675262

EXPLORATION MEETING
STEWART, BRITISH COLUMBIA

AUGUST 08, 1992

# RED MOUNTAIN PROPERTY

SKEENA MINING DIVISION

LOCATED

8 KM NORTHWEST OF MT. ANDREAS VOGT
BRITISH COLUMBIA

CENTERED ON

LATITUDE: 55 57' NORTH
LONGITUDE: 129 42' WEST

NTS 103P/13

OWNER/OPERATOR

LAC MINERALS LTD.

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1:2,500 DIAMOND DRILL HOLE PLAN

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1 gram/tonne Au cut-off

## REGIONAL GEOLOGY AND MINERALIZATION

GEOLOGY:

The Red Mountain property is situated within a broad, north-northwest trending volcano-plutonic belt composed of Upper Triassic Stuhini Group and Upper Triassic to Lower - Middle Jurassic Hazelton Group. This belt has been termed the "Stewart Complex" and forms part of the Stikinia Terrane. The Stikinia Terrane together with the Cache Creek and Quesnel Terranes constitute the Intermontane Superterrane which is believed to have accreted to North America in Middle Jurassic time. To the west, the Stewart Complex is bordered by the Coast Plutonic Complex. Sedimentary rocks of the Middle to Upper Jurassic Bowser Lake Group overlay the oomplex to the east.

Formational subdivisions of the Jurassic stratigraphy have been and are in the process of being modified and refined as a result of recent work being undertaken in the Stewart, Sulphurets, and Iskut areas by the Geological Survey Branch of the BCMEMPR, the Geological Survey of Canada, and the Mineral Deposits Research Unit at the University of British Columbia. A sedimentological, stratigraphic, and structural synthesis is slowly emerging for this area.

The Hazelton Group represents an evolving (alkalic/calc-alkalic) island arc complex capped by a thick succession of turbidites (Bowser Lake Group). The Hazelton Group has been subdivided into four litho-stratigraphic units: the Upper Triassic to Lower Jurassic (Norian to Pliensbachian) Unuk River Formation, the Middle Jurassic Betty Creek (Pliensbachian to Toarcian) and Salmon River (Toarcian to Bajocian) Formations, and the Middle to Upper Jurassic (Bathonian to Oxfordian- Kimmeridigian) Nass Formation. Formational status (Mt.Dilworth Formation) has been assigned to a Toarcian rhyolite unit (Monitor Rhyolite) overlying the Betty Creek Formation. Rocks of the Salmon River Formation are transitional between the mostly volcanic Hazelton Group and the wholly sedimentary Bowser Lake Group and are presently treated either as the uppermost formation of the former or the basal formation of the latter. The Nass Formation has now been assigned to the Bowser Lake Group.

The Unuk River Formation, a thick sequence of andesitic flows and tuffs with minor interbedded sedimentary rocks, hosts several major gold deposits in the Stewart area. The unit is unconformably overlain by heterogeneous maroon to green, epiclastic volcanic conglomerates, breccias, greywackes and finer grained clastic rocks of the Betty Creek Formation. Felsic tuffs and tuff breccias characterize the Mt.Dilworth Formation. The

Mt. Dilworth Formation represents the climactic and penultimate volcanic event of the Hazelton Group volcanism and forms an important regional marker horizon. The overlying Salmon River Formation has been subdivided in the Iskut area into an Upper Lower Jurassic and a Lower Middle Jurassic member. The Upper member has been further subdivided into three north-trending facies belts: the eastern Troy Ridge facies (starved basin), the medial Eskay Creek facies (back-arc basin), and the western Snippaker Mountain facies (volcanic arc).

Sediments of the Bowser Lake Group rest conformably on the Hazelton Group rocks. They include shales, argillites, silt- and mudstones, greywackes and conglomerates. The contact between the Bowser Lake Group and the Hazelton Group passes between Strohn Creek in the north and White River in the south. The contact appears to be a thrust zone with Bowser Lake Group sediment "slices" occurring within, and overlying, the Hazelton Group pyroclastic rocks to the west.

Two main intrusive episodes occur in the Stewart area: a Lower Jurassic suite of dioritic to granodioritic porphyries (Texas Creek Suite) that is comagmatic with extrusive rocks of the Hazelton Group and an Upper Cretaceous to Early Tertiary intrusive complex (Coast Plutonic Complex and satellite intrusions). The Early Jurassic suite is characterized by the occurrence of coarse hornblende, orthoclase and plagioclase phenocrysts and, locally, potassium feldspar megacrysts.

The Eocene Hyder quartz-monzonite, comprising a main batholith, several smaller plugs, and a widespread dyke phase, represents the Coast Plutonic Complex.

Middle Cretaceous regional metamorphism is predominantly of the lower greenschist facies. This metamorphic event may be related to west-vergent compression and concomitant crustal thickening at the Intermontane-Insular superterrane boundary. Biotite hornfels zones are associated with a majority of the quartz monzonite and granodiorite stocks.

Recent structural studies indicate that Bowser Basin strata are part of a regional Skeena fold and thrust belt. This tectonism developed between latest Jurassic and early Tertiary time and involved strata at least as young as Lower and Middle Jurassic Hazelton Group. This implies that the thrust faults of this belt have affected rocks of Stikinia, and may root in the Coast Plutonic Complex.

No significant deformation has been described for the interval between the deposition of the Hazelton and Bowser Lake Groups.

This has led researchers to conclude that folds in the Hazelton Group are likely to be the result of shortening during the formation of the Skeena fold belt.

MINERALIZATION:

The Stewart Complex is the setting for the Stewart (Silbak-Premier, Big Missouri), Iskut (Snip, Johnny Mountain, Eskay Creek), Sulphurets, and Kitsault (Alice Arm) gold/silver mining camps. Mesothermal to epithermal, depth-persistent gold-silver veins form one of the most significant types of economic gold deposits. There is a spatial as well as temporal association of this gold mineralization with Lower Jurassic calc-alkaline intrusions and volcanic centres. These intrusions are often characterized by 1-2 cm-sized potassium feldspar megacrysts and correspond to the top of the Unuk River Formation.

The most prominent example of this type of deposit is the historic Silbak-Premier gold-silver mine which has produced 56,600 kg gold and 1,281,400 kg silver between 1918 and 1976. Current open pit reserves are 5.9 million tonnes grading 2.16 g Au/t and 80.23 g Ag/t. The ore is hosted by Unuk River Formation andesites and comagmatic Texas Creek porphyritic dacite sills and dikes. The ore bodies comprise a series of en echelon lenses developed over a strike length of 1,800 metres and through a vertical range of 600 metres. The mineralization is controlled by northwesterly and northeasterly trending structures and their intersections, but also occurs locally concordant with andesitic flows and breccias. Two main vein types occur: silica-rich, low-sulphide precious metal veins and sulphide-rich base metal veins. The precious metal veins are more prominent in the upper level of the deposit and contain polybasite, pyrargyrite, argentiferous tetrahedrite, native silver, electrum, and argentite. Pyrite, sphalerite, chalcopyrite and galena combined are generally less than 5%. The base metal veins crosscut the precious metal veins and increase in abundance with depth. They contain 25 to 45% combined pyrite, sphalerite, chalcopyrite and galena with minor amounts of pyrrhotite, argentiferous tetrahedrite, native silver, electrum and arsenopyrite. Quartz is the main gangue material, with lesser amounts of calcite, barite, and some adularia. Mineralization is associated with strong silicification, feldspathization, and pyritization. A temperature range of 250 to 260 degrees C has been determined for the deposition of the precious and base metals.

The Eskay Creek gold deposits are underlain by Lower to Middle Jurassic volcanic and sedimentary rocks of the Hazelton Group. Mineralization occurs in two separate zones, the 21A zone and the 21B zone. The former shows epithermal deposit characteristics, while the latter shows volcanigenic massive sulphide characteristics. The 21A zone is a rhyolite-hosted, stockwork and disseminated sulphide suite containing stibnite +/- realgar +/- orpiment +/- tetrahedrite +/- cinnibar. Vertical geochemical and mineralogical zonation indicates increasing temperatures and base metal content with depth. The 21B zone is a stratabound massive sulphide hosted by a graphitic argillite unit which overlies a rhyolite unit. Gold mineralization occurs along with sphalerite, galena, tetrahedrite and Pb-sulfosalts. Probable reserves, using a 8.6 gram gold cut-off and a minimum 2 metre thickness, for the 21A and 21B zones have been published as 183,000 tonnes at 24.3 grams gold and 233.1 grams silver per ton, and 1,073,000 tonnes at 56.9 grams gold and 1,484.6 grams silver per ton, respectively.

Middle Eocene silver-lead-zinc veins are characterized by high silver to gold ratios and by spatial association with molybdenum and/or tungsten occurrences. They are structurally controlled and lie within north, northwest, and east-trending faults. This mineralization is less significant in economic terms.

Porphyry molybdenum deposits are associated with the Tertiary Alice Arm Intrusions, a belt of quartz-monzonite intrusions parallel to the eastern margin of the Coast Plutonic Complex. An example of this type of deposits is the B.C. Molybdenum Mine at Lime Creek.

## RED MOUNTAIN REGIONAL GEOLOGY

The rocks within the LAC claim block have been divided into volcanic-dominant and sedimentary-dominant rock units. These units generally correspond with the Stuhini, Hazelton and lower Bowser Group rocks as described by Grove (1986), Anderson (1989) and Alldrick (1989). There are problems, however, in consistent unit correlations.

The west side of the map area is comprised dominantly of thinly bedded black to light gray siltstones and fine-grained wackes (ssw; swbr). Fine-grained intermediate tuff layers are locally interbedded with the siltstones. Moving east across Bitter Creek the sediments generally start to coarsen, limey units increase and volcanic components also increase. These sediments grade into the dominantly volcanic andesitic pyroclastic unit, vapg. At the base the vapg is predominantly andesitic fine to coarse tuffs. To the east, the tuffs coarsen and vary from andesitic fine tuffs to agglomerate lapilli tuffs. Clasts are generally intermediate volcanic or hypabyssal. The vapg may correlate with the Unuk River formation.

The vapg rocks commonly grade into maroon agglomerate lapilli tuffs to fine tuffs (vapm). Although the maroon coloring varies locally, sedimentary structures such as cross-bedding and graded bedding are characteristic. The vapm unit may correlate with the Betty Creek formation.

Sometimes spatially associated with the maroon and green agglomerates and tuffs is a felsic unit, vfpw. The vfpw unit is a dacite to rhyolite (?) agglomerate lapilli tuff. Rounded to subrounded clasts are dominantly felsic to intermediate plutonic and less commonly volcanic rocks. The unit is commonly associated with intervolcanic limey sandstones, wackes and limestones. The vfpw may correlate with the Dilworth formation.

Across the Cambria icefield east of Red Mountain and Otter Mountain, sedimentary rocks are generally coarser than at Bitter Creek. These sediments, sawc, are comprised of sandstones, siltstones, wackes and conglomerates. The sawc rocks may correspond to the Bowser Lake Group. It is unclear what the volcanics associated with the sawc rocks, the vbga unit, may correspond with.

All the rocks in the Red Mountain area are deformed, with the sedimentary units displaying folding and shearing most clearly. It is difficult to trace structures or lithologic units, but Skeena fold and thrust tectonics have clearly played a significant role in scrambling the stratigraphy in the area.

Large scale warping is indicated by an antiform running down Bitter Creek and small scale structures are apparent in every outcrop.

If the units in the Red Mountain area correlate to the Hazelton Group rocks as described elsewhere, there are significant discrepancies with the stratigraphic sequence. This is significant with respect to the stratigraphic position of ore deposits in the region. For example, the Eskay Creek deposit is thought to lie in the transition between Dilworth volcanics and Salmon River sediments. It is important to decipher the stratigraphy in the Red Mountain area.

## RED MOUNTAIN PROPERTY GEOLOGY

The Red Mountain Project area is underlain by a series of intermediate and felsic pyroclastic and epiclastic rocks with minor siltstones and limestones. These bedded rocks are intruded by hornblende-feldspar-porphyritic andesite and diorite dikes and stocks of Jurassic (200 m.y.) age.

The bedded units are best exposed on the summit and west ridge of Red Mountain where they consist predominantly of light- to medium-grey, thin (0.5 to 5 cm) bedded, fine- to coarse-grained tuff. Most of the pyroclastics are water reworked, as many of the beds are graded and show channel scours and other sedimentary features. These sedimentary structures frequently indicate tops. Coarser beds, with lapilli- and more rare agglomerate-sized fragments, are common on the upper part of the west ridge east of the summit and adjacent to the glaciers on the northeast side of the mountain.

Quartz and feldspar crystal tuff beds occur locally on the property, and many of the clasts in the fragmental units appear to be felsic. In general the pyroclastic units have average compositions of rhyolite or dacite, with up to 64% normative quartz indicated in whole-rock analyses. Dark-grey beds of limestone of up to 30 cm in width occur in local areas on the west ridge.

The bedded units are locally contorted, but many of the local perturbations appear to be due to soft-sediment deformation. Beds on the west ridge generally strike north-westerly, with a possible anticlinal axis (confirmation pending establishment of tops on the west limb) located about 500 meters southwest of the summit. On the surface, bedding which apparently trends into the Marc and North zone areas dips to the northeast. Beds on the summit and east ridge of Red Mountain are more irregular but many of the dips are to the north, indicating possible doming due to intrusion.

The bedded rocks are cut by porphyritic intrusive rocks with 10 to 20% hornblende phenocrysts and up to 20% feldspar laths. These intrusive rocks are a heterogeneous mixture texturally, with feldspar contents and grain sizes varying greatly. Biotite and augite phenocrysts are seen locally. Two of the porphyry units which cross the west ridge appear to conform to the bedding and may be flows. Whole rock analyses indicate that despite differing appearances, the intrusives and possible extrusives are predominantly of similar andesitic composition, and they are probably dikes, stocks, and apophyses branching from a deeper pluton.

To the southeast of the summit of Red Mountain, an andesitic stock and the adjacent bedded rocks are bleached, silicified and pyritized (with an average of up to about 5% pyrite disseminated and in veinlets) over a large area. The Marc and North zones, which contain the most significant mineralization discovered to date on the property, occur in and adjacent to this altered intrusion.

Additional alteration and pyrite-vein zones which occur elsewhere on the property have not yet been explored in detail, and may indicate the presence of additional gold mineralization.

## RED MOUNTAIN DISCUSSION

Most of the work to date has concentrated on Red Mountain. Here thin- and thick-bedded volcaniclastic, massive and brecciated hornblende feldspar porphyritic flow rocks, hetrolithic lapilli stone and tuff, siliceous argillite and rare limestone have been intruded by hypabyssal hornblende feldspar stocks and sills of the Goldslide Intrusive dated at 200 Ma. Intrusive and intruded volcaniclastic rocks all have similar, intermediate in composition, major oxide chemistry. This, coupled with the presence of hornblende feldspar porphyry clasts in beds of hetrolithic breccia, suggests a common origin for most of the lithologic rock types associated with the gold mineralization that underlies Red Mountain.

A quartz monzonite intrusion, the Erin Stock, is exposed on the southwest flank of Red mountain and has been dated at 45 Ma. Regionally, the stratigraphic section strikes northerly and dips moderately to the east. West of Red Mountain in the valley occupied by the Bromley Glacier and Bitter Creek an west dipping thrust fault is exposed.

At least ten gold showings are reported on Red Mountain. Two zones are presently being drill tested, the Marc and North zones. A geological inventory of drill indicated and probable resource, using a 1 gram/tonne Au cut off, calculated before the start of the 1992 drill program stood at:

| | TONNES | Au gm/t | Ag gm/t |
|---|---|---|---|
| Marc Zone | 1,440,000 | 9.56 | 30.26 |
| North Zone | 410,000 | 6.08 | 20.32 |
| Total | 1,850,000 | 8.79 | 28.06 |

16,261,500 grams of gold

The 1992 drill program, presently in progress, has added significantly to the resource potential of the North Zone with a size now comparable to the Marc Zone.

The Marc and North zones appear to be part of an en echelon set that strikes northwest and dips moderately to the southeast. The best mineralization occurs in hetrolithic volcaniclastic and tuff rocks, but always near porphyry. Mineralization in both the Marc and North zones is underlain by a large zones of $Na_2O$ depletion, $K_2O$ enrichment, coarse grained pyrite stockwork, and an anomalous gold concentration that offers a potential for a large, low grade resource.

High grade gold is associated with semi-massive, coarse grained pyrite veins and stockwork. Gold occurs as native gold, electrum and telluride minerals. Minerals identified include hessite (Ag2Te), altaite (PbTe), petzite (Ag3AuTe2), calaverite (AuTe2), sylvanite (AuAgTe4), native tellurium, aurostibite (AuSb), bournontite (PbCuSb3), hedleyite? (Bi7Te3), native bismuth and bismuthinite (Bi7S3). Pyrrhotite and tourmaline are common in the porphyritic and sedimentary rocks away from the gold zone. Sphalerite and apatite are common to the gold zones. At the UTEM zone, which appears to be a distal part of the Marc Zone, 5.6% Zn over 9.0 metres is reported.

The potential for a large gold resource underlying Red Mountain is considered excellent. The 1992 drill and surface program will hopefully better define this potential.