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Tom Schroeter
Oct. 2/05
– site visit
– GRANDUC

TECHNICAL REPORT

GRANDUC PROPERTY
NORTHWESTERN BRITISH COLUMBIA, CANADA

Skeena Mining Division

104B/1E, 1W, 8W

Latitude: 56°14'
Longitude: 130°20'

Owner:

Bell Resources Corporation

By:

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303-5455 West Boulevard
Vancouver, B.C. V6M 3W5

Date:

May 20, 2005

SUMMARY

The Granduc deposit, located 40 km northwest of Stewart in northwestern British Columbia (Fig. 1), is a copper-rich syngenetic volcanogenic massive sulphide deposit hosted in strongly deformed volcanic, chemical, and clastic sedimentary rocks. Total mineral inventory calculated by Newmont, in 1966, for in-situ resources above the 1600 level, was 39,442,403 tonnes grading 1.73% copper (Schmidt, et al 1983). Unpublished figures from 1968 to 1984 were 15.42 million tonnes of production (Melnyk, 1991). Low copper prices forced the closure of the mine and demolition of the mill facilities in 1985. Prior to the closure of the mine, the remaining resources were estimated to be 5,083,178 tonnes, grading 1.84% copper, not including the resources in the North Zone (Schmidt, et al 1983). Historical mineral inventories were prepared during the operation of the Granduc mine and are not compliant with current national standards for disclosure of mineral resources. These figures must be considered geological information only, for the purposes of this report.

The Granduc Property is 100% beneficially owned by Bell Resources Corporation ("Bell"), and consists of a central parcel of 64 Crown Granted mineral claims, comprising 1090.97 hectares, subject to a 2% Net Smelter Return payable to Glencairn Gold Corporation, which can be purchased by Bell for cash payments totaling $1.5 million dollars.

Rocks mapped on Granduc Mountain and to the north are separated into two easily recognizable geological successions (Figs.2, 3): Upper Triassic and Lower to Middle Jurassic age successions, termed in earlier studies the western and eastern series, respectively. The Triassic and Jurassic successions are separated on the Granduc property by the north-northwest striking South Unuk shear zone (Fig. 2; Lewis, 1994).

The Late Triassic or older strata are correlated with the Stuhini Group. They consist of moderately to highly foliated schists, phyllites, marbles and gneisses. North of Granduc Mountain and the North Leduc Glacier, Late Triassic rocks are subdivided into six lithological rock types; similar rock types on Granduc Mountain (units 1-8) have been described by Klepacki and Read (1981) and include the Granduc Mine series (McGuigan and Tucker, 1981). U-Pb analyses of zircons collected from the Western series mafic volcanic rocks (North zone) are 230.5 $\pm$ 14 Ma (Childe, 1994). An intermediate sill that intrudes the mafic volcanics has an identical age within error of 232 $\pm$ 3 Ma .

The Lower to Middle Jurassic age Eastern series rocks are correlated with the Lower to Middle Jurassic Hazelton Group. They consist of relatively undeformed, mainly volcanic rocks that are subdivided into three conformable stratigraphic units (units 15-17). U-Pb analysis of zircon from dacitic tuffs (unit 16) north of the North Leduc Glacier returned a date of 186.8 $\pm$ 9 Ma. An identical age within error of 185.4 $\pm$ 9 Ma was obtained from a felsic lapilli tuff approximately 7 km to the south (Childe, 1994). This unit is similar in age to felsic units in the footwall of the precious metal rich Eskay Creek massive sulphide deposit (Bartsch, 1993) and correlate with the Betty Creek formation.

The South Unuk shear zone is a north-northwest striking subvertical fault that has dominantly a sinistral sense of displacement; it is mapped from the Iskut River area south to Granduc Mountain, a distance of 60 km (Lewis, 1994). The shear zone terminates at the contact with the younger Coast Range intrusive suite lying south of the Granduc Property.

On Granduc Mountain, and to the north (Divelbliss, Duke and North Leduc areas), Late Triassic rocks record strongly heterogeneous deformation with a large component of simple shear in a ductile to semi-brittle environment; these features indicate Western Series rocks should be included as part of the shear zone (Lewis, 1994). The linear associated with the South Unuk shear zone north of the North Leduc Glacier is on trend with the HKF fault mapped by McGuigan and Marr (1979). The HKF fault is a north-northwest striking steeply dipping fault; locally, a ultramafic horizon of dunite, talc-chlorite schist and chlorite-serpentine schist occurs along the fault.

The first two phases of deformation are the most intense and affected the distribution of orebodies underground in the Granduc Mine. Lewis (1994) attributes F1 and F2 folds on Granduc Mountain to progressive deformation associated with the South Unuk shear zone. This new interpretation is significant because according to Lewis (1994) a major F1 fold is unlikely, and its postulated occurrence should not be used to guide exploration.

A limited lithogeochemical study of mainly Western series rocks from the North zone (Fig. 4; Granduc Mountain) indicates the volcanic rocks are mainly mafic with a tholeiitic magma affinity (Barrett, 1994). These rocks are most like mid-ocean ridge or marginal basin basalts (Wilson, 1989). However, the slightly enriched LILE and gentle negative REE pattern suggests some crustal contamination from a subduction zone. Rocks logged as 'cherty tuff' or 'dacitic tuff' have REE patterns similar to that of the mafic volcanic rocks indicating they are not dacitic in composition as logged in the field. A 'mafic 'sill (field term) within the Footwall series rocks is chemically intermediate in composition and has a similar, but elevated REE pattern compared to the mafic volcanics. The similar REE element chemistry and the identical U-Pb (zircon) dates from these units suggest they are genetically related. The intermediate sill is similar in composition and age to the Bucke Glacier stock and is tentatively correlated with this suite of intrusions.

