1:10,000 Scale Mapping and Structural Geology of the Braid, Thro, and Rift Claims

Gataga River Area
Liard Mining Division
British Columbia

Latitude 58° 15'N Longitude 126° 05'W

NTS 94K4W, 94L1E, and 94L8E

by:

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Owned and operated by

Ecstall Mining Corporation

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1. INTRODUCTION

Significant stratiform barite-zinc-lead mineralization occurs in Devonian clastic strata of the Kechika Trough, a linear belt of highly folded and thrusted, Ordovician through Mississippian, dominantly fine-grained siliciclastic rocks in the western Rocky Mountains of northeastern British Columbia (Fig. 1). The Kechika Trough represents the southern extension of the Selwyn Basin and is underlain principally by late Proterozoic (Hadrynian) through Cambro-Ordovician platformal to off-shelf siliciclastics and carbonates deposited on the ancestral North American craton. Within the Kechika Trough, the "black clastic" Gunsteel Formation of the Devonian lower Earn Group (Gordey et al., 1982, 1987), hosts significant stratiform barite-zinc-lead mineralization, including the Driftpile Creek, Bear, Cirque, Akie, Elf and Fluke occurrences (MacIntyre, 1983; Carne and Cathro, 1982; Jefferson et al., 1983).

Ecstall Mining Corp.'s Braid, Thro, and Rift claims cover an area approximately 5 km x 20 km, encompassing four previously discovered but undrilled, lead-zinc soil geochemical anomalies and the throughgoing outcrop belt of Road River and Gunsteel formations which host them (Figs 1, 2). The northern part of the Braid claims contains the MS anomaly, outlined by soil sampling completed by Noranda in 1981. This 471 sample > 100 ppm lead anomaly is 1.5 km long with peak values up to 2,400 ppm lead. Soil sampling in the northern part of the Thro claims by Texasgulf, defines the 650 sample > 100 ppm lead Rough soil anomaly, approximately 1.5 km long with peak values up to 1,680 ppm lead. Subsequent more detailed sampling on a smaller grid near the centre of the Rough lead anomaly by Riocanex confirmed its significance, with peak values of up to 12,500 ppm lead and many samples containing >1,000 ppm lead. South of the Rough grid, the 492 sample >100 ppm lead SIC anomaly, defined by soil sampling completed by Riocanex, is 1.8 km long with peak values up to 1,200 ppm lead. All three anomalies on the Braid and Thro claims are open along strike.

Anomalously high contents of zinc, arsenic, barium, silver, nickel, manganese, cadmium and copper also occur in numerous samples. Prospecting along ridges within the claims identified massive bedded barite layers up to 10 metre thick within the Gunsteel Formation near the Rough and SIC targets, as well as on the first ridge north of the Rough target. Significant thicknesses of nodular baritic Gunsteel Formation black shales were discovered on the MS target as well as the Rough and SIC targets. Rock samples of bedded barite and nodular baritic shale were taken from all these areas and analyzed but did not contain significant contents of lead or zinc (Graf, 1995a,b).

Texasgulf had previously discovered and blast trenched the Waterfall zone of zinc-lead mineralization on the western side of the Rough target. This structurally controlled replacement style mineralization occurs along a strike length of 5 km in limestones and black argillites that underlie the Gunsteel Formation and is thought to represent a syndepositional feeder or vent zone that may have discharged sulphides onto the sea floor during Gunsteel Formation shale deposition, which are manifested in the large Rough, SIC and MS lead-zinc soil anomalies. A number of samples of Waterfall zone mineralization previously assayed from 3% zinc to 20% zinc, up to 67 ppm silver, but less than 0.5% lead. A 5.5 metre chip sample taken along the Waterfall trench assayed 4% zinc and 15 ppm silver. These rock samples also contained elevated concentrations of arsenic (up to 546 ppm), cadmium (over 100 ppm), and lead (up to 3,261 ppm), but were low in barium (less than 660 ppm) and manganese (less than 55 ppm).

The Rift claims cover the undrilled Roen lead-zinc soil geochemical anomaly, defined by SEREM (SEREM Ltd., 1980). This anomaly, represented by 236 samples, measures at least 1.5 km by 600 m, with peak values of up to 1,240 ppm lead. It is contiguous with a soil anomaly to the south on Teck's Saint claims. Subsequent exploration work (Graf, 1995b) extended the SEREM soil geochemical survey, and contributed new rock geochemical analyses.

In 1997, a 1:10,000 scale mapping project was conducted on the Thro, Braid and Rift claims, to provide a stratigraphic and structural framework to assist further exploration of the previously discovered soil anomalies. Mapping was completed between August 9 and August 21, covering an area extending from the southern part of the Braid claims southward to and including the Rift claims (Fig. 2). All previously discovered soil geochemical anomalies, excepting the MS anomaly, lie within the mapped area. The primary mapping focus was on defining the stratigraphic and structural history of the area. A small number of outcrop samples was collected for biostratigraphic and geochemical analyses. Maps and interpretive structural sections generated during the study are included as attached sheets 1-3.

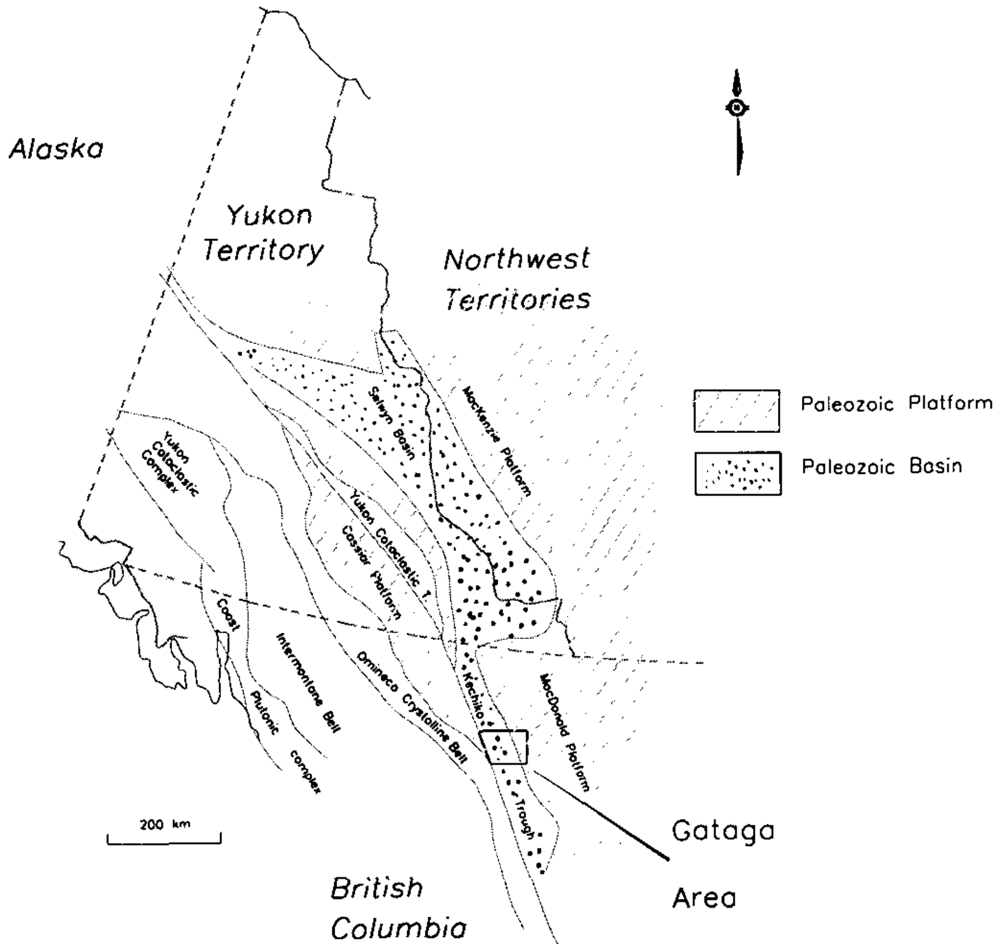

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Figure 1: Index map showing location of the Gataga River area (inset), and major tectonic features (Modified after McClay and Insley, 1986).

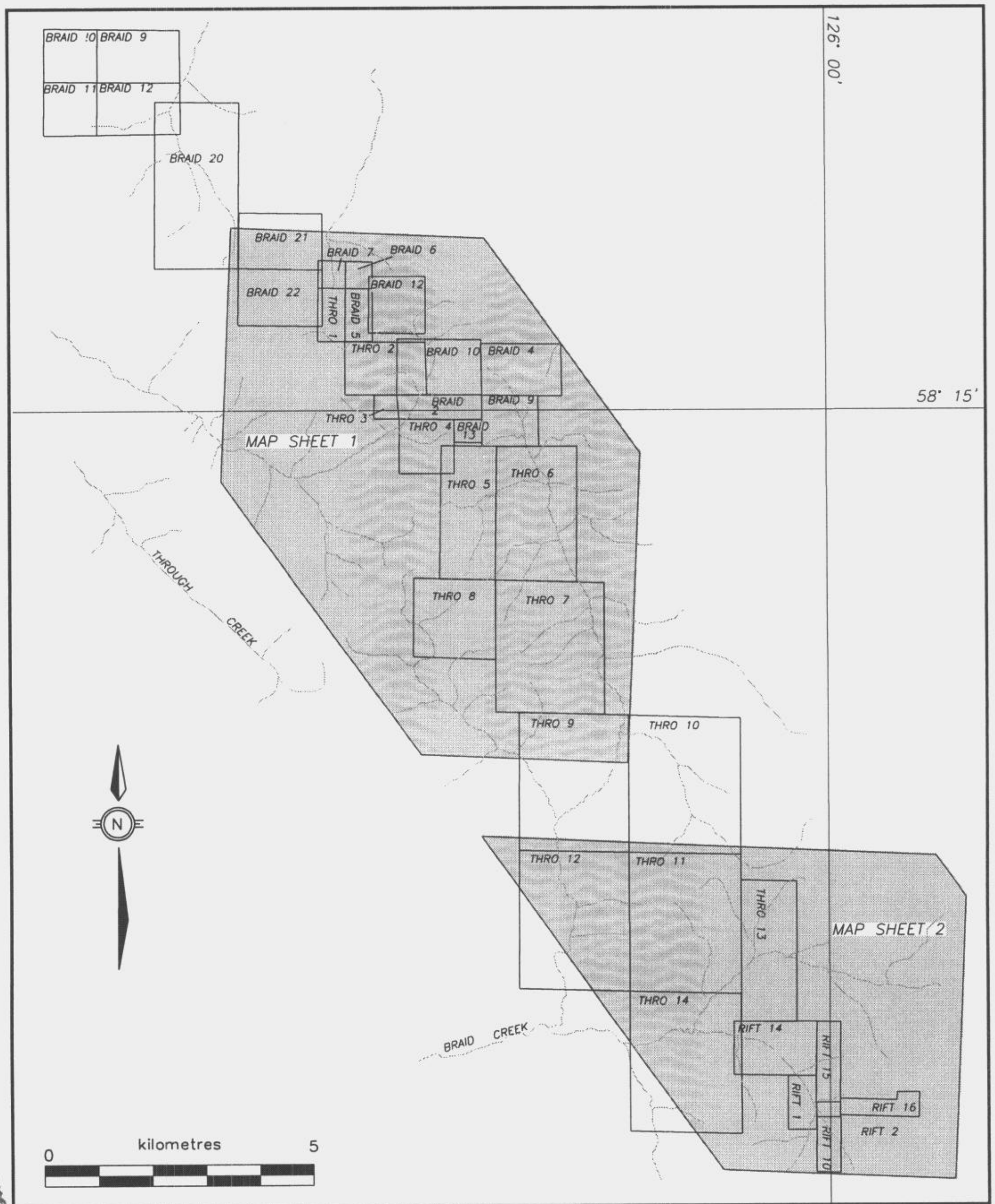


Figure 2: Location map of the Gataga River area (inset), showing claim outlines, and area of included map sheets.

