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SALISBURY HILL EL 20/94

ANNUAL REPORT

1998

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G. MacDonald
September 1998

ANNUAL REPORT-EL 20/94
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1. SUMMARY

EL 20/94 lies <1 kilometre south along of the Beaconsfield Mine Joint Venture's 2Moz (pre-mining) high grade mesothermal Tasmania Reef on the western side of the Tamar River in Tasmania's north.

The licence contains ~5 kilometres of strike of the favourable host sediments to the Tasmania Reef. It also contains significant strike length of the adjacent thrust slices to the east and west. There are old workings in a number of locations and especially around the Salisbury Hill prospect.

Previous exploration has been spasmodic and largely ineffectual.

Exploration has been devoted largely to regional mapping and resolving some of the priority geological issues relevant to gold exploration in this highly prospective licence. Apart from geological mapping and core logging use was made of petrology and lithogeochemistry.

To date this work on EL 20/94 has:

- Recognised a major structural zone, the Johnson Creek Fault zone, adjacent to and associated with high grade gold mineralisation (to +10 g/t Au) at the Salisbury Hill prospect.
- Provided solid argument for correlating the sandstones, siltstones and shales outcropping west of Cabbage Tree and Salisbury Hill's, in particular on Daakes Hill, in Middle Arm Creek below Leviathan Hill and intersected in drilling along the Rifle Range Road (north of EL 20/94), with the Devonian Corn Hill Beds. This differs from earlier correlation with the Cambrian sediments.
- Mapped and interpreted the existence of the Cabbage Tree thrust running along the base of the western side of Cabbage Tree and Salisbury Hills.
- Mapped and interpreted the Bulls Road Fault with Ordovician quartzose sediments thrust over Devonian Corn Hill Beds in the Bull's Road area in the southern part of the licence.
- Recognised the probable structural significance of the serpentinite and dolomite in diamond drill core at the Salisbury Hill prospect. The alteration is interpreted to be fault related.
- Recognised the significance of the basalt unit outcropping at the mouth of Eaglehawk Gully in Middle Arm Gorge. The basalt displays peperitic textures indicating that it has intruded the host siltstones of the lower Eaglehawk Gully Formation whilst they were wet and unconsolidated, i.e. near the sea floor at the time. The basalt has high Ti levels and a Nb/Y ration ~1 indicating that it is a alkali/transitional basalt and probably from a within plate setting.

Recommendations are made for RC drilling the Johnson Creek Fault zone (~500 metres), a higher resolution helimagnetic data set, completion of regional mapping and detailed grid based soil sampling and mapping of all pre-Carboniferous rocks. Some priority must be given to adequately assessing those areas likely to be relinquished in the 50% relinquishment due on October 28th 1999.

2. *INTRODUCTION*

2.1 LOCATION AND ACCESS

EL 20/94 lies to the south of the township of Beaconsfield near Tasmania's central north coast (figure 1). Beaconsfield lies approximately 40 kilometres northwest of Launceston on the western side of the Tamar River. Access to the EL is by bitumen road from Launceston. Access within the licence is generally good with a number of bitumen roads and numerous gravel roads crossing the licence area.

2.2 TENURE AND LAND USAGE

The licence was granted to Allstate Prospecting Pty Ltd and is held on behalf of the Beaconsfield Mine Joint Venture, operators of the Beaconsfield Gold Mine. The licence is due for final relinquishment on 28th October 2004 with a 50% relinquishment on 28th October 1999.

Exclusions from the licence area include a number of mining leases. The land is used largely for agriculture or forestry. Forestry is practised on the hilly ground and hence is more common over the favourable rocks.

2.3 TOPOGRAPHY AND VEGETATION

The topography is dominated by Salisbury Hill (and the southern end of Cabbage Tree Hill) and Peaked Hill in the northern half of the licence becoming generally more hilly in the south. The area between these hills in the north is moderately flat.

Apart from the area under agricultural cultivation (~60%) the rest of the licence is covered by dry sclerophyll vegetation on the slopes becoming more of a wet sclerophyll community in the gullies and on shaded slopes.

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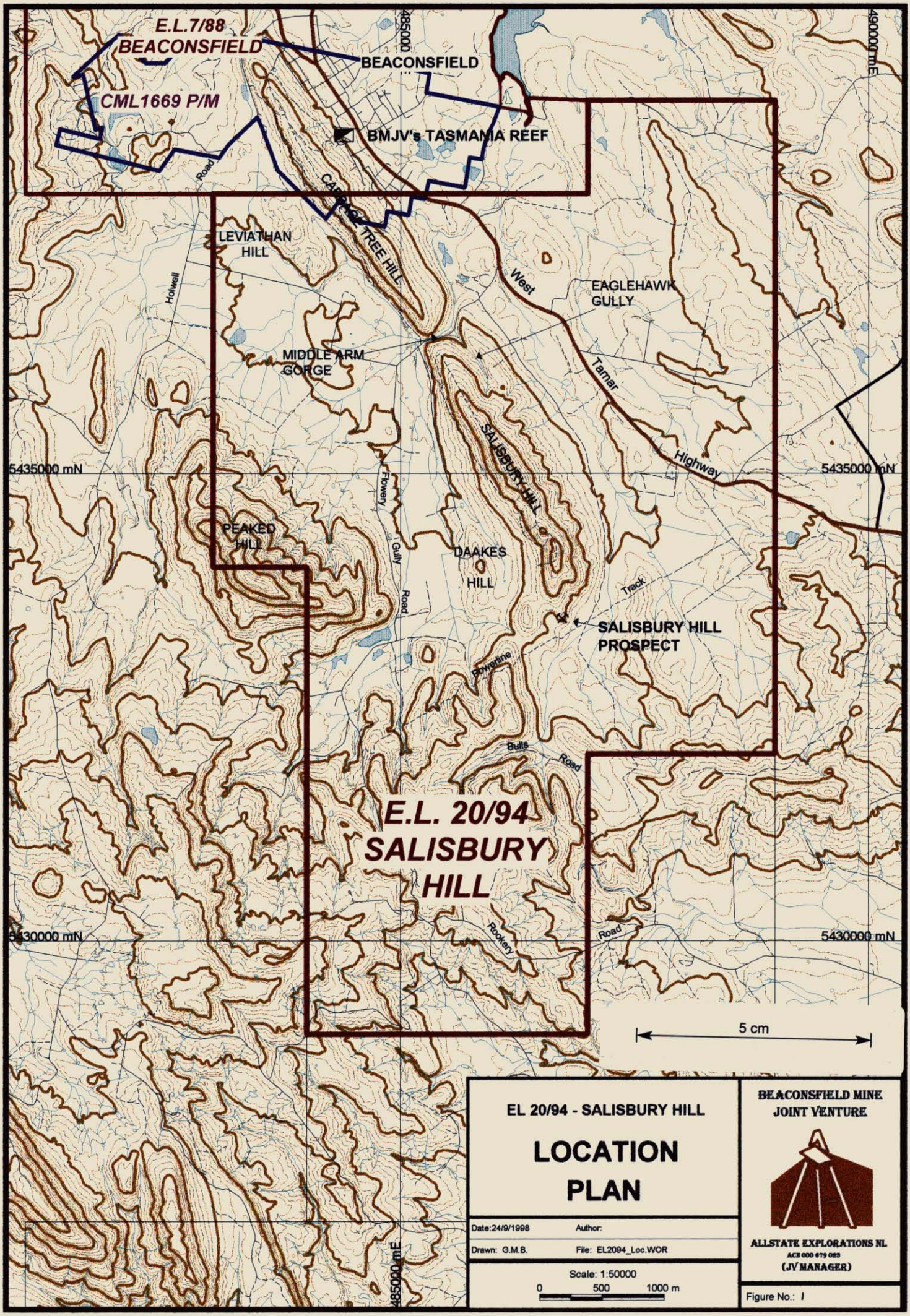

E.L.7/88
BEACONSFIELD
CML1669 P/M
BEACONSFIELD
BMJV's TASMANIA REEF
Road
LEVIATHAN HILL
Holwell
TREE HILL
West
EAGLEHAWK GULLY
MIDDLE ARM GORGE
Tamar
Highway
SALISBURY HILL
5435000 mN
Flowery
Gully
Road
PEAKED HILL
DAAKES HILL
Track
SALISBURY HILL PROSPECT
Powerline
Bulls
Road
E.L. 20/94
SALISBURY
HILL
Rookery
Road
5430000 mN
485000 mE
490000 mE
5 cm
EL 20/94 - SALISBURY HILL
LOCATION PLAN
Date:24/9/1998
Author:
Drawn: G.M.B.
File: EL2094_Loc.WOR
Scale: 1:50000
0 500 1000 m
BEACONSFIELD MINE JOINT VENTURE
ALLSTATE EXPLORATIONS NL
ACN 000 679 023
(JV MANAGER)
Figure No.: 1

3.0 EXPLORATION PHILOSOPHY

The BMJV is exploring EL 20/94 with gold as the principal target commodity.

The BMJV's approach to exploration on EL 20/94 is strongly influenced by its knowledge of the Tasmania Reef deposit (pre-mining 2Moz Au) 0.5 km north of the northern boundary of the licence.

The Tasmania Reef is a quartz+ankerite+gold+arsenic+chalcopyrite+sphalerite +galena reef of mesothermal type. The reef strikes in a northeasterly direction and dips moderately to the southeast. It is hosted within the carbonaceous sandstones, grits and pebbly conglomerates of the Salisbury Hill Formation and the calcareous sandstones and siltstones and interbedded limestones of the Eaglehawk Gully Formation. Together these two formations were previously grouped as the Transition Sequence or Transition Beds (Hills, 1998).

The reef is apparently not well developed in the Cabbage Tree Conglomerate which stratigraphically underlies the Salisbury Hill Formation, nor in the Flowery Gully Limestone which stratigraphically overlies the Eaglehawk Gully Formation. There is some historical evidence that a zone of auriferous quartz veining in the Bonanza Shaft may be the Tasmania Reef structure in the Blyth's Creek Formation which underlies the Cabbage Tree Formation.

The controls upon deposition of gold within the reef structure are uncertain. There are two principal options, these being either the relative ductility of the host rocks (relative to adjacent rocks) or the chemistry of the host rocks.

The mine sequence rocks are very brittle, particularly the sandstones in the lower approximately two-thirds of the mine sequence, often breaking with a concoidal fracture when not along a joint plane. Deformation within these rocks is characterised by the extensive development of jointing. Chemically the host rocks are bimodal. The lower part of the mine sequence, corresponding approximately with the Salisbury Hill Formation, is carbonaceous and indicates a reduced assemblage, whilst the upper part of the mine sequence contains carbonate, indicating an oxidised assemblage.