Lead (galena and microcline) isotope analysis of two samples from the B orebody indicate the lead is relatively non-radiogenic, and compared to mineralization of known age within Stikinia, indicates a pre-Jurassic age (Childe, 1994).

The Granduc property contains very significant volumes of mafic to intermediate volcanic rocks within a clastic sedimentary succession of Upper Triassic age. The Granduc deposits, including those of the North Zone and the South Zone (Fig. 4), demonstrate a world class scale of Besshi-type copper-silver volcanogenic massive sulphide deposits. The focus on this exploration program should be for the discovery of a new, large massive sulphide deposit. The Granduc deposit has strong similarities to the Windy Craggy deposit. The Windy Craggy is the largest Besshi deposit in the world and contains between 210 and 320 million tonnes of ore grading 1.66% copper, 0.09% cobalt, 3.5 grams silver and 0.2 gram gold.

Data from past operations indicates it is reasonable to target the following deposit characteristics:

(a) **Besshi-type massive sulphide targets** for 40 to 150 million tonnes of 2 to 2.5% copper with zinc, silver, gold and cobalt contents, should the geology prove to be consistent with the previous operation;

(b) **Higher grade Besshi-type massive sulphide deposits**, more proximal to a vent source, stringer zones and with superior deposition sites; South zone grades show this is possible and North Zone geology also shows promise for vent-proximal targets (Fig. 4);

(c) **Plunging zones of very high grade massive sulphides**, in areas of remobilization and structural repetition by F_2 fold structures;

Exploration is recommended in the following target areas to test for Besshi volcanogenic massive sulphide deposits:

(a) **Target 1: Down plunge of the existing Granduc deposit,** in areas down plunge of the thickest and highest grade orebodies, the F and B_1 (Fig. 4)

(b) **Target 2: South Zone,** beneath areas grading in excess of 3% copper.

(c) **Target 3: Under the South Leduc glacier.** The B_1 orebody forms a distinct magnetic anomaly which was traced under the South Leduc glacier (Fig. 4). These horizons are probably modified by F_2 folds, with steep to vertical plunges.

(d) **Target 4: North Zone.** Alteration indicates that this zone is proximal to a feeder zone, and higher grades might be encountered (Fig. 4).

(e) **Target 5: F Zone Extension.** The F zone terminates on its northern extremity against the Granduc Fault (Fig. 4). Reconstruction of movement on the Granduc and Western faults, indicates a target area in the western side (hanging wall) of the Western fault zone. Target 5 is located at the same elevation as the F orebody, but approximately 1 to 4 km north-northwest.

A two phase exploration is recommended to follow-up on the Targets 2 through 5: (i) **Phase One** comprises airborne geophysical surveys, 2500m of diamond drilling and technical work, at an estimated cost of **$1,518,000**, (ii) **Phase Two**, is success contingent on Phase One, and is for 6000m of diamond drilling and comprises **$2,068,000**. The total recommended **Phase One and Phase Two is for $3,586,000.**

INTRODUCTION

The author was requested by Bell Resources Corporation to prepare an overview of the geology and exploration potential of the Granduc Mine property. The technical report was prepared under the guidelines of National Instrument 43-101 (the "Instrument") to identify exploration targets and guide the next phase of exploration, with a major emphasis on the testing of new copper-silver targets within the Upper Triassic succession. The known Granduc copper-silver deposits are included in this overview, but a re-evaluation of the mineral resources reported by past operators is beyond the scope of this report.

Field involvement of the author in the Granduc spans all programs since 1979 on the property. The author was a Senior Geologist for Esso Resources Canada at the time of their operation of the Granduc Mine from 1979 to 1984. He led the geological teams that mapped the surface of the mine property (McGuigan and Marr, 1979), surface diamond drilling and re-establishing underground mapping procedures (McGuigan, 1981). The author is a principal of Cambria Geological Ltd. that conducted surface geological mapping and re-logging of diamond drill core (Melnyk, 1991; McGuigan, et al 1992; and Dawson, et al 1994). The author visited the site of the Granduc mine in 2004, and observed no evidence of work since the decommissioning of the mine site in 1984. He has personally supervised and attended the field work on each of the above cited programs. No other field programs have been conducted on the property to the date of this report.

In preparing this report, the author relies upon the assistance of Don Harrison, P. Geo. and Tyler Ruks, M.Sc.. (Geology) The work of Barrett (1994), Lewis (1994), Childe (1994) (of the Mineral Deposits Research Unit ("MDRU") of the University of British Columbia) and Klepacki and Read (1981), is used extensively in this report. All were sub-contractors to programs supervised by the author on the Granduc. McDonald (1981) contributed an early study on the petrography.

DISCLAIMER

The author relies on several mineral resource calculations (and reconciliations to production) on the Granduc deposit prepared by qualified independent mining consultants, and by Newmont and Esso professionals during the period 1963 to 1983. These mineral resource calculations appear to conform to standards in use during the periods that the each calculation was made. They appear acceptable to the author with the qualification that they be considered geological information only. However, none of these mineral resource calculations meet current standards for reporting of mineral resources in Canada under the Instrument.

