGS Duplicates)

6.7.3.3 EXPLORATION DRILLING

In all exploration drill holes, blanks and one gram standards were included every forty samples. No random duplicates were included but check assays are routinely done by the lab for samples grading over 3g/t and occasional blind duplicates were included after the initial assay results had been examined.

The two areas outlined in the graph below are evidence of lab contamination problems in the Golden Bear Lab. The points lying along the x-axis are obvious contamination in which initial assay of up to 3.29g/t gold returned duplicate near or below detection limit. These duplicate results and their inferred cause are discussed in detail insection 6.7.4 Results and Recommendations. The box marked possible lab contamination covers samples which graded notably higher in duplicate than original assay. The reason for a less pronounced bias with these samples is simply that very few samples grading below one gram were chosen for duplicate analysis. Therefore contamination in the lab which affected duplicate samples is less obvious than that which affected barren original samples. A half gram of contamination affecting a 0.10g sample is a percent increase of 500% whereas 0.50g contamination of a 2.0g sample is only an increase of 25%.

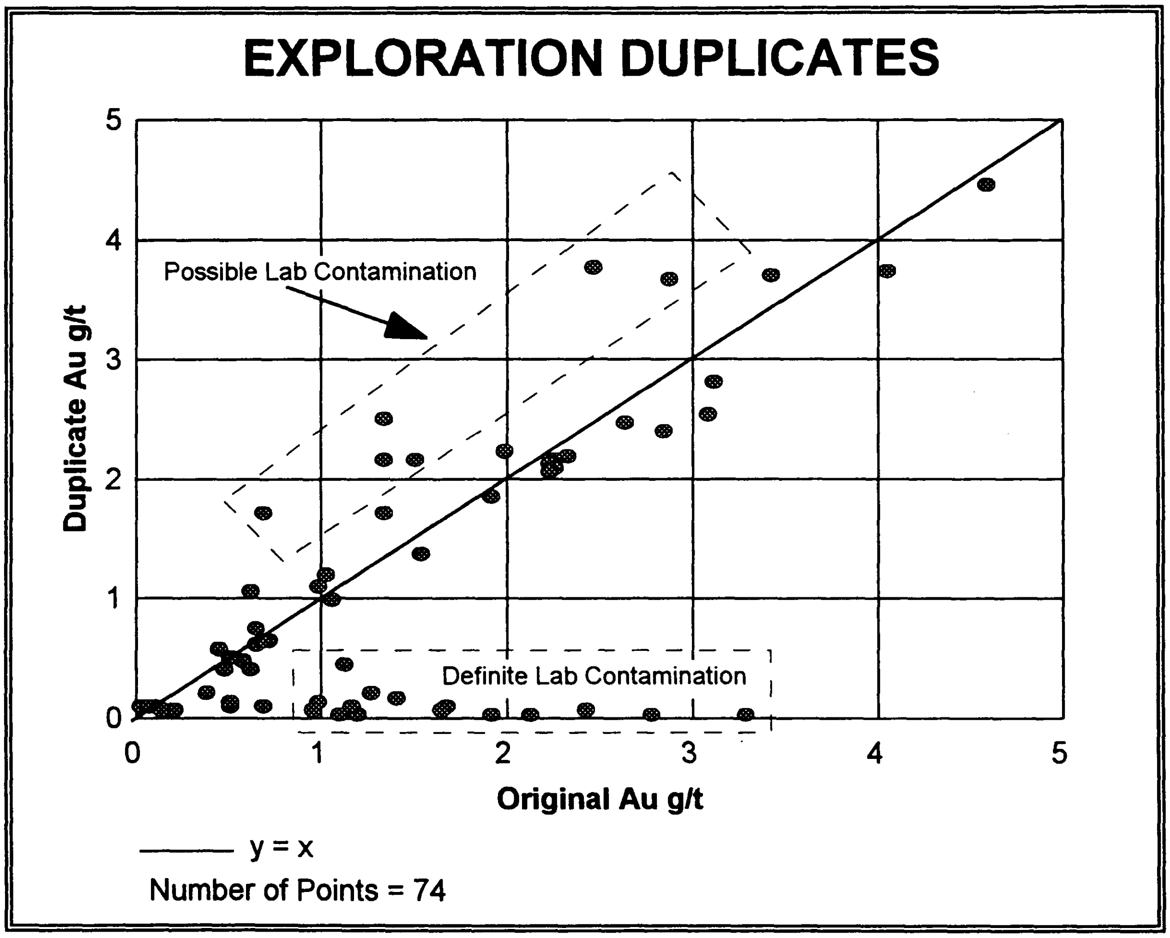


Figure 6.7-6: Exploration Duplicate Analyses

6.7.3.4 BLANKS AND STANDARDS SUMMARY

As assay results were received, the blank and standard values were entered into a spread sheet and graphed. The following three graphs summarize all the standards data collected this season. Overall results were consistent with expectations, although some anomalous results occurred which could not be explained as bookkeeping errors. Anomalous results are dated.

6.7.4 RESULTS AND RECOMMENDATIONS

As a result of the 1996 quality control program some bookkeeping and ordering errors were caught and corrected. Also, anomalous gold in blank samples combined with some inconsistent duplicate results indicated that contamination was occurring in the lab. Several samples, summarized in Table 6.7.3, had initial grades of 0.51 g/t to 3.29 g/t, but duplicate gold values at or near detection limit! This problem occurred throughout the season and in RC as well as DH holes. Once this was noticed the pulps from some of the initial samples were rerun in most cases also returning no gold values.

The fact that both the rerun from pulp and reject returned no gold values indicates that contamination is occuring sometime after the samples are pulverized in the ring mill. This removes the crushing, splitting and pulverizing steps as possible sources of contamination. The most likely cause for this late stage contamination is in the reuse of crucibles. Crucibles are routinely reused in the lab although any crucibles containing an assay of greater than 3 g/t should be thrown out. It is possible that this was not being done. Another possible source of this error would be in parting the silver from the gold. It is the opinion of the exploration staff that sufficient care and attention are taken by lab personnel during parting to make this an unlikely source of repeated error.

Contamination will be more of a problem in 1997 as both production and exploration samples will be routinely run through the lab. Tight quality control is critical for production, operating at a 1g/t cut off and a very high turnover rate for samples, to prevent waste from ending up on the heap leach pad. It is also strongly suggested that the exploration department has its own crucibles which are to be used only for exploration samples.

Table 6.7-3: Problematic Duplicate Results, Evidence of Lab Contamination

Hole #	Original Au g/t	Duplicate Au g/t		
		From Reject		From Pulp
T96RC321	1.68	0.07	0.10	
T96RC321	1.65	0.1	0.07	
T96RC339	1.92	0.03		
T96RC344	3.29	0.03	0.03	0.03
T96RC344	1.2	0.03	0.10	0.10
T96RC344	2.13	0.03	0.07	0.07
T96RC344	2.43	0.07	0.03	0.03
T96RC344	1.10	0.03	0.03	0.03
T96RC344	2.78	0.03	0.03	0.03
T96DH362	2.67 (blank)	0.03		0.00
T96DH362	0.99	0.62		0.14
T96DH362	0.51	0.07		0.10
T96DH362	1.17	0.07		0.10
T96DH362	0.51	0.17		0.14
T96DH362	0.96	0.07		0.07
T96DH362	1.27	0.10		0.21

This years program was very much a learning experience for both geologists and lab personnel. Some improvements could be made to run a more effective program in coming years involving greater cooperation between exploration staff and the lab. A geologist in charge of the QC program should be on site at all times. This may mean having two people who work opposite rotations and between whom there is consistent and thorough communication.

In order to recognise and correct bookkeeping errors there must be a blank, a standard and a random duplicate sample in each lab charge. It is by comparing the standard results to duplicate results from the same charge that a run which has been entered backwards can be recognised. It would be helpful if the results received from the lab could be labelled according to oven charge. This way the person in charge of quality control can examine each lab charge individually and if errors can not be accounted for as bookkeeping mistakes the entire charge should be rerun from reject.

Ideally all blanks standards and duplicates should be blind to the assayer. This is very difficult at Golden Bear because all our work is being done on site and the assayer becomes very familiar with the materials he is working with. The assayer generally does all the bucking and therefore knows the contents of each oven charge. The one and three gram standard material has passed a -140 mesh and is therefore easily recognised by lab personnel. Occasionally in 1996 standards and blanks were set aside and run all together which completely defeats the purpose of including them. The assayer must know to include these samples in the stream as they are received.

In 1996, duplicates of drill core were being taken from the reject but should ideally be taken from the core in order to test for any sampling bias at the splitting stage. This also ensures that the duplicates are blind to the assayer who can easily recognize reject material because of the crush size. Core can either be quartered or both haves of the core can be assayed leaving no core in the core box for one out of every 20 metres.

During the 1996 field season no quality control was done for field samples. It is recommended that this be done in future. In soil sampling, prospecting and trenching programs any anomalous value is likely to be followed up. If a lab result is contaminated and not caught money may well be spent doing follow up work on an erroneous value. It would be easy to duplicate trench, soil and prospecting samples in the field and even feasible to have one of the core splitters go through the samples and insert standards and blanks into the stream before they are dropped off at the lab.

An example of this occured in 1996 when contaminated assay results from a soil profile lead to a day of trenching with the back-hoe at a cost of $120 per hour. The adjacent soil pits yielded no significant values and so the original soils were reassayed from pulps. The check assays came back with no significant gold and an external check ran at Northern Analytical Laboratories in Whitehorse gave the same results. The initial contamination would have easily been spotted in the blank and duplicate had these been incuded.

These suggestions may imply a lot of extra work and cost but once a system is in place and understood by everyone it becomes an efficient routine.Costs are negligible compared to the potential cost of following up on misleading results. One misplaced drill hole can cost on the order of $30,000 and mining waste material could cost even more.

Following this report is an outline for a quality control program based on Barry Smee's suggestions and my experience with the program at Golden Bear in 1996.

Quality Control Program Outline

1. Prepare Standards - see instructions next page

2. Label Tags - sample tags should be labelled in advance. A rubber stamp would be a quick way to label them. Stamp one in twenty with blank, standard and duplicate so that the sample prep crew knows to insert them. If you are going to run a different frequency of QC samples for different projects label the tags accordingly and make sure everyone knows to take tags from the right piles for different types of sampling. It is ideal to have one blank, one standard and one duplicate in every oven charge.

3. Duplicates - should be taken at sample site, ie. in the field (trench, soils, prospecting) or when core is split.

4. Results - there should be one person on site at all times when the lab is running who's job is to monitor the QC results as they come in. QC should be checked before anything is done with the received data to prevent decisions being made on erroneous results. If a mistake is noticed first attempt to solve it by looking for mistakes in ordering or in data entry in the lab. If the error cannot be easily explained then the entire lab charge should be rerun from reject.

5. If a contamination problem is found, exploration and lab personnel should work together to identify and correct the problem as soon as it is discovered.

References

Zar, Jerrold H.,1984. Biostatistical Analysis. Second Edition. Prentice Hall inc., 1984. Pp 152-154.

G;\ DATA\ QUALITY.WPD

6.8 Diamond Drill Hole vs. Reverse Circulation Drilling Test

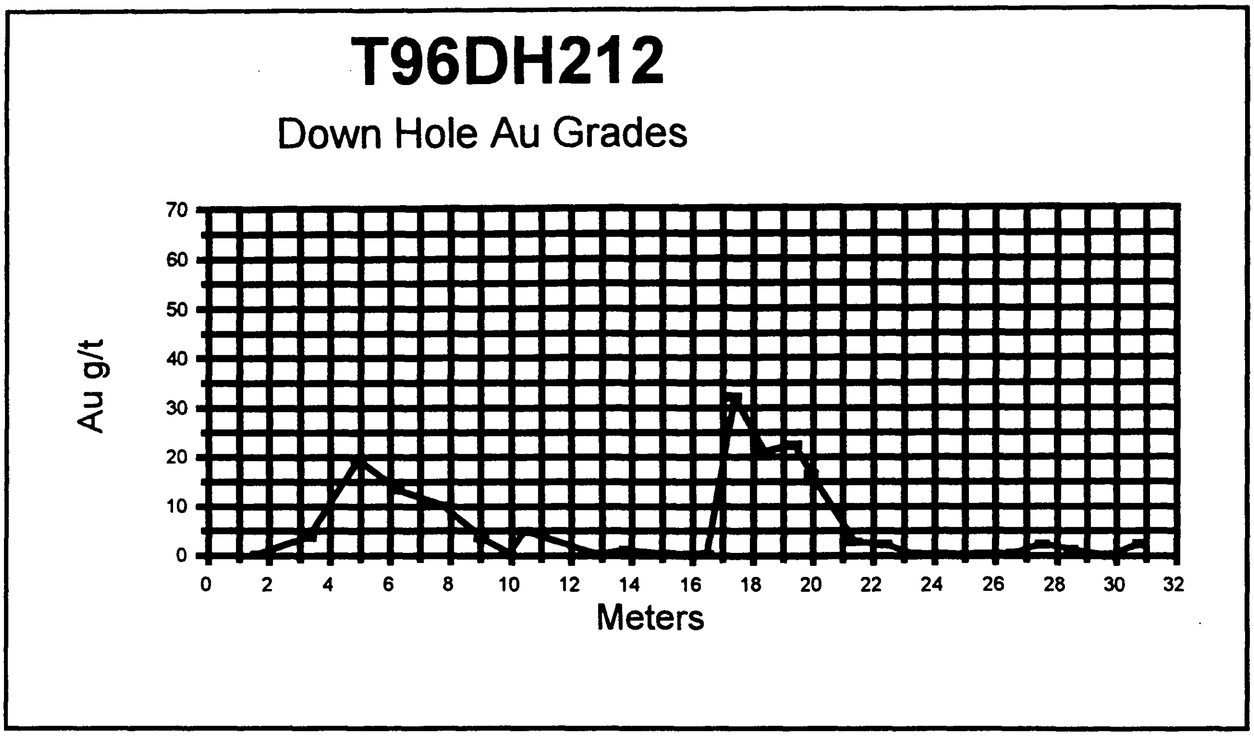
During 1996, RC drilling was instituted for the first time as a prospecting method for rapidly evaluating targets early in the season. It was designed as a test of the procedure to evaluate it's cost effectiveness when compared to historical diamond drilling efforts. RC drilling was used in 1992 as a method of getting through ± 200' of overburden and preparing a hole for HQ diamond drilling.This section is a discussion of the results of twinning a RC hole with a DDH hole in the Kodiak A Deposit. The purpose of the hole was to examine the relationship of the gold recovery using the two different methods of drilling.

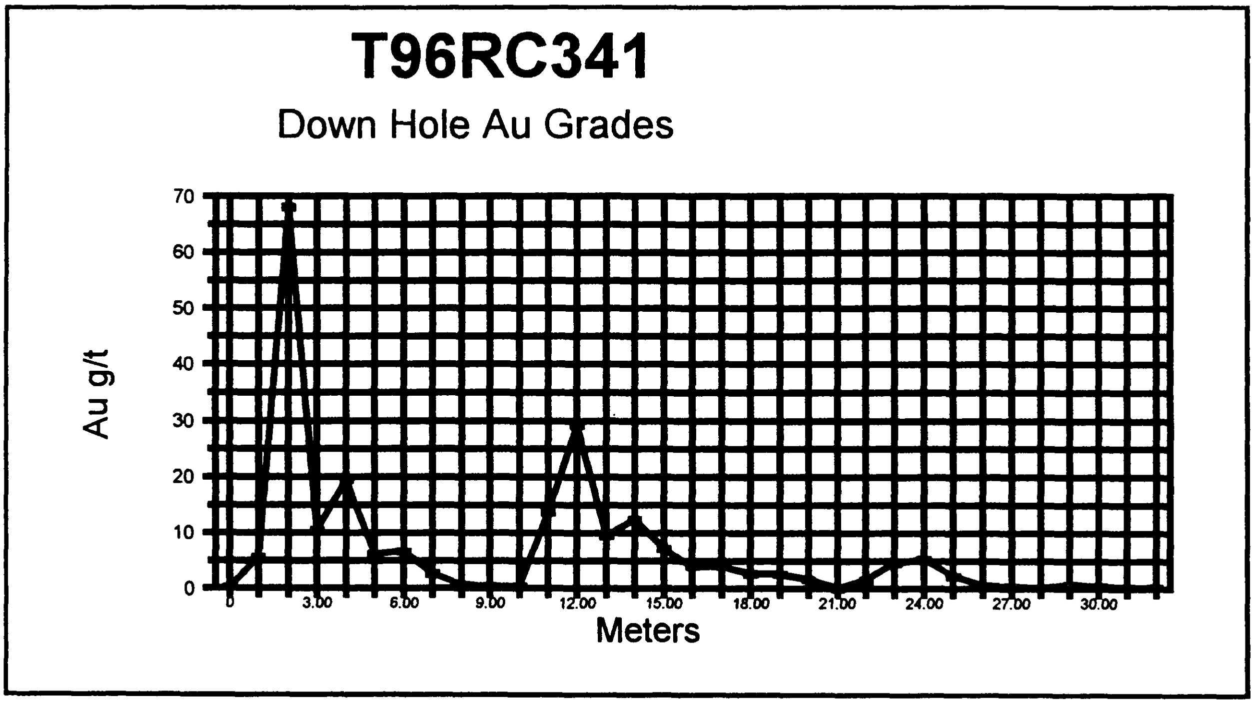
The RC drill was collared on the 1935 bench of the Kodiak Pit on July 9, 1996. It was placed such that a hole would be drilled parallel to diamond drill hole T94DH212 on Section 700+40 which was drilled from original topography in January of 1994. Both holes were surveyed in using minesite instruments and correctly entered in the database.A plot of the two holes was generated by PCX software and is displayed on the following page. The two holes correlate well with the beginning of the mineralization within error expected of mineralization and survey control.

Downhole plots of the mineralization display similar bimodal ore grade intercepts with the difference residing in the length of the ore intercept being longer in the RC hole. This was the major objective of the test: was RC drilling giving a down hole "bleeding" or "placering" in the drill hole? At first glance, the results would indicate that both were true. Spatial offsetting of the mineralized intercepts in the two holes may be due to either survey control, mineralization being fracture controlled at an oblique angle to intercept or both.

If it is assumed both the zones are spatially the same, then the following graphs illustrate the down hole bleeding of mineralization in the two zones (see following page). The table below illustrates the effect on ore reserves if the blocks surrounding the drill holes were estimated using a 10 metre radius zone of influence (polygonal):

	Uncut				***Cut to 20 g/t Au***			
	Upper Zone		Lower Zone		*Upper Zone*		*Lower Zone*	
	Au g/t	Metres	Au g/t	Metres	*Au g/t*	*Metres*	*Au g/t*	*Metres*
RC341	16.97	7.00	6.68	15.00	*10.11*	*7.00*	*6.07*	*15.00*
DDH212	10.27	7.39	14.96	5.90	*10.27*	*7.39*	*12.50*	*5.90*
RC tonnes	1750.00		3750.00		*1750.00*		*3750.00*	
DDH tonnes	1847.50		1475.00		*1847.50*		*1475.00*	
RC total oz.	954.90		805.47		*568.89*		*731.91*	
DDH total oz	610.09		709.52		*610.09*		*592.85*	
RC/DDH tonnes	-5%		154%		*-5%*		*154%*	
RC/DDH oz	57%		14%		*-7%*		*23%*	





High grade assays (>10 g/t) in RC hole 341 were re-assayed with near identical values indicating that a strong nugget effect is not present. It is suspected that due to the breccia type nature of the mineralization, collapse or shaking loose of the breccia downward into the hole would cause a bleeding effect of grade down hole. The RC drill also will tend to grind loose material into a fine powder whereas diamond drilling results in poor recovery in these areas. This "powdering" may be the cause of a placering effect in high grade zones although Kodiak A gold is generally less than 20 microns which argues against a gravity differential.

RC drilling results in a much larger sample than diamond drilling which is an advantage. The average weight of an RC sample can be anywhere from 5 kg to 50 kg depending on recovery. This variance in sample size did not effect grade in the East Low Grade Stockpile where very strict measurements were kept, but the material was of a completely different nature (ROM vs. bedrock).

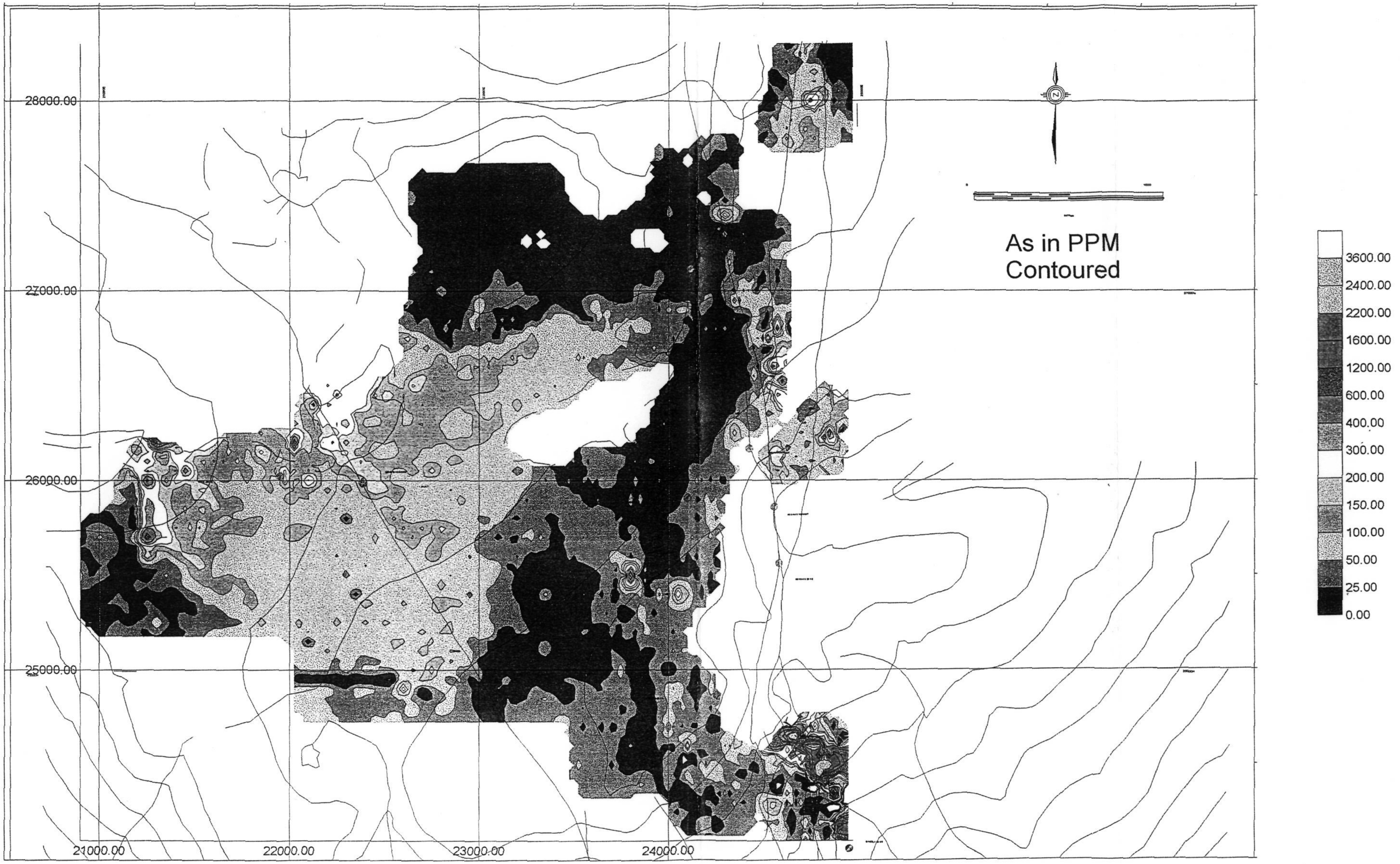
In summary, RC drilling had a dramatic change in both grade and tonnage effects on the Kodiak A twin hole test. Both tonnage and grade would have been dramatically changed if RC drilling was used on the Kodiak A deposit. This begs the question of which is accurate. The true answer will be known after reconciliation on the Kodiak A mining but an indicator is provided by the grade and tonnage of the 1940 bench is very close to predicted grade and tonnage yielded by diamond drilling.

The test serves as an indicator for a high degree of caution when using RC drilling on any project but in particular as a reserve tool on Golden Bear projects. During 1996, RC drilling was used as a prospecting tool where the program was looking for the presence or absence of gold in a variety of structures. Any follow up drilling was done by diamond drill. As a prospecting tool it was adequate, allowing for numerous areas to be tested in a relatively brief period of time. The cost was similar or greater per metre than drilling HQ core and as such the primary advantage was speed.

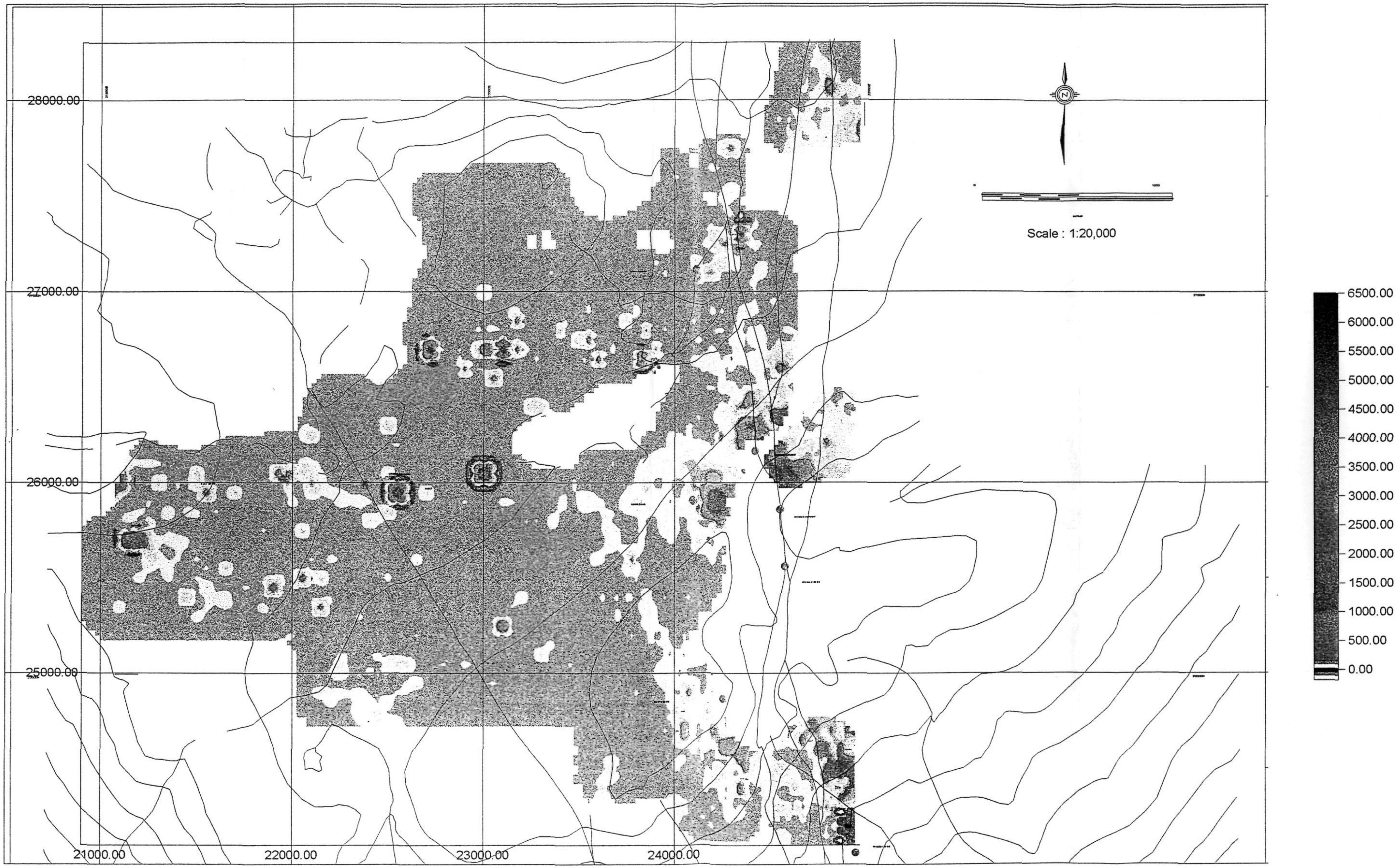
The resulting loss of information using RC and the poor correlation of gold values coupled with the comparable costs make this a poor choice for exploration at Golden Bear. In it's defence, it should be said that a better drilling contractor could be instrumental in reducing costs.

If RC drilling is attempted at Golden Bear in the future, a very strict quality control test program must be instituted before any of the results can be used in ore reserve calculations.

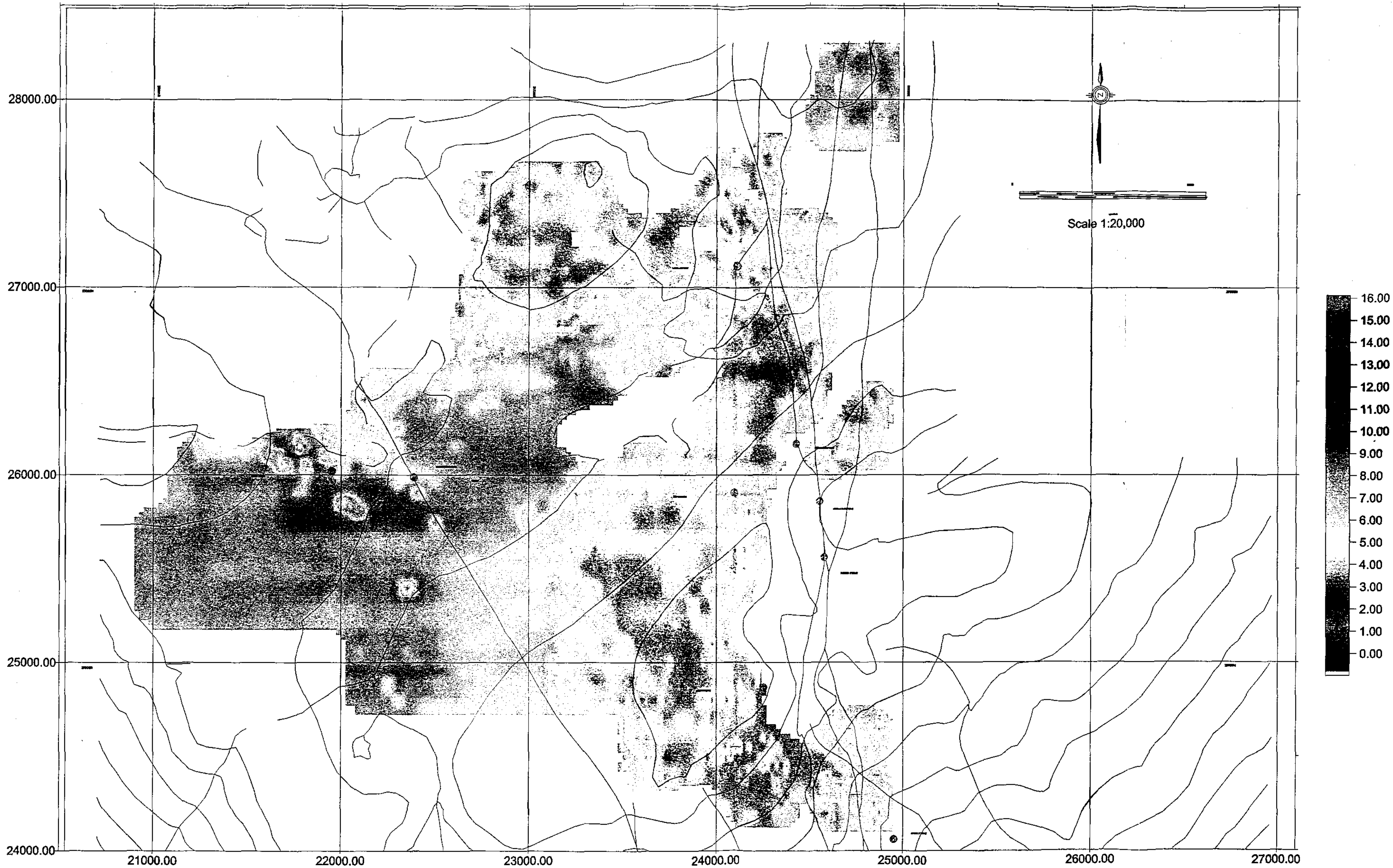
g:\96report\section6\wp_qpo\sect6.8.wpd
g:\96report\section6\geochem\ddhvsrc.wb2
g:\96report\section6\geochem\rc_vs_ddh.dwg



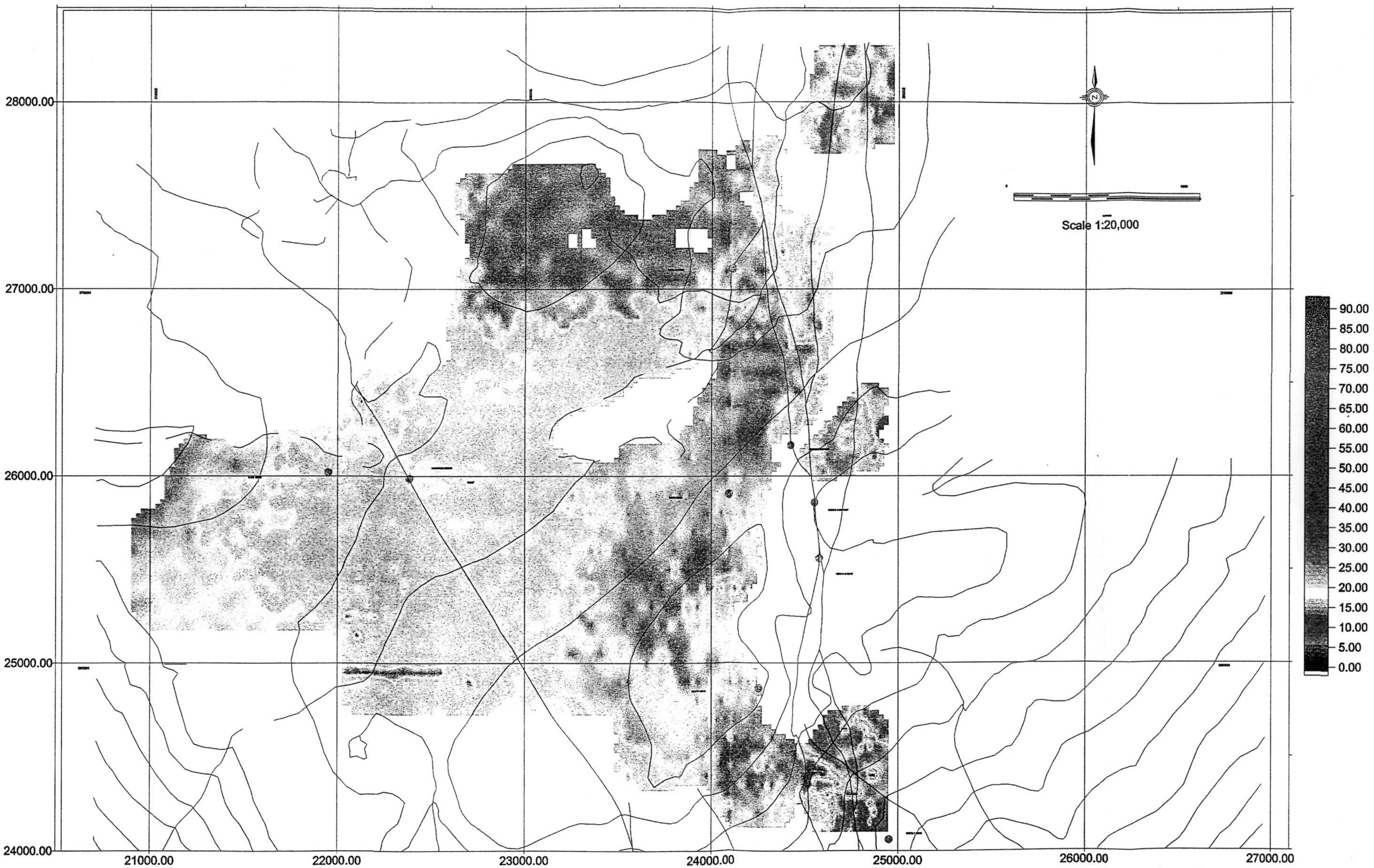
North American Metals Corp.
1996 Soil Geochemistry Compilation
As in PPM



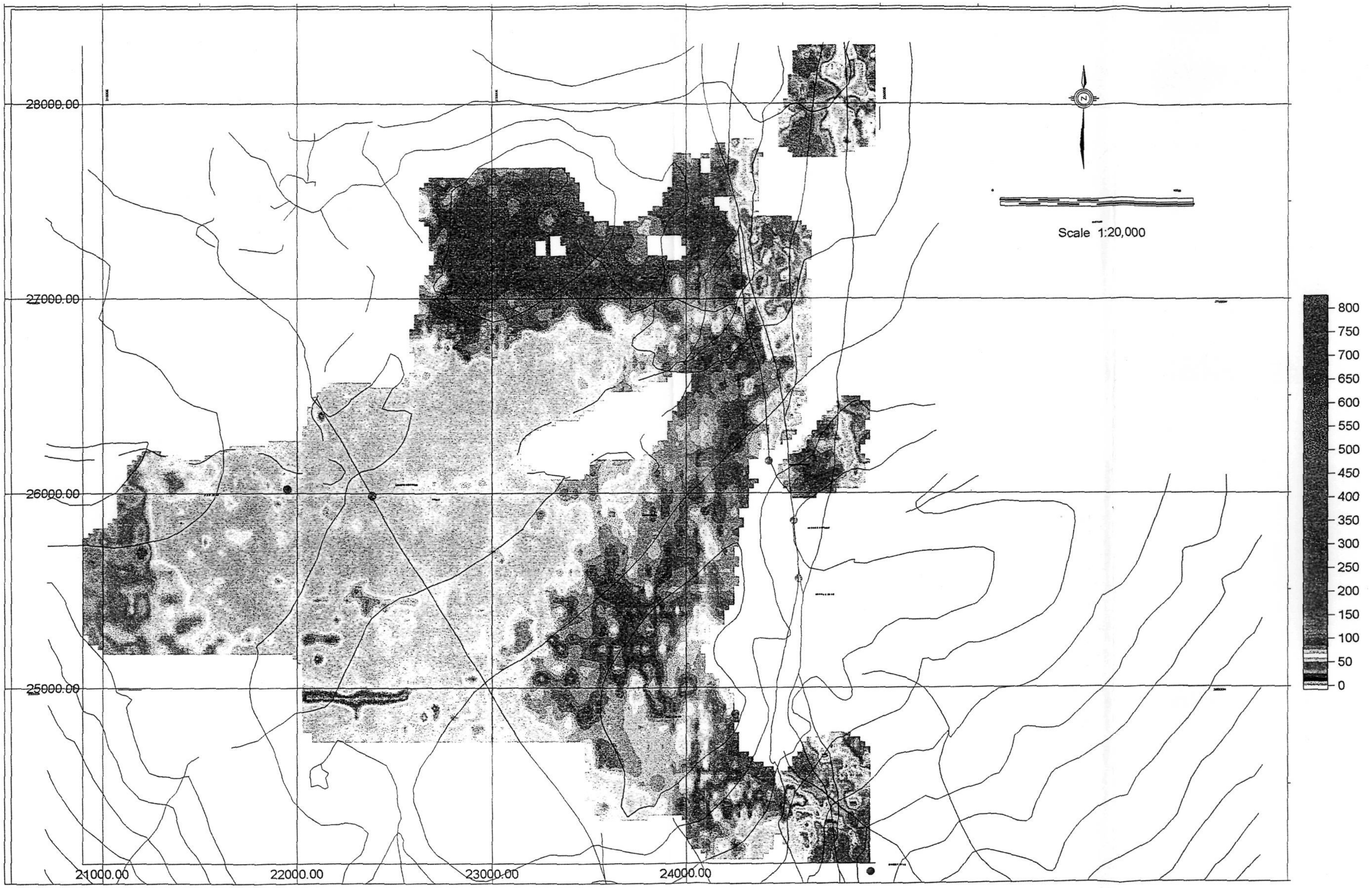
NORTH AMERICAN METALS CORP.
1996 SOIL GEOCHEMISTRY COMPILATION
AU IN PPB



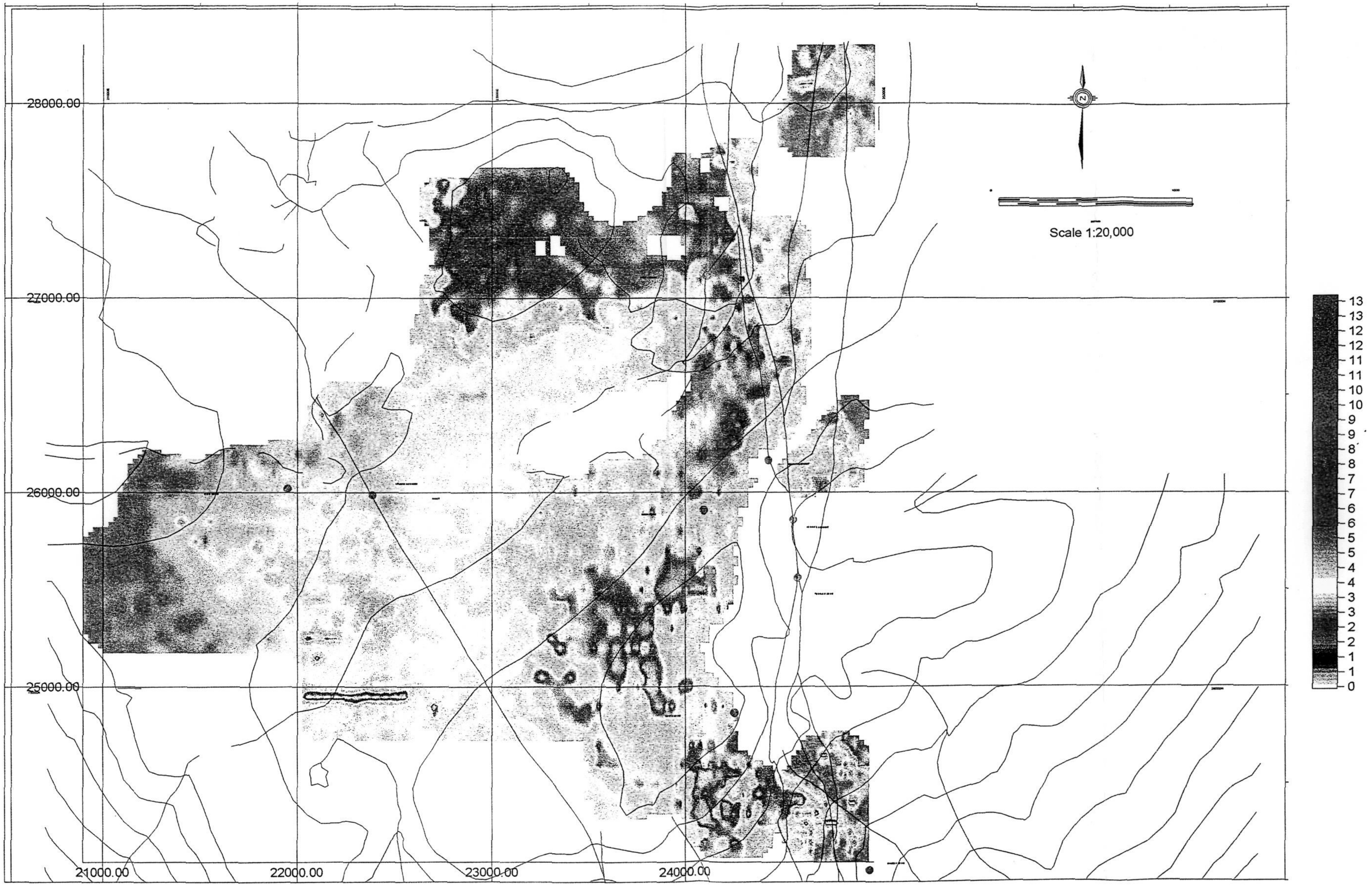
North American Metals Corp.
1996 Soil Geochemistry Compilation
Ca in %



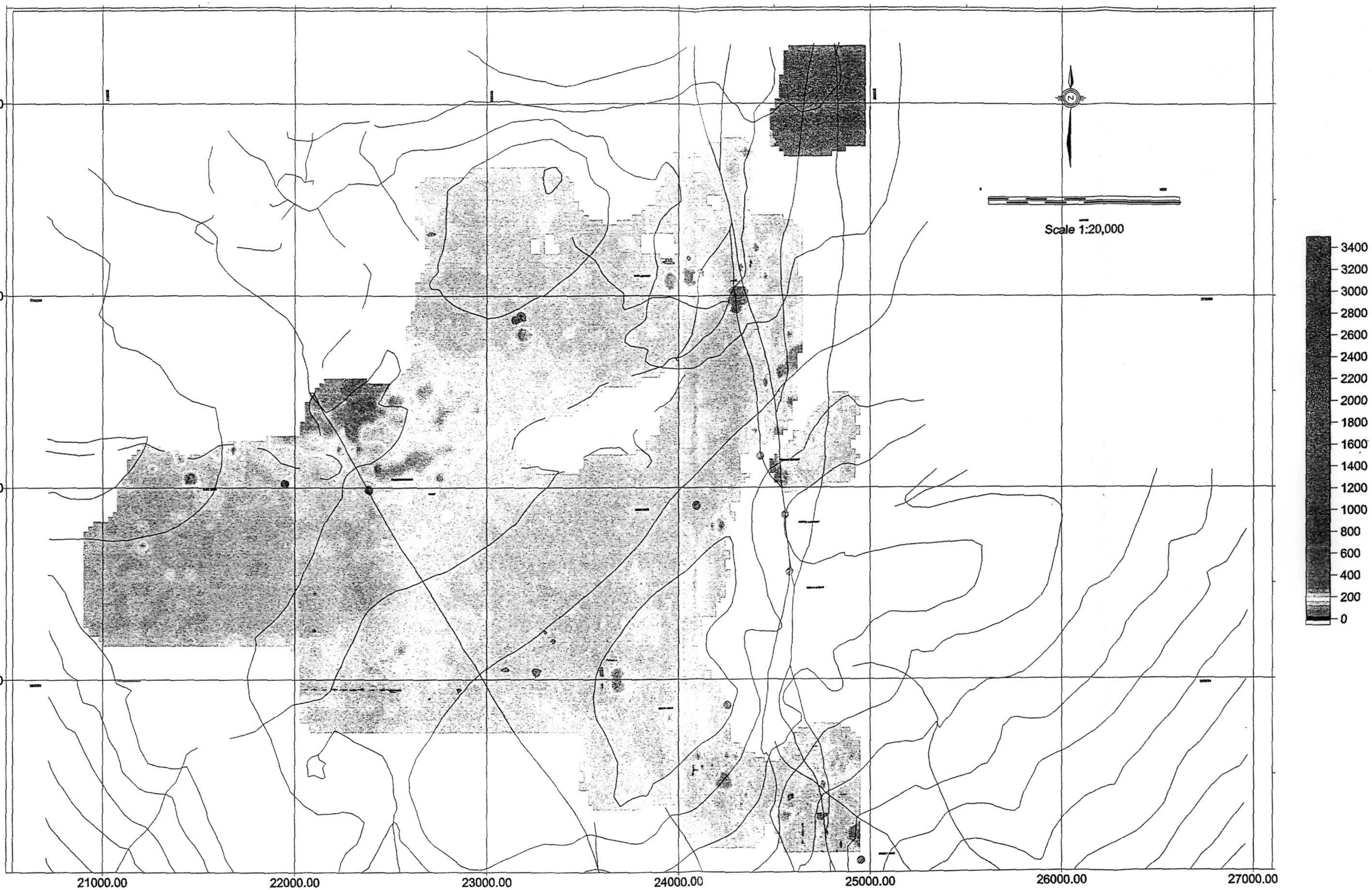
North American Metals Corp.
1996 Soil Geochemistry Compilation
Co in PPM



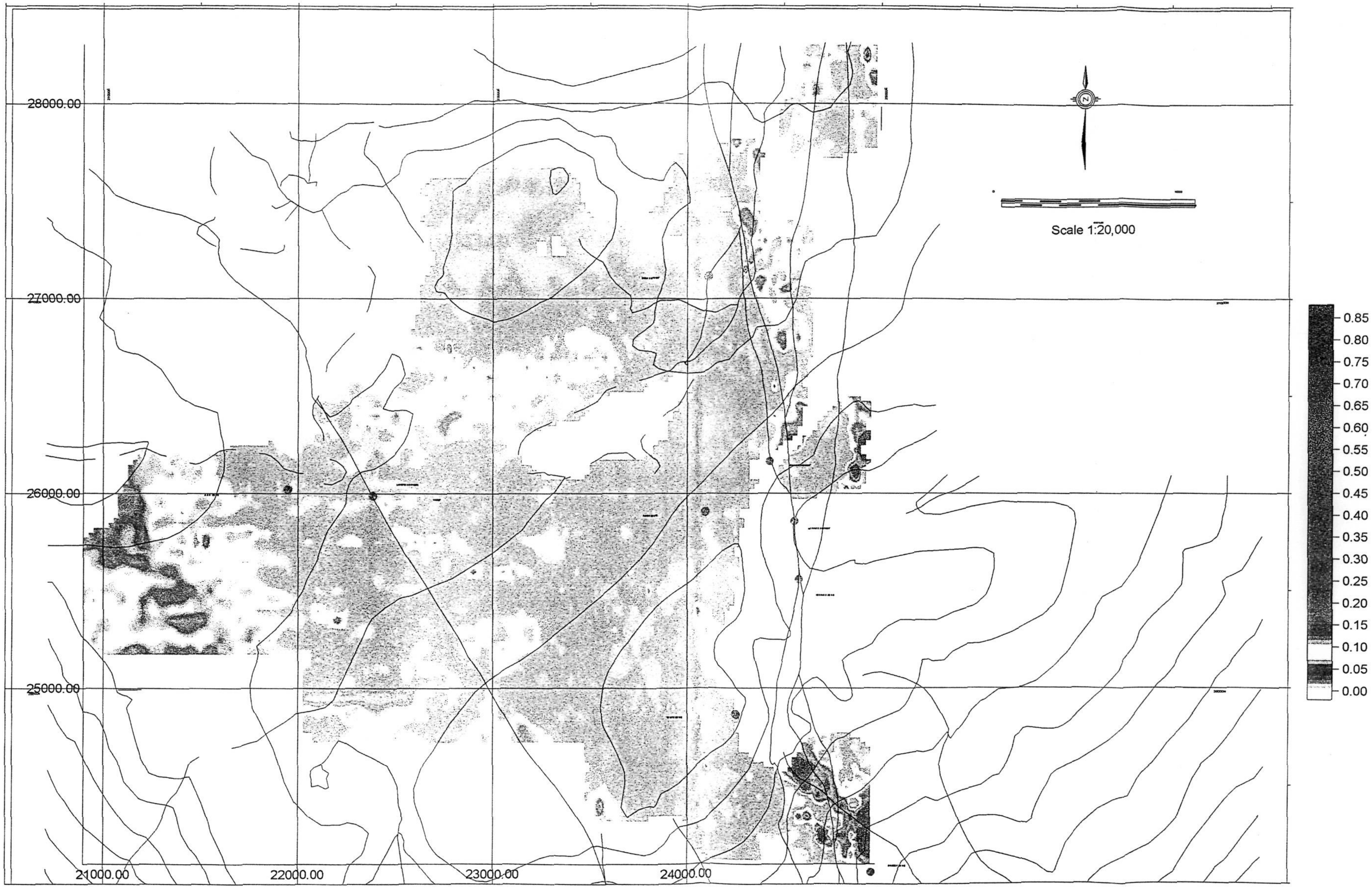
NORTH AMERICAN METALS CORP.
1996 SOIL GEOCHEMISTRY COMPILATION
CU IN PPM



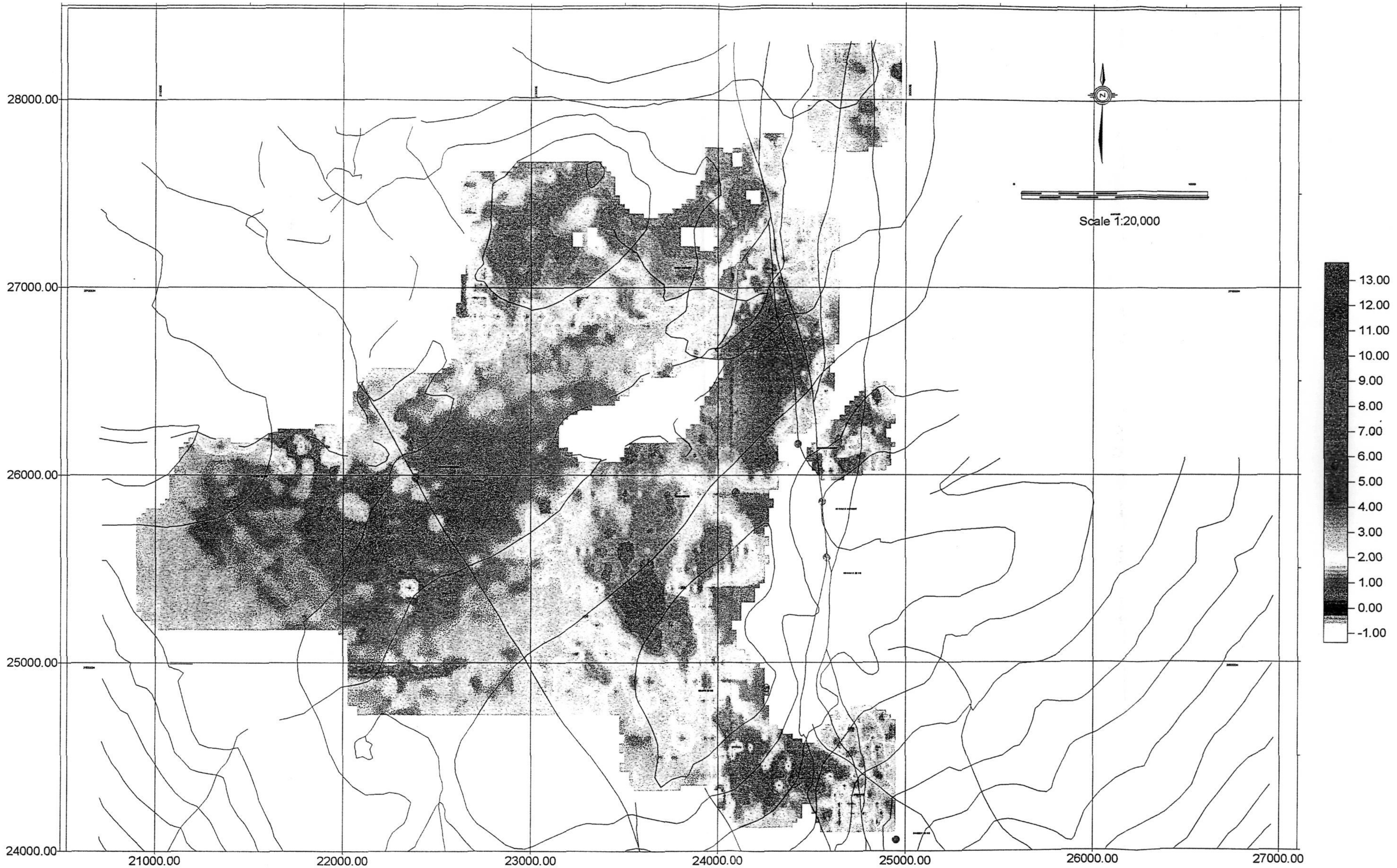
North American Metals Corp.
1996 Soil Geochemistry Compilation
Fe in %



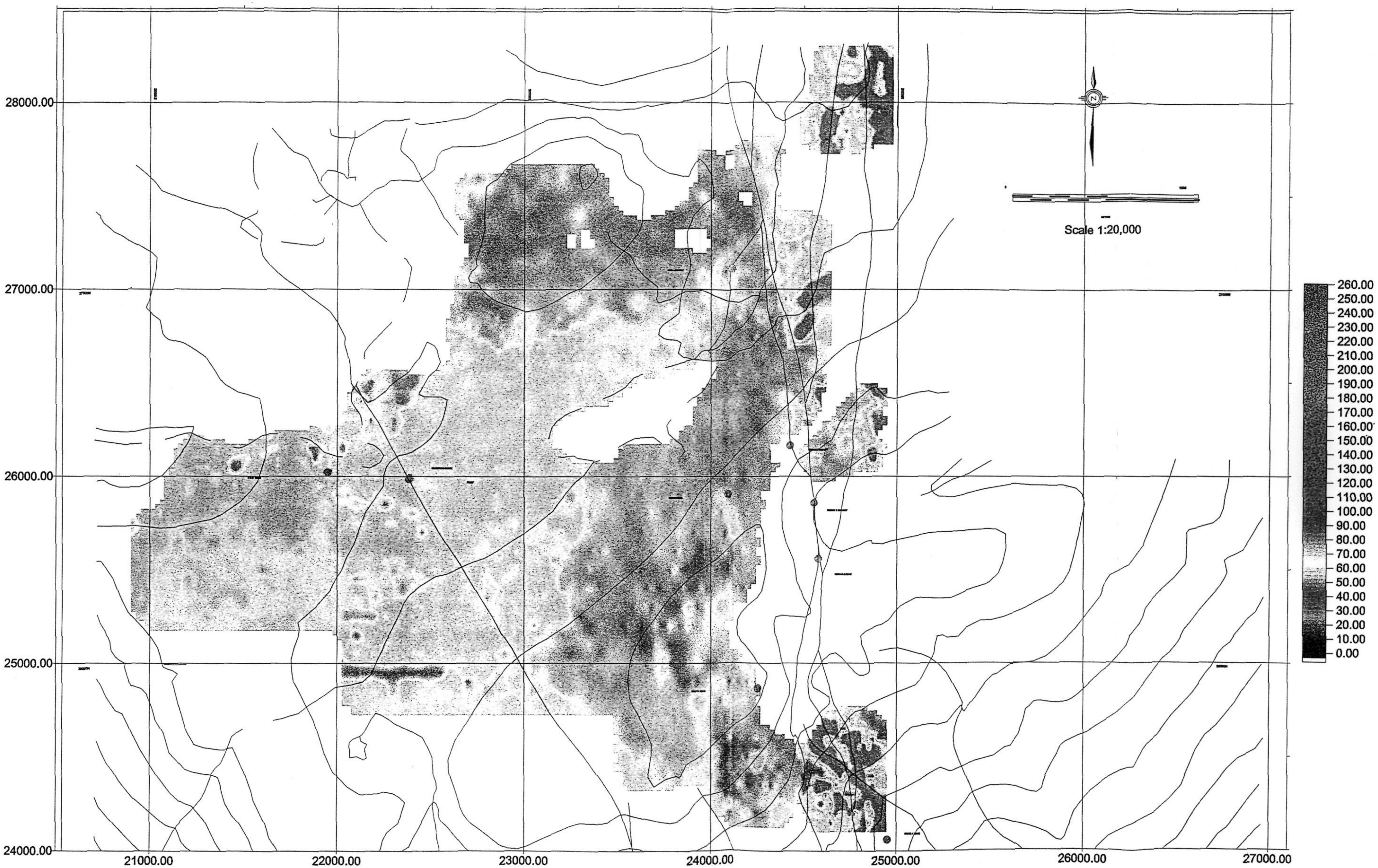
North American Metals Corp.
1996 Soil Geochemistry Compilation
Hg in PPB