It is likely that both relative ductility and chemistry have exercised some control over the deposition of gold. A strong correlation between higher arsenic levels in the Reef and in the Eaglehawk Gully Formation argues for some form of chemical control, whilst the lack of significant mineralisation within the Flowery Gully Limestone argues for some structural control.

The structure within which the Tasmania Reef lies has undergone an apparent dextral movement of around 40 metres though there is also evidence for a normal strike slip component to this displacement. The deformation responsible for the formation of the Tasmania Reef is considered to be the Middle Devonian Tabberrabberran Orogeny with the Tasmania Reef structure opening under a roughly northeast/southwest principal stress regime.

The Tasmania Reef is associated with a number of much smaller mineralised structures and any anomalous intersections, however small, may be reflecting the proximity of more major structures.

There is evidence of mineralisation in a number of orientations other than that of the Tasmania Reef in the district.

- The North Tasmania reef (CML 1669P/M) strikes more 080°, dipping moderately southwards. This vein is quite sulphidic, particularly rich in chalcopyrite.
- Mineralisation in the Moonlight-cum-Wonder workings (CML 1669P/M) has a wide range of orientations (including sub-horizontal and both north-south and east-west striking) along a trend which strikes north-north-westerly, parallel to the regional strike.
- Old workings at Salisbury Hill (EL 20/94) are at least partly on veins which dip shallowly to the west and are hosted within quartz sandstones and grits possibly in the hangingwall to a thrust? contact with ultramafics.
- A drill hole passing through the contact between the Anderson's Creek Ultramafic Complex and cherty siltstones on Dan's Hill on the very western boundary of EL 7/88 intersected 3m @ 1g/t Au in a carbonaceous arsenopyritic quartz vein.
- There are old workings on quartz veins within the Devonian Corn Hill Beds on EL 20/94 (though there is no significant evidence for gold mineralisation within these veins).
- Given a northeast/southwest principal stress orientation there are a number of settings in which gold mineralisation may be expected.

East of the Tamar River auriferous reefs of the Lefroy Goldfield strike approximately 080 and are arranged in an en-echelon pattern along a 5km long north-north-west trending zone. Although the Lefroy reefs are hosted within the Siluro-Devonian Mathinna Beds the structural setting is very similar in orientation to the Tasmania Reef.

Thus the perceived trap for gold mineralisation is structurally dilational zones formed under a northeast/southwest principal stress regime in the Middle Devonian. Any rocks older than this may be mineralised but empirically the ideal trap rocks are the Salisbury Hill and Eaglehawk Gully Formations, the "Transition beds".

The source of the gold is considered to be the devolatilisation of metamorphic rocks at depth, probably greenstones. There has been some suggestion that the Anderson's Creek Ultramafic Complex may be the source, or associated with the source of the gold. Roach (1994) shows the presence of a mafic/ultramafic body at depth to the east of the Tamar River.

The deformation in the Middle Devonian involved westward directed thrusting. This thrusting is considered to have occurred during or just prior to the opening of the Tasmania reef structure. The thrusts are therefore likely to have played a role as fluid conduits. It is not necessary that all thrusts acted as conduits as fluid may well have preferentially passed along a discrete route of least resistance. Only the thrust beneath the Cabbage Tree slice has established its pedigree as a mineralising structure.

Empirically the ideal place to look for Tasmania Reef style mineralisation is within the Transition beds along the Cabbage Tree slice. Analogous structural and lithological settings may lie along the Cobblestone Creek slice to the east and the very small area of the Dan's Hill slice in the west of the licence area.

Mineralisation does occur with a range of other orientations within both the Transition beds and other rock units. To date these have not proven to be economic.

Exploration is influenced by the fact that the Transition beds in the Cabbage Tree slice have been picked over comprehensively by early prospectors. Exploration must therefore be deeper looking, either to get beneath the area worked by the prospectors or to look beneath the cover rocks. Although overlapping fences of RC holes are a logical first approach, the expense means that some form of focusing is required.

In areas of outcrop soil geochemistry may be of assistance in locating sub-cropping mineralisation. Pathfinder elements are likely to be more useful than the less mobile gold. Arsenic is particularly mobile and may create a relatively broad geochemically anomalous halo around a mineralised structure. Care must be taken in sampling and interpreting the data to take account of the proximity of old workings and the location of the anomalies topographically.

Although the favourable host rocks are essentially non-magnetic, aeromagnetics is perhaps the only tool available to help in recognising structure beneath cover.

4. PREVIOUS EXPLORATION

4.1 INTRODUCTION

The history of exploration of EL 20/94 reads very similarly to that of EL 7/88 in the latter part of last century with prospectors active throughout the district.

Modern exploration commenced on the area covered by EL 20/94 in the early 1970's when the Mines Department drilled two diamond drill holes S1 and S2 to test reported nickel at the Salisbury Hill prospect (see figures 1 and 5). Both holes were drilled to the west (S1 177.6m and S2 233.0m). There was no assaying of core for gold though reassaying was conducted subsequently by Amax (see below).

4.2 1980-82 AMAX: (Poltock, 1980; Hamlyn, 1982, TCR 82-1681)

In 1980 AMAX carried out exploration over their Authority to Prospect 6/80. Their work was focused on gridded soil sampling and mapping around the Salisbury Hill prospect. Problems with scree cover led to the soil sampling being abandoned with the emphasis shifting to mapping and sampling the old workings. Specifically this involved mapping and sampling of the Powerline and Dyke Tunnel adits and attempts to reopen the Duchess of York and Victoria adits.

Sampling of the Dyke Tunnel returned low values (all <0.03g/t), however, the Powerline adit returned consistently anomalous values with assays up to 5 metres @ 4.35g/t and 7 metres @ 4.37g/t with individual assays up to 11.83, 11.75, 8.92, 7.00, 4.50, 4.00, 3.58, 3.09 and 3.08 g/t Au. Samples were analysed for Au, As, Ag, Cu, Pb, Zn and Mn. Au, Mn, As, Cu and Ag.

Ground magnetics was read over the 100 metre spaced grid with data presented as profiles. Geological fact and interpretative maps (which forms the basis of all subsequent mapping) were also prepared.

Soil samples were assayed for As, Ni, Cr, Cu, Pb and Zn. Anomalous results are superceded by Goldfields work (see below).

4.3 1985 GOLDFIELDS EXPLORATION: (Pease, 1984, TCR 84-2311)

In 1985 Goldfields carried out some more substantial exploration around the Salisbury Hill prospect. Their work involved extending the gridding and soil sampling to the south and infilling in the northern part of the AMAX grid with analysis for As with Au analysis for anomalous samples. This work defined two anomalous zones referred to as the Salisbury Hill zone and Johnson Creek Fault zone in the north and south respectively. The northern anomaly is observed on lines 1050N-1250N and peaks at 970ppm As whilst the southern anomaly is more patchy. Au values from the northern anomaly confirm the anomaly with values up to 0.7g.t whilst in the Johnson Creek Fault zone all Au is<0.01g/t.

Four diamond drill holes (S3 to S6) were drilled to test these two anomalies. Three holes were drilled into the northern anomaly with only one, S5, drilled into the southern zone. The location and effectiveness of these holes is discussed below.

Further infill gridding was recommended as well as re-assaying of drill core in order to determine vectors to gold using pathfinder element ratios.

4.4 1988 STACPOOLE AND MIEDECKE / BHP: (Stacpoole and Miedecke, 1988, TCR NR)

In 1988 Harry Stacpoole and John Miedecke entered into an agreement with BHP to explore for gold on Consolidated Mineral Lease 145M/79 (after it was discovered that the prospect did not lie on the Beaconsfield gold mines Joint Venture ground).

Stacpoole and Miedecke spent approximately $23 000 on the Salisbury Hill prospect completing a small programme of RAB drilling. This was preceded by gridding (50m x 50m on southern end of spur), costeaning on the crest of the spur apparently with assayed sampling (no data is provided), and the drilling of seven vertical RAB holes (for 108 metres) around the Powerline adit. Three of these holes were drilled into the Powerline Adit with the other four drilled just south of the adit. The three holes drilled into the adit seem reasonably well placed, however, they are much too short. Details regarding these holes are poor and so they are not shown on mapping. A hole in the roof of the large chamber in the Powerline adit is one of these holes but it is uncertain which one. Assays for all samples are uneconomic with the best 8 metres @ 0.25 g/t Au and 3 metres @ 0.3 g/t Au.

Drill hole locations and assays are available, however, the costeans have since been filled in and no assays or mapping is available. There is evidence for 4 such costeans.

4.5 1989 BEACONSFIELD GOLD MINES LIMITED: (Hicks, 1989, TCR 89-3011)

A considerable amount of regional work was carried out from late 1987 to January 1989 with some of this work covering the Salisbury Hill area. In particular stream sediment BLEG sampling and a fixed wing aeromagnetics/radiometrics surveys were conducted as well as regional mapping.

4.6 1997 BMJV: (Hills, 1997, TCR ??)

The southern half of the Salisbury Hill ridge was gridded (50 metre lines with pegs every 50 metres) and a high resolution ground magnetics survey conducted using a new generation continuous sampling magnetometer.

Ridge top soil sampling was carried out over ridges underlain by Cabbage Tree Formation rocks within E.L. 20/94 (as well as E.L. 7/88). Traverses (40 metre sample spacing) were completed along the main spur, as well as across the western side of the main sluiced area and the ridge further west again.

Existing gridded soil geochemical sampling (Amax's 1980 sampling and Goldfields' 1984 sampling) was digitised and plotted.

5. WORK COMPLETED AND RESULTS, 1998

5.1 INTRODUCTION

Work completed this reporting year has focused on resolving the geology of the licence. The conclusions reached from this work are detailed in section 6.0 with the results of more specific work described in section 6.5.

The actual work undertaken in arriving at these geological conclusions is detailed here.

5.2 REGIONAL MAPPING

Regional mapping is ongoing within EL 20/94. To date this work has focused largely on discrete geological problems. Mapping has been completed in the Middle Arm Gorge, West Tamar Highway, Salisbury Hill and Bulls Road areas. Fact mapping to date is presented as figures 3, 4 and 5 and interpreted on figure 2.

As part of this work 52 samples of quartz veining were collected and assayed. Sample locations and assays are presented on figures 3, 4 and 5. No significant results were received. 33 (total) samples of coherent mafic and ultramafic volcanics (15) and sediments (18) were collected for more detailed lithogeochemical analysis. The sediments were collected as part of a larger sampling programme including samples from the Beaconsfield Mine and EL 7/88. Sample locations are shown on figures 3, 4 and 5. Results for the sediments are listed in appendix 3 and discussed in section 6.5.2. Results for the mafics and ultramafics are listed in Table 2 and discussed in section 6.5.4.