PROPERTY DESCRIPTION AND LOCATION

The Granduc Property is located in northwestern British Columbia, Canada (Fig. 1). The property, location and ownership interests are as follows:

(a) the Granduc property is comprised of 64 Crown Granted claims that total 1090.97 hectares in area (Figs. 2, 3); the list of claims is given in Appendix I, and shown of Fig. 1a. All claims are in the Skeena Mining Division. All the Crown-granted mineral claims are in a contiguous claim block;

(b) the property is located in northwestern British Columbia, 900 km northwest of Vancouver and 40 km northwest of Stewart (Fig. 1). It is located on NTS Maps 104B/1E, 1W, 8W and centered near longitude: 130°20' and latitude: 56°14';

(c) all claims constituting the Granduc property are 100% beneficially owned by Bell Resources Corporation, subject to the terms of a property purchase agreement with Glen Zinn ("Zinn"), of Roseburg, Oregon, dated November 3, 2004 and pending approval of the purchase transaction by the Toronto Stock Exchange;

(d) to complete the property purchase agreement, Bell must pay the purchase price of $34,000 to Zinn, issue 1,000,000 common shares of Bell to Zinn and issue 100,000 common shares of Bell to Glencairn Gold Corporation ("Glencairn"), to satisfy Zinn's obligations to Glencairn;

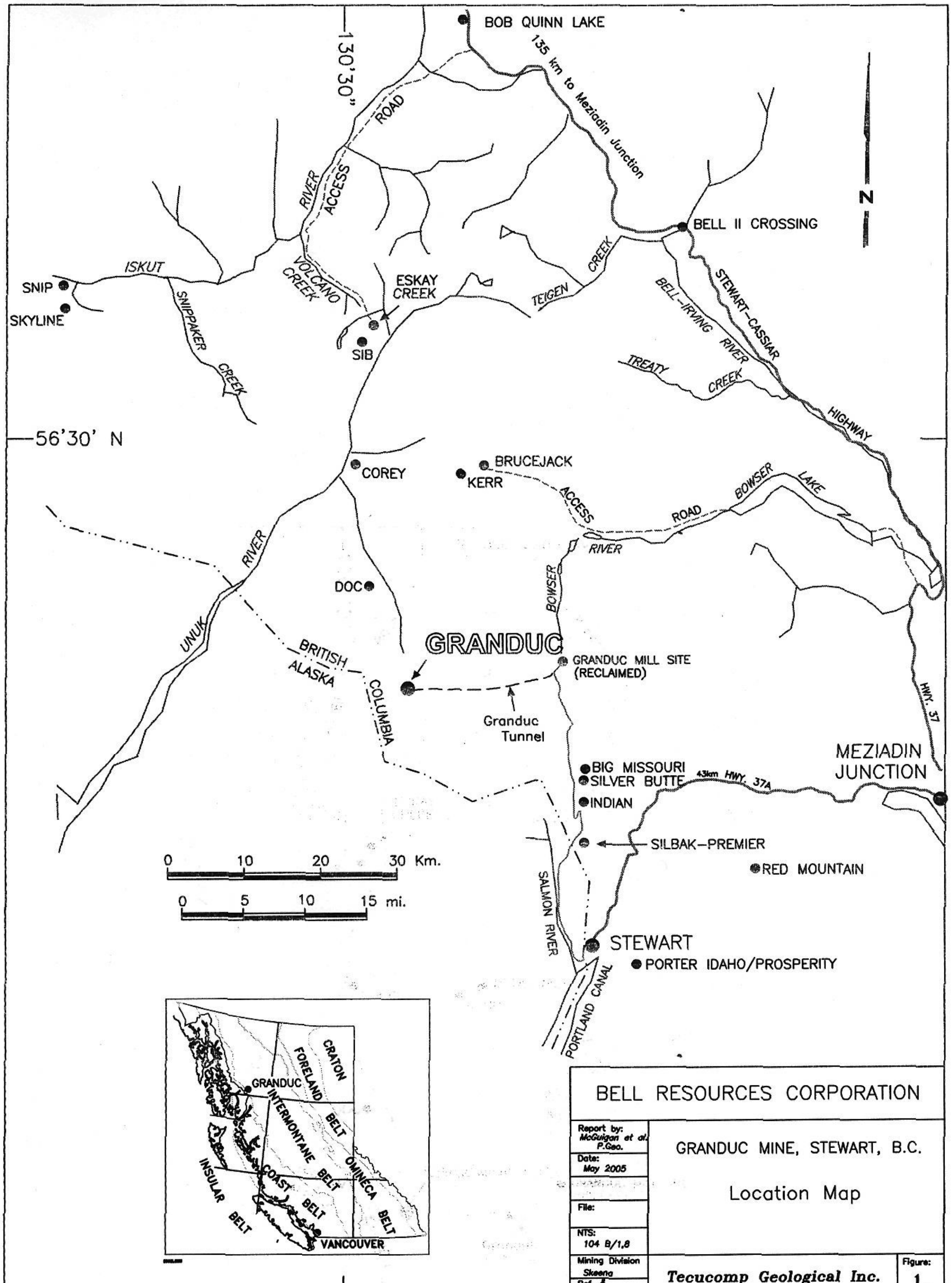
(e) the Granduc property is subject to a 2% Net Smelter Royalty (NSR), payable to Glencairn; the NSR can be purchased by Bell for $500,000 for the first one percent (1%) and $1 million for the remaining one percent (1%);

(f) taxes are fully paid on the Crown Granted claims and the titles are in good standing;

(g) the Crown Granted claims were legally surveyed as part of the granting process and the locations of those surveys has been tied into Hole 1 survey monument, coordinates for which are known in both the Granduc Mine Grid and in relation to first order survey monuments in the area of the mine;