North American Metals Corp.
1996 Soil Geochemistry Compilation
K in %

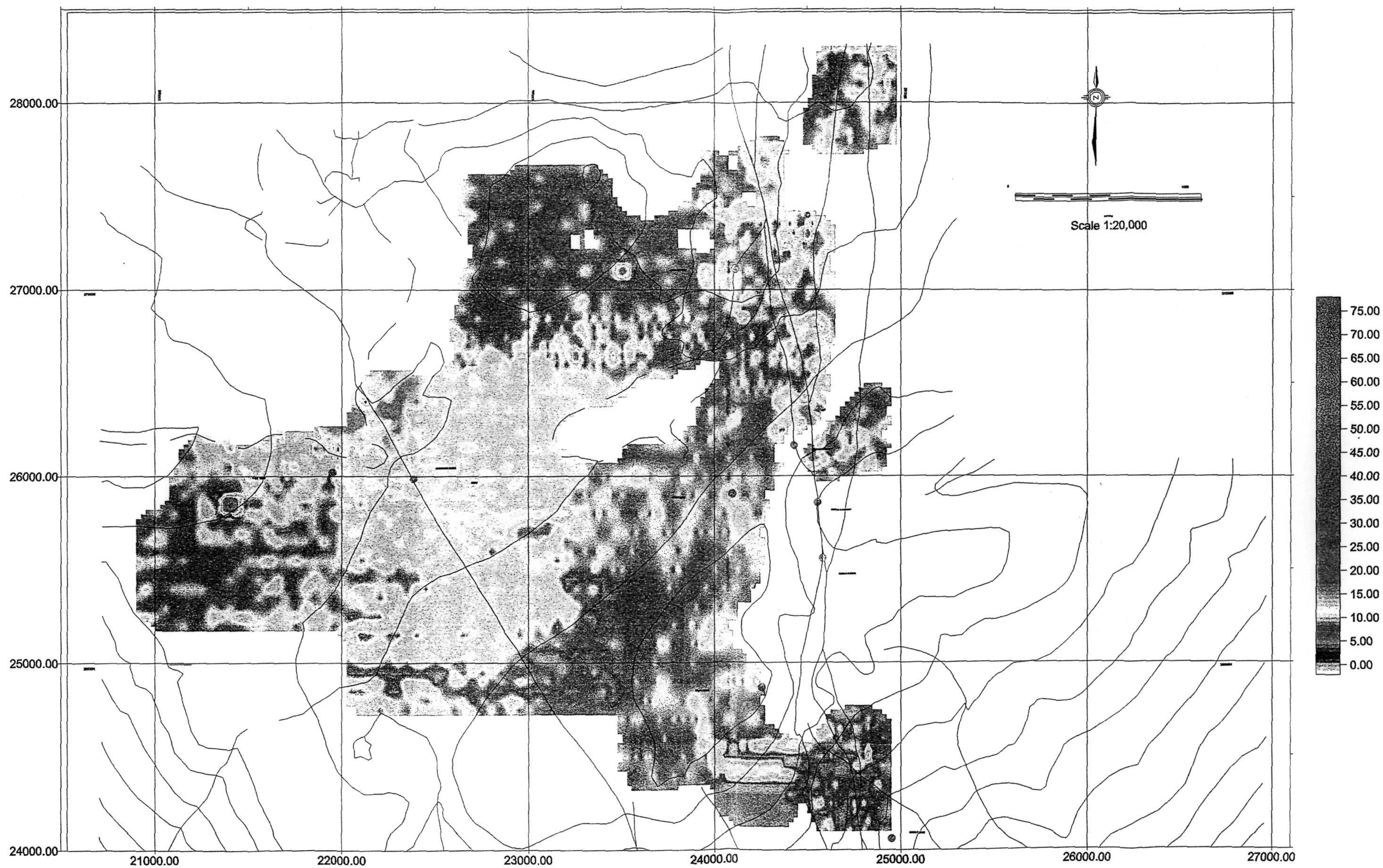


North American Metals Corp.
1996 Soil Geochemistry Compilation
Mg in %

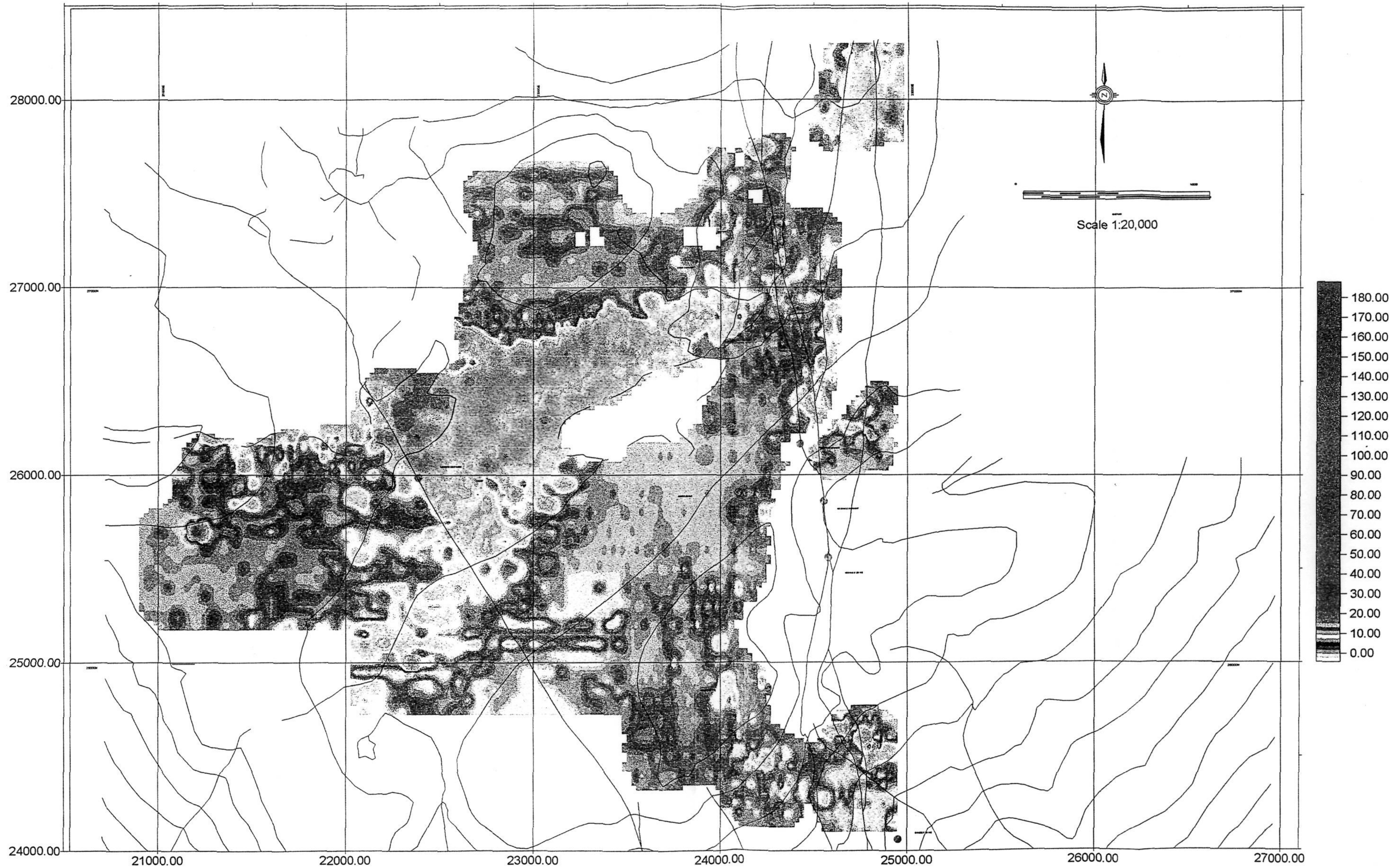


North American Metals Corp.
1996 Soil Geocemistry Compilation
Ni in PPM

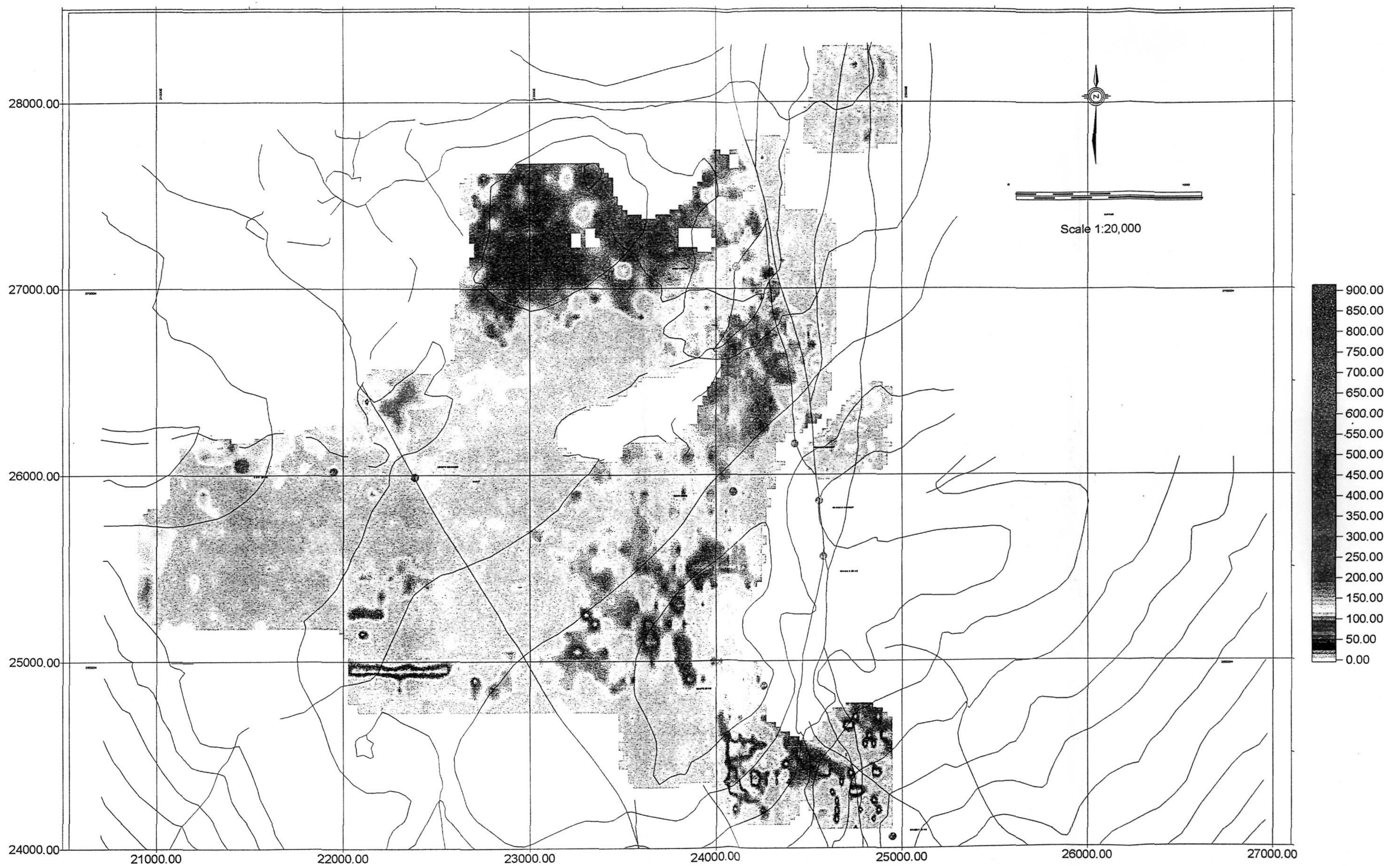
North American Metals Corp.
1996 Soil Geochemistry Compilation
P in PPM



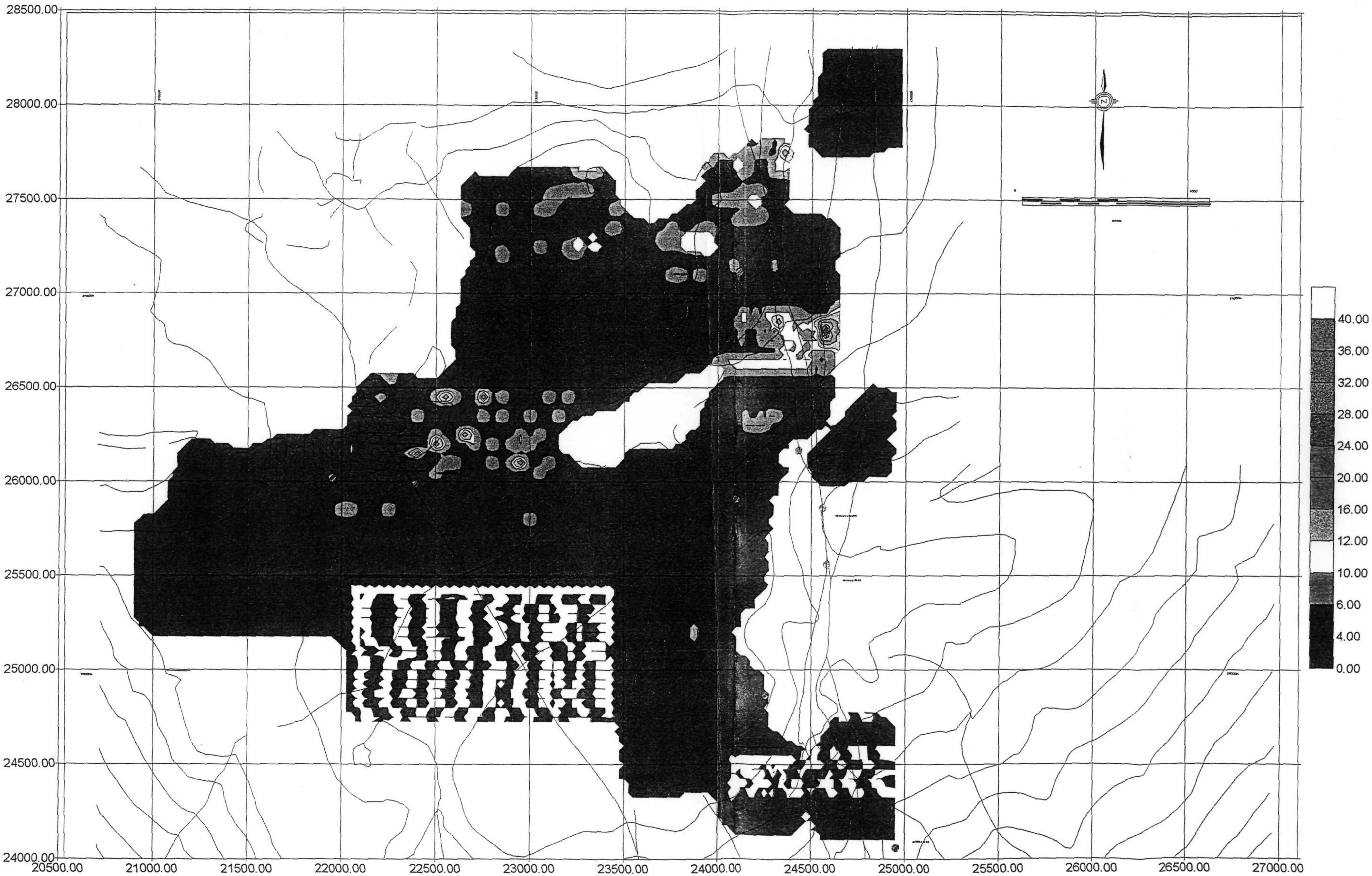
North American Metals Corp.
1996 Soil Geochemistry Compilation
Pb in PPM



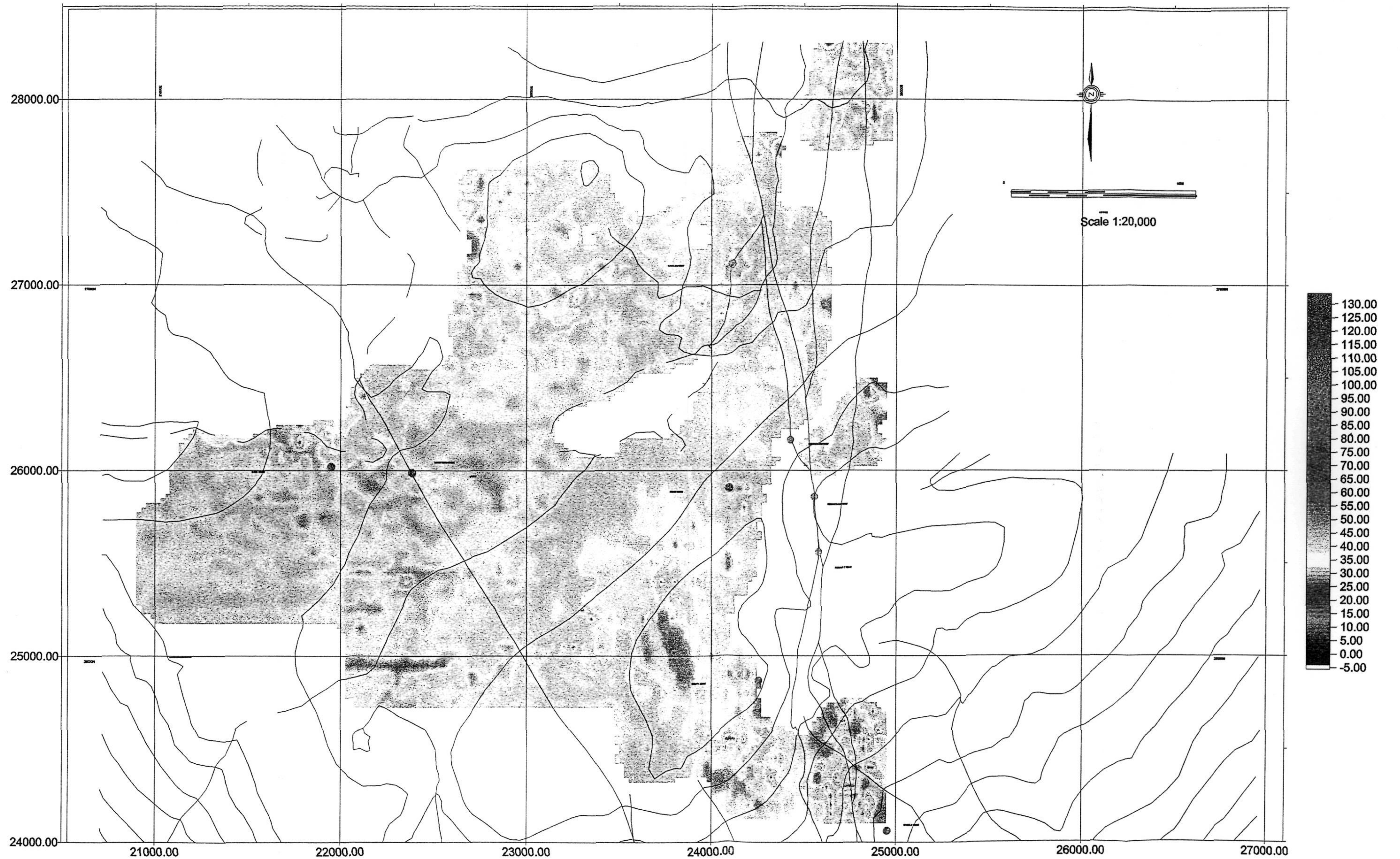
North American Metals Corp.
1996 Soil Geochemistry Compilation
Sb in ppm



North American Metals Corp.
1996 Soil Geochemistry Compilation
Zn in PPM



North American Metals Corp.
1996 Soil Geochemistry Compilation
W in PPM



North American Metals Corp.
1996 Soil Geochemistry Compilation
Sr in PPM

7.0 REGIONAL AND PROPERTY GLACIATION

The Golden Bear property has been subject to several periods of glacial advance and retreat. When exploration efforts were directed towards the area underlain by carbonate rocks to the west of the Ophir Break and the Limestone Creek Fault, it became apparent that significant glacial cover was present and that the glacial history was complex. In order to proceed with exploration activities in these areas, a better understanding of the glacial history was required.

To this end NAMC commissioned K.W. Savigny of Bruce Geotechnical Consultants Inc. to conduct a terrain analysis study from air photos. His report is included here as Section 7.1. Additional comments and field observations made by NAMC staff are discussed in Section 7.2.

7.1 TERRAIN ANALYSIS - GOLDEN BEAR PROPERTY

- see following report

BRUCE GEOTECHNICAL CONSULTANTS INC.
AN APPLIED EARTH SCIENCES COMPANY

Suite 210, 1290 Hornby Street
Vancouver, B.C. V6Z 2G4
Phone: (604) 684-5900
Fax: (604) 669-0430

File Number 0090-001-01
May 13, 1996

North American Metals Corp.
1500 - 700 West Pender St.
Vancouver, B.C. V6C 1G8
Fax No. 684-3123

Attention: Mr. Dunham Craig, P.Geo.
Vice President Exploration

Terrain Analysis - Golden Bear Mine Expansion, Northwestern B.C.

Dear Sir:

Further to our meeting on February 14, and the Bruce Geotechnical Consultants Inc. proposal, dated 21 February 1996, I have completed a terrain analysis of the Golden Bear Mine expansion area for the purpose of elucidating patterns of Late Wisconsinan and Neoglacial advance and retreat of glaciers as they might influence mineral dispersion in the area.

The results were discussed briefly in meetings on 14 and 25 March 1996. This letter report is a summary of the details I provided at these earlier meetings.

1.0 Methodology

A literature review of available published geological information was completed at the outset. Relevant details are included in the text with appropriate citations, and references appear in Section 5. Aerial photographs were provided by North American Metals Corp. (NAM). Initial review of the air photos found the high level set to be incomplete, hence additional coverage was ordered. The airphoto coverages used are summarized in Table 1. Reference was made to NTS topographic maps 104K & 104L (1:250,000) and 104K/1 (1:50,000), and to Dwg. No: G:\data\siteplan.dwg which was supplied by NAM.

Table 1: Summary of airphoto coverages used in the study.

FLIGHT LINE NO.	PHOTO NOS.	DATE FLOWN	TYPE	SCALE
BC 82016	2 TO 5	1982	B & W	1:60,000
"	27 TO 30	"	"	"
40074-0-R261	50 TO 57	08/8/93	COLOUR	1:16,000
"	76 TO 83	"	"	"
"	84 TO 91	"	"	"
"	102 TO 113	"	"	"

The terrain analysis reported here has not been field checked by BGC personnel. For this reason, the reader should treat the results as preliminary and subject to change as field data are obtained.

The work was carried out subject to the General Terms of Engagement attached.

2.0 Quaternary Glacial History of the Region

The Quaternary glacial history of the region is reviewed in this section as a framework for the local pattern of deglaciation interpreted from aerial photographs and discussed in Section 3.

2.1 General Summary

The Quaternary glacial history of the Tulsequah region is believed to be similar to southern British Columbia, involving multiple glaciations which began as early as late Pliocene. The Late Wisconsinan Cordilleran Ice Sheet was the most recent, although not the most extensive to cover the region. This Fraser Glaciation as it is known throughout British Columbia was followed by glacier recession then a late Neoglacial maximum and subsequent glacier recession which may be ongoing (Ryder and Maynard 1991). Periglacial processes have been active at higher elevations for many thousands of years. These processes are also ongoing.

2.2 Fraser Glaciation

Ice build up commenced about 29 000 years BP, culminated between 14 500 and 14 000 years BP, and deglaciation was largely completed by 11 500 years BP (Ryder et al. 1991).

It is believed that an ice dome existed over the northern Skeena Mountains during Fraser Glaciation. From here glaciers flowed northwest toward the Golden Bear area. Smaller accumulation zones existed in the Coast Mountains a short distance southwest of Golden Bear and flowed northeast (Ryder and Maynard 1991). This ice is believed to have affected the mine site and expansion areas.

Outlet glaciers appear to have drained westward through the Coast Mountains to the Pacific, particularly in the Taku region northwest of the site. Minimum surface elevations of the ice sheet, based on erratics and striations, have been recorded for parts of northern British Columbia; 2300 m is recorded for the Omineca Mountains and 2100 m in the Cassiar Mountains (Ryder and Maynard 1991). Unfortunately, data on glacial limits are not available for the region around Golden Bear. It is my feeling that ice streams occupied major valleys to elevations of 1900 to 2000 m. This elevation was not likely exceeded because of the "draining" effect of the major valleys and the relative proximity of the coast.

There is little doubt that alpine glaciers were also active around the Golden Bear property during Fraser Glaciation. They almost certainly contributed to filling of the plateau west of Kodiak and Ursa zones, ultimately discharging in a generally northeastward direction and becoming part of the major valley glaciers "draining" the Coast Mountains.

Following Fraser deglaciation, ice can be expected to have been less extensive than at the present time, and may have been absent from the Golden Bear area.

2.3 Neoglaciation

Increased snowfall about 4000 years ago resulted in expansion of snowbanks and glaciers. These remained more extensive than at present until the late Neoglacial maximum. In the Golden Bear area, this probably occurred in the late 17th or early 18th centuries. Associated trimlines mark the maximum post-Pleistocene extent of most glaciers (Ryder 1987).

Ice remained near Neoglacial maxima through the late 1800s building recessional moraines near the terminus and locally overriding Neoglacial maxima during surges. Neoglacial recession during the early part of this century has probably been more rapid and prolonged than at any other time during the past four millennia, and glaciers are now smaller than at any other time during this interval (Ryder 1987).

2.4 Periglacial Processes and Landforms

Although it is likely that early Pleistocene glaciations completely inundated mountain peaks in the Golden Bear area, the same peaks stood as nunataks above the Fraser Glaciation ice with limited areas affected by alpine glaciation. For tens of thousands of years, these areas have been exposed to periglacial processes. These include the mechanical breakdown of intact rock and transported clasts, and the slow downslope transport of the comminuted materials under the influence of gravity. Permafrost aggraded deeply into exposed areas. Permafrost is reported to be present above approximately elevation 1220 m (Brown 1967) in the region.

3.0 Patterns of Glaciation in the Golden Bear Region.

Glacial landforms were interpreted and annotated directly on air photographs 40074-0 R.251 numbers 82, 86, 87 and 89. Alternate photographs, 40074-0 R.251 numbers 85 and 88 were scanned independently and then merged into a single digital file which was used as a base mosaic for presentation of the annotated terrain analysis data.

Three base mosaics are attached. Each has common glacial landform data shown in black symbols. Coloured symbols illustrate the interpreted details related to glaciers (in green) and glacial lakes (in purple) in three chronological stages as follows:

Stage I - Late Wisconsinan maximum
Stage II - Neoglacial maximum
Stage III - Late Neoglacial

Each stage is described separately below. The reader should refer to the appropriate diagram while reading each section.

Details as to how the interpretations were made are kept to a minimum in this letter. This is in keeping with the preliminary nature of the work. It is anticipated that some details will require substantive elaboration and more intensive consideration - possibly through field checking - in the future. Upgrading of the interpretation details in these areas can be undertaken in the future as required.

3.1 Stage I - Late Wisconsinan Maximum

The Golden Bear Mine expansion area was above the level of nearby valley glaciers during Fraser Glaciation, but was affected by alpine glaciers from three distinct accumulation areas denoted as A, B and C.

The main centre of accumulation was A. At its Late Wisconsinan maximum, this ice flowed northeast into a prominent valley as well as east and southeast into the plateau area west of Kodiak and Ursa zones where B is located. A ridge on which accumulation area C is shown was the divide. How far south this ice extended toward the rim of the Bearskin Creek valley is unclear. It probably inundated the entire plateau region and spilled into the upper reaches of tributaries to Bearskin Creek. The clearest geomorphic evidence is illustrated on the stage I drawing. This shows a dashed green line as the southern terminus and a proglacial lake impounded between the ice and topographic lows which controlled discharge into the Bearskin Creek valley. The shoreline, shown in purple, probably had an outlet at approximately elevation 1920 m at the outset, but this quickly eroded to approximately elevation 1880 m where it remains today. This accounts for why the shoreline shown on the stage I drawing appears to cross strandlines. The strandlines are actually late Neoglacial in origin, but they indicate contour lines for the purposes of this discussion.

Ice in area B originated in A. Because of the bowl-shaped configuration of the plateau, ice originating in area A flowed quickly into area B where it stalled, built up thickness, slowly increased its areal extent, and ultimately spilled north. During Late Wisconsinan deglaciation between 100 and 200 m of head differential existed between the proglacial lake at the southwest and the northeast side of area B. In the absence of lateral meltwater channel evidence connecting directly to the glacial lake it must be assumed that this proglacial lake either drained supraglacially or subglacially. The former is uncommon in this setting. There is an abundance of meltwater channel evidence at the northeastern edge of area B which is attributed to the emergence of subglacial drainage at the edge of the plateau where the glacier surface might be expected to have been crevassed as a consequence of local increases in flow velocity. Because of the high head differential, tunnel valleys (i.e. deep subglacial erosion channels) can be expected to have exploited localized zones of weakness in the bedrock surface.

The area C accumulation zone was simply an isolated cirque glacier. This joined ice flowing from areas B and A, spilling northeast and north of the plateau area, respectively.

3.2 Stage II - Neoglacial Maximum

The most significant aspect of the Neoglacial activity as interpreted here is that none of the three accumulation areas coalesced.

The main centre of accumulation continued to be A. Ice flowing from this peak encountered the west end of the ridge on which area C is located and deflected north and generally northeast into the prominent valley. The closely juxtaposed lateral moraines at the southeast flank of area A, nearest to area B, indicate a long-standing obstruction. These moraines are interpreted as evidence that Neoglacial ice from area A at no time entered the plateau in which area B is located.

Ice in area B probably accumulated slowly and was largely inactive except along the northeastern flank where there is evidence that it flowed a short distance. How far southwest area B ice extended is unclear. It is believed to have extended slightly farther west than the glacial lake limit shown on the stage II illustration, as indicated by the dashed green line to the west of the glacial lake shoreline. The glacial lake covered the southwest flank of the ice but was almost certainly shallow and subject to large lateral shifts in the lake-on-ice shoreline position in response to minor glacial activity through the short summer seasons, and fluctuations in subglacial drainage and precipitation. It is expected that there was substantial subglacial drainage. There is no evidence of supraglacial drainage of this lake over area B ice. The other outlet for this glacial lake was into Bearskin Creek valley. This was controlled at a relatively stable elevation of approximately 1880 m, similar to Fraser deglaciation as described for stage I.

Ice in area C had limited extent beyond the prominent cirque in which remaining ice is located.

3.3 Stage III - Late Neoglacial

The stage III illustration is an example of how glaciers in areas A, B and C receded from their Neoglacial maximum. In comparison to earlier stages, it is less clear whether the positions illustrated in the stage III drawing were coeval.

Ice from area A systematically receded upstream along the prominent valley. Early in the deglacial period a prominent ridge emerged from beneath ice in the accumulation area (north of the letter A on the illustration). Presently, this ridge divides the two ice streams in the upper portion of the prominent valley.

The green lines in the stage III illustration indicate a late phase in which flow of area B ice continued. During periods of ice activity when subglacial drainage became obstructed or cut off, the glacial lake formed and the level systematically rose, with the limiting condition being overtopping of the basin and discharge across the approximately 1880 m outlet into Bearskin Creek valley. As long as flow was occurring, subglacial drainage conditions were susceptible to cut off. When flow ceased and subglacial drainage channels became established, as is the present condition, no glacial lake existed along the southwest margin of area B ice. The several levels of strandlines shown between the stage II shoreline and the present extent of area B ice attest to several long-standing (i.e. up to several years) levels of glacial lakes.

Presently, area B ice appears to be dead ice which is slowly degrading. Obstruction of subsurface drainage and development of a glacial lake remains a possibility, particularly during long return period precipitation events (rainfall or rain on snow pack).

Stage III ice in area C continued a slow retreat to its present position in the cirque.

3.4 Ice-Cored Moraines

Many of the moraines created during the Neoglacial maximum (stage II illustration) and during Neoglacial recession (examples provided in stage III illustration) remain ice cored, hence subject to ongoing vertical and lateral displacements. These movements are a consequence of both ablation (i.e. slow melt out) as well as mass movements in the form of slumps and flows of earthen materials in response to oversteepening of slopes and commonly in association with thaw consolidation related excess pore pressures.

The stage II illustration shows a snout of ice extending east-southeast from the area C accumulation zone. A short distance from the terminus as shown by the green line on this drawing there is presently a prominent closed depression with what appears to be a natural pipe draining the bottom. This unusual condition is an indication that degrading ice-cored moraines also have an ongoing influence on local hydrology (both surface and groundwater). The location of this closed depression is in the vicinity of the Ursa zone on the basis of limited information available to me at this time, hence the development of ice cored moraines and degradational processes affecting them should be considered by NAM in ongoing exploration activities at this site.

4.0 Glacial Drift Transport Implications

The terms of reference outlined in our meeting of 14 February 1996 did not include specific advice on dispersion trains. The purpose of the following comments is to summarize the salient aspects of the Section 3 discussion as general guidance for NAM efforts toward interpretation of dispersion trains.

- There is a high degree of certainty that all drift in the plateau area west of Kodiak and Ursa zones is locally derived. The most distal source area is the cirque designated as area A. Local glacial transport is generally in an eastward direction across the plateau and into valleys discharging northeast.
- A complex pattern of glaciofluvial channels is situated along the northeastern corner of the study area as shown in the attached illustrations. There appears to have been limited glaciofluvial deposition along these channels. Most geomorphic work involved glaciofluvial erosion, meaning that concentrations of cobbles and boulders may represent lag deposits. These glaciofluvial channels formed during Fraser Glaciation.
- Accumulation area B has experienced limited glacial transport since late Fraser Glaciation.
- Periglacial processes and degradation of ice-cored moraines caused varying degrees of vertical and lateral transport up to the order of tens of metres.

5.0 References

B.C. Ministry of Environment. 1990. Terrain Materials Map, 104K. B.C. Ministry of Environment, Open File Map and Legend. Based on mapping by L. Lacelle.

Brown, R.J.E. 1967. Permafrost in Canada. Geological Survey of Canada. Map 1246A, first edition.

Ryder, J.M. 1987. Neoglacial history of the Stikine - Iskut area, northern Coast Mountains, British Columbia. Canadian Journal of Earth Sciences, 24, pp. 1294-1301.

Ryder, J.M., Fulton, R.J. and Clague, J.J. 1991. The Cordilleran ice sheet and the glacial geomorphology of southern and central British Columbia. Géographie Physique et Quaternaire, 45(3), pp. 365-377.

Ryder, J.M. and Maynard, D. 1991. The Cordilleran ice sheet in northern British Columbia. Géographie Physique et Quaternaire, 45(3), pp. 355-363.

6.0 Closure

I trust the foregoing details are adequate for your present efforts in interpreting dispersion trains. I remind you of the cautionary note regarding lack of field checking which appears at the top of page 2. I look forward to your feedback regarding the accuracy of this terrain analysis. I would also look forward to an opportunity to field check this work during the upcoming summer season.

Thank you for the opportunity to undertake this work.

Yours very truly
Bruce Geotechnical Consultants Inc.

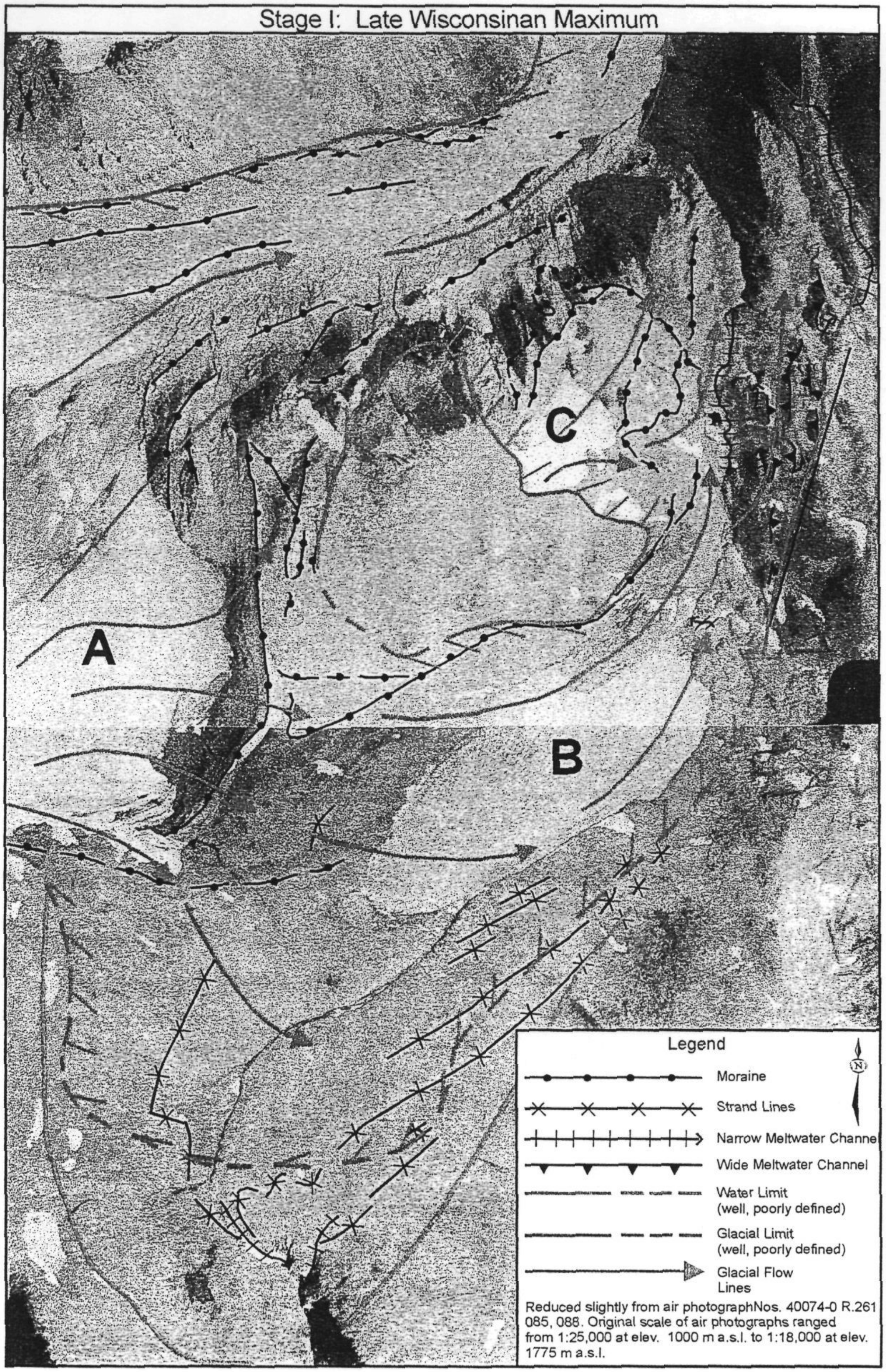
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. W. SAVIGNY

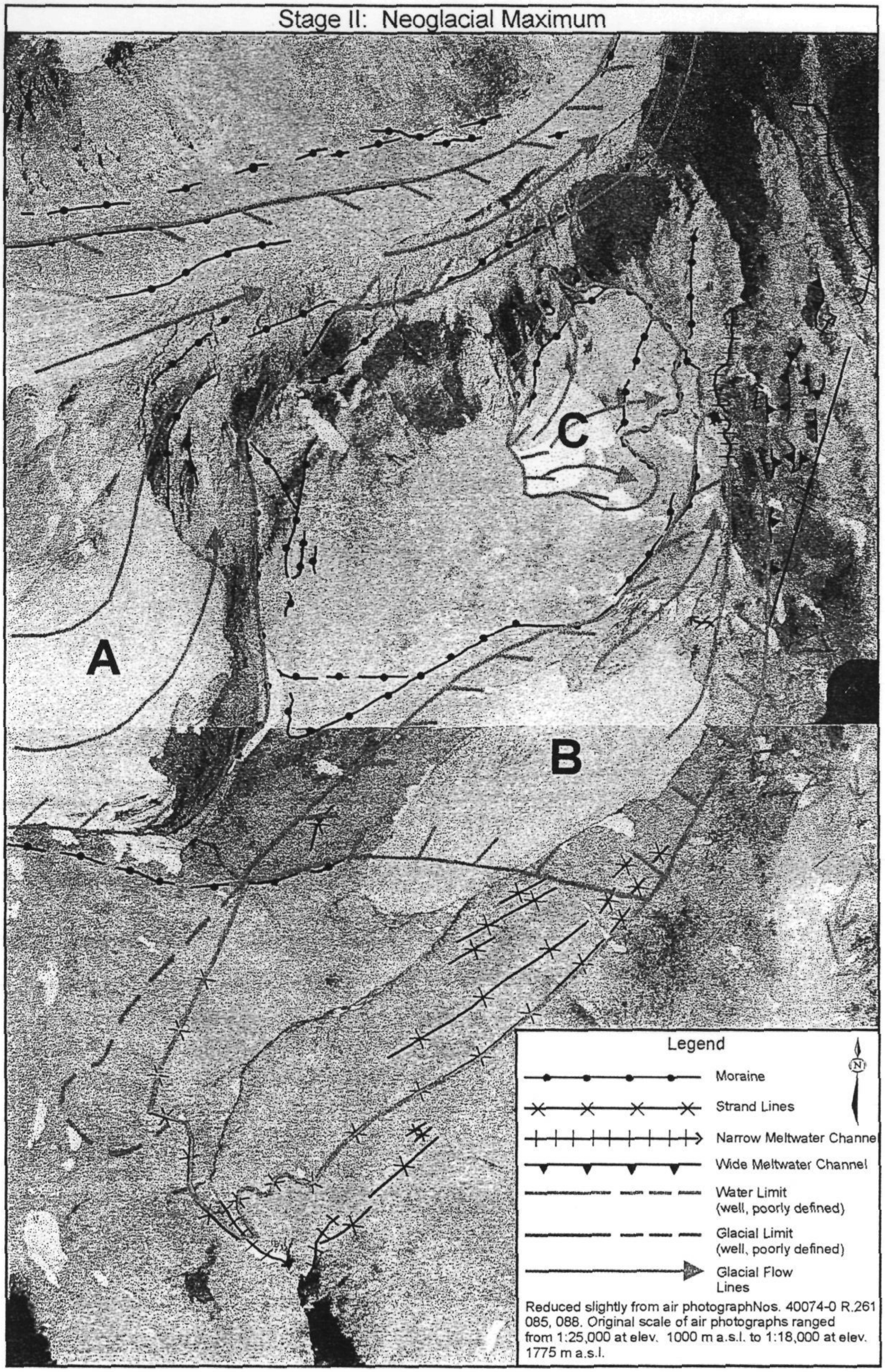
PROFESSIONAL GEOSCIENTIST PROVINCE OF BRITISH COLUMBIA K. W. SAVIGNY

per K. Wayne Savigny, P.Eng., P.Geo.
Senior Geotechnical Engineer/Engineering Geologist

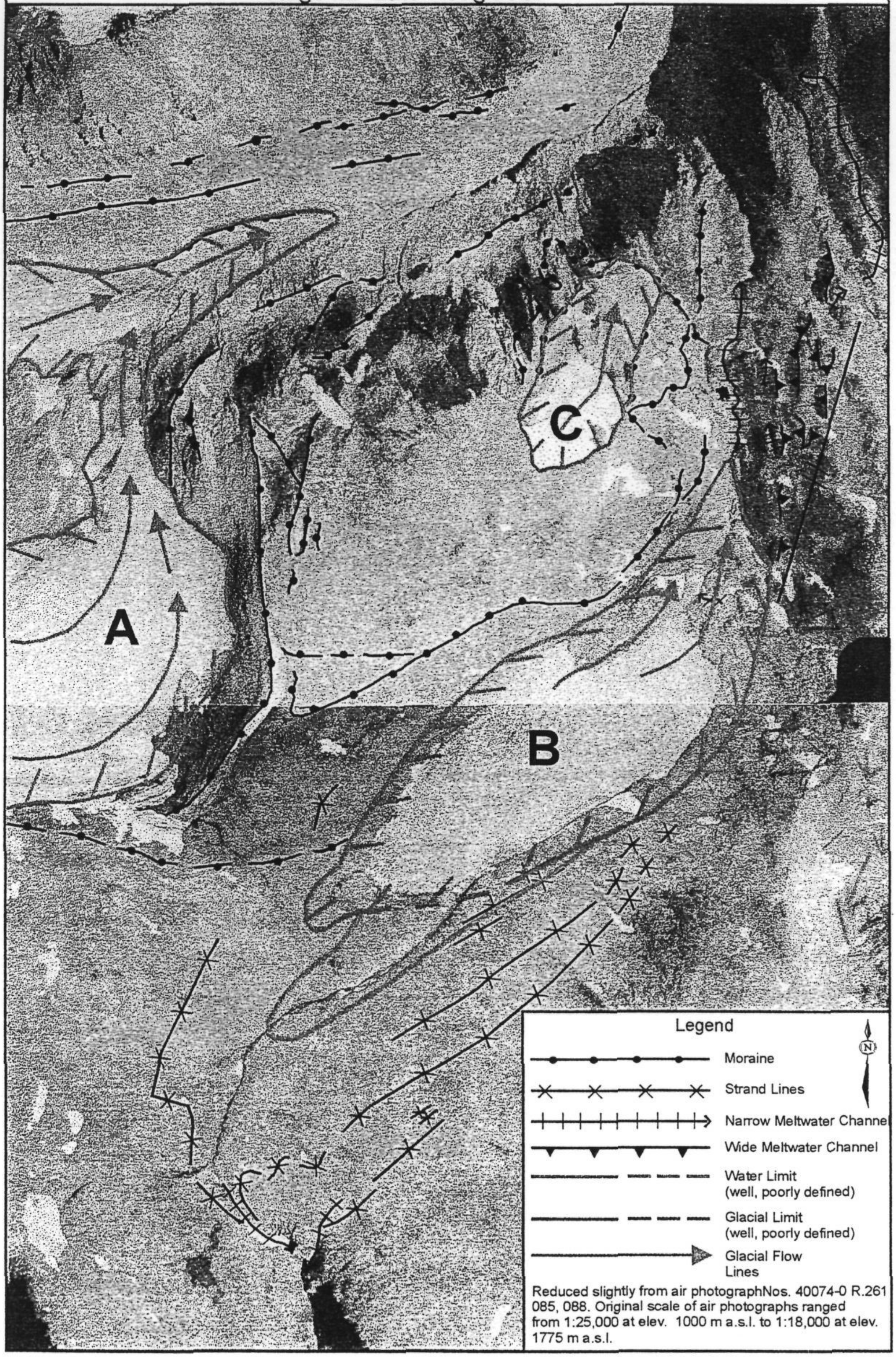
attachment

C:\BGC\0090\LET03.DOC


Stage I: Late Wisconsinan Maximum
A
B
C
Legend
Moraine
Strand Lines
Narrow Meltwater Channel
Wide Meltwater Channel
Water Limit
(well, poorly defined)
Glacial Limit
(well, poorly defined)
Glacial Flow
Lines
N
Reduced slightly from air photographNos. 40074-0 R.261
085, 088. Original scale of air photographs ranged
from 1:25,000 at elev. 1000 m a.s.l. to 1:18,000 at elev.
1775 m a.s.l.


Stage II: Neoglacial Maximum
A
B
C
Legend
N
Moraine
Strand Lines
Narrow Meltwater Channel
Wide Meltwater Channel
Water Limit
(well, poorly defined)
Glacial Limit
(well, poorly defined)
Glacial Flow
Lines
Reduced slightly from air photographNos. 40074-0 R.261 085, 088. Original scale of air photographs ranged from 1:25,000 at elev. 1000 m a.s.l. to 1:18,000 at elev. 1775 m a.s.l.

Stage III: Late Neoglacial



Reduced slightly from air photographNos. 40074-0 R.261 085, 088. Original scale of air photographs ranged from 1:25,000 at elev. 1000 m a.s.l. to 1:18,000 at elev. 1775 m a.s.l.

BRUCE GEOTECHNICAL CONSULTANTS INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL TERMS OF ENGAGEMENT
(Effective January 1, 1996)

GENERAL
Bruce Geotechnical Consultants Inc. ("BGC") shall render its services to Client for Project in accordance with the following Terms of Engagement.

In rendering services to Client, BGC may, at its discretion and at any stage, engage subconsultants to perform services necessary to enable BGC to carry out its duties and responsibilities as set forth.

COMPENSATION
Charges for services rendered will be made in accordance with BGC's Schedule of Fees in effect at the time the work is performed. All charges will be made in, and will be payable in, Canadian Dollars. Invoices will be due and payable in 30 days from date shown on invoice without holdback. Interest on overdue accounts will accrue at 1.5% per month (19.56% per annum). The Goods and Services Tax will be added to invoiced amounts, if applicable.

NOTICES
BGC will designate a project manager who shall be responsible for Project. Client shall designate an authorized representative to act with respect to Project.

TERMINATION
Either party may terminate this engagement for cause upon 30 days' notice in writing. Client shall forthwith pay to BGC its fees for all services performed, including all expenses and other charges payable that are associated with obligations incurred by BGC for Project.

ENVIRONMENT AND POLLUTION
The BGC field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater. BGC will co-operate with Client's environmental consultant during the field phase of the investigation.

STANDARD OF CARE
BGC will provide the standards of care, skill and diligence normally provided by a Professional Engineer in the performance of engineering services as contemplated for this project.

PROFESSIONAL RESPONSIBILITY
BGC shall not be responsible for a Contractor's failure to perform work in accordance with the relevant contract documents; for design of, or defects in, proprietary equipment; for loss of earnings or other consequential damage, however caused.

LIMITATION OF LIABILITY
Notwithstanding anything to the contrary, the aggregate liability of BGC, its directors, officers and employees, including liability for negligence, negligent misrepresentation and breach of contract, shall be limited to the amount of Professional Liability Insurance available to BGC at the time any claim is made.

Client's failure to accept the professional recommendations and advice of BGC with respect to geotechnical conditions at the Project shall relieve BGC from any and all legal liability, whether in contract, or tort, to Client for all manner of loss and damage, which arise out of the BGC services.

BGC's liability in contract, or tort shall be limited to 2 years from the date of completion of Project.

DOCUMENTS
All of the Documents prepared by BGC in connection with Project are instruments of service for the execution of the work. BGC retains the property and copyright in those Documents whether Project is executed or not. These Documents may not be used on any other project without prior written agreement of BGC.

FIELD SERVICES
Where applicable, field services recommended for Project are the minimum necessary to ascertain whether the Contractor's work is being carried out in general conformity with the intent of BGC's recommendations. Any reduction from the level of services recommended will result in BGC providing qualified certifications for the work.

ahr\c:\1996admn\projman\bgcgento.doc

7.2 DISCUSSION

In general the field observations made by NAMC staff during the 1996 filed season concur with the results of terrain analysis by Bruce Geotechnical. Of most interest is the interpretation of the ice advance during the Wisconsinan glaciation as several soil geochemistry anomalies and the mineralized boulders of the C & C Zone are associated with overburden materials correlated to this event.

When compared with the terrain analysis interpretation for the Fraser glaciation, the distribution of several elements closely match patterns of ice flow and the limits of maximum glacial advance, including Sb, As, Hg, Zn, Pb and Ni. In general soil values are highest in close proximity to Sam Glacier and decrease in intensity with increasing distance, presumably due to dilution. Of particular interest is the correlation of Sb with the Limestone Creek fault, suggesting a source within the fault zone that has been smeared east towards the Ursa deposit.

Also of interest is the moraine mapped by Savigny (1996) immediately to the south of Sam Glacier. This moraine lies outside the advance of Neoglacial ice but within the area of Fraser glaciation. This moraine suggests that there were ice surges during the time that the Fraser ice accumulation was generally in retreat. This is an important feature as the C & C Zone boulder train lies immediately south of this moraine indicating that the up ice continuation of this boulder train may now be masked by a layer of till that is not present further down ice. Evidence for a similar surge has been mapped by Cooley (1996) in the form a gabbro line in till to the south and southwest of the C & C Zone (see Figure 3.0-1). This feature suggests that the ice surges may have been southeasterly trending as the only gabbro outcropping nearby is located to the west at the southern margin of Sam Glacier.

8.0 EXPLORATION WORK 1993-1996

Sections 8.1 to 8.11 provide summaries of exploration work completed on the deposits and mineralized zones on the Golden Bear property between 1993 and 1996.

8.1 GRIZZLY ZONE SUMMARY

The Grizzly Zone lies 400 metres below, and on the same structure as, the Bear Main deposit (see Figure 8.1-1). Exploration was first carried out in this area of the property in 1990 after the projections of consulting structural geologists indicated that a second carbonate lens appeared at depth on the same fault structure. Between 1990 and 1992, the area was tested from surface by a number of drill holes that defined the upper portion of the lens and encountered narrow mineralized zones (up to 14.4 g/t gold over 1.8 metres). Results suggested that the mineralization strengthened to the north and followed a gentle northerly plunge. This idea was pursued in 1993 with three drill holes that stepped out to the north. The first two intersected low grade mineralization while the third, B94DH194, returned 14.38 g/t gold over an intersection length of 15.54 metres.

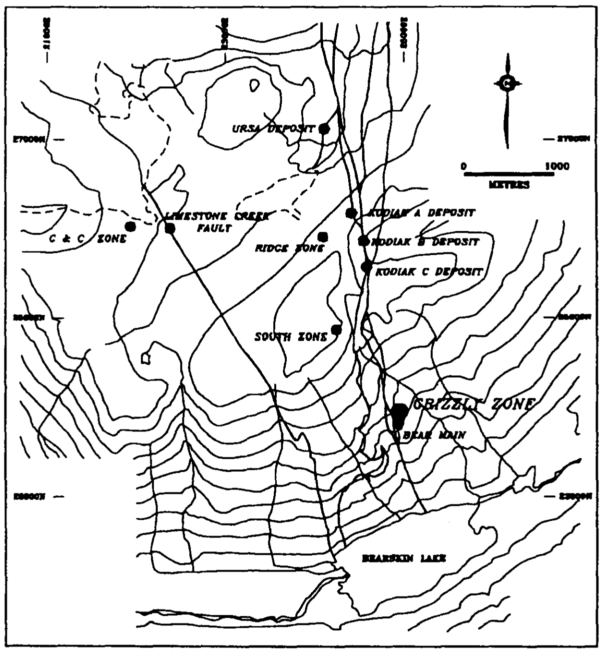


Figure 8.1-1: Location of Grizzly Zone

Rather than drill this new discovery from surface, which would require holes of a minimum 600 metres length, it was decided to assess its economic potential by drilling from underground stations. This would allow for greater accuracy in drilling and provide some initial development access if the zone reached production. The Grizzly decline was collared in January 1994, and driven at a 15% grade for 860 metres. Cutouts were placed at regular intervals to serve as diamond drill stations.

Ground conditions were initially poorer than expected resulting in heavy timbering over the first 250 metres of advance. After this point ground conditions improved and generally only minimal ground support was required.

From December 1994 to August 1995 two phases of diamond drilling were carried out on sections spaced 50 metres apart in order to outline the extent of mineralization. During this time a total of 5606 metres of drilling in 33 holes was completed.

Since August of 1995 no further exploration work has been carried out on the Grizzly Zone. It was decided at that time that ongoing exploration and development activities would be focussed on near surface, bulk mineable targets that could be put into production quickly. All services were removed from the Grizzly decline and the ramp was allowed to flood.

8.1.1 GEOLOGY

The geology of the Grizzly Zone is very similar to that of the overlying Bear Main deposit. The Grizzly carbonate lens is composed of a number of fault bound blocks and slices that form a northerly trending package up to 70 metres thick. Bound both east and west by Stuhini Group volcanics, the lens dips steeply to the east and appears to narrow and pinch out at depth. The surrounding volcanics are altered in an envelope 30 to 50 metres wide to an orangy or grayish green colour with stringers and disseminations of pyrite. The strongest structural feature is the Footwall Fault, which forms the western contact of the carbonate lens with the volcanics. It consists of a 1 to 10 metre wide gouge zone of predominantly volcanic origin.

Within the lens itself, fault blocks of both carbonate and volcanic rocks are present in an anastomosing system of faults and shears. Volumetrically the carbonate rocks are dominant. The margins of the fault blocks are typically sheared and gougy in the case of the volcanic rocks and brecciated and crackled in the case of the carbonate rocks. The cores of the fault blocks generally show little or no sign of shearing or brecciation.

Three primary carbonate lithologies are present: dolomite with chert nodules (DOCH), Bedded, silty limestones (LMST), and chert (CHRT). DOCH is the most abundant rock type and forms the most competent blocks. LMST has been encountered less often and typically at greater depths. The cherts are the least abundant and are most often located at the hangingwall contact of the lens where they have been extensively brecciated. Whether or not the relative positions of these rock units within the carbonate lens reflects original stratigraphic position or not is uncertain.

Intrusive rocks are present in the Grizzly Zone in the form of fine grained basalt dykes that run in irregular swarms along fault structures. They are known to be post mineral.

8.1.2 MINERALIZATION

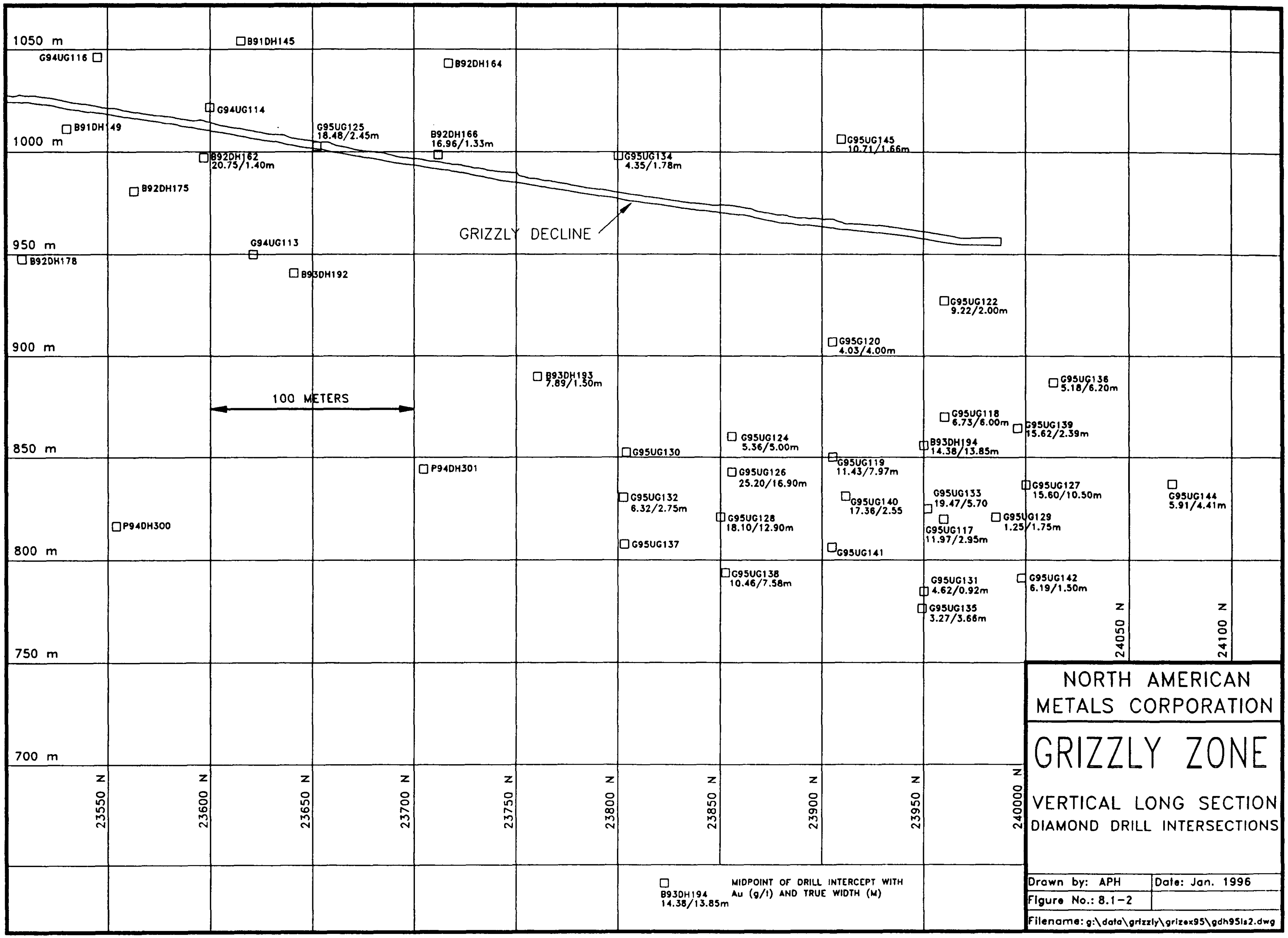
Gold values in the Grizzly Zone are strongly associated with fine grained dark gray pyrite that occurs in gouge or in the siliceous matrix of carbonate breccias. Microprobe work on similar pyritic material from the overlying Bear Main deposit by Oliver (1996) noted two different pyrite populations: a fine grained arsenian pyrite which contained significant gold values, and a coarser, brassy coloured euhedral pyrite which was barren. SEM examination by Cannon (1996) of a sample of pyritic carbonate breccia from the Grizzly Zone also detected arsenian and non-arsenian pyrites, suggesting a similar gold occurrence. In addition Cannon located several 5 - 20 micron grains of electrum.