2. LOCATION AND ACCESS

The Braid, Thro, and Rift claims, hereafter referred to as the "project area", form a contiguous claim group centered at approximately 58°15' N and 120°09'W on NTS map areas 94L1E, 94L8E, and 94K4W (Figs. 1,2). The claims lie within the Muskwa Range of northern Rocky Mountains, northeast of the Rocky Mountain Trench between the Gataga River and Through Creek.

The nearest major population centers are Fort Nelson, 200 km to the northeast, Fort St. John, 350 km to the southeast, MacKenzie, 350 km to the southeast, and Watson Lake, Yukon, 240 km to the northwest. Between Fort Nelson and Watson lake, the Alaska highway passes 75 km east of the property at Muncho Lake. A bulldozer trail from Muncho Lake is reported to end 23 km east of the claims at the divide between Toad River and Gataga River.

The 1997 exploration work was conducted from a fly-in camp, with ten days spent in the Braid-Thro area, and four days spent in the Rift area. Helicopter support was used for camp moves and on two occasions for mapping ridges between the two camp areas.

Scheduled twin otter and other fixed wing aircraft flights are made daily from Mackenzie to the Finbow airstrip and Fort Ware which are 125 km and 100 km southwest of the property in the Rocky Mountain Trench.

3. PHYSIOGRAPHY

The project area lies within the Muskwa Range of the northern Rocky Mountains. From the broad valley of the Gataga River, less than 1,000 metres above sea level, the ground rises abruptly to northwest-trending ridges, locally cresting at over 2,400 metres. In the northern portion of the Braid area, creeks drain northeast directly to the Gataga River. Most of the remaining claim area is drained by Braid Creek, which flows southwest into the Rocky Mountain Trench, and tributaries of Through Creek. The physiography is typified by fairly short but steep northerly-trending ridges and valleys. The highest peaks are underlain by craggy, cliff-forming limestones, whereas shales underlie lower, rounded ridges. Treeline is at approximately 1,600 metres on the south facing slopes. Most of the property is above treeline and is covered by talus and felsenmeer. Vegetation at lower elevations consists principally of small spruce, juniper and bushes, and dense scrub occupies the valley bottoms. Grasses and alpine flowers cover the higher elevations. The alpine soil development on the ridges is very thin, and uppermost ridges exhibit no soil cover, and are flanked by talus.

4. PREVIOUS WORK

Previous regional geological mapping in the Gataga area includes regional 1:250,000 scale reconnaissance mapping by Taylor and Stott (1973) and Gabrielse (1962), and 1:50,000 mapping by MacIntyre (1981, 1983). Detailed mapping of the Driftpile Creek Ba-Zn-Pb deposit, located just south of the Rift Claims, was completed by Archer Cathro and Associates (Carne and Cathro, 1982). McClay et al. (1986) conducted a two-year geological study in 1985-1986, concentrating in the first year on the detailed structure and mineralization of the Driftpile deposit (McClay and Insley, 1986), followed in 1986 by regional mapping at scales 1:20,000 and 1:50,000, (NTS sheets 94E/16, 94F/14, 94K/4, 94L/1, 7, 8; McClay et al., 1987) measuring of stratigraphic sections, and logging of drill core from the Driftpile Creek and Bear deposits. Attention was focused on regional structural and stratigraphic analysis and on the sedimentology and stratigraphy of the lower Earn Group. In particular the stratiform barite and barite-zinc-lead mineralization was mapped and sampled in detail. No maps are publicly available from this work.

Mineral exploration in the Gataga District dates from 1957 when Frobisher Ltd., a predecessor company to Falconbridge Nickel Mines Ltd., investigated several gossans developed from springs draining Devonian black shales immediately north of Gataga Lakes.

In 1970, Geophoto Consultants Limited conducted a reconnaissance stream sediment survey in this region on behalf of a syndicate of Pembina Pipeline Ltd., Sun Oil (Delaware) Ltd. and General Crude Oil Company Northern Ltd. In 1973, the syndicate entered a joint venture with Canex Placer Ltd. (now Placer Dome Ltd.) to investigate some of the 1970 anomalies. Initial prospecting resulted in the discovery of mineralized float on the Driftpile Creek property and the staking of 153 "two-post" mineral claims and fractions in 1974. Canex Placer and its partners continued surface exploration on the claims during 1974 and 1975 including mapping, geochemical and geophysical surveys. Proposed diamond drilling was deferred due to disappointing results from the earlier surveys.

The Gataga Joint Venture (GJV) was formed in April, 1977 to investigate unstaked lead anomalies obtained near the Placer Syndicate property by Castlemaine Exploration Ltd. during regional exploration in 1976. Prompted by similarities between the geological setting in the Gataga shale belt and the Macmillan Pass area, the GJV staked a large claim position and carried out an extensive regional sampling and mapping program in 1977. An agreement to option the Driftpile Creek property from the Place Syndicate was negotiated early in 1978. Work on the GJV claims from 1978 to 1982 was carried out in conjunction with higher priority exploration on the optioned claims.

During 1977, other companies staked a total of 842 units (55 claims) in the shale belt north and south of Driftpile Creek. Of these, Texasgulf continued work in 1978 and was joined by Granby, Serem, Jubilee, Riocanex and Esso in 1979. Exploration activities in the area peaked in 1980 with programs carried out by Chevron, Cominco, Esso, Noranda, AJM Mining, Asarco, Serem, Cyprus Anvil/HBOG and Riocanex. Chevron and Cominco returned in 1981 to conduct limited work on their holdings between Gataga Lakes and Kwadacha Park. During 1982, Archer Cathro and Associates carried out limited work on Riocanex's SIC 1 and SIC 2 claims north of Driftpile Creek, while Texasgulf carried out mapping, sampling and a geophysical survey of its adjoining Rough claims. Noranda also conducted work on its MS claims adjacent to the SIC and Rough claims and returned in 1983 to perform additional exploration.

Ecstall Mining Corp. (Graf 1995a, 1995b) provide an account of previous exploration work on the Rift, Thro, and Braid claims, including detailed description of soil sampling methods and results; this summary is not reproduced here.

5. Claims Information

The Braid-Through and Rift properties area owned 100% by Ecstall Mining Corporation and consists of 17 claims (64 units):

Table 1: Claim information

Claim Name	Tenure No.	No. of Units	Expiry Date
Thro 1	314196	1	14/10/2001
Thro 2	314197	6	14/10/2001
Thro 3	314202	1	14/10/2001
Thro 4	314203	4	14/10/2001
Braid 2	223934	3	13/04/1998
Braid 5	223937	2	13/04/2000
Braid 6	223938	1	13/04/2000
Braid 7	223939	1	13/04/2000
Braid 10	323807	4	17/02/1998
Braid 11	323871	4	17/02/1998
Braid 12	323872	6	17/02/1998
Braid 9	329180	6	16/07/1998
Braid 10	329181	6	16/07/1998
Braid 12	329182	4	16/07/1998
Braid 13	329183	3	16/07/1998
Braid 21	329185	6	20/07/1998
Braid 22	329186	6	20/07/1998
Rift 1	223925	2	13/04/2000
Rift 2	223926	1	13/04/2000
Rift 10	226126	2	17/05/2000
Rift 14	323877	6	17/02/1998
Rift 15	323878	9	17/02/1998
Rift 16	329086	3	13/07/2000

6. Regional Geology

The Gataga area is located in the Kechika Trough, an extensional basin active in Paleozoic time lying between the Cassiar Platform on the west and the McKenzie Platform on the east. True basinal sedimentary strata of the trough and its northern extension, the Selwyn Basin, are restricted to the Middle Ordovician to Lower Devonian Road River Group (Carne and Cathro, 1982). The "black clastic group" rocks of the Devonian Earn Group, including the target Gunsteel Formation, blankets both basin and adjacent platforms. Regionally, both the Road River Group and the Gunsteel Formation are host to sedex deposits, although in the Kechika Trough the Gunsteel Formation is the primary exploration target (MacIntyre, 1992; Carne and Cathro, 1982).

Relatively quiescent conditions in the Selwyn Basin and Kechika Trough during Road River Group sedimentation progressed to a tectonically active period, characterized by block faulting, rifting, and basin uplift during deposition of the black clastic units. Faults accommodating extension may also have served as conduits for metalliferous fluids which formed the stratiform barite-lead-zinc sedex deposits of the Gataga area (Carne and Cathro, 1982; McClay, 1985). Intraformational breccias within some of the deposits are possible evidence that fault movement accompanied barite-sulfide precipitation and provided a mechanism for the expulsion of heated, overpressured metalliferous brines from permeable reservoirs within the sedimentary pile. Sedimentary exhalative deposits formed where these brines were exhaled as buoyant plumes onto the sea floor cooled, and ponded in anoxic sea floor depressions.

The Late Devonian barite-sulfide deposits are typically zoned: interlaminated barite-sulphide-galena-pyrite occurring near suspected vent areas grades outward into bedded barite. Laminated beds of pyrite often occur in hangingwall siliceous shales, particularly above the inferred vent zone. The apparent absence of epigenetic stringer sulfide zones and footwall alteration implies that the deposits were formed from ponded brines at relatively low temperature. Away from the main deposits, the favourable stratigraphic interval is marked by the presence of thin beds of nodular and laminated barite and thin laminae of pyrite. Thin tuff beds also occur locally in this stratigraphic interval and are evidence for a Late Devonian volcanic event (Graf, 1995a). Stratiform barite and barite-sulphide mineralization in the Gunsteel Formation of the lower part of the Earn Group has been mapped over a stratigraphic thickness of 400 m, and over a continuous to semi-continuous strike length of 50 km. Five mineralized horizons have been identified, three of which contain significant barite and barite-sulphide accumulations.

During Late Mesozoic and Cenozoic time, the west coast of the North American craton experienced northeast-directed contraction or oblique contraction, forming the Rocky Mountain fold and thrust belt. Rift faults were likely reactivated as thrust faults during this event, creating complex deformation styles related to structural inversion (McClay, 1985). In the Gataga area, this fold and thrust belt affects Hadrynian through Mississippi strata, and is informally termed the Gataga fold and thrust belt. The lower Earn Group is intensely folded and faulted, hence thickness determinations and correlation of mineralized intervals are difficult. McClay et al (1987) suggest that stratiform barite and barite-sulphide mineralization was deposited in a Late Devonian half graben system that was inverted during Mesozoic contractional deformation.

According to Carne and Cathro (1982) the Gataga River area is broken into three northwest-trending, parallel belts by two fault zones that have major vertical and/or lateral displacement. These are termed the Mount Waldemar Fault and the Goat Mountain Fault. West of the Mount Waldemar Fault, Paleozoic sedimentary rocks are cut by numerous, westerly-dipping, anastomosing thrust faults. Most of the Braid, Thro, and Rift claims lie in the central belt between the Mount Waldemar Fault and the Goat Mountain Fault (GMF), an area described as dominated by open to tight, upright to slightly overturned folds occasionally modified by thrust faulting in areas of extreme tectonic shortening (Carne and Cathro, 1982). East of the Goat Mountain Fault, folds are open and upright while thrust faults are uncommon. The three belts and the structures that bound them can be traced for over 150 km to the southeast, although the informal nomenclature taken from Carne and Cathro (1982) and used here applies only to the Gataga River area.

The Mount Waldemar Fault varies in style and orientation along its strike length. In the north, within the present project area, it is described as a steep mylonite zone ranging from 2 m to 10 m wide with a west-side-up apparent stratigraphic displacement of greater than 1 km (Graf, 1995a). The dip of the structure decreases gradually and regularly to the southeast. At the Cirque deposit, where it forms a hanging wall fault zone, it is a westerly dipping, complex thrust fault comprising gouge and breccia zones. This fault may be rooted in, or coincide with, a vertical fault zone that limits the Cirque deposit on its south end. Devonian Earn

Group clastic sedimentary rocks, especially Gunsteel Formation shales, differ markedly across the fault, lending support to its origin as a syn-depositional extensional structure.