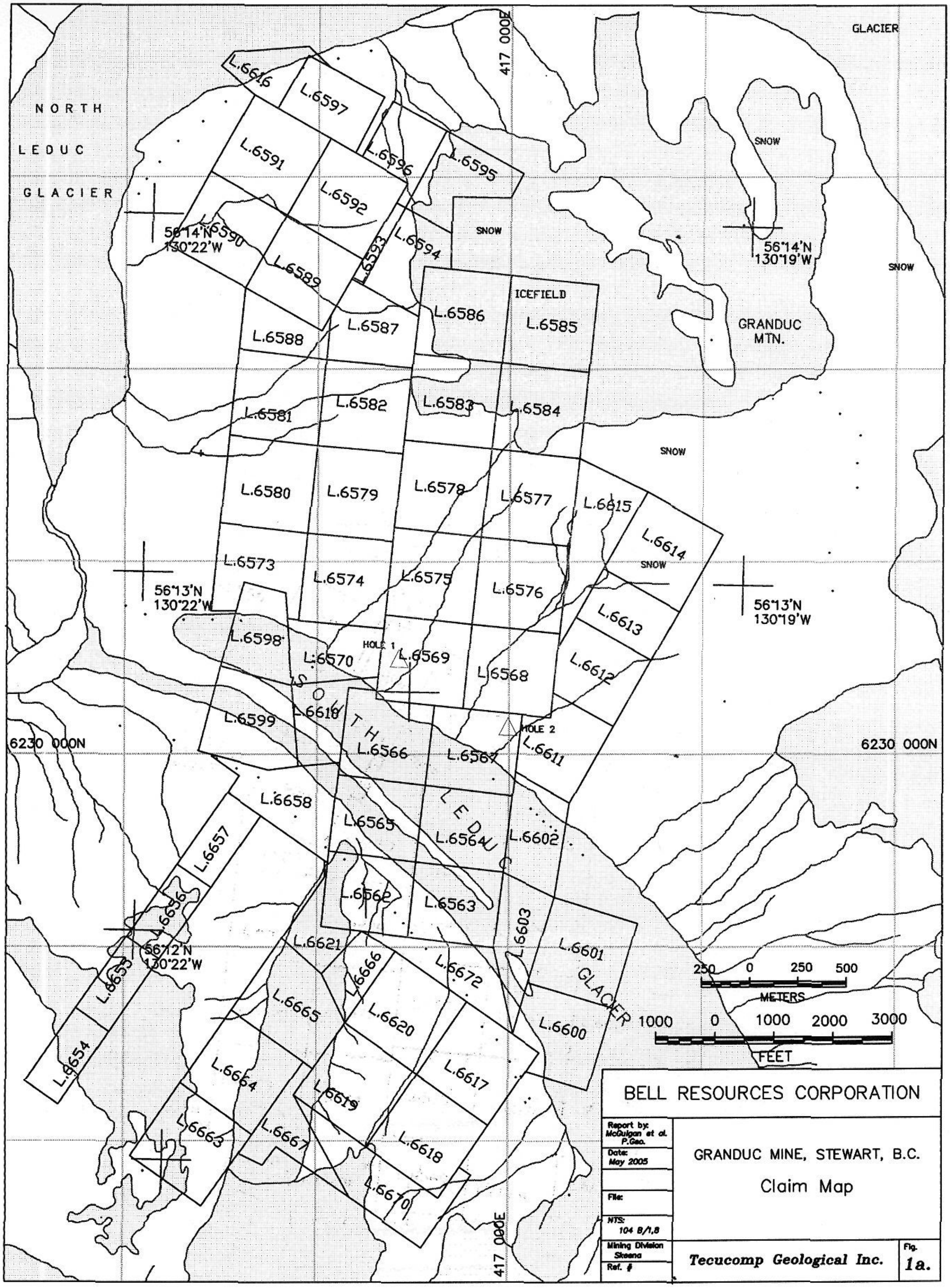
(h) Bell reports no royalties, back-in rights, payments or other agreements and encumbrances to which the property is subject, except to transfer the claims upon request to Bell at no additional cost, after the approval by the Toronto Stock Exchange and completion of the property purchase price. There are no obligations to other parties to hold the properties, other than disclosed above;

(i) recently, under the provisions of the new regulations, the Mining Recorder has allowed the overstaking of the Granduc property by MCX claims. These claims hold no rights to the mineral resources on the property in the opinion of the author, as all minerals except coal, petroleum and natural gas were granted to Granduc Mines NPL in its title; additionally, the new MCX claims hold no priority for the surface of the Crown Granted claims; see Appendix 2 for the Mining Recorder's records of these claims;



BELL RESOURCES CORPORATION

Report by: McGuigan et al. P.Geo.	GRANDUC MINE, STEWART, B.C.
Date: May 2005	Location Map
File:	
NTS: 104 B/1,8	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. #	Figure: 1.


GLACIER
NORTH
LEDUC
GLACIER
SNOW
ICEFIELD
GRANDUC MTN.
SOUTH LEDUC GLACIER
417 000E
6230 000N
56°14'N 130°22'W
56°14'N 130°19'W
56°13'N 130°22'W
56°13'N 130°19'W
56°12'N 130°22'W
HOLE 1
HOLE 2
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L.6597
L.6591
L.6596
L.6595
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FEET
BELL RESOURCES CORPORATION
Report by: McGuigan et al. P.Geo.
Date: May 2005
File:
NTS: 104 B/1,8
Mining Division Skeena
Ref. #
GRANDUC MINE, STEWART, B.C.
Claim Map
Tecucomp Geological Inc.
Fig. 1a.

(j) the author knows of no environmental liabilities to which the property is subject, the mine having been closed under proper Mines Act regulations in 1985; and

(k) to diamond drill on the property, exploration permits and bonds must be obtained; these permits, that cover the recommended program herein, have been applied for and the author expects to be in receipt of the permits before the program commences.

ACCESSIBILITY & INFRASTRUCTURE

Topography at the Granduc property is mountainous, with elevations ranging from 700 to 2000m above sea level on most of the property (Figs., 2, 3). Vegetation is mostly sub-alpine and alpine shrubbery, with significant snow and ice coverage. Valley glaciation dominates. Most prominent on the property are the North and South Leduc glaciers (Figs. 2, 3). The climate is typical of northern coastal mountain ranges.