The Grizzly diamond drilling program indicates that anomalous to low grade gold values are present in gougy volcanic tuffs and tectonic carbonate breccias along most, if not all, fault structures in the Grizzly carbonate lens. Significant gold values however, have mainly been intersected in two zones. These can be seen on the longsections of the Grizzly Zone (Figures 8.1-2 and 8.1-3).

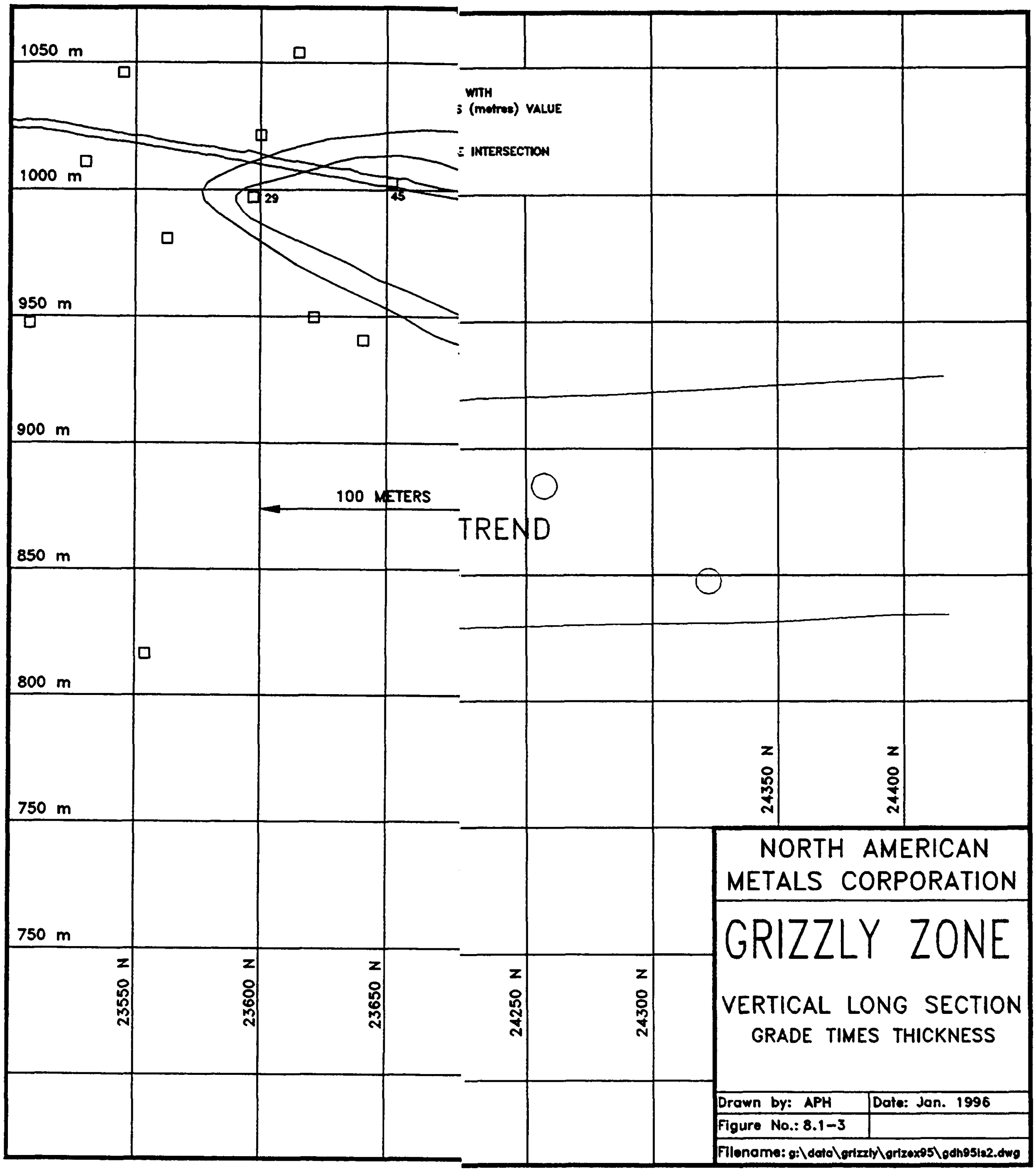
The first forms a thin sliver extending between sections 23600N and 23700N at an elevation of 1000 metres. The zone is located on the eastern edge of an internal sliver of altered volcanics and has returned values of up to 18.48 g/t gold over a true width of 2.46 metres. To date it has only been intersected in one hole on each section. The zone appears to be closed off on section 23550N and appears to be of limited vertical extent on sections 23600N and 23650N. Because of its narrow width the zone has limited tonnage potential as defined to date, however the zone does remain open to the north.

The second zone extends between sections 23850N and 24000N, near 850 metres elevation. This zone contains the Grizzly discovery hole (B94DH194) and contains the bulk of the mineralization outlined to date. It occurs in extensively brecciated and silicified carbonate rocks in the immediate hangingwall of the Footwall Fault (see Figure 8.1-4) over true widths ranging from 2.5 to 16.9 metres. The zone has been closed off by drilling to the south and up and down dip, but remains open to the north where further exploration drilling is needed to define the extent of mineralization.

Included in the Grizzly drilling program were two widely spaced drill holes, G95UG134 and G95UG145, that were drilled to test portions of the Grizzly carbonate lens that had no previous drill coverage. The holes returned 4.35 g/t gold over 1.78 metre and 10.71 g/t gold over 1.66 metre true widths. While these results are not of economic grade and thickness they suggest


NORTH AMERICAN METALS CORPORATION
GRIZZLY ZONE
VERTICAL LONG SECTION
DIAMOND DRILL INTERSECTIONS
Drawn by: APH
Date: Jan. 1996
Figure No.: 8.1-2
Filename: g:\data\grizzly\grizex95\gdh95ls2.dwg
GRIZZLY DECLINE
100 METERS
MIDPOINT OF DRILL INTERCEPT WITH Au (g/t) AND TRUE WIDTH (M)
B93DH194 14.38/13.85m
1050 m
1000 m
950 m
900 m
850 m
800 m
750 m
700 m
23550 N
23600 N
23650 N
23700 N
23750 N
23800 N
23850 N
23900 N
23950 N
24000 N
24050 N
24100 N
B91DH145
G94UG116
B92DH164
G94UG114
B91DH149
G95UG125 18.48/2.45m
B92DH166 16.96/1.33m
G95UG145 10.71/1.66m
B92DH162 20.75/1.40m
G95UG134 4.35/1.78m
B92DH175
G94UG113
B92DH178
B93DH192
G95UG122 9.22/2.00m
G95G120 4.03/4.00m
B93DH193 7.89/1.50m
G95UG136 5.18/6.20m
G95UG118 6.73/6.00m
G95UG139 15.62/2.39m
G95UG124 5.36/5.00m
B93DH194 14.38/13.85m
G95UG130
G95UG119 11.43/7.97m
P94DH301
G95UG126 25.20/16.90m
G95UG127 15.60/10.50m
G95UG144 5.91/4.41m
G95UG132 6.32/2.75m
G95UG140 17.36/2.55
G95UG133 19.47/5.70
G95UG128 18.10/12.90m
G95UG129 1.25/1.75m
G95UG117 11.97/2.95m
P94DH300
G95UG137
G95UG141
G95UG138 10.46/7.58m
G95UG131 4.62/0.92m
G95UG142 6.19/1.50m
G95UG135 3.27/3.66m

133


1050 m
1000 m
950 m
900 m
850 m
800 m
750 m
750 m
WITH
(metres) VALUE
INTERSECTION
29
45
100 METERS
TREND
23550 N
23600 N
23650 N
24250 N
24300 N
24350 N
24400 N
NORTH AMERICAN METALS CORPORATION
GRIZZLY ZONE
VERTICAL LONG SECTION
GRADE TIMES THICKNESS
Drawn by: APH
Date: Jan. 1996
Figure No.: 8.1-3
Filename: g:\data\grizzly\grizex95\gdh95ls2.dwg

that other zones of significant mineralization may be present within the Grizzly carbonate lens.

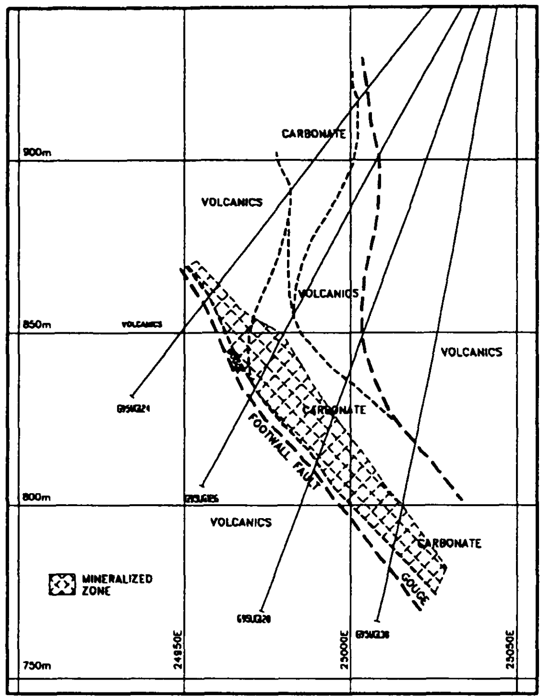


Figure 8.1-4: Grizzly Section 23850N

8.1.3 MINERAL RESOURCE

Preliminary mineral resource estimates for the Grizzly Zone have been prepared by Pigage (1995). Calculations were made based on eight, ten and twelve gram cutoffs.

A sectional polygonal approach was used, based on 50 metre sections approximately perpendicular to the trend of the mineralized zone. Eight, ten and twelve gram per tonne cutoffs were used for establishing resource polygons which were manually prepared, and in most cases correspond to a single drillhole intersection with polygon boundaries drawn halfway between holes. Polygons were extended halfway to adjacent sections for a total thickness of 50 metres. Of this, 20 metres (10 on either side of the section) was assigned to the probable category while the remaining 30 metres was assigned to the possible category. A uniform specific gravity of 2.5 was used for all volume to tonnage calculations. High assays were cut to 34.286 grams/tonne (1 oz/ton). No correction was made for dilution or recovery.

Based on these criteria and a 12 gram per tonne cutoff, the mineral inventory of the Grizzly Zone was calculated to be 149,008 tonnes grading 20.47 grams per tonne gold, cut. Of this total 8,394 tonnes grading 23.08 grams per tonne are contained in the narrower upper zone, and 140,614 tonnes grading 20.31 grams per tonne gold are contained in the main, lower zone. Totals for both probable and possible categories at all three cutoffs are presented in Table 8.1-1.

Cutoff	Category	Tonnes	Au g/t Uncut	Au g/t Cut	Contained Ounces Uncut	Contained Ounces Cut
8 g/t	probable	94,188	19.87	17.36	60,172	52,571
8 g/t	possible	100,118	19.18	17.23	61,739	55,462
8 g/t	total	194,306	19.52	17.29	121,911	108,033
10 g/t	probable	77,220	22.89	19.76	56,829	49,058
10 g/t	possible	82,460	22.11	19.63	58,618	52,043
10 g/t	total	159,680	22.49	19.69	115,447	101,101
12 g/t	probable	72,066	23.82	20.46	55,191	47,406
12 g/t	possible	76,942	23.00	20.34	56,897	50,317
12 g/t	total	149,008	23.39	20.40	112,088	97,723

Table 8.1-1: Summary of Grizzly Zone Resource Calculations

8.1.4 METALLURGY

Metallurgical test work has been carried out on composites from two Grizzly Zone drill holes, G95UG126 and G95UG127, in order to determine the most appropriate method for gold recovery.

The first tests were were performed by McClelland Laboratories Inc. of Sparks, Nevada, to determine amenability to direct agitated cyanidization. Bottle roll tests at 80% minus 200 mesh feed size indicated that neither composite was amenable to this treatment. Gold recoveries of only 6.9 and 2.5% were returned from composites from G95UG126 and G95UG127, respectively, after 96 hours of leaching.

Additional testwork was carried out on composites from the same drill holes by Lakefield research Ltd. of Lakefield, Ontario. Initial 72 hour CIL bottle roll tests confirmed the McClelland results with recoveries of 6.8 and 3.6% respectively for G95UG126 and G95UG127. Further tests on the same composites, with the material undergoing roasting prior to CIL gave excellent gold recoveries of 92.5% and 94.7% for G95UG126 and G95UG127 respectively. This indicates that Grizzly mineralization can be processed in the present Golden Bear mill, which is set up with a roaster and CIL circuit, as this was the treatment method used to mill the refractory ore from the Bear Main deposit.

8.1.5 CONCLUSIONS AND RECOMMENDATIONS

There is good potential to significantly increase the mineral inventory of the Grizzly Zone through additional diamond drilling. This is particularly true of the larger, lower zone of mineralization that remains open to the north and requires drill testing in this direction. In addition several widespread drill intersections suggest that gold mineralization is widespread and that potential for locating other zones of significant mineralization is high. Such zones could be tested for by drilling additional wide spaced hole in areas of the Grizzly carbonate lens where current drill coverage is sparse or lacking.

Two options exist for this work. Firstly, the Grizzly ramp can be dewatered and the services replaced such that the ramp can be extended far enough to facilitate additional drilling. Drilling off the end of the current ramp will not allow intersections much, if any, further north than G95UG145 (24075N). Secondly, the northern projection of the Grizzly Zone could be tested by drilling from surface. This would require that 2000 foot (600 metre) holes be drilled. Based on previous holes of this length drilled on the property each hole would cost approximately $100,000. The second option is preferred as it avoids the high cost of reestablishing and extending the underground workings, which would have to be done prior to obtaining any additional drill data. Relative to this approach, drilling from surface would allow a cost effective assessment of whether or not a large enough mineral inventory is present to justify the cost of returning underground. It is estimated that a minimum of 300,000 tonnes grading a minimum of 20 g/t (200,000 contained ounces) would be needed. This is roughly two times the current mineral inventory. A preliminary layout of three potential drillholes is shown on Figure 8.1-3. Additional holes would be added pending results.

8.1.6 GRIZZLY DATA

Computerized data on the Grizzly is located as follows:

Drillhole database: Data from all Grizzly drillholes has been entered into NAMC's PCExplor Exploration Drillhole and Trenches database (G:\PXDBGB).

Drawings: All Grizzly drawings are stored on NAMC's computer network under G:\data\grizzly. This includes ramp geology, reserve estimates, assessment reports, and geological sections (including drillhole geotech that documents where and how much water was encountered in Grizzly Zone holes).

8.1.7 REFERENCES

Cannon, B., 1996. Electron Microprobe and Scanning Electron Microscope Analysis of Drill Core. Report for North American Metals Corp.

Hamilton, A.P., 1994. Technical report of activities on the Grizzly Project. Explore B.C. Program Technical Report, Grant I.D. #94/95 A-17, 10 pages.

Hamilton, A.P., 1995. Technical report of activities on the Grizzly Diamond Drilling Project. Explore B.C. Program Technical Report, Grant I.D. # 95/96 A-118, 12 pages.

Pigage, L.C., 1995. Polygonal Mineral Inventory for the Grizzly Zone. North American Metals Corp., internal company memorandum.

8.2 KODIAK A SUMMARY

The Kodiak A deposit is located 2.5 kilometres north of the Bear Main open pit at an elevation of 1900 metres (see Figure 8.2-1). Exploration on this portion of the property was first carried out by Chevron between 1982 and 1985, during which prospecting, geologic mapping, geophysical surveys, four trenches and six diamond drill holes totalling 950 metres were completed in the area. While this work outlined the major faults that form the Ophir Break most of it was focussed to the immediate east of the Kodiak A area. It was not until 1992, when North American Metals Corp conducted a multifaceted exploration program, that the first indications of gold mineralization were noted. At this time several grab samples returned anomalous gold values and IP surveys indicated some interesting anomalies trending through the Kodiak A area.

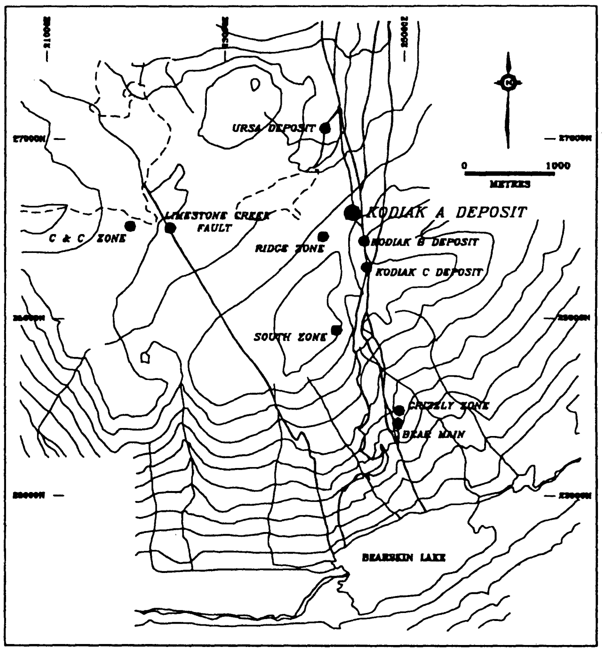


Figure 8.2-1: Location of Kodiak A Deposit

These results were followed up by NAMC in late 1993 with five trenches. Anomalous results were returned from all trenches, with the best result being 7.21 grams per tonne gold over 20 metres. Drilling commenced immediately and by the end of 1993, a twelve hole program totalling 1377 metres had been completed that verified a significant gold bearing resource in the Kodiak A area. An infill drilling program, based on 20 metre centres, was carried out in two phases during the first seven months of 1994. 34 holes totalling 2652 metres were drilled and defined mineralization over a strike length of 160 metres.

A review of NAMC's own internal feasibility evaluation of the Kodiak A project was performed by HBT Agra when the 1994 drilling was complete. The review indicated that mining by open pit methods and gold recovery through heap leaching was economic. Mining permits were received in August of 1994 and heap leach pad construction and mining began, only to be halted September 21 when a severe storm caused flooding that washed out the mine access road and airstrip. The first three benches of the Kodiak A open pit had been mined and the ore stockpiled.

For most of 1995 development of the Kodiak A project was put on hold, however a second feasibility study, by Kappes, Cassidy and Associates of Reno, Nevada, was initiated when the project was expanded to include the Ursa deposit, which lies one kilometre to the north of Kodiak A. Completed in early 1996 the study indicated that a Kodiak open pit / heap leach operation was economic. Construction and lining of the Fleece Bowl heap leach pad and a water reservoir was completed in September 1996, with ongoing construction, mining and stacking of Kodiak A ore scheduled for 1997.

8.2.1 GEOLOGY

The geology of the Kodiak A area is dominated by two of the limestone units that form the Permian carbonate package. The oldest unit, as mapped by Cooley (1996), is LMST1, a massive to medium bedded, creamy white to pale gray limestone. This is overlain by LMBC, a dark to medium gray banded and locally crinoidal limestone. Locally these units contain intervals of pale to dark gray chert. It is uncertain whether this chert is sedimentary or is a completely silicified limestone.

Structurally, two features dominate the Kodiak A area. The first is a fault zone locally called the Kodiak fault. This fault zone, which is 3 to 35 metres thick, trends 340 degrees and dips 55 degrees to the northeast, is located roughly 100 metres west of the Ophir Break. It is assumed that the Kodiak fault is a splay from the larger fault system and that they merge at depth. The fault zone is characterized by extensive breccias and orange to red, hematitic gouge.

The second dominant structure is a northeast trending, southeast verging, overturned anticline that lies to the west of, and appears to be truncated by, the Kodiak fault. This structure is of interest because the region where this anticline and the Kodiak fault intersect is the location of the Kodiak A deposit. The area is characterized by extensive crackle and breccia textures and silicification. The silicification predates the latest movement on the Kodiak fault as silicified limestone clasts are found in gouge along the fault (Pigage, 1994).

8.2.2 MINERALIZATION

Kodiak A gold mineralization occurs in strongly crackled, brecciated and silicified carbonates in the footwall of the Kodiak fault, where it has been defined over a 160 metre strike length and 60 metres downdip from surface.

The mineralized zone has the general shape of an inverted teardrop extending down dip immediately beneath the fault zone (see Figure 8.2-2) Above an elevation of 1875 metres the zone extends greatly away from the Kodiak fault into the footwall, with true thicknesses reaching 40 metres. This general geometry is well expressed on a grade-thickness longsection (Figure 8.2-3). Individual drillhole assay results are plotted on a diamond drill intersection longsection (Figure 8.2-4).

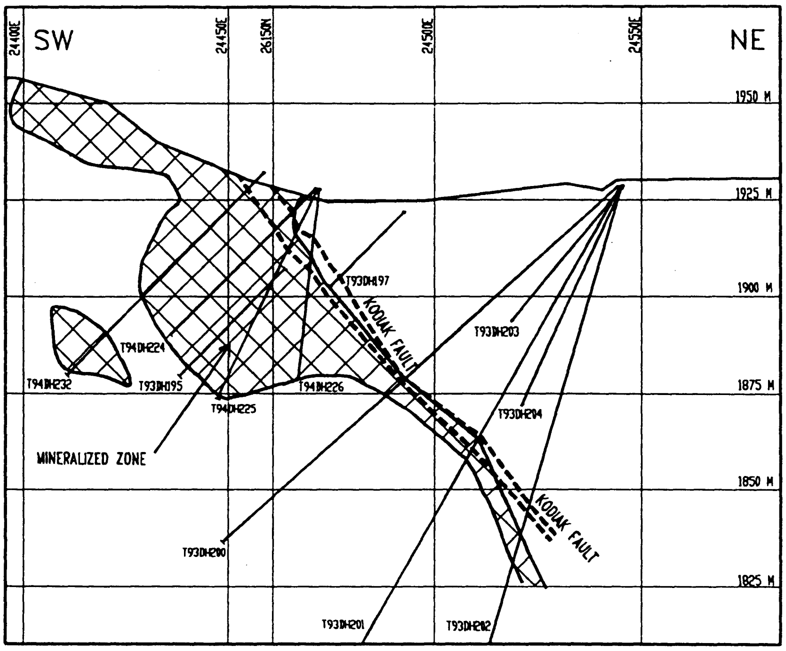


Figure 8.2-2: Kodiak Section K600+80

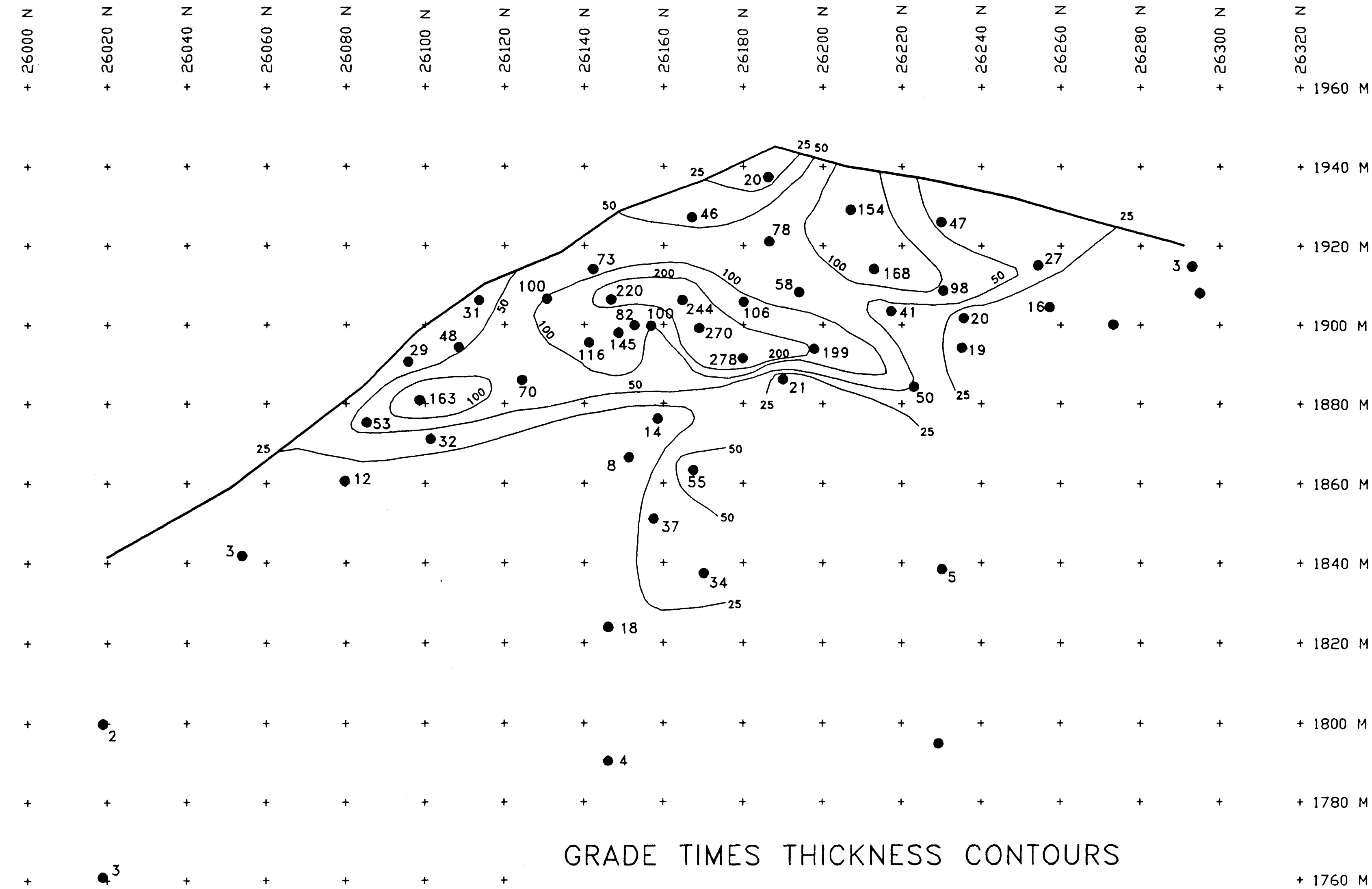
Gold appears to be reasonably evenly disseminated throughout the deposit, although local small gouge zones may have highly concentrated gold assay values. At the macroscopic level no pyrite or other sulphides have been noted, however the silicified carbonate that hosts gold mineralization is often hematitic and could be referred to as a jasperoid. At the microscopic level, SEM and microprobe work by Cannon (1996) has indicated that gold occurs as grains of 920 to 960 fineness, generally less than 20 microns in size, and most often with iron oxide stained muscovite along fractures. Other metallic phases were found to either be absent or present only as occasional grains.

8.2.3 RESERVES

Mineable reserves have been calculated for the Kodiak A deposit by Strathcona Mineral Services of Toronto, Ontario. The estimate utilizes a data base that includes 48 diamond drill holes, trenching results and blasthole assays from initial mining activities in 1994.

A block model, with grade extrapolation based on ordinary kriging and a 5.0

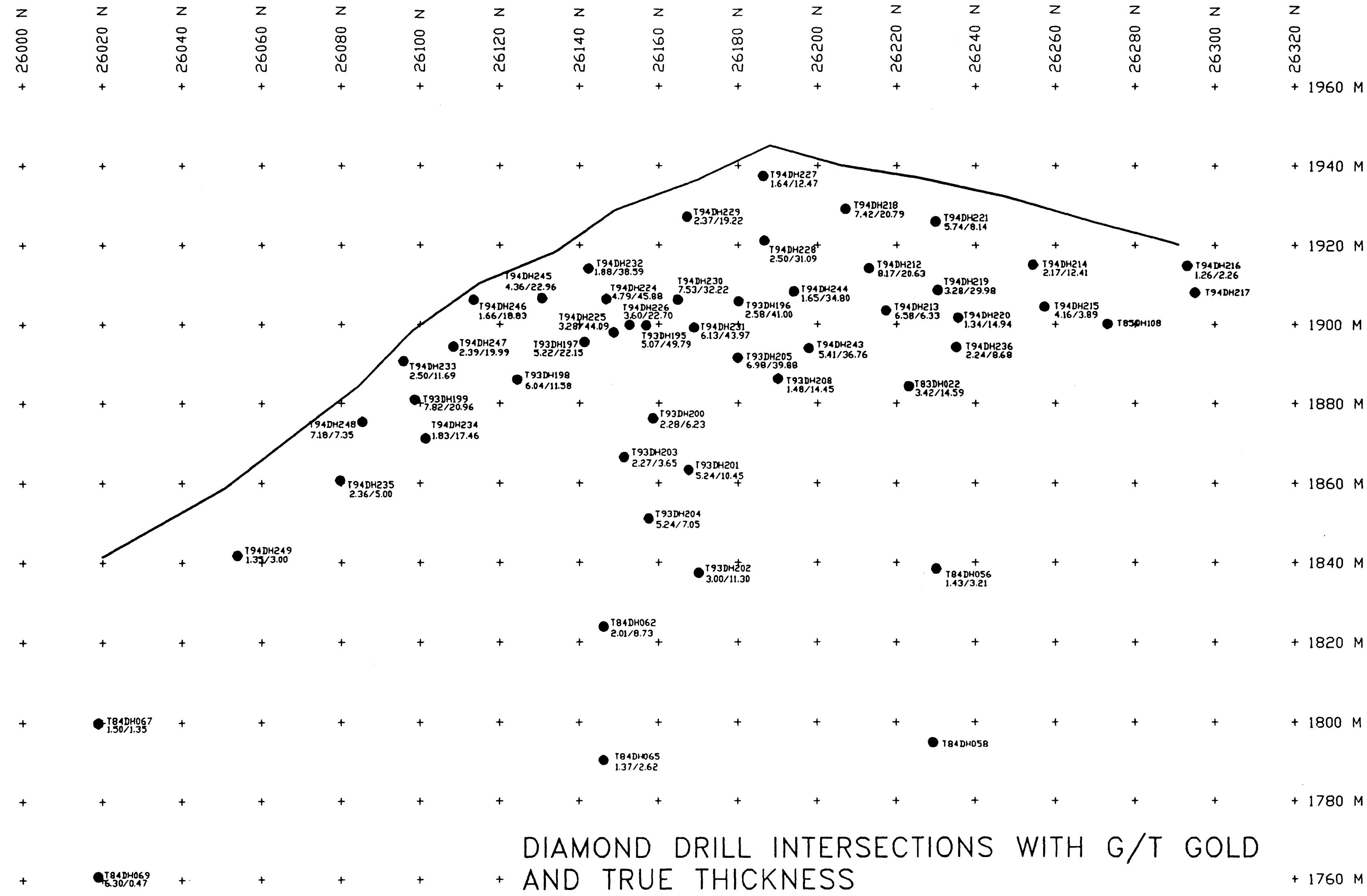
VERTICAL LONG SECTION OF THE KODIAK A DEPOSIT



G:\data\kodiak-a\misc\kalosect

Figure 8.2-3

VERTICAL LONG SECTION OF THE KODIAK A DEPOSIT



G:\data\kodiak-a\misc\kalosect

Figure 8.2-4

metre block size was used for reserve estimation. External and internal cutoff grades, assessed by examining costs for an open pit mining / heap leaching operation, were determined to be 1.8 g/t gold and 0.9 g/t gold respectively. Bulk densities, assigned to different materials based on testwork and field observation, are as follows:

Material	Density (t/m^3)
Mineralization outside Kodiak Fault	2.4
Mineralization in fault	2.3
Waste outside fault	2.5
Waste inside fault	2.3

Table 8.2-1: Kodiak A Bulk Densities

The cutting level was set at 20 g/t gold which corresponds to the 97.5 percentile of the cummulative assay distribution. Dilution was calculated by adding two metres of waste on both walls of the ore outline and determining this amount as a percentage of the bench tonnage. The dilution figure varies from 75% to 30% depending on the bench, with overall dilution equalling 12%.

Based on these criteria the mineable reserves for the Kodiak A deposit, including ore stockpiled in 1994, were calculated to be 824,000 tonnes grading 3.3 grams per tonne gold. The ore to waste ratio is 1 : 1.

8.2.4 METALLURGY

Metallurgical testwork was carried out on two Kodiak A deposit drillhole composites to determine their amenability to cyanidation processes. The tests were performed by McClelland Laboratories of Sparks, Nevada, and consisted of column leach tests on 80% minus 3/4 inch crush material. The results of these tests, both of which returned recoveries of greater than 90%, are summarized below.

Test	Crush Size	Calculated Assay Head (g/t)	Percentage Recovery	Leach Time (days)
KA-1994	-3/4"	5.36	93.5	61
KA-1995	-3/4"	4.84	91.1	105

Table 8.2-2: Kodiak A Column Leach Results

8.2.5 CONCLUSIONS AND RECOMMENDATIONS

The Kodiak A deposit has been placed in North American Metals mine plan, with open pit mining scheduled for 1997 and 1998, and heap leaching of the ore to take place from 1997 to 1999. For more detailed information on all aspects of the Kodiak A project the reader is directed to the feasibility study written by Kappes, Cassidy and Associates (see section 8.2.7).

8.2.6 KODIAK A DATA

Computerized database information on the Kodiak A deposit is located as follows:

G:\PXDBGB - PCExplor Exploration Drillholes and Trenches
G:\PXDBKA - PCXplor Kodiak A Compositing Database
G:\PMDBKA - PCMine Kodiak A Pit
G:\GMDBKB - GeoModel Kodiak A 5 Metre Composites

Drawing, spreadsheet and document files are located on NAMC' s computer network under the following directories:

G:\DATA\KODIAK-A
P:\DATA\K-A

8.2.7 REFERENCES

Cannon, B., 1996. Electron Microprobe and Scanning Electron Microscope Analysis of Drill Core. Report for North American Metals Corp.

Cartwright, P.A., 1992. Report on the Induced Polarization and Resistivity Survey on the Totem Grid, Golden Bear Mine, Atlin Mining Division, British Columbia. Pacific Geophysical Ltd. report for North American Metals Corp.

Kappes, Cassidy and Associates, 1996. Golden Bear Heap Leach Project Feasibility Study. Report for North American Metals Corp.

Pigage L.C., 1994. Kodiak A Project Diamond Driling Assessment Report. British Colombia Assessment Report.

Visser, S., 1993. Magneitc and VLF-EM Survey for North American Metals Corp. at Golden Bear Mines Kodiak Zone Grid. S.J. Geophysics report for North American Metals Corp.

8.3 KODIAK B SUMMARY

The Kodiak B deposit is located 2.0 kilometres north of the Bear Main open pit at the head of Fleece Bowl (see Figure 8.3.1). The deposit is a blind one, extending from 35 to 135 below surface. As such it was not detected during surface exploration programs conducted in the immediate area as early as 1981 by Chevron. Rather, it was discovered in 1984, when Chevron was drilling wide spaced exploration drillholes along the Ophir Break.

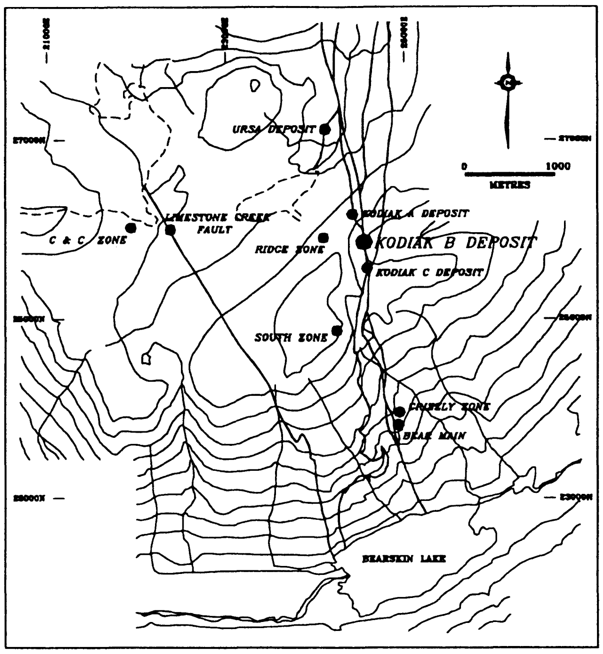


Figure 8.3-1: Location of Kodiak B Deposit

Since discovery in 1984, four diamond drill programs, in 1984, 1992, 1994 and 1996, have been carried out on the zone. Drilling from all programs totals 5414 metres in 43 holes (see Table 8.3-1). Early drillholes were directed in several

Year	Number of Holes	Metres Drilled
1986	12	1625.23
1992	10	1394.17
1994	10	1132.64
1996	11	1261.75
Totals	43	5413.79

Table 8.3-1: Kodiak B Drilling Summary

orientations while the general geometry of mineralization was being outlined. The 1994 and 1996 programs were drilled on east-west sections spaced 20 metres apart. These programs outlined gold mineralization over a strike length of 180 metres.

A feasibility study prepared by Canandian Mine Development of Brampton, Ontario and Kappes, Cassidy and Associates of Reno, Nevada, has allowed NAMC to place the Kodiak B deposit in their mine plan. An underground, longhole stoping mining operation is scheduled to begin in 1999 with ore to be placed on the Fleece Bowl heap leach pad for processing.

8.3.1 GEOLOGY

The geology of the Kodiak B area is dominated lithologically by Permian carbonate units and structurally by the northerly trending, steeply easterly dipping Fleece Fault. Carbonate units present (after Cooley, 1996) include LMST1, a massive to medium bedded creamy coloured limestone, LMBC, a dark to medium gray banded and locally crinoidal limestone, and DOCH, a thick bedded to massive dolomite with irregular chert lenses. On the hangingwall (east) side of the Fleece Fault, LMST1 and LMBC are the most abundant with both units commonly being crackled and silicified. Local calcite welded breccias of silicic fragments have also been intersected in drill core. In the footwall only DOCH has been intersected.

The Fleece Fault, which ranges from 3 to 12 metres in thickness, is a broken and gougy structural zone that contains several lithologic units. Fault blocks of all of the above listed carbonate units are present, as are heterolithic carbonate breccias (HLBX), formed during movement on the fault. In addition, in the southern half of the Kodiak B area the fault zone contains a thin wedge of altered mafic volcanics (MFCA). The northern termination of this wedge plunges from surface to the south at an angle of roughly 30 degrees.

Intrusive rocks are present in the Kodiak B zone in the form of a fine to medium grained, massive, strongly altered intermediate dyke. The dyke strikes northeasterly and dips gently to the northwest. It is present only in the footwall rocks and is truncated by the Fleece Fault.

8.3.2 MINERALIZATION

Gold mineralization in the Kodiak B deposit occurs in two crudely tabular zones, mainly in the footwall DOCH unit. The largest of these has been outlined over a 160 metre strike length and 90 metre dip extent, and in section has and inverted teardrop shape very similar to that of the nearby Kodiak A deposit (see Figure 8.3-2). For the most part this Main Zone lies immediately adjacent to the Fleece Fault, however at the north end it moves a short distance away from the fault and at the south end mineralization moves into the altered volcanics and heterolithic carbonate breccias of the Fleece Fault (see Figure 8.3-3). The thickness of this mineralized zone varies from 2 or 3 metres to approximately 30 metres, with higher grade gold values generally being located closer to the fault. The Main Zone also includes the cross cutting intermediate dyke which carries gold values that are as high as anywhere else in the deposit. Individual drillhole assays are plotted on a drill intersection longsection (Figure 8.3-4).

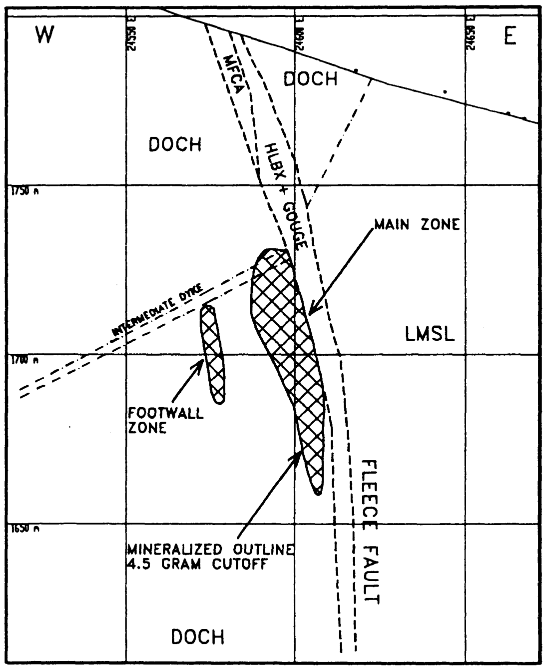


Figure 8.3-2: Schematic Section of the Kodiak B Deposit

The smaller, Footwall Zone, which measures 40 metres by 40 metres and has an average thickness of 3 to 4 metres, lies a short distance into the footwall and overlaps partially with the main zone in longsection. While the Main Zone is roughly parallel to the northerly trending Fleece Fault, the Footwall Zone trends 330 degrees. This 330 degree trend is not apparent in the Main Zone until higher grade assays are contoured in plan. When this is done a number of shoots with this orientation are discernable within the Main Zone that are enveloped by slightly lower grade mineralization.

Both of these mineralized zones are characterized by breccia or strong crackle textures in the DOCH. Where brecciation is most intense the clasts are moderately milled and the matrix an orangy-tan colour. These areas also tend to carry the strongest gold grades, with values dropping off as structural disruption decreases. This generally equates to increasing distance from the Fleece Fault.

While sulphides are absent from most of the Kodiak B mineralization they are present in some portions of the deposit as fine grained, dark gray sulphides. They are most abundant in the fault wedge of altered mafic volcanics at the south end of the zone where they occur as even disseminations and as fine coatings on fractures or shears. Fine pyrite also occurs along fractures in the carbonate rocks but mainly where they are adjacent to the volcanic fault wedge or at lower elevations in both the Main and Footwall Zones. Sulphide content may reach 3 or 4 percent in the volcanics but rarely exceeds 2 percent in the carbonate rocks.

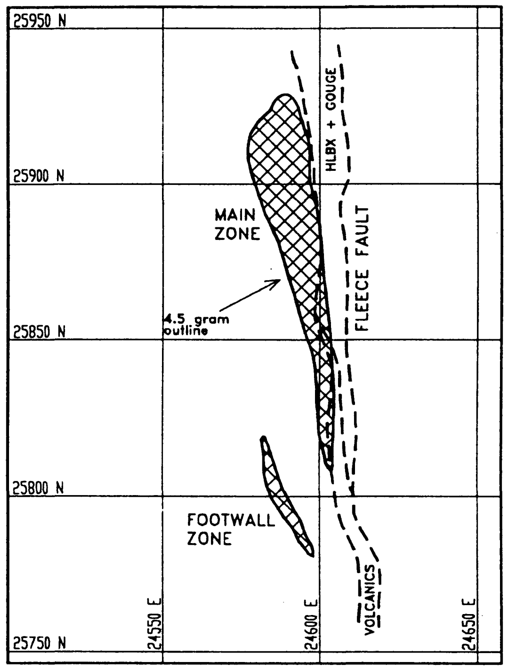


Figure 8.3-3: Kodiak B Level Plan 1720 M Elevation

Pyrite mineralization is also present in the intermediate dyke as fine disseminations up to 10% of the rock. This sulphide appears to be present both with or without gold, as intersections further away from the Fleece Fault contain sulphide but no gold mineralization.

8.3.3 RESERVES

Reserves have been calculated for the Kodiak B deposit by Hamilton (1996). Estimates were made for both insitu, geologic and insitu recoverable reserves, using the following parameters:

- A cutoff grade of 4.5 grams per tonne.
- High assays were cut to 42 g/t gold. This corresponds to both the mean plus two standard deviations, and tail of histogram.
- A specific gravity of 2.65. The average of testwork on ore grade samples was 2.72 and a calculated S.G. for an unbrecciated DOCH based on an 80% dolomite and 20% chert composition is 2.81. The

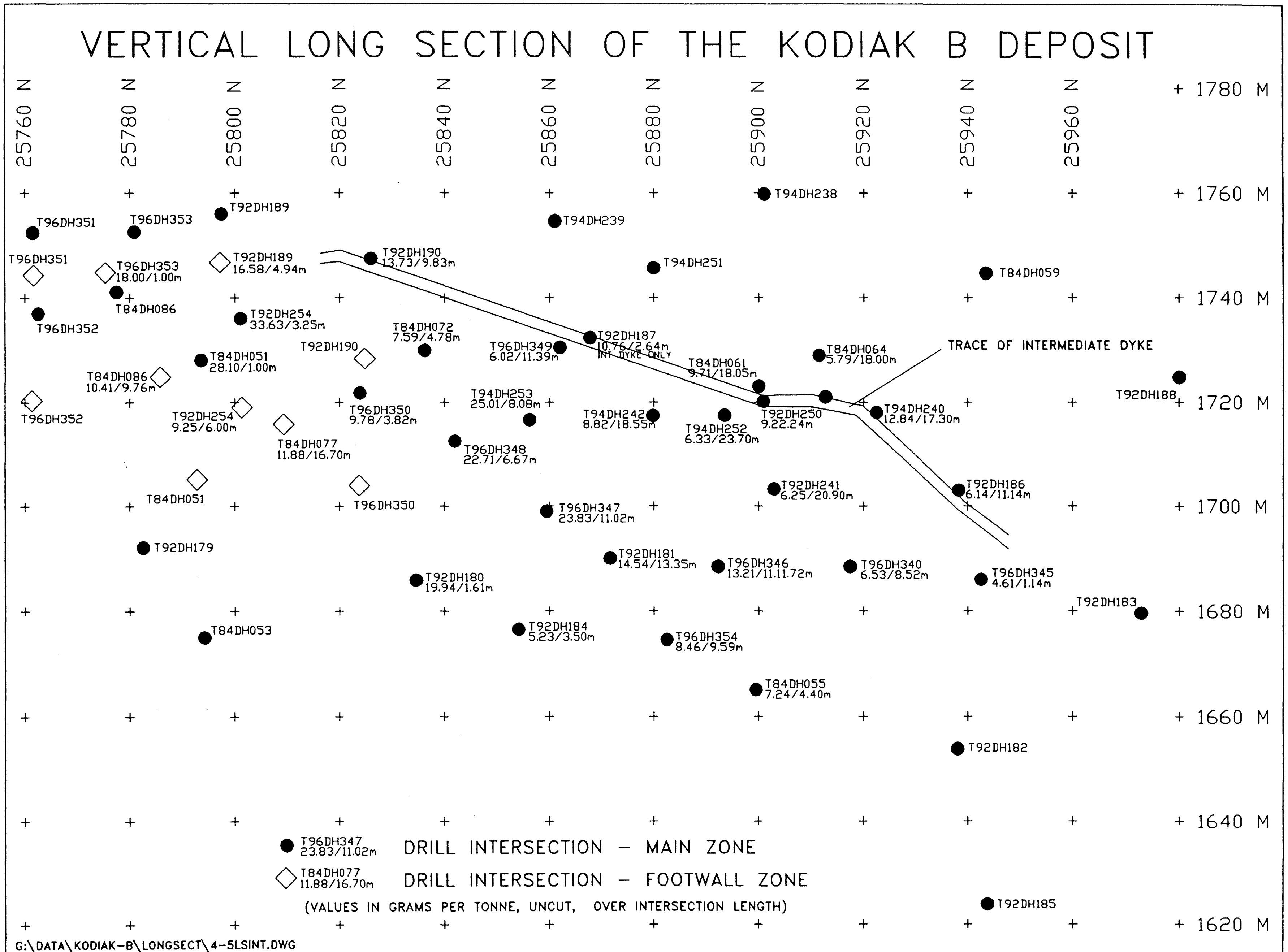

VERTICAL LONG SECTION OF THE KODIAK B DEPOSIT
25760 N
25780 N
25800 N
25820 N
25840 N
25860 N
25880 N
25900 N
25920 N
25940 N
25960 N
+ 1780 M
+ 1760 M
+ 1740 M
+ 1720 M
+ 1700 M
+ 1680 M
+ 1660 M
+ 1640 M
+ 1620 M
T96DH351
T96DH353
T92DH189
T94DH239
T94DH238
T96DH351
T96DH353 18.00/1.00m
T92DH189 16.58/4.94m
T92DH190 13.73/9.83m
T94DH251
T84DH059
T84DH086
T96DH352
T92DH254 33.63/3.25m
T84DH072 7.59/4.78m
T92DH190
T96DH349 6.02/11.39m
T92DH187 10.76/2.64m
INT DYKE ONLY
T84DH064 5.79/18.00m
TRACE OF INTERMEDIATE DYKE
T84DH051 28.10/1.00m
T84DH086 10.41/9.76m
T84DH061 9.71/18.05m
T92DH188
T96DH352
T92DH254 9.25/6.00m
T96DH350 9.78/3.82m
T94DH253 25.01/8.08m
T94DH242 8.82/18.55m
T94DH252 6.33/23.70m
T92DH250 9.22.24m
T94DH240 12.84/17.30m
T84DH077 11.88/16.70m
T96DH348 22.71/6.67m
T92DH241 6.25/20.90m
T92DH186 6.14/11.14m
T84DH051
T96DH350
T96DH347 23.83/11.02m
T92DH179
T92DH181 14.54/13.35m
T96DH346 13.21/11.11.72m
T96DH340 6.53/8.52m
T96DH345 4.61/1.14m
T92DH180 19.94/1.61m
T92DH183
T84DH053
T92DH184 5.23/3.50m
T96DH354 8.46/9.59m
T84DH055 7.24/4.40m
T92DH182
T96DH347 23.83/11.02m DRILL INTERSECTION – MAIN ZONE
T84DH077 11.88/16.70m DRILL INTERSECTION – FOOTWALL ZONE
(VALUES IN GRAMS PER TONNE, UNCUT, OVER INTERSECTION LENGTH)
T92DH185
G:\DATA\KODIAK-B\LONGSECT\4-5LSINT.DWG

Figure 8.3-4

value of 2.65 allows for approximately 6% open space (fractures, breccia cavities) relative to an unbrecciated DOCH.

- Categories were assigned as follows:
  - Probable
    - drill intersection on this section.
    - 10 metre zone of influence, depending on distance to adjacent holes.
  - Possible
    - no drill intersection on this section.
    - based on geologic interpretation.
    - interpolated between drillholes.
  - Inferred
    - no drillholes on this section.
    - based on geologic interpretation
    - extrapolated beyond drillholes on section.
- The recoverable estimate was calculated by applying the recovery percentage for a drillhole composite to its corresponding geologic grade. Drillholes on which no metallurgical testwork was performed were assigned a recovery percentage by averaging recoveries from immediately adjacent drillholes on which testwork was carried out. Polygons that did not meet the cutoff grade of 4.5 g/t gold after application of recovery percentages were not included in the recoverable estimate.

- Neither estimate takes into account dilution.

The reserves calculated using these criteria are tabulated below:

Estimate	Tonnes	Grade (g/t Au)	Contained Ounces
Insitu Geologic	172,554	10.24	56,790
Insitu Recoverable	141,150	8.51	38,620

Table 8.3-2: Kodiak B Geologic and Recoverable Reserves (cut)

8.3.4 METALLURGY

Considerable metallurgical test work has been carried out on material from the Kodiak B deposit. The results of four bottle roll tests conducted prior to 1994, on samples of high grade carbonate ore and samples of combined high grade intermediate dyke ore and low to medium grade carbonate ore, led Homestake to determine that the ore was refractory and would require milling. A review of this data by Craig (1994), suggested that poorer recoveries were due higher proportions of intermediate dyke material in the sample material. Subsequent test work, consisting of both bottle roll tests and column leach tests, tested this hypothesis on two composites, one of DOCH and one of dyke material. Results are tabulated below. They indicate that gold recoveries from the intermediate dkye are consistently lower than those from carbonate.

Composite	Rock Type	% Recovery	Test Time	Type	Grind
A	DOCH	89.9%	96 hours	Bottle	-1/8"
A	DOCH	90.1%	96 hours	Bottle	-3/4"
A	DOCH	94.5%	48 days	Column	-3/4"
B	DYKE	52.1%	96 hours	Bottle	-1/8"
B	DYKE	55.3%	96 hours	Bottle	-3/4"
B	DYKE	50.5%	48 days	Column	-3/4"

Table 8.3-3: Kodiak B Comparative Column and Bottle Roll Tests

A number of drill hole composites from the 1994 and 1996 drilling programs, were subsequently tested in order to assess all portions of the Kodiak B deposit and all mineralized rock types for amenability to heap leaching. In total 32 Kodiak B drillhole composites have been subjected to bottle roll tests. A summary of results is given in Table 8.3-4.

Lithology	Number of Samples	Lowest Recovery	Highest Recovery	Average Recovery
Intermediate Dyke	5	41.1%	82.1%	55.7%
Volcanics	3	12.3%	68.4%	33.2%
Carbonate	24	50.5%	99.3%	80.5%

Table 8.3.-4: Summary of Kodiak B Bottle Roll Tests

The bottle roll tests confirm consistently poor recoveries from the intermediate dyke and altered volcanics. The logged descriptions of these rock types and the descriptions of carbonate from which poor recoveries were obtained all mention that sulphide mineralization is present. Fortunately, pyrite mineralization is not widespread, occuring in the dyke, the volcanics, and more rarely in carbonate, both adjacent to the volcanics and at depth in the Main and Footwall Zones. The overall, weighted recovery for the Kodiak B recoverable reserve is 78.0%. This reflects low volumes of these materials in the deposit relative to the mineralized carbonate, which is felt to be readily heap leachable.

8.3.5 CONCLUSIONS AND RECOMMENDATIONS

The Kodiak B deposit has now been placed in North American Metals mine plan, with underground mining scheduled to take place over two years commencing in 1998. The ore will be placed on the Fleece Bowl heap leach pad. A mineable reserve has been calculated for the deposit that consists of 183,835 tonnes grading 8.67 g/t gold, or 51,250 contained ounces. Based on metallurgical testwork it is projected that 39,370 ounces of gold will be recovered through heap leaching of the ore. For more detailed information on the Kodiak B mining project the reader is directed to the development report prepared by Canadian Mine Development (see Section 8.3.7).

8.3.6 KODIAK B DATA

Computerized database information on the Kodiak B Deposit is located as follows:

G:\PXDBGB - PCXplor Exploration Drillholes and Trenches
P:\GMDBKB - GeoModel Database

Drawings, spreadsheet and document files are located on NAMC's computer network under the following directories:

G:\DATA\KODIAK-B
G:\DATA\KODIAKB&C
P:\DATA\K-B
P:\DATA\KODIAK-B

8.3.7 REFERENCES

Canadian Mine Development, 1996. Golden Bear Mine Kodiak B Zone Mining and Developement. Report for North American Metals Corp.

Hamilton, A.P., 1996a. Kodiak B 4.5 Gram Mineral Inventory Calculations. North American Metals Corp. internal company memorandum.

Hamilton, A.P., 1996b. Polygonal Mineral Reserve for the Kodiak B Deposit, North American Metals Corp. internal company memorandum.

McBean, D.A. and Reddy, D.G., 1993. 1992 Fleece Bowl Exploration Report. North American Metals Corp. internal company report.

8.4 KODIAK C SUMMARY

The Kodiak C Zone is located 1.7 kilometres to the north of the Bear Main open pit (see Figure 8.4-1). Exploration was first carried out on this portion of the property in 1981 and 1982 by Chevron, who completed 1:1000 scale geologic mapping, magnetometer and VLF surveys, and trenching. Linear VLF highs were found to closely define the Fleece and Black faults, two large structures that comprise the Ophir Break in this area. As a result trenching in the area concentrated on these structures. A total of 7 trenches were dug, with low grade gold values being returned from most trenches. Trenching efforts however, were hampered by significant thicknesses of glacial moraine.

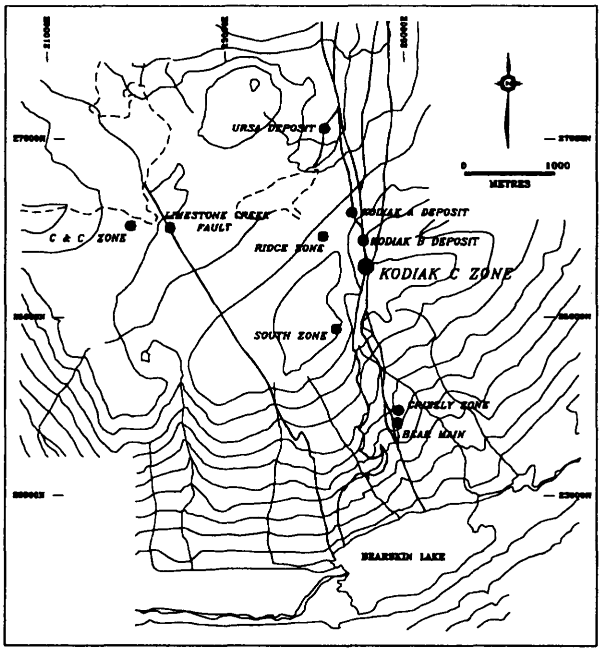


Figure 8.4-1: Location of Kodiak C Zone

Diamond drilling on the Kodiak C Zone first took place in 1983 and targeted the Fleece Fault. Subsequent programs were carried out in 1984 and 1992. To date a total of 18 holes have been drilled on sections spaced 40 to 60 metres apart, with at least 50 metre spacing between holes on section. This work has outlined gold mineralization over a strike length of 360 metres. A summary of diamond drilling is given in Table 8.4-1.

Attempts to trench the Kodiak C Zone were made in 1994 with very limited success as overburden materials were found to be cemented by permafrost. Bedrock was not exposed. To date no further exploration work has taken place.

Year	Number of Holes	Metres Drilled
1983	3	396.70
1984	13	2390.40
1992	2	509.93
Totals	18	3297.03

Table 8.4-1: Summary of Kodiak C Zone Diamond Drilling

8.4.1 GEOLOGY

The geology of the Kodiak C area is dominated by three major north-south trending fault structures that coalesce along the strike of the zone to form this portion of the Ophir Break. From west to east these are the West Wall, Fleece and Black faults, all steeply easterly dipping. The three fault strands form a zone 30 to 75 metres wide that places Stuhini Group volcanics in the hangingwall against Permian carbonate rocks in the footwall. Between the bounding West Wall and Black faults, fault slivers of both carbonate and volcanic rocks are present, separated by the Fleece fault (see Figure 8.4-2). Both slivers appear to pinch out, the volcanic wedge to the north, the carbonate wedge to the south. The faults themselves are often characterized by 3 to 5 metre wide breccia and gouge zones.