The Goat Mountain Fault separates Ordovician to Devonian Road River Group and Earn Group shales and fine-grained clastic rocks from lower Cambrian Atan Group shallow-water carbonates and quartzites in the Gataga River area. Stratigraphic displacement is greater than 1 km, although the magnitude is difficult to assess since local thickness of the faulted-out Cambro-Ordovician Kechika Group is not known. The Goat Mountain Fault is a complex belt of shear zones and splays whose attitudes change markedly over relatively short distances. The coincidence between the trace of the Goat Mountain Fault and abrupt facies changes in Devonian rocks suggest it formed a topographic break during Earn Group sedimentation.

The Gataga District is presently bound to the west by the Rocky Mountain Trench, a regional-scale tectonic feature thought to have accommodated by dextral transcurrent movement during Mesozoic and/or Cenozoic time, and to the east by the shallow marine clastic and carbonate rocks of the MacDonald Platform (MacIntyre, 1992).

7. 1997 EXPLORATION PROGRAM

7.1 PROJECT AREA GEOLOGY

7.1.1 Stratigraphy

Rocks exposed in the project area and mapped during 1997 include Cambrian through Devonian strata. Oldest strata, assigned to the Gataga Group, consist of interstratified carbonate and siliciclastic rocks. The Road River Group comprises calcareous siltstones, shales, limestones, and volcanic rocks which unconformably overlie Gataga Group and define the basal basinal succession. The overlying Middle Devonian to Mississippian Earn Group Rocks, including the Gunsteel Formation, is represented by blue to silvery-grey weathering shales, siliceous carbonaceous shales, cherty argillites, porcelanite, and coarse turbidites (McIntyre, 1992). Stratigraphic intervals within Earn Group rocks have proven difficult to correlate, even over short distances, as the turbiditic facies have abrupt lateral changes (Carne and Cathro, 1982).

The siliciclastic units of the Road River Group and the overlying Gunsteel Formation are similar in appearance, making the two units difficult to distinguish in areas of poor exposure or complex structure. Most outcrops in the project area are relatively small, and the presence of fault repetition and folding preclude estimating thicknesses of map units, especially in the mechanically weak and recessive shale units. Marker units, such as bedded or nodular barite horizons, may occur at numerous stratigraphic levels. Conodont biostratigraphy is being investigated as a possible means of correlating map units and defining stratigraphic relationships.

Cambian Gataga Group:

Oldest units in the project area are interstratified limestone, sandstone, and quartzite. Based on similarities to published descriptions (e.g., McClay et al., 1987), these units are assigned to the informally defined Cambian Gataga Group. These strata are exposed in northwest-trending belts flanking younger strata on the Braid and Thro claims, and to the northeast of the Rift claims. In the eastern Thro claims four subunits can be distinguished, but the presence of strongly developed overprinting tectonic fabrics and the lack of sedimentary structures preclude definition of facing direction. Most easterly rocks in this section are fine- to medium-grained, strongly foliated quartzose sandstone and phyllitic siltstone (unit CGa), forming a belt at least 100 m thick. These are in sharp conformable contact to the west with a sequence 50-75 m thick comprising medium bedded, strongly foliated, oolitic to peloidal limestone (unit CGl1). These are in sharp contact to the west with poorly-exposed, tan-weathering, well-bedded mature quartzites at least 100 m thick (unit CGq). The western contact of this unit is faulted against thickly-bedded, fine-grained, grey limestone with common buff-weathering laminated layers and dolomitic patches (unit CGl2). The four subunits described above display strong similarities to published descriptions of the Lower Clastic, Lower Carbonate, Middle Clastic, and Upper Carbonate divisions of the Gataga Group as outlined by McClay et al (1987). This correlation has two significant implications to the geological framework of the Through area: first, it suggests that older rocks flanking the eastern edge of the study area young to the west, and second, it implies that the northwest-striking fault cutting through the sequence results in omissions of the Middle Carbonate and Upper Clastic subunits of the Gataga Group.

Thickly-bedded limestones of the Gataga Group (unit CGl2) are well exposed along the western edge of the Braid/Thro claims in thrust fault contact with younger rocks to the east, and in fault slivers in the southwestern part of the claims. Adjacent to the bounding fault, these limestones commonly contain a strong, locally mylonitic, tectonic foliation, along with abundant carbonate veins and areas of coarse recrystallization. These tectonic features obscure any sedimentary structures that may have been present in this area. Several tens of metres west of the contact, fabric intensity lessens and thick beds are visible. However, no sedimentary facing direction indicators are present, and the younging direction in uncertain. Undeformed, thickly bedded limestones similar to those in the western Braid/Thro claims are present along the northeast edge of the Rift claims area.

Ordovician - Lower Devonian Road River Group

Overlying the Cambrian carbonate and siliciclastic section is a thick sequence of slaty to phyllitic siltstone, black shale, and lesser limestone and chert (unit SRS). The lower contact of this sequence is exposed only in the northern part of the Rift area, where tan weathering, platy calcareous siltstones overlie Cambrian limestones along a sharp contact; elsewhere, contacts with older rocks are faulted.

McClay et al. (1987) assign rocks occurring above the Cambrian succession and below the Earn Group to either the Kechika or Road River groups. They define the Kechika Group as a sequence of interstratified thin-bedded limestones and calcareous phyllites. In contrast, they define the Road River Group as characterized by a basal graptolitic shale, passing upwards into orange- to tan-weathering dolomitic siltstone. The scarcity of limestone in the present map area, together with the abundance of calcareous siltstone, is consistent with their descriptions of the Road River Group, and the Kechika Group is likely thin or absent.

The lack of a well-exposed, unbroken section of rocks overlying the Cambrian sequence precludes determination of a detailed stratigraphic succession, but several map units can be distinguished. Thicknesses of the individual subunits, as well as that of the entire sequence, are unknown but the extent of areas underlain by the units suggest that many hundreds of meters to more than a kilometre of section are present.

Black, carbonaceous graptolitic shale (unit ORs), considered to be regionally characteristic of the Road River Group, occurs in the southern part of the Braid/Thro area. Lithologically similar rocks occurring in other parts of the project area lack the diagnostic graptolites, and may represent higher stratigraphic levels. The carbonaceous shale intervals are typically recessive, and contain minor thinly-bedded to laminated, grey limestone and tan phyllitic siltstone. The black shale interval is at least 40-50 metres thick on the Thro claims.

Orange weathering, laminated, micaceous dolomitic siltstone form a distinctive rock type (unit SRSl), likely correlative to the Silurian Siltstone of McClay et al. (1987). It is best exposed along the Mt. Waldemar thrust fault along the southwest edge of the Braid/Thro claims, where it occurs as a thrust-bounded sheet up to 150 metres thick. Tan-weathering, thinly-bedded to massive, platy calcareous siltstone (unit SRSb) occurs throughout the Braid/Thro area and along the eastern margin of the Rift claims. Units SRSl and SRSb can be difficult to differentiate, the primary criteria being the distinctive orange weathering color, ubiquitous finely laminated character, and rare cross-stratification of the former. Rocks in many areas are transitional between the two units, which may represent lateral facies equivalents.

Devonian to Mississippian Earn Group

Youngest rocks in the project area are dark grey to black siliciclastic rocks of the Earn Group, which include the prospective Gunsteel Formation. Earn Group rocks can undergo rapid lateral facies variation, but also contain monotonous thick sequences of black siltstone and shale lacking any significant lithologic variation. As a result, it is difficult to construct a sequence of mapable units which can be applied over a large area. Units defined on the accompanying maps allow for both detailed subdivision where possible, and more generalized groupings where exposure is poor or lithologic variations cannot be easily mapped. The greater level of exposure of Earn Group units in the Rift claims allows a more detailed subdivision of units than in the Braid/Thro area. For this reason, the Earn Group succession for the two areas is described separately below.

At the Rift area, the Earn Group contains a distinctive lower sequence of dark grey to black shales and interstratified cherts lying stratigraphically beneath the Gunsteel Formation shales. Lowest Earn Group rocks, which overlie calcareous siltstones along the eastern edge of the area, comprise thinly-bedded, carbonaceous, platy black shale to silty shale (unit Des) approximately 150 - 200 metres thick. These shales are overlain by 60-80 metres of thinly-bedded, dark gray to black chert (unit DEc). Silty shale forms cm-thick layers between individual chert beds, and comprises 10-30% of the unit. The cherts are in turn overlain by an additional sequence of carbonaceous, black platy shale to silty shale at least 150 m thick. In the northern part of the Rift area, carbonaceous black shales tentatively assigned to this part of the stratigraphic sequence contain thick beds of coarse granular cherty sands to pebble conglomerates (unit Decl).

Carne and Cathro (1982) and Graf (1995b) describe a conglomerate/sandstone/siltstone sequence in the Rift claims area lying between the Road River Group and the Earn Group, and assign it to the Besa River Formation. The Earn Group units described above differ from descriptions of the Besa River rocks in their fine grained nature, although previous maps of the Rift claims assign them to the Besa River Formation. Based on lithologic similarities to overlying rocks of the Gunsteel Formation, the Earn Group designation is preferred in this study.

Silty, locally baritic, variably siliceous, silver to black shales overlying the lower Earn Group sequence in the Rift area are assigned to the Gunsteel Formation. The Gunsteel Formation here contains two main rock types which occur in roughly equal abundance and are likely lateral facies equivalents. Thinly-bedded to laminated, platy, silver to black semi-phyllitic silty shale (unit MDEGs) contains intervals of dark grey to black, carbonaceous platy shale, lithologically similar to that in the lower Earn Group. This subunit is distinguished from lower Earn Group rocks by the presence of barite as discontinuous white streaks on cleavage surfaces. Thinly-bedded to laminated siliceous silver-grey siltstone with common thin chert beds comprises a second Gunsteel Formation unit (unit MDEGc). This unit contains bedded barite intervals in the southern part of the Rift claims, along with minor, thin limestone beds or nodules.

Gunsteel Formation shales are overlain by medium to thickly-bedded quartzose sandstone to pebble conglomerate of the Mt. Warneford Formation to the north of the Rift claims.

In the Braid/Thro area, Earn Group rocks are less well exposed, and consequently, the sub-units outlined above are difficult to apply. The principal difference between the two areas is that rocks correlative to the Lower Earn Group at Rift are not recognized to the north. Lowest Earn Group rocks at Braid/Thro, interpreted to conformably overlie Road River Group calcareous siltstones, are typical Gunsteel Formation siliceous shales, containing both laminated barite streaks and bedded barite intervals. In addition, rocks of the Gunsteel Formation are finer grained in the northern area.

7.1.2 Structural Geology

Structures within the project area are dominated by northeast-verging thin-skinned deformation features of the Rocky Mountain Fold and Thrust Belt, overprinted by displacements along steep, northwest-striking faults. The resulting structural pattern is dominated by northwesterly-elongate, fault-bound thrust sheets displaying varying degrees of internal folding. Given the limited exposure in much of the project area, field recognition of faults is limited to mapable lithologic breaks; additional unmapped intrafomational faults are likely to occur in many areas. No direct evidence of faulting prior to folding and thrusting is recognized. However, the abrupt lateral facies changes within parts of the Earn Group section may be related to syn-depositional faults controlling sedimentation patterns.

Late Mesozoic to Cenozoic folding and thrusting (D1):

Folds and thrust faults in the project area are elements of the Gataga fold and thrust belt, formed during Late Mesozoic to Cenozoic regional northeasterly-directed thrusting. Mapped faults dip moderately to the southwest, displacing older strata northeasterly over younger strata. Bedding within the thrust sheets dips moderately to steeply to the southwest and less commonly to the northeast, reflecting the northeasterly vergent structural asymmetry of the area (Fig. 3a).