Twenty samples, including 7 analysed lithogeochemically were also described petrologically. Sample locations are shown on figures 3, 4 and 5, the petrological report is included as appendix 1 and the results are discussed in section 6.5.4.

5.3 SALISBURY HILL PROSPECT

The following work has been completed in late 1997/early 1998.

The historical records and reports were read and appraised.

Drill core from DDH's S1, S2, S4, S5 and S6 was relogged (logs are in appendix 4) with S1 and S2 also logged for magnetic susceptibility. In addition 31.55 metres of core (26 samples) was sampled from S1 with a further 11.15 metres (12 samples) from S2. The sampling was largely from serpentinite and/or dolomite altered zones. All core was assayed for Au, As, Ni and Cr. Assay results and magnetic susceptibility profiles are presented in figures 10 and 11. A number of samples from these two holes were studied petrologically (as detailed above). Three samples of clay from the Powerline and Dyke Tunnel adits were analysed by XRD. Results are discussed in section 6.5.3

A number of the quartz samples and lithogeochemical samples as detailed above were collected from the Salisbury Hill prospect area.

Surface outcrop has been mapped in the gridded area between 5433200mN to 5433800mN and 486200mE and 487000mE (shown on figure 5). The

Powerline Adit and Dyke Tunnel Adits have been mapped in some detail (figures 8 and 9 respectively).

3 rocks from near the mouth of the Powerline Adit were sampled and assayed for Au and As. 22 channel samples (for 29.4 metres) were taken from the vertical faces surrounding the mouth of the Powerline Adit. All bar one were vertical samples. The channel samples were assayed for Ni and Cr as well as Au and As. Sample locations for channel samples and rocks are shown on figure 8 with results tabulated on figure 5.

6. GEOLOGY

6.1 INTRODUCTION

The Beaconsfield Gold Mine in Northern Tasmania is focussed on a mineralised shear structure of Middle Devonian age, the Tasmania Reef, which crosscuts an easterly dipping Ordovician stratigraphy. The resource is a large mesothermal vein deposit similar in style to the Central Victorian deposits at Ballarat and Bendigo and prior to historical mining constituted a resource in excess of 2 million ounces of gold. Diamond drilling over thirty years since the mid 1960's has confirmed that continuous mineralisation extends to a vertical depth of 700m beneath the historical mining operation. The current resource of 1.929 million tonnes at 17.37 g/t Au (1.08 million ounces) (Hills, 1998a) was estimated using information gained from the diamond drilling.

6.2 REGIONAL GEOLOGY

The geology of the Beaconsfield area of central northern Tasmania encompasses many of the major elements of Tasmanian geology within an area of less than 100 square kilometres. Of particular significance is the fact that the Beaconsfield area is the only part of the state where an interpreted contact between the Eastern and Western Tasmanian Terranes outcrops. This regional setting may play a significant role in the location of the 2 million ounce Tasmania Reef deposit.

The interpreted geology of EL 20/94 is included as figure 2. Many of the elements discussed later in this section fall within the area of EL 20/94.

Elliott et. al. (1993) studied the area between Port Sorell and the Tamar River, and identified three distinct structural and stratigraphic terranes (from west to east) the Port Sorell Block, Badger Head Block and Beaconsfield Block, providing a framework within which the following description of the geology is conveniently constrained (the Tasmania Reef is hosted within the Beaconsfield Block).

The original contacts between these three allochthonous blocks are most probably east-dipping thrusts, interpreted by Elliott et. al. (1993) to be Late Cambrian thrusts reactivated in the Middle Devonian.

Due to the allochthoneity of these blocks, it is not clear which are the oldest rocks in the region. The structural interpretation of Elliott et. al. (1993) invokes westward directed thrusting in the Late Cambrian juxtaposing the Port Sorell Formation, Badger Head Formation, Anderson's Creek Ultramafic Complex and Cambrian? sediments (the latter including the siltstones and cherts which lie between the Badger Head Block and the Anderson's Creek Ultramafic Complex as well as Dally's Siltstone at the base of the Cobblestone Creek slice in the Beaconsfield Block - see below). Ages have been assigned to these rocks largely on affinities with rocks elsewhere in Tasmania or relative degree of deformation, the exception being Dally's Siltstone which contains fossils of Cambrian age (Green, 1959).

The Port Sorell Formation consists of shales, siltstones, chert, impure and quartz rich sandstones, dolomite, matrix supported conglomerate, intermediate

volcanic or hypabyssal rocks and blocks, dykes and sills of dolerite (Elliott et. al., 1993; Gee and Legge, 1979). It is interpreted to be a tectonic melange deformed in an east facing accretionary wedge (Elliott et. al., 1993). Age constraints are poor but angular organic fragments and degree of metamorphism probably place it as Cambrian in age (Elliott et. al., 1993).

The Badger Head Block is structurally complex area consisting of multiply folded quartzites and phyllites of the Badger Head Formation. Although correlated with the Precambrian Burnie Formation, largely on the basis of the degree of deformation, Gee and Legge (1979) note the similarity with the Siluro-Devonian Mathinna Beds from the Eastern Tasmania Terrane. Rocks of probable Ordovician age unconformably overlie the Badger Head Formation near Mt Careless precluding a direct correlation with the Mathinna Beds (Gulline, 1981; Purvis, 1998). Elliott et. al. (1993) simply conclude that the Badger Head Formation is probably an allochthonous block introduced in the Late Cambrian thrusting.

The eastern boundary of the Badger Head Block is in faulted contact along its eastern margin with cherts and shales, the westernmost rocks of the Beaconsfield Block.

The pre-Carboniferous geology of the Beaconsfield Block is divided into four or five parallel imbricate thrust slices, each containing discrete parts of the stratigraphic section (Gee and Legge, 1979). From west to east the five are called the Anderson's Creek slice, Dan's Hill slice, Peaked Hill slice, Cabbage Tree slice and Cobblestone Creek slice (figure 2). Despite some differences between recognisable units in different slices, the similarities are such that a reasonable picture of the overall stratigraphic section from Cambrian to Devonian is attainable. Structurally the rocks are dominated by faulting with only very minor folding. For the most part, bedding retains a north-northwest strike and mostly though not always a moderate easterly dip although recent mapping by Purvis (1998) has identified a tight synclinal axis related to recumbent folding within the Ordovician sequence near Glengarry. A similar structural attitude was identified within the presumed Cambrian sequence at Port Sorell (Gee and Legge, 1979).

The sediments along the western side of the Anderson's Creek slice are contact metamorphosed against the Anderson's Creek Ultramafic Complex to the east and contain undated but presumably Cambrian columnar stromatolites (Banks, 1989). The Anderson's Creek Ultramafic Complex consists of pyroxenite, gabbro, serpentinite and hornfelsed sediments (Green, 1959; Gee and Legge, 1979). Dating of hornfelsed sediments is equivocal (Elliot et. al., 1993) but the rocks are considered to be of the same age as similar ultramafic bodies in western Tasmania.

Gee and Legge (1979) have mapped a thrust running through the Anderson's Creek Ultramafic Complex. The ultramafics east of this thrust are included as part of the Dan's Hill slice, defined by this sliver of ultramafics and an overlying small thickness of quartz sandstones, grits and conglomerates correlated with the Ordovician Cabbage Tree Conglomerate and Salisbury Hill Formations (terminology of Lewis, 1998). The faulted contact with the next slice to the east, the Peaked Hill slice, is inferred in the Dan's Hill area from the

interpretation of the shales and sandstones to the east of these Ordovician rocks as Cambrian in age, an interpretation disputed here. Further south the existence of this fault is supported by the presence of Cambrian fossils in siltstones and slate at the base of the Peaked Hill slice (Gee and Legge, 1979) with another area of outcropping Ordovician quartz sandstones to the west in the Dan's Hill slice.

The oldest rocks in the Peaked Hill slice are the two small areas of outcropping Cambrian shales along the base of the western edge of Peaked Hill referred to above. The Ordovician rocks in the Peaked Hill slice consist of quartz sandstones and siltstones and a unit of quartz pebble conglomerate all essentially outcropping on Peaked Hill itself. The conglomerate outcropping near the crest of Peaked Hill may be the Cabbage Tree Conglomerate. On the flat to the east of Peaked Hill is a swampy depression around which limestone can be seen outcropping (figure 2). This limestone is correlated with the Flowery Gully Limestone that outcrops 4-5 km to the south.

Gee and Legge (1979) interpreted a thrust along the eastern edge of this limestone, again based upon the interpretation of the shales, siltstones and sandstones outcropping along Middle Arm Creek beneath Leviathan Hill (as well as along Tattersalls Road) as being Cambrian in age. Where mapped or intersected in drilling these rocks consist of graded beds of turbiditic type. Simple field mapping with some support from lithogeochemistry (Ni and Cr in particular - see below) argues for these rocks being correlates of the Corn Hill Beds (Hills, 1982) which are defined along Bull's Road approximately 6 km to the south-southeast and contain Devonian fossils.

The above interpretation requires a thrust between the mine sequence on Cabbage Tree Hill and these Corn Hill Bed 'correlates' on Leviathan Hill. It also would see the Corn Hill Bed correlates overlying the Flowery Gully Limestone as part of the same structural block. The contact between the two units may be an unconformity.

There is evidence for a major fault on the western side of Cabbage Tree Hill both from outcrop and old mine plans. At the western end of Middle Arm Gorge a steeply east dipping fault zone can be recognised between the sandstones, grits and conglomerates of the Cabbage Tree Conglomerate and strongly weathered grey siltstones and weathered sandstones (figure 2 and 3). The fault in the serpentinite at the ends of two of the deepest drill holes B13 and B32 into the Tasmania Reef is quite possibly the basal thrust to the Cabbage Tree slice. Given a modest arcuate shape an east dipping structure intersected in these holes may correlate with a clearly major shear zone along the western base of Cabbage Tree Hill. This fault has been shown in previous mapping.

This interpretation is supported on historical mine plans. Such a structure has been documented in Montgomery (1892) and particularly his Plan 3 showing the drive west on the No. 5 level cross-cut, 422' below the collar of the Moonlight shaft, at around 100 metres R.L., i.e. ~40 metres below sea level. This cross-cut intersects a 10 metre wide zone of soft black slate ('pug') immediately underlying dark bluish and black grits and sandstones (Montgomery, 1892) of the Salisbury Hill Formation. Immediately west of this

pug the rocks are shown by Montgomery (1892) as very black much jointed slate with faces of joints often brightly polished. Montgomery's plan shows the rocks west of this latter unit to be fine grained black sandstones and dark clay-slates.