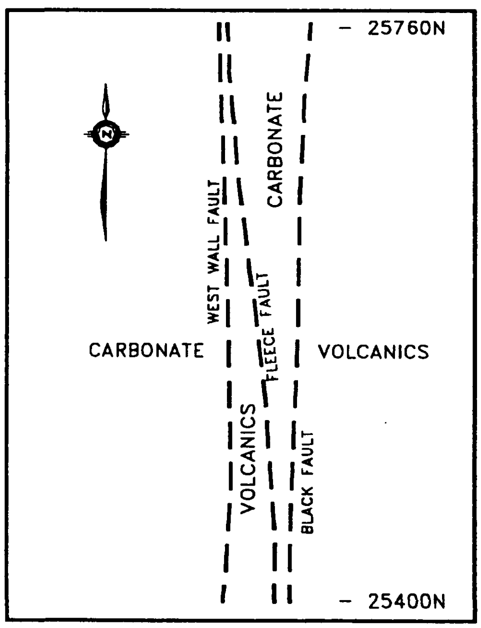


Figure 8.4-2: Schematic Geology Plan of the Kodiak C Zone

The carbonate rocks in the footwall are predominantly DOCH, with deeper holes having intersected massive to thin bedded limestones and in the footwall that may correlate to the LMBC, LMST1 and LMGT1 of Cooley (1996). The carbonate fault wedge contains the same units, however DOCH is not as abundant as in the footwall, and the rocks are more strongly broken.

The Stuhini group volcanics are comprised mainly of thin to medium bedded ash tuffs. Within 30 or 40 metres of the Black fault these rocks are commonly carbonatized, and have been bleached to a light gray-green or creamy colour with fuchsitic alteration, and stringers and disseminations of pyrite. This alteration is particularly intense in the fault bound volcanic wedge.

8.4.2 MINERALIZATION

Gold mineralization in the Kodiak C Zone is primarily developed in the carbonate rocks, with only two drill intersections encountering significant gold values in the altered volcanic fault wedge. Two mineralized zones have been identified to date. The first and largest zone lies as a panel in the immediate hangingwall to the Fleece fault in the carbonate fault wedge (see Figure 8.4-3). Wide spaced drilling has intersected this zone over the full 360 metre strike length of the Kodiak C Zone in true thicknesses varying from 1.0 to 8.0 metres. The second zone, which has been intersected in only 3 drillholes, lies 10 to 30 metres into the footwall carbonate rocks. Many drillholes were not extended far enough to test for this zone and it's continuity remains uncertain.

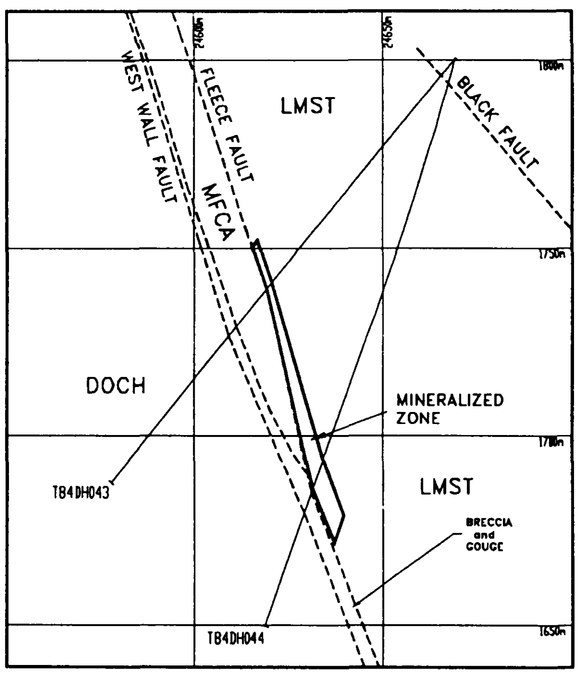


Figure 8.4-3: Kodiak C Section 25600N

The mineralization is associated with zones of crackle, breccia and shear textures in silicified carbonates. Sulphides, which are more or less ubiquitous in the altered volcanics, are generally not associated with gold values. Limonite and hematite however, are commonly present as pervasive staining and fracture coatings in mineralized intersections.

Individual assays have returned values of up to 17 g/t gold, with stronger drill intersections grading 7.62 g/t over 12.96 metres in hole T84DH054, and 8.97 g/t over 5.08 metres in hole T84DH045. In general gold grades seem to be very consistent within the mineralized zones. All Kodiak C Zone drill intersections are shown on Figure 8.4-4.

8.4.3 RESERVES

A preliminary resource estimate based on a sectional polygonal method has been prepared by Pigage (1994) using the following parameters:

- a 3.0 g/t cutoff for mineral inventory polygons.
- a specific gravity of 2.5.
- a 20 metre zone of influence for each vertical section (10 metre limit both up and down dip, and towards and away from section). If two or more holes were present on a section mineralization was extended between drillholes.
- categories - polygons were classified as probable if they contained a drillhole intersection and possible if no drillhole intersection was present.
- no cutting, dilution or mining loss factors are included in the inventory.

The results, with figures for both Fleece fault and footwall intersections are tabulated below (Table 8.4-2).

Zone	Category	Tonnes	Grade (g/t)	Contained Oz.
Fleece Fault	Probable	63,482	7.30	14,943
	Possible	11,056	6.66	2,367
	Total	74,538	7.21	17,310
Footwall	Probable	23,160	3.74	2,754
Totals		97,698	6.39	20,064

Table 8.4-2: Kodiak C Zone Preliminary Mineral Inventory

The mineralization associated with the Fleece fault appears to be continuous, however most of the drilled sections are at least 40 metres apart and therefore are not contiguous. If similar grade and tonnes are assumed

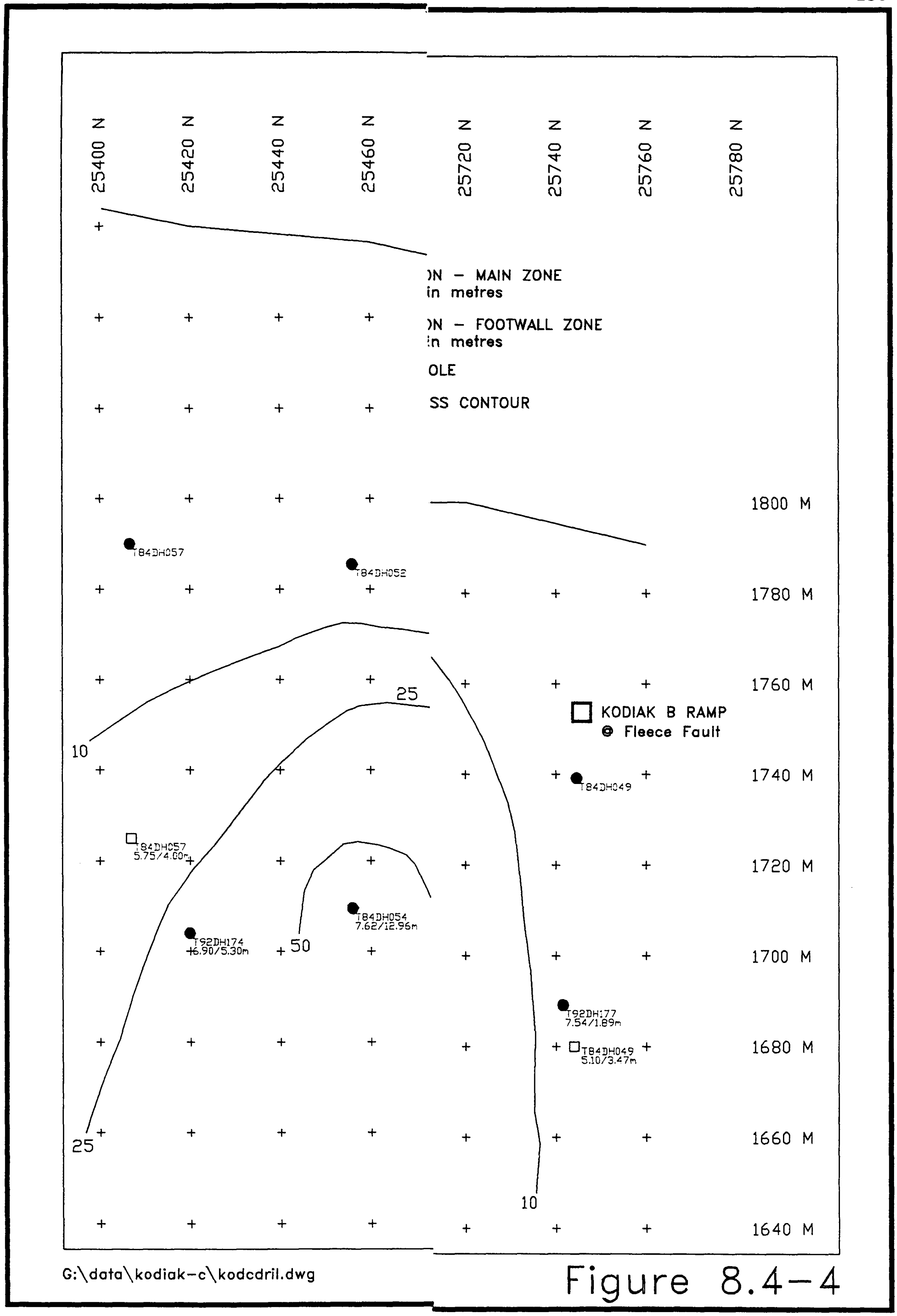

25400 N
25420 N
25440 N
25460 N
25720 N
25740 N
25760 N
25780 N
)N - MAIN ZONE
in metres
)N - FOOTWALL ZONE
in metres
OLE
SS CONTOUR
1800 M
1780 M
1760 M
1740 M
1720 M
1700 M
1680 M
1660 M
1640 M
T84DH057
T84DH052
KODIAK B RAMP
@ Fleece Fault
T84DH049
T84DH057
5.75/4.00m
T84DH054
7.62/12.96m
T92DH174
6.90/5.30m
T92DH177
7.54/1.89m
T84DH049
5.10/3.47m
10
25
50
G:\data\kodiak-c\kodcdril.dwg

Figure 8.4-4

for undrilled sections the estimated mineral resource indicated by drilling would amount to 140,000 tonnes at 7.2 g/t for this mineralized zone (32,000 contained ounces).

8.4.4 METALLURGY

Metallurgical testwork on Kodiak C Zone mineralization has been carried out on three individual drillhole composites by McClelland Labs in Sparks, Nevada and one multi-drillhole composite by Lakefield Research in Ontario. All tests were performed to assess gold recovery from direct cyanidation treatment. Data for these tests is tabulated below.

Sample	Grind Size	Time	Recovery %
T83DH015	-200 mesh	96 hours	91.5%
T92DH177	-200 mesh	96 hours	89.3%
T84DH045	-200 mesh	96 hours	93.8%
	-3/4"	96 hours	78.6%
Composite (holes T44, T45, T46, and T54)	?	?	89.1%
	?	?	87.6%

Table 8.4-3: Kodiak C Metallurgical Summary

The results indicate that Kodiak C mineralization is amenable to direct cyanidization and therefore, heap leaching. The single, lower recovery rate from the -3/4" sample suggests that future testwork should further assess the recovery rates from different crush sizes.

8.4.5 CONCLUSIONS AND RECOMMENDATIONS

The widespaced exploration drillholes that currently define the Kodiak C Zone indicate that a significant gold bearing resource may be present in this area of the property. The zone is of interest because of its proximity to the planned Kodiak B underground workings, the most southerly of which will pierce the Fleece Fault at roughly 25750N (see Figure 8.4-4). The workings could be used to drive a drift for ongoing drilling of the Kodiak C Zone.

While many of the Kodiak C drillholes indicate a mineable, mineralized width, the grade of the current resource may be marginal for an underground operation at Golden Bear. Based on the 7.2 g/t resource grade calculated for the entire Kodiak C Zone using a 3 g/t cutoff, and a recovery factor of 80%, recoverable grade from the Kodiak C would be projected at 5.76 g/t gold. For comparison, the recoverable grade from the Kodiak B deposit, based on a 4.5 g/t cutoff, is 8.51 g/t gold. Using a 4.5 g/t cutoff for the Kodiak C would increase the resource grade and therefore reduce the discrepancy between the two recoverable grades.

An examination of the long section (Figure 8.4-4) suggests that there are two shoots within the Kodiak C Zone that have the potential to host higher grade gold mineralization. These are centred on sections 25460N and 25660N respectively. A diamond drilling program consisting of 7 drill holes totalling approximately 1500 metres is proposed to test these shoots. Results should indicate whether or not potential exists to develop a mineable resource.

8.4.6 KODIAK C DATA

Computerized database information on the Kodiak C Zone is located as follows:

G:\PXDBGB - PCXplor Exploration Drillholes and Trenches.

Drawings, spreadsheet and document files are located on NAMC's computer network under the followeing directories:

G:\DATA\KODIAK-C
G:\DATA\KODB&C

8.4.7 REFERENCES

Pigage, L.C., 1994. Fleece A Mineral Inventory and Exploration Program, North American Metals Corp. internal company memorandum.

McBean, D.A. and Reddy, D.G., 1992. 1992 Fleece Bowl Exploration Report, North American Metals Corp. internal company report.

Wober, H.H. and Shannon, K.R., 1985. Bear-Totem Status Report, Chevron Canada Resource Limited internal company report.

8.5 URSA SUMMARY

The Ursa deposit lies 3.3 kilometres north of the Bear Main open pit, at an elevation of 1780 metres (see Figure 8.5-1). The area was first staked in 1982 by Chevron Minerals during the original staking over the Bear Main deposit, and over the next three years geologic mapping, geophysics, trenching and diamond drilling were carried out. This work was focussed to the east of the Ursa deposit and outlined the West Wall fault, the western margin of the Ophir Break. Little further work was completed in the area until the 1992 field season when North American Metals Corp. conducted a multifaceted exploration program over the West Wall fault and Totem Silica zone. One grab sample from a subcrop area of heterolithic breccia, on the western limit of the ground covered, returned a value of 7.17 grams per tonne gold (Jaworski and Reddy, 1993) and the area was targeted for additional work.

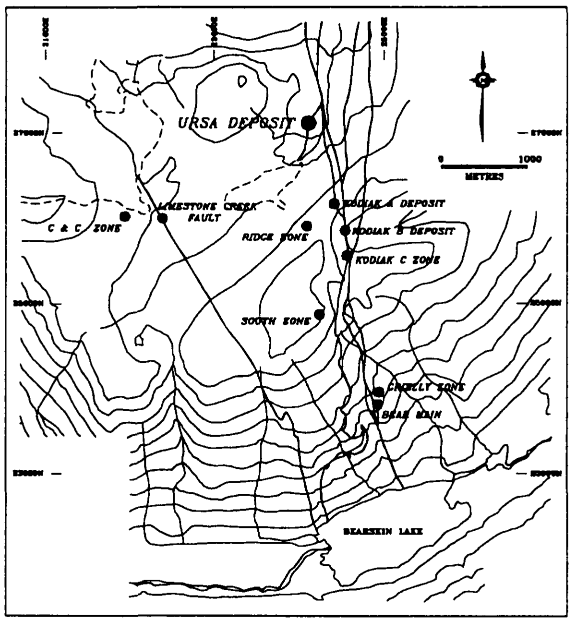


Figure 8.5-1: Location of the Ursa deposit

In late July 1994, the anomalous material was relocated and resampled as part of NAMC's Kodiak North project. Additional float boulders of an orange to red, heterolithic carbonate breccia in the area were sampled, with 25 of the first 39 samples returning values of greater than 3.0 g/t gold and up to 20.16 g/t gold. The program was immediately expanded to include the digging of 16 trenches, from which values of up to 3.8 g/t gold over 11.0 metres were obtained.

Late in 1994 an initial diamond drilling program of 12 NQ holes, totalling 1414.57 metres on four sections, indicated that gold mineralization was present over a 140 metre strike length. This was followed up in 1995 with an infill drilling program based on 20 metre centres. A total of 30 NQ and HQ holes totalling 4560.22 metres were drilled to close off the mineralized zone.

A feasibility study was completed on the Ursa deposit early in 1996 by Kappes, Cassidy and Associates of Reno, Nevada. The study indicates that the proposed Ursa open pit/ heap leach operation is economic. Initial mining and construction of the Totem heap leach facility is scheduled to begin in 1997.

8.5.1 GEOLOGY

The geology of the Ursa area is dominated lithologically by the massive to thin bedded Permian carbonate units, and structurally by the Ursa Fault. Carbonate units present (after Cooley,1996) include LMBC, a dark to medium gray and locally crinoidal limestone, DOCH, a thick bedded to massive dolomite with irregular chert lenses, and LMGT1, a dark gray thin bedded and graphitic limestone.

The Ursa Fault is the most important structural feature in the area as it hosts gold mineralization. It is a south to southwesterly trending splay from the West Wall Fault, the westernmost structure of the Ophir Break, which trends north-south a short distance to the east of the Ursa deposit area. The fault places the LMGT (west side) against the DOCH and LMBC (east side). The fault zone is often characterized by the presence of a one to two metre wide zone of heterolithic carbonate breccia.

Other structural elements present include an evenly spaced (30 metres) set of fracture zones that trend southeasterly and dip steeply northwest.

Intrusive rocks are not common in the Ursa area, however a few, narrow, fine grained basaltic dykes similar to those intersected in Grizzly Zone drilling have been noted. They are presumed to belong to the Tertiary Level Mountain Group.

8.5.2 MINERALIZATION

Mineralization in the Ursa deposit is hosted along the Ursa Fault. Vertical sections indicate that the structure dips steeply to the west at surface but at depth rolls over and dips steeply eastward. Intense fracturing and brecciation is developed along the fault plane in all rock units, although most extensively in the LMGT1 unit.

Gold mineralization occurs primarily in association with extremely brecciated and milled, strongly hematitic LMGT immediately adjacent to the Ursa Fault Figure 8.5-2). The mineralized zone has strike and dip extents of 100 metres each, with true width remaining consistent at 10 to 15 metres. Gold mineralization also extends a short distance away from the main Ursa Fault breccia zone along the SE trending, NW dipping fractures sets, one of which is strongly enough developed that it offsets the main zone (Figure 8.5-3).

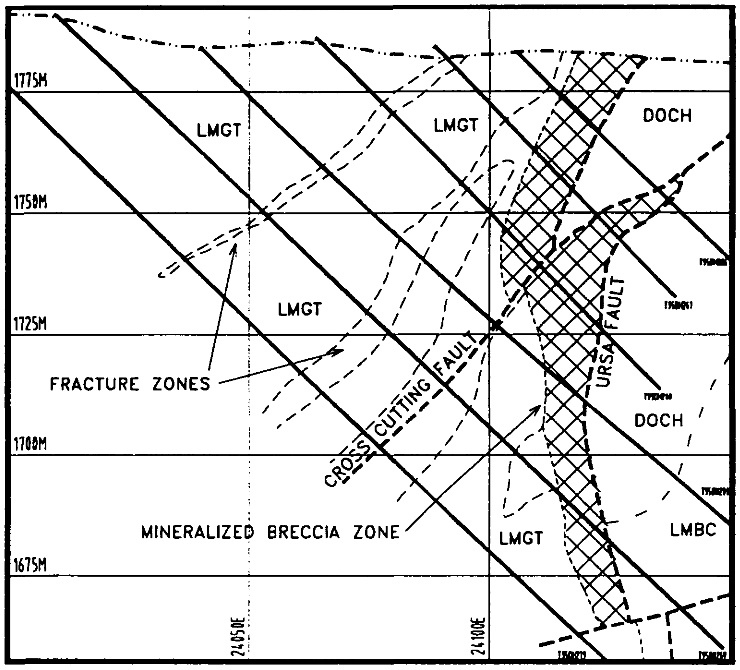


Figure 8.5-2: Ursa Deposit Section 27120N

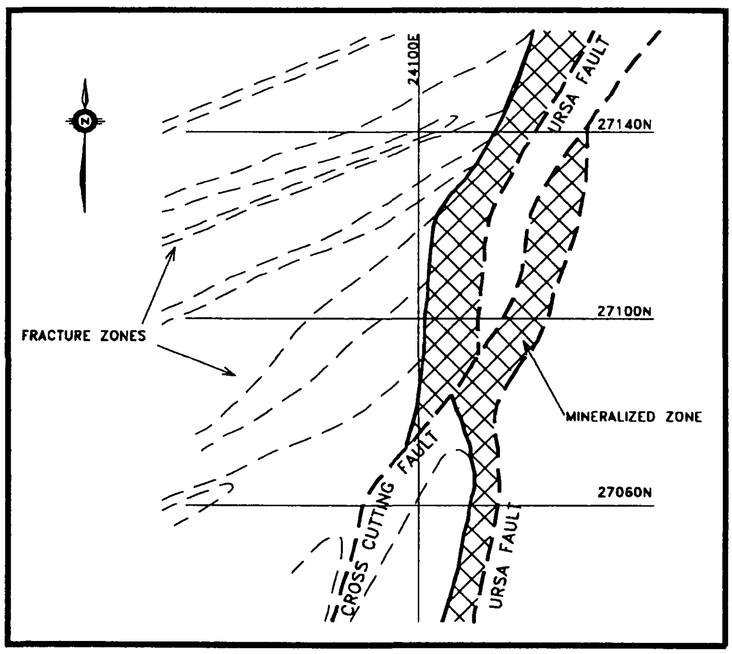


Figure 8.5-3: Ursa Deposit Level Plan 1750M

Mineralized intersections are commonly silicified, although gold values also occur in unsilicified material. Empirically the best values are asscoiated with strong deep, reddish brown, fine grained hematite that occurs on fractures and as breccia matrix. Sulphides are not noted to occur in the mineralized zone, and only rarely as very fine, isolated grains in the surrounding rocks. Native gold has been noted in several drill holes as fine flakes and grains to 2.0 mm in size.

ICP analysis of mineralized intercepts indicates that the Ursa deposit contains anomalous levels of mercury and tellurium. SEM/microprobe analysis of similar material indicated the presence of rare, fine grains of a bismuth telluride (Cannon, 1996). No mercury bearing phases were indentified.

8.5.3 RESERVES

Mineable reserves for the Ursa deposit have been calculated by Strathcona Mineral Services of Toronto, Ontario. The estimate utilizes a database that includes 42 diamond drill holes and 35 surface trenches.

A block model, using a 4.0 metre block size, was constructed for reserve estimation, and included two search ellipsoids, one for the primary mineralized zone and one for mineralization located in the southwesterly trending fracture zones. External and internal cutoff grades, assessed by examining costs for an open pit / heap leaching operation, were determined to be 3.8 g/t gold and 1.0 g/t gold respectively. Bulk densities, assigned based on testwork and field observation are as follows:

Material	Density (t/m^3)
All ore types	2.4
Waste (Limestone)	2.6
Waste (Dolostone)	2.7
Overburden	2.0

Table 8.5-1: Ursa Bulk Densities

Cutting levels were set at 75 g/t gold for the main zone and 45 /gt gold for the fracture zones, coinciding with the 97th and 99th percentiles of the uncut sample distributions, respectively. Dilution was calculated by adding two metres of waste on the east wall of the pit and a full four metres on the other three walls. Overall dilution is calculated at 30%.

Based on these criteria the mineable reserves for the Ursa deposit were calculated to be 511,000 tonnes grading 7.0 grams per tonne gold. The waste to ore ratio is 6.6 : 1.

8.5.4 METALLURGY

Metallurgical testwork has been performed on samples of both low and high grade material from the Ursa deposit.

The low grade material has been subjected to three bottle roll tests and a column test all performed by McClelland Labs in Sparks, Nevada. The bottle roll tests were performed on material at 38 mm, 19 mm and 9.5 mm grind sizes, from which gold recoveries of 80.4%, 84.3% and 88.4%, respectively, were obtained. A column leach test on a composite sample of low grade (4.35 g/t Au) at the 19 mm size, reported a recovery of 90.6% after 144 days of leaching.

High grade material from the Ursa deposit has been tested in 12 direct agitated cyanidization bottle roll tests, six by McClelland Labs and six by Kappes Cassidy and Associates in Reno, Nevada. The results are summarized below.

Lab	Number of Samples	Lowest Recovery	Highest Recovery	Average Recovery
McClelland	6	94.9	99.4	97.0
Kappes Cassidy	6	93.9	98.7	96.3

Table 8.5-2: Summary of Ursa High Grade Metallurgical Testing

A column test is currently being carried out on Ursa high grade material. The test will be completed before production to verify gold recoveries.

8.5.5 CONCLUSIONS AND RECOMMENDATIONS

The Ursa deposit has been placed in North American Metals mine plan, with mining and development scheduled to begin in 1997 and carry through to the year 2000. For detailed information on the Ursa project the reader is reffered to the feasibility study written by Kappes, Cassidy and Associates (see section 8.5.7).

8.5.6 URSA DATA

Computerized data on the Ursa deposit is located as follows:

G:\PXDBGB - PCExplor Exploration Drillholes and Trenches
G:\PXDBUR - PCXplor Ursa Compositing Database
G:\PMDBUR - PCMine Ursa Pit
G:\GMDBUA - GeoModel Ursa Geology

Drawing, spreadsheet and document files are located on NAMC's computer network under the following directories:

G:\DATA\URSA

G:\DATA\KNORTH
P:\DATA\URSA
P:\DATA\TOTEMPAD

8.5.7 REFERENCES

Cannon, B., 1996. Electron Microprobe and Scanning Electron Microscope Analysis of Drill Core. Report for North American Metals Corp.

Hamilton, A.P., 1995. Ursa Project Diamond Drilling Assessment Report. Brithish Columbia Assessment Report.

Kappes,Cassidy and Associates, 1996. Golden Bear Heap Leach Project Feasibility Study. Report for North American Metals Corp.

Pigage, L.C., 1994. Kodiak North Project Geochemistry, Geology, Geophysics, Trenching and Diamond Drilling Assessment Report. British Columbia Assessment Report.

8.6 RIDGE ZONE SUMMARY

The Ridge Zone is a recently discovered area of gold mineralization that lies 2.5 kilometres north of the Bear Main open pit and 300 metres west of the Kodiak A deposit (see Figure 8.6-1). Although first staked in 1982 by Chevron Minerals during initial staking over the Bear Main deposit, no work was carried out on the immediate Ridge Zone area until 1995, when North American Metals Corp. conducted a multifaceted exploration program that covered this portion of the property.

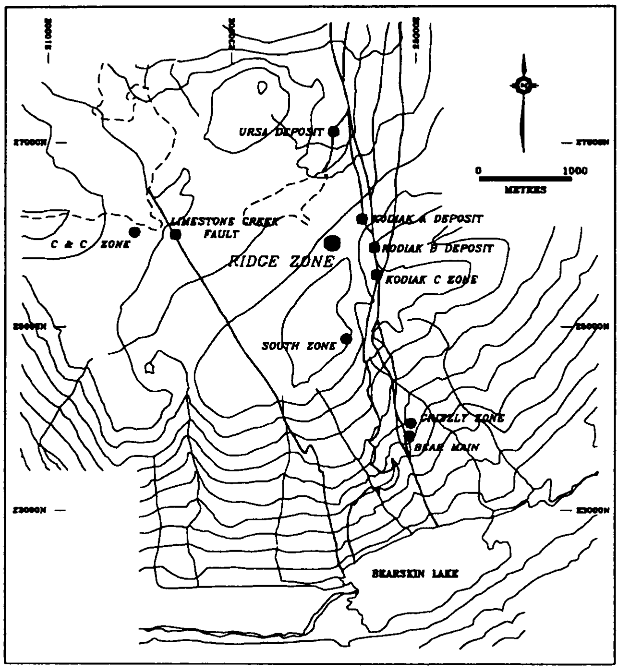


Figure 8.6-1: Location of Ridge Zone

The initial work completed in 1995 in the Ridge Zone area consisted of prospecting. Float boulders of weakly to strongly hematitic, crackled and/or brecciated, very strongly silicified limestone were collected that consistently returned results of 1.0 to 10.0 grams per tonne gold, with two samples returning values of 77.21 and 101.73 grams per tonne gold. The anomalous samples defined a north to northeasterly trending boulder train over a length of 350 metres. The presence of an area strongly anomalous in gold was confirmed by the results of a grid soil sampling program.

The program of work on the Ridge Zone was expanded based on these results to include a trenching program. Eight trenches totalling 808 metres were dug along the trend of the boulder train and geochemistry anomaly. Results obtained from this work included 2.46 g/t gold over 16.0 metres and 1.67 g/t gold over 17 metres (see Table 8.6-1).

TRENCH NUMBER	LENGTH OF INTERSECTION	GRADE (g/t Au)
KN95TR7	17.0 M	1.67
KN95TR8	16.0 M	2.46
including	8.0 M	4.15
KN95TR9	7.0 M	2.00
including	3.0 M	3.61
KN95TR10	no significant intersections	
KN95TR17	5.0 M	1.01
KN95TR18	2.0 M	2.67
and	1.0 M	1.34
KN95TR32	no significant intersections	
KN95TR33	no significant intersections	

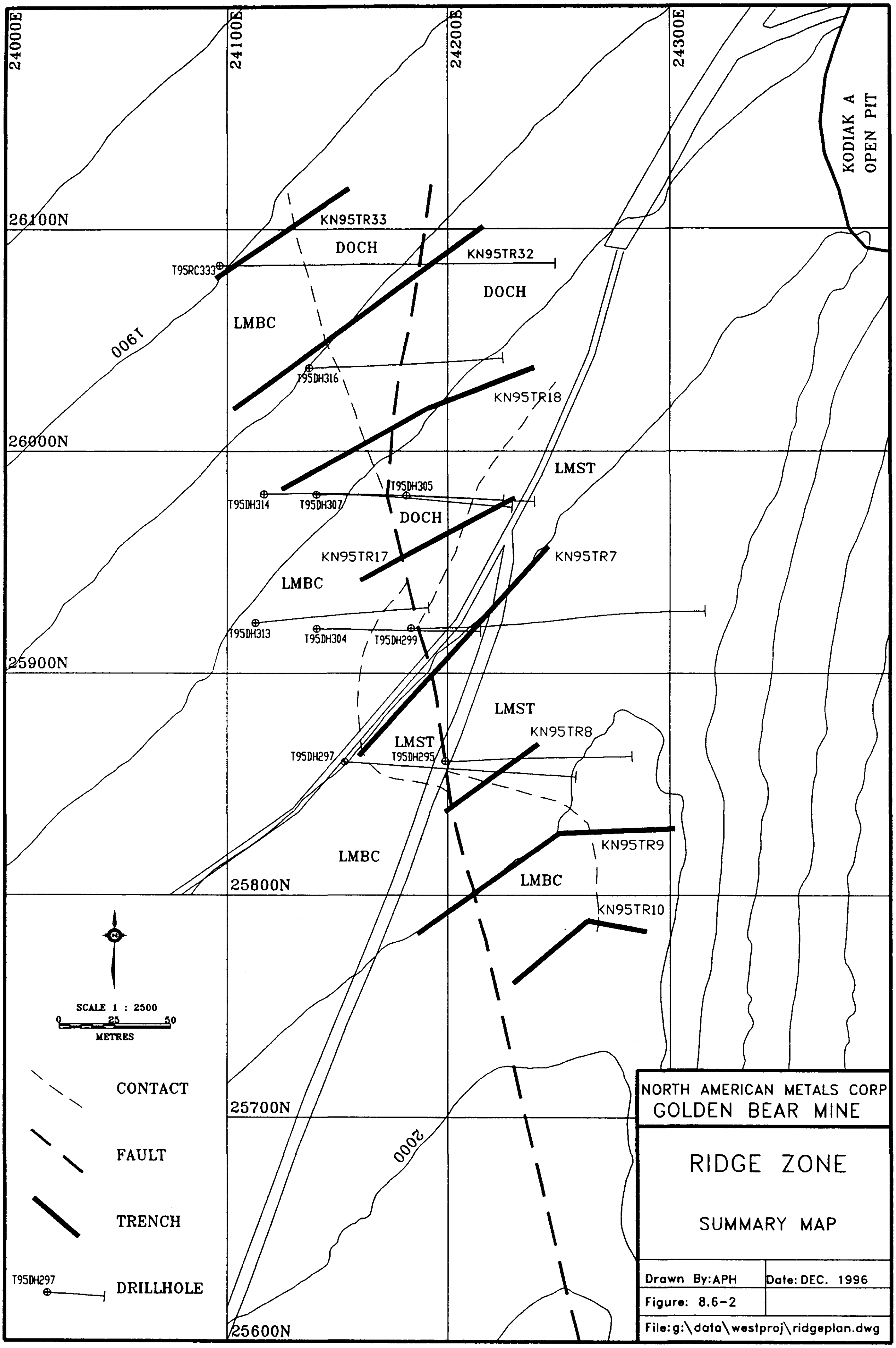
Table 8.6-1: Ridge Zone Trenching Summary

Late in the 1995 field season a diamond drilling program consisting of 9 NQ diameter holes totalling 1128.91 metres, on four sections spaced 60 metres apart was carried out. The initial drillholes of this program did not intersect a mineralized zone beneath the trenches from which grade was obtained. They did however, intersect a structure that while having a subdued expression and no gold values on surface, develops into a strong, gold bearing structure at depth. Diamond drilling has encountered mineralization over a 180 metre strike length. A single reverse circulation hole drilled in 1996 extended known mineralization a further 40 metres to the north for a total mineralized strike of 220 metres. The zone is open to the north, south and at depth.

The location of trenches and drillholes are shown on Figure 8.6-2. A summary of drilling results is given in Table 8.6-2, intersections are plotted on Figure 8.6-3 and all drillholes are shown on vertical sections on Figures 8.6-4 to 8.6-8 .

8.6.1 GEOLOGY

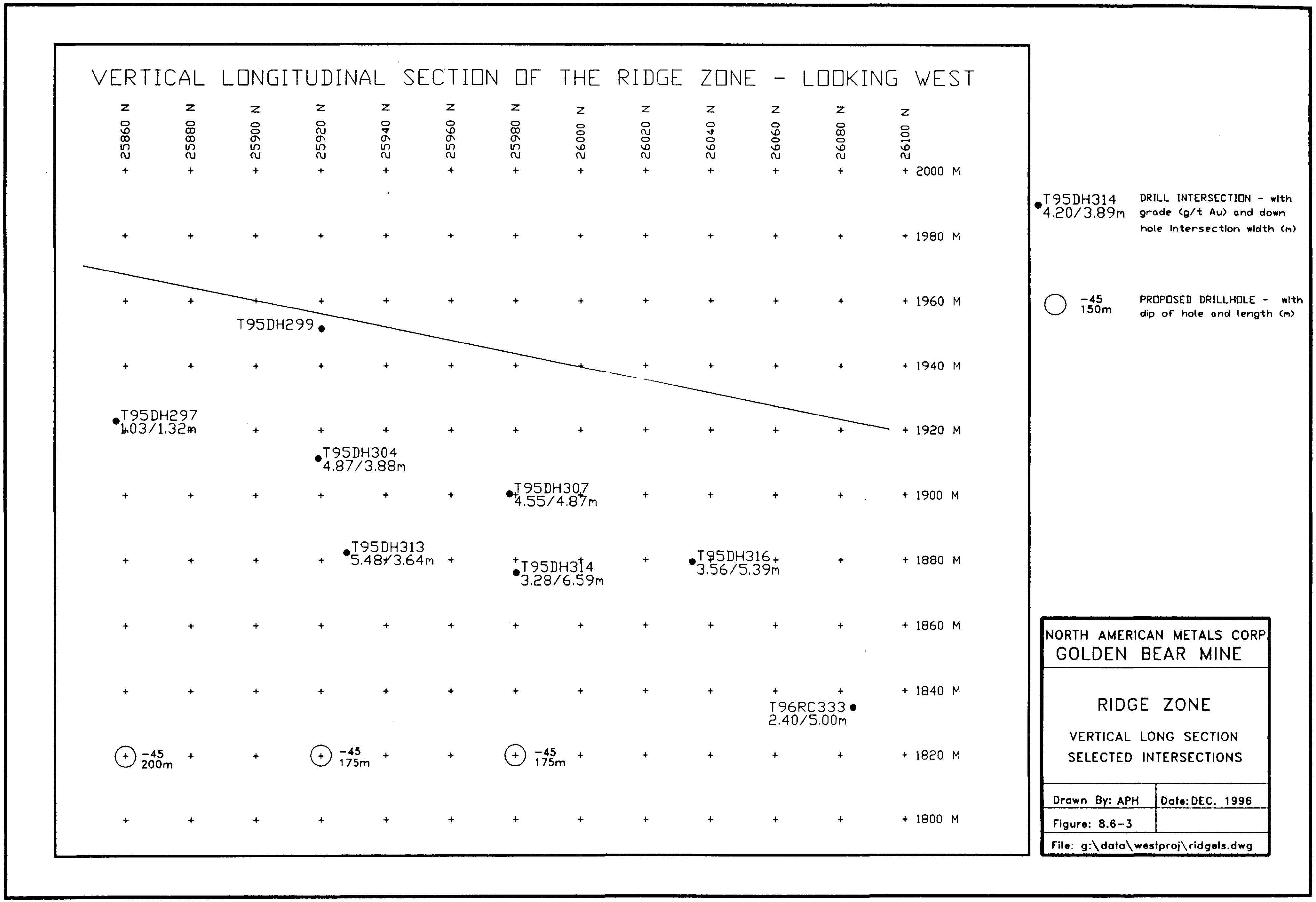
The Ridge Zone occurs entirely within the Permian carbonate package. Three lithologic units are present: LMST1, a massive to thick bedded creamy coloured limestone, LMBC, a banded and locally crinoidal limestone, and DOCH, massive to thick bedded dolomite with irregular chert lenses. In all three units patchy, irregular zones of silicification have been noted in both trenches and drillholes.



24000E
24100E
24200E
24300E
KODIAK A OPEN PIT
26100N
KN95TR33
DOCH
KN95TR32
T95RC333
DOCH
LMBC
1900
T95DH316
KN95TR18
26000N
LMST
T95DH305
T95DH314
T95DH307
DOCH
KN95TR17
KN95TR7
LMBC
T95DH313
T95DH304
T95DH299
25900N
LMST
KN95TR8
LMST
T95DH297
T95DH295
KN95TR9
LMBC
LMBC
25800N
KN95TR10
SCALE 1 : 2500
0
25
50
METRES
CONTACT
FAULT
TRENCH
T95DH297
DRILLHOLE
25700N
2000
25600N
NORTH AMERICAN METALS CORP
GOLDEN BEAR MINE
RIDGE ZONE
SUMMARY MAP
Drawn By:APH
Date: DEC. 1996
Figure: 8.6-2
File:g:\data\westproj\ridgeplan.dwg

Drillhole #	Section	Depth (m)	From (m)	To (m)	Length (m)	Au g/t
T95DH295	25860N	112.77	32.00	33.50	1.50	1.06
			85.05	91.13	6.08	1.93
		inc.	89.86	91.13	1.27	3.19
T95DH297	25860N	143.25	50.70	52.02	1.32	1.03
			120.81	123.49	2.68	1.89
T95DH299	25920N	181.36	22.40	23.45	1.05	1.10
			138.85	139.85	1.00	3.12
			146.25	147.25	1.00	1.27
T95DH304	25920N	103.93	45.27	65.50	20.23	2.40
		inc.	52.12	56.00	3.88	4.87
		inc.	52.70	53.03	0.33	31.58
		inc.	62.34	65.50	3.16	4.07
T95DH313	25920N	111.25	73.85	89.45	15.60	2.12
		inc.	78.51	87.57	9.06	2.91
		inc.	83.93	87.57	3.64	5.48
T95DH305	25980N	80.77	29.66	30.66	1.00	5.11
			53.34	56.39	3.05	5.04
T95DH307	258980N	128.58	42.39	50.29	7.90	3.20
		inc.	45.42	50.29	4.87	4.55
			61.50	69.50	8.00	1.87
		inc.	68.50	69.50	1.00	8.23
T95DH314	25980N	146.91	71.63	86.91	15.28	2.21
		inc.	73.18	79.77	6.59	3.28
		inc.	73.18	74.74	1.56	5.16
T95DH316	26040N	120.09	54.01	62.12	8.11	2.64
		inc.	56.73	62.12	5.39	3.56
		inc.	56.73	57.17	0.44	20.06
T96RC333	26080N	200.00	94.00	102.00	8.00	1.81
		inc.	94.00	99.00	5.00	2.40

Table 8.6-2: Ridge Zone Drilling Summary



VERTICAL LONGITUDINAL SECTION OF THE RIDGE ZONE - LOOKING WEST
25860 N
25880 N
25900 N
25920 N
25940 N
25960 N
25980 N
26000 N
26020 N
26040 N
26060 N
26080 N
26100 N
2000 M
1980 M
1960 M
1940 M
1920 M
1900 M
1880 M
1860 M
1840 M
1820 M
1800 M
T95DH299
T95DH297
1.03/1.32m
T95DH304
4.87/3.88m
T95DH307
4.55/4.87m
T95DH313
5.48/3.64m
T95DH314
3.28/6.59m
T95DH316
3.56/5.39m
T96RC333
2.40/5.00m
-45
200m
-45
175m
-45
175m
T95DH314
4.20/3.89m
DRILL INTERSECTION - with grade (g/t Au) and down hole intersection width (m)
-45
150m
PROPOSED DRILLHOLE - with dip of hole and length (m)
NORTH AMERICAN METALS CORP
GOLDEN BEAR MINE
RIDGE ZONE
VERTICAL LONG SECTION
SELECTED INTERSECTIONS
Drawn By: APH
Date: DEC. 1996
Figure: 8.6-3
File: g:\data\westproj\ridgels.dwg

The norththwesterly and northeasterly trending sets of folds mapped by Cooley (1996), corresponding to D2 and D3 deformation events (see Section 3.1), are well expressed as interference patterns in outcrop and felsenmeer in this area. Wavelengths of both fold sets vary between 50 and 100 metres.

The strongest structural feature in the Ridge Zone is a north-south trending fault that is now known as the Ridge Fault. It has been exposed in trenches over a 300 metre strike length and encountered in drill holes over a 220 metre strike length. While the northern extension is concealed by overburden, what is believed to be the southern extension can be traced for approximately 500 metres until it disappears under Helen Glacier. The fault can be picked up again on the south wall of Helen Bowl and appears to be coincident with Cooley Zone mineralization as shown on the mineralized structures map in Section 3.2. The Ridge Fault is an important structure in that it hosts gold mineralization.

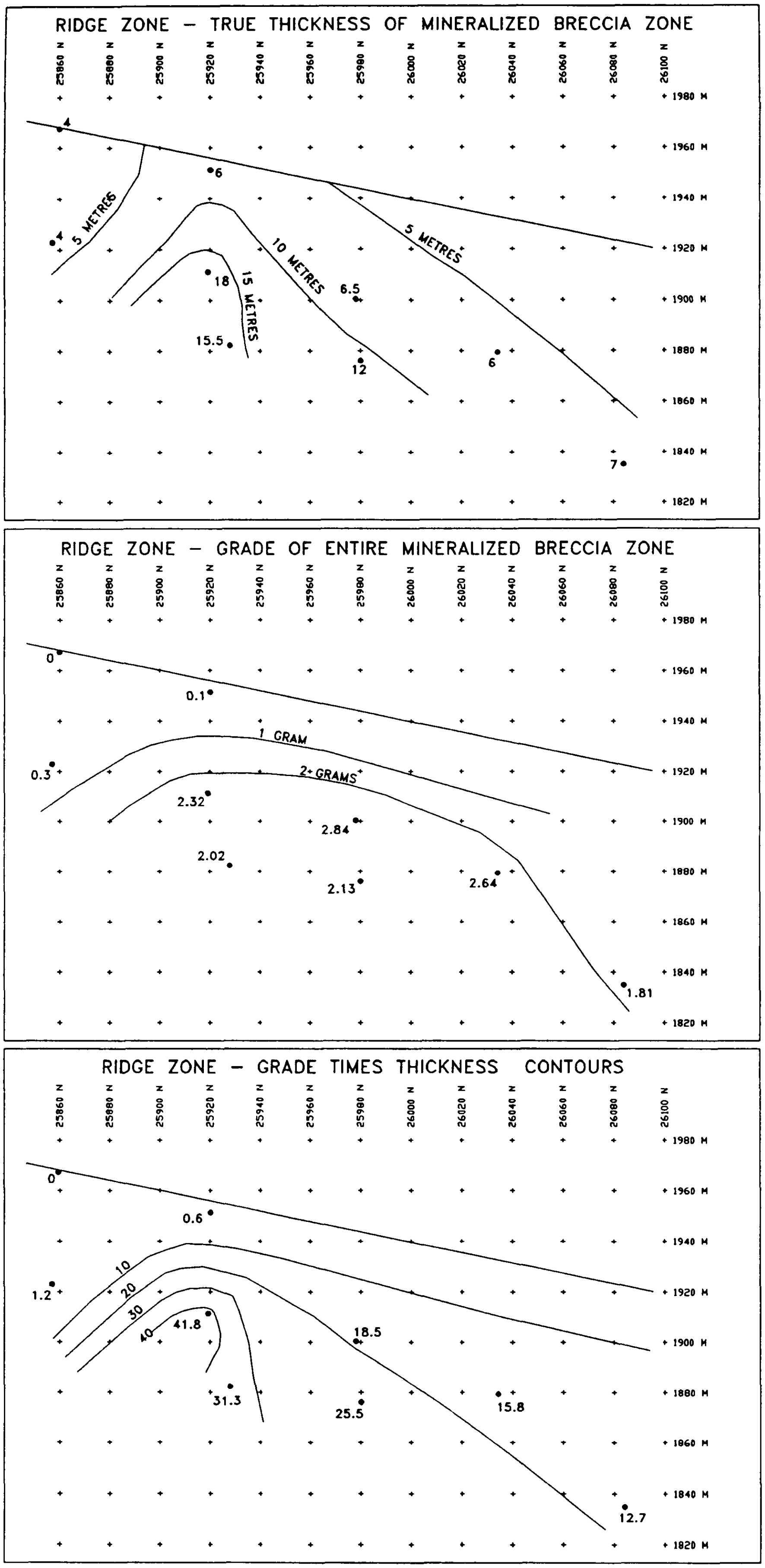
8.6.2 MINERALIZATION

Gold mineralization in the Ridge Zone is hosted in breccias and crackle zones that have been developed along the Ridge Fault. Interperetation on vertical sections and exposure on the north wall of Helen Bowl indicate that the fault generally strikes due north and dips 70° to the west. Where exposed on surface the fault has been observed to be a very tight and planar structure.

The mineralization along the fault is characterized by hematitic and limonitic, silicified limestone breccias and crackle zones. The hematite and limonite occurs on clast and crackle surfaces, and more rarely as a pervasive staining. Sulphides were not noted to be present. Late stage, white calcite occurs as breccia cement.

In the exposure on the north wall of Helen Bowl the mineralized breccias occur as lenses that range in thickness from a few tens of centimetres to two metres. Strike extent of these lenses appears limited to a few metres. It is probable that mineralization here is restricted to these narrow lenses as the planar nature of the fault, and the minor displacement interpreted for it (Cooley, 1996)(Section 3.1), preclude the development of wide structural zones.

The diamond drilling however, has outlined a mineralized dilatent zone on the Ridge Fault where the true width of the structural zone reaches 18 metres. The mineralized zone, which does not extend to surface, is centered on section 25920N and remains open down dip and in both directions along strike. The geometry of this dilatancy is well expressed on a grade times thickness longsection (Figure 8.6-9). The dilatancy appears to be due to a flexure in the Ridge Fault that steepens the dip to vertical from 70°.



RIDGE ZONE - LONG SECTIONS

Figure 8.6-9

Gold values obtained to date by drilling are relatively consistent when weighted over the full width of the mineralized zone, averaging between 1.81 and 2.84 g/t gold. These intersections most commonly include higher grade zones of 3.28 to 5.48 grams per tonne over intersection lengths of 3.64 to 6.59 metres. Individual assays of up to 31.58 g/t have been returned from narrow intervals.

8.6.3 CONCLUSIONS AND RECOMMENDATIONS

Exploration work on the Ridge Zone has identified the Ridge Fault as a significant gold bearing structure with gold mineralization being detected over an 800 metre strike length. Drilling has partially defined a mineralized dilatant zone that remains open at depth and along strike. Large portions of the Ridge Fault remain untested.

Ongoing exploration spaced diamond drilling is recommended for the Ridge Zone. The first area to be assessed should be down dip projection of the mineralized dilatant zone. As the zone occurs at depth on the fault, a mineralization that carries gold grades of at least 8 grams per tonne would be the target. Such a deposit could be mined by underground bulk mining methods similar to those planned for the Kodiak B deposit. Access could be gained from Fleece Bowl, allowing gravity to aid mining. An initial program of 6 holes on three sections totalling 1100 metres is proposed to test the zone. The location of these holes is shown on Figure 8.6-3. The two holes on section 25920N should be given first priority.

Additional drilling should be carried out along the strike of the Ridge Fault in order to test for other mineralized dilatant zones. As the Ridge fault is known to be fairly tight and narrow to the south of the area drilled to date, drill testing of the northern strike extension may be the most prospective. A program consisting of 3 or 4 widely spaced holes step out holes to the north, each 200 metres long, is recommended.

6.4 RIDGE ZONE DATA

Computerized database material on the Ridge Zone is located as follows:

G:\PXDBGB - PCXplor Exploration Drillholes and Trenches

G:\PXDBTM - PCXplor Totem/Kodiak North Soils/Rocks

Drawing, spreadsheet and document files are located on NAMC,s computer network under the following directories:

G:\DATA\WESTPROJ

8.7 SOUTH ZONE SUMMARY

8.7.1 LOCATION AND ACCESS

The South Zone is located on a south facing ridge overlooking Bearskin Lake and the minesite approximately 2 kilometres to the southeast (see Figure 8-7-1). The area ranges in elevation from 1600 metres at the top of the scarp above the Bear Main open pit and Alpha gully to the top of the ridge at 2000 metres. The area is reached via the Fleece bowl and Kodiak A haul roads and then southerly along Troy Ridge.

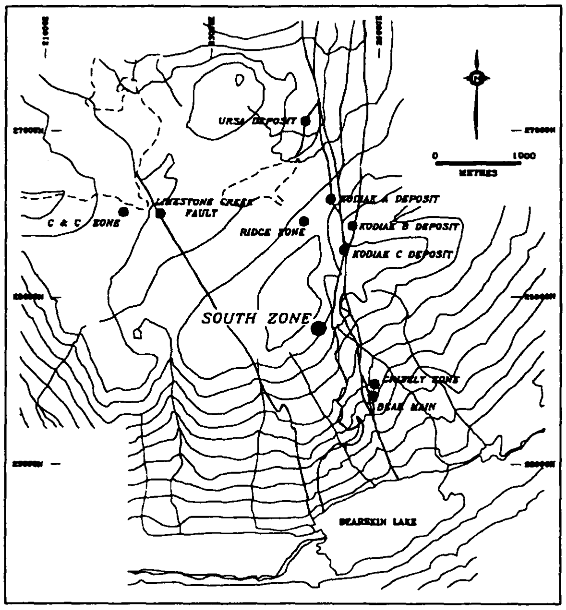
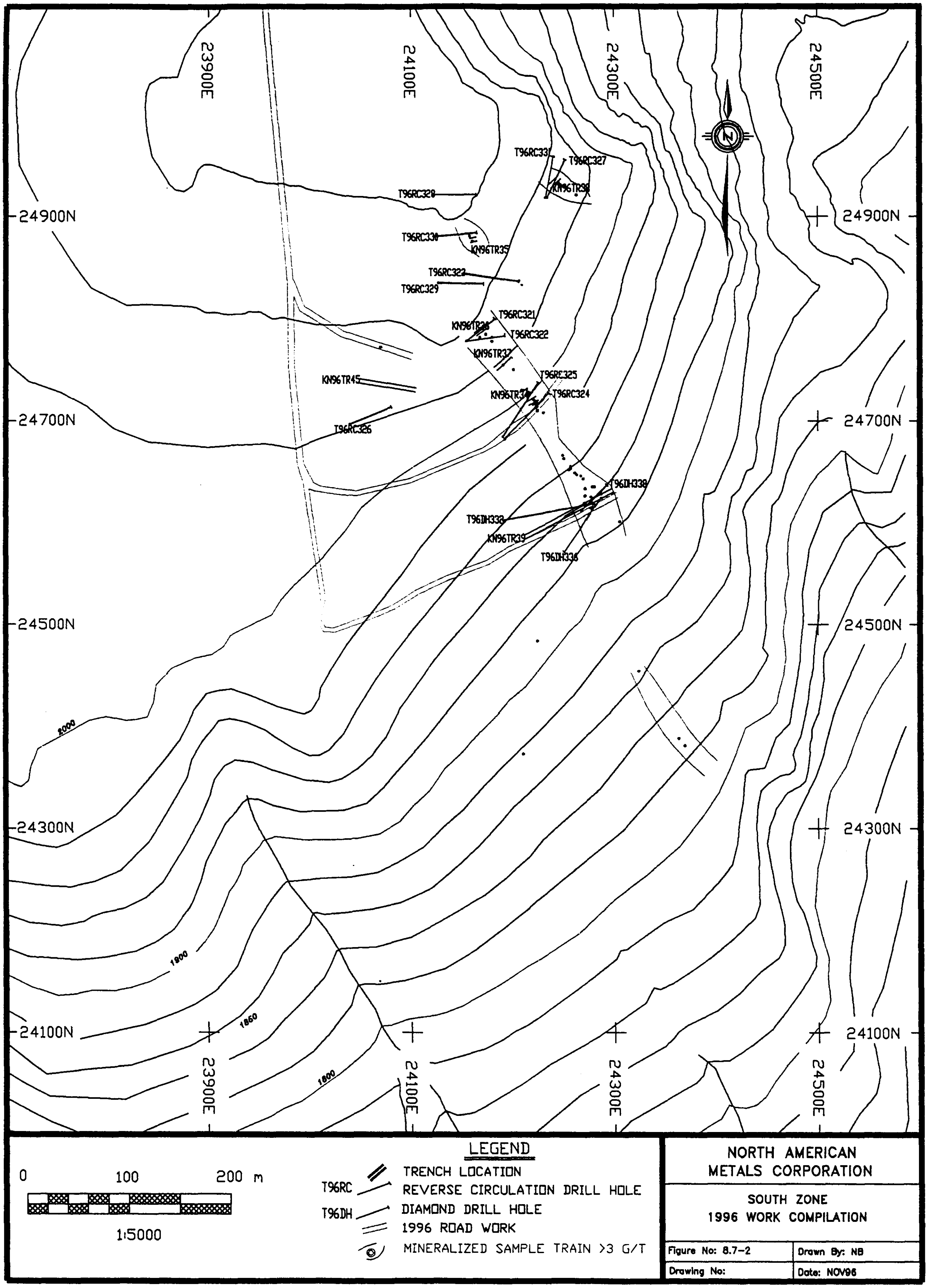


Figure 8.7-1: Location of South Zone

8.7.2 OVERVIEW

The area was targeted for prospecting primarly based on the results of the 1995 soil sampling program which outlined a gold and indicator element soil anomaly over the area. Prospecting in the area began in late May of this year and continued with road work, trenching, reverse circulation drilling, and diamond drilling until late July. In addition, detailed structural mapping of the area was carried out by Cooley as part of his structural mapping program of the property. The 1995 soil grid was also extended in aneffort to outline the extent of mineralization. The location of this work is shown on Figure 8.7-2.

The float sampling in the South Zone area was very encouraging with a considerable number of samples returning significant gold values. Follow up trenching and drilling subsequently identified insitu gold mineralization, although the grade and widths encountered were disappointing. There


23900E
24100E
24300E
24500E
24900N
24700N
24500N
24300N
24100N
T96RC331
T96RC327
KN96TR38
T96RC328
T96RC330
KN96TR35
T96RC323
T96RC329
T96RC321
KN96TR36
T96RC322
KN96TR37
KN96TR45
T96RC325
KN96TR34
T96RC324
T96RC326
T96DH338
T96DH332
KN96TR39
T96DH335
2000
1900
1850
1800
LEGEND
0
100
200 m
1:5000
TRENCH LOCATION
T96RC
REVERSE CIRCULATION DRILL HOLE
T96DH
DIAMOND DRILL HOLE
1996 ROAD WORK
MINERALIZED SAMPLE TRAIN >3 G/T
NORTH AMERICAN METALS CORPORATION
SOUTH ZONE
1996 WORK COMPILATION
Figure No: 8.7-2
Drawn By: NB
Drawing No:
Date: NOV96

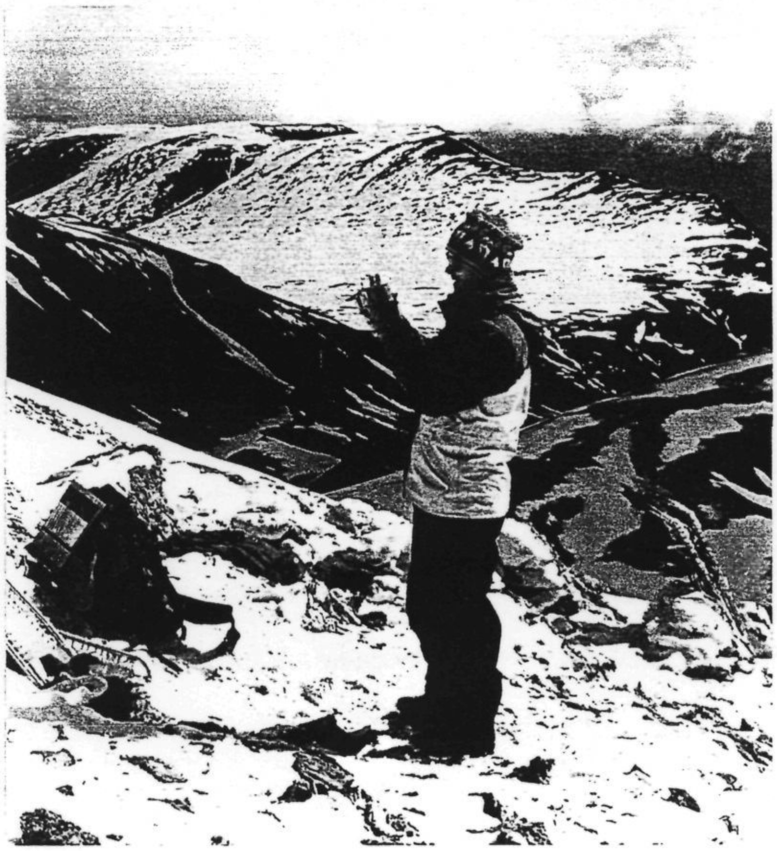


Plate 8.7-1: Looking westerly M.Cooley mapping Cooley Showing Helen Bowl Scarp in foreground

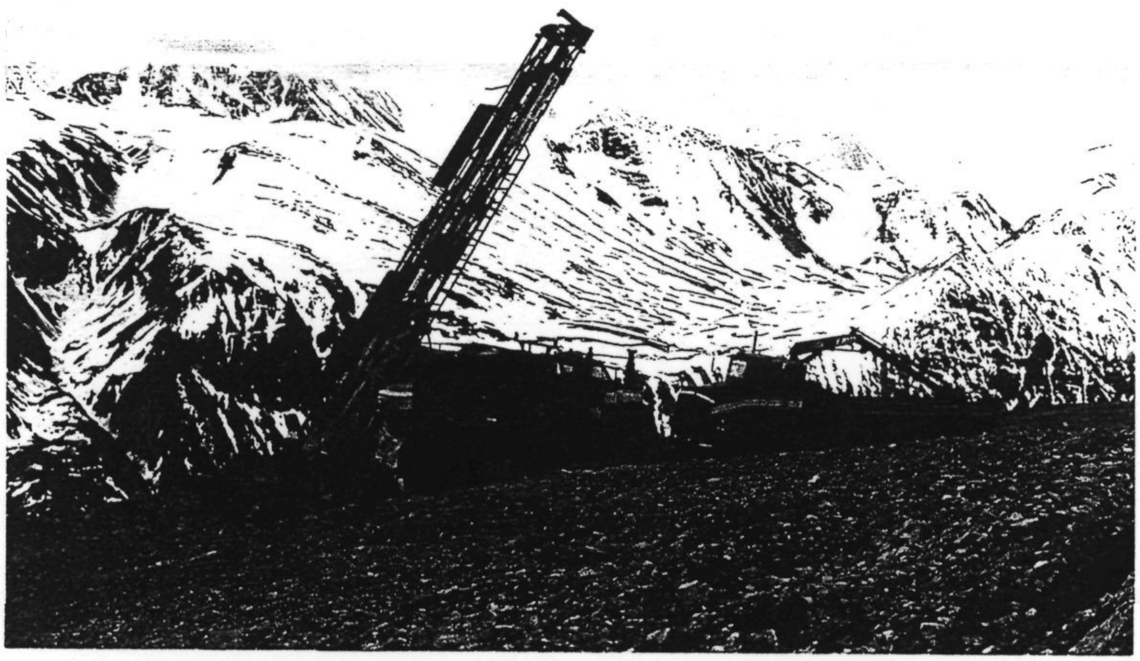


Plate 8.7-2: Reverse Circulation Drilling T96RC321 Trench KN96TR36 to left of drill

remain however, some potential drill targets at depth in the zone that should be evaluated by drilling.