The most significant thrust fault in the project area displaces Cambrian Gataga Group carbonates over Ordovician to Devonian siltstones and shales along the western margin of the Braid/Thro claims. This fault is correlated with the Mt. Waldemar Fault, which has been traced along strike for over 100 kilometres to the south and occurs at the Cirque deposit (Carne and Cathro, 1982). On the Braid and Thro claims, the Mt. Waldemar Fault occurs as an imbricate thrust system of two or three splays (sections A, B, and C on sheet 3). Individual splays have map traces indicating curviplanar forms, likely resulting from intersecting frontal and oblique thrust ramps. Cambrian limestones in the hangingwall of the thrust are strongly mylonitized, and contain abundant calcite veins ranging from undeformed to isoclinally folded. No evidence was observed supporting regional folding of the Mt. Waldemar thrust, as has been suggested for the Braid/Thro area by McClay et al. (1987). Displacement magnitude on the Mt. Waldemar thrust is not possible to estimate given the uncertainties of the hangingwall structural configuration and fault geometry, but stratigraphic distribution patterns and the intensity of structural fabrics along the fault suggest a minimum of several kilometres of displacement.

The position of the southern extension of the Mount Waldemar Fault is uncertain. In the SIC target area, the main fault strand is cut by a more westerly-striking, southwest-dipping fault. Southwest of this structure, at least two additional thrust faults occur within the Thro claims, including one placing Cambrian strata eastward over probable Road River Group siltstones. However, rocks adjacent to these possible offset equivalents lack the intensity of structure fabrics typical along the Mt. Waldemar Fault only two kilometres to the north.

Most of the Braid/Thro area, and all of the Rift area, lie within Ordovician to Devonian strata in the footwall of the Mt. Waldemar thrust. These strata are structurally thickened by numerous northeast-vergent imbricate thrust faults and folds, and in most areas contain a steeply southwest-dipping slaty cleavage (S1) parallel to fold axial surfaces (Fig 3d-f). Folds are best exposed in the northern part of the Braid/Thro area, where they have upright to moderately reclined forms, and locally are overturned to the northeast (e.g., the "thumbprint" fold). Fold hinges here are rounded, and plunge shallowly to the southeast. In the central part of the Braid/Thro area, megascopic folds are not directly exposed, but their presence can be inferred from minor folds, bedding facing direction reversals, and cleavage/bedding relationships. In the southern Braid/Thro area, consistent cleavage/bedding facing directions indicate that shortening is accommodated preferentially by imbricate thrusting rather than folding, although the faults accommodating this thrusting are difficult to document within the thick Earn Group succession. Additional evidence for imbricate thrusting in this area includes consistently shallow angles between cleavage and bedding in float chips, and the discontinuity of bedded barite intervals when mapped to lower elevations on flanks of ridges (section C-C'), which implies stratigraphic truncations along ramp segments of thrust faults.

Mesoscopic folds associated with regional thrusting in the Braid /Thro area are best exposed in the immediate footwall to the Mt. Waldemar Fault, and are rare elsewhere. These folds typically have tight, subrounded to angular, sub-horizontal hinges, and a preferred northeasterly sense of vergence. Several mesoscopic folds in the southern part of the Rift area are geometrically similar.

Throughout the Braid/Through and Rift areas, early contractional structures display a shallow, southeasterly structural plunge, demonstrated by:

1.) poles to bedding, which outline a great circle with a π axis plunging 135/13 (Fig. 3a-c);

2.) Mesoscopic D1 fold axes, which plunge on average 126/11 (Fig. 3j); and

3.) Calculated and measured bedding/cleavage intersection lines, which plunge on average 133/11 (Fig. 3g-i).

There is little variation in the southeasterly plunge direction throughout the project area. As a result of this structural plunge, southern parts of the area will likely expose slightly higher stratigraphic levels, and potentially contain greater thicknesses of upper Earn Group strata.

Post-contractional displacements on steep faults:

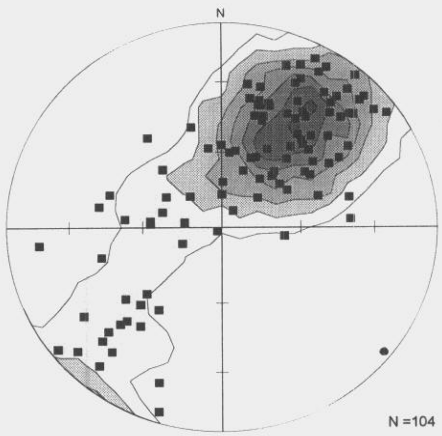
Contractional structures of the Gataga fold and thrust belt are cut and offset by several northwest-striking, steeply-dipping faults. At least three of these faults cut the Braid/Thro area, where they form a right-stepping en-echelon pattern. The southernmost of the faults can be traced southward into the Rift area, a strike length of at least ten kilometres. The faults are not exposed at surface, but outcrop distribution along their traces suggests steep, southwest dips. The easternmost fault likely is equivalent to the Goat Mountain Fault of Carne and Cathro (1982).

The parallelism of the steep, northwesterly structures to nearby strike-slip faults of the Rocky Mountain Trench invites speculation of a late, dextral strike-slip movement history, but independent field support is lacking. Because of the sub-horizontal intersection line between contacts and the faults, magnitudes of horizontal displacements are difficult to assess. Similarly, vertical offsets are difficult to quantify, due to imbricate faulting within adjacent fault blocks. Most faults juxtapose younger strata on the southwest against older strata on the northeast, suggesting southwest-side-down movement. This sense of movement implies that thrust faults on the adjacent blocks occur at different structural levels, possibly as imbricate thrusts soling into a common detachment surface (Fig. 4a). Alternatively, if the steep northwest-striking faults accommodated southwest-side-up apparent displacement, thrust faults within the juxtaposed blocks may restore to a common level, resulting in a structural style wherein more extensive thrust sheets stack the Silurian section onto the Devonian section (Fig. 4b). The first scenario proposes a fault configuration most consistent with the mechanical properties of strata in the project area, and is shown on the accompanying sections. Apparent dip-slip displacements of several hundreds of metres are required to accommodate the present stratigraphic distribution.

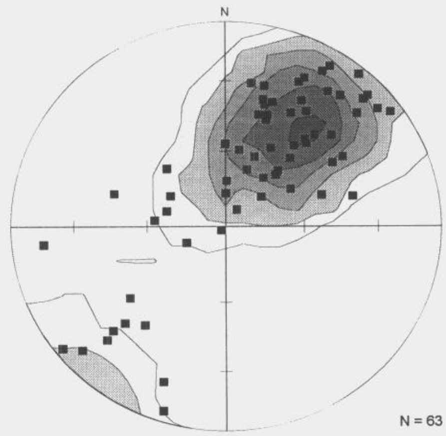
Northeast-trending folding (D2):

Northeast-trending folds and fine crenulations locally overprint D1 fabrics in the project area. Best examples are preserved within phyllite and phyllonite along the Mt. Waldemar Fault, where symmetric, upright folds with wavelengths of around 0.5 - 1.0 m plunge moderately to the southwest. Elsewhere, weak crenulation lineations and rare crenulation cleavage are preserved within some of the more strongly foliated rocks. The timing of D2 folds relative to movement on the steep northwesterly faults is uncertain, and the total shortening accommodated by D2 structures is negligible.

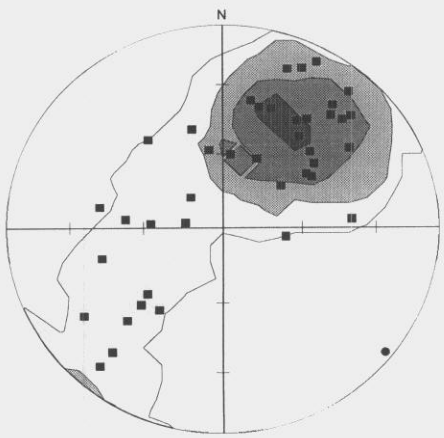
Figure 2a-c (following 2 pages): Stereographic projections of structural data collected during 1997 exploration program in the Braid, Thro, and Rift areas: **a-c)** poles to bedding show weak to moderate great circle distributions in all areas, reflecting regional folding and thrust faulting. The shallow southeast plunging π-axis is representative of structural plunge in all areas. Cluster of southwest bedding dips reflects northeasterly structural vergence. **d-f)** poles to cleavage planes show a preference for steep southwest dips consistent with northeast structural vergence; cleavage on Rift claims is slightly more upright than on Braid/Thro claims. **g-i)** calculated bedding-cleavage intersection lines illustrate gentle southeasterly structural plunge in all areas. **j)** D1 mesoscopic fold elements show a preference for shallow southeast plunging axes and southwest-dipping axial surfaces. **k)** D2 mesoscopic fold elements and crenulations trend/strike northeast-southwest, orthogonal to earlier fold elements.



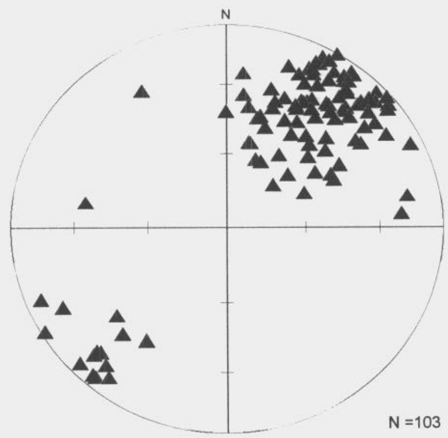
a) poles to bedding, all areas; π axis = 135/13



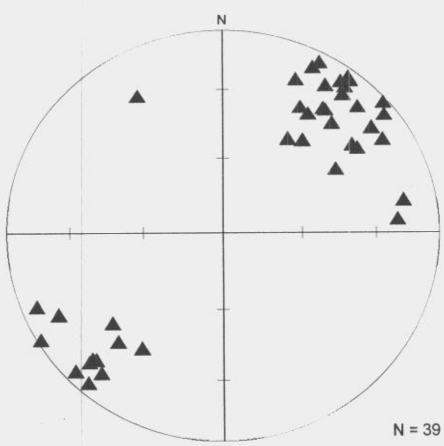
b) poles to bedding, Braid/Thro; π axis = 134/12



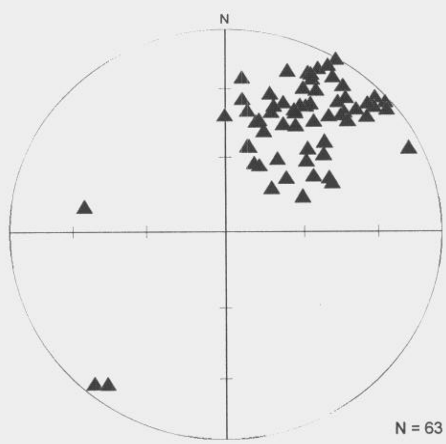
c) poles to bedding, Rift Claims; πaxis = 136/15



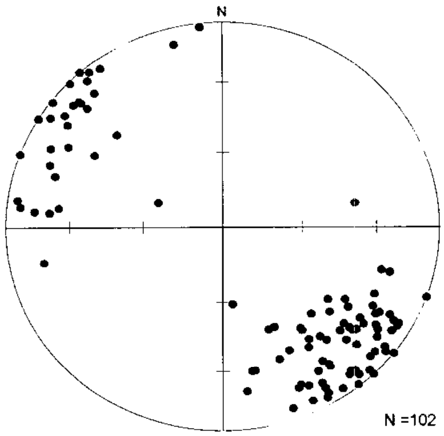
d) poles to cleavage, all areas; peak = 039/21



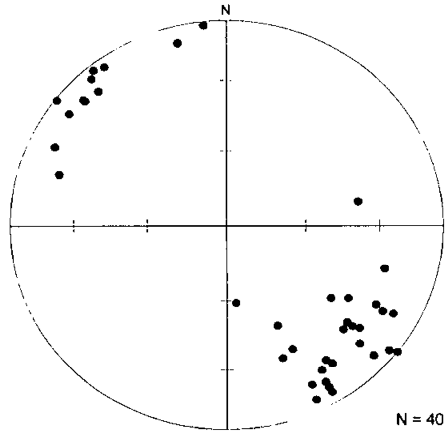
e) Rift cleavage; peak pole = 044/08



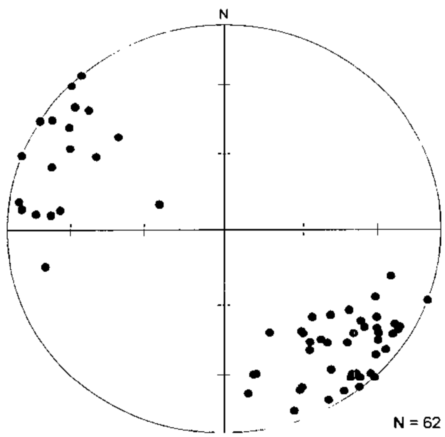
f) Braid/Thro cleavage; peak pole = 034/28