Access is by helicopter from Stewart, B.C. or via the Tide tunnel (19.5 km) which connects underground workings at Granduc Mountain with the former mill site near Summit Lake (Fig. 2). This tunnel has been decommissioned and is not available for exploration activities. Summit Lake is accessed by a 35 km all weather road from Stewart-Hyder. Stewart has port facilities for Panamax-size ocean-going ships, and a paved 5000 ft. airstrip capable of handling prop-driven aircraft and small business jets.

In the event of a new mining operation on the Granduc property the following access alternatives are available:

(a) rehabilitation of the Granduc Tunnel and also the Summit Lake road access to tidewater in Stewart via the Salmon River valley; and/or

(b) construction of an extension to the Eskay Creek mine access road, which originates on Highway 37 at Bob Quinn lake. The end of the Eskay Creek mine access road is in the headwaters of the Unuk River, 30 km north of the Granduc property (Fig. 1). An extension road would use the valley of the Unuk River and its tributary the South Unuk River to access a possible mill site near the North Leduc glacier.

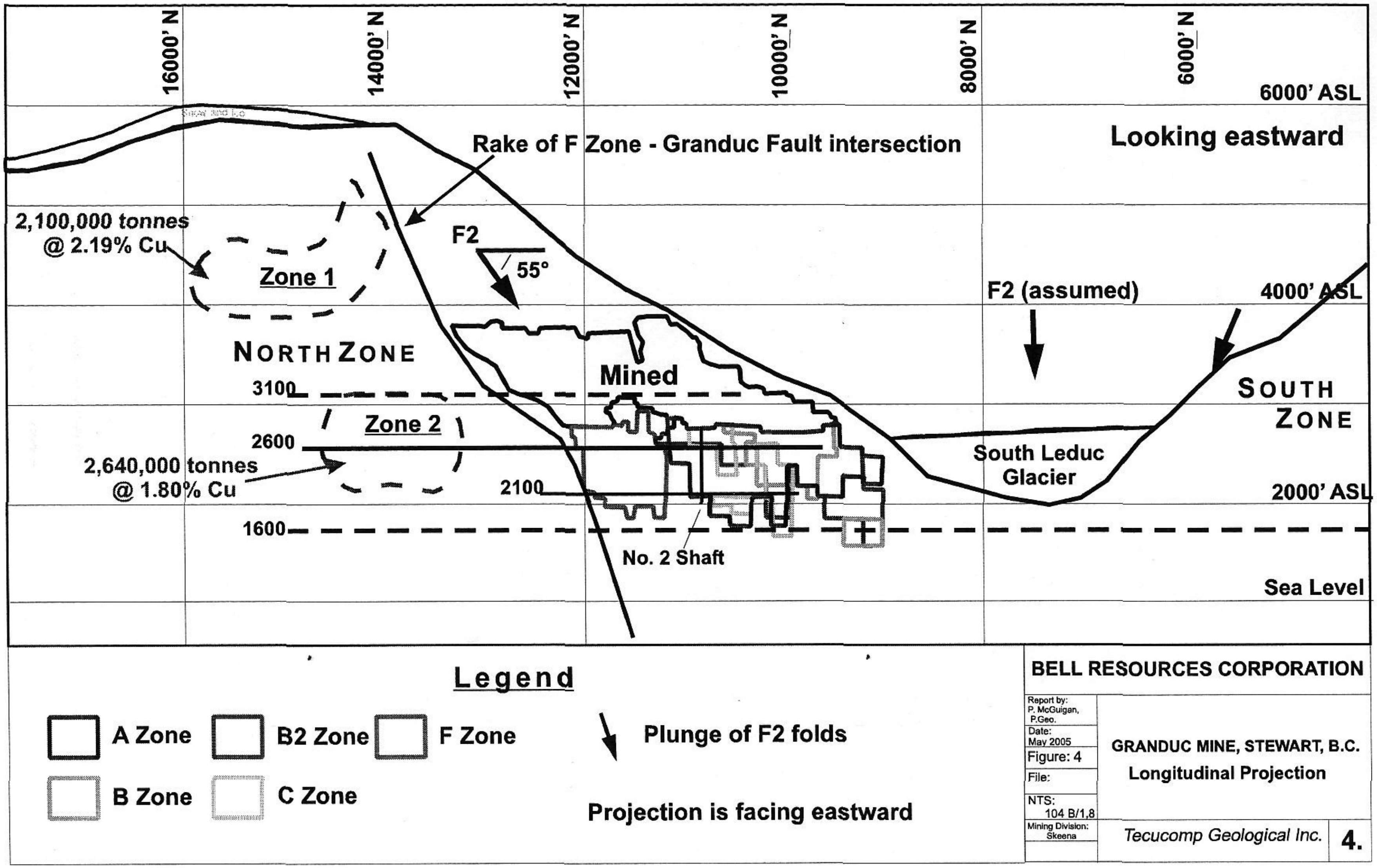
Crown Granted claims include the right to employ the surface for mine access as well as mine and mill facilities. However, other rights and permits would be required to conduct a full mining operation at this location. The Crown Grants are within the municipality of Stewart, and surface improvements are subject to municipal taxes. In the past these taxes were used to maintain infrastructure and schools for the community of Stewart where the mine personnel were housed.

HISTORY

Mineralization was first discovered on Granduc Mountain by Wendell, Dawson and W. Fromholz in 1931. E. Kvale and T.J. McQuillan staked the copper showings in 1951 for Helicopter Exploration Company Ltd. Granby Mining Company acquired the property in 1952 and completed surface and underground exploration work under their newly formed company, Granduc Mines Ltd. Newmont Mining Corporation Ltd. entered into an agreement with Granby in 1953 whereby Newmont would finance mine development. Mine development commenced in the early 1960s with production in 1968 at a mine/mill capacity of 2000 tpd. The mine was acquired in 1979 by Esso Minerals Canada (Canada Wide Mines division) and operated until closure in May, 1984. No other major mining or exploration activities were conducted after 1984.