8.7.3 PROSPECTING

Prospecting of the area began in late May when most of the area was snow covered and prospecting restricted to the exposed southwest ridge top. The initial goal was to identify the source of the geochemical anomaly and develop targets for additional work.

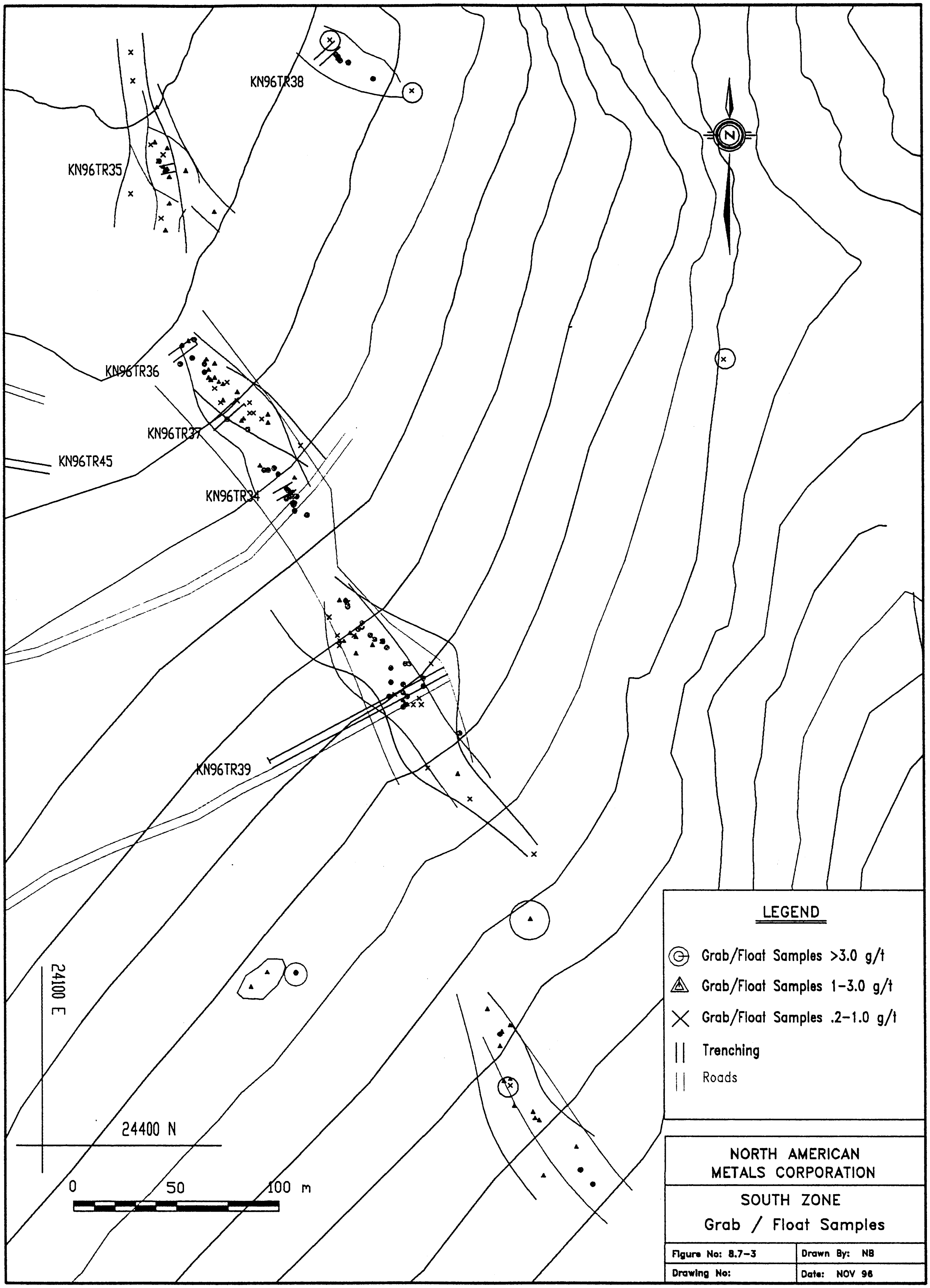
The periglacial terrain of the area is covered in a thin but ubiquitous layer of carbonate rubble with little outcrop exposed. The primary prospecting technique was saturation sampling of float and sub crop. Early in the prospecting a favourable gold bearing lithology was identified and prospecting concentrated on tracing it's areal extent. This activity continued concurrently with road building, trenching and drilling as additional areas were exposed by the retreating snow pack.By the end of the project in mid July when work in the area was complete, a total of 447 float and grab samples were taken over the area. The location of these samples is shown on Figure 8.7-3.

The rock prospecting outlined a mineralized boulder train extending from the top of the ridge south easterly and directly down slope for approximately 500 metres to the top of the Alpha gully scarp. A second zone much smaller in aerial extent and referred to as the Cooley Zone was outlined approximately 100 metres east of the up slope terminus of the main boulder train and near the upper scarp edge of Helen Bowl (see Plate 8.7-1).

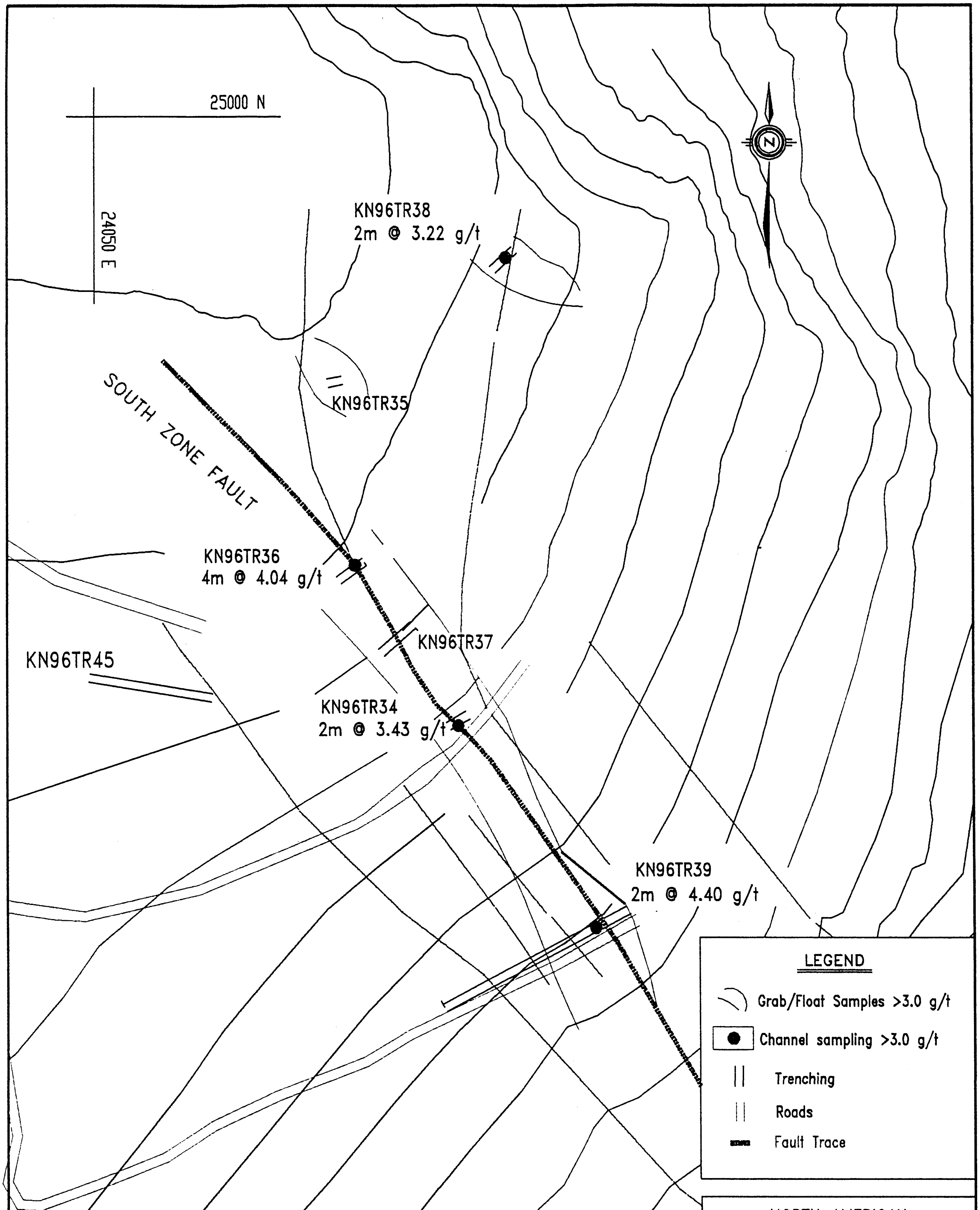
Looking at the dispersion pattern of the greater than 3 gram material in more detail suggests at least three and possibly four smaller and higher grade zones along the long axis of the boulder train. The long axis of these smaller zones have approximate azimuths of 140° and have long axis dimensions of 40 to metres over narrow widths. The periodicity to the occurrence of the higher grade sections and their oblique strike relative to 150° azimuth of the entire boulder train may suggest en echelon structures or possibly regular normal offsets to a single more continuous structure.

8.7.4 TRENCHING

Trenching targets were based on the results the prospecting program (see Figure 8.7-4). One trench, KN96TR45 to the west of main mineralized structure was a follow up on a soil anomaly outlined from the 1995 geochemistry program. In most cases the trenching exposed gold mineralization, but did not produce any of the greater than 10 gram/tonne material that was found in the sampling program. The best grade-width interval in the trenching program occurred in KN96TR36 and ran 4.04 grams/tonne over 4 metres. The best width occurred in KN96TR39 and ran



KN96TR38
KN96TR35
KN96TR36
KN96TR37
KN96TR45
KN96TR34
KN96TR39
24100 E
24400 N
0
50
100 m
LEGEND
Grab/Float Samples >3.0 g/t
Grab/Float Samples 1-3.0 g/t
Grab/Float Samples .2-1.0 g/t
Trenching
Roads
NORTH AMERICAN
METALS CORPORATION
SOUTH ZONE
Grab / Float Samples
Figure No: 8.7-3
Drawn By: NB
Drawing No:
Date: NOV 96



NORTH AMERICAN METALS CORPORATION

SOUTH ZONE

Trench channels > 3 g/t

Figure No: 8.7-4	Drawn By: NB
Drawing No:	Date: NOV 96

1.27 grams/tonne over 12 metres. Table 8.7-1 following lists the mineralized intervals of all the trench sampling results.

Trench number	Total length(m)	Sample interval(m)	Sample length (m)	Au >0.2 g/t	Au >1.0 g/t
KN96TR34	12	3-5 3-6 7-8	2 3 1	-- -- 0.99	3.43 2.62 --
KN96TR35	17	2-4	2	0.21	--
KN96TR36	15	6-8 8-12 6-12	2 4 6	0.46 --	-- 4.04 2.84
KN96TR37	20	--	--	--	--
KN96TR38	14	7-8 8-10 10-11 7-11	1 2 1 4	-- -- 0.21 0.96	1.31 3.22 -- --
KN96TR39 (Road cut)	67	0-2 6-12 12-14 14-18 6-18	2 6 2 4 12	0.45 0.37 -- 0.83 --	-- -- 4.40 -- 1.27
KN96TR45 (geochem)	86	--	--	--	--
Total	231				

Table 8.7-1: South Zone Trenching Summary

The following is a brief description of the target selection and geological and structural findings of each trench. The trenches are described in the order of work carried out, the first four trenches were done out of numerical sequence (Figure 8.7-4 shows the locations of the trenches).

KN96TR36
This trench was targeted on a cluster of higher grade float samples near the upper terminus of the sample train with some evidence of mineralized sub crop in the immediate area. The trench runs at 040° and is perpendicular to apparent structure. The six metre mineralized zone in the summary table occurs in a sheared and faulted zone of

LMBC and HLBX.

The west or footwall side(?) is a weakly silicified LMBC which extends into the fault zone and is in contact with the HLBX. The eastern half of the zone or hanging wall side is a very calcareous and limonitic HLBX unit and is restricted to the fault zone. The eastern limits of the trenching are LMST.

KN96TR35
This trench is approximately 100 metres north of KN96TR36 and cross cuts the projected mineralized structure found in it. There were several anomalous float samples in the immediate area.

The trench consists entirely of LMBC. A very narrow, silicified breccia zone is centred on the weak 2.0 metre gold anomaly listed in the previous summary table. Sub-parallel joint sets in the anomalous area clearly post date brecciation. A small calcite welded breccia was mapped on the on the eastern(hanging wall?) side of the trench but has no gold values associated with it.

KN96TR37
This trench, which lies approximately 50 metres down slope and down trend from KN96TR36 on the boulder train, encountered little of economic interest. The single 0.75 gram channel is probably associated with a small silicified HLBX unit mapped in the eastern portion of the trench. The breccia unit lies between a LMBC unit on the west and a LMSL unit to the east side.

KN96TR34
This trench became part of the middle drill road as it cross cuts the mineralized trend and is the centre of a another cluster of higher grade prospecting samples. The highest graded sample, 21.70 g/t was taken in the vicinity of the original trench. After road access was complete the trench was re-scraped and the higher grade intervals reported in Table 8.7-1 were taken. These samples centre on a fault/breccia zone that remained partially permafrosted. The basic lithology and structure was similar to the two up slope trenches and consists of the fault/breccia unit forming a structural contact between the western footwall LMBC unit and a massive LMST on the west.

KN96TR38
The highest grade grab sample, a silicified HLBX grading 19.06 g/t gold, came from this outcrop location which is known as the Cooley Zone. The trench cross cut a 2 metre interval of silicified HLBX . Both footwall and hanging wall are weakly silicified LMST. The interval

reported in the summary table corresponds to the HLBX unit. This trench is the only one excavated across this particular structure, which may be the southern extension of the Ridge Fault.

KN96TR39
This trench is the lower road cut that crosses the main boulder train. The highest grade interval was encountered in the road cut in the sheared and faulted contact zone between a LMBC on the western side and a silicified LMST on the eastern hanging wall side. There is another fault zone approximately 6 metres west of this structure and hosted entirely in silicified LMST that also contains anomalous gold values.

KN96TR45
The trench was follow up work on a narrow northwest trending three line gold geochemical anomaly and centred on a 540 ppb gold sample location. No anomalous Au values were encountered in the trenching that could explain the geochemical linear.

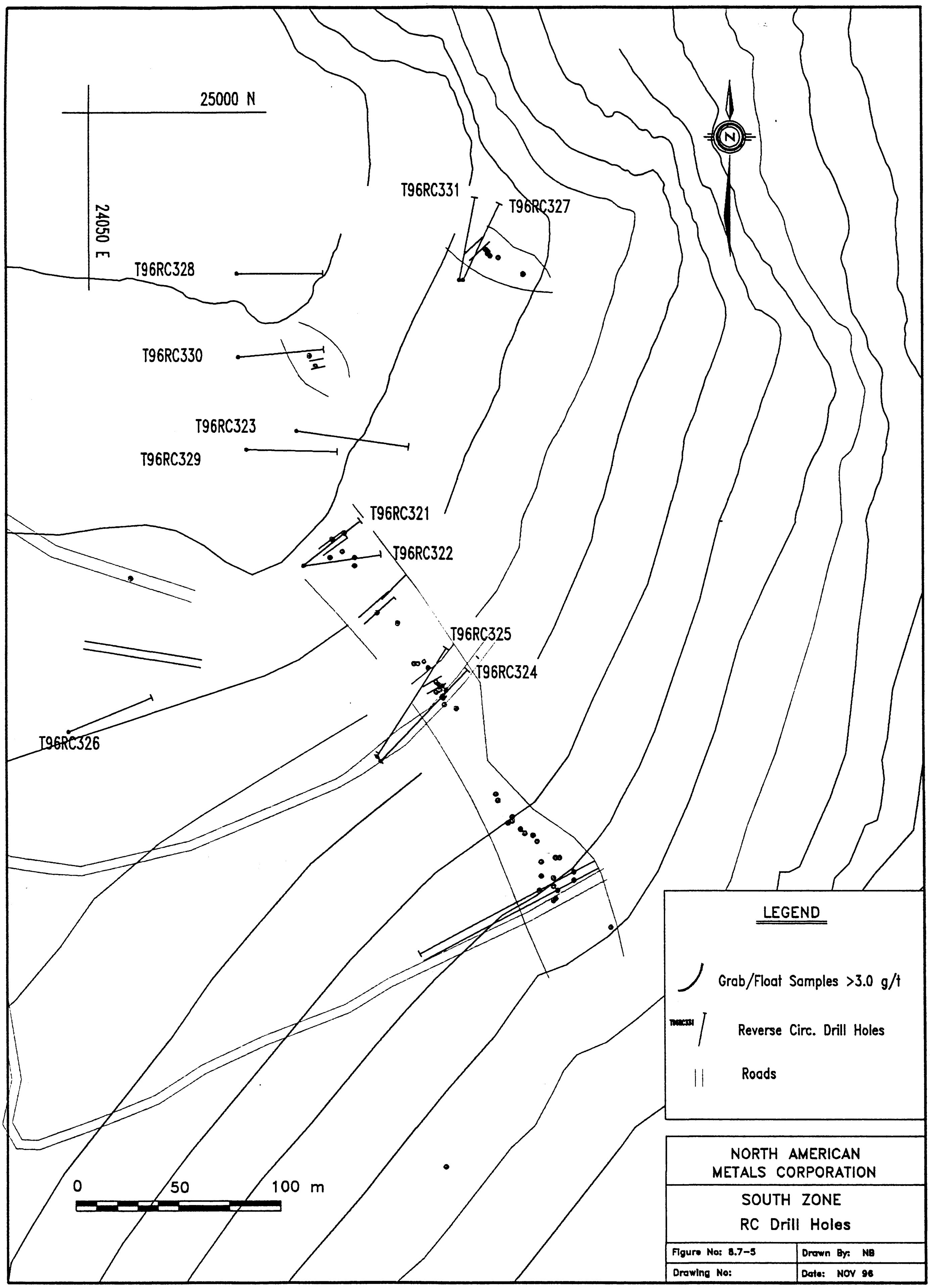
8.7.5 REVERSE CIRCULATION DRILLING

Starting in the second week of June, a rerverse circulation drilling program was started on the South Zone, and during the next two weeks 11 holes were drilled totalling 736 Metres (see Plate 8.7-2 and Figure 8.7-5). Table 8.7-2 summarizes the results of this drilling. The targets were primarily the structure outlined by the prospecting and concurrent trenching which was being carried out. Nine holes were drilled to test the main South Zone structure, two were drilled on the Cooley showing and one on a geochemical target west of the main structure.

Data collection and analysis was restricted using this drilling technique to gold analysis by fire assay and chip logging of the washed, coarser chips in each 1.0 metre sample. Sample size varied considerably based on the amount of air return over each sample interval. Sample weights varied from 20 kilograms to 1.0 kilogram or less.

Target selection and the results of individual holes are discussed briefly below, detailed drill sections are included in the map appendix of this report.

T96RC321
This hole was the first hole to test the area directly below trench KN96TR36 which ran 4.04 g/t over 4 metres. Two weakly mineralized zones occur between 40 and 50 m and corresponds to a change in rock chip lithology from LMBC to LMCH noted in the chip log. This is probably the down dip extension of contact structure seen in the trench.


25000 N
24050 E
T96RC331
T96RC327
T96RC328
T96RC330
T96RC323
T96RC329
T96RC321
T96RC322
T96RC325
T96RC324
T96RC326
0
50
100 m
LEGEND
Grab/Float Samples >3.0 g/t
Reverse Circ. Drill Holes
Roads
NORTH AMERICAN
METALS CORPORATION
SOUTH ZONE
RC Drill Holes
Figure No: 8.7-5
Drawn By: NB
Drawing No:
Date: NOV 96

Drill Hole	Hole length	Assay Interv	length m.	Au g/t >0.2	Assay Interv	Length m.	Au g/t >1.0
T96RC321	60 m	9-10 24-26 40-42 46-48 49-50 59-60	1 2 2 2 1 1	0.70 0.93 0.25 0.96 0.34 0.21	24-25 46-47	1 1	1.68 1.65
T96RC322	60 m	32-35 58-60	3 2	0.65 0.30	11-12 33-34	1 1	1.68 1.65
T96RC323	80 m	37-38	1	0.21			
T96RC324	90 m	12-17 36-37 61-62 70-74 82-85	5 1 1 4 3	0.31 0.31 0.24 0.29 0.53	74-78 80-82 80-85 70-85	4 2 5 15	1.84 2.30 1.24 1.00
T96RC325	86 m	26-27 51-57 80-89	1 6 9	0.31 0.25 0.70	80-82 85-86	2 1	1.72 1.54
T96RC326	60 m	14-16 23-24 31-33 35-39 43-44	2 1 2 4 1	0.23 0.24 0.21 0.22 0.24			
T96RC327	60 m	10-11 13-15	1 2	0.21 0.26			
T96RC328	60 m	24-26	2	0.39			
T96RC329	60 m	--		--			
T96RC330	60 m	41-42 44-45	1 1	0.21 0.21			
T96RC331	60 m	30-31	1	0.62	27-30	3	3.38

Table 8.7-2: South Zone Reverse Circulation Drilling Summary

T96RC322
This hole was step out fan hole to the north from the same drill pad as T96RC321. A 3.0 metre intersection grading 0.65 g/t coincident with a FZ/HLBX section noted in the chip log is probably the structure noted in the trench above.

T96RC323
An additional step out hole approximately 50 metres to the north to test the same structure came up with only a single 1.0 metre interval of 0.21 g/t across the projected strike of the structure.

T96RC324
The drill was moved to the middle drill road to test an area of high grade float and the mineralized structure cross cut in KN96TR34.

The 80-85 m interval grading 1.24 g/t appears to line up with zone located in the above trench. The chip log also indicates that the hole ended in a LMBC with anomalous gold values. Based on the section exposed in the trench it suggests the hole may not have completely cut the zone.

T96RC325
This hole was fanned to the north to follow up on the structure. The size of the drill rig and the tight pad only allowed an approximate offset of 15 m. Two individual sample intervals near the end of the hole and chip logged as a HLBX / FZ probably are the down dip extension of the surface structure.

T96RC326
The Geochem anomaly to the west of the main south structure was the target of this hole which came up with very weakly anomalous zone over approximately 30 metres.

T96RC327
The Cooley Zone structure was the target of this hole and proved to be barren of any anomalous gold values. The chip log indicated a massive and silicified LMST unit.

T96RC328,T96RC329,T96RC330
These holes were drilled along the projected northern strike of the main mineralized structure and were barren or reported weakly anomalous gold values. The chip logging does report a continuation of breccia textures and suggests the South Fault has a strike between 350° and 010° north.

T96RC331
This hole was the second to test the Cooley Zone and intersected 3.0 metres of 3.38 g/t in a hematitic LMST.

8.7.6 DIAMOND DRILLING
Starting in the first week of July diamond drilling began on the lowest drill

road to cross cut the zone. Three holes were drilled for a total of 267 metres (see map 8.7-6) are summarized in Table 8.7-3 and the following individual drillhole summaries.

T96DH332
The hole was drilled easterly to intersect the down dip trace of KN96TR39 which produced the best trench section of 2 metres at 4.40 g/t. A strongly faulted HLBX unit was cut below the mineralized surface trench but did not produce the grade of the trench sampling. The best interval produced was 3.94 metres at 1.34 g/t. An additional 90 metres was drilled into the footwall but produced few anomalous gold values.

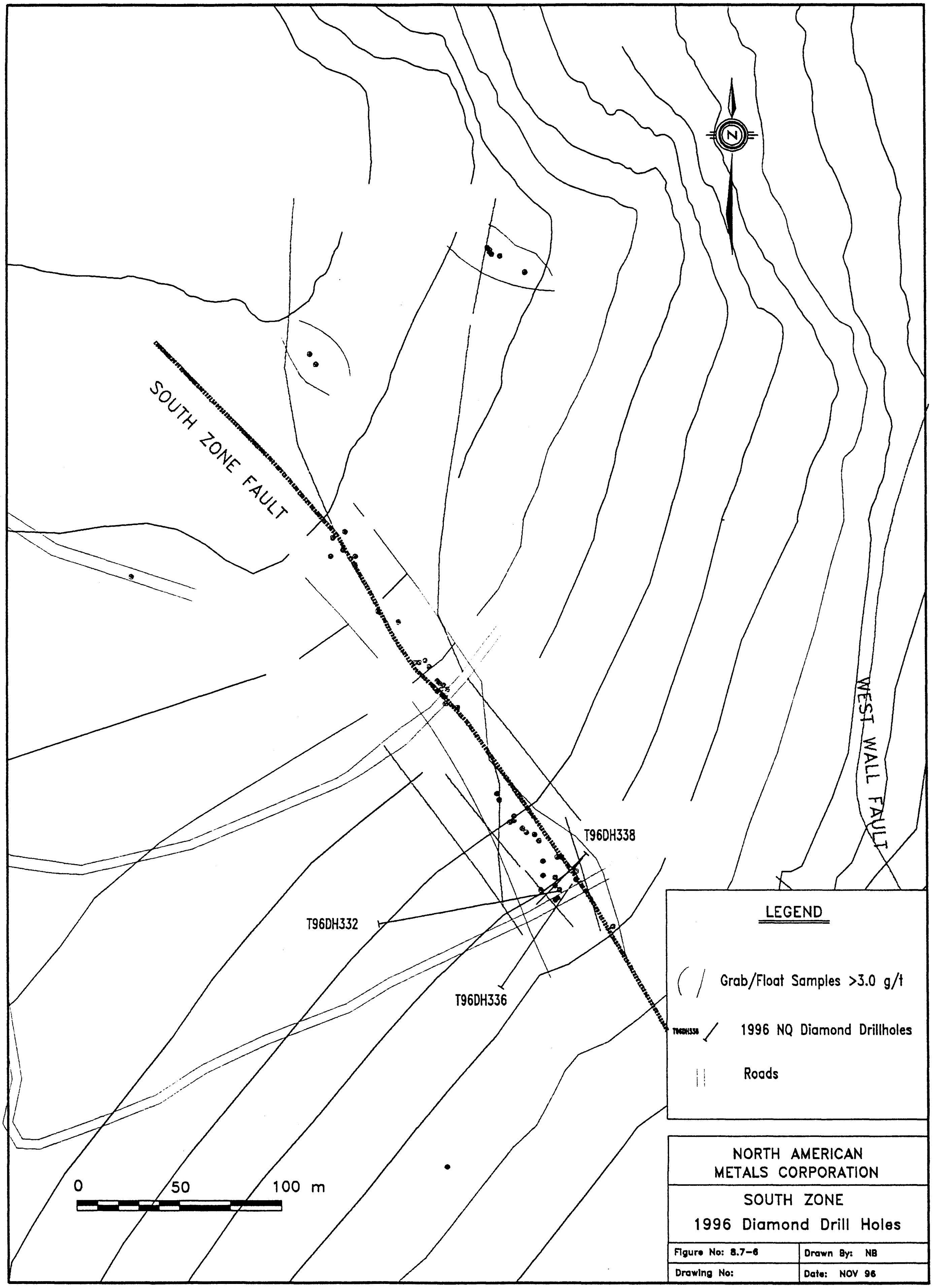
Drill Hole	Hole Length	Assay Interv.	Length m.	Au g/t >0.2	Assay Interv.	Length m.	Au g/t >1.0
T96DH332	126.52	3.07-4.17	1.12	0.38	33.29-37.23	3.94	1.34
		7.40-8.40	1.00	0.34			
		10.40-11.40	1.00	0.41			
		17.83-37.23	15.46	0.56			
		37.23-38.23	1.00	0.27			
		71.71-73.71	2.00	0.27			
		113.4-116.5	3.10	0.43			
T96DH336	85.52	6.10-6.82	0.72	0.48			
		18.45-19.64	1.19	0.45			
		34.00-35.00	1.06	0.24			
		41.16-45.18	4.02	0.30			
		73.98-75.05	1.07	0.86			
		81.84-82.90	1.06	0.27			
T96DH338	54.86	32.58-33.60	1.02	0.24	14.18-15.20	1.02	3.12
		36.50-38.30	1.80	0.35	38.30-40.20	1.90	1.47
		40.20-41.20	1.00	0.24			
		36.50-41.20	4.70	0.99			
TOTAL	212.04						

Table 8.7-3: South Zone Diamond Drilling Summary

T96DH336
A fan hole to the south from the same setup to gain a step out.

The interval of expected interest, 30-50 metres consisted of competent HLBX core sections intermixed with mud and in some intervals ice. There was a weakly anomalous 4.0 metre section in the interval of 0.30 g/t.

T96DH338
This hole was drilled westerly and two intersections ran greater then one gram. A single 3.12 gram/t interval at 15 metres appears to be associated with a small section of brecciated LMST while the second


SOUTH ZONE FAULT
WEST WALL FAULT
T96DH338
T96DH332
T96DH336
0
50
100 m
LEGEND
Grab/Float Samples >3.0 g/t
1996 NQ Diamond Drillholes
Roads
NORTH AMERICAN
METALS CORPORATION
SOUTH ZONE
1996 Diamond Drill Holes
Figure No: 8.7-6
Drawn By: NB
Drawing No:
Date: NOV 96

2 metre interval at 39 m. And grading 1.47 gram/t occurs on a faulted contact between a HLBX and a SLST unit.

8.7.7 GEOLOGY AND STRUCTURE

The geological terrain of the South Zone lies completely within the Permian carbonate units which have undergone D2 fold deformation (Cooley, 96 mapping program) and subsequent structural disruption by northerly and northwesterly near vertical faults(see foldout Figure 8.7-7).

The principle control on gold mineralization appears to be the South Fault and the possible extension of the Ridge Fault into the area of the Cooley showing. The intersection of the South Fault and the large D2 fold features may also have some control on the localisation of gold in the zone (Cooley, internal report Nov 96).

The carbonate units proximal to the South Zone Fault gold mineralization are chiefly LMBC, a medium grey crinodal limestone, LMST(1), a cream buff massive limestone and DOCH, a thick bedded dolomite with highly variable amounts of chert lenses. Chert with lesser dolomite is the dominate lithology moving west from the South Fault. Moving east from the South Fault, DOCH becomes the dominant lithology and is in fault contact with the West Wall Fault.

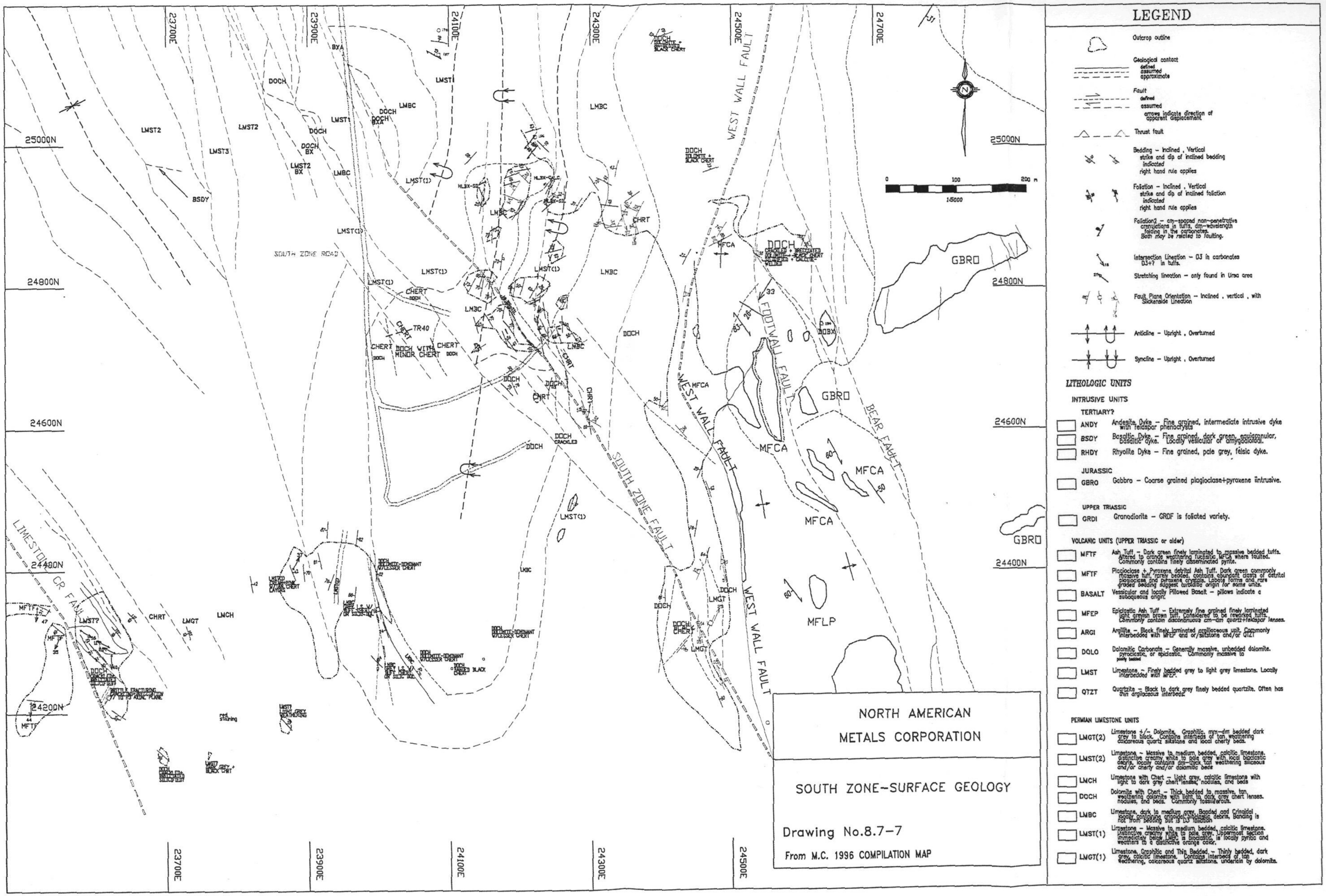
The South Fault structure appears to be splay of the anastomosing West-Bear fault system. At the northerly limits the structure is very tight with a metre or less of gougy and broken material. It appears to open up in the direction of the West Wall Fault and contains increasing amounts of calcite welded breccia. The orientation of the fault at the north end based on trench KN96TR36 and the limited RC data north of if gives a strike of 355° and a near vertical dip. To account for the surface trace down slope to the lower road would require some deviation or flexure in the structure. This may have developed dilatant zones and partially explain the location of gold mineralization.

Structural control in the Cooley showing is less clear, it may be part of a continuous structure extending north into the Ridge Zone fault, a secondary structure of the West Wall Fault system or small detached and isolated lens.

The gold bearing rocks in general are well silicified, exhibit strong breccia or crackle textures and may have a pronounced hematitic and limonitic colouration varying from cream to burgundy. Calcite welded breccias normally have low gold values.

8.7.8 CONCLUSIONS & RECOMMENDATIONS

The 1996 South Zone exploration program successfully located a


LEGEND
Outcrop outline
Geological contact
defined
assumed
approximate
Fault
defined
assumed
arrows indicate direction of apparent displacement
Thrust fault
Bedding – Inclined , Vertical
strike and dip of inclined bedding indicated
right hand rule applies
Foliation – Inclined , Vertical
strike and dip of inclined foliation indicated
right hand rule applies
Foliation2 – cm–spaced non–penetrative crenulations in tuffs, dm–wavelength folding in the carbonates. Both may be related to faulting.
Intersection Lineation – D3 in carbonates D3+? in tuffs.
Stretching lineation – only found in Ursa area
Fault Plane Orientation – Inclined , vertical , with Slickenside Lineation
Anticline – Upright , Overturned
Syncline – Upright , Overturned
LITHOLOGIC UNITS
INTRUSIVE UNITS
TERTIARY?
ANDY Andesite Dyke – Fine grained, intermediate intrusive dyke with feldspar phenocrysts
BSDY Basaltic Dyke – Fine grained, dark green, equigranular, basaltic dyke. Locally vesicular or amygdaloidal.
RHDY Rhyolite Dyke – Fine grained, pale grey, felsic dyke.
JURASSIC
GBRO Gabbro – Coarse grained plagioclase+pyroxene iintrusive.
UPPER TRIASSIC
GRDI Granodiorite – GRDF is foliated variety.
VOLCANIC UNITS (UPPER TRIASSIC or older)
MFTF Ash Tuff – Dark green finely laminated to massive bedded tuffs. Altered to orange weathering fuchsitic MFCA where faulted. Commonly contains finely disseminated pyrite.
MFTF Plagioclase + Pyroxene detrital Ash Tuff. Dark green commonly massive tuff, rarely bedded, contains abundant clasts of detrital plagioclase and pyroxene crystals. Lobate forms and rare graded bedding suggest turbiditic origin for some units.
BASALT Vessicular and locally Pillowed Basalt – pillows indicate a subaqueous origin.
MFEP Epiclastic Ash Tuff – Extremely fine grained finely laminated light greyish brown tuff. Considered to be reworked tuffs. Commonly contain discontinuous cm–dm quartz+feldspar lenses.
ARGI Argillite – Black finely laminated argillaceous unit. Commonly interbedded with MFEP and or/siltstone and/or QTZT
DOLO Dolomitic Carbonate – Generally massive, unbedded dolomite. pyroclastic, or epiclastic. Commonly massive to poorly bedded
LMST Limestone – Finely bedded grey to light grey limestone. Locally interbedded with MFEP.
QTZT Quartzite – Black to dark grey finely bedded quartzite. Often has thin argillaceous interbeds.
PERMIAN LIMESTONE UNITS
LMGT(2) Limestone +/– Dolomite, Graphitic, mm–dm bedded dark grey to black. Contains interbeds of tan weathering calcareous quartz siltstone and local cherty beds.
LMST(2) Limestone – Massive to medium bedded, calcitic limestone. distinctive creamy white to pale grey with local bioclastic debris, locally contains dm–thick tan weathering siliceous and/or cherty and/or dolomitic beds
LMCH Limestone with Chert – Light grey, calcitic limestone with light to dark grey chert lenses, nodules, and beds
DOCH Dolomite with Chert – Thick bedded to massive, tan weathering dolomite with light to dark grey chert lenses. nodules, and beds. Commonly fossiliferous.
LMBC Limestone, dark to medium grey, Banded and Crinoidal locally containing crinoidal bioclastic debris, Banding is not from bedding but is D3 foliation
LMST(1) Limestone – Massive to medium bedded, calcitic limestone. Distinctive creamy white to pale grey. Uppermost section immediately below LMBC is bioclastic, is locally pyritic and weathers to a distinctive orange color.
LMGT(1) Limestone, Graphitic and Thin Bedded – Thinly bedded, dark grey, calcitic limestone. Contains interbeds of tan weathering, calcareous quartz siltstone, underlain by dolomite.
23700E
23900E
24100E
24300E
24500E
24700E
25000N
24800N
24600N
24400N
24200N
0
100
200 m
1:5000
SOUTH ZONE ROAD
WEST WALL FAULT
FOOTWALL FAULT
BEAR FAULT
SOUTH ZONE FAULT
LIMESTONE CR FAULT
LMST2
LMST3
LMST1
BSDY
DOCH
LMBC
LMST(1)
LMBC
CHERT
TR40
DOCH WITH MINOR CHERT
CHRT
DOCH CRACKLED
MFCA
GBRO
DOBX
MFLP
LMGT
LMCH
LMST?
MFTF
NORTH AMERICAN
METALS CORPORATION
SOUTH ZONE–SURFACE GEOLOGY
Drawing No.8.7–7
From M.C. 1996 COMPILATION MAP

mineralized structure that hosts gold mineralization with grades of up to 20 g/t. While the trench and drill intersections were not of economic grade by present Golden Bear parameters, the existence of economic mineralization in this area of the property has not been eliminated.

Additional trenching should be carried out on the South Zone where significant gaps exist. This targets the 100 metre gap between the mid and lower roads that has no trenching or drill coverage, and the float sample area approximately 150 metres below the lower road which was not covered in the 1996 field season.

The South Zone should also be subject to further drill testing. Drill targets should be selected after detailed structural analysis in order to identify areas with the greatest potential for structural dilatantcy. One very prospective target is the intersection of the South Zone Fault and the southern extension of the Ridge Fault, which is believed to be the structure that hosts the Cooley Zone.

8.8 C & C ZONE SUMMARY

8.8.1 LOCATION AND ACCESS

The C & C Zone is located on a southwestern slope of gentle to moderate topography, and lies roughly 400 metres to the west of the Limestone Creek Fault. The elevation of the area varies from 1850 to 2050 metres. As this is above tree line for the area, and part of the area has only recently been uncovered by the retreat of glacial ice, there is minimal vegetative growth. Access to the area is via a 3.5 kilometre exploration road originating from the Kodiak A Deposit haul road system (see Figure 8.8-1 and Plate 8.8-1).

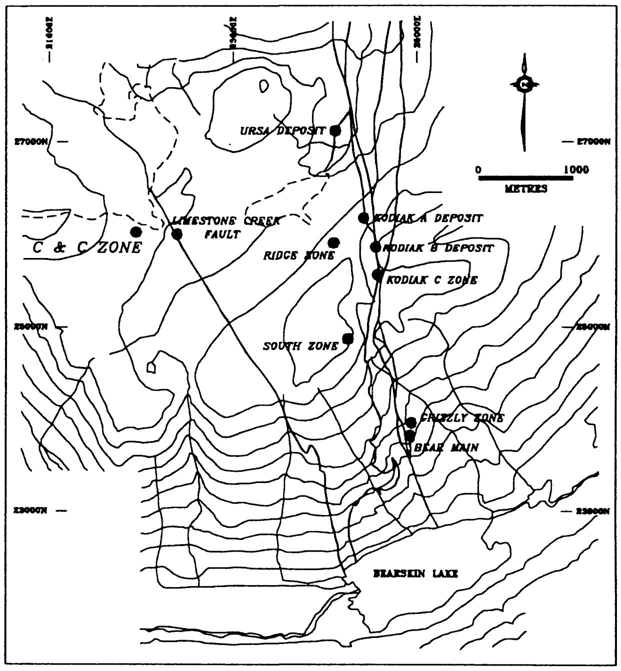


Figure 8.8-1: Location of C & C Zone

8.8.2 OVERVIEW

The area was targeted for exploration work when a 1995 soil geochemistry program indicated the presence of several gold anomalies. In addition, the Limestone Creek Fault, which is masked by till cover, seemed to be the source of coincident arsenic antimony and mercury anomalies. As the fault is viewed as a mirror image of the Ophir Break fault system this area was felt to be highly prospective for gold mineralization.

When snow conditions permitted access to the area, a program of prospecting and float sampling was carried out in the area. Gold mineralization identified in float and followed up slope to the area currently known as the C & C Zone. Overall the sampling outlined a boulder train that originates at the projected Limestone Creek Fault trace and extends to the northwest for approximately 600 metres. Follow up work on the zone included trenching, mapping, infill soil sampling and diamond drilling. This summary deals primarily with the investigation of the mineralized float train and the trenching and diamond drilling generated as a result (see Figure 8.8-2).

The results of this phase of the program were very mixed. The prospecting identified and outlined a visibly distinctive breccia float train with excellent gold values. Subsequent trenching identified insitu gold mineralization, but it lacked the better values and textures seen in the float samples. Three diamond drill holes in the immediate vicinity of the best trench results produced only low grade and narrow intersections.

The work carried out to date has not properly identified the source of the high grade mineralized float and the relationship between the up slope terminus of the boulder train and the insitu mineralization is uncertain. More work needs to be carried out to properly assess this area.

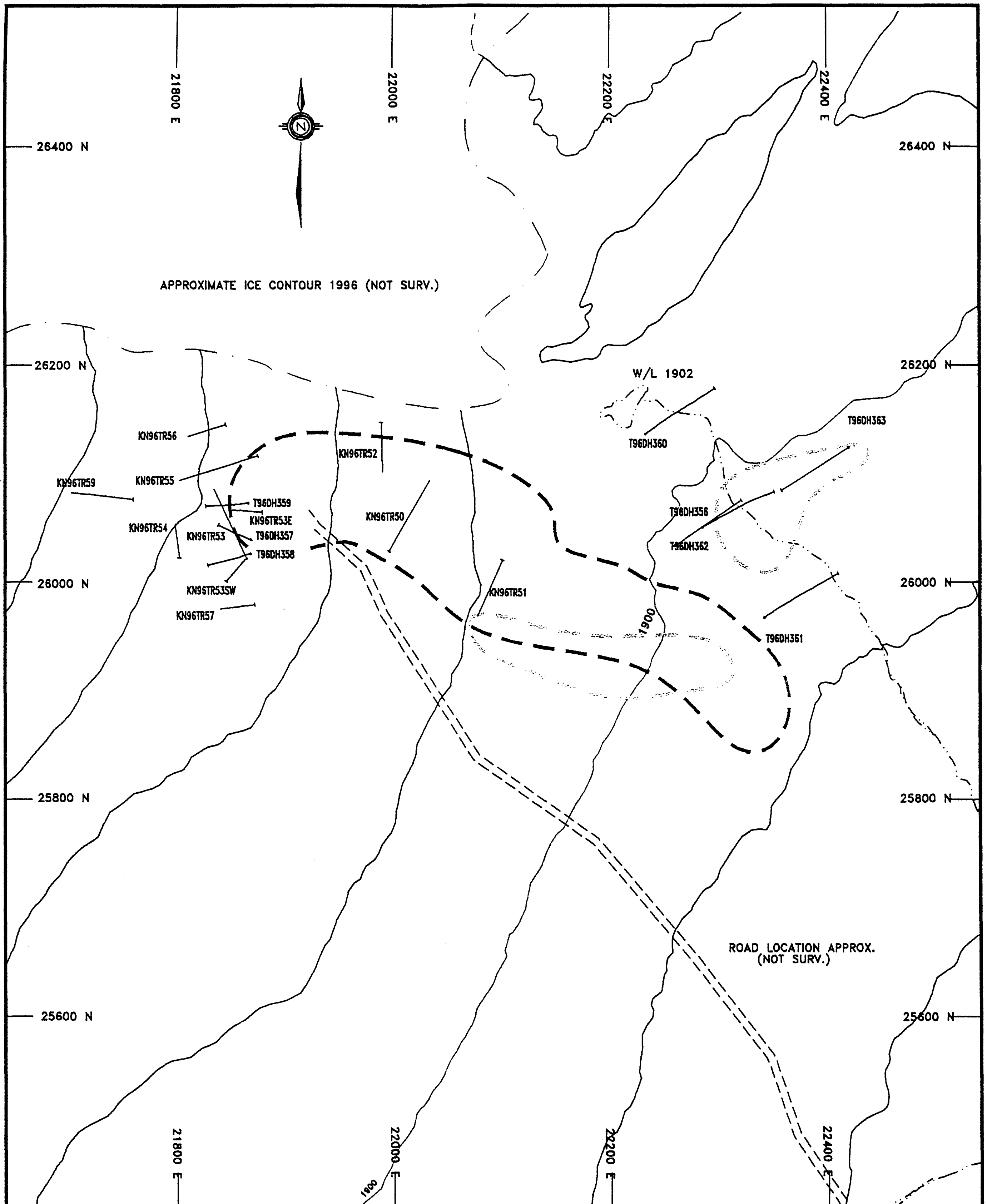
8.8.3 PROSPECTING

The C & C Zone area is almost completely till covered with only minor outcrop and sub crop exposed in the immediate area. Repeated episodes of ice movement, have added to the complexity of the overburden cover. The little outcrop exposure, which has been mapped by Cooley (1996), consists of the ARGI, MFCA and QTZT units of the Upper Jurassic Stuhini Group, which have been placed in fault contact with the Permian carbonates on the east side of the Limestone Creek Fault.

The initial work in the area , carried out in early August, consisted of a high density float sampling. This identified a gold bearing lithology and outlined a boulder dispersion train with a definite up slope terminus. From this upper terminus, at 26100 N, 21850 E, the boulder train extends down slope at a 140° azimuth for 550 metres (see Figure 8.8-3), with an average width of roughly 100 metres.

The results of the float sampling program are summarized in Table 8.8-1. This summary only includes samples from within the window defined by the extent of Figure 8.8-1.

Extremely detailed prospecting efforts failed to extend the limits of the boulder train in up slope or up ice directions. A review of the soil geochemistry in this area (Section 6.0) indicates that gold values alone are coincident with the boulders. A number of elements including Hg, Sb, Mg, Ca, and Sr suggest that there was a recent ice advance in a more or less due south direction from Sam Glacier that stopped just short of the C & C Zone area. Although this advance did not leave a noticeable moraine, it may have masked additional portions of the boulder train.



LEGEND

1:5000

200 METRES

KN96TR53E 1996 TRENCHING

T96DH357 1996 DIAMOND DRILLING

FLOAT SAMPLING > 3.0 G/T Au

FLOAT SAMPLING 1.0–3.0 G/T Au

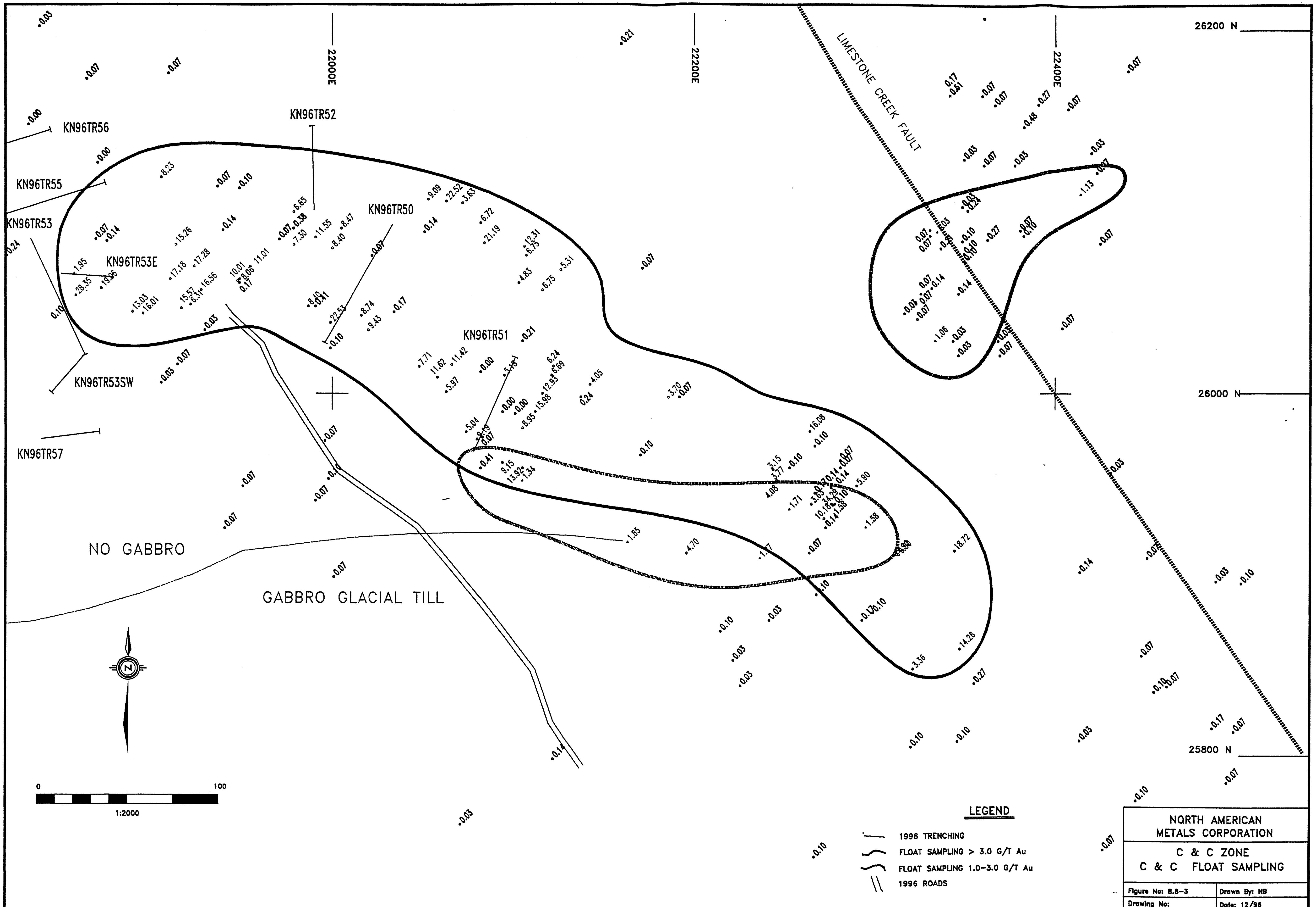
1996 ROADS

NORTH AMERICAN METALS CORPORATION

C & C ZONE

C & C SUMMARY OF WORK

Figure No: 8.8-2	Drawn By: NB
Drawing No:	Date: 12/96



NORTH AMERICAN METALS CORPORATION	
C & C ZONE C & C FLOAT SAMPLING	
Figure No: 8.8-3	Drawn By: NB
Drawing No:	Date: 12/96

Au Value gram/t	Number of samples	Mean Value of samples	Max.Value of samples
>10	26	16.49	34.29
5-10	26	7.47	9.50
3-5	11	3.98	3.98
1-3	11	1.41	1.85
.2-1	39	0.34	0.99
0-.2	188	0.07	0.17
TOTAL	301		

Table: Summary of Float Sampling on the C & C Zone

8.8. 4 TRENCHING

Trenching in the area began on the Limestone Creek Fault structure initially and then as sampling and prospecting continued, followed the boulder train up slope to it's terminus. Approximately 350 metres of trenching was sampled and mapped (see Figure 8.8-4). Several trenches and pits in the lower slope of the zone were dug and refilled without finding outcrop due to the depth of overburden. A brief description of the results of the this trenching follows.

KN96TR50

The trench is located at 25950N, 22280E and a bearing 020°.

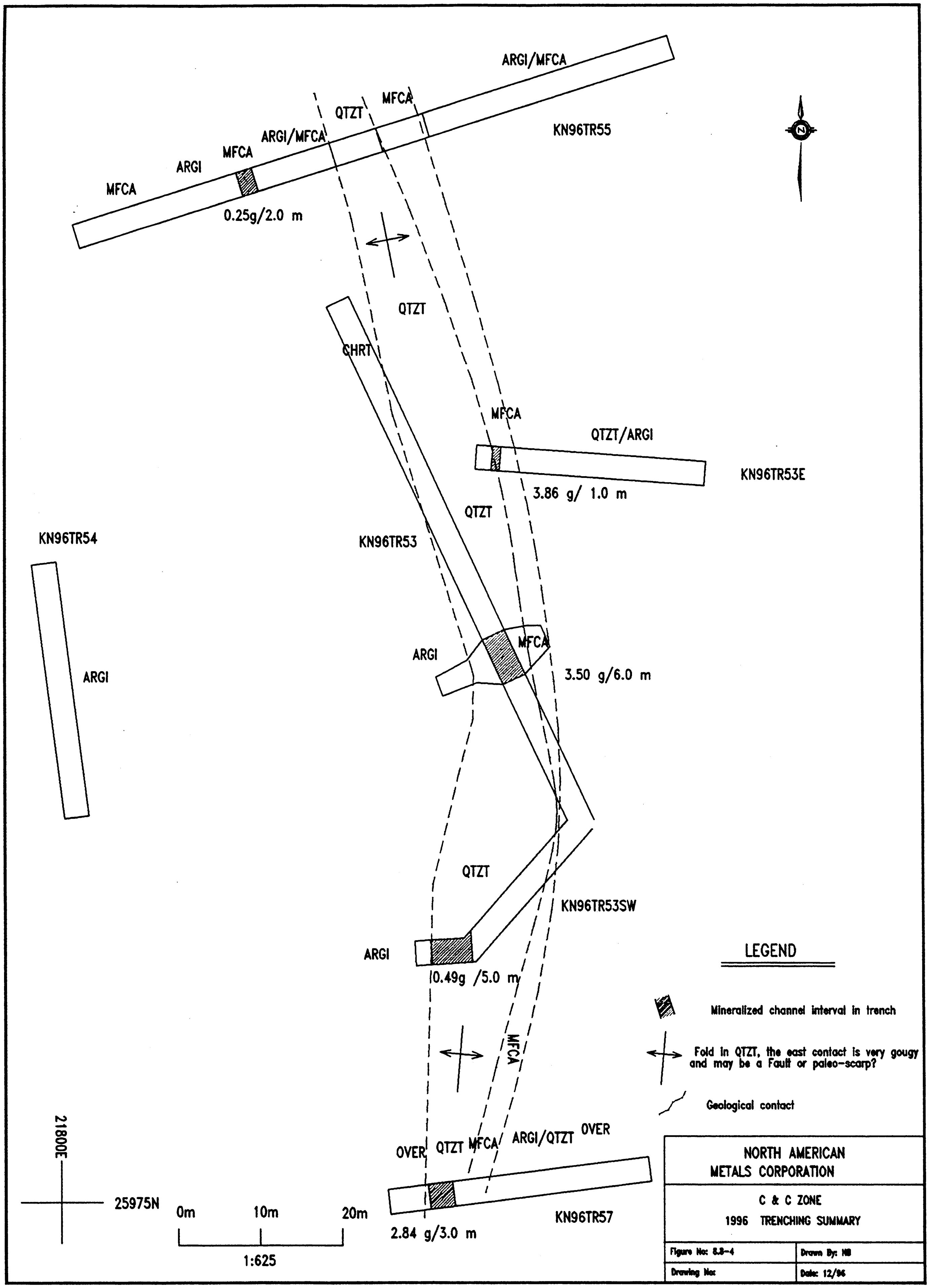
The floor of the trench is in permafrost and exposed a grey argillite or phyllite unit. The north end of the trench exposed a 40 cm quartz-ankerite vein in the permafrost but sampling this structure did not produce anomalous gold values. Interval sampling of the frost heaved wall material produced only one 0.21 g/t analysis.

KN96TR51

The trench is located approximately 100 metres to the southeast and down slope from KN96TR50. It cross cuts the mineralized boulder train at 025° in the centre of some of the highest grade float samples. It exposes, from south to north, ARGI, QTZT and MFEP units. No anomalous samples of interest was taken in the trench.

KN96TR52

Located approximately 50 metres to the west of north end of


ARGI/MFCA
MFCA
QTZT
ARGI/MFCA
MFCA
ARGI
MFCA
KN96TR55
0.25g/2.0 m
QTZT
CHRT
MFCA
QTZT/ARGI
KN96TR53E
3.86 g/ 1.0 m
QTZT
KN96TR54
KN96TR53
ARGI
MFCA
3.50 g/6.0 m
ARGI
QTZT
KN96TR53SW
ARGI
0.49g /5.0 m
MFCA
LEGEND
Mineralized channel interval in trench
Fold in QTZT, the east contact is very gougy and may be a Fault or paleo-scarp?
Geological contact
OVER
QTZT
MFCA
ARGI/QTZT
OVER
2.84 g/3.0 m
KN96TR57
21800E
25975N
0m
10m
20m
1:625
NORTH AMERICAN METALS CORPORATION
C & C ZONE
1996 TRENCHING SUMMARY
Figure No: 8.8-4
Drawn By: NB
Drawing No:
Date: 12/96

KN96TR50 the trench cross cuts MFEP, ARGI AND SLST in permafrost. In combination with KN96TR50, the two trenches represent a south to north section across the width of the boulder train. Sampling in the trench produced no significant gold values.

KN96TR53, KN96TR53E and KN96TR53SW
These trenches cross cut the western and upper terminus of the float train and produced the best gold values in trenching the zone. KN96TR53 intersected 6.0 metres at 3.50 g/t or 9.0 metres at 2.48 g/t (see Plate 8.8-3). Additional panel sampling in a much expanded trench over this section indicates the mineralized true section width is less then two metres. Trenches 53E and 53SW are extensions of the original KN96TR53 to follow up on the gold mineralization.

The original trench sub-parallels a northerly trending lithological contact between a QTZT unit on the west a MFCA unit on the east side of the trench. The contact dips moderately to steeply to the east. The gold mineralized QTZT in the central portion of the trench occurs in the contact zone. The initial appearance of the contact suggested a fault structure but additional exposure across section now indicates that the QTZT represents an open antiform fold hinge structure which can be traced north to KN96TR55 and south to KN95TR57. The extremely altered MFCA contact unit overlaying the QTZT appears in sections to be conformable to it but also shows evidence of possible mass sown slope movement over the more competent QTZT.

KN96TR53E cross cuts the hanging wall lithology at 100 degrees and produced a one metre interval of 3.86 g/t in QTZT. It appears to be an extension of the mineralization in the central portion of KN96TR53. KN96TR53SW extends the main trench in a southwesterly curve where the QTZT hinge is again crosscut It is weakly mineralized over 5 metres at 0.49 g/t.

KN96TR55
The trench is runs 70 metres at an azimuth of 080° and cross cuts both the footwall and hanging wall units seen in KN95TR53 trenching to the south of it. The section remains similar with east portion of the trench section exposing open to locally tightly folded ARGI, MFCA and LMST units. A weak 2 metre interval of 0.25 g/t occurs in the channel sampling at 21-23 metres. The QTZT fold occurs on trend with the two exposures in KN96TR53 but sampling produced no significant gold values associated with it. The western section of the trench is ARGI, MFCA and QTZT and LMST and returned no significant gold values.

KN96TR57
The trench is approximately 30 metres south of KN96TR53SW at 080° and exposed a similar section. This trench produced the only interesting gold interval outside of the KN96TR53, 2 metres of 3.89 g/t associated with the folded QTZT in the west end of the trench (the samples that ran are not closed off). This means the zone remains open to the south.

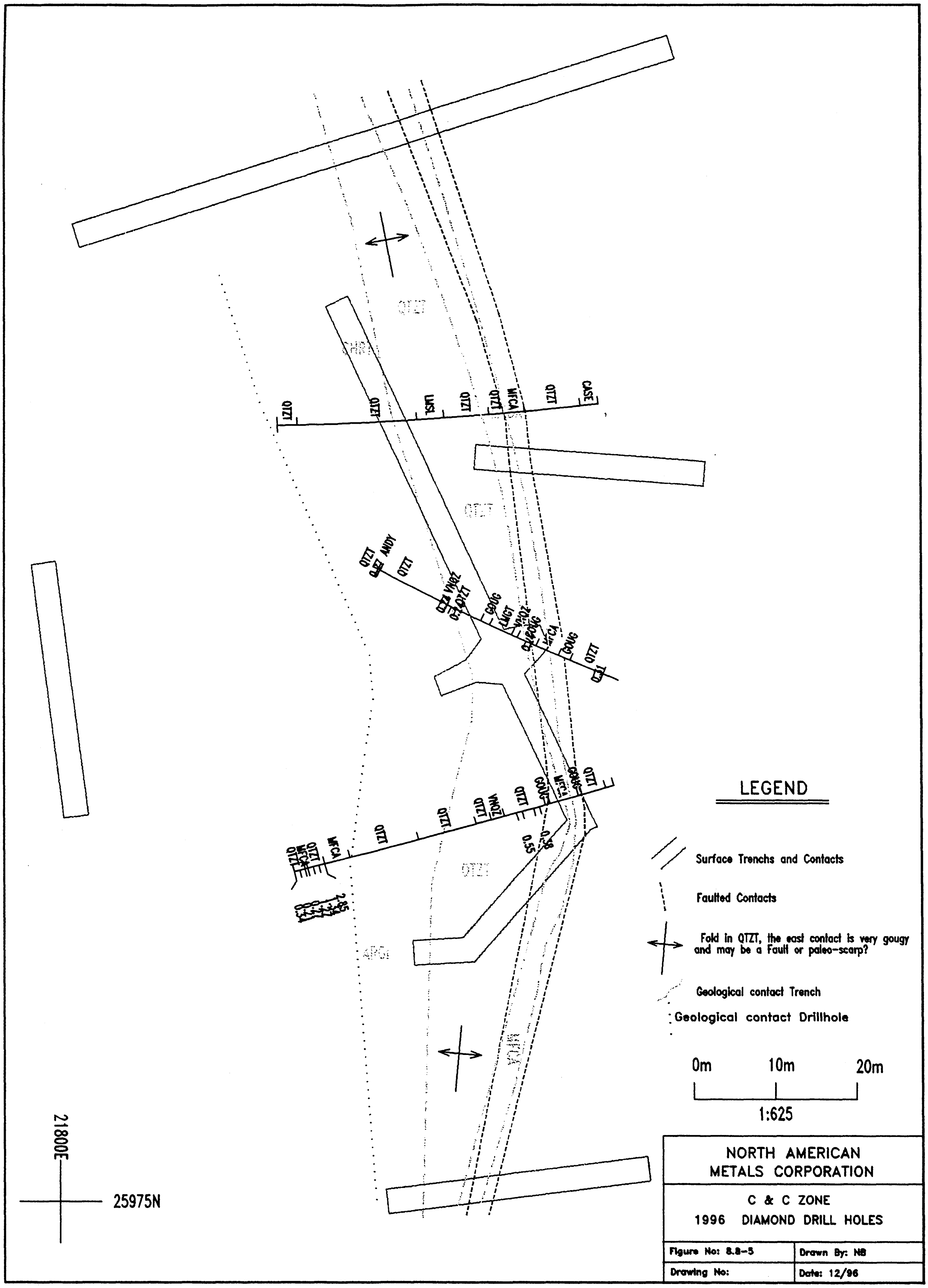
KN96TR56
The trench is a 30 metre step out trench north and parallel to KN96TR55. Little depth was achieved due to permafrost and as only sub-cropping blocks of ARGI and MFCA were exposed, no sampling was done.

KN96TR54 & KN96TR59
Both of these trenches are located 50-100 metres west and up slope of the boulder train anomaly. Trench KN96TR54 cuts obliquely to the lithology was primarily ARGI with little of interest except small scale normal faulting of argillite beds. KN96TR59 located 100 metres west of the was trenched across a lithology of ARGI, QTZT and MFCA. Sample results did not produce any values of interest.

The trenching of the upper terminus area of the mineralized float train located a mineralized zone in quartzites that appears to follow the hinge and western limb of an open anticline that trends 005°. Mineralization has been encountered over a strike length of approximately 100 metres, and over widths of 1.0 to 2.0 metres. The trend was not traced to the north due to deepening overburden but remains open of the south. It's location directly across the upper terminus of the mineralized float train is enigmatic. While both the boulder train and trench mineralization are quartzite hosted, they appear to be different quartzite lithologies. The trenching exposed massive dark grey quartzites as opposed to the creamy colored, vuggy (etched?) quartzites seen in the boulder train. In addition the brecciation textures in the trench material are not the same as those seen in the high grade float samples.

<u>8.8.5 DIAMOND DRILLING</u>
Three NQ drill holes were drilled in the area to test the mineralized structure identified in the KN96TR53 area (see Plate 8.8-4 and Figure 8.8-5). This totalled 160 metres with all core intervals split and sampled.

T96DH357
This hole drilled at -50° westerly and directly under the best interval of channel sampling in KN96TR53. The section was as indicated by the trenching but without any significant grade. The gougy contact


QTZT
MFCA
CASE
GOUG
LEGEND
Surface Trenchs and Contacts
Faulted Contacts
Fold in QTZT, the east contact is very gougy and may be a Fault or paleo-scarp?
Geological contact Trench
Geological contact Drillhole
0m
10m
20m
1:625
NORTH AMERICAN METALS CORPORATION
C & C ZONE
1996 DIAMOND DRILL HOLES
Figure No: 8.8-5
Drawn By: NB
Drawing No:
Date: 12/96
21800E
25975N

between the MFCA and the underlying QTZT which returned the better values in the trench reported a single 0.97 metre of 0.25 g/t. A section of QTZT with vuggy and small breccia sections occurs on the western limb of the fold. The last run of the hole intersected a small 0.5 metre bleached andesite dike containing finely disseminated pyrite which graded 0.27 g/t gold.

T96DH358
Drilled from the same pad as T96DH357, the hole was drilled southwesterly at -45° to intersect the structure below KN96TR53SW. Primarily in QTZT with minor MFCA, this hole intersected 2.93 metres grading 1.83 g/t gold within in a QTZT breccia and occurs on the western limb of the northerly trending fold.

T96DH359
Drilled 30 metres to the north to intersect the structure below KN96TR53E, the drill hole did not any anomalous gold intersections. The hole ends in a vuggy QTZT with minor breccia textures.

Drilling below the known mineralized trench sections did not demonstrate any continuity to gold grades down the eastern limb of the anticline. There is some evidence in the T96DH358 intersection to suggest that a mineralized zone is present on the western limb, and the vuggy textures associated with gold values in this intersection were observed in a similar structural position in the other two holes.

8.8.6 GEOLOGY AND STRUCTURE
The geological terrain of the C & C zone is within rocks of the the Upper Triassic Stuhini group. The eastern boundary of the volcanics and of the C & C zone is the Limestone Creek Fault. Permian carbonates lie to the east of this fault contact. A prominent gabbro ridge dominates the northwest slopes of the area. Geological exposure is terminated to the north by the Sam Glacier (see Figure 8.8-6).

The most abundant lithological units in the area of the C & C Zone are QTZT, a series of quartzites which varies in colour from nearly white, to cream, to dark grey or black and is thin to medium bedded quartzite, ARGI, a black finely laminated argillite to phyllite unit with intercalated of quartzite and siltstone and MFCA, a highly altered mafic epiclastic unit. Lesser amounts of limestone and dolomite also occur.

The dominant structure in the area is the Limestone Creek Fault forming the eastern boundary to the area. The nature of this fault is not well understood, due to the presence of a thick till cover, however preliminary drilling in 1996 inidicates that the fault does contain gold mineralization (see Section 8.9). The relationship of this fault to gold mineralizationin the C & C Zone is not known. Where encountered in trenching C & C Zone gold mineralization appears to be associated

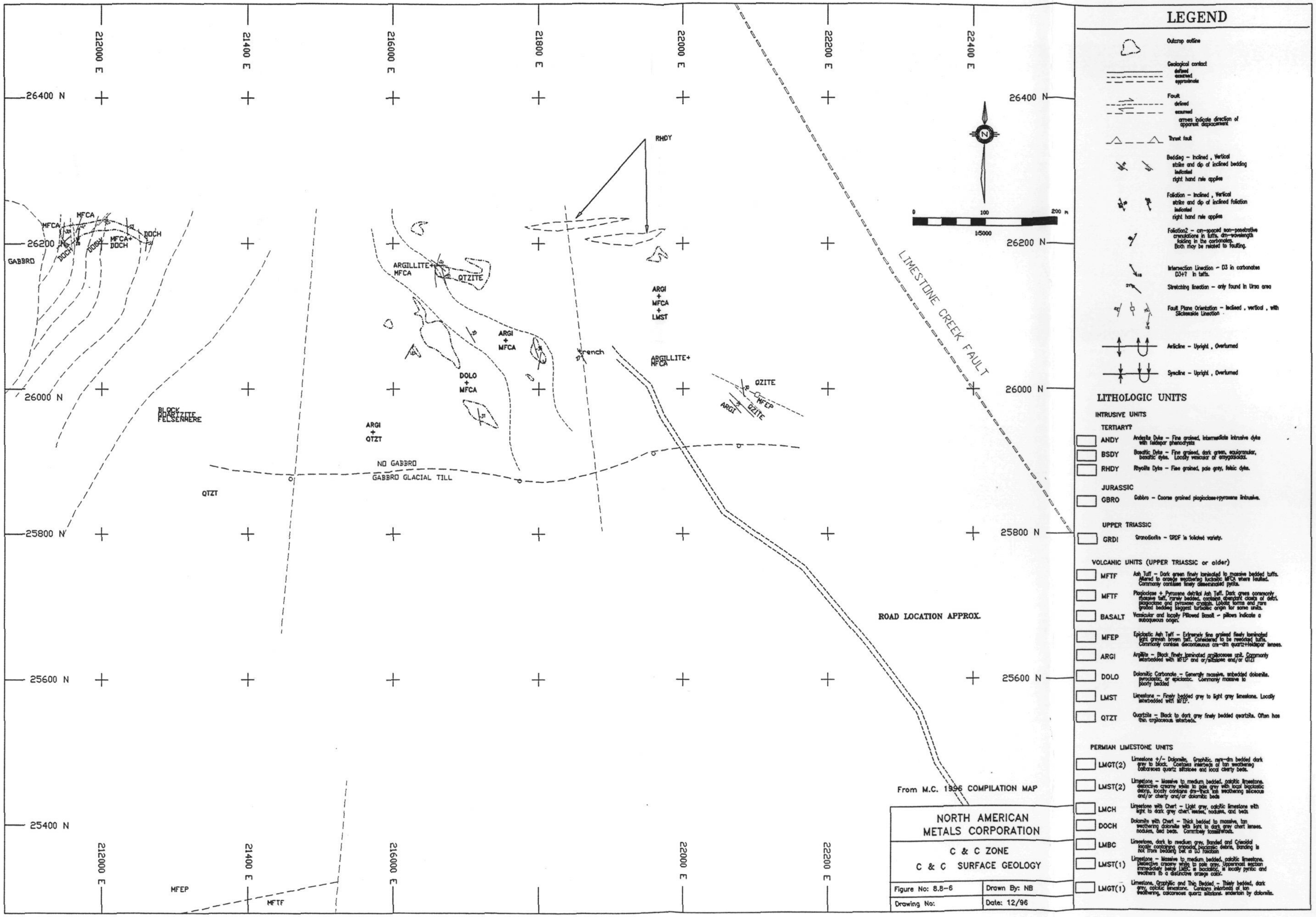

LEGEND
Outcrop outline
Geological contact defined assumed approximate
Fault defined assumed arrows indicate direction of apparent displacement
Thrust fault
Bedding - Inclined , Vertical
Foliation - Inclined , Vertical
Anticline - Upright , Overturned
Syncline - Upright , Overturned
LITHOLOGIC UNITS
INTRUSIVE UNITS
TERTIARY?
ANDY Andesite Dyke - Fine grained, intermediate intrusive dyke with feldspar phenocrysts
BSDY Basaltic Dyke - Fine grained, dark green, equigranular, basaltic dyke. Locally vesicular or amygdaloidal.
RHDY Rhyolite Dyke - Fine grained, pale grey, felsic dyke.
JURASSIC
GBRO Gabbro - Coarse grained plagioclase+pyroxene intrusive.
UPPER TRIASSIC
GRDI Granodiorite - GRDF is foliated variety.
VOLCANIC UNITS (UPPER TRIASSIC or older)
MFTF
MFTF
BASALT Vesicular and locally Pillowed Basalt - pillows indicate a subaqueous origin.
MFEP
ARGI
DOLO
LMST Limestone - Finely bedded grey to light grey limestone. Locally interbedded with MFEP.
QTZT Quartzite - Black to dark grey finely bedded quartzite. Often has thin argillaceous interbeds.
PERMIAN LIMESTONE UNITS
LMGT(2)
LMST(2)
LMCH
DOCH
LMBC
LMST(1)
LMGT(1)
212000 E
21400 E
216000 E
21800 E
22000 E
22200 E
22400 E
26400 N
26200 N
26000 N
25800 N
25600 N
25400 N
LIMESTONE CREEK FAULT
ROAD LOCATION APPROX.
NO GABBRO
GABBRO GLACIAL TILL
RHDY
ARGILLITE+ MFCA
QTZITE
ARGI + MFCA
DOLO + MFCA
ARGI + QTZT
QTZT
BLOCK QUARTZITE FELSENMERE
GABBRO
MFCA
DOCH
MFEP
MFTF
ARGI + MFCA + LMST
ARGILLITE+ MFCA
QZITE
Trench
1:5000
0 100 200 m
From M.C. 1996 COMPILATION MAP
NORTH AMERICAN METALS CORPORATION
C & C ZONE
C & C SURFACE GEOLOGY
Figure No: 8.8-6
Drawn By: NB
Drawing No:
Date: 12/96

Plate 8.8-1: View of C&C Zone from Limestone Creek (foreground) KN96TR53 at end of road, Gabbro ridge on left horizon and Sam Glacier on center horizon, trenching on Limestone FZ right centre

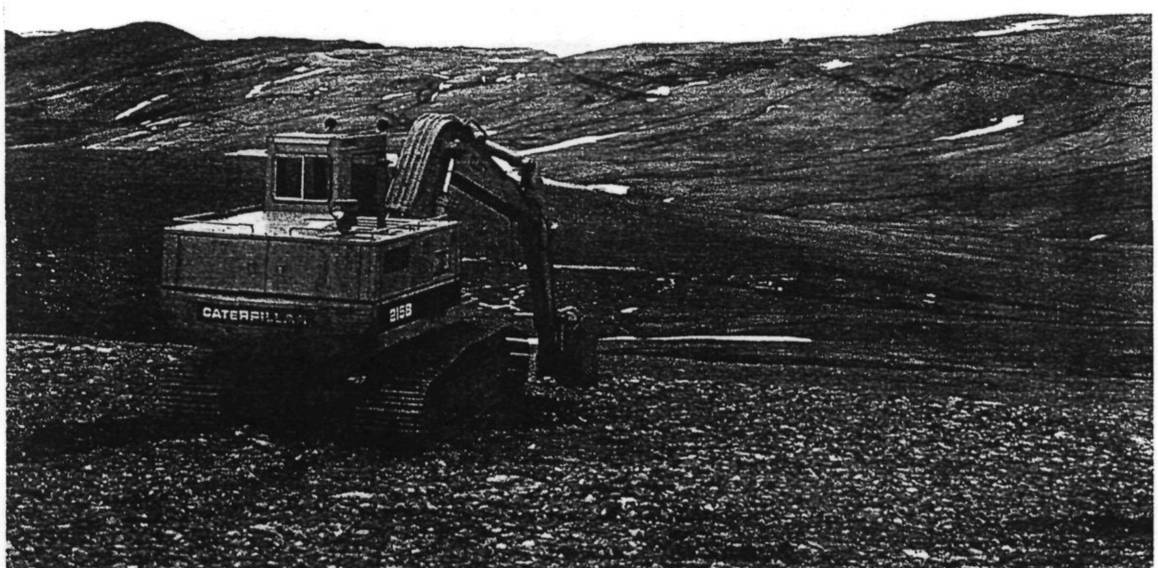


Plate 8.8-2:View westerly from KN96TR53 area looking down slope along boulder train to Limestone Creek Fault drilling (middle ground) and Kodiak A access (on horizon)

Plate 8.8-3: KN96TR53 Mineralized outcrop(foreground with trenching tools) 6 m.at 3.5 g/t Au

Plate 8.8-4: Diamond Drilling on the C&C T96DH359, Limestone Creek in middle ground
South and Ridge Zones on the left horizon

with a folded lithological contact.

The high grade lithology of the boulder train consists of grey and pink coloured quartzite unit exhibiting breccia and crackle textures. It often appears to be solution etched, vuggy and infilled with druse quartz. Petrographic investigation was carried out on a suite of progressively more etched, altered and mineralized hand samples. Two phases of quartz were recognized: one that forms a fine grained, weakly foliated rock that contains variably oxidized, extremely fine pyrite along or near foliation planes, and a later coarser grained quartz that is commonly comb-textured and vuggy. This second phase of quartz appears to be hydrothermal, although there appear to be no mineral associations with it.

8.8.7 CONCLUSIONS & RECOMMENDATIONS

Work in the area of the C & C Zone has identified two distinct mineralized lithologies, one insitu and the other in a float boulder train. The relationship between the two is uncertain.

The insitu mineralization, which appears to be associated with a northerly trending anticline, has returned low gold values over narrow widths. Continuity of the mineralized zone appears to be getting better at the south end of the trenched area, and the mineralized zone is open to the south. Additional trenching is required in this direction.

The source of the high grade mineralization encountered in the boulder train has not been established. The up slope terminus is abrupt, and cannot be tied to a specific ice advance or geomorphic feature. Bedrock encountered in adjacent trenches is a quartzite, but not the same quartzite unit that has acted as a host for the high grade mineralization. Quartzites that appear to be a more appropriate protolith outcrop roughly 700 metres upslope to the west, adjacent to the gabbro, however at that location they are unmineralized.

There is some geochemical evidence to suggest that this material could have been rafted by ice in a more or less north-south direction, placing the source under Sam Glacier. This idea should be tested by detailed till prospecting on the terminal moraine to the north and east of the C & C Zone. As this moraine represents the most recent ice advance it is possible that it contains mineralized material plucked from a bedrock source by ice flow at that time.

There is ground between the boulder train and Sam Glacier that has not yet been tested as a source for the mineralized boulders, however the problem remains of what direction the float actually came. Some geochemistry, as mentioned above, does suggest from an area due north of the dispersion train, but air photo interpretation of the area has indicated that there is a complex glacial history, and other vectors are possible. On top of this, frost heaving and solifluction features are often seen, further complicating the origin of overburden materials. To gain a clearer picture, and a better idea of the point of origin of the boulder train it is recommended that a geologist or prospector specializing in glacial terrane be hired to assist on a contract basis. In addition the area should be subject to deep till sampling. This could be accomplished by using an excavator to dig pits on a 50 by 50 metre grid, placed between the terminus of the boulder train and Sam Glacier.

8.9 LIMESTONE CREEK FAULT ZONE SUMMARY

8.9.1 INTRODUCTION

The Limestone Creek Fault (LCF) is a north - northwesterly trending fault which lies 2.0 km. west of the Ophir break (Figure 1). This fault separates Permian carbonates on the east from an interbedded volcanic, epiclastic and clastic package on the west and has a possible displacement of greater than one kilometre.

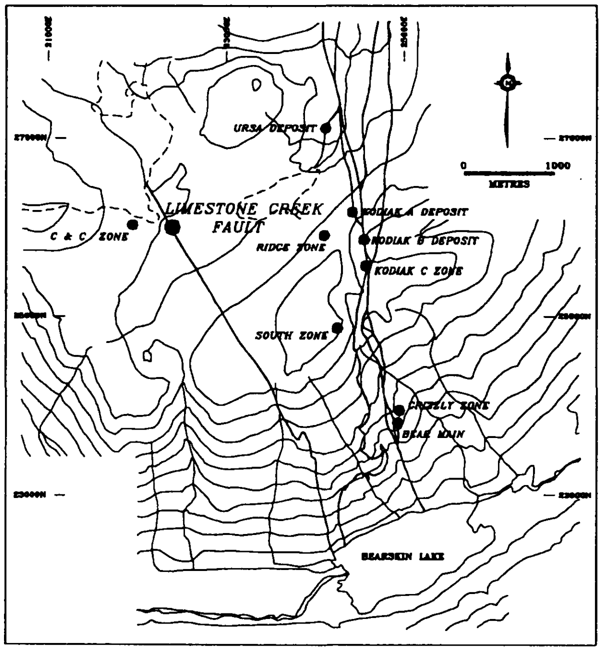


Figure 8.9-1: Location of Limestone Creek Fault Zone.

During the 1996 field season five NQ and HQ diamond drill holes, totalling 617.45m (2025.75ft), were drilled along the Limestone Creek Fault. The holes were drilled to test soil geochem (As, Sb, Hg) anomalies and a coincident HLEM conductor along the trace of the fault.

Results showed the Limestone Creek fault to be a near vertical structure separating Permian carbonates on the east side from a younger interbedded volcanic and quartzite package on the west side. Hole number T96DH356 intersected grade in the fault of 7.93g/t over 4.57m (intersection length). Holes 360 and 361 also intersected the fault 100m to the north and south respectively but returned no significant results. Two holes were drilled on section with 356 in an attempt to test below the grade returned in that hole but both holes 362 and 363 were lost before the planned target due to broken ground.

The Limestone Creek Fault places carbonates adjacent to volcanics. This setting has proved to be a good environment for gold mineralization elsewhere on the Golden Bear property. Further drilling along this fault is recommended to test along strike and at depth.

8.9.2 EXPLORATION HISTORY

The ground staked in 1982 by Chevron Canada Minerals Ltd. during the original staking over the Bear Main deposit. In the early eighties Chevron carried out extensive surface geological mapping in the Golden Bear area. The northwest corner of the area was mapped during this early work but no sampling was done and no additional work was done on the claim until 1994.

In 1994 North American Metals ran a soil geochemistry grid over the claim area and in 1995 this grid was extended and an HLEM geophysical survey was carried out in the area. Both gold and pathfinder element (most notably As, Sb, Hg) anomalies were found as a result of the soil sampling, in addition several HLEM conductors were noted. A large arsenic, antimony, mercury anomaly and an HLEM conductor are coincident with the surface trace of the Limestone Creek Fault and provided the target for the drilling discussed in this section.

8.9.3 GEOLOGY

The Limestone Creek Fault is a major structural contact which crosses the southwest corner of the claim. East of this fault is the Permian Limestone package, which was mapped in detail by Pigage (1994) and Cooley (1996). The Permian stratigraphy outlined below is from Cooley (1996).

LMGT (2)- Limestone +/- Dolomite, Graphitic and Thinly Bedded - graphitic, bedded dark grey to black. Contains interbeds of tan weathering calcareous quartz siltstone and local cherty beds.

LMST (2)- Limestone - massive to medium beded, calcitic limetone distinctive creamy white to pale grey with local bioclastic debris , locally contaims dm-thick tan wathering siliceous and or cherty and/or dolomitic beds.

LMCH- Limestone with Chert - light grey, clacitic limestone with light to dark grey chert lenses, nokules and beds.

DOCH- Dolomite with Chert - thick bedded to massive, tan weathering dolomite with light to dark grey chert lenses, nodules and beds. Commonly fossiliferous.

LMBC- Limestone Banded and Crinoidal - dark to medium grey, locally containing crinoidal bioclastic debris, banding is not from bedding but is D3 foliation.

LMST (1)- Limestone - massive to medium bedded, calcitic limestione. Distinctive ceamy white to pale grey. Uppermost section immediately below LMBC is bioclastic, is locally pyritic or weathers to a distinctive orange color.

LMGT (1)- Limestone Graphitic and Thinnly Bedded - mm-dm bedded dark grey, calcitic limestone. Contains interbeds of tan weathering, calcarous quartz siltstone.

On the west side of the fault is an interbedded volcanic, epiclastic and clastic package containing the following units (not in stratigraphic order).

QTZT- Quartzite - black to dark grey finely bedded quartzite. Often has thin argillaceous interbeds. Locally buff weathering.

PHYL- Phyllite - fine grained, dark, clastic sedimentary rock with secondary fine grained mica development forming a platy phyllitic texture and lustrous sheen. Typically intercalated with volcanic rocks which have been largely converted to greenstone and chlorite-amphibole schist. Primary bedding and textural features are preserved.

MFCA- Carbonate Altered Mafic Volcanics - basaltic flow, pyroclastic or epiclastic rock bleached medium brown to light grey or cream. Coloured by carbonatization. May contain pyrite.

MFEP- Epiclastic Ash Tuff - extremely fine grain finely laminated light greyish brown tuff. Considered to be reworked tuffs. Commonly contain discontinuous cm-dm qtz+feldspar lenses.

MFAS- Mafic Ash Tuff - basaltic pyroclastic rock comprised of at least 50% vitric and lithic clasts less than 2mm across. Variants include crystal tuff where at least some of the clastic components include crystal fragments. Rock may be well bedded to poorly bedded and is typically dark green.

MFLP- Mafic Lapilli Tuff - basaltic pyroclastic rock comprised of vitric and lithic clasts 2mm to 64mm across which occupy greater than 50% of the rock by volume. Rock may be massive or poorly bedded and is typically dark green.

The Limestone Creek Fault is a north - northwesterly trending, near vertical fault. Displacement along this fault is best seen in the cliffs to the south of the LCF 1996 drilling which descend into the minesite. Here, the DOCH unit is in contact with tuffs from approximately 1km up-section from the base of the tuff package indicating the west side is the down dropped side. Actual amount of displacement is unknown but may be greater than a kilometre (Cooley, 1996). Data from surface mapping and drill holes on this claim show a quartzite - volcanics interbedded package in fault contact with the dolomites. Surface exposure is sparse due to thick overburden.

8.9.4 1996 WORK PROGRAM

In the 1996 field season (May 30 to Oct 3) five NQ and HQ diamond drill holes, totalling 617.45m, were drilled along the Limestone Creek Fault. Three sections showing gold grades (greater than 0.10g/t) and down hole geology for all holes are included as Figures 8.9-2 to 8.9-4.

The collar location and orientation of each drill hole was surveyed using mine grid coordinates. Depth down the drill hole is measured from the top of the casing. Down hole deviations were measured using a Pajari instrument.

The drill core was logged for lithology, structure, assay, and geotechnical information at the exploration trailer at the minesite camp using custom field logging forms. All core was photographed prior to being split. The core is stored at the airstrip situated immediately west of the minesite camp. Requested intervals were split and assayed at the minesite assay lab for gold (see Appendix III for analytical procedures), one blank and one gram standard were inserted in every 40 samples to monitor for contamination in the lab.

8.9.5 RESULTS

Five diamond drill holes were drilled along the trace of the Limestone Creek Fault. Down hole geology and assay results are shown on three vertical sections (Figures 8.9-2 to 8.9-4) and results are summarized in Table 8.9-1. The Limestone Creek fault separates a DOCH and LMST unit on the east from a quartzite, volcanic, epiclastic package on the west. This interbedded package lies nearly horizontally based on correlation between the drill holes. Information gathered to date suggests the fault structure is widest on the middle section and narrows both to the north and south. In drill hole 356 we see a wide fractured and faulted zone within which is a narrower zone of mineralization.

The first hole drilled on this structure (T96DH356) intersected grade in the fault of 7.93g/t over 4.57m. This interval contained .91 metres of 24.82 g/t Au. Because of the extreme significance of finding Au in a new fault structure, the 24 g/t interval was re-assayed from reject as well as a second sample taken from the core box and a third sample was sent to Chemex Labs for fire assay. All three duplicates and re-assays reported between 24.8 to 26.7 g/t Au. Holes drilled to test the structure along strike 100 m to the north and south (360 and 361 respectively) intersected the fault but returned no significant gold values >.38 g/t. Two attempts were made to drill under the initial intersection on the same section. T96DH360 was targeted at 40 m below the intersection of 356 but poor ground conditions prevented the hole from reaching the fault. Hole number 363 was an attempt to reach the same target by drilling through the more competent carbonate unit to the east but poor ground adjacent to the main fault structure terminated this hole before it reached the targeted depth also.

Drill Hole #	Azimuth	Dip	Length (m)	Intersections	Comments
T96DH356	060.5°	-54.6°	128.20	7.93g/t over 4.57m	
T96DH360	052.8°	-44.1°	121.91	no significant intersections	
T96DH361	056.7°	-43.2°	114.33	no significant intersections	
T96DH362	055.7°	-54.0°	126.79	did not intersect fault	lost hole before target
T96DH363	237.6°	-54.0°	126.22	did not intersect fault	lost hole before target

Table 2: Limestone Creek Fault Diamond Drill Summary

8.9.6 CONCLUSIONS AND RECOMMENDATIONS

The discovery of gold in the Limestone Creek Fault has a very significant impact on the exploration potential of the Golden Bear Property. Firstly, the Limestone Creek Fault (LCF) is a mirror image of the Ophir Break Fault with a configuration of a horst structure. Central to the horst is the carbonate lens with down dropped volcanics flanking the east and west. As such, the LCF is a fault panel of size equivalent to the structure hosting the 6 known deposits at Golden Bear. The 3 successful holes drilled in 1996 are the first drill holes to intercept this structure.

The area is covered by glacial till ranging from 3 to 20 metres in depth with till increasing in depth to the north and east. The fault responds well to HLEM and is projected to the north and south geophysically. To the north the LCF was mapped by Cooley east of the Sam Glacier.

The mineralised intercept consisted of limestone/quartzite gouge in the low grade intercept with a carbonatised tan highly altered clay rich volcanic(?) rock hosting the 25 g/t intercept. No sulphides were visible in the mineralised zone.

Further drilling is required in the area adjacent to the known mineralization with recommended stepouts of 40 metres in the north, south and down dip directions. A large diamond drill (56 or Val 'd Or) should be used with HW casing being used as far as possible to alleviate problems with overburden collapse on the rods. The zone is faulted and fractured on both the hanging wall and footwall, a good indication for a dilatancy zone and subsequent gold mineralization, but also requiring maximum horsepower to drill.

As the LCF is covered by overburden and geophysics and geochemistry is completed, the only remaining tool to use is the diamond drill. Three holes totalling 450 metres is a minimum to test the zone. Additional holes would be beneficial but the fault will have to be drilled on a grid pattern to be tested.

Surface geochemistry indicates that their may by a slight As, Hg signature to the LCF with the intensity increasing to the north. This is a faint signature and may be the result of glacial dispersion from Sam Glacier.

Down hole ICP - 32 geochemistry was performed on the T96DH356 hole to search for associated pathfinder elements. Elements that are altered by the presence of Au are:

Element	Average	Anomalous Range	Location
As	4-244	300-700	Zone
Cr	+/- 180	30-50	Zone
Co	<1	17	Zone
K%	<.01	.13	Zone
La	<10	10-20	Zone
Mn	40-80	290-660	Zone
P	60-880	2610	Zone
Hg	<1	<1	DDH
Sb	2-26	138-1135	west wall

Table 9.8-2 : Summary of Limestone Creek Fault Drill Hole Geochemistry

Further drilling should submit every other interval for ICP-32 analysis to determine if a path finder can be utilised as a vector to mineralization.

8.10 WEST PROJECT - COMPILATION

The West Project encompasses all exploration work carried out on the Golden Bear property from May 1994 to the present. The program was initiated in 1994 after the discovery of the Kodiak A deposit indicated that gold mineralization could be entirely carbonate hosted. This opened up a large portion of the property that is underlain by the Permian carbonate but had seen little or no exploration activity. The area lies to the west of the Ophir Break, which had previously been the focus of exploration efforts.

Work carried out over the course of the project to date includes geological mapping, a HLEM survey, a soil geochemistry survey, prospecting, trenching, and reverse circulation and diamond drilling. The mapping, geophysics and geochemistry are reported in sections 3.0, 5.0 and 6.0 respectively. Zone specific information is reported in section 8.0.

The purpose of this section is to present summary maps showing the location of prospecting rock samples, trenches and drill holes. This information is shown at 1:5000 scale on Figures 8.10-1, 8.10-2 and 8.10-3 respectively.

8.10.1 WEST PROJECT DATA

Computerized West Project data is located in the following PCXplor databases:

G:\PXDBGB - Exploration Drillholes and Trenches
G:\PXDBTM - Totem/Kodiak North Soils/Rocks

All West Project drawing, spreadsheet and document files are located on NAMC's network server under G:\data\westproj.

8.11 EAST LOW GRADE STOCKPILE

The East Low Grade Stockpile lies adjacent to the Bear Main Open Pit and consists of waste materials removed from the open pit during production (Figure 8.11-1). The East Low grade Stockpile project was conducted to assess these dumped materials for gold grade, tonnage and heap leachability. Studies conducted in 1994 determined the stockpile to be of economic interest for a low grade, bulk tonnage mining operation. Total volume of waste materials is estimated at 2.47 million tonnes (Smallwood, 1994a).

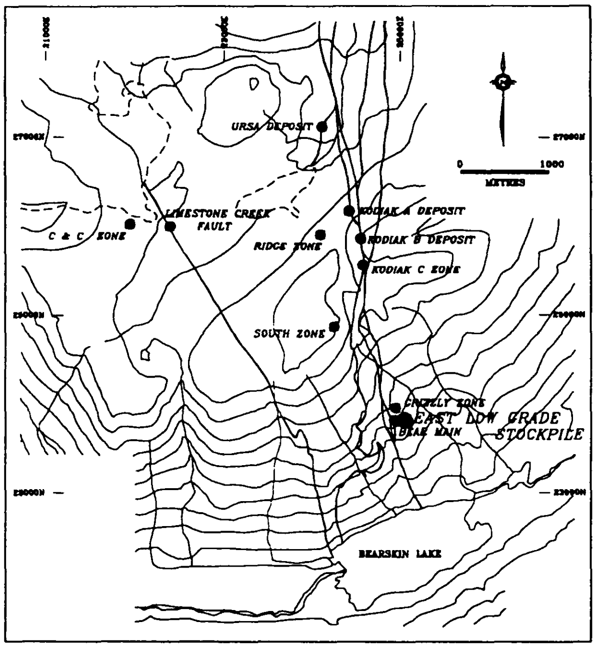


Figure 8.11-1: Location of the East Low Grade Stockpile

The 1996 program included 1706.5 metres of sectional reverse circulation drilling. Sixty- one holes were drilled on 17 sections spaced at 10 and 20 metres apart. 113 metres of trenching were done, both channel samples and a bulk sample were collected. A screen test was run on the bulk sample. Reserves were estimated for the portion of the waste materials directly tested by drilling. Reserves for both probable and possible categories, based on the 1996 drilling, consist of 242 775 tonnes at 1.61 g/t gold.

8.11.1 PREVIOUS WORK

Previous work included an attempt at estimating grade and distribution in the stockpile using production records. These records are limited and zero grade was assigned to unknown blocks therefore producing a conservative estimate (Smallwood, 1994a). In 1994 a trench sampling program was run to sample the surface of the stockpile and estimate reserves from this data.

This previous trenching data is located in an ELGS summary report (Smallwood, 1994b). Due to difficulty with the survey control the 1994 trenching data could not be compared with the 1996 drill holes and as a result another trenching program was carried out in 1996.

A column leach test was run on ELGS material by McClelland Laboratories of Sparks, Nevada in 1995. Seventy-three percent gold recovery was achieved after 183 days of leaching. McClelland also ran a head screen analysis which showed that only 3.4% of the gold occurs in the +50mm size fraction and 31.4% occurs in the fines (-147μm). These results are summarized in McClelland (1995).

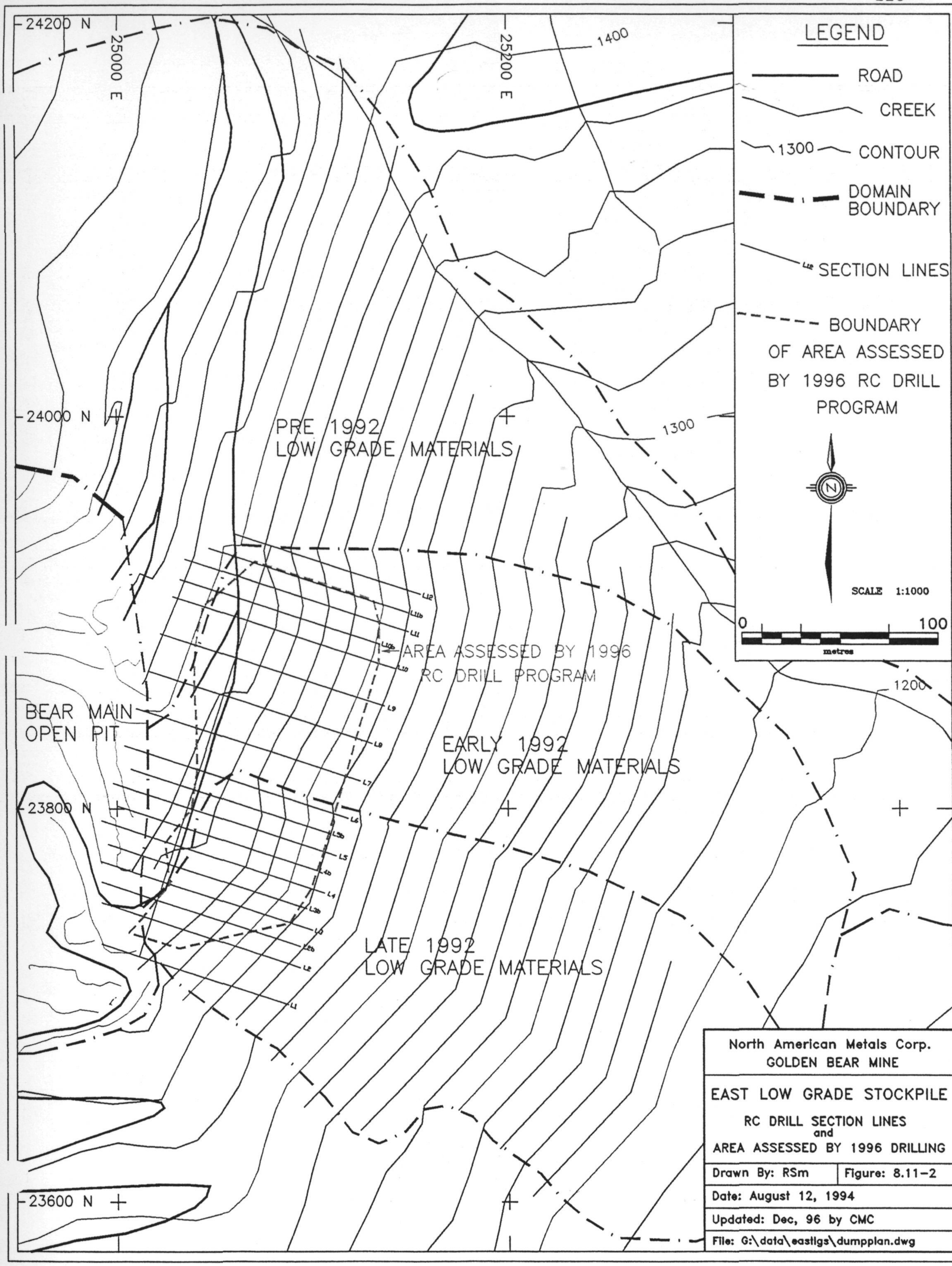
8.11.2 1996 WORK PROGRAM

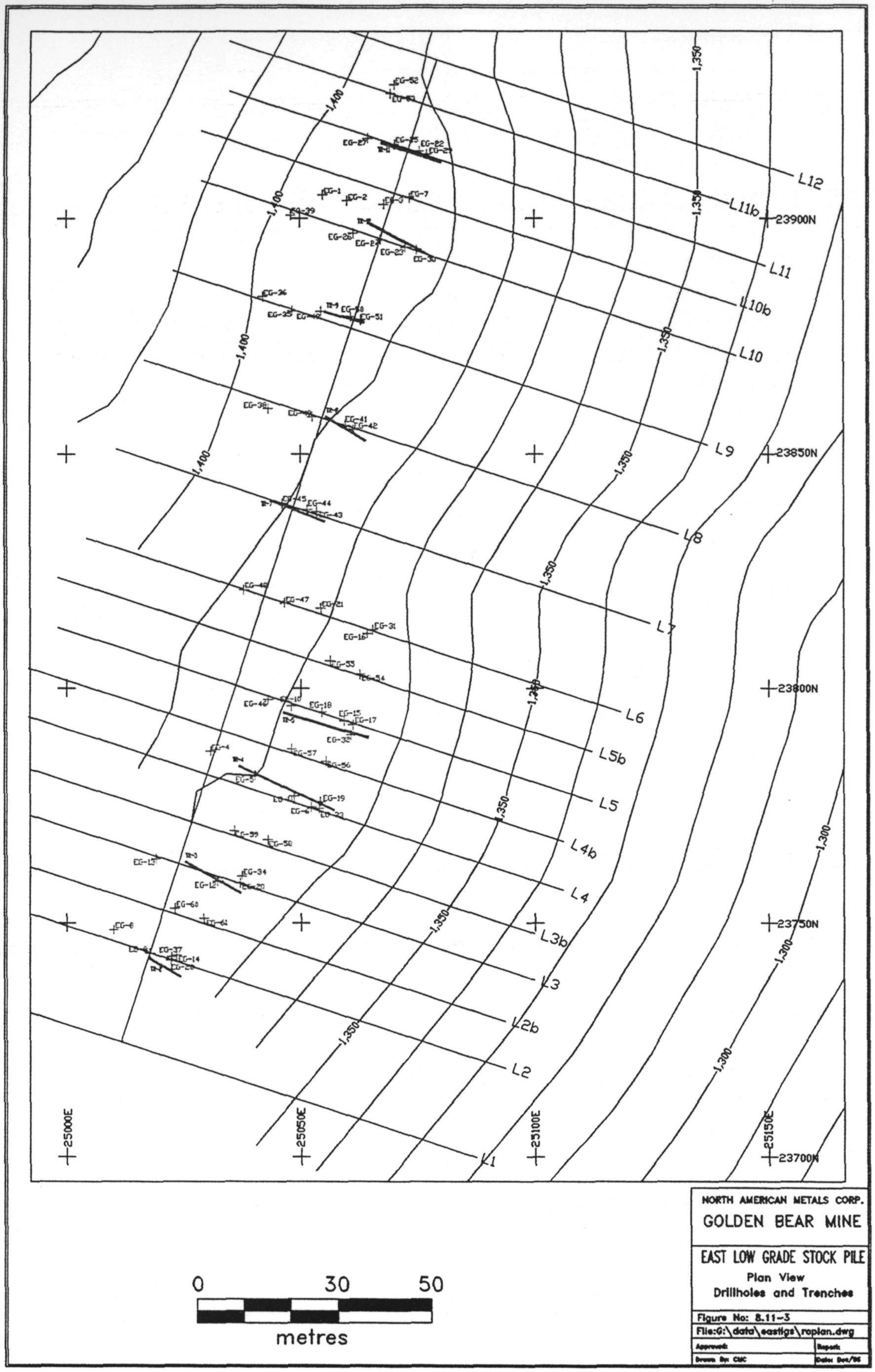
During the 1996 field season, work included 1706.5 metres of reverse circulation drilling, 113 metres of trenching and a bulk sample screen test. Figure 8.11-2 shows the location of this drill and trenching program on the East Low Grade Stockpile and Figure 8.11-3 is a detailed plan view showing the section lines and the location of the drill holes and trenches. The bulk sample was collected with the backhoe from these trenches. Figures 8.11-10 to 8.11-24 are vertical sections showing drill hole and trench trace and gold grade.

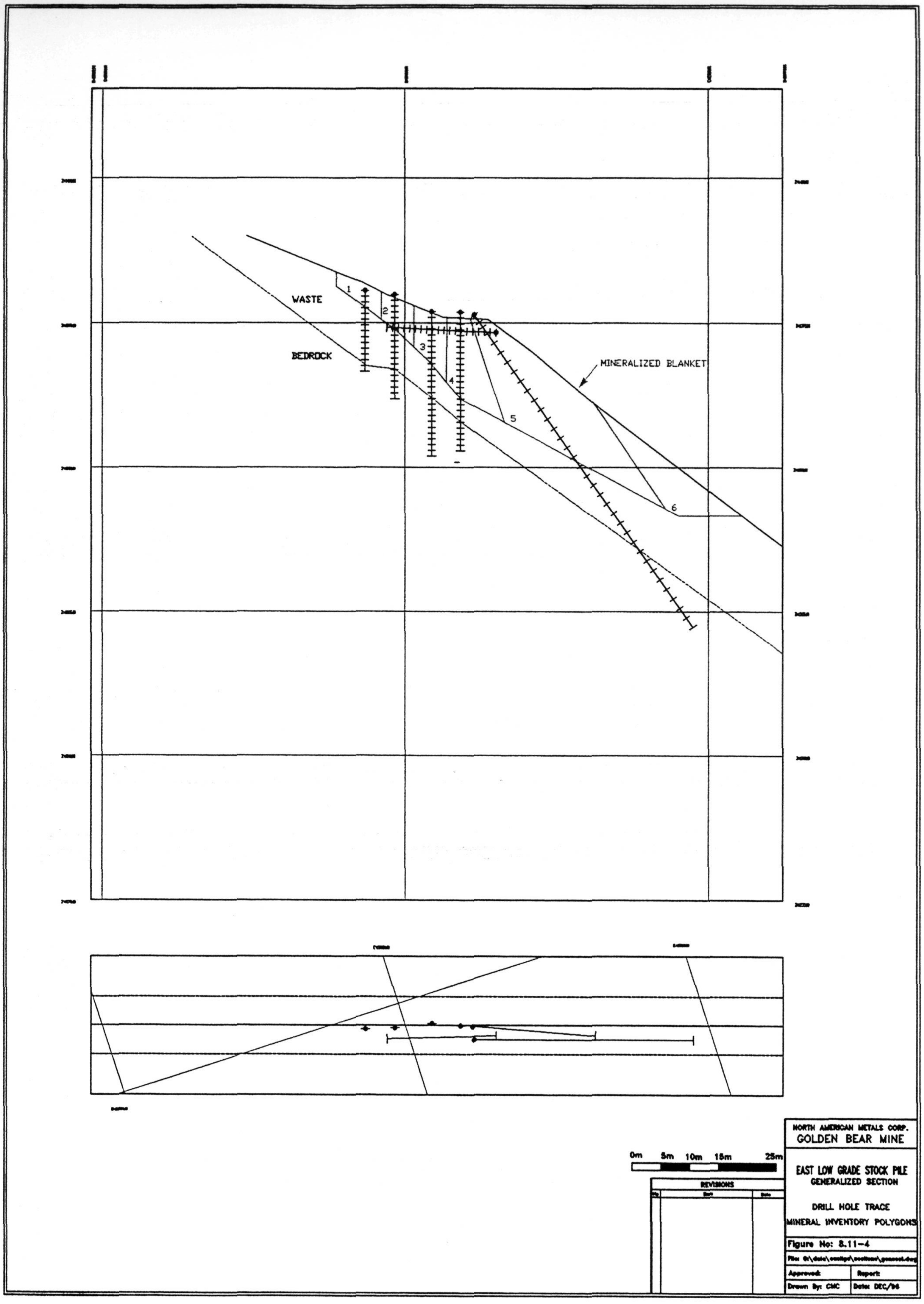
8.11.3 REVERSE CIRCULATION DRILL PROGRAM

The drilling was done on twelve section lines laid out at 108° (perpendicular to the face of the stockpile) and 20m apart. Due to the geometry of the stockpile and the size of the RC drill rig, holes were only drilled on ten of these sections, sections 2 - 11. After the initial drilling was completed additional sections were added in between existing sections at the southwest end of the stockpile creating ten meter section spacing at this end. An additional section, 11b, was added 10m north of section eleven. The angled hole on this section was drilled perpendicular to the section orientations in order to test the dump materials to the Northeast. As a result of this drill hole orientation the data on this hole was not included in the reserve assessment.

On the main sections, drilling consisted of three or four vertical holes and one angled hole drilled at -55 . The intermediate sections 2b, 3b, 4b, and 5b consist of only two vertical holes each. The holes were drilled to bedrock where possible. A generalized section is presented in Figure 8.11-4. The angled holes were consistently losing air pressure and therefore losing all sample recovery before the bedrock was reached. It was decided to tricone the lower part of these holes to reach the target depth. Several of the original angled holes were twinned with triconed holes to ensure comparable results. The following table (Table 8.11-1) summarizes these results.


LEGEND
ROAD
CREEK
1300 CONTOUR
DOMAIN BOUNDARY
SECTION LINES
BOUNDARY OF AREA ASSESSED BY 1996 RC DRILL PROGRAM
N
SCALE 1:1000
0
100
metres
24200 N
25000 E
25200 E
1400
24000 N
1300
1200
23800 N
23600 N
PRE 1992 LOW GRADE MATERIALS
AREA ASSESSED BY 1996 RC DRILL PROGRAM
BEAR MAIN OPEN PIT
EARLY 1992 LOW GRADE MATERIALS
LATE 1992 LOW GRADE MATERIALS
L12
L11b
L11
L10b
L10
L9
L8
L7
L6
L5b
L5
L4b
L4
L3b
L3
L2b
L2
L1
North American Metals Corp.
GOLDEN BEAR MINE
EAST LOW GRADE STOCKPILE
RC DRILL SECTION LINES and AREA ASSESSED BY 1996 DRILLING
Drawn By: RSm
Figure: 8.11-2
Date: August 12, 1994
Updated: Dec, 96 by CMC
File: G:\data\eastlgs\dumpplan.dwg


NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
Plan View
Drillholes and Trenches
Figure No: 8.11-3
File:G:\data\eastlgs\roplan.dwg
Approved:
Report:
Drawn By: CMC
Date: Dec/96
0
30
50
metres
L1
L2
L2b
L3
L3b
L4
L4b
L5
L5b
L6
L7
L8
L9
L10
L10b
L11
L11b
L12
23900N
23850N
23800N
23750N
23700N
25000E
25050E
25100E
25150E
1,400
1,350
1,300



WASTE
BEDROCK
MINERALIZED BLANKET
1
2
3
4
5
6
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
GENERALIZED SECTION
DRILL HOLE TRACE
MINERAL INVENTORY POLYGONS
Figure No: 8.11-4
Approved:
Report:
Drawn By: CMC
Date: DEC/96

Section	Drill Hole Number	Drill Hole Type	Average Au (g/t) over length of hole
Section 2	EG-28	Odex	0.65
Section 2	EG-37	Tricone	0.66
Section 3	EG-20	Odex	1.62
Section 3	EG-34	Tricone	1.35
Section 4	EG-19	Odex	1.63
Section 4	EG-33	Tricone	1.77
Section 5	EG-17	Odex	1.99
Section 5	EG-32	Tricone	2.46

Table 8.11-1: Twinned holes, Odex vs Tricone

These results show that there is some variability between the twinned holes but no definite pattern emerges. No bias appears to exist which indicates that either drilling method yields consistently higher grades. The duplicate samples taken during this program demonstrate that there is some type of nugget effect which is discussed in detail in section 8.11.4. The variance between the twinned holes is likely an effect of this gold distribution.

One metre samples were taken from the vertical holes and two metre samples from the angled holes. The samples were collected at the drill and split down at the minesite using a Jones splitter. Details on the sample preparation procedure are outlined in Section 8.11.4. Assays are presented on Figures 8.11-10 to 8.11-24. These sections also show the ore polygons which outline a blanket of mineralized material (Figure 8.11-4) Consistent grade seems to be confined to this blanket of material which averages 10-15 m thick and only rarely extends right through the dump to the original bedrock surface. Section 8.11.3 outlines the present reserve estimate.

8.11.4 1996 TRENCHING PROGRAM

The trenching was done subsequent to drilling. The trenches were dug with a backhoe parallel to section lines on sections 2 - 5 and 7 - 11. No trenches were dug on the intermediate sections (2b, 3b, 4b, 5b). One metre continuous chip samples were collected from the trenches. The material removed from the trenches as they were being dug was collected as a bulk sample. The treatment of this bulk sample is discussed in section 8.11.2.3.

The trenching was done to examine the relationship between the surface gold distribution and the downhole gold distribution. Examination of a washout gully on the dump surface showed the dump to be stratified as would be expected from its method of formation (Smallwood, 1994). Comparison of the 1996 trenches with the drill holes did not show any obvious stratification of gold grades but did correlate well with the blanket of mineralized material outlined by the drilling.

It was expected that the trench gold values may have been inflated due to selective sampling of -2 inch material in the trench samples. Therefore trench values were compared with the values at the tops of the drill holes which intersected the trenches. Results from these two data sets, summarized in Table 8.11-2, do not support this theory. Although gold values vary between drill holes and the trenches they crosscut the drill holes are neither consistently higher nor lower than the trench values. The overall averages of the two sets of data are nearly identical, 1.48g/t for trenches and 1.44 g/t for the intersecting part of the drill holes.

SECTION	TRENCH AVERAGE	DRILL HOLE AVERAGE*
2	1.59	1.43
3	1.46	1.54
4	1.87	1.34
5	2.23	2.19
7	1.41	1.68
8	1.24	0.82
9	0.88	0.88
10	0.93	1.47
11	0.94	0.90
overall average	1.48	1.44

*average value for drill hole samples taken in the region of trenching (upper 3-4m of drill holes)

Table 8.11-2: Comparison of Trench and Drillhole assay values in g/t.*

<u>8.11.5 1996 SCREEN TEST</u>

Following the 1996 drilling program, sufficient grade and tonnage of the ELGS was outlined to warrant a screening test of the material to see if gold resided primarily in the -2" fraction. Tail screen analysis from the ELGS run of mine column test indicated that the +3/4" (19mm) fraction contained only 9.7 of the total contained gold. As such two screen tests were planned; one for a -2" screen size and a subsequent screen test of -3/4" material. It was hoped that the removal of the +2" fraction would greatly reduce the volume to be transported and also reduce the size of the pad while enhancing the grade.

Material was collected from the top of the waste dump by excavator and trucked to a level open area at the garbage dump. The site was chosen to eliminate any possibility of contamination from underlying materials. The material was collected on 20 meter sections which corresponded to the sectional RC drilling. The excavation was generally greater than 2 meters in depth to avoid any "mixing" that might occur from road construction on top of the dump. The trenches were surveyed and sampled on a 1 meter increment parallel to the section lines.

Screening was done on a Barber-Green vibrating screening plant with a 4' x 8' shaking table. Run of mine material contained a high clay content and was wet. As such, it tended to plug up the 2" screen and the screen had to be steepened to allow the coarser material to "bounce" it's way down the screen. This bouncing action assisted the vibration and allowed the -2" material to pass the screen. During the warm part of the day the screen passed material well. In the mornings when the screen and material were cold, the screening plant would plug within 15 to 20 minutes. After the -2" material was processed, it was attempted to rerun the -2" material with the 2" screen. It was found that without the boulders to "bounce" on the screen, the -2" fraction would form into baseball sized balls of clay and roll off of the screen. Less than 50% of the material passed through the screen during this second pass through the plant at a 2" screen size. From these results it was determined that testing the -3/4" fraction was futile.

Results indicated that the -2" material averaged 1.53 g/t Au; almost exactly the same as the combined trench assays of 1.56 g/t Au. This indicated the trench assays may have had a -2" sampling bias as with the removal of the >2" fraction, no noticeable grade enhancement occurred. As an after thought, this seems reasonable as the trenches were dug a the top of the dump where the particle size will be mechanically sorted towards the fine fraction as well as a natural tendency by the sampler to not sample the big boulders that have to be chipped.

Prior to screening the area was topographically surveyed before the material was dumped due to the unavailability of a bulldozer to level to ground to grade. Thirty two dump truck loads were brought down from 10 trenches on the waste dump. The truck loads were loaded proportional to the length of the trench; i.e. if the trench was 10 meters long, 3 truckloads were taken; if the trench was 20 meters long, 6 truck loads were taken. This was an attempt to keep a weighted average of the waste dump distribution in the bulk sample. When the trucking was completed, the pile was pushed together with a loader and the top of the pile was levelled off. Again, the pile was surveyed on the ground position and on the top. These two surveys allowed for a kriged volume calculation utilising the computer program Surfer 6.0 by volume calculating between the two grided survey planes.

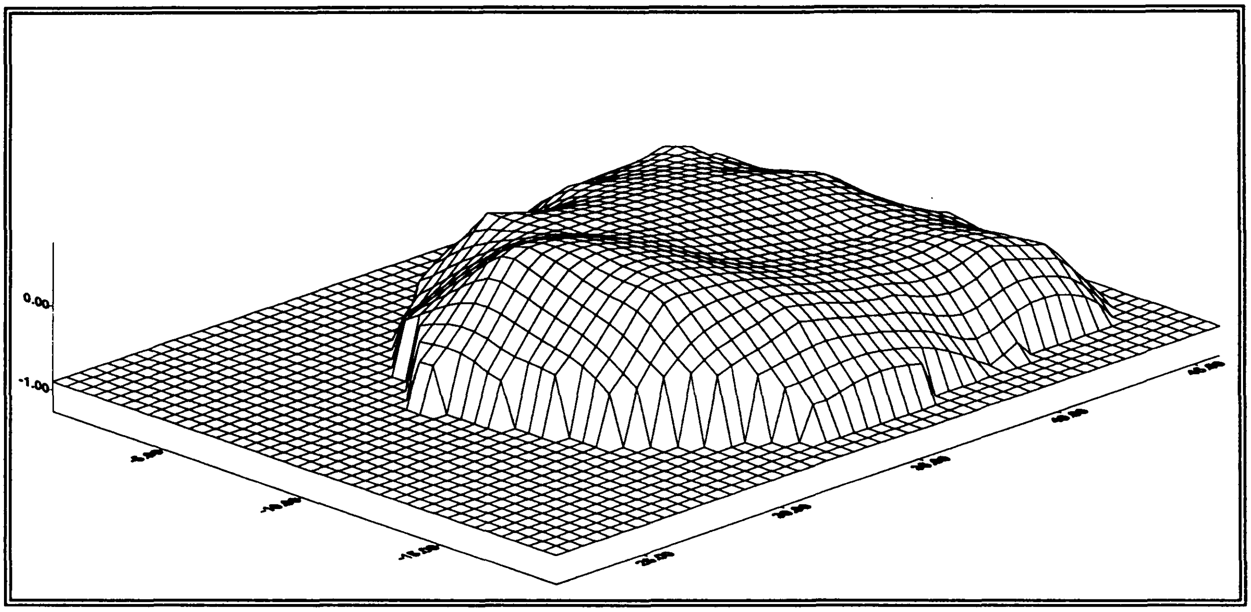


Figure 8.11-5: Bulk sample surveyed topography after dumping

After screening, both the cone of -2" material created by the conveyor belt and the oversize(+2") cone were surveyed to determine volume. The following table describes the volumes surveyed:

Surveyed total volume	175.2 cubic metres	100% of Total
Surveyed Cone - 2" material	103.2 cubic metres	59%
Surveyed Cone - +2" material	39.9 cubic metres	23%
Lost material on ground and through processing	32.1 cubic metres	18%

Table 8.11-3 : Screen Test Volumes

If the ratio of the+2' and -2" cones are taken as the total volume of material processed, the distribution is as follows:

Total of 2 Cones	143.1 cubic meters	100% of Total
Surveyed Cone - 2" material	103.2 cubic meters	72.1 %
Surveyed Cone - +2" material	39.9 cubic meters	27.8 %
Ratio of +2" to -2" material	39.9/103.2	1:2.6

Table 8.11-4: Screen Test Size Fraction Distribution.

Due to the uneven ground and sampling method, the ratio of the final product processed above is probably the best to use in determining the ratio of volume lost by screening. This percentage (27.8%) may be down graded a bit if a more efficient method of screening is performed.

Sampling for gold was completed by bulldozing the -2" cone to a one meter height and sampling in a H pattern over the flattened area.

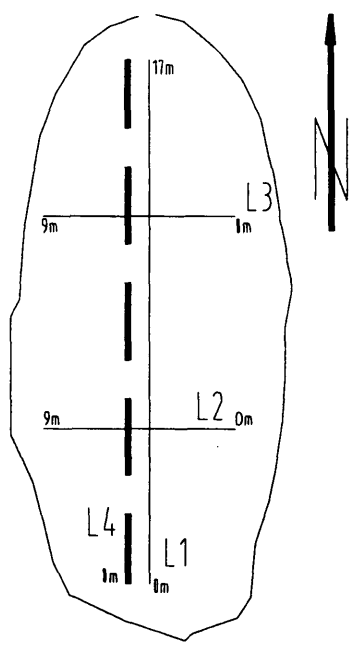


Figure 8.11-6: Screen Test Sample lines taken on -2" material.

Samples taken on the -2" material are outlined above with L1 to L3 taken from the top of the pile in an "H" pattern. L4 was a set of samples taken from the same pile after a trench was cut with a bulldozer. Below are the statistical values for those samples (sum L1 - L4).

Sample Size:	49	Minimum:	0.89
Number Missing:	0	Maximum:	2.5
Sum:	75.01	Range:	1.61
Sum of Squares:	121.9955	Semi-Inner Qt. Range:	0.265
Mean:	1.53082	Median:	1.41
Lower 99% C.I.:	1.38233	5th Percentile:	0.96
Lower 95% C.I.:	1.41962	10th Percentile:	1.1
Upper 95% C.I.:	1.64201	25th Percentile:	1.27
Upper 99% C.I.:	1.67931	75th Percentile:	1.8
Adj. Sum Squares:	7.16897	90th Percentile:	2.06
Harmonic Mean:	1.44349	95th Percentile:	2.385
Variance:	0.14935	Standard Error:	0.05521
Standard Deviation:	0.38646	t-Value (Mean=0):	27.72767
Coef. of Variation:	0.25246	Mean Abs. Dev:	0.31246
Skewness:	0.74214	Kurtosis:	0.03945

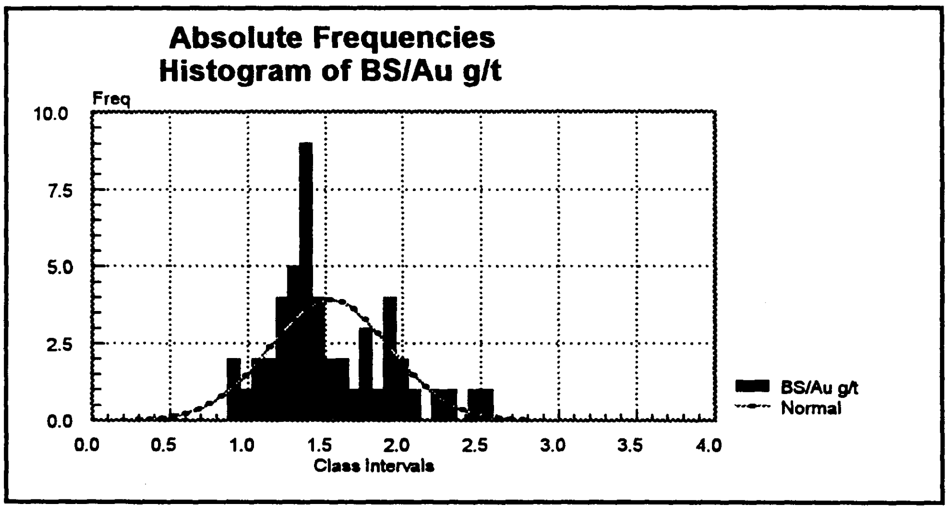


Figure 8.11-7: Bulk Sample Au Frequency Distribution -Normal.

Frequency distribution exhibits a minor bimodal population distribution with a second population in the 1.7 to 2.2 g/t level. Plotting the same data on a logarithmic scale produces the same population distribution:

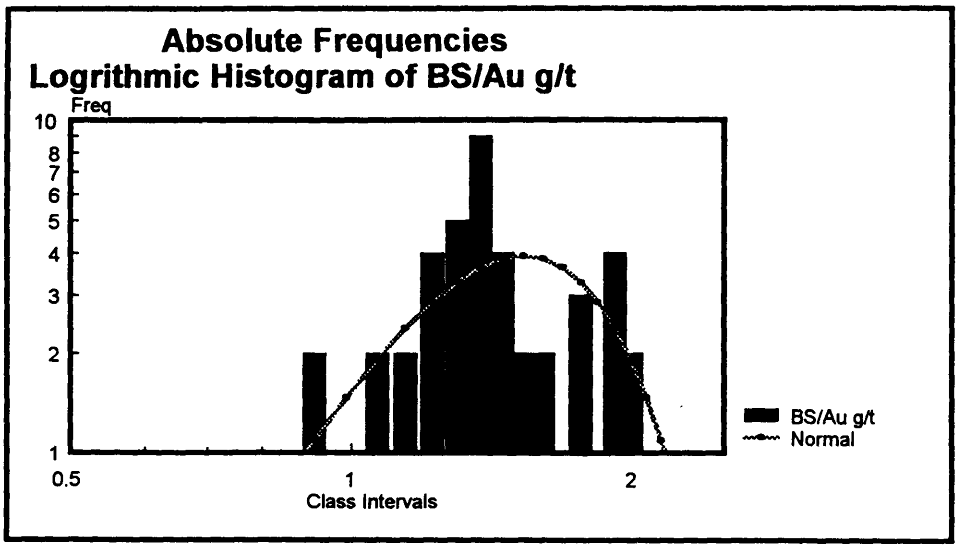


Figure 8.11-8: Bulk Sample Au Frequency Distribution - Logarithmic .

Several conclusions can be drawn from the bulk sample test:

i. The grade is not enhanced from trenching by the screening of the -2" material even though 27% of the >2" fragments which should not be leach able by cyanide were removed. This indicates that either the +2" fraction contains Au or the sampling of the trenches is strongly biased to the -2" fraction size. Proof of the presence of Au in the +2" fraction can be gained by analysis of a 1.5 tonne sample currently stored in Dease Lake.

ii. Screening of fractions < 2" will be difficult unless special screening methods are used. It will require a plant capable of handling high clay and moisture contents.

iii. Bulk Sample assay values exhibit a minor bimodal population distribution in both normal and logarithmic values. The reason for this is unknown. The screening did blend the sample sufficiently to remove any high values (>3 g/t Au) witnessed in the trench sampling.

From (m)	To (m)	L1	L2	L3	L4
0	1	0.99	1.75	1.41	1.37
1	2	1.47	1.44	1.99	1.27
2	3	1.78	1.92	1.17	0.89
3	4	1.23	1.82	1.58	1.37
4	5	1.2	2.19	1.1	2.06
5	6	1.23	1.92	1.68	1.51
6	7	1.37	1.41	1.27	1.06
7	8	1.78	1.51	1.47	1.37
8	9	2.3	1.3	1.44	0.93
9	10	2.5	End	End	1.27
10	11	1.13			1.23
11	12	1.95			1.27
12	13	1.61			1.99
13	14	1.41			End
14	15	1.34			
15	16	2.47			
16	17	1.92			
		End			

Table 8.11-5: Sample Assays from -2" Screened Material

8.11.6 RESERVES

Reserves have been calculated for the ELGS by McPhee (1996), based on reverse circulation drill results. The following parameters were used:

-A cutoff grade of 0.75 grams per tonne

-High grade assays were cut to 4 grams per tonne. This value is derived from of the mean plus two standard deviations, the 95th percentile and the tail of the histogram are all equal.

-A bulk density of 1.53 tonnes per metre cubed. This is the bulk density for loose material reported by Process Research Assoc. Ltd of Vancouver, B.C.

Categories were assigned to polygons as follows:

-Probable

-drill intersection in this polygon.

-ten metre influence, or half the distance to adjacent holes. Five metre influence up slope from uppermost hole on section.

-Possible

-no drill hole in this polygon.

-based on extrapolation down slope from lowest drill hole.

For possible polygons on sections with an angled hole, the grade of the polygon containing that hole was used. For intermediate sections the grade for the possible polygons is the weighted average of the values for the angled holes on adjacent sections. The down slope termination of the defined polygons is based on lack of data. Data from the angled holes was extended to a maximum of twenty metres down slope.

Details for the reserve calculation are summarized on a spread sheet in Appendix A, both cut and uncut values are presented. Drill sections with drill hole trace, location of bedrock and gold grades are contained in map pockets. Internal dilution was included in some polygons for continuity of the ore block.

8.11.7 METALLURGY

A pilot column percolation leach test was run by McClelland Laboratories on East Low Grade Stockpile material in 1995. The test was conducted on run-of-mine materials and a gold recovery of 73.2% was achieved after 183 days of leaching (McClelland, 1995)

8.11.8 QUALITY CONTROL

During the ELGS drill program, one blank and one gram standard were included in every twenty samples. Every sample grading more than 0.75 g/t was duplicated from reject material and one in five samples grading over 0.75 g/t were sent to Chemex for an external check. The following graph contains only internal data. External check data is summarized in the following table.

Table 8.11-6: External Check Data For ELGS Samples

Golden Bear (original, fire assay)		Chemex (duplicate, AA)	
Sample Number	Gold (g/t)	Sample Number	Gold (g/t)
33801	1.06	36150	1.20
33826	1.78	36151	2.55
33845	1.75	36152	1.65
33902	1.75	36153	1.90
33963	0.75	36154	1.00
33990	3.84	36155	7.50
34002	0.99	36156	1.65

Golden Bear (original, fire assay)		Chemex (duplicate, AA)	
Sample Number	Gold (g/t)	Sample Number	Gold (g/t)
34012	2.67	36157	1.25
34051	1.41	36158	2.05
34066	1.27	36159	1.4
36930	3.29	36161	3.10
36944	0.75	36163	1.00
36969	1.71	36164	2.10
37002	0.86	36165	1.20
37075	0.93	36166	1.05
37133	1.06	36169	1.10
37170	1.03	36170	0.31
35908	2.54	36171	3.20
35925	0.82	36172	1.00
35986	5.76	36173	7.80
35997	1.95	36174	1.90
Average:	1.81	Average:	2.19
Percent Difference:		17%	

Chemex results were higher than golden bear for 76% of the samples. Chemex also had an average value 17% higher than Golden Bear's. This may be due in part to the use of AA verses fire assay for gold. In the round robin analysis conducted for the standards Chemex had a lower average value than Golden Bear. Details of this round robin analysis are contained in section 6.3.

In holes EG-1 to EG-7, every sample was duplicated. From this information we noticed considerable scatter appeared for values grading 0.75 or higher. After experimenting with several methods we determined that this scatter was effectively reduced by pulverizing the samples twice (doubling the pulverizing time did not have the same effect), or by crushing to one tenth inch before splitting and pulverizing once. Each of these processes seemed to effectively free up the gold and gave reasonably repeatable results. The gold assay values in ore from the Bear Main deposit were nuggety and a similar case in this low grade stockpile was to be expected.

All samples from hole EG-8 to EG-61 were crushed to one tenth inch, split using the Jones splitter and then pulverized in a ring mill for 60 seconds. Every sample in holes EG-8 and EG-9 was duplicated and in holes EG-10 to EG-61 every sample grading over 0.75g/t was duplicated. It is the data from holes EG-8 to EG-61 that is summarized in the following graph.

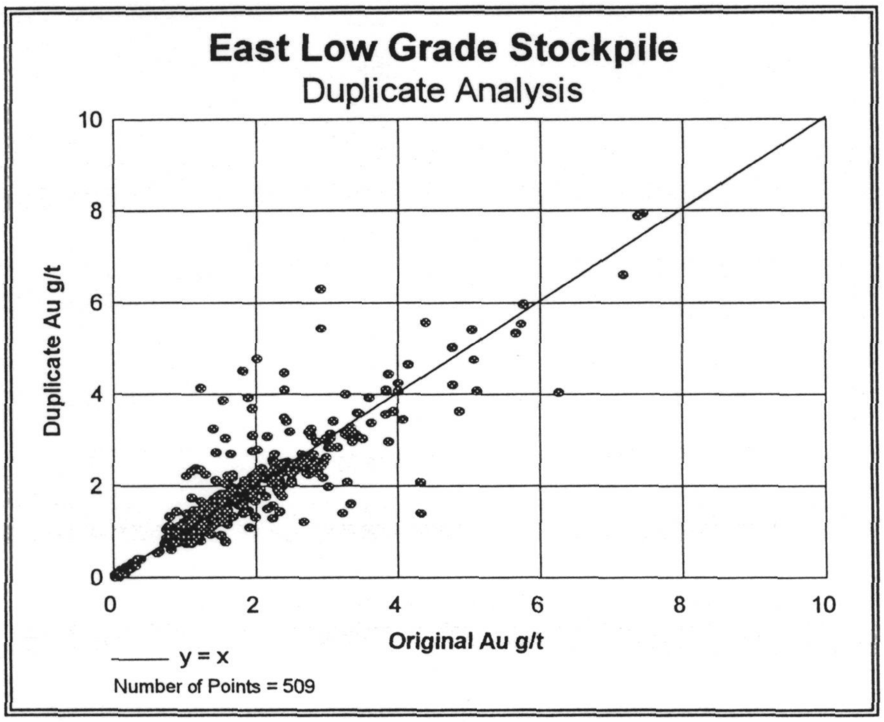


Figure 8.11-9: East Low Grade Stockpile Duplicates

A two-tailed, paired sample T-test was run to test the null hypothesis that the difference between the two sets of data, original and duplicate gold values, was equal to zero.

HO: $\mu d = 0$

HA: $\mu d \neq 0$

$n = 509$ $v = 508$ $\bar{d} = -0.033$ $S_d = 0.528$ $S_{\bar{d}} = 0.0234$

$t = \bar{d}/S_{\bar{d}} = -0.033/0.0234 = -1.41$

$t_{(0.05),500} = 2.820$*

$0.005 < P(|t| \geq 2.820) < 0.01$
therefore do not reject the null hypothesis

*d_i is the set of values corresponding to the differences between original and duplicate gold assay values for each duplicate pair.
*$\bar{d}$ is the average of the differences.
*n is the number of datapoints.
*v is the degrees of freedom = n-1.
*S_d is the standard deviation for the set of d_i values.
*$S_{\bar{d}}$ is the standard error for the set of d_i values.
*$t_{(0.05),500}$ is the critical t value for a 95% confidence interval and 500 degrees of freedom.

* the critical t value for v=508 is not listed in the table of critical values used (Zar, 1984). However, the $t_{(0.05),500}$ value is more conservative than the value for v=508 and therfore if the critical t value for v=508 were available the test conclusion would be the same)

The absolute value of the resulting t value is less than the critical value. This result means the null hypothesis is not rejected and supports the hypothesis that the two data sets are equal.

The data for this T-test is located in the Quality control qpro spreadsheet (G:\data\qpro\quality.wb2, page ELGS Duplicates).

8.11.9 CONCLUSIONS AND RECOMMENDATIONS

The 1996 reverse circulation drilling program on the East Low grade Stockpile outlined a reserve of 247 775 tonnes at 1.61 g/t gold. Due to limitation on where the drill could safely be placed, only the upper portion of the material could be assessed. If the geometry of the mineralized blanket is projected downslope it is estimated that there are approximately 750 000 tonnes of material (see FigURE 8.22-2). Estimates of contained and recoverable ounces are given in Table 8.11-7.

Table 8.11-7: East Low Grade Stockpile Reserve Summary

TONNES		Grade (g/t)	Ounces	
			Contained	Recoverable*
Assessed	247 775	1.61	12 825	9388
Potential	750 000	1.61	38 823	28 418

*based on 73.2% recovery from pilot column leach test (McClelland, 1995).

The next step would be to examine the economic feasibility of mining the 28, 418 recoverable ounces profitably. with the experience of having constructed the Fleece Bowl heap leach facility, it is possible to reliably estimate the costs of building a pad and mining the Stockpile materials. It must be kept in mind that an accurate assessment of the gold contained in the lower two thirds of the stockpile cannot be done until the upper materials are removed.

8.11.10 SCREEN ANALYSIS ON + 2" MATERIAL (ADDENDUM)

Screening of the ELGS resulted in a -2" fraction that graded 1.53 g/t Au as compared to a overall reserve grade of 1.61 g/t Au. Because of this discrepancy, a 1.5 tonne sample of the +2' material was sent to Process Research Associates Ltd. in Vancouver. This material was to be crushed, split and assayed to determine the quantity of Au in the fraction. The process is outlined in the appendix and the results are as follows:

Sample	Au g/t	Ag g/t
Sample A	.86	2.4
Sample B	.93	2.6
Average	.90	2.5

The screening test was designed to determine if the removal of the 2" fraction would increase grade. As it did not and the + 2" fraction contains .90 g/t Au, then the following wet screen analysis was done to determine where the gold resided.

Screen Product	Weight %	Assay g/t Au	Au distribution %
+½	55.3	.40	30.8
-½ inch +9 mesh	24.9	.82	28.2
-9 mesh +35 mesh	6.1	.91	7.6
-35 mesh +100 mesh	3.1	1.08	4.6
- 100 mesh	10.6	1.97	28.7

20 wt %
41% of Au

The 1995 ELGS ROM Column Test conducted by McClelland included a detailed head screen analysis. The >½" fraction in the ROM Head Screen column test is approximately the same average grade as the >½" fraction of the +2" screen test:

ROM +½" (Column): .43 g/t Au +½" (>2" Screen):.40 g/t Au

The location of the gold in both the +2" screen test and the column test appear to be in the same fraction; < than ½" with a steady increase in grade to the -100 mesh (-150µm) size. In observing the screening plant it is apparent that a great deal of the boulders are coated with a very sticky clay and as this clay fraction seems to carry 1.97-2.91 g/t Au, it is becoming evident that screening is not a cost effective procedure for enhancing grade. The graphs on the following two pages illustrate the relationship between the size fraction gold relationship of the ELGS column test(head screen) and +2" screen test.

In conclusion, it is apparent from both size fraction analysis screen tests that grade should be enhanced by removing the coarse fraction (>2"). After running the bulk sample it was determined that it was not true. The fine clay fraction (-40 mesh) carries considerable gold (1.3-2.9 g/t Au) and due to the wet nature of the material, it sticks to the boulders giving the coarse fraction an apparent grade. To wet screen the material would free this clay fraction from the >2" size but this procedure is not seen as economical in view of the mining method.

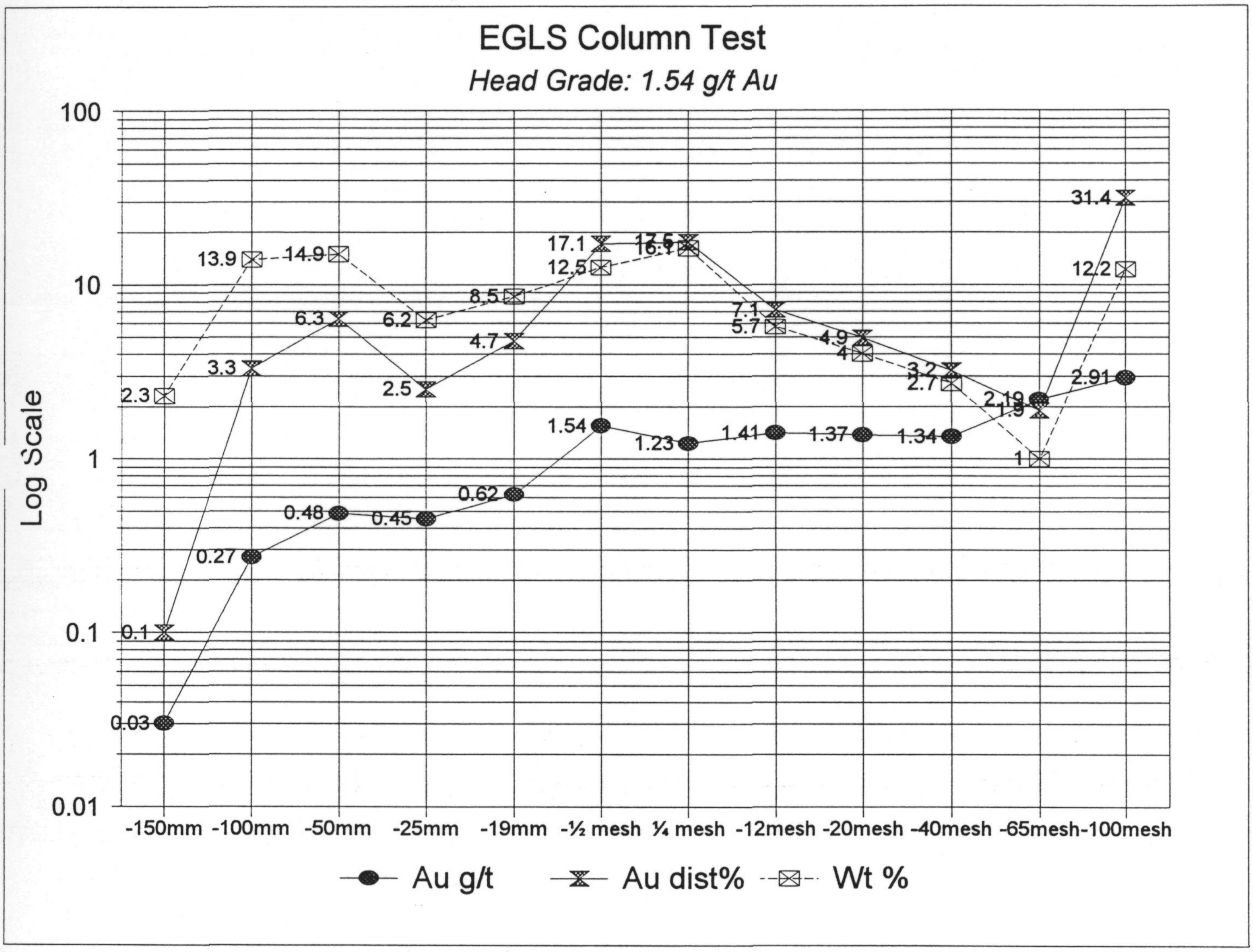
8.11.11 BULK DENSITY DETERMINATIONS

Eight bulk density samples were sent to Process Research Labs in Vancouver, B.C. Four 5 gallon pails were filled with ROM samples (#33680-33683) and four 5 gallon pails were filled with -2" screened material (#33684 - 33687). Both loose and packed determinations were done to simulate in situ waste dump material and to simulate moving material onto a heap pad. The table below illustrates the results:

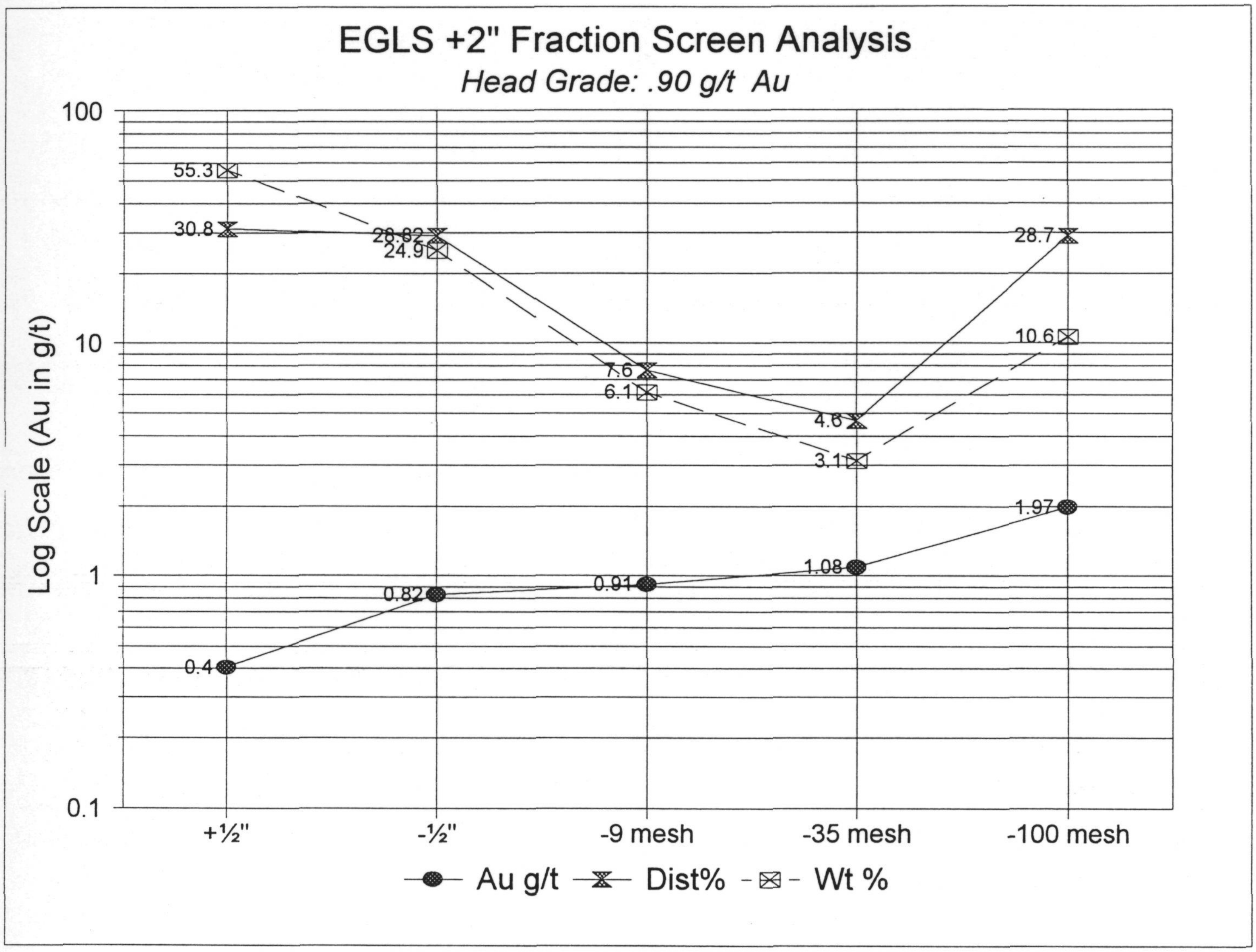
Sample #	Loose	Packed	Δ L vs. P	Δ% L vs. P
33680 ROM	1636	1894		
33681 ROM	1537	1842		
33682 ROM	1563	1816		
33683 ROM	1615	1912		
Average ROM	1580	1860	280	18%
33684 -2"	1431	1754		
33685 -2"	1504	1873		
33686 -2"	1469	1788		
33687 -2"	1472	1819		
Average -2"	1460	1800	340	23%
Average All	1530	1837	300	19.6%

Ore reserves on the ELGS were conducted using a conservative 1.53 S.G. value. This is probably a too severe bulk density to be utilised for accurate estimation of grade as the above packed density indicates 1.80 would be more appropriate. Upon investigating the method used by Process Research it was found that they crushed the ROM to -2" before performing the test for reasons unknown.

To investigate the influence of crushing the ROM prior to doing bulk density, data was sent from their Carmacks copper test work where they did comparative S.G.



EGLS Column Test
Head Grade: 1.54 g/t Au
Log Scale
100
10
1
0.1
0.01
-150mm
-100mm
-50mm
-25mm
-19mm
-½ mesh
¼ mesh
-12mesh
-20mesh
-40mesh
-65mesh
-100mesh
Au g/t
Au dist%
Wt %
0.03
0.27
0.48
0.45
0.62
1.54
1.23
1.41
1.37
1.34
2.19
2.91
0.1
3.3
6.3
2.5
4.7
17.1
7.1
4.9
3.2
1.9
31.4
2.3
13.9
14.9
6.2
8.5
12.5
16.1
5.7
4
2.7
1
12.2


EGLS +2" Fraction Screen Analysis
Head Grade: .90 g/t Au
Log Scale (Au in g/t)
100
10
1
0.1
55.3
30.8
28.82
24.9
7.6
6.1
4.6
3.1
28.7
10.6
1.97
1.08
0.91
0.82
0.4
+½"
-½"
-9 mesh
-35 mesh
-100 mesh
Au g/t
Dist%
Wt %

work from column tests crushed at -2"and -3/8" of the same material. The bulk density changed from 1.45 to 1.32; a change of .13 or 9%. As a result of the crushing of the ROM material, it is strongly suggested that the ROM bulk density determinations be performed again either at the site or by another lab. The economics of bulk determination displayed below:

ELGS Reserve

Bulk Density 1.53 - 750,000 tonnes @1.61g/t Au @$500 CDN/oz	$19,400,000
Bulk Density 1.86 - 900,000 tonnes @1.61g/t Au @$500 CDN/oz	<u>$23,300,000</u>
ΔDensity	$ 3,900,000

8.11-12 REFERENCES

McClelland Laboratories Inc. 1995. Report on Pilot Column Leach Test - Golden Bear Waste DumpSample. Oct. 27, 1995.

Smallwood, Randy. 1994a. Internal memorandum re: Wast Dump Movements, June 3, 1994.

Smallwood, Randy. 1994b. Internal memorandum re: Wast Dump Sampling Program, June 12, 1994.

Smallwood, Randy. 1994c. Internal memorandum re: Grade Estimation of the East Low Grade Stockpile, July 25, 1994.

Smallwood, Randy. 1994d. Summary Report on the East Low Grade Stockpile, Internal Report, Aug. 12, 1994.

Smallwood, Randy. 1994e. Internal memorandum re: Sampling of the East Low Grade Stockpile Washout Gully, Oct. 28, 1994.

Zar, Jerrold, H., 1984. Biostatistical Analysis, Second Edition. Prentice Hall inc., 1984. Pp. 150-152.

8.11.13 APPENDIX A - RESERVE CALCULATION SPREADSHEETS

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High assays cut to 4.00 g/t

SECTION	Probable tonnes	AU g/t cut	AU g/t uncut	Possible tonnes	AU g/t cut	AU g/t uncut	All categories tonnes	AU g/t cut	AU g/t uncut
2	3274.05	1.35	1.35	402.31	1.44	1.44	3676.36	1.36	1.36
2b	1503.53	1.73	2.22	3204.28	1.74	1.77	4707.81	1.74	1.91
3	6972.82	1.70	1.72	4099.02	1.77	1.80	11071.85	1.73	1.75
3b	4674.46	1.73	1.90	7585.59	1.72	1.88	12260.05	1.72	1.74
4	11565.12	1.67	1.69	1933.31	2.02	2.06	13498.43	1.72	1.74
4b	4766.26	1.31	1.31	7091.70	2.10	2.29	11857.96	1.78	1.90
5	8315.55	1.93	2.16	1781.07	2.18	2.55	10096.62	1.98	2.23
5b	2910.37	1.09	1.09	4811.70	2.12	2.43	7722.07	1.73	1.93
6	4971.66	1.70	1.85	1024.03	2.02	2.23	5995.69	1.76	1.92
7	11266.31	1.77	1.81	7799.02	1.79	1.85	19065.33	1.78	1.83
8	28644.97	1.92	1.98	14579.37	1.95	2.00	43224.34	1.93	1.99
9	19819.01	1.19	1.19	15578.46	1.21	1.21	35397.47	1.20	1.20
10	22105.44	1.27	1.27	8869.26	1.35	1.35	30974.70	1.29	1.29
10b	4980.92	2.05	2.40	10601.68	1.84	1.97	15582.60	1.91	2.11
11	10546.44	1.17	1.17	7097.29	1.15	1.15	17643.73	1.16	1.16
TOTALS	146316.91	1.57	1.63	96458.09	1.68	1.76	242775.01	1.61	1.67

CATEGORIES	TONNES	Au g/t cut	Au g/t uncut
Probable	146316.91	1.57	1.63
Possible	96458.09	1.68	1.76
Probable + Possible	242775.01	1.61	1.67

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff

Bulk Density = 1.53 tonnes/m3

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t	
2	2-1	A	10	5	24.47	367.05	561.59	1.12	628.98
	2-2	A	10	5	19.12	286.80	438.80	1.19	522.18
	2-3	A	10	5	99.07	1486.05	2273.66	1.44	3274.07
	2-4	B	10	5	17.53	262.95	402.31	1.44	579.33
			Probable				3274.05	1.35	
			Possible				402.31	1.44	
			Probable + Possible				3676.36	1.36	

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff

Bulk Density = 1.53 tonnes/m3

High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
2b	2b-1	A	5	5	13.32	133.20	203.80	1.74	1.74	354.61	354.61
	2b-2	A	5	5	84.95	849.50	1299.74	1.73	2.29	2248.54	2976.39
	2b-3	B	5	5	209.43	2094.30	3204.28	1.74	1.77	5577.07	5664.61
			Probable				1503.53	1.73	2.22		
			Possible				3204.28	1.74	1.77		
			Probable + Possible				4707.81	1.74	1.91		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
3	3-1	A	5	5	66.12	661.20	1011.64	1.28	1.28	1294.89	1294.89
	3-2	A	5	5	389.62	3896.20	5961.19	1.77	1.80	10551.30	10730.13
	3-3	B	5	5	267.91	2679.10	4099.02	1.77	1.80	7255.27	7378.24
			Probable				6972.82	1.70	1.72		
			Possible				4099.02	1.77	1.80		
			Probable + Possible				11071.85	1.73	1.75		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
3B	3B-1	A	5	5	85.7	857.00	1311.21	1.37	1.37	1796.36	1796.36
	3B-2	A	5	5	219.82	2198.20	3363.25	1.87	2.10	6289.27	7062.82
	3B-3	B	5	5	495.79	4957.90	7585.59	1.72	1.88	13015.70	14286.14
			Probable				4674.46	1.73	1.90		
			Possible				7585.59	1.72	1.88		
			Probable + Possible				12260.05	1.72	1.89		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff　　Bulk Density = 1.53 tonnes/m3　　High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
4	4-1	A	5	5	53.67	536.70	821.15	0.89	0.89	730.82	730.82
	4-2	A	5	5	108.32	1083.20	1657.30	1.02	1.02	1690.44	1690.44
	4-3	A	5	5	85.48	854.80	1307.84	1.49	1.49	1948.69	1948.69
	4-4	A	5	5	125.62	1256.20	1921.99	1.61	1.61	3094.40	3094.40
	4-5	A	5	5	382.80	3828.00	5856.84	2.02	2.06	11830.82	12065.09
	4-6	B	5	5	126.36	1263.60	1933.31	2.02	2.06	3905.28	3982.61
			Probable				11565.12	1.67	1.69		
			Possible				1933.31	2.02	2.06		
			Probable + Possible				13498.43	1.72	1.74		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff　　Bulk Density = 1.53 tonnes/m3　　High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
4b	4b-1	A	5	5	84.46	844.60	1292.24	1.50	1.50	1938.36	1938.36
	4b-2	A	5	5	227.06	2270.60	3474.02	1.24	1.24	4307.78	4307.78
	4b-3	B	5	5	463.51	4635.10	7091.70	2.10	2.29	14869.33	16275.17
			Probable				4766.26	1.31	1.31		
			Possible				7091.70	2.10	2.29		
			Probable + Possible				11857.96	1.78	1.90		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
5	5-1	A	5	5	28.37	283.70	434.06	1.12	1.12	486.15	486.15
	5-2	A	5	5	33.56	335.60	513.47	1.7	1.70	872.90	872.90
	5-3	A	5	5	50.08	500.80	766.22	1.69	1.69	1294.92	1294.92
	5-4	A	5	5	94.94	949.40	1452.58	1.5	1.50	2178.87	2178.87
	5-5	A	5	5	336.55	3365.50	5149.22	2.18	2.55	11225.29	13130.50
	5-6	B	5	5	116.41	1164.10	1781.07	2.18	2.55	3882.74	4541.74
				Probable			8315.55	1.93	2.16		
				Possible			1781.07	2.18	2.55		
				Probable + Possible			10096.62	1.98	2.23		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
5b	5b-1	A	5	5	47.32	473.20	724.00	0.75	0.75	543.00	543.00
	5b-2	A	5	5	142.90	1429.00	2186.37	1.20	1.20	2623.64	2623.64
	5b-3	B	5	5	314.49	3144.90	4811.70	2.12	2.43	10208.46	11707.74
			Probable				2910.37	1.09	1.09		
			Possible				4811.70	2.12	2.43		
			Probable + Possible				7722.07	1.73	1.93		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff — Bulk Density = 1.53 tonnes/m3 — High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
6	6-1	A	5	10	10.59	158.85	243.04	0.93	0.93	226.03	226.03
	6-2	A	5	10	23.93	358.95	549.19	0.91	0.91	499.77	499.77
	6-3	A	5	10	26.83	402.45	615.75	0.86	0.86	529.54	529.54
	6-4	A	5	10	155.28	2329.20	3563.68	2.02	2.23	7198.63	7947.00
	6-5	B	5	10	44.62	669.30	1024.03	2.02	2.23	2068.54	2283.58
			Probable				4971.66	1.70	1.85		
			Possible				1024.03	2.02	2.23		
			Probable + Possible				5995.69	1.76	1.92		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff — Bulk Density = 1.53 tonnes/m3 — High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
7	7-1	A	10	10	58.53	1170.60	1791.02	1.87	1.87	3349.20	3349.20
	7-2	A	10	10	34.10	682.00	1043.46	1.39	1.39	1450.41	1450.41
	7-3	A	10	10	275.55	5511.00	8431.83	1.79	1.85	15092.98	15598.89
	7-4	B	10	10	254.87	5097.40	7799.02	1.79	1.85	13960.25	14428.19
			Probable				11266.31	1.77	1.81		
			Possible				7799.02	1.79	1.85		
			Probable + Possible				19065.33	1.78	1.83		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff   Bulk Density = 1.53 tonnes/m3   High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
8	8-1	A	10	10	100.12	2002.40	3063.67	1.70	1.70	5208.24	5208.24
	8-2	A	10	10	124.34	2486.80	3804.80	2.59	2.84	9854.44	10805.64
	8-3	A	10	10	122.21	2444.20	3739.63	1.24	1.24	4637.14	4637.14
	8-4	A	10	10	589.44	11788.80	18036.86	1.95	2.00	35171.88	36073.73
	8-5	B	10	10	476.45	9529.00	14579.37	1.95	2.00	28429.77	29158.74
			Probable				28644.97	1.92	1.98		
			Possible				14579.37	1.95	2.00		
			Probable + Possible				43224.34	1.93	1.99		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff   Bulk Density = 1.53 tonnes/m3   High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
9	9-1	A	10	10	10.57	211.40	323.44	1.20	1.20	388.13	388.13
	9-2	A	10	10	38.71	774.20	1184.53	1.24	1.24	1468.81	1468.81
	9-3	A	10	10	50.92	1018.40	1558.15	1.08	1.08	1682.80	1682.80
	9-4	A	10	10	95.38	1907.60	2918.63	1.11	1.11	3239.68	3239.68
	9-5	A	10	10	452.10	9042.00	13834.26	1.21	1.21	16739.45	16739.45
	9-6	B	10	10	509.10	10182.00	15578.46	1.21	1.21	18849.94	18849.94
			Probable				19819.01	1.19	1.19		
			Possible				15578.46	1.21	1.21		
			Probable + Possible				35397.47	1.20	1.20		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff   Bulk Density = 1.53 tonnes/m3   High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
10	10-1	A	10	5	77.33	1159.95	1774.72	1.51	1.51	2679.83	2679.83
	10-2	A	10	5	48.44	726.60	1111.70	1.51	1.51	1678.66	1678.66
	10-3	A	10	5	103.17	1547.55	2367.75	0.91	0.91	2154.65	2154.65
	10-4	A	10	5	96.38	1445.70	2211.92	1.24	1.24	2742.78	2742.78
	10-5	A	10	5	123.94	1859.10	2844.42	1.04	1.04	2958.20	2958.20
	10-6	A	10	5	513.94	7709.10	11794.92	1.35	1.35	15923.15	15923.15
	10-7	B	10	5	386.46	5796.90	8869.26	1.35	1.35	11973.50	11973.50
			Probable				22105.44	1.27	1.27		
			Possible				8869.26	1.35	1.35		
			Probable + Possible				30974.70	1.29	1.29		

NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff   Bulk Density = 1.53 tonnes/m3   High grades cut to 4 g/t

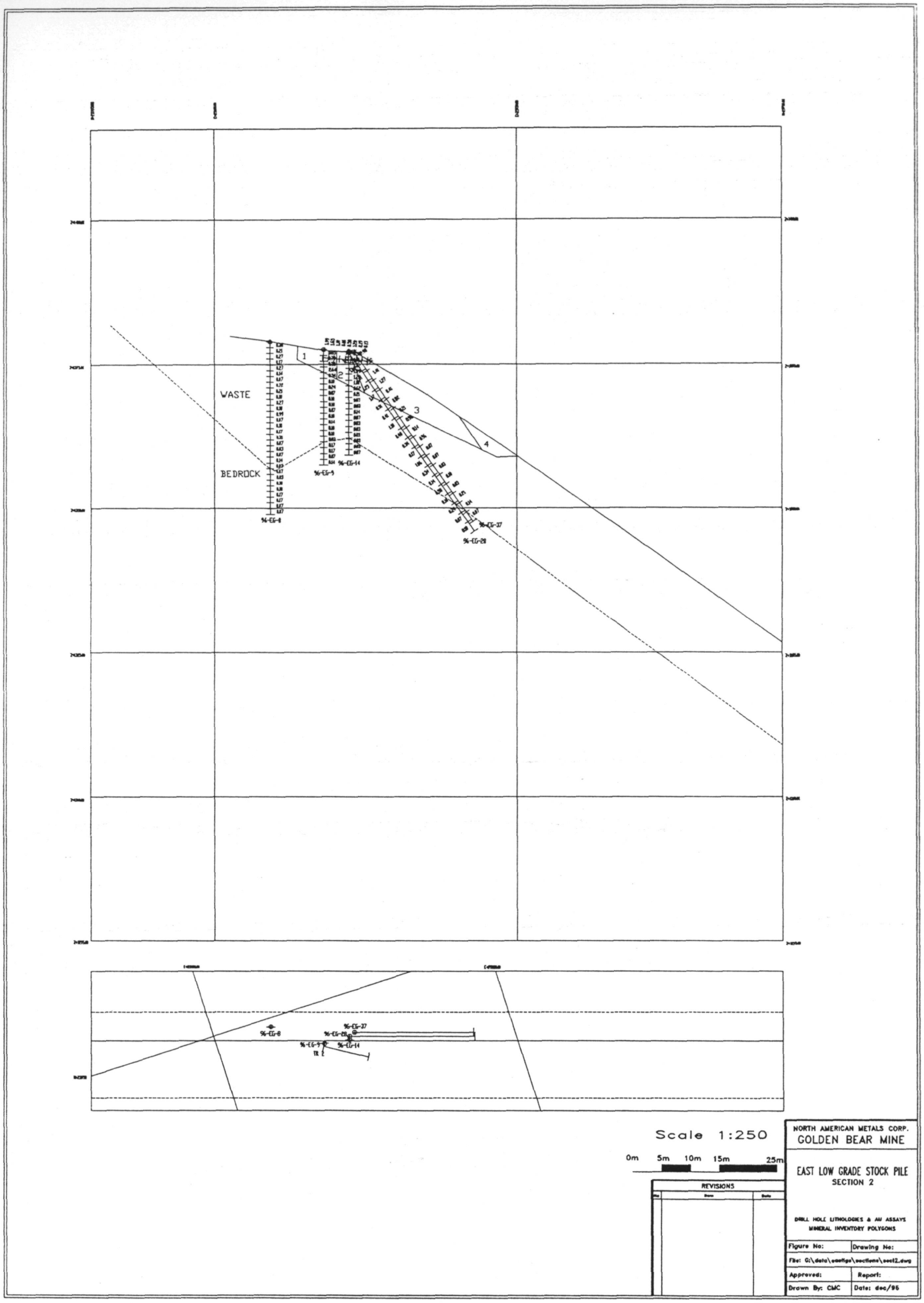
SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
10b	10b-1	A	5	5	95.02	950.20	1453.81	2.57	3.43	3736.28	4986.55
	10b-2	A	5	5	230.53	2305.30	3527.11	1.84	1.97	6489.88	6948.40
	10b-3	B	5	5	692.92	6929.20	10601.68	1.84	1.97	19507.08	20885.30
			Probable				4980.92	2.05	2.40		
			Possible				10601.68	1.84	1.97		
			Probable + Possible				15582.60	1.91	2.11		

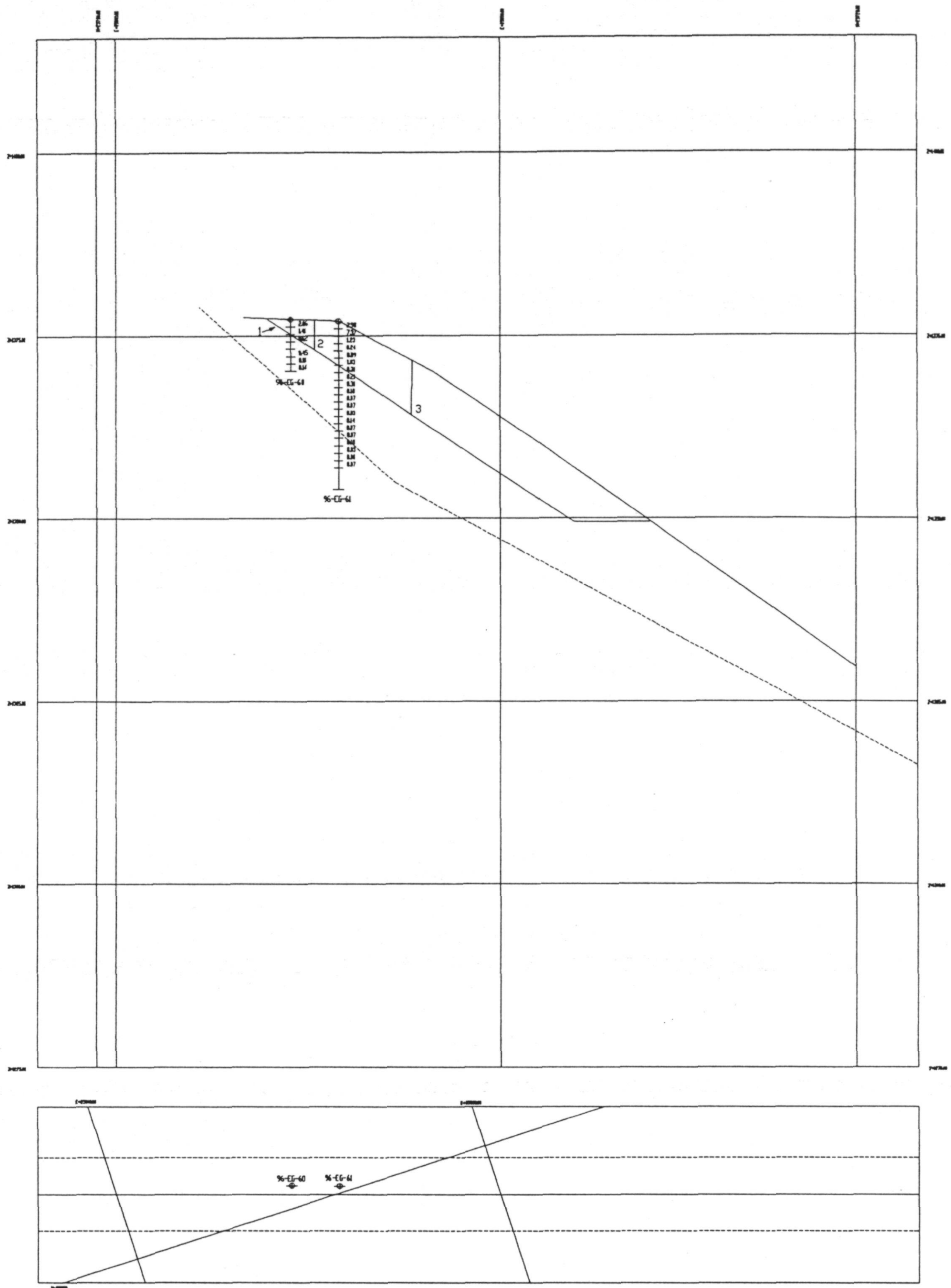
NORTH AMERICAN METALS CORP. - EAST LOW GRADE STOCKPILE ORE RESERVES

0.75g cutoff | Bulk Density = 1.53 tonnes/m3 | High grades cut to 4 g/t

SECTION	POLYGON	CLASS	TO meters	AWAY meters	AREA m2	VOLUME m3	TONNES	AU g/t cut	AU g/t uncut		
11	11-1	A	5	10	4.73	70.95	108.55	2.47	2.47	268.13	268.13
	11-2	A	5	10	13.95	209.25	320.15	1.20	1.20	384.18	384.18
	11-3	A	5	10	22.84	342.60	524.18	1.26	1.26	660.46	660.46
	11-4	A	5	10	418.02	6270.30	9593.56	1.15	1.15	11032.59	11032.59
	11-5	B	5	10	309.25	4638.75	7097.29	1.15	1.15	8161.88	8161.88
			Probable				10546.44	1.17	1.17		
			Possible				7097.29	1.15	1.15		
			Probable + Possible				17643.73	1.16	1.16		

8.11.14 APPENDIX B - DRILL SECTIONS (8 ½ x 11)


WASTE
BEDROCK
96-EG-8
96-EG-9
96-EG-14
96-EG-37
96-EG-28
TR 2
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 2
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
File: G:\data\eastlgs\sections\sect2.dwg
Approved:
Report:
Drawn By: CMC
Date: dec/96



Scale 1:250

0m 5m 10m 15m 25m

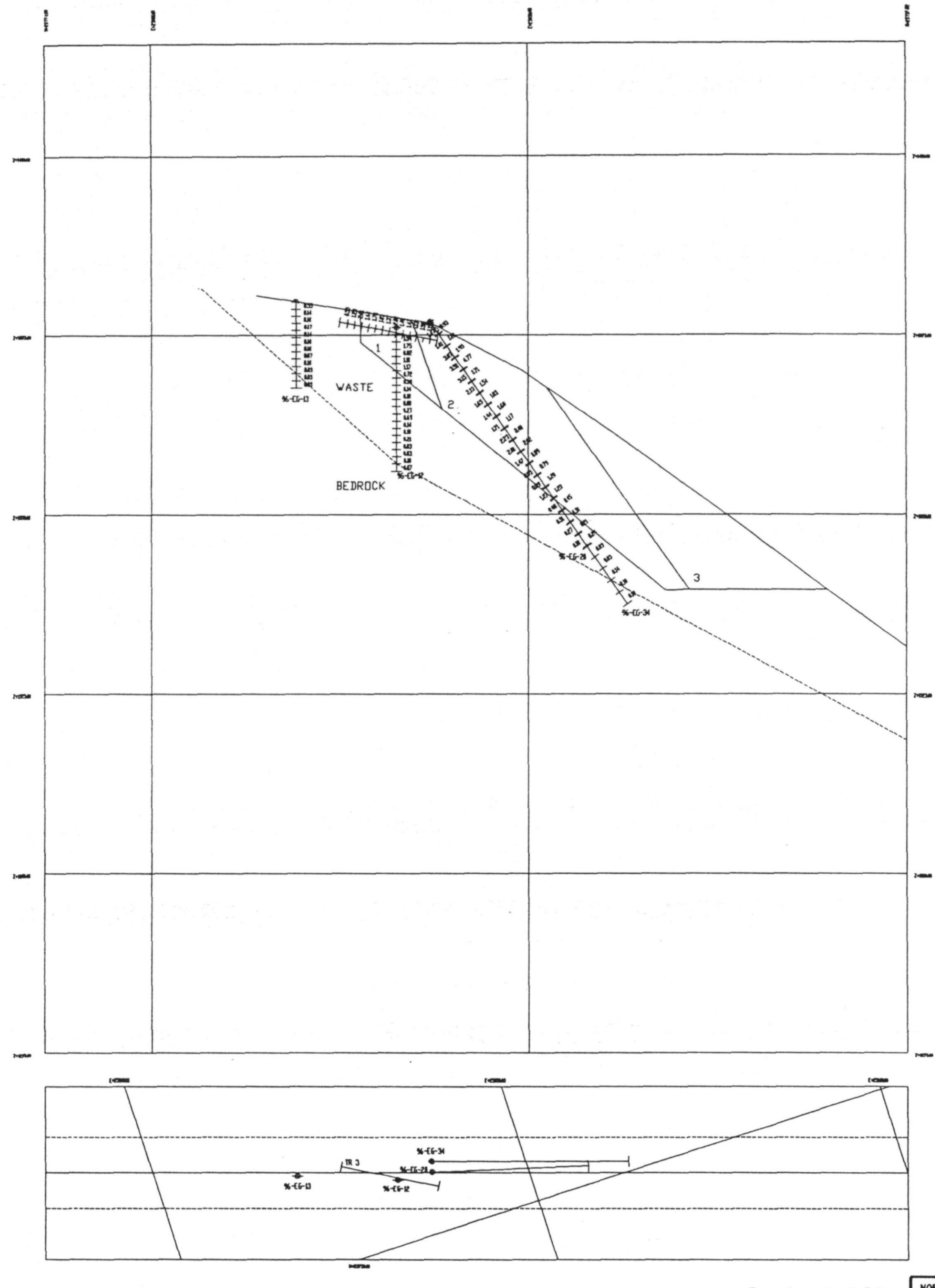
REVISIONS		
No	Item	Date

NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 2b

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: G:\data\eastlgs\sections\sect2b.dwg	
Approved:	Report:
Drawn By: CMC	Date: dec/96



Scale 1:250

0m 5m 10m 15m 25m

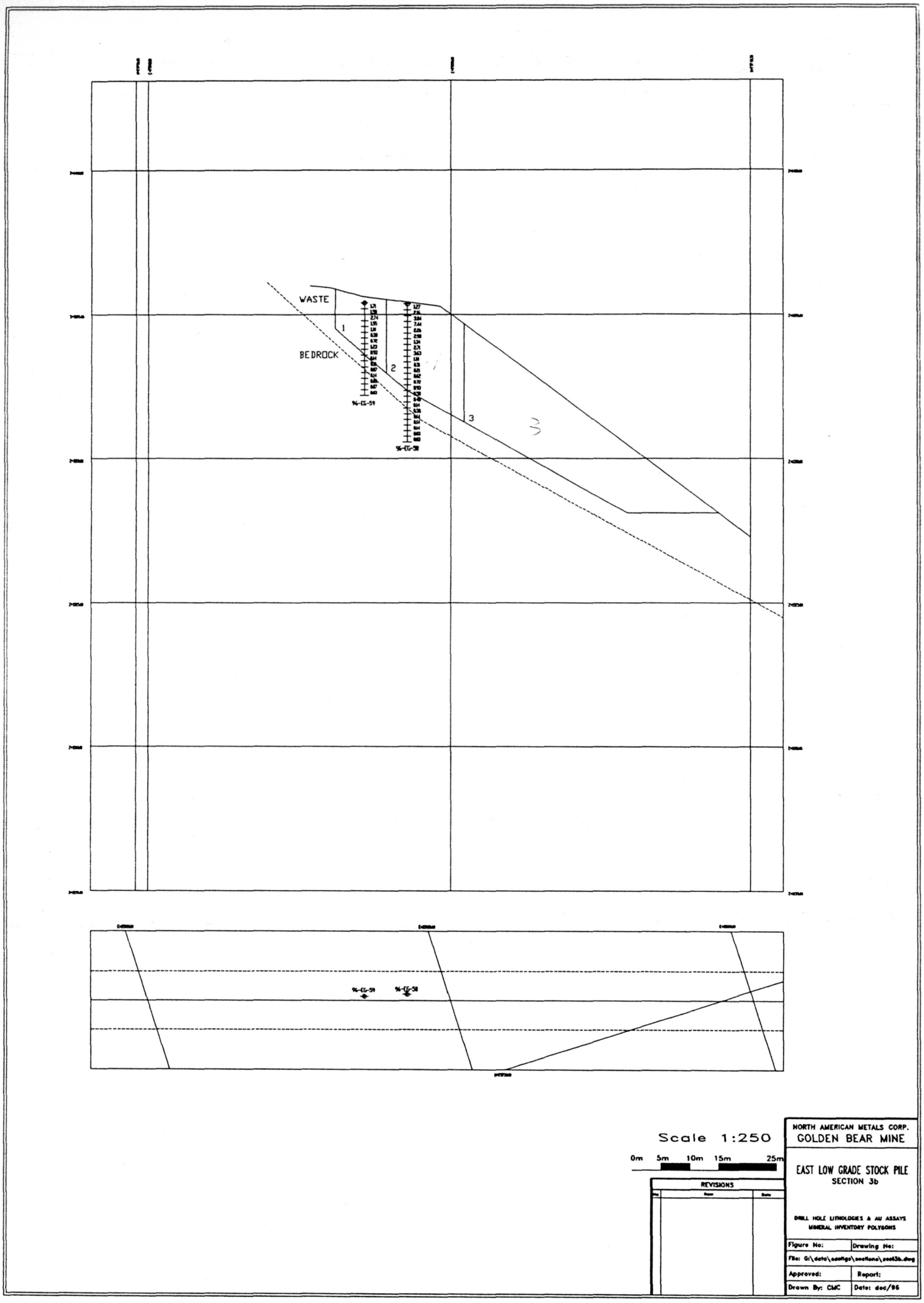
REVISIONS		
No	Item	Date

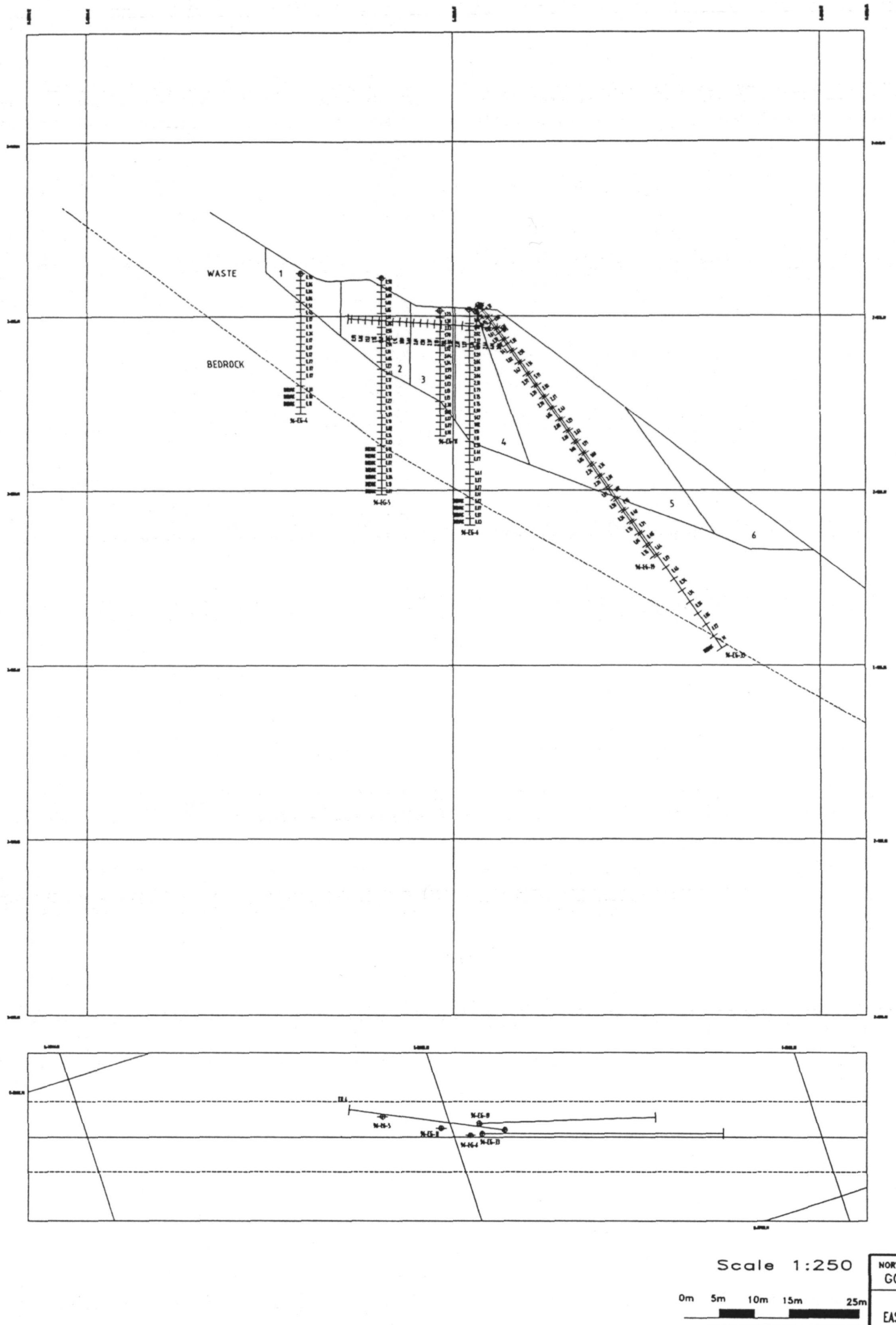
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 3

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: G:\data\eastlgs\sections\sect3.dwg	
Approved:	Report:
Drawn By: CMC	Date: dec/95


WASTE
BEDROCK
1
2
3
96-EG-59
96-EG-58
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 3b
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
Approved:
Report:
Drawn By: CMC
Date: dec/96



REVISIONS

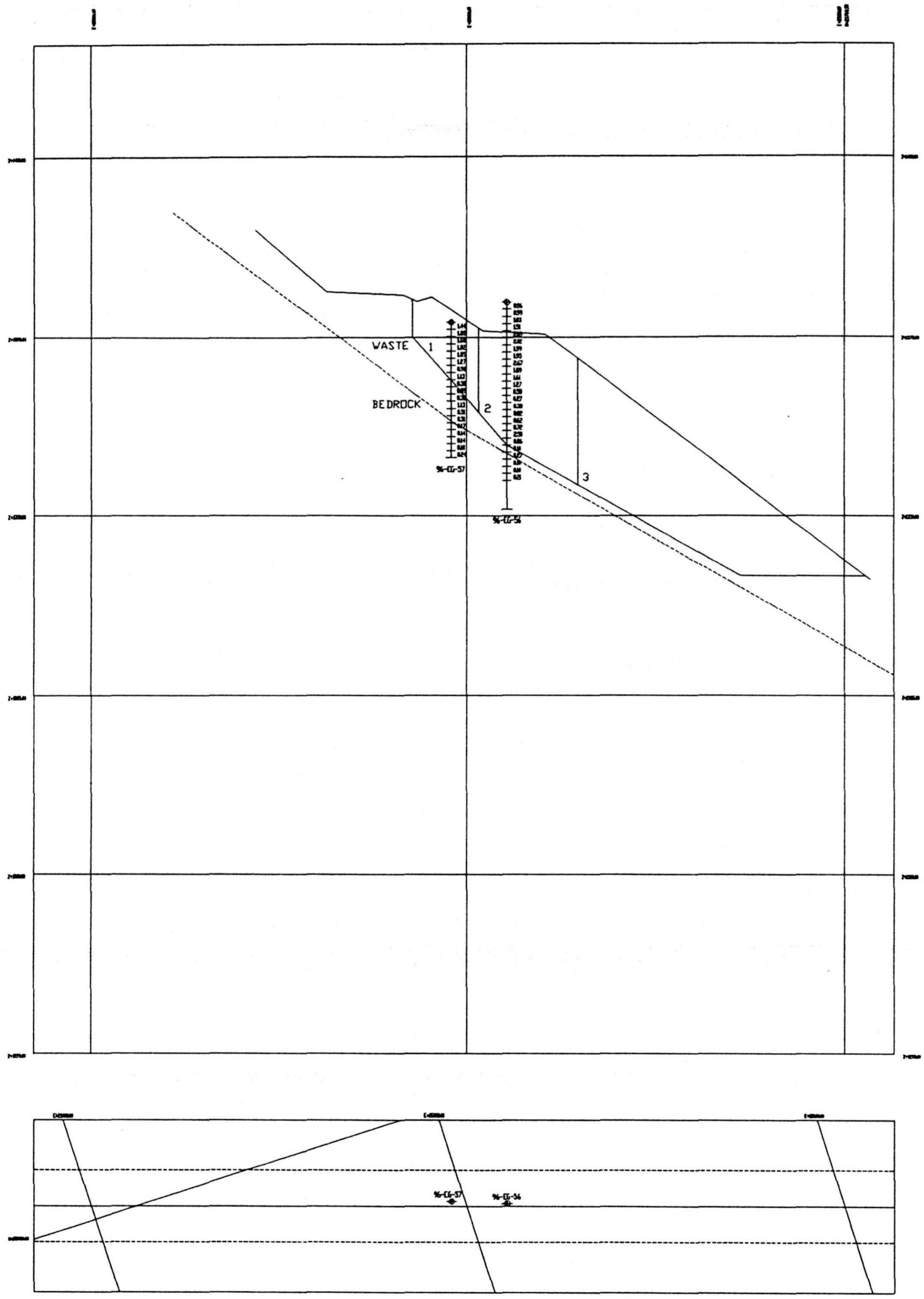
No	Item	Date

NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 4

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: O:\data\eastlgs\sections\sect4.dwg	
Approved:	Report:
Drawn By: CMC	Date:



Scale 1:250

0m 5m 10m 15m 25m

REVISIONS

NORTH AMERICAN METALS CORP.

GOLDEN BEAR MINE

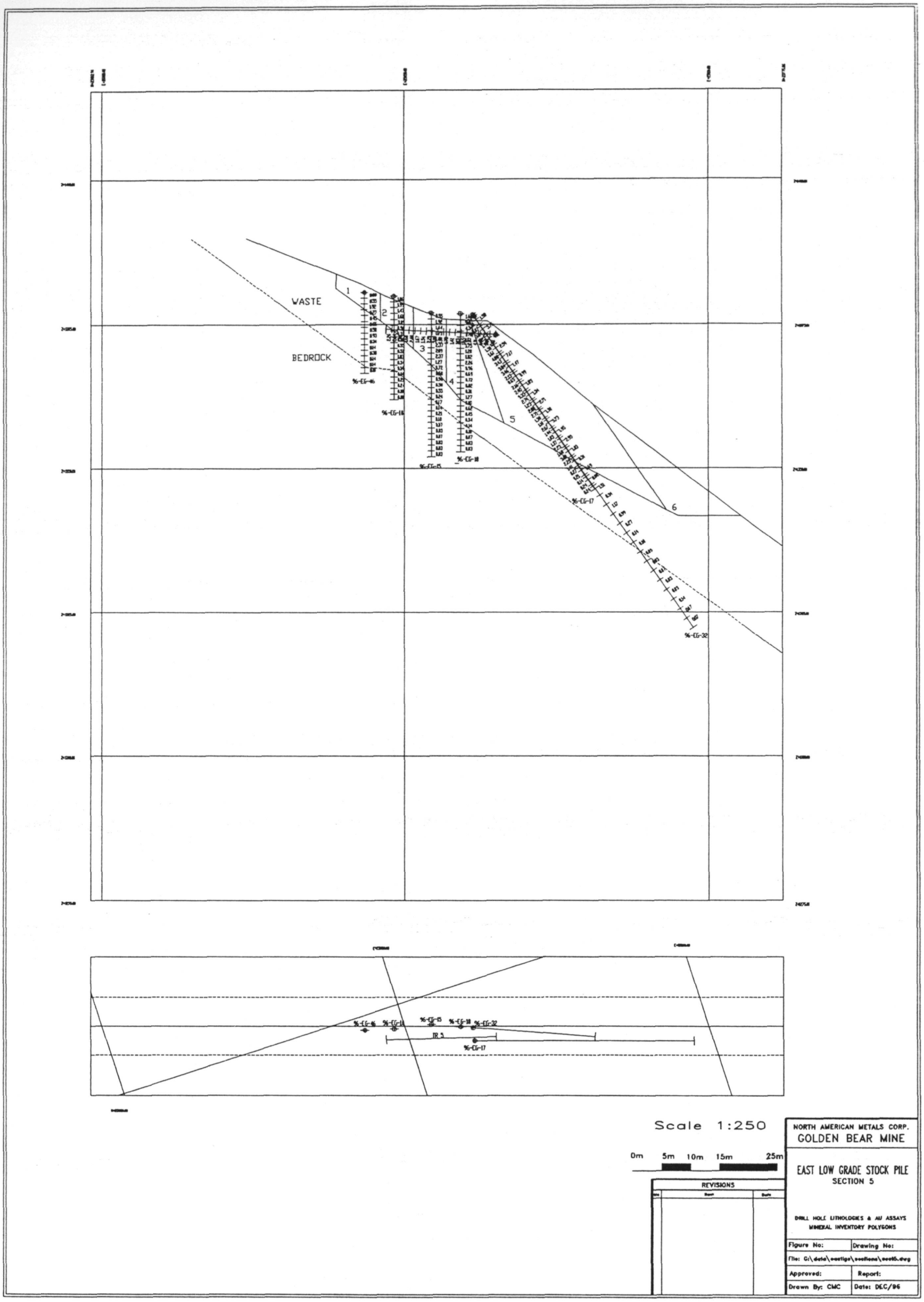
EAST LOW GRADE STOCK PILE

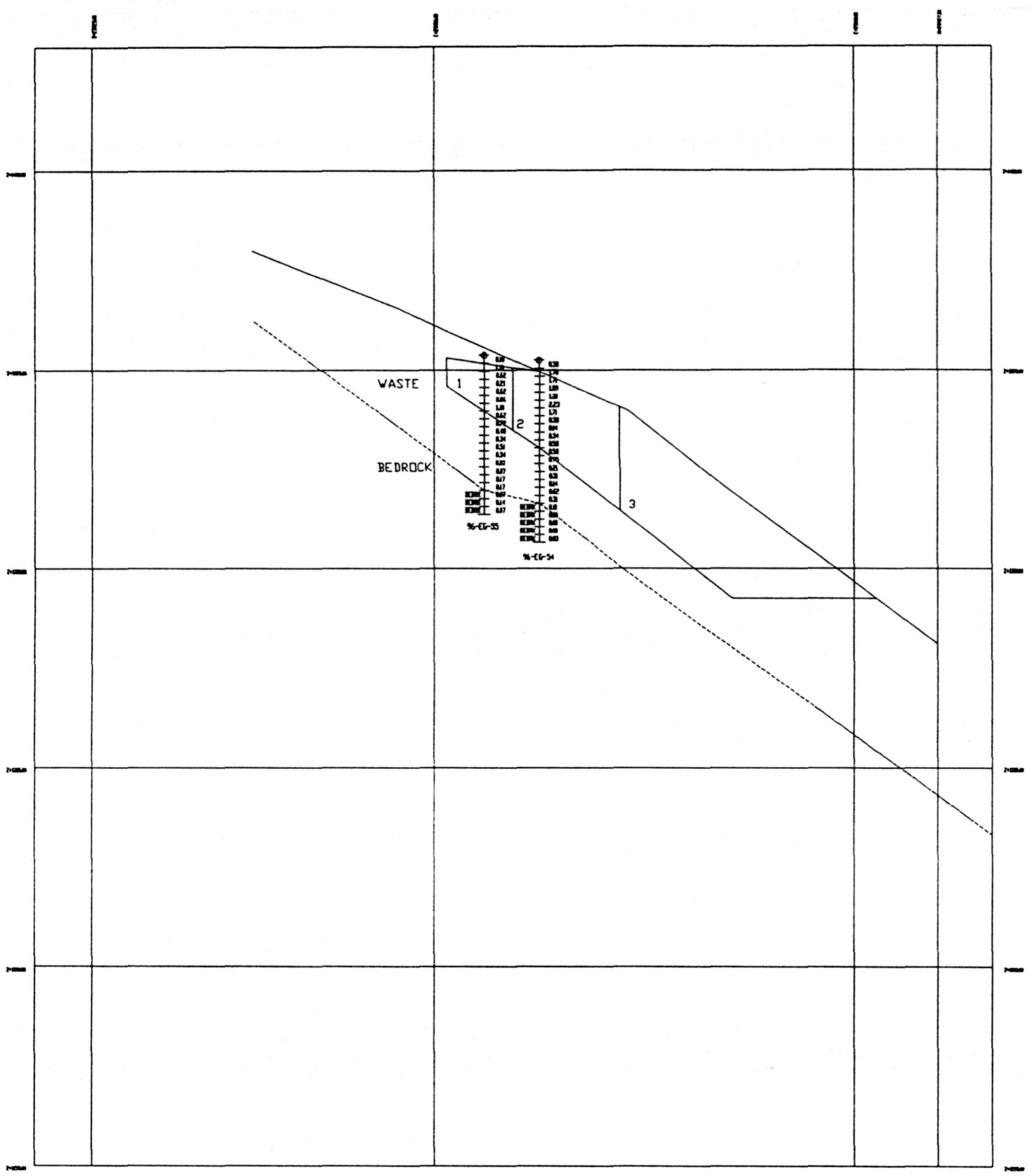
SECTION 4b

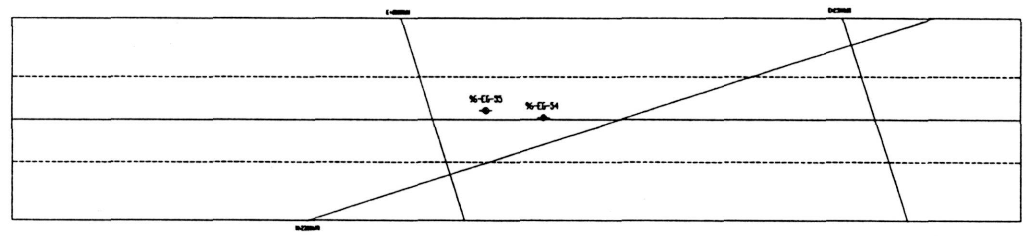
DRILL HOLE LITHOLOGIES & AU ASSAYS

MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File:G\data\eastlgs\sections\sec4b.dwg	
Approved:	Report:
Drawn By: CMC	Date: dec/96


WASTE
BEDROCK
96-EG-46
96-EG-16
96-EG-15
96-EG-18
96-EG-17
96-EG-32
TR 5
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 5
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
Approved:
Report:
Drawn By: CMC
Date: DEC/96





Scale 1:250

0m 5m 10m 15m 25m

REVISIONS		
No	Desc	Date

NORTH AMERICAN METALS CORP.

GOLDEN BEAR MINE

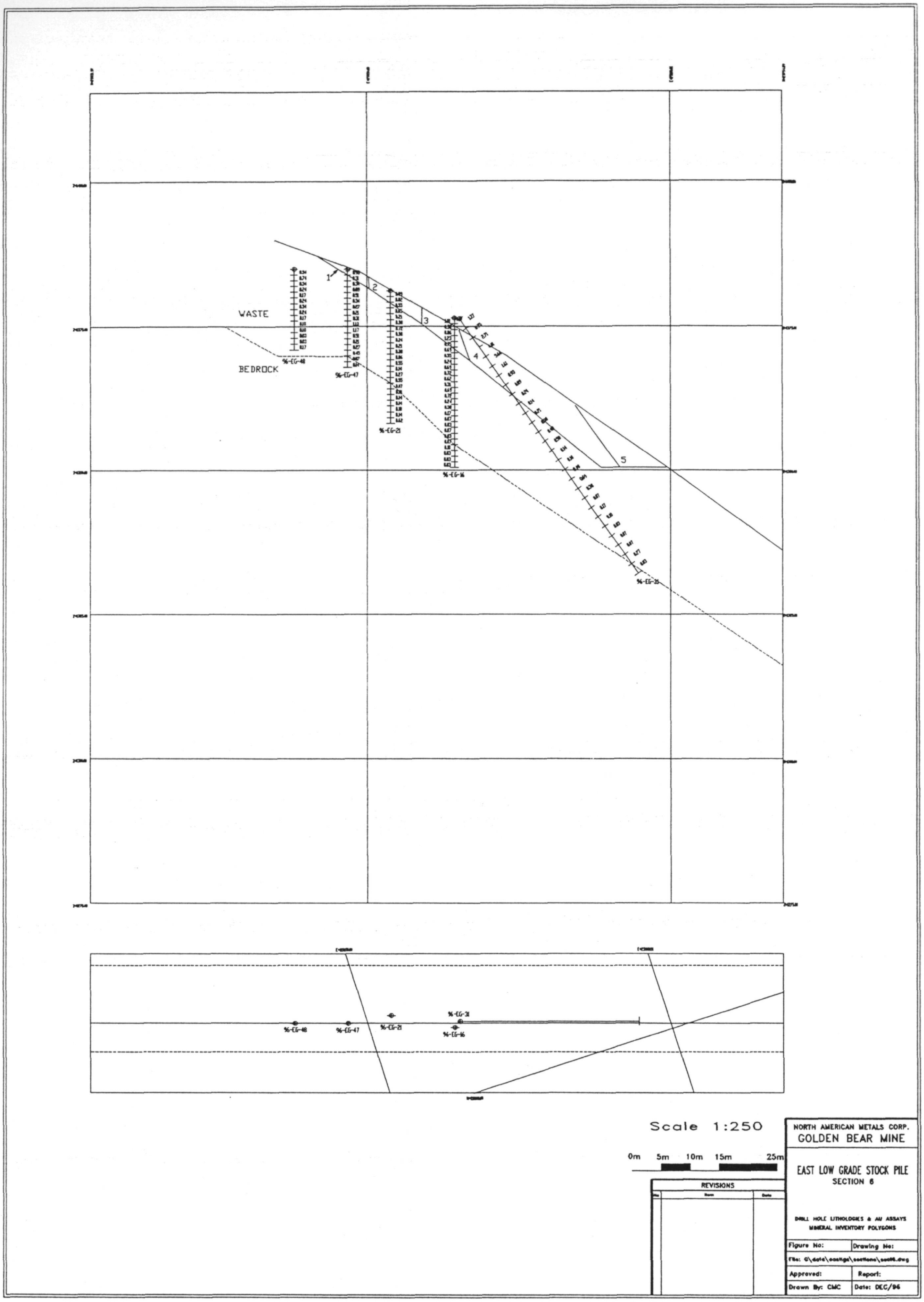
EAST LOW GRADE STOCK PILE

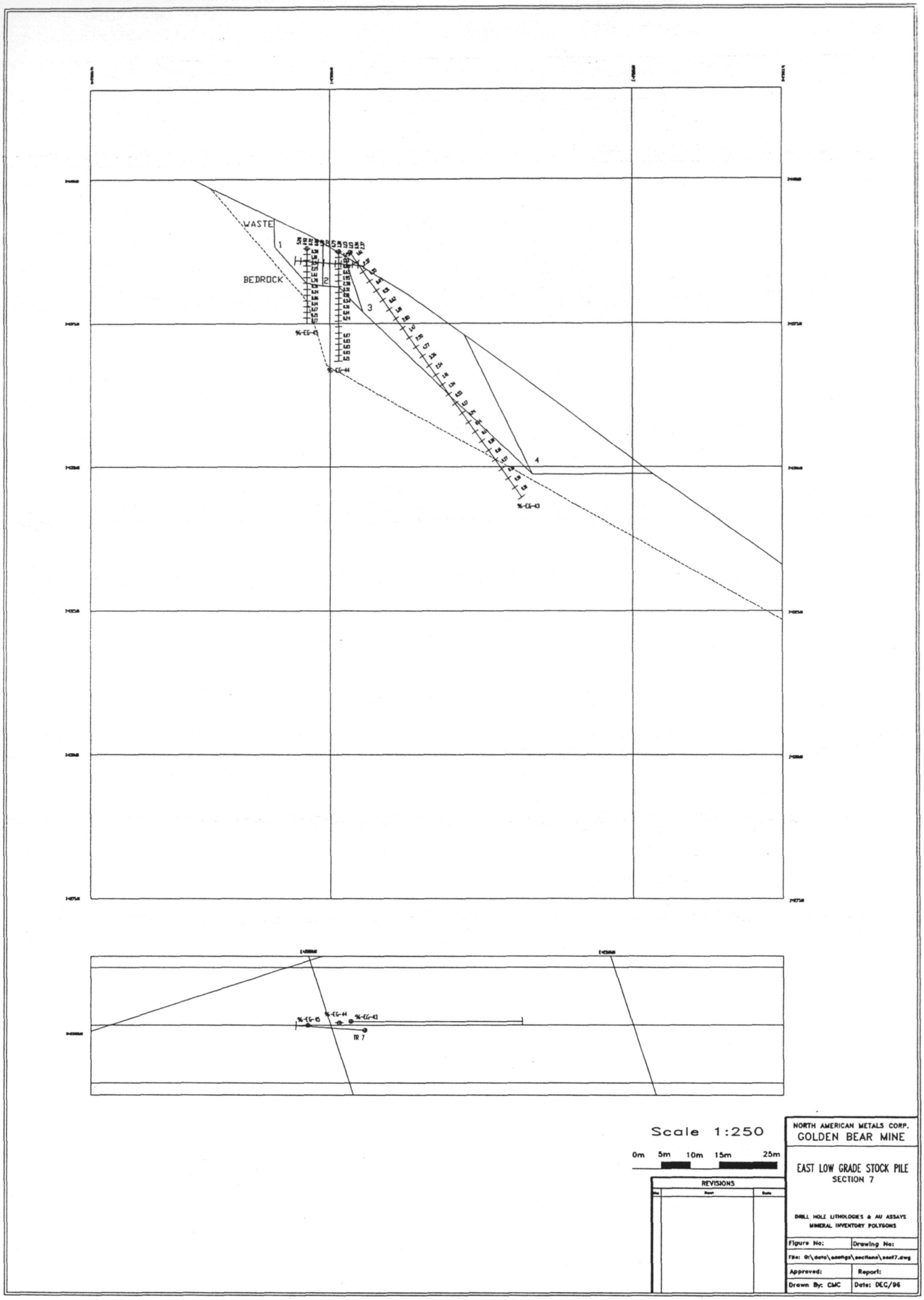
SECTION 5b

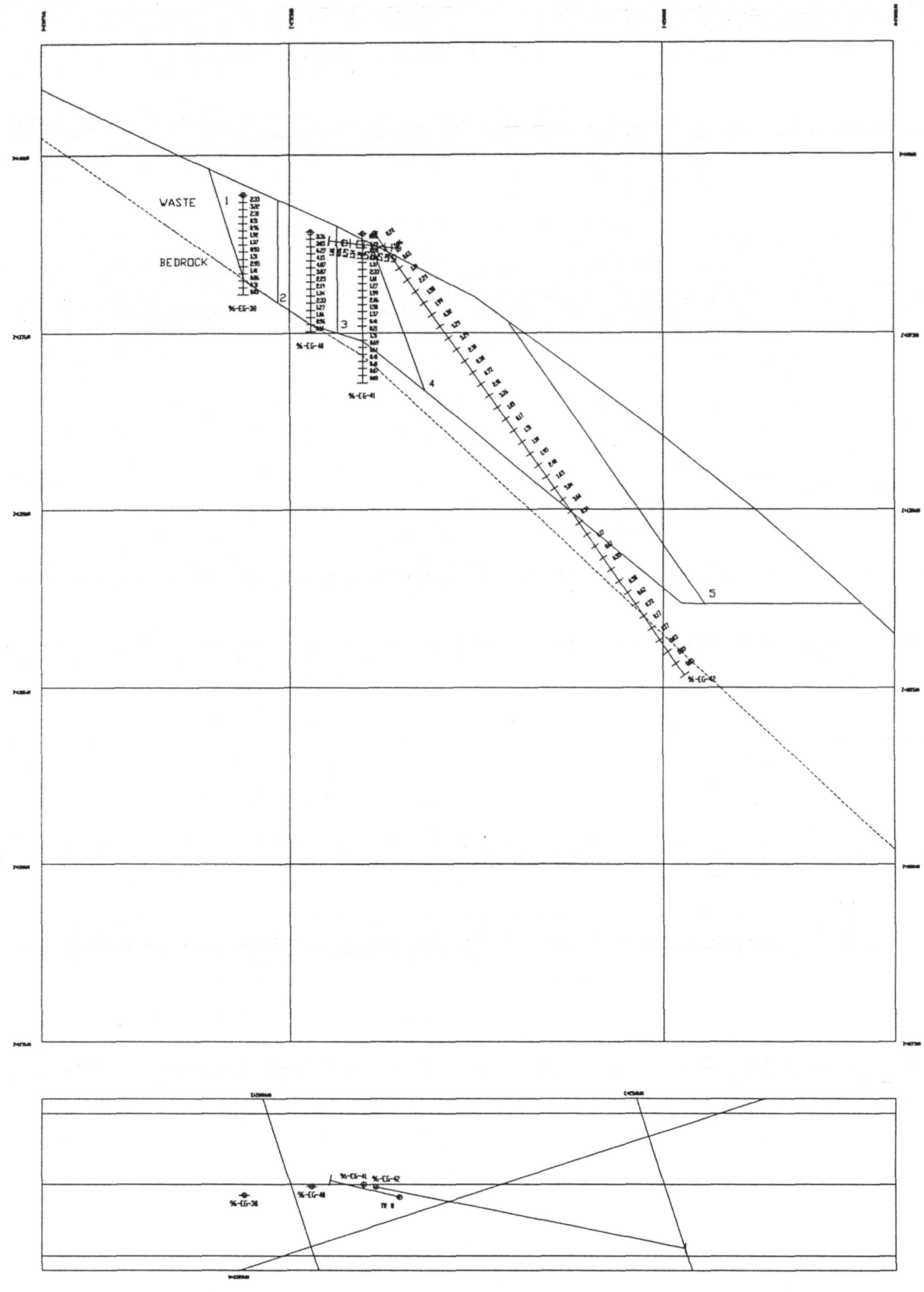
DRILL HOLE LITHOLOGIES & AU ASSAYS

MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: G:\data\ceelgs\sections\sect5b.dwg	
Approved:	Report:
Drawn By: CMC	Date: DEC/96


WASTE
BEDROCK
1
2
3
4
5
96-EG-48
96-EG-47
96-EG-21
96-EG-16
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 6
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
Approved:
Report:
Drawn By: CMC
Date: DEC/96


WASTE
BEDROCK
1
2
3
4
96-EG-45
96-EG-44
96-EG-43
TR 7
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 7
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
File: G:\data\eastlgs\sections\sect7.dwg
Approved:
Report:
Drawn By: CMC
Date: DEC/96



Scale 1:250

0m 5m 10m 15m 25m

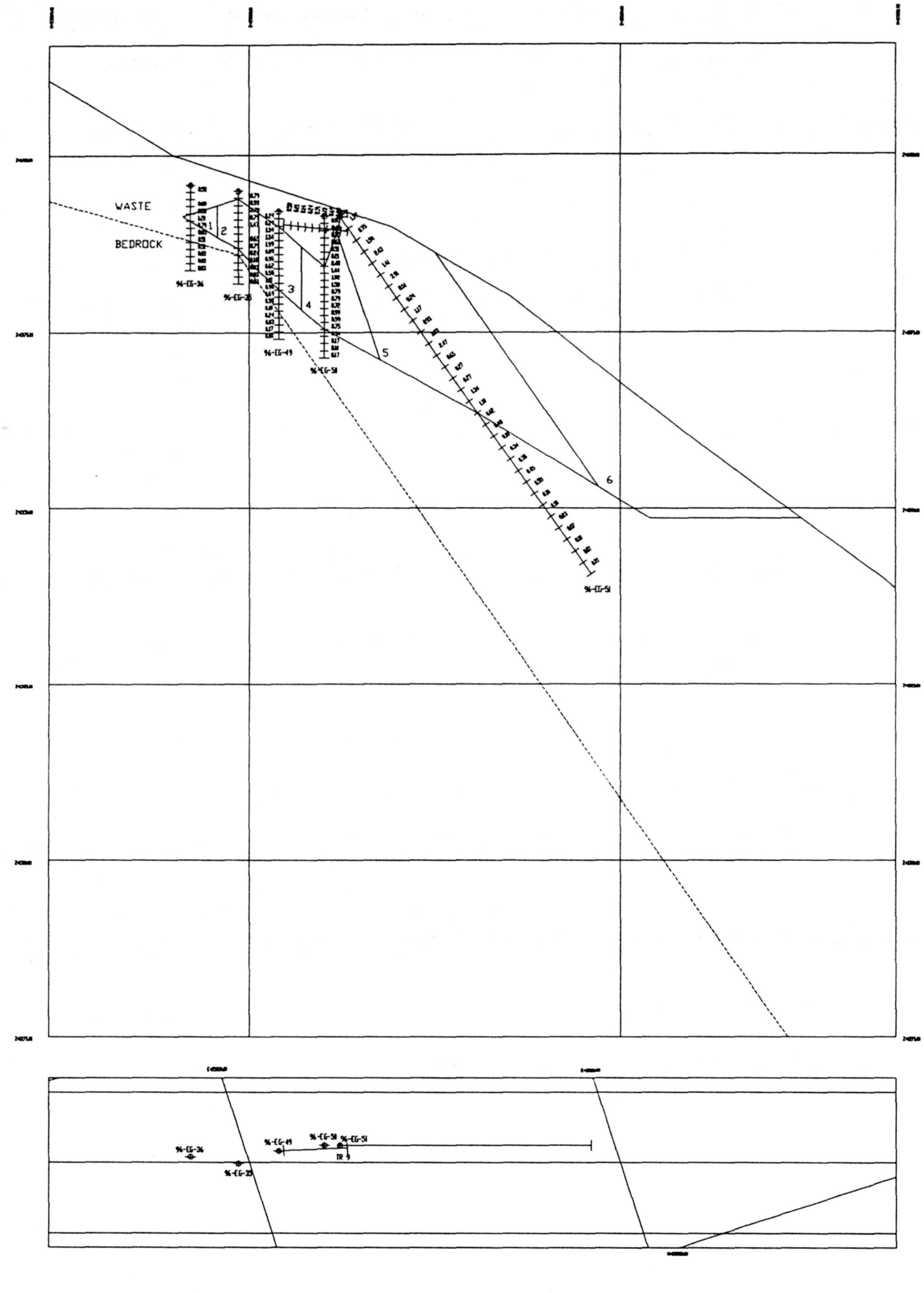
REVISIONS		
No	Item	Date

NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 8

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

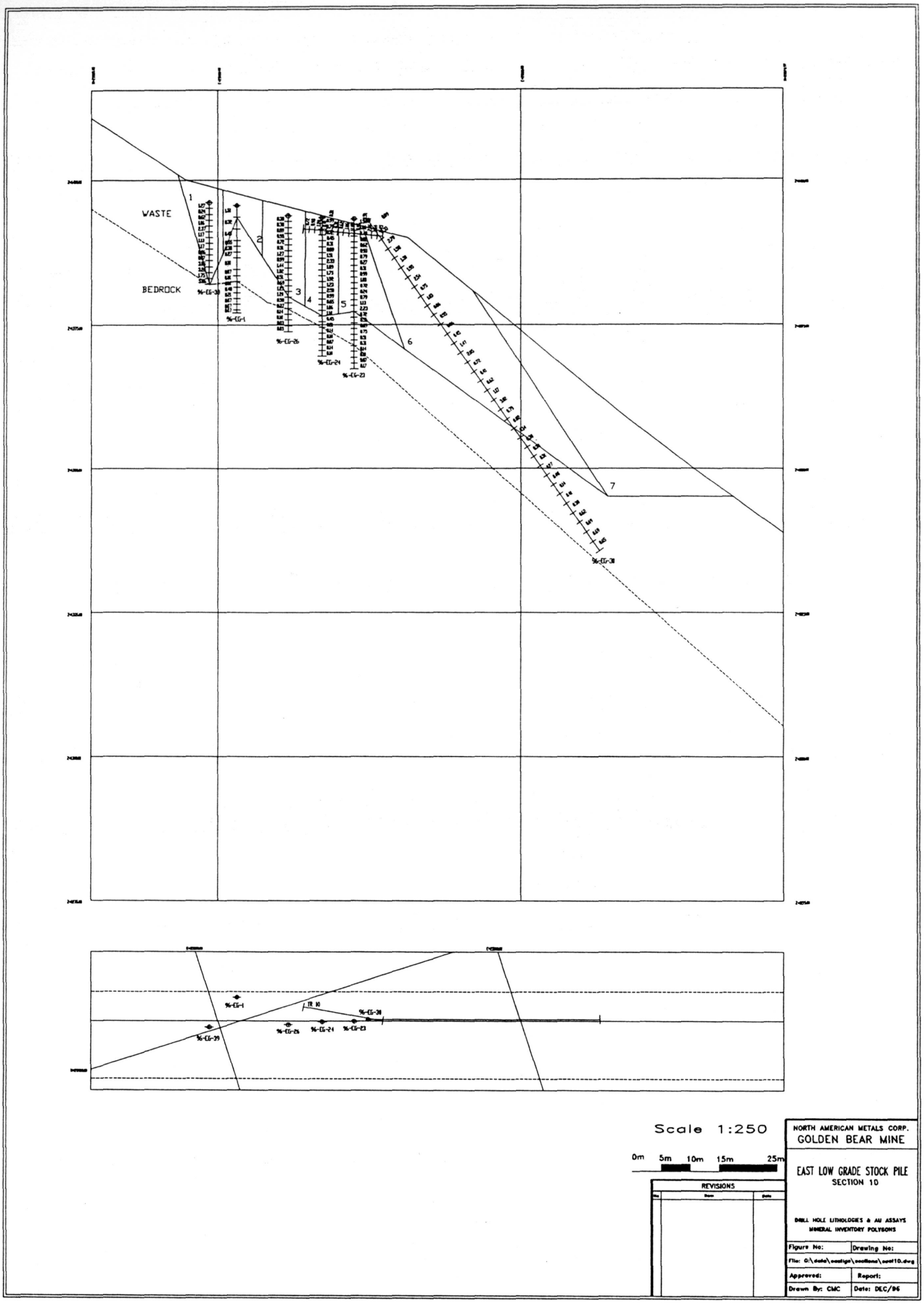
Figure No:	Drawing No:
File: G:\data\eelgs\sections\sec18.dwg	
Approved:	Report:
Drawn By: CMC	Date: DEC/96

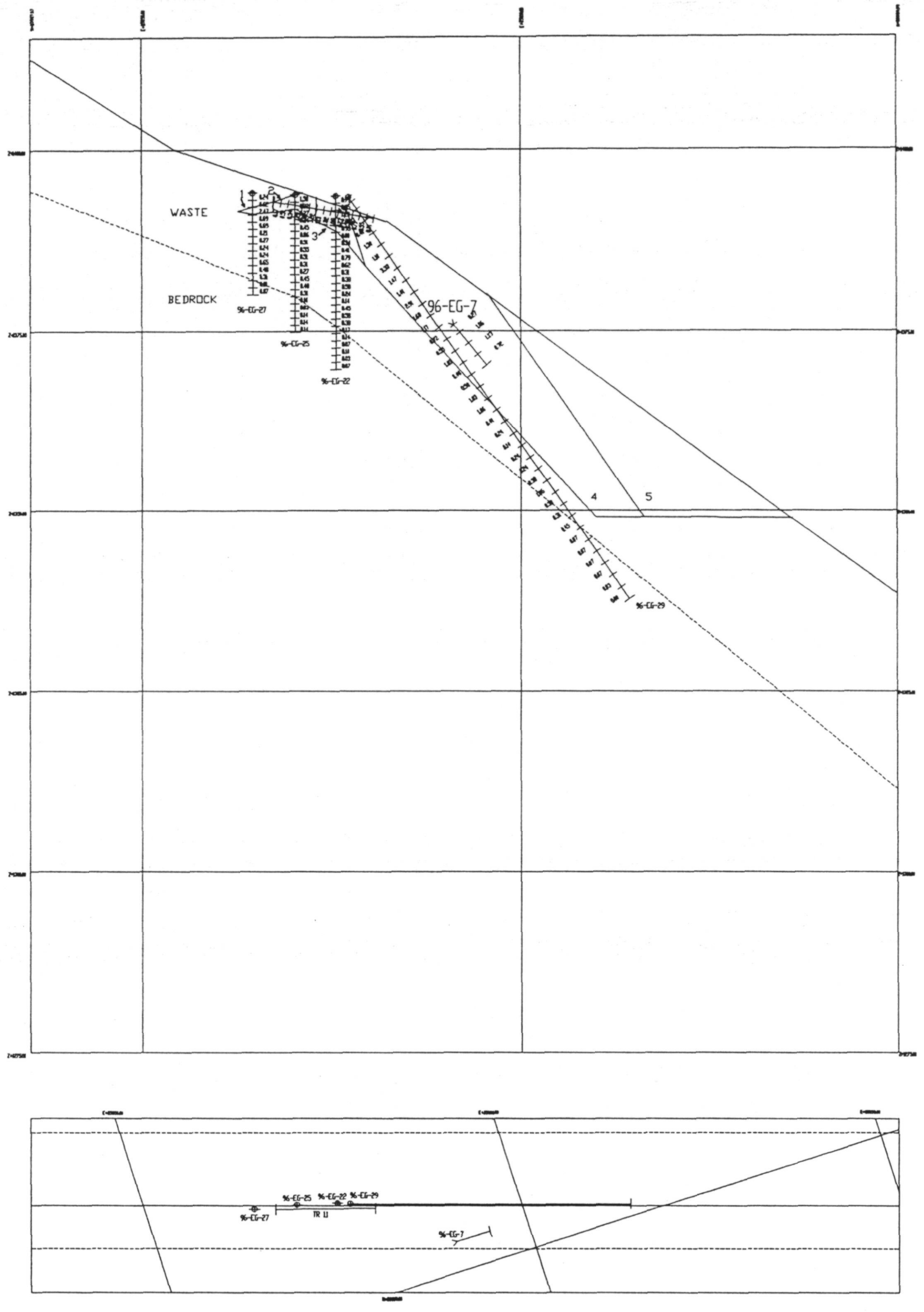


NORTH AMERICAN METALS CORP. GOLDEN BEAR MINE	
EAST LOW GRADE STOCK PILE SECTION 9	
DRILL HOLE LITHOLOGIES & AU ASSAYS MINERAL INVENTORY POLYGONS	
Figure No:	Drawing No:
File: D:\data\eastlgs\sections\sec09.dwg	
Approved:	Report:
Drawn By: CMC	Date: DEC/96

REVISIONS

No	Item	Date


WASTE
BEDROCK
1
2
3
4
5
6
7
96-EG-1
96-EG-26
96-EG-24
96-EG-23
TR 10
96-EG-30
96-EG-39
Scale 1:250
0m 5m 10m 15m 25m
REVISIONS
NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE
EAST LOW GRADE STOCK PILE
SECTION 10
DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS
Figure No:
Drawing No:
Approved:
Report:
Drawn By: CMC
Date: DEC/96



Scale 1:250

0m 5m 10m 15m 25m

REVISIONS

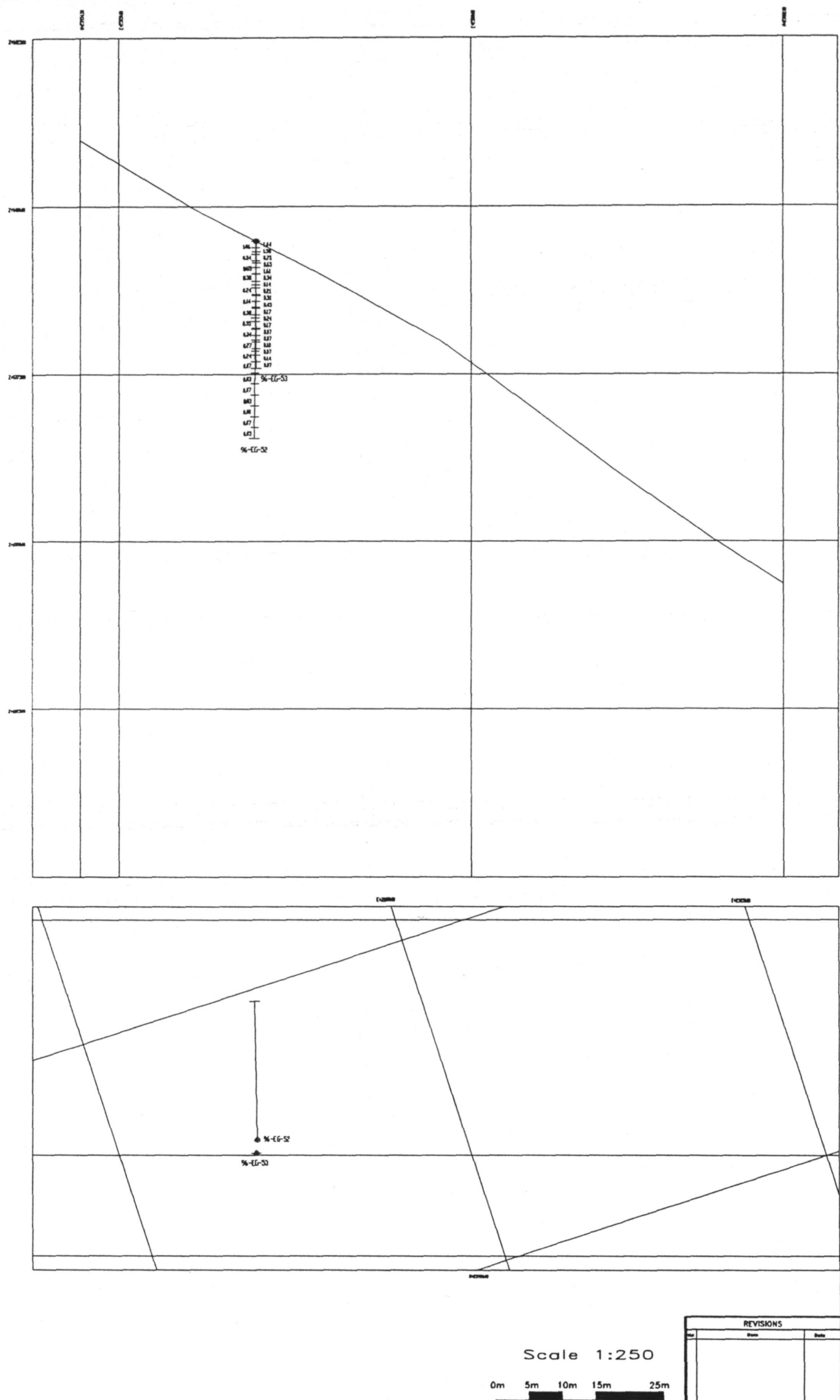
NORTH AMERICAN METALS CORP.

GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 11

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: D:\data\eastlgs\sections\sect11.dwg	
Approved:	Report:
Drawn By: CMC	Date: DEC/96



REVISIONS

NORTH AMERICAN METALS CORP.
GOLDEN BEAR MINE

EAST LOW GRADE STOCK PILE
SECTION 11b

DRILL HOLE LITHOLOGIES & AU ASSAYS
MINERAL INVENTORY POLYGONS

Figure No:	Drawing No:
File: G:\data\eeelgs\sections\sect11b.dwg	
Approved:	Report:
Drawn By: CMC	Date:

9.0 SURVEY CONTROL

Survey control and a local mine grid were established at Golden Bear in the early 1980's when Chevron Minerals was carrying out initial exploration work on the property. This mine grid has been maintained and survey stations added as necessary. A listing of all survey station coordinates is given in the following table and their locations are shown on Figure 9.0-1. Computer survey data is stored on NAMC's server under G:\data\qpro\survey.

STATION NUMBER	NORTHING	EASTING	ELEVATION
B1	22900.870	25797.870	961.980
B10	24807.250	24579.980	1836.410
B11	23447.360	25172.630	1212.260
B2	24389.276	25231.487	1497.632
B3	24057.980	24774.770	1578.730
B33	23800.260	24965.010	1428.100
B35	23874.450	24990.950	1430.170
B39	24556.920	24955.330	1316.680
B40	24557.850	24785.800	1655.240
B42	24163.130	24991.520	1474.650
B43	23734.560	24998.000	1385.900
B7	24078.200	25206.280	1363.250
B8	22889.110	25415.410	971.440
B9	25000.000	25000.000	1793.400
BANDIT LCP	8344.307	25653.697	2164.829
BM1	21783.026	24887.964	982.461
BM11	23214.111	25682.834	1005.672
BM13	22430.330	24345.519	959.841
BM14	22880.186	25194.618	979.019
BM16	22693.214	24149.591	1183.975
BM17	23279.960	25280.620	1121.579
BM18	23888.282	24904.365	1485.167
BM2	21558.973	23799.971	1011.602
BM21	23147.697	25378.996	1027.992
BM23	23560.525	24984.521	1296.373
BM24	23074.610	25677.571	989.919
BM24r	23074.610	25677.571	989.919
BM25	23176.775	25698.115	997.633
BM26	22129.800	23889.630	960.410
BM29	23414.450	25853.879	1082.808
BM3	23325.003	25900.127	1054.386
BM4	23792.733	24893.855	1442.850
BM6	24015.317	24836.545	1540.969
BM8	23007.067	25426.729	977.893
XP9	24559.530	25500.740	1548.220
T2r	26537.873	24994.285	1945.186
T29	25375.113	24624.211	1869.254
T2	26537.873	24994.285	1945.186
S62	26233.212	25320.650	1746.541
S63	25915.638	25364.631	1701.058
S64	25905.001	26325.829	1642.820
S65	25829.339	25046.066	1741.969
S68	23113.475	25469.971	985.447
S69	23065.089	25529.243	983.909
S70	23151.350	25618.303	993.995
S71	23236.783	25346.979	1079.713
S72	23901.867	24909.736	1430.567
S73	23920.629	24906.293	1446.239
S74	23143.227	25520.966	986.197
S75	23578.270	25095.297	1273.238
S76	22054.274	22815.240	971.403
S77	22245.914	22790.973	979.316
S78	22213.891	23426.194	977.648
S79	22303.514	23313.528	977.498
S80	22357.106	22803.510	996.262

STATION NUMBER	NORTHING	EASTING	ELEVATION
S81	22262.465	22784.161	982.604
S82	26213.622	24519.002	1945.338
S83	24038.081	25262.632	1335.289
S84	23996.216	25189.326	1330.925
S85	23729.007	25011.787	1376.759
S86	24288.486	24859.600	1537.601
S87	23764.388	24935.748	1376.249
S88	24282.347	24863.461	1534.977
S89	23229.834	25332.806	1083.715
S90	23225.201	25340.806	1081.449
S91	26200.538	24391.818	1941.067
S92	26160.454	25687.456	1646.397
S93	26102.978	25129.919	1740.708
S94	26225.059	24555.369	1947.816
S96	26196.178	24390.270	1943.933
S98	25954.480	24905.211	1746.280
S99	26181.480	24383.602	1944.853
S100	23230.847	25341.040	1081.029
S101	26063.653	25612.606	1653.525
S102	26011.980	25631.087	1677.547
S103	26099.350	24381.194	1959.839
S104	23232.263	25340.983	1081.233
S106	25825.487	24935.077	1746.784
S201	22194.174	24196.242	957.751
S202	20980.362	23552.911	1484.507
S203	19476.861	23951.812	1917.479
S204	18530.000	23380.057	1951.107
S205	16890.012	23217.440	1629.249
S206	14614.728	22779.437	1171.413
S207	14197.769	23498.673	1437.277
S208	12328.381	23341.011	1737.182
S209	10490.462	23652.824	2170.329
S210	10227.461	23709.962	2164.542
S211	8567.603	24232.587	2190.639
S212	8340.304	25652.409	2164.883
S213	7305.327	26443.954	1494.628
S214	7533.010	25402.162	1734.624
S215	7880.400	24263.842	2014.959
S250	28149.469	24584.811	1705.856
S251	29735.917	23626.528	1804.696
S252	30670.451	23505.159	1995.082
S253	30007.183	23054.090	2006.802
S254	32405.661	22940.344	2046.710
S255	33732.110	23045.627	1833.355
S256	33273.906	23762.299	1954.471
S257	26884.969	24735.883	1876.326
S257	26884.969	24735.883	1876.326
S258	27150.348	24046.459	1788.203
S258	27150.348	24046.459	1788.203
N36	23954.072	24914.773	1362.789
N37	23963.966	24900.511	1362.289
N52	23921.977	24917.197	1362.218
N69	23821.098	24908.629	1387.991
N70	24661.575	25640.523	1520.430
N71	23831.312	24925.073	1387.589

STATION NUMBER	NORTHING	EASTING	ELEVATION
N78	25679.209	26283.601	1635.290
N82	26045.288	25347.728	1695.875
N83	26159.485	25576.558	1667.875
N85	25509.678	24668.294	1842.779
N88	24224.559	25826.774	1366.770
N94	24893.106	25967.444	1529.808
N95	24967.981	26001.126	1539.107
N96	25082.209	26068.191	1550.097
N97	25564.320	26299.968	1605.432
LPM199	23499.759	25052.928	1027.802
LPM213	23642.673	25047.978	1006.108
LPM218	23655.159	25048.818	1004.432
LPM222	23760.608	25047.994	986.609
M111	23804.658	25014.598	1398.361
M111rr	23804.638	25014.678	1398.642
M188	23315.989	25127.510	1056.240
M209	23586.954	25043.857	1015.572
M210	23247.778	25313.457	1085.218
M211	23612.222	25039.317	1011.044
M212	23626.709	25037.646	1008.598
M213	23640.656	25047.885	1006.258
M214	23676.807	25049.187	1000.142
M215	23548.866	25046.812	1020.990
M216	23692.371	25049.131	997.312
M217	23707.415	25049.452	995.929
M218	23652.443	25048.850	1005.004
M219	23723.149	25049.121	993.238
M220	23738.866	25048.906	990.497
M221	23752.317	25049.072	987.838
M222	23758.502	25047.985	986.773
M225	23807.139	25049.537	979.350
M131	23602.144	25029.952	1014.067
M132	23846.750	25049.735	973.961
M130	23832.059	25047.794	975.859
M133	23641.391	25036.160	1006.877
M134	23550.945	25044.322	1020.490
M135	23865.340	25048.723	972.104
M136	23879.201	25048.150	969.215
M137	23891.855	25047.772	967.508
M128	23911.341	25049.706	965.172
M138	23935.645	25057.859	962.077
M139	23948.879	25062.018	960.170
M141	23854.999	25046.731	973.760
M142	23801.145	25046.724	980.862
M143	23749.412	25036.343	988.688
M144	23637.694	25037.245	1007.608
M145	23961.972	25065.833	958.291
M146	23970.654	25067.081	958.440
M147	23900.108	25048.620	966.945
survey stations in the kodiak north /ursa area			
J01	26065.310	24364.520	1966.065
J02	25869.342	24285.167	1982.458

STATION NUMBER	NORTHING	EASTING	ELEVATION
J03	26328.131	24383.038	1905.613
J04	26527.505	24544.993	1906.845
J05	26603.669	24363.536	1850.921
JO7	26002.272	24204.287	1945.364
TH1	26873.265	23776.573	1815.933
TH2	26431.025	23299.988	1845.745
TH3	26205.382	22897.754	1876.986
TH4	25946.317	22580.293	1872.503
TH5resurvey	25986.028	22137.822	1910.686
TH6	25901.725	23270.290	1838.459
TH8	25873.424	21363.190	2023.922
TH9	25547.830	24256.057	2032.470
TH10	25107.602	24057.261	2070.129
TH11	24971.230	23855.049	2060.651
TH12	24882.653	23804.847	2048.220
TH13	24600.395	22957.659	1928.039
TH14	24723.805	22217.309	1885.810

10.0 CONCLUSIONS AND RECOMMENDATIONS

From late 1993 to the end of 1996 North American Metals Corp. has carried out an aggressive program of exploration on it's Golden Bear property in northwestern British Columbia. During this period a total of 12.2 million dollars (Cdn) has been spent in exploration on the property.

Gold mineralization is localized in breccia zones along brittle failure fault structures, primarily within the Ophir Break, a regional scale strike slip fault system. Two styles of gold mineralization are present: oxide mineralization which is hosted entirely in Permian carbonate rocks, and pyritic refractory mineralization which is hosted either in sheared and gougy volcanic rocks of the Stuhini Group or in carbonate rocks in fault contact with volcanic rocks. Both styles of mineralization are consistent with Carlin trend models.

Over three and a half years the program has successfully discovered and defined a total of 1,500,000 mineable tonnes grading 5.1 grams per tonne gold in the Kodiak A, Kodiak B and Ursa deposits. These reserves, which contain a total of 214,000 recoverable ounces of gold, have now been placed in a five year mining plan. A further 140,000 ounces gold at resource status have been outlined in the Grizzly Zone and East Low Grade Stockpile. In addition a number of zones of insitu gold mineralization have been discovered that warrant further investigation.

It is felt that there is excellent potential to locate additional mineral resources on the Golden Bear property.

Recommendations for further work on the property are as follows:

Geochemistry - a large portion of the property has been covered in the past in the last three year by soil grids, resulting in several significant discoveries (Ridge, South and C & C Zones). Two areas require coverage: the southern portion of the plateau to the west of the Limestone Creek Fault, and portions of the Totem Silica Zone that have not been previously tested. It is anticipated that 1000 samples will need to be collected to cover these areas.

Grizzly Zone - the main zone of Grizzly mineralization remains open to the north and requires drill testing in this direction. Initial drilling would be carried out from surface with a return to underground drilling if sufficient potential is indicated to justify the dewatering and extension of the current underground workings.

Kodiak C Zone - the Kodiak C Zone is open downdip and is an attractive target for exploration due to it's proximity to the proposed Kodiak B underground workings. A diamond drilling program consisting of seven widely spaced hole is proposed to test the potential for economic grade and tonnage.

Ridge Zone - the Ridge fault has been identified as a gold bearing structure with at least one significant mineralized dilatant zone. The dilatant zone needs to be tested at depth by drill holes at 60 metre spacing to assess the area for mineralization of economic grade and tonnage. In addition the structure needs to be tested along strike to the north for other mineralized dilatant zones, with step outs of at least 100 metres being recommended.

South Zone - work in this area to date has identified a mineralized structure that hosts gold grades of up to 20 grams per tonne. Additional trenching of the fault should be carried out where significant gaps in previous work occur. In addition the South Zone should be subject to further drill testing with targets to be selected based on best potential for structural dilatancy. In particular the intersection of the South and Ridge Faults may be an attractive target.

C & C Zone - work in the C & C Zone has identified two mineralized lithologies, one insitu and the other in a float boulder train. Both require further work. The insitu mineralization is open to the south and requires further trenching. The source of the high grade mineralization in the boulder train has not been established. In order to gain a clearer picture of the origin of the boulder train a geologist or prospector specializing in glacial terrain could be hired on a contract basis. Geochemically, the area should be tested by some deep soil pits to the north and northwest of the up ice terminus of the boulder train. Compilation of all existing data for the periphery of Sam Glacier would assist in assessing this area.

Limestone Creek Fault - drilling on coicident geochemical and geophysical anomalies successfully intersected the Limestone Creek Fault, with significant gold values returned from one of three holes that pierced the structure. Additional drilling is needed to test below this intersection and to test this large structure on strike, particularly to the north where geochemical values appear the strongest.

East Low Grade Stockpile - results from reverse circulation drilling in 1996 indicate that the East Low Grade Stockpile contains 38,823 ounces of gold. The next step would be to assess the economic feasibility of mining this resource. The experience of constructing the Fleece Bowl heap leach pad should help in this assessment.

Prospecting and Trenching - examination of the geochemistry plots, rock sampling plots and earlier compilations by Homestake indicate that there are several areas on the Golden Bear Property that require further investigation. These include:

- a soil geochemistry anomaly immediately north of Helen Bowl: the anomaly has the same geochemical signature as the Kodiak A, Ridge and South Zones, with the exception of gold, and a large fault or fracture zone that can be seen in the wall of Helen Bowl may be related. Prospecting, the collection of deep soil samples and trenching is recommended for this area.

- the Helen Bowl Carbonate lens: several grab rock samples from outcrop in this area returned 1.0 to 2.0 grams per tonne gold. Channel sampling of these outcrops is needed to determine the extent of mineralization.

- Highway Creek: lying to the northwest of the Kodiak A deposit is a fault bound sliver of carbonate rocks from which a grab sample returned 1.34 grams per tonne gold, and within which hematitic carbonate breccias have been mapped. The area requires additional mapping and rock sampling work.