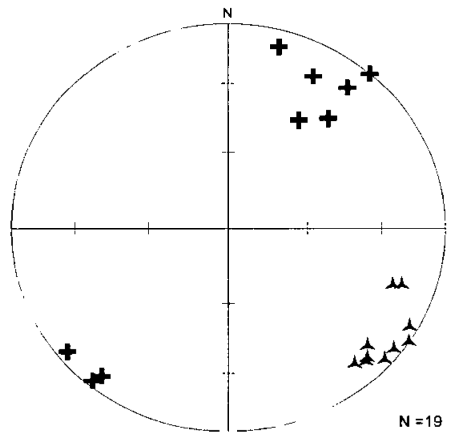
g) All S0/S1 intersection lines; peak = 133/11



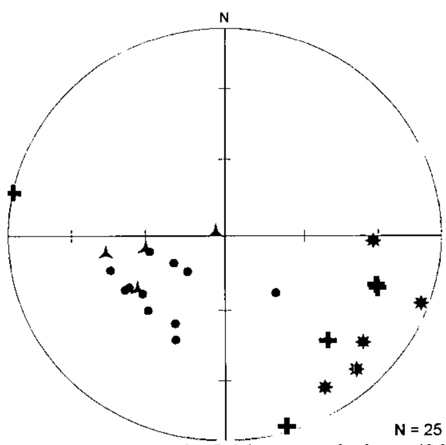
h) Rift S0/S1 intersection lines; peak = 136/12



i) Through S0/S1 intersection lines; peak = 130/09



j) D1 fold axes (126/11); poles to ax. planes (036/10)



k) D2 mesoscopic folds, crenulations (235/58);
poles to axial planes and crenulation cleavage (124/18)

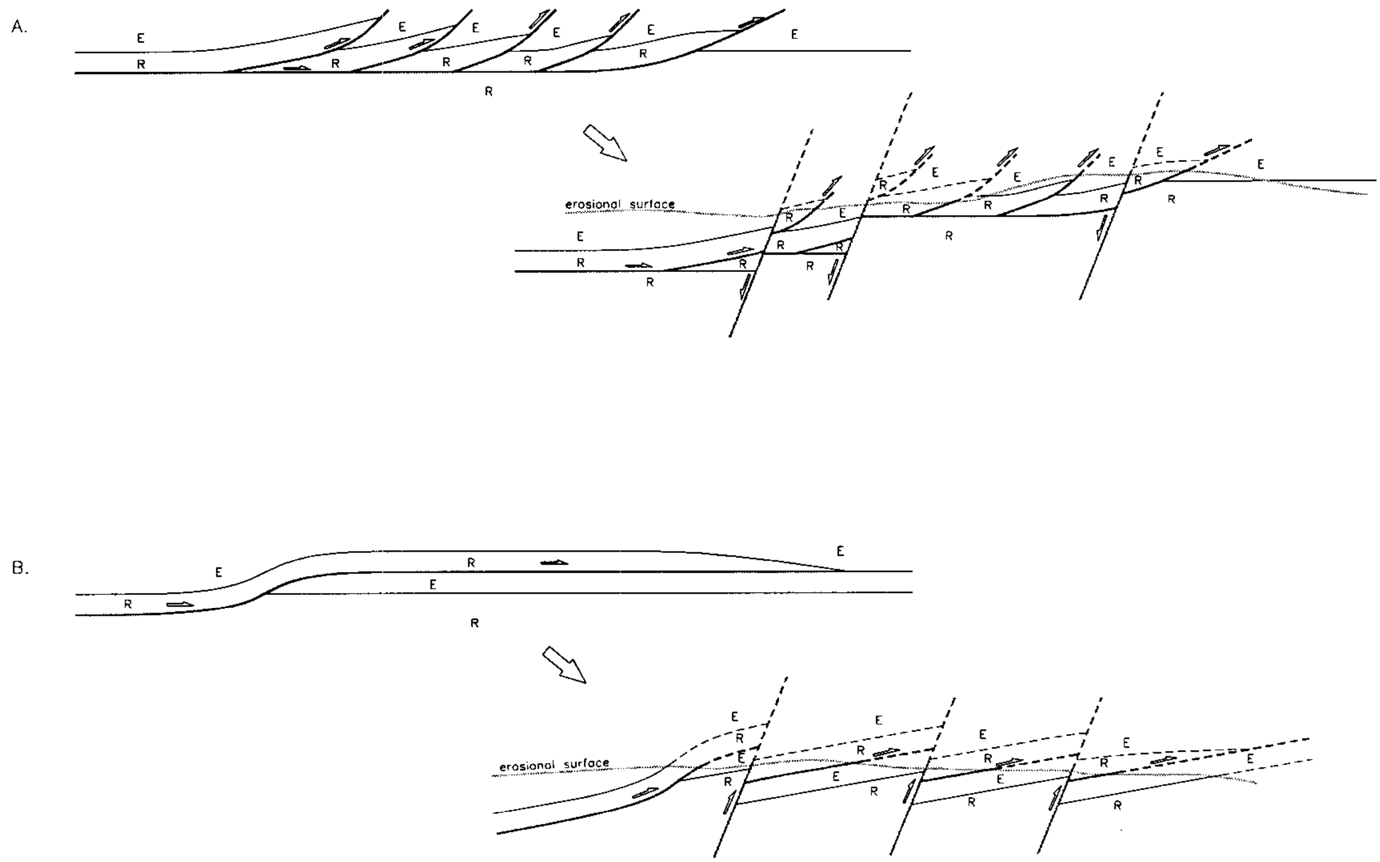


Figure 3: Schematic structural sections showing geometric implications of apparent normal vs. apparent reverse offset on late, steeply southwest-dipping faults: a) normal displacement, when restored, implies an imbricate thrust pattern within Road River Group / Earn Group strata, soling into a basal detachment fault; b) reverse displacement implies thrust movement along a single regional layer-parallel detachment stacking Road River Group over Earn Group strata. Note that both scenarios result in similar stratigraphic distribution patterns on present erosional surface.

7.1.3 Mineralization:

Waterfall Showing:

A narrow zone of Pb-Zn mineralization has been traced over a 5 km strike length coincident with the Mt. Waldemar Fault. This zone is best exposed at the original Waterfall showing (Sheet 1), where previous detailed mapping, prospecting, trenching, and geophysical exploration work by Texasgulf Canada Ltd. was focused. At the Waterfall showing, the Mt. Waldemar Fault comprises several thin (<5 m) thrust slivers of siliceous phyllite, tectonically interleaved with mylonitized marble. Mineralization within the zone occurs exclusively within strongly foliated, siliceous, pyritic phyllonites, over a width of up to 5 metres. Abundant quartz and quartz + pyrite veins vary from strongly deformed, boudined pods, to undeformed planar extension veins cutting the foliation. Fine- to medium-grained galena and sphalerite occur in thin, deformed veinlets and as isolated disseminated grains.

Silicification and pyritic alteration can be traced along the Mt. Waldemar Fault northward from the Waterfall showing at least as far as the "thumbprint" ridge. Float blocks of semi-massive sulphides in siliceous phyllonite here contain abundant sphalerite and galena, texturally similar to the main Waterfall showing. On the ridge south of the Waterfall showing, the Mt. Waldemar Fault forms a zone at least 2-3 metres thick characterized by a quartz vein breccia with an oxidized rusty matrix. A hangingwall splay of the main thrust zone here contains an additional zone of sphalerite-galena-pyrite mineralization within siliceous phyllonite.

Pb isotope analyses of galena from the Waterfall showing have isotopic ratios similar to that of sedex massive sulphide deposits of the Selwyn Basin and Kechika Trough (Graf, 1995a), leading to speculation that the Waterfall showing could represent a deformed, crosscutting feeder zone to undiscovered mineralization within the Gunsteel Formation. In this interpretation, the Mt. Waldemar Fault may have formed originally as a syn-depositional structure, inverted during subsequent contractional deformation. However, this interpretation does not account for the extreme aspect ratio of the zone, nor the occurrence of similar styles of mineralization along other thrust splays.

Pb-Zn soil anomalies:

Areas of anomalous Pb and Zn values in soils were outlined by Texasgulf and Riocanex on the Braid/Thro claims, and by SEREM and Ecstall on the Rift claims. These areas boast Pb values > 1000 ppm, and are roughly northwesterly elongate, parallel to structural trends in the area. Peak Zn anomalies are commonly displaced downslope from corresponding Pb anomalies. No significant sulphide mineralization is present in surface outcrops within the anomalous areas. Most areas with Pb > 100 ppm are either underlain by Gunsteel Formation strata, or occur downslope from Gunsteel Formation strata.

Barite occurrences:

Bedded barite occurrences are described in previous reports on the Rift Claims and in the SIC and Rough targets of the Braid and Thro claims, as possible indicators of nearby Pb-Zn sulphide mineralization. These occurrences, along with several previously undescribed occurrences and locations of outcrop or float with laminated or nodular barite, are identified on the accompanying maps.

Bedded barite occurs in at least three distinct layers within the SIC target area (Map 1). The lack of continuity of the bedded barite layers away from the ridge crest suggests these to be stacked fault repetitions of a single interval, rather than three distinct stratigraphic levels. The southeasterly structural plunge within the project area indicates that this baritic interval likely occurs at a higher stratigraphic levels than exposed in the Rough target area.

Bedded barite occurs in at least two parts of the Rough target area. Changes in bedding/cleavage angles and bedding facing direction suggest these two locations may represent the same layer on opposing fold limbs, although it is not possible to trace barite around the fold hinge.

Barite streaks and laminations visible on cleavage surfaces are common throughout the Rift claims, and their presence was used in part to distinguish Gunsteel Formation from underlying units. Bedded barite occurs in outcrops with open, upright folds along the southern border of the Rift area. Average orientations of layering in this area are slightly steeper than topography, resulting in irregular dip-slope distribution patterns. Most bedded barite here occurs near the lowest part of the Gunsteel Formation.

Geochemical Sampling:

Geochemical sampling during the 1997 exploration program was limited to a small number of rock samples from outcrops in the Thro, Braid, and Rift claims. Samples were collected to complement more detailed sampling programs conducted during 1994, and to evaluate specific rock types or mineral occurrences. Samples were analyzed at Min-En labs, Ltd. in Vancouver, B.C. by ICP for 12 elements (Table 1).