Rocks from these fine grained black sandstones and dark clay-slates, mapped as Cambrian by Gee and Legge (1979) were included in the sampling for trace element lithogeochemistry discussed in section 6.5.2. On the basis of Ni and Cr levels in a limited number of samples the unassigned Cambrian(?) rocks have a clearer affinity with the Devonian Corn Hill Beds to the south along strike and not with demonstrably Cambrian trilobite bearing siltstones and sandstones in the Cobblestone Creek slice. These rocks lie north-northwest along strike from the Corn Hill Beds on Bulls Road and are hence simply a continuation of that unit. The relationship between the Corn Hill Beds and the Flowery Gully Limestone sub-cropping east of Peaked Hill is unknown but might be an unconformity

Thus, the Peaked Hill slice consists of Cambrian siltstones, overlain by quartz pebble conglomerate, quartz sandstones and siltstones. These are correlated with the Salisbury Hill and Eaglehawk Gully Formations (terminology of Lewis, 1998) with the conglomerate possibly but not necessarily a correlate of the Cabbage Tree Conglomerate. These Ordovician siliciclastics are overlain by the Flowery Gully Limestone which is in turn overlain, possibly unconformably, by shales, siltstones and sandstones of the Corn Hill Beds.

The next slice to the east is the Cabbage Tree slice, host to the Tasmania Reef. As a result of its economic significance it is the best understood slice with a full cross-section in drill core in the vicinity of the mine. The oldest rocks in the sequence are white limestones with occasional 10cm thick beds of chromite bearing quartz pebble conglomerates and dark grey foliated siltstone comprising the Blyth's Creek Formation. The serpentinite at the bottom of B13 and B32 (the deepest drill hole in the mine) is interpreted from petrology to be a serpentinised ultramafic with altering fluids likely to have been channeled up the thrust. The Blyth's Creek Formation is overlain sequentially by the Cabbage Tree Conglomerate, the Salisbury Hill Formation, the Eaglehawk Gully Formation, the Flowery Gully Limestone and the Grubb Shale before the overlying thrust, the Cobblestone Creek Thrust, truncates the section.

The Tasmania Reef is hosted in those rocks which lie between the Cabbage Tree conglomerate and the Flowery Gully Limestone. Until recently these rocks have been informally called the Transition beds or Transition sequence, a term originally coined by the early miners for reasons apparent in the descriptions given below. The Transition beds have been divided into the Upper and Lower Transition beds with the contact defined by Hills (1998) as the uppermost pebble bed in the Lower Transition beds. Lewis (1998) has formalised the stratigraphic nomenclature for the Lower and Upper Transition beds and given the two formations the new formal names, the Salisbury Hill Formation and the Eaglehawk Gully Formation respectively. Collectively, the Cabbage Tree Conglomerate, the Salisbury Hill Formation and the Eaglehawk

Gully Formation combine to form the Denison Group Correlates in the Beaconsfield district.

Lewis (1998) defines the Cabbage Tree Conglomerate as consisting of grey-light brown oligomictic pebble paraconglomerate interbedded with conglomeratic quartz arenite and fine quartz arenite. The conglomerate of the unit is very poorly sorted, and has a composition dominated by sub-angular to sub-rounded quartz, with minor chert and coarse siltstone. He describes "minor detrital pyrite, chromite, olivine and detrital Fe oxide sand" in the sandstones. The anomalous presence of chromite was noted previously (Gee and Legge, 1979) and is taken to indicate that the Anderson's Creek Ultramafic Complex was exposed and shedding material at the time of deposition of the Cabbage Tree Formation. Lewis (1998) interprets the Cabbage Tree Formation to have been deposited within an alluvial fan system by a combination of debris flow and braided stream flow by eastward directed rivers flowing across and eroding the Badger Head Group, Anderson's Creek Ultramafic Complex and associated Cambrian cherts and siltstones.

Lewis (1998) formalized the Lower Transition beds with the term Salisbury Hill Formation and defined it as a sequence of dark grey-black quartz arenite interbedded with oligomictic granule-pebble (para- and ortho-) conglomerate and granule conglomeratic quartz arenite. It is divisible into five members based upon the abundance of conglomerate. Conglomerate of the Salisbury Hill Formation is poorly sorted and consists of sub-rounded to rounded quartz and minor chert, coarse siltstone, 'rip-up' mudstone and Fe oxidised mudstone/chert clasts. The top of the Formation remains as defined by Hills (1998). Lewis (1998) does not state the correlation but by his definition places the top of the quartz arenite and conglomerate bearing Salisbury Hill Formation at the uppermost pebble bed, the same position as Hills (1998).

Hills (1998) presented a section through the same sequence without formally defining them. The correlation between Hills (1998) and Lewis (1998) is quite clear with Lewis simply subdividing the sequence further.

Lewis (1998) defines the Eaglehawk Gully Formation, equivalent to the Upper Transition beds, as a sequence of grey/grey-green quartz arenite interbedded with light grey, stylolitised bioclastic grainstone. It has been divided into six members mainly by variations in limestone abundance. The quartz arenite decreases in grainsize with decreasing depth and is calcareous in the upper two and lower two members. The limestone contains bioclasts of Nuia, echinoderms and brachiopods and minor grapestone within sparry calcite cement.

Lewis (1998) interprets the palaeoenvironment of deposition of the Cabbage Tree Conglomerate, Salisbury Hill and Eaglehawk Gully Formations in the Cabbage Tree slice as follows. "The Cabbage Tree Conglomerate and the members of the Salisbury Hill Formation represent a repetitive alternation between alluvial fan and broad braided fluvial depositional systems. These systems were derived from an eastward directed river(s) originating on the Badger Head Block to the west of Beaconsfield, which passed over a thin Cambrian slice, and the Anderson's Creek Ultramafic Complex collecting sediment along the way. The Eaglehawk Gully Formation was deposited

within a transgressive tidal flat-carbonate barrier system, with a palaeo-shoreline striking approximately north-south".

A conodont biostratigraphy constructed for the Eaglehawk Gully Formation determined a stratigraphic range for the Formation from Middle Tremadoc to Upper Arenig. This is consistent with macrofossil correlation determined by Laurie (1996) The upper contact of the formation with the overlying Gordon Group at Beaconsfield is Middle to Upper Arenig on fossil evidence.

Two kilometres south of the mine in Middle Arm Gorge, a basalt unit (location on figures 2 and 3) with both coherent (plate 1) and brecciated and peperitic textures (plate 2 as well as plate 5 in section 6.5.4) is exposed in the road cut on the Flowery Gully Road. The textures seen in the basalt indicate that it was emplaced as a very shallow sill intruding wet unconsolidated sediments. It is immediately underlain by a localised unit of green sandstone which clearly (on lithogeochemical grounds) derived from the basalt which must have been exposed and shedding fine material probably hyaloclastically. The intercalated sediments are from the lower part of the Eaglehawk Gully Formation, approximately one third of the way up from the base of the Formation. Lithogeochemcially the basalt is best described as being a transitional alkali - tholeiite from an intraplate setting. The high Ti content of the basalt is not reflected in the sediments of the Eaglehawk Gully Formation. SHRIMP U-Pb isochron dating of zircons from the basalt is currently in progress.

Plate1*.Eaglehawk Gully basalt (213425) showing clay altered mafic phenocrysts (pyroxene or olivine).*

Plate 2 *Eaglehawk Gully basalt breccia (213421) showing peperitic texture. Basalt (tan) is intruding wet, unconsolidated siltstone (green).*

Overlying the Eaglehawk Gully Formation is the Flowery Gully Limestone. This unit is a pure stylolitic limestone of deep-water origin (Hills, 1998). It is light grey in colour and of fine calcarenite grade and recrystallised (Lewis, 1998). This unit is approximately 170 metres thick in the vicinity of the mine. Overlying this unit is the Grubb Shale (Green, 1959), a black graphitic shale at least 30 metres thick. Together these two units form the Gordon Group equivalents in the Beaconsfield district. The eastern boundary of the Grubb Shale is the Cobblestone Creek thrust.

The only Formation represented in the Cabbage Tree slice not yet discussed is the basal Blyth's Creek Formation.

The Blyth's Creek Formation is intersected in a limited number of generally deep diamond drill holes. The rocks of this unit were also worked in the Bonanza Shaft to a depth of approximately 300+ metres. In core the Blyth's Creek Formation is essentially defined to be those rocks lying beneath the Cabbage Tree Conglomerate. They occur as grey to dark grey siltstones and/or very grey but occasionally apple green or burgundy red stylolitic limestones with occasional distinctively apple green spotted quartz pebble conglomerates. The apple green colour is due to chromite grains, now oxidising, in the matrix. The base of this unit is sheared where intersected. The fault is associated with characteristically green serpentinite with carbonate veining/alteration and

disseminated magnetite and/or a reddish orange dolomite. Petrological study of a very similar serpentinite (samples C108115, C108118 and C108119 in appendix 1) from drill core from the Salisbury Hill prospect suggests that these rocks are the products of alteration of coherent (at least in part) ultramafics. Alteration may be early diagenetic and perhaps associated with Ca and Mg rich fluids or may be associated with thrust faulting. The serpentinite is strongly sheared whilst the dolomite is more competent. Previous descriptions have the serpentinite as a dyke or a fault. Its origin is unclear, however, it is unlikely to include an option as a dyke. In this interpretation of the geology the serpentinite is considered to be associated with thrusting.

The upper bounding thrust is the Cobblestone Creek Thrust. The fault itself is placed at the top of the Grubb Shale and beneath the polymict conglomerate unit in the overlying thrust slice. Inspection of drill core indicates that the top of the black shale is sometimes apparently conformable with the polymict conglomerate with the strongest shearing located within the shale unit. It is possible that some of the black shale is actually basal to the conglomerate though for the most part the shale is clearly conformable with the underlying Flowery Gully Limestone. The polymict conglomerate is associated with finer grained shales and siltstones to the south in Middle Arm Creek (Dally's Siltstone) (sample 213612 in plate 3). The conglomerate has been included in the Blyths Creek Formation on the basis of its apparent conformity with overlying sediments.

The Cobblestone Creek thrust passes just east of the Flowery Gully Limestone in Middle Arm Creek with slumped blocks of black shale adjacent to a sink hole in the area analogous to B13's intersection within the "deep lead" - a karst feature which is the surface expression of the limestone.