Exploration on the Granduc property during the period 1974 to 1984 focused primarily on extending copper mineralization along strike north and south of the mine, in areas east of the Granduc fault (Fig. 3). Work during that time discovered the North Zone, located about 3 km north of the main mine workings (Fig. 4). No copper mineralization has been discovered west of the Granduc fault on Granduc Mountain.

In 1991, a small surface exploration program was funded by Hecla Mining Company ("Hecla"), controlling shareholder of Granduc Mines Ltd, (N.P.L.). The program focused on several surface mineralized zones on the Granduc property. The program consisted of surface sampling and mapping by Cambria Geological Ltd. (Melnyk, 1991). In 1993, Hecla financed a field program that retained Cambria to conduct additional mapping and sampling. Cambria conducted the work and in addition, funded the Mineral Deposits Research Unit (MDRU) of the University of BC to conduct structural mapping, geochronology and lithogeochemistry of the Granduc property (Dawson, et al, 1994). The author of this report supervised the 1991 and 1993 programs.


16000' N
14000' N
12000' N
10000' N
8000' N
6000' N
6000' ASL
Looking eastward
Rake of F Zone - Granduc Fault intersection
2,100,000 tonnes
@ 2.19% Cu
Zone 1
F2
55°
F2 (assumed)
4000' ASL
NORTH ZONE
Mined
SOUTH
ZONE
3100
Zone 2
2600
2,640,000 tonnes
@ 1.80% Cu
2100
South Leduc
Glacier
2000' ASL
1600
No. 2 Shaft
Sea Level
Legend
A Zone
B2 Zone
F Zone
B Zone
C Zone
Plunge of F2 folds
Projection is facing eastward
BELL RESOURCES CORPORATION
Report by:
P. McGuigan,
P.Geo.
Date:
May 2005
Figure: 4
File:
NTS:
104 B/1,8
Mining Division:
Skeena
GRANDUC MINE, STEWART, B.C.
Longitudinal Projection
Tecucomp Geological Inc.
4.

REGIONAL GEOLOGICAL SETTING

The area north of Granduc Mountain along the eastern flank of the South Unuk River was mapped by Lewis (1994) in order to extend stratigraphic and structural features documented in the MDRU Iskut River study (Lewis, 1993; Lewis *et al.*, 1993) southward into the Granduc Mountain mine area. Previous regional mapping in the area is by Alldrick *et al.* (1989) and references therein.

Stratified rocks exposed on Granduc Mountain and to the north are subdivided into two easily recognizable units, termed the western and eastern series, that are separated by the north-northwest striking South Unuk shear zone (Fig. 2; Lewis, 1994). The terms Western series and Eastern Series predate the availability of fossil and radiometric age determinations, and are retained in the 1994 report and within this report for continuity to work conducted in the 1979 to 1993 period. The unit names for lithologies are the same as adopted in Lewis (1994) and Klepacki and Read (1981), again for commonality with earlier work.

Western series rocks consist of foliated, greenschist facies metavolcanic and metasedimentary rocks and include the Granduc Mine series (McGuigan and Marr, 1979), units lying north of the North Leduc glacier and units in the hanging wall of the Granduc fault on Granduc Mountain (Fig. 3).

Eastern series rocks are much less deformed and are mainly volcanic. The boundary between western and eastern series rocks is easily identifiable north of Granduc Mountain, however on Granduc Mountain itself, the boundary is uncertain.

Intrusive suites consist of the pre-tectonic Late Triassic Bucke Glacier stock and syenite sills or dykes that intrude Western series rocks and the post-tectonic Eocene Lee Brant pluton that intrude both Western and Eastern series rocks (Fig. 2).

STRATIGRAPHY

Western series

Western series rocks crop out east of the South Unuk River where they form a north-northwest striking and steeply dipping unit (Figs. 2, 3). They consist of moderately to highly foliated schist, phyllite, marble and gneiss. The stratigraphic thickness of the western series is uncertain because facing indicators have been destroyed by metamorphism and deformation. Repetition of similar lithologic units suggests structural duplication. North of Granduc Mountain, western series are subdivided into six lithological (no stratigraphic order) rock types consisting of:

(i) strongly foliated, medium grained biotite schist,

(ii) pale green argillite and cherty argillite,

(iii) marble,

(iv) mafic hornblende schist and gneiss,

(v) intermediate schist and gneiss, and

(vi) layered to laminated phyllitic mudstone to siltstone.

Similar rock types defined by Klepacki and Read (1981) on Granduc Mountain (units 1 to 8) were retained by Lewis (1994); correlation of individual units across the North Leduc Glacier was not attempted.

A minimum age of 220 Ma for the western series is obtained by U-Pb (zircon) dates from the Bucke Glacier stock north of the North Leduc Glacier, and related bodies on Granduc Mountain, that intrude western series rocks. The Bucke Glacier stock ranges from 220 to 223 Ma (J. Mortensen, personal communication to P.D. Lewis, 1994); similar composition sills on Granduc Mountain were 232 $\pm$ 3 Ma (Childe, 1994). In addition, a U-Pb (zircon) analysis from the footwall andesite on Granduc Mountain (North zone) returned an identical date within error of 230.5 $\pm$ 14 Ma.

Eastern series

Eastern series rocks form a northwest trending package of rocks that are separated from western series rocks by the South Unuk shear zone on the west, and are bounded by the Frank Mackie Glacier on the east (Figs. 2, 3). They are subdivided into three lithologically distinct conformable volcanic units (from oldest to youngest) consisting of:

(i) heterolithic intermediate volcanic breccia to conglomerate,

(ii) bedded dacitic(?) tuffs, tuffaceous conglomerate and homolithic breccia, and

(iii) andesitic pillowed flow and pillow breccia. In the North Leduc Glacier area, sedimentary grading and pillow shapes indicate these units face southwest; in other areas, facing directions are uncertain.

The age of the Eastern series is partly constrained by U-Pb analyses of zircons separated from a dacite megaclast collected north of Granduc Mountain. An interpreted age for this unit, based on four zircon fractions, is 186.8 $\pm$ 5.6 Ma (J. Mortensen, personal communication to P. Lewis, 1994). An identical age within error of 185.4 $\pm$ 9 Ma was obtained from a felsic lapilli tuff approximately 7 km to the south on the Homestake property (Childe, 1994). These rocks are similar in age to felsic rocks (Hazelton Group) in the footwall of the precious metal rich Eskay Creek massive sulphide deposit (Bartsch, 1993). Volcanic rocks of this age correlate with the Betty Creek formation (Hazelton Group) in the Stewart - Iskut mining camps.

INTRUSIONS

Bucke Glacier stock

Bucke Glacier stock forms a northwesterly elongate body (approximately 10 km long by 2 km wide) in western series rocks north of Granduc Mountain (Figs. 2, 3). It consists of fine to coarse grained hornblende-biotite diorite to monzodiorite. The contacts of the stock are parallel to subparallel to regional foliation, and the stock is foliated itself, however, to a lesser degree than the enclosing Western series rocks. Intermediate intrusive rocks exposed on the north side of Granduc Mountain (Klepacki and Read, 1981) and intersected in North zone drilling (Freckelton *et al.*, 1982) are correlated with the Bucke Glacier suite based on similar lithologies and preliminary U-Pb (zircon) dates (Childe, 1994).

The age of the Bucke Glacier stock is constrained by two widely separated U-Pb (zircon) dates. To the north, near the northern most exposure of the stock, a foliated diorite phase of the stock returned a date of 221 $\pm$ 1 Ma (M.L. Bevier, personal communication to P. Lewis, 1994). To the south, near the southern most exposure of the stock, a hornblende quartz monzodiorite phase returned a date of 220 - 223 Ma (J. Mortensen, personal communication to P. Lewis, 1994).

Syenite sills (and dykes)

Syenite sills (and minor dykes) form north-northwesterly trending elongate bodies (<1.5 km long and 10's of metres thick) in western series rocks north of Granduc Mountain (Figs. 2, 3). Sill contacts are parallel to subparallel to regional foliation and compositional layering measured in the enclosing western series rocks. The sills contain crowded megacrystic (<5 cm) potassium feldspar and are weakly foliated.

Lee Brant stock

Lee Brant stock forms a large stock in eastern series rocks north of Divelbliss Creek (Figs. 2, 3). The stock consists of undeformed hornblende - biotite quartz monzonite. A U-Pb (zircon) date of 55.6 $\pm$ 2 Ma was obtained from a sample collected along the eastern margin of the body north of Divelbliss Creek (J. Mortensen, personal communication to P. Lewis, 1994).

STRUCTURE

The major structure identified in the Unuk River area is the South Unuk shear zone (Figs. 2, 3). It is a north-northwest striking, subvertical fault that is mapped from the Iskut River area south to Granduc Mountain, a distance of 60 km (Lewis, 1994). The fault varies along strike (north to south) from a brittle fault (10-20 m thick) with uncertain sense and direction near Mount Shirley that widens to a ductile deformed zone greater than 1 km wide south of Sulphurets creek where sinistral offset is indicated.

Further south, in the Divelbliss, Duke and North Leduc areas, western series rocks record strongly heterogeneous deformation with a large component of simple shear in a ductile to semi-brittle environment (Lewis, 1994); these features indicate western series rocks should be included as part of the shear zone.

The eastern boundary of the shear zone is marked by a fault that separates the more deformed Late Triassic (or older) western series rocks from relatively undeformed Lower to Middle Jurassic eastern series rocks.

PROPERTY GEOLOGICAL SETTING

Work on the Granduc property that was supervised by the author spanned two periods of work: 1979 to 1984 and 1991 to 1994. No other work on the property has been conducted since 1979. The best reference to the geology of the property is offered in the report of the 1993 field program (Dawson et al 1994).

Work on the Granduc property during the 1993 study focused on re-logging and sampling selected drill holes for lithogeochemistry and geochronology. Surface mapping on Granduc Mountain was limited to a few traverses to examine: (i) previous stratigraphic subdivisions (McGuigan and Marr, 1979; Klepacki and Read, 1981), (ii) previous structural analysis (Klepacki and Read, 1981), and (iii) to help with correlation of units logged in drill core and mapped north of the North Leduc Glacier during the 1993 study (Lewis, 1994).

The following brief description of stratigraphy, structure and mineralization is based mainly on mapping by McGuigan and Marr (1979) and Klepacki and Read (1981), Lewis (1994) and re-logging selected drill holes (Dawson et al 1994).

STRATIGRAPHY

Previous surface mapping on the Granduc property by McGuigan and Marr (1979) outlined three major rock assemblages: (i) Hanging Wall series, (ii) Mine series, and (iii) the Footwall series—all of which are part of the Western series rock assemblage. These assemblages were further subdivided by Klepacki and Read (1981) into 47 map lithologic units. Rapid facies changes, faulting and folding makes correlation of individual units difficult.

The Western series rocks on Granduc mountain are an assemblage of volcanic and sedimentary rocks approximately 1 500 m thick; the exact thickness is difficult to determine because of likely stratigraphic repetition, due to folding and faulting.

Footwall series rocks consist of pillowed and massive andesite to basalt flows which are overlain by flow breccias, crystal and lithic andesite tuff. **Mine series** rocks are cyclic mafic tuffs and chemical sediments that include chert, magnetite iron formation and sulphides. **Hanging Wall** series rocks consist of siliceous and mafic wacke followed by andesite tuff, argillite, siltstone and limestone.

As will be discussed herein in the section on Interpretations and Conclusions, the facing of the units described here is uncertain, due to folding and faulting, and local overturning of the section. The terms Footwall, Mine Series and Hanging Wall are the terms employed in earlier studies, and are repeated to maintain consistency with previous generations of mapping. They do not imply a particular stratigraphic order.

Footwall series (Units 1 and 2)

Lower Footwall sequence

Footwall series rocks have been divided into a *Lower Footwall* and an *Upper Footwall sequence*. The *Lower Footwall sequence* consists mainly of augite phyric andesite flows (1v), siliceous wacke (1w), and augite phyric andesite tuff (1t). These units are locally calcareous and contain rare disseminated magnetite, pyrrhotite and chalcopyrite. A thin ultramafic horizon consists of dunite, talc-chlorite schist and chlorite-serpentine schist; locally it marks the top of the Lower Footwall sequence.

Upper Footwall sequence

The *Upper Footwall sequence* is distinctly more sedimentary and thinner bedded than the Lower Footwall sequence. It consists of argillite (2p2-5), phyllite (2p1), tuffaceous sandstone (2ss), and tuffaceous argillite and minor augite phyric andesite flows (2v). Locally, units are calcareous and contain disseminated magnetite, pyrrhotite and chalcopyrite.

Mine series (Unit 3)

Mine series rocks consist primarily of interbedded tuff (3v1-2), chert (3c), and minor chloritic$\pm$calcareous wacke (3w1), argillite (3p1-2) and the Granduc limestone (3l). Mine series rocks were subdivided by McGuigan and Tucker (1981) into the: (i) *Lower Mine unit*, (ii) *Middle Mine unit*, and (iii) the *Upper Mine unit*. They are separated by faults of small displacement. The three units each represent similar cycles of argillite, siltstone, mafic tuff deposition, marked by an interval of exhalative mineralization comprised of massive sulphide, tourmaline-bearing chert and magnetite iron formation.

Lower Mine Unit

The *Lower Mine unit* is at the same stratigraphic level as the B_1 and possibly the F orebody (Fig. 4). The unit has a limited strike extent and does not extend north of 12000 N on surface. It consists of laminated brown chert at its base, succeeded by interbedded amphibolitic tuff, chert, and biotitic feldspar phyric dacite tuff (probably a mafic tuff, see the Section on Lithogeochemistry). The tuffs contain disseminated magnetite, pyrrhotite and chalcopyrite. The top of the unit consists of laminated brown chert. The B_1 orebody consists of massive pyrrhotite, chalcopyrite within an interval of chert and magnetite iron formation (see the section on Mineralization).

Middle Mine Unit

The *Middle Mine unit* corresponds to the same stratigraphic level as the C and B_2 orebodies (Fig. 4). Surface exposures are limited due to overburden and surface cave from underground mining. Underground, the unit consists of a lower tuff, a middle coarse chert marker, and an upper thinly laminated chert and tuff unit. Minor disseminated magnetite, pyrrhotite and chalcopyrite occur throughout the unit. It is separated from the Lower Mine unit by a minor fault (0.3 m fault gouge). The C and B_2 orebodies are comprised of cherty magnetite iron formations.

Upper Mine Unit

The *Upper Mine unit* corresponds to the same stratigraphic level as the A orebodies underground (Fig. 4). The unit consists of equal amounts of interbedded tuff and laminated brown chert. Tuff decreases northward where chert and fine grained siliciclastics predominate. Tuffaceous sulphide-bearing magnetite iron formation (1.5 - 3.0 m thick) occurs near the top of the formation.

Granduc Limestone

Granduc limestone overlies the Upper Mine unit. It consists of grey to black tuffaceous limestone and calcareous-chloritic dacite tuff. The unit grades upward into thick bedded feldspar phyric ash and lapilli tuff that is locally calcareous. The top of the unit is cut by the Granduc fault.

Hangingwall series (Units 4 to 8)

Hanging Wall series rocks are separated from the underlying Mine series by the Granduc fault (Fig. 3). The unit has been subdivided into the: (i) *Gash Banded Tuff sequence*, (ii) *Varied sequence*, (iii) *Siliceous Wacke sequence*, and (iv) *Upper Volcanic sequence*.

Gash Banded Tuff

Gash Banded Tuff sequence crops out mainly between the Granduc and Western faults (Fig. 3). It consists of tuffaceous sandstone (4t), wacke (4w1-2), and massive limestone (4l). Fine carbonate veinlets are abundant in many of the sandstone and wacke beds, and are likely related to carbonate formation in extensional fractures adjacent to F3 folds and shears.

Varied sequence

Varied sequence is separated from the underlying Gash Banded Tuff sequence by the Western fault (Fig. 3). The sequence consists of a heterogeneous package of thinly bedded sediments and volcanic rocks. In decreasing order of abundance, they include argillite (5p1-6), siliceous wacke (5w1-2), foliated andesite volcanics (5v1-2), tuffaceous sandstone (5ss) and limestone (5l1-3). Facing indicators throughout this unit are right-way up.

Mafic Wacke sequence

Mafic Wacke sequence conformably overlies the Varied sequence (Fig. 3). It consists of dark green wacke (6w1-3), argillite (6p), foliated amphibole phyric tuff (6v), calcareous tuff and limestone (6t), chert (6c1-2) and feldspathic arenite (6s).

Siliceous Wacke

Siliceous Wacke sequence is separated from the underlying Mafic Wacke by a thin basal limestone (Fig. 3). The rest of the unit is a relatively homogeneous fine to medium grained siliceous wacke (7w) that contains rare pyrite clots.

Upper Volcanic sequence

Upper Volcanic sequence conformably overlies the Siliceous Wacke sequence (Fig. 3). It consists of foliated feldspar and augite phyric andesite flows and tuffs (8v), and white to black chert (8c).