Table 2: Geochemical results from ICP analyses, 1997 rock samples

Sample #	UTM	Description	Sample Type	Ag ppm	As ppm	Ba ppm	Cd ppm	Cu ppm	Fe %	K %	Mn ppm	Na %	Ni ppm	Pb ppm	Zn ppm
P97-T5	665149.8E, 6462730N	semi- massive sulphide clasts in float	grab	11.1	401	17	31.3	79	11.06	0.03	21	0.01	127	562	> 10000
P97-T6	665248.8E, 6462667N	silicified grey phyllite w/ abundant irregular quartz veins	2 m chip	3.9	52	263	2.1	36	.56	.02	21	.01	9	98	863
P97-T18	666830.9E, 6461819N	silver-grey phyllitic shale, siliceous layers; contains barite spots/streaks on cleavage surfaces		0.4	2	219	.1	6	.31	.19	5	.01	3	31	44
P97-T27	667071.2E, 6460574N	Gossanous outcrop of phyllitic siltstone; pyrite in pods and coarse-grained knots, lenses parallel to foliation; sphalerite, galena; outcrop located directly below Mt. Waldemar Fault	1.5 m chip	21.4	205	50	63.2	39	3.53	.03	13	.01	83	7267	> 10000
P97-T37	667040.4E, 6460360N	Rusty, gossanous black pyritic shale west of Mt. Waldemar Fault with disseminated to laminated fine grained pyrite	2 m chip	1.6	96	363	2.0	46	1.66	.14	8	.01	39	67	442
P97-T44	666216.6E, 6461983N	silvery-grey shale/slate with faint barite(?) streaks; strong sulphide smell but none visible	grab	.5	19	148	.2	13	.71	.11	7	.01	9	60	64
P97-T50	669013.7E, 6461532N	Contact, probably faulted, between calcareous tan siltstone and rusty-weathering slaty shale/siltstone; layers with diagenetic pyrite clots (oxidized) in shale	2 m chip	.3	9	963	.1	17	.82	.15	8	.01	8	16	32
P97-T93	668622.8E, 6462195N	rusty-weathering, platy shale w/ pyrite as elongate blebs and isolated cubes	grab	.1	23	1429	.1	19	3.13	.07	19	.01	35	5	25
P97-T96	668370.1E, 6462326N	tan to light grey siliceous siltstone with thin barite beds	grab	.1	5	3652	.1	3	.50	.01	9	.01	4	6	6
P97-R173	677361.6E, 6448213N	Laminated chert and barite from black carbonaceous shale in lower part of Earn group	chip over 1.5 m	.1	13	3570	1.9	28	2.07	.02	29	.01	82	6	255
P97-R222b	673422.3E, 6450809N	same as above; float sample	grab (float)	.5	27	77	.1	7	1.01	.02	21	.01	18	30	15

Highest Pb-Zn values were obtained from two samples of semi-massive to disseminated sulphide mineralization similar in style to the Waterfall showing; one located at the "thumbprint" showing (P97-T5), the other along a splay of the Mt. Waldemar thrust west of the Waterfall showing (P97-T27). Both samples also contain anomalous As, Cd, and Ni values.

8. Conclusions and Recommendations

The 1997 exploration program on the Braid, Thro, and Rift claim groups completed geological mapping of most areas on the claims with good geological exposure, and established a stratigraphic and structural framework for previous soil geochemical surveys and outcrop sampling programs on the claims. This structural/stratigraphic framework will serve as a basis for future exploration in the area, as well as drill target definition.

Stratified units within the claims comprise Cambrian through Devonian/Mississipian miogeoclinal strata of the Gataga Group, Road River Group, and Earn Group. Kechika Group rocks, occurring regionally between the Gataga and Road River groups, are not identified on the claims. Gataga Group carbonates and siliciclastic sedimentary rocks flank both sides of the northern part of the project area. These rocks are thrust eastward along the Mt. Waldemar Fault, over Road River and Earn group shales and siltstones forming the central portion of the claim area. Within the shale/siltstone sequences, megascopic structures are dominated by upright to overturned folds in the north and imbricate northeast-vergent thrust faults in the south. A moderately to strongly developed slaty cleavage cuts shallowly to steeply across layering, dipping more steeply than bedding in most areas. The main contractional deformation belt has a shallow southeasterly plunge reflected in mesoscopic fold axes, bedding orientations, and bedding-cleavage intersection lines. As a result, successively younger strata are expected within southern portions of thrust sheets, which explains in part the southward pinch-out of Cambrian carbonate units on the Braid/Thro claims.

Steep southwest-dipping faults cut stratigraphic contacts and structures with apparent west-side-down displacement, although the strike-slip component of fault movement is uncertain. These faults, combined with the northeast-vergent imbricate contractional structures, result in numerous repetitions of the siltstone/shale sequence on exposed ridges in the claim areas.

Pb-Zn mineralization can be traced for several kilometres along the Mount Waldemar Fault, where it occurs associated with weakly to strongly deformed quartz veins in an approximately 5 m thick phyllonite zone. Similar mineralogical and textural characteristics are present in a showing along an imbricate splay in the hangingwall of the Mt. Waldemar Fault. Previously defined soil geochemical anomalies in the Braid, Thro, and Rift areas correspond in general to the distribution of Gunsteel Formation shales as defined in the present study, but some areas of elevated Pb in soils are mapped as Road River Group. There is no lithotype within the Gunsteel Formation or Road River Group that consistently provides strongly anomalous soil geochemistry.

The imbricate fault style within the claims, as defined in the 1997 mapping and illustrated on interpretive structural sections, underscores the importance of careful drill hole placement in any future drill-testing of exploration targets. In most areas of Gunsteel Formation, drill holes collared immediately east of northeast-vergent thrust faults and inclined steeply to the northeast will provide thickest intersections of target strata. Collection of oriented drill core samples will be desirable, to provide bedding and cleavage orientation data for interpretation of structural sections. The western portion of the Rift claims forms a dip slope, with target strata exposed at or near the present erosional surface. Exploration within this area, which has poor levels of exposure, will require careful assessment of whether or not Gunsteel shales have been too deeply eroded.

The southeasterly structural plunge defined by the present mapping augers well for the exploration potential of the topographically lower parts of the southern Thro claims, where Gunsteel Formation is poorly exposed. Silt sampling should be completed along the tributaries of Braid Creek which drain this area.

9. STATEMENT OF COSTS

Geological Consultants	
Lewis Geoscience Services, consulting structural geologists	$19,800.00
Food and camp supplies	$1554.63
Camp Lodging	
Slocan Group	$165.00
Transportation	
Northern Mountain Helicopters	$14,365.34
Geochemical analyses	
Min-en Labs Ltd.	$124.30
Licenses and Fees	$9,460.00
TOTAL	$45,469.27

10. STATEMENT OF QUALIFICATIONS

I, **PETER D. LEWIS** HEREBY CERTIFY THAT:

1. I AM A CONSULTING GEOLOGIST WITH AN OFFICE AT 15715 MOUNTAINVIEW DRIVE, SURREY, BRITISH COLUMBIA, V4P 2W9.

2. I AM A GRADUATE OF STANFORD UNIVERSITY (B.SC., 1984, GEOLOGICAL SCIENCES) AND THE UNIVERSITY OF BRITISH COLUMBIA (M.SC., 1987, GEOLOGICAL SCIENCES; PH.D., GEOLOGICAL SCIENCES, 1992).

3. I HAVE PRACTICED MY PROFESSION AS A GEOLOGIST CONTINUOUSLY FOR MORE THAN FOURTEEN YEARS AS A RESEARCHER, AND AS A STRUCTURAL GEOLOGY CONSULTANT TO THE MINERAL EXPLORATION INDUSTRY.

4. I AM REGISTERED AS A PROFESSIONAL GEOSCIENTIST IN THE PROVINCE OF BRITISH COLUMBIA, AND AM A MEMBER OF THE SOCIETY OF ECONOMIC GEOLOGISTS AND THE INTERNATIONAL ASSOCIATION OF STRUCTURAL AND TECTONIC GEOLOGISTS.

5. THIS REPORT IS BASED ON GEOLOGICAL STUDIES CONDUCTED BY MYSELF OR UNDER MY SUPERVISION, AND A REVIEW OF DATA AVAILABLE TO THE GENERAL PUBLIC.

6. I HAVE NO DIRECT, INDIRECT, OR CONTINGENT INTEREST IN EITHER ECSTALL MINING CORP. OR ANY OF THE PROPERTY DESCRIBED IN THIS REPORT, OR IN OTHER MINING PROPERTIES IN THE REGION.

7. I HEREBY GIVE PERMISSION FOR THE USE OF THIS REPORT IN ITS COMPLETE AND UNEDITED FORM IN A STATEMENT OF MATERIAL FACTS OR FOR LIKE PURPOSE. WRITTEN PERMISSION MUST BE OBTAINED BEFORE PUBLICATION OR DISSEMINATION OF ANY EXCERPT OR SUMMARY.

8 December, 1997

Peter D. Lewis, Ph.D., P. Geo.

Date

PROFESSIONAL PROVINCE OF P. D. B. LEWIS BRITISH COLUMBIA GEOSCIENTIST

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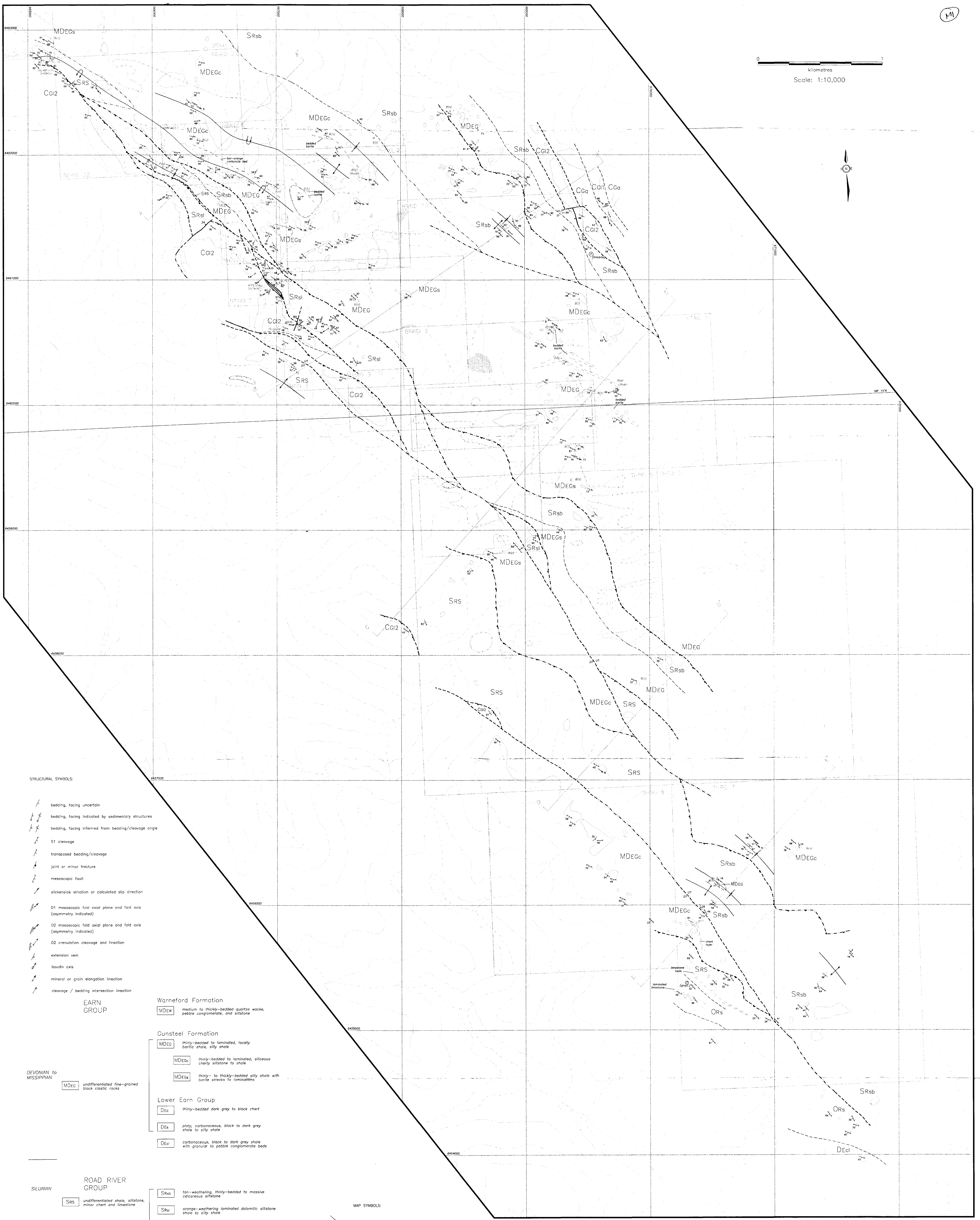


STRUCTURAL SYMBOLS:

- bedding, facing uncertain
- bedding, facing indicated by sedimentary structures
- bedding, facing inferrred from bedding/cleavage angle
- S1 cleavage
- transposed bedding/cleavage
- joint or minor fracture
- mesoscopic fault
- slickenside striation or calculated slip direction
- D1 mesoscopic fold axial plane and fold axis (asymmetry indicated)
- D2 mesoscopic fold axial plane and fold axis (asymmetry indicated)
- D2 crenulation cleavage and lineation
- extension vein
- boudin axis
- mineral or grain elongation lineation
- cleavage / bedding intersection lineation

DEVONIAN to MISSIPPIAN

EARN GROUP

MDEC — undifferentiated fine-grained black clastic rocks

Warneford Formation

MDEW — *medium to thickly-bedded quartze wacke, pebble conglomerate, and siltstone*

Gunsteel Formation

MDEG — *thinly-bedded to laminated, locally baritic shale, silty shale*

MDEGc — *thinly-bedded to laminated, siliceous cherty siltstone to shale*

MDEGs — *thinly- to thickly-bedded silty shale with barite streaks to laminations*

Lower Earn Group

DEc — *thinly-bedded dark grey to black chert*

DEs — *platy, carbonaceous, black to dark grey shale to silty shale*

DEcl — *carbonaceous, black to dark grey shale with granular to pebble conglomerate beds*

SILURIAN

ROAD RIVER GROUP

SRS — *undifferentiated shale, siltstone, minor chert and limestone*

SRsb — *tan-weathering, thinly-bedded to massive calcareous siltstone*

SRsl — *orange-weathering laminated dolomitic siltstone shale to silty shale*

ORDOVICIAN

ORs — *black-carbonaceous graptolitic shale*

-above all include minor limestone and chert layers

CAMBRIAN

GATAGA GROUP

CGl2 — *thickly-bedded to massive limestone, silty limestone, minor dolomite*

CGq — *thickly-bedded, red-weathering quartzite*

CGl1 — *thinly-bedded, peloidal/oolitic limestone*

CGa — *phyllitic, platy quartz arenite to siltstone*

MAPPING BY: Peter Lewis and Susan Taite

MAP SYMBOLS:

- stratigraphic or intrusive contact (defined, approximate, inferred)
- intraformational lithologic boundary
- fault (showing dip direction and amount) (defined, approximate inferred)
- outcrop or area of outcrops
- D1 megascopic fold axial surface trace (antiform, synform, overturned equivalents)
- linear slope break (fault or slump block)

(grapt.) fossil locality

MINERAL OCCURRENCES

- B (s,n,l,b) — barite (streaks, nodules, laminations, beds)
- py — pyrite
- sp — sphalerite
- ga — galena
- gossan or ferruginous mud

ALTERATION

- pyrite + silicification

SOIL GEOCHEMISTRY

- Pb > 50 ppm
- Pb > 100 ppm
- Pb > 1000 ppm

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,279

ECSTALL MINING CORP.

BRAID, THRO, CLAIMS

British Columbia

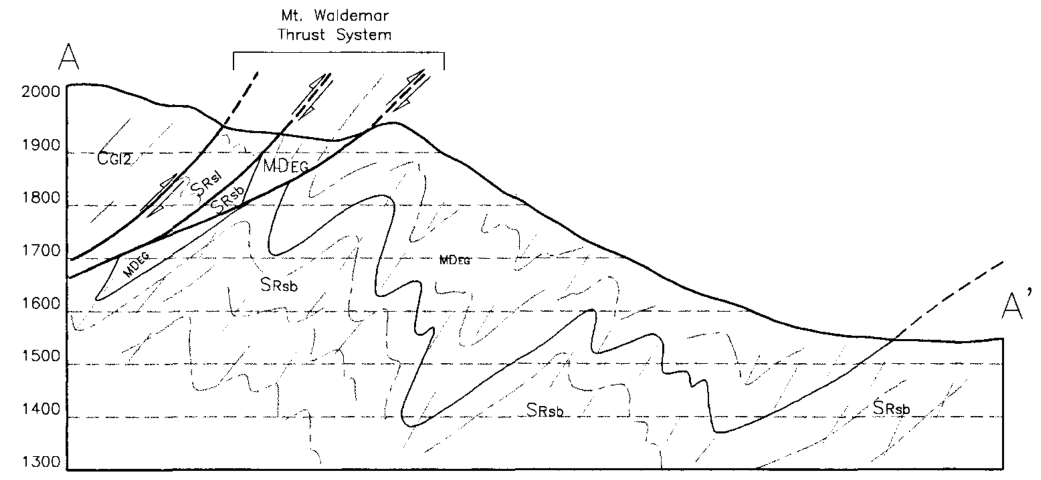
GEOLOGY

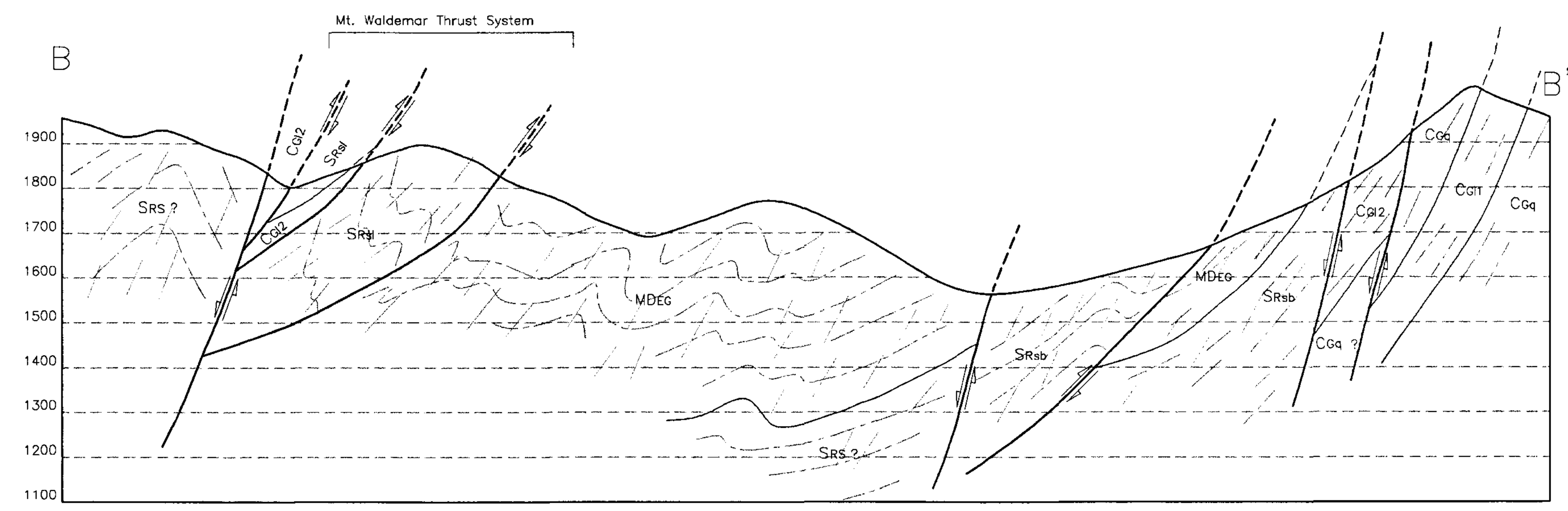
DATE: 7 Dec. 1997

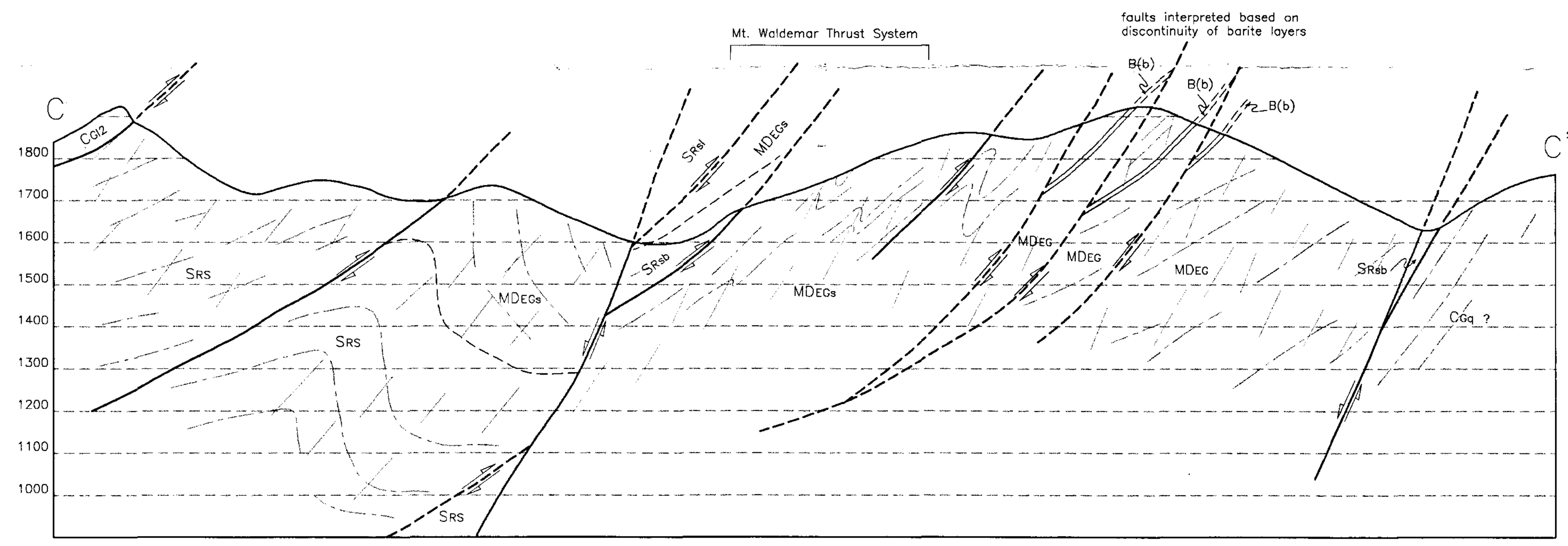
LEWIS GEOSCIENCE SERVICES INC.

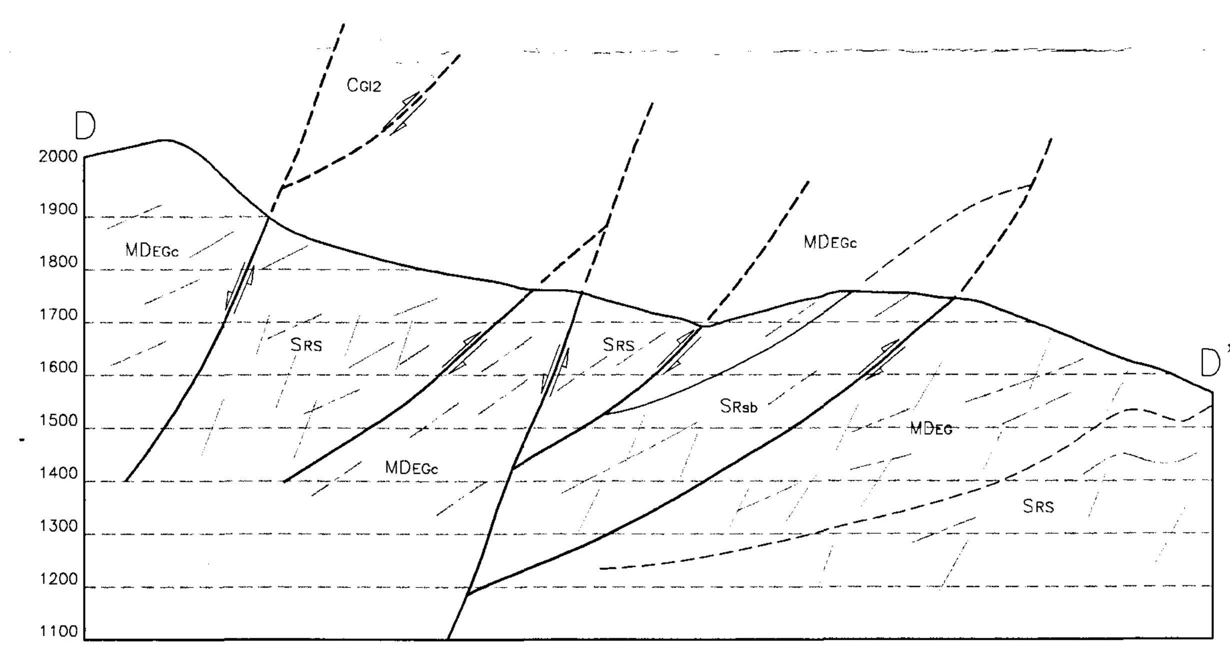
FILE: BRAID10K.DWG

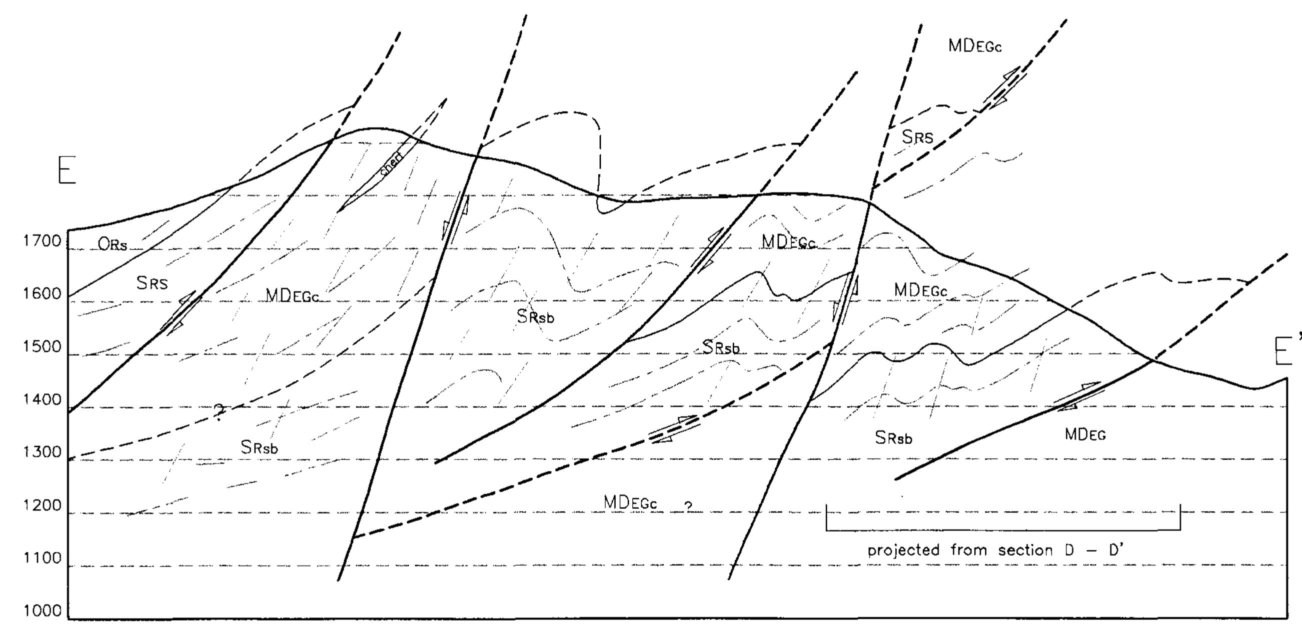
BRAID/THROUGH:











EARN GROUP

DEVONIAN to MISSIPPIAN

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MDEGs	thinly- to thickly-bedded silty shale with barite streaks to laminations

Lower Earn Group

DEc	thinly-bedded dark grey to black chert
DEs	platy, carbonaceous, black to dark grey shale to silty shale
DEcl	carbonaceous, black to dark grey shale with granular to pebble conglomerate beds

ROAD RIVER GROUP

SILURIAN

SRS	undifferentiated shale, siltstone, minor chert and limestone
SRsb	tan-weathering, thinly-bedded to massive calcareous siltstone
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ORDOVICIAN

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–above all include minor limestone and chert layers

GATAGA GROUP

CAMBRIAN

CGl2	thickly-bedded to massive limestone, silty limestone, minor dolomite
CGq	thickly-bedded, red-weathering quartzite
CGl1	thinly-bedded, peloidal/oolitic limestone
CGa	phyllitic, platy quartz arenite to siltstone

MAP SYMBOLS:

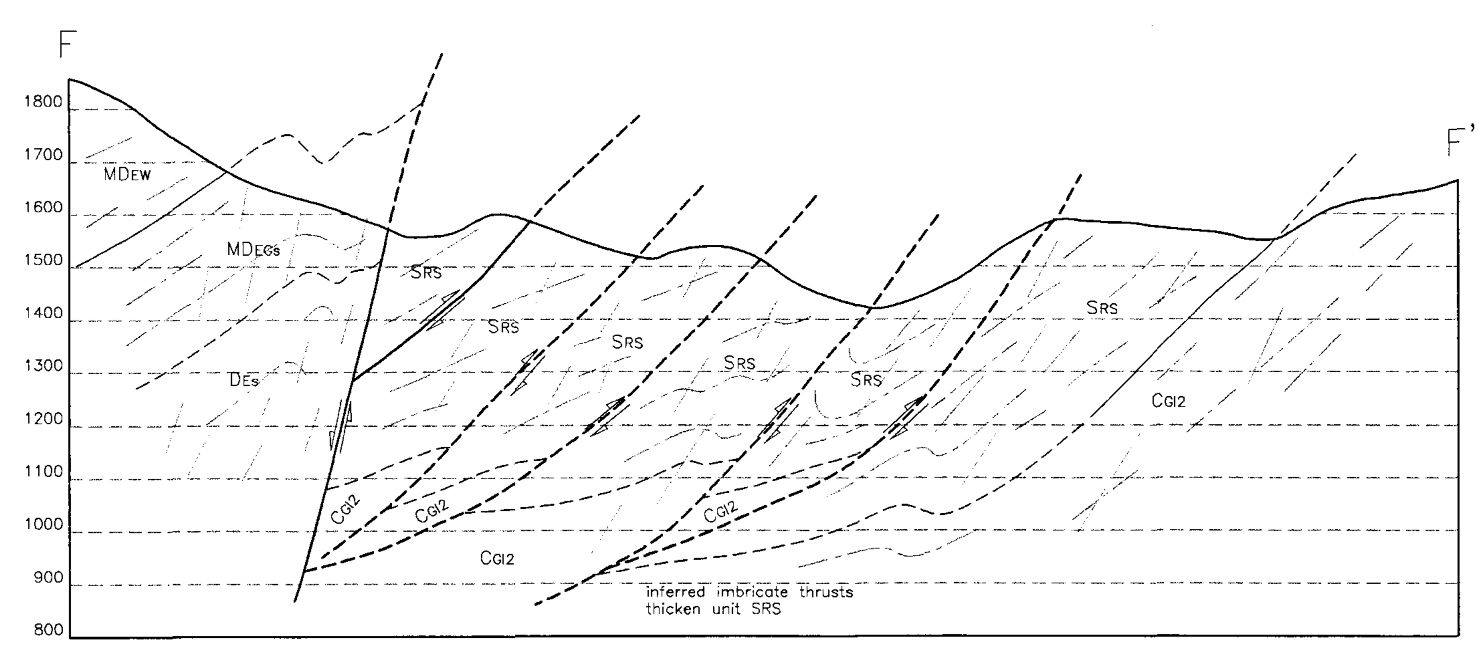
stratigraphic or intrusive contact (defined, inferred)

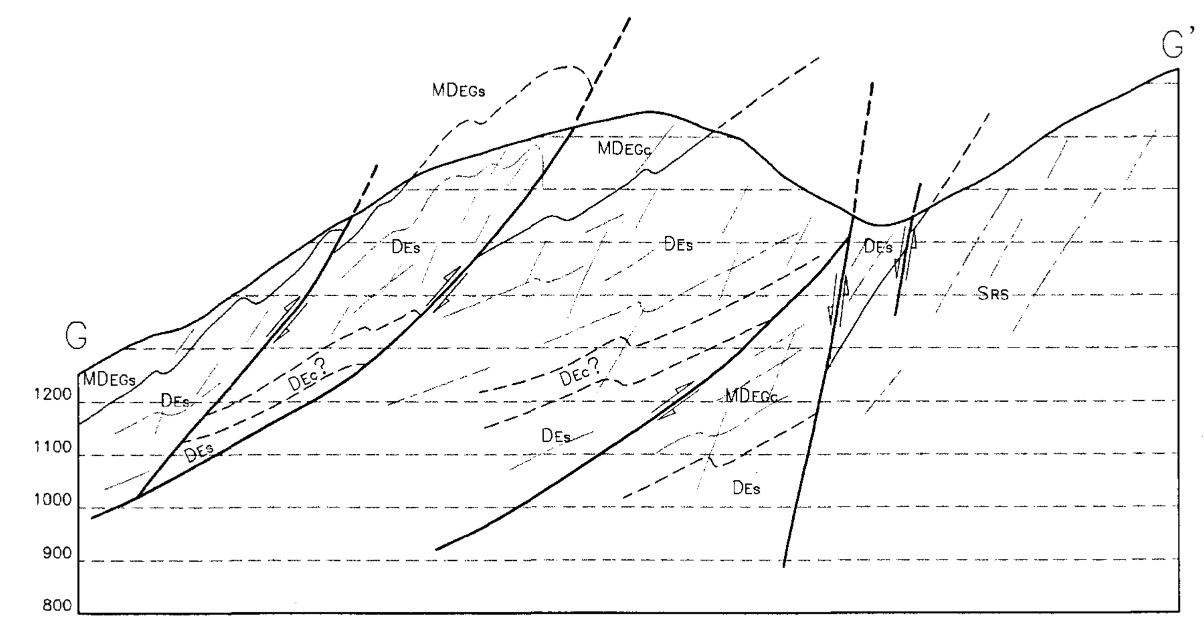
intraformational stratigraphic form line

fault (showing dip direction and amount) (defined, inferred)

S1 cleavage trace

RIFT:





GEOLOGICAL SURVEY BRANCH ASSESSMENT REPORT

25,279

P. D. B. LEWIS GEOSCIENTIST

ECSTALL MINING CORP.

BRAID, THRO, RIFT CLAIMS

British Columbia

STRUCTURAL SECTIONS

DATE: 7 Dec. 1997

LEWIS GEOSCIENCE SERVICES INC.

FILE: SECTIONS.DWG

STRUCTURAL SYMBOLS:

- bedding, facing uncertain
- bedding, facing indicated by sedimentary structures
- bedding, facing inferred from bedding/cleavage angle
- S1 cleavage
- transposed bedding/cleavage
- joint or minor fracture
- mesoscopic fault
- slickenside striation or calculated slip direction
- D1 mesoscopic fold axial plane and axis (asymmetry indicated)
- D2 mesoscopic fold axial plane and axis (asymmetry indicated)
- D2 crenulation cleavage and lineation
- extension vein
- boudin axis
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Lower Earn Group

DEc — thinly-bedded dark grey to black chert

DEs — platy, carbonaceous, black to dark grey shale to silty shale

DEcl — carbonaceous, black to dark grey shale with granular to pebble conglomerate beds

SILURIAN

ORDOVICIAN

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CGl1 — thinly-bedded, peloidal/oolitic limestone

CGa — phyllitic, platy quartz arenite to siltstone

0 — 1 kilometres

Scale: 1:10,000

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- ga — galena
- gossan or ferruginous mud

ALTERATION

- pyrite + silicification

SOIL GEOCHEMISTRY

- Pb > 50 ppm
- Pb > 100 ppm

(ticks on high side)

MAPPING BY: Peter Lewis and Susan Taite

ECSTALL MINING CORP.

RIFT CLAIMS
British Columbia
GEOLOGY

LEWIS GEOSCIENCE SERVICES INC.

DATE: 7 Dec. 1997

FILE: RIFT10K.DWG