The easternmost outcropping slice is the Cobblestone Creek slice. This slice is exposed in the upper sections of some of the Tasmania Reef drilling as well as outcrops predominantly to the west but also east of the West Tamar Highway south of Beaconsfield. The oldest lithology in this slice in the mine area is a distinctive polymict conglomerate containing rounded clasts of gabbro, dolerite, basalt, andesite, quartz wacke, carbonates, quartz-mica schists, cherts and carbonate altered ultramafics (Bottrill in appendix 1 and shown in plate 3 as well as a photomicrograph in plate 6). The polymict conglomerate is strongly sheared and attenuated in drill core though less so in outcrop along Middle Arm Creek. In Middle Arm Creek the conglomerate is interbedded with siltstones and shales of Dally's Siltstone (figure 3). Macroscopically the sense of shearing agrees with an east side up movement on a moderately east dipping structure. The limestone and calcareous sediments overlying this unit are correlated with the Blyth's Creek Formation limestones in the underlying Cabbage Tree Hill slice. Individual sections of core are macroscopically similar in appearance with the Eaglehawk Gully Formation. The grey to grey-green quartz sandstones intersected in the upper part of DDH B8 and the outcrop of sandstones and grits on Lightwood Hill to the south of Middle Arm Creek and east of the highway, is correlated with the siliciclastics of the Salisbury Hill Formation on lithological grounds. Detailed correlation remains unclear and requires some verification though more exposure of the section is probably required.

Plate 3 *Polymict conglomerate (213612) from the bank of Middle Arm Creek at the base of the Cobblestone Creek slice.*

South of the Flowery Gully Road the siltstones and polymict conglomerate apparently underlie the pyroxene phyric basaltic andesite referred to here as the West Tamar Highway basalt (see plate 4). This coherent body runs for ~2 kilometres sub-parallel to the highway. The basaltic andesite is in the process of being dated.

Much of the Beaconsfield Block is overlain by recent cover sequences. A prograding sequence of limestone, mudstone and sandstone of Permo-Triassic age unconformably overlies but has largely been eroded off the underlying Lower Palaeozoic geology in the immediate environs of Beaconsfield. This sequence, which occurs throughout Tasmania, generally dips gently to the northeast at approximately 10° and is in turn intruded by a thick dolerite sill of Jurassic age. Tertiary aged basalts and unconsolidated sediments fill the Tamar Graben and associated smaller grabens that formed in an extensional environment during continental break-up. Quaternary alluvium occurs along the water courses.

Plate 4 *West Tamar Highway basalt (213549).*

6.3 STRUCTURE

The structure of the Badger Head region was the focus of the work by Elliott et. al. (1993). Their interpretation agrees with the geological evidence available and is accepted as the regional structural framework in this report. An alternative explanation is being proposed by Alistair Reed of Mineral Resources Tasmania who has been studying the structure of the northeast and argues that the earlier thrusting event was east directed (Reid pers. comm.).

Essentially Elliott et. al. (1993) recognised four major episodes of faulting. The earliest occurred in the Late Cambrian and was characterised by east dipping, west directed thrusting bringing together the Port Sorell Formation, Badger Head Formation and the Anderson's Creek Ultramafic Complex and associated Cambrian cherts and siltstones. There followed a period of sedimentation during which the Ordovician to Silurian rocks were deposited. The next phase of deformation took place in the Middle Devonian and was characterised by further west directed thrusting focussed on the existing thrusts. Gold mineralisation in the northeast of Tasmania was also associated with this event. Following deposition of the Permo-Triassic sediments and widespread intrusion of Jurassic dolerite the third phase of faulting occurred. This was characterised by extensional faulting associated with the formation of

grabens at Port Sorell and the Tamar Valley. The fourth phase is characterised by compressional oblique slip structures in Permo-Triassic and Jurassic rocks.

The Late Cambrian thrusting event correlates with the Delamerian Orogeny (Berry, 1994). The Middle Devonian event correlates with the Tabberrabberran Orogeny.

The deformation suffered by the pre-Middle Devonian rocks is expressed as faults with little significant folding.

The deformation is manifested differently between rocks of different strength. The finer grained Cambrian siltstones in Middle Arm Creek and the shales and siltstones of the Corn Hill Beds west of Cabbage Tree Hill have a moderately to well developed slatey cleavage generally dipping steeply to the east-northeast. The coarser, siliciclastic, Cabbage Tree Conglomerate, Salisbury Hill and Eaglehawk Gully Formations are strongly jointed.

The major thrusts themselves are generally poorly exposed. As noted the Cobblestone Creek Thrust is intersected in some of the deeper targeted diamond drill holes in the vicinity of the Tasmania Reef in Beaconsfield i.e. A3, B8, B14, B25 and B30. The Cabbage Tree Thrust is considered to outcrop at the western end of the Middle Arm Gorge on the Flowery Gully Road and be intersected by the west cross cut on the 422' level of the Moonlight Mine as well as at the ends of B13 and B32. The existence of another thrust is generally inferred by the occurrence of older rocks overlying younger rocks.

Hills (1998) describes the principal joint sets in the mine sequence rocks as averaging 72/291 (AMG) and 64/166 based upon underground mapping. This apparently conjugate set is bisected by the orientation of the Tasmania Reef which Hills (1998) describes as being 60/131. Although the shales and siltstones to the east and west are generally cleaved they are occasionally jointed with joint orientations consistent with those in the mine sequence rocks. The jointing is most probably Middle Devonian in age and related to a compressional regime at the time of formation of the Tasmania Reef structure.

Further mapping underground of new development in the Beaconsfield Mine indicates that there are three sets of faults. The age relationship of the earlier two sets is unclear but may be coeval. These two sets have similar orientations but largely antithetic senses of movement. The faults strike east to northeast, though predominantly east-northeast, and are sub-vertical. Dragging of bedding and rarer quartz and/or carbonate fibres record oblique slip of either combined dextral normal movement or sinistral reverse movement. The former are more common than the latter. Many of these structures carry narrow (generally in the order of a few centimetres) veins which are often sulphidic and can be gold bearing. The Tasmania Reef is considered to be an example of the dextral normal type. Both fault sets are considered to be Middle Devonian in age.

The east drive on the 375mL passes through 14 of these veins over 150 metres between 150 and 300 metres in the hangingwall to the Tasmania Reef.

The third set of faults strikes north to north-northeast and is sub-vertical with oblique slip apparently made up of dextral strike slip and a lesser normal dip

slip component. This set is analogous with other north to north-northwest trending faults elsewhere in the northeast of Tasmania which have been interpreted to be Middle Devonian in age (e.g. the main slide at Mathinna; Keele, 1994).

The evidence underground is in agreement with Richard Keele's mapping of the Temco Quarry (Hills, 1997) where he recognised numerous north-northeast to north-northwest striking dextral faults (a dip slip component is unstated but may not be significant) as well as two east-northeast striking sinistral structures. The north trending dextral set is also represented by the main slide. The relationship of the second slide to this grouping is unclear considered against Montgomery's (1892) discussion of the possible location of the Tasmania Reef west of this second slide.

6.4 MINERALISATION

Regionally the most significant gold deposit is the Tasmania Reef. The Tasmania Reef is a quartz + ankerite + gold + arsenic + chalcopyrite + sphalerite + minor galena reef of mesothermal type. The reef is approximately 320-350 metres long and averages 3 metres in width (Hills, 1998). It is analogous in many ways to mesothermal slate belt deposits in northeastern Tasmania, Victoria and elsewhere in the world. The main difference is the actual host rocks themselves.

The reef shows evidence of multiple openings and movement on the same structure with both laminated textures, defined by carbonaceous and/or sulphidic material in sub-parallel seams, and brecciated textures, with sulphide and/or ankerite infilling (healing) common. As discussed earlier there are a number of sub-parallel structures in the underground development which also carry lower levels of gold (generally a few g/t Au at best) and are considered to have formed at the same time as the Tasmania Reef. The South Lode is an example of one of these. Further afield the North Tasmania reef is considered to be of the same style and origin as the Tasmania Reef. However, in contrast with Lefroy for instance, the number and size of these sub-parallel structures is somewhat limited.

Gold occurs both as coarse particulate free gold in quartz and ankerite and intimately associated with the sulphides, particularly arsenopyrite. The deposit is relatively silver poor hence the relatively high fineness of around 937 (Russell and Van Moort, 1992).

Other gold mineralisation within the region is also of mesothermal type and structurally hosted. As noted earlier the other principal examples on the western side of the Tamar River are North Tasmania, Pease Creek and Salisbury Hill. East of the Tamar are a number of goldfields of similar age and style to the Tasmania Reef except that they are hosted within the Ordovician-Early Devonian Mathinna Beds. Further gold mineralisation east of the Tamar is considered by some to be associated with Devonian granodiorites.

6.5 LOCAL GEOLOGY

6.5.1 Introduction

The emphasis on exploration in the reporting year has been on resolving the geology of the licence. Many of the descriptions and conclusions have been detailed in the preceding section. However, much mapping has been reconnaissance in nature and has focused on particular geological issues, i.e.

- The true stratigraphic affinity of the (hereby "unassigned") sandstones, siltstones and shales outcropping to the west of Cabbage Tree Hill and Salisbury Hill and shown as Cambrian in age.
- The structural and stratigraphic setting of the Salisbury Hill prospect and its relationship to gold mineralisation.
- The nature of the mafic and ultramafic rocks in EL 20/94.
- Ramifications or conclusions flowing from the answers to these questions.

Following a brief overview of the geology of EL 20/94 each of these geological issues will be discussed in turn.

The factual geology of EL 20/94 mapped to date is shown on figures 3, 4 and 5 with the interpretation on figure 2. The interpretation is based on the Mines Departments 1:25 000 Beaconsfield and 1:63360 Frankford sheets with revisions to the "Cambrian" rocks west of the Cabbage Tree-Salisbury Hill strike ridge and in the Salisbury Hill prospect area.

The dominant trend recognisable in the interpretative geology (figure 2) is clearly north-northwest. Permian rocks cover the northeastern and southwestern quarters of the licence. The central part of the licence consists of the Peaked Hill, Cabbage Tree and Cobblestone Creek thrust slices, all trending north-northwesterly through the licence except for the dislocation across the (revised) Johnson Creek Fault. The contact with the Permian in the southwest is mapped as a fault. The contact in the northeast is apparently onlapping.

6.5.2 Corn Hill Beds Correlates

Considerable attention has been paid to resolving the structural complexity implicit in assigning the sandstones, siltstones and shales west of Cabbage Tree Hill a Cambrian age whilst less than 0.5 km to the south the same rocks are shown to be Devonian with identifiable fossils (Hills, 1982). There is clearly a marked mismatch between the sequence mapped around Corn Hill and that to the north. The change coincides with the boundary between Gulline's Frankford map sheet and Gee and Legge's Beaconsfield map sheet.

Mapping has revealed that these rocks consist of dark grey to almost black shales and fine siltstones grading up to medium grained quartzose and quatz wacke sandstones. Finer rocks bleach with weathering.

Sandier rocks weather to an orange yellow colour. Where better exposed (Bulls Road, B48/B49, Middle Arm Creek west) the rocks appear as normally graded beds over centimetres to tens of centimetres in thickness. In Middle Arm Creek west (below Leviathan Hill) the rocks are a dark greenish grey in colour. On the Derwent adit mullock the shales and sandstones are very black and carbonaceous. At other locations i.e. Powerline track, Daakes south, Daakes west, Tattersall's Road the rocks are variably weathered shales, siltstones or sandstones.

The rocks are generally moderately foliated with cleavage dipping steeply to the northeast to east-northeast. Bedding is harder to recognise but is generally dipping moderately to the northeast.

Fossil cephalopods have been found on the Powerline track indicating a post-Cambrian origin for these rocks.

Attempts were made to find fossils at the other outcrop localities unsuccessfully.

Samples of this unit were included in the two batches of samples collected for detailed lithogeochemical analysis from mine drill core and outcrop. All samples are described in appendix 2 with full results in appendix 3. The lithogeochemical study commenced with a first batch of samples taken almost entirely from drill core from the mine sequence. This batch also included three outcrop samples from EL 20/94. Two of the samples are of trilobite bearing sandstone from the base of the Cobblestone Creek slice just west of the West Tamar Highway. The other sample occupies a similar stratigraphic position on Middle Arm Creek again just west of the West Tamar Highway. Four samples of sandstone (2) and shale (2) were taken from DDH's B48 and B49 which were drilled into the rocks mapped as Cambrian to the west of Cabbage Tree Hill within EL 7/88. Samples were analysed by Analabs, Welshpool W.A., for Ti, Zr, V, Nb, Rb, Y, Ba, Sr, Sn and Cr using XRF and Ni and Co by AAS. Included in this batch of samples was the suite of mafics and ultramafics discussed below (which were also analysed for whole rock and LREE).

The second batch of sampling collected samples from outcrop largely from EL 20/94 with some drill core reassayed for further elements. Samples were again analysed by Analabs, Welshpool W.A., for Ti, Zr, V, Nb, Rb, Y, Ba, Sr, Sn and Cr (as above) as well as P using XRF and Ni and Co by AAS. Samples of shales and finer grained siltstones (not sandstones) were also analysed for La, Ce, Pr, Nd, Sm, Eu, Gd, Dy, Er, Yb, Ga, Th, Tb, Ho, Tm, Lu and Sc using ICP-MS.

The outcrop samples come from the following locations (shown on figures 3 and 4). Since this section deals with the correlation of the "unassigned" rocks west of Cabbage Tree Hill with either the Corn Hill Beds or Cambrian rocks these categories are used here:

- Corn Hill Beds shales (5 samples), 3 (213623, 213627 and 213635) from the Bulls Road fossil locality with a further two cephalopod

bearing samples (213628 and 213631) collected from the Powerline track.

- Corn Hill Beds sandstones (2 samples). Both samples (213629 and 213630) were collected from the fossil locality where the sandstones are interbedded with the shales.
- Cambrian shale (3 samples). The samples (213577, 213638 and 213639) come from outcrop in the bank (limited old scratchings have exposed bedrock) along the northern side of Middle Arm Creek where they are interbedded with polymict conglomerate and thus lie at the base of the Cobblestone Creek slice.
    - Cambrian sandstones (2 samples). Both samples (213576 and 213578) are of trilobite bearing sandstone from the area between Salisbury Creek and the West Tamar Highway.
    - "Unassigned" black shale (213624) and sandstone (213625) was collected from the mullock heap at the (collapsed) mouth of the old Derwent Adit along the Powerline track. Moving northwards, "unassigned" shales/siltstones was collected from road cuts south (213636) and west (213637) of Daakes' Hill and "unassigned" siltstone (213622) and sandstone (213626) collected from the bed of Middle Arm Creek where it flows along the base of Leviathan Hill.
    - The two "unassigned" shales from DDH's B48 (213574) and B49 (213571) were reassayed for the LREE's.
    - In addition Ken Morrison provided three samples, two of shale/siltstone (213641 and 213642) and one of sandstone (213640) collected in the southern part of EL 20/94. These samples are from the "unassigned" sequence but further south.

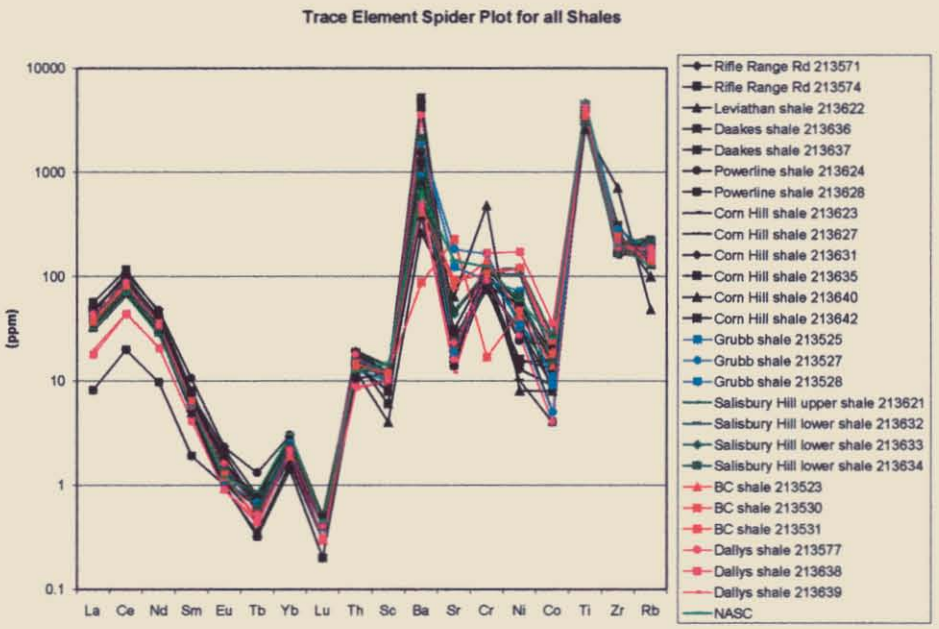
Aside from the above sampling and assaying designed to resolve the "unassigned" sequence, further samples of fine-grained sediments were collected from the following locations:

- Three samples of the Blyths Creek Formation shale (213523, 213530 and 213531) and three samples of Grubb Shale (213525, 213527 and 213528) from drill core in the mine were reassayed for the LREE's.
- A sample of black shale (213621) was collected from the dump around the easternmost shaft at Salisbury Hill.
- Three samples of shale were taken from DDH S5. Two samples (213632 and 213633) are interbedded with quartz pebble conglomerate beds whilst the other (213634) is from higher up the hole.
- Three samples of Blyths Creek limestone (213532, 213566 and 213567) and three of the Flower Gully limestone (213493, 213494 and 213539), all from drill core from the mine, were reassayed for the LREE's.

The trace element levels in these latter rocks are listed in appendix 3 and shown on figure 6. There is a remarkable similarity between all shales apparent on this plot (the exception is detailed below). No further discussion will be made of these latter samples here.

The averages (and standard deviations where relevant) for the shales and sandstones of the Corn Hill Beds and Cambrian rocks are compared against the "unassigned" shales and sandstones in table 1.

The average values for most elements are statistically indistinguishable between the three units. Numerous plots of elements and element ratios confirm this. A spider plot (in figure 6) compares all shales from these three units with the NASC standard (Gromet et. al., 1984)



showing this. The exception is in the levels of Cr and Ni. The spider plot shows some variability in the levels of these two elements. This is borne out in figure 7a showing Ni against Cr for the shales, supported by the levels of Cr and Ni in the sandstones (figure 7b).

Under previous interpretations the "unassigned" rocks have been mapped as Cambrian in age and included in the Cabbage Tree slice while the trilobite bearing Cambrian sediments are included in the overlying Cobblestone Creek slice. As discussed elsewhere there is evidence that the source of much of the sediment in the clastics in the Ordovician was derived from the general west. In this interpretation the "unassigned" sediments lay between the high Ni and Cr trilobite bearing siltstones and sandstones and the Anderson's Creek Ultramafic Complex, quite probably the source of the Ni and Cr in the sediments, yet themselves have very low levels of Ni and Cr.

This evidence as well as the macroscopic similarity of the rocks and marked simplification of the geology is considered more than justification for reinterpreting the age and association of these rocks.

Unit	Sample No.	Tl	Zr	Nb	Rb	Y	Ba	Sr	Sn	V	Ni	Cr	Co	Tl/Zr	Nb/Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ga	Th	Sc	P	La/Sc	Eu/Sm	La/Lu	Th/Co	La/Co
Corn Hill Beds shales	Average	3960	176	16.6	204.2	28.8	2366.6	18.8	6.4	121.4	28.2	92.8	<6	22.9	0.58	31.6	67.7	7.61	28.5	5.2	1.35	4.1	0.56	3.7	0.72	2	0.31	2	0.3	24.3	15.9	11	267	3.03	0.3	94.2		
	Std. dvn.	329	27.4	2.7	34	3.6	2023	4.5	1.8	14.8	17.9	11.6	NR	3.6	0.11	13.9	28.2	3	11	2	0.41	1.5	0.17	1.3	0.24	0.56	0.08	0.48	0.08	4.5	3.8	2.3	200	1.74	0.14	31.4		
Cambrian shales	Average	4277	193	16	163	30.3	1485	17	5.7	125	105	126	<28	22.2	0.53	27.2	58.7	6.68	25.1	4.6	1.13	3.7	0.47	3.2	0.61	1.8	0.3	2.1	0.33	21.7	11.7	10	244	2.72	0.24	78.4		
	Std. dvn.	303	14.4	1.7	23.7	3.2	1764	5.6	0.58	7.55	73.5	39.9	NR	0.17	0.01	14.3	24.8	2.39	7.56	0.87	0.41	0.55	0.05	0.38	0.08	0.17	0.02	0.11	0.06	1.26	5.3	0	21.6	1.43	0.04	26.9		
Unassigned shales	213636	4493	221	21	185	37	4309	18	4	96	15	96	16	20.3	0.57	46.51	99.21	10.5	39.4	7.4	2.18	6.1	0.79	5.1	0.96	2.5	0.39	2	0.4	23.6	18.6	12	55	3.88	0.29	116.3	1.16	2.91
	213637	3639	311	15	129	34	887	24	4	74	16	74	13	11.7	0.44	56.54	116.11	12.43	45.1	8	1.64	5.9	0.72	4.7	0.83	2.1	0.33	2.1	0.3	14.8	16.3	6	105	9.42	0.21	188.5	1.26	4.35
	213641	2204	365	9	46	29	238	36	3	30	8	76	10	6.04	0.31	44.9	77.66	9.7	36	6.2	1.22	4.7	0.59	3.8	0.65	1.6	0.24	1.5	0.2	5.3	11.1	2	413	22.5	0.20	224.5	1.11	4.49
	213642	4197	208	18	205	32	5216	26	5	117	55	77	18	20.2	0.56	38.42	80.67	8.84	32.6	5.9	1.95	4.7	0.63	4	0.77	2.2	0.33	2.2	0.4	23.6	18.1	10	178	3.84	0.33	96.05	1.00	2.13
	213622	3100	273	60	99	33	383	21	7	60	32	77	9	11.4	1.82	33.6	69.37	7.87	29.5	5.6	1.09	4.7	0.65	3.9	0.75	2.1	0.32	2	0.3	14.6	14.2	8	456	4.20	0.19	112	1.58	3.73
	213621	4079	212	16	235	38	1631	21	6	130	32	78	13	19.2	0.42	37.54	80.96	9.32	34.5	6.3	1.37	4.9	0.67	4.1	0.82	2.3	0.36	2.4	0.4	27.6	18.2	14	105	2.68	0.22	93.85	1.4	2.89
	213624	3649	180	15	176	74	1539	46	7	141	24	101	22	20.3	0.20	45.56	106.43	11.48	47.3	10.5	2.3	10	1.3	6.9	1.21	3.2	0.46	3	0.5	22.1	15.2	12	564	3.80	0.22	91.12	0.69	2.07
	213574	4430	204	13	208	37	699	31	8	134	55	118	15	21.7	0.35	48.3	98.83	10.96	40.3	7.2	1.5	5.6	0.69	4.5	0.85	2.3	0.36	2.4	0.4	24.3	19.21	12	630	4.03	0.21	120.8	0.96	2.42
	213571	4639	193	14	184	39	963	23	8	130	45	108	20	24.0	0.36	46.79	97.03	10.73	40.1	7.4	1.51	5.9	0.8	5.1	0.97	2.6	0.4	2.7	0.4	25.2	18.62	12	490	3.90	0.20	117.0	1.24	3.12
	213632	2932	181	14	176	28	864	48	5	87	105	107	17	16.2	0.50	36.52	78.23	8.78	33	6.1	1.15	4.1	0.47	3.6	0.71	1.8	0.32	2.2	0.4	20.2	13.2	12	258	3.04	0.19	91.3	0.78	2.15
	213633	3027	168	11	171	28	690	44	10	86	120	118	27	18.0	0.39	35.64	75.67	8.49	31.6	5.8	1.2	4.1	0.48	3.7	0.7	1.9	0.32	2.2	0.4	19.9	12.9	12	258	2.97	0.21	89.1	0.48	1.32
	213634	3942	191	17	213	34	2114	24	5	107	65	91	15	20.6	0.50	39.64	82.05	9.13	33.9	6.1	1.5	4.8	0.59	4.3	0.84	2.2	0.35	2.3	0.4	22.2	16.3	10	302	3.96	0.25	99.1	1.08	2.64
Corn Hill Beds sandstones	Average	3221	313	12.5	107.5	26	631	19	7	66	26	101	10	11.2	0.48	32.9	7-.4	7.95	29.3	5.3	1.01	3.9	0.4	3.2	0.61	1.6	0.26	1.7	0.3	14.3	14.5	6	268	5.48	0.2	109.6	1.45	3.29
Cambrian sandstones	Average	4569	341	11	53	33	235	10	4	107	232	1174	26	13.5	0.34																									
Unassigned sandstones	213640	2586	705	10	48	32	262	64	4	34	8	475	8	3.67	0.31	48.24	74.97	9.17	32.3	4.9	0.94	3.3	0.35	2.6	0.48	1.3	0.22	1.6	0.3	5.7	12.45	4	1640	12.06	0.19	160.8	1.56	6.03
	213626	2708	341	14	87	25	340	21	6	61	29	126	6	7.94	0.56	32.43	66.67	7.49	28.1	5.2	1.01	4.1	0.52	3.4	0.65	1.7	0.27	1.7	0.3	12.3	12.69	6	478	5.41	0.19	108.1	2.12	5.41
	213625	2662	318	9	85	21	548	29	4	74	34	66	6	8.37	0.43	30.97	63.02	6.91	25.6	4.7	0.9	4	0.53	3.1	0.6	1.7	0.27	1.6	0.3	12.1	12.58	6	439	5.16	0.19	103.2	2.10	5.16
	213573	3064	435	9	81	31	306	34	6	65	25	255	<5	7.0	0.29																									
	213572	2960	418	9	75	30	411	15	3	63	24	76	17	7.1	0.30																									

Table 1. Trace elements; Corn Hill Beds, Cambrian and "unassigned" sediments

Figure 7a. Cr versus Ni for all "shales"

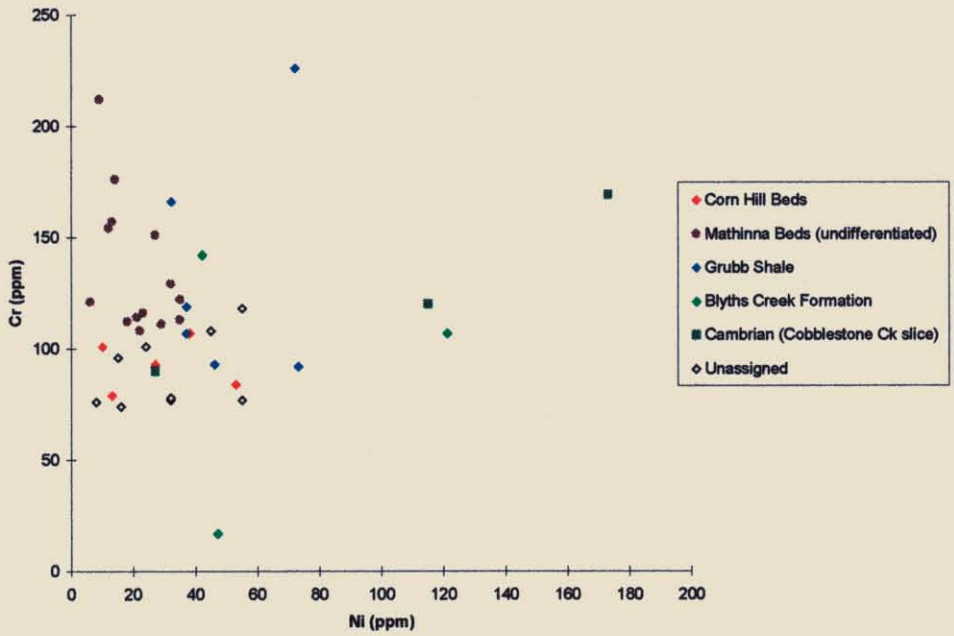
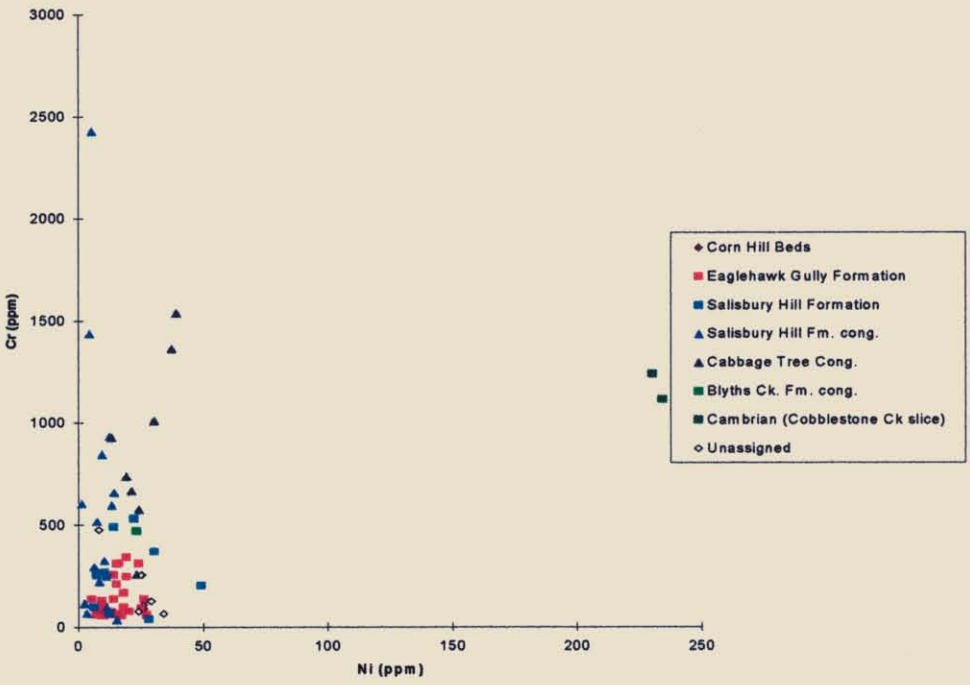


Figure 7b. Cr versus Ni all "sandstones" and "conglomerates"



6.5.3 Salisbury Hill Prospect.

The Salisbury Hill prospect lies 5-6 kilometres south-south-east of the Tasmania Reef along the same strike ridge (for location see figure 2 with the geology and old workings shown on figure 5). The prospect consists of a number of adits and shafts and evidence of sluicing at the southern end of the Salisbury Hill ridge.

Gold was won over a short period of time last century. High gold grades returned from sampling of some old workings, as well as some interesting results from ground magnetics and soil sampling surveys, confirm its potential. Limited drilling to date has been largely ineffectual.

The prospects setting has some analogies to the Tasmania reef in that most workings are on the eastern side of Salisbury Hill within the "Transition Sequence" rocks, the host of the Tasmania Reef. However, the Salisbury Hill prospect also has a number of specific characteristics of its own detailed below. In particular the prospect lies adjacent or perhaps within a major east-west dextral transfer zone with considerable potential for Tasmania Reef style mineralisation. The associated bulls-eye magnetic high may be due to serpentinisation up a thrust fault with gold mineralisation possibly associated with the serpentinising fluid. Aside from the direct potential of the prospect itself, these characteristics are also significant for exploration elsewhere in the district.

There are no production records for the goldfield, however, the field is reported to have been discovered not long after the Tasmania Reef and certainly before 1883 by which stage the field had become dormant. A revival of activity occurred in 1893-96 and in 1903.

Most gold was won from one of two sources. The first is described as "coarse lumps of gold" and "patches of free gold met with in sugary quartz and soft seams of pug" (Twelvetrees, 1903). "The quantity of gold found was surprising, but its irregularity was a marked feature of the field" (Twelvetrees, 1903). The gold often had a black manganiferous coating leading to the term "black gold" (Twelvetrees, 1903). The other source of gold was from surface deposits with the gold won by hydraulic sluicing.

Twelvetrees (1903) states that superficial detritus on the south end of the spur was washed by the Salisbury Hydraulicing Association leaving auriferous quartz veins exposed in the face, hosted by friable sandstones with green staining (Ni or Cr). No mention is made in Twelvetrees (1903) or Thureau (1883) regarding the disturbed area immediately west of the spur shown on previous mapping as a sluiced area.

More recent exploration of the Salisbury Hill prospect was detailed in section 4.0.

Mapping of the Powerline Adit (figure 8) revealed that the anomalous gold values reported from channel sampling are associated with sub-

horizontal to shallowly west dipping ferruginous veins hosted within Salisbury Hill Formation sandstones, grits and minor pebbly conglomerates. A moderately northeasterly dipping siltstone unit seen outcropping in the northeastern corner of the open cut at the mouth of the Powerline Adit is intersected in the northern end of the adit. Here the siltstone overlies the principal vein worked in the adit suggesting that the contact between the two rocks types may have been dilational under the deformation which accompanied mineralisation. The sub-vertical east-west fault at the mouth of the adit appears to have had a dextral strike slip sense of movement.

Channel samples from the walls of the small open cut were generally disappointing with a single anomalous result of 1.8 metres @ 3.24 g/t Au.

The Dyke Tunnel adit (figure 9) passes through a sequence of very weathered but strongly foliated and sheared shales and polymict conglomerate before meeting a shallowly east dipping faulted contact with quartzite of the Salisbury Hill Formation. The contact is very clayey (a wombat has burrowed approximately 2 metres along the fault!), has vertical slickensides and is a reverse fault.

The Dyke Tunnel has outcropping polymict conglomerate at its mouth. In the adit walls the polymict conglomerate appears as a very friable siliceous weathered rock. Occasional interbeds of black shale are more recognisable. The rock becomes increasingly deformed further into the adit until approximately 20 metres from the entrance. At this point there is a conformable contact (dipping moderately to the northeast) with overlying shales (c.f. drill core) which become increasingly foliated until the first significant fault at 33 metres (45-045 TN) which parallels a seam of green (Ni or Cr stain - not Cu) clay at approximately 35 metres. From here to 55 metres the rock in the walls is a strongly sheared and/or brecciated sandstones with green spots and irregular dismembered quartz veins. There is another focus of deformation at 46 metres (45-055 TN) with the main fault at 55 metres. This latter fault dips at 37-090 TN and has been driven on in a southerly cross-cut for ~10 metres (collapsed and dangerous towards the end). Slickensides on this fault are sub-vertical. The rocks in the hanging wall to this fault are quartzites with occasional narrow darker shaley beds. Bedding here dips ~59-064 TN.

Although the relationship between these units (the interbedded polymict conglomerate and shales and the quartzites and sandstones) is the same as their interpreted stratigraphic relationships there has clearly been considerable deformation with the reverse faults causing much deformation in the footwall and hangingwall rocks.

The polymict conglomerate is a distinctive unit and has been logged as such by Goldfields Limited (Pease, 1984) with the clasts described as a "basic cobble conglomerate with poorly sorted clasts in chloritic matrix. Sheared with fuchsite along shear planes." And of being a "poorly sorted cobble conglomerate consisting of generally rounded clasts of

siltstone, basic material, shale, quartzite and locally quartz in a soft chloritic matrix which commonly appears sheared or faulted" (Pease, 1984). It is visually the same unit as that intersected in diamond drill holes B25 and B30 drilled into the Tasmania Reef 5-6 kilometres to the north. Here the unit lies at the base of the Cobblestone Creek slice. It has also been intersected in diamond drill holes S1 to S5.

Petrological samples were taken from the conglomerate in drill core and studied by Bottrill (appendix 1). He describes the clasts in the talcose conglomerate as including "gabbro, dolerite, basalt, andesite, quartz wacke, carbonates, quartzites, quartz-mica schists, cherts and carbonate altered ultramafics. The clast proportions vary widely in different samples, from quartz dominated to mafic/ultramafic dominated." Petrological descriptions are very similar for samples of polymict conglomerate from the base of the Cobblestone Creek slice (in drill core and in outcrop and along Middle Arm Creek) and from drill core at the Salisbury Hill prospect. This is in spite of the two localities lying up to 6 kilometres apart and probably (see below) in different thrust slices (see plates 5 and 6).

Plate 5 *Clasts of basalt (RHS), quartz schist, carbonate-chert (LHS) and ultrabasics(?) in a carbonate-altered, stylolitised matrix (from the polymict conglomerate unit intersected in DDH SH2/227.4 metres).*

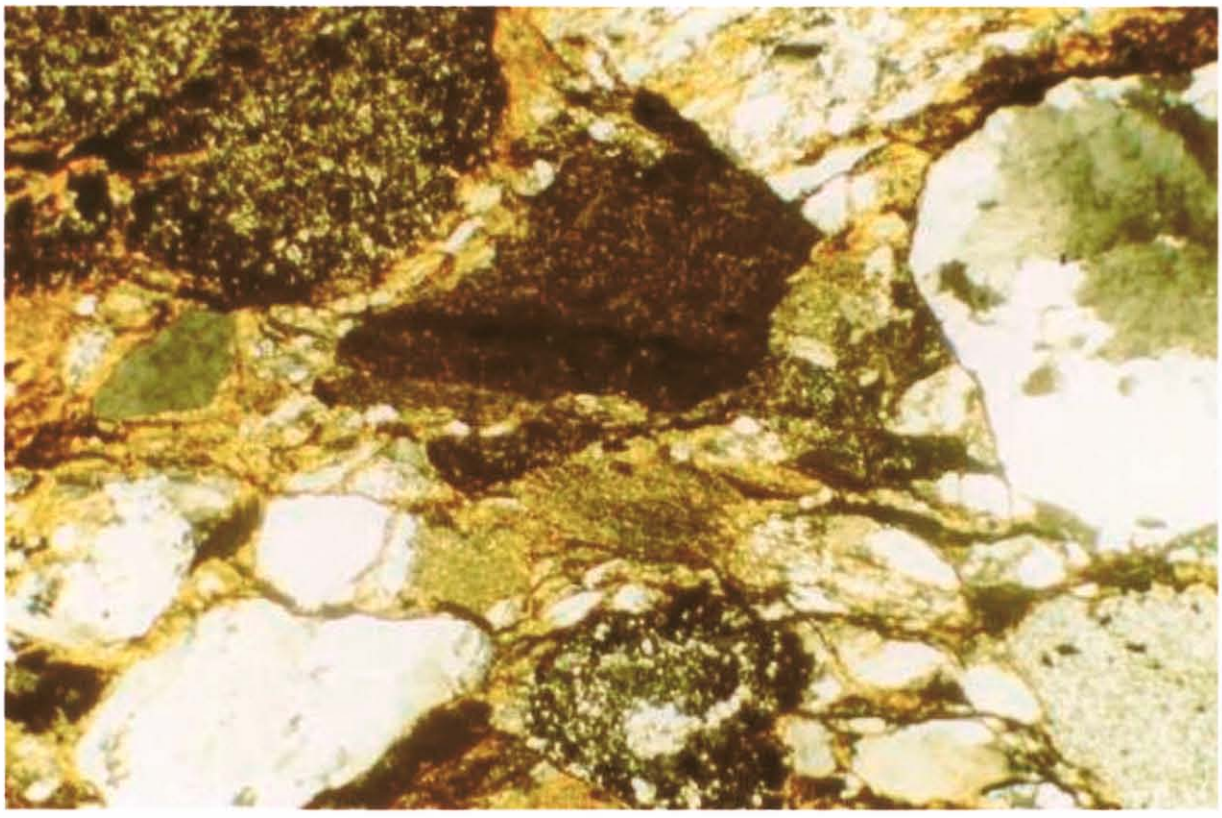


Plate 6 *Clasts of chromite-bearing chloritised ultramafics(?), quartz arenite, chert, carbonaceous chert (black), and basalt in a carbonate altered matrix (213612 from bank of Middle Arm Creek).*

The two adits provide a continuous cross-section through the nose of the ridge. The same sequence is intersected in S2 and S1 with some variations. In particular the rocks beneath the Salisbury Hill Formation grits and sandstones and minor pebbly conglomerate include zones of dolomitisation (S1) or dolomitisation and serpentinisation (S2). In both cases the polymict conglomerate and associated sediments are present but the contact is not faulted in S2. The apparent discrepancies between the rocks intersected in the upper parts of S1 and S2 can be explained by a dextral strike slip fault between the two holes but intersected by S1 from 92.7 to 94.2 metres where there is a cavity.

The dolomite and serpentinite was initially thought to be the product of early diagenesis, however, it is now believed that the alteration is a product of fluids passing up structures. If greenstones are the source of gold at depth, Mg and Fe rich fluids might well be derived from the same source. Three samples are described petrologically by Bottrill who concludes that the rocks are altered ultrabasics with "an alteration style (that) appears to me to be unique in Tasmania".

Assaying of much of the serpentinite from S2 and all siliceous dolomite from S1 and S2 revealed that gold values are almost invariably low (single best of 0.17g/t with all else <0.01g/t). However, Ni values are elevated in both the serpentinite and siliceous dolomite with results ranges from 961 to 1352ppm. Cr values are similar between both rock

types and are generally elevated ranging from 177 to 1097ppm, but generally between 300 and 600ppm. Except for a zone of carbonate veining at the upper contact of the dolomite with As 1543 and 2184ppm all other As values are moderate to low.

S1 and S2 also provide information regarding the source of the bulls-eye magnetic high. Magnetic susceptibilities of S1 and S2 are shown on figures 10 and 11. They show a peak towards the end of each hole associated with magnetite veining in dolomite in S1 and magnetite veining and disseminations in serpentinite in S2. The serpentinite and/or dolomite is interpreted to have been the product of fluids moving up the reverse faults in the district. A similar association is seen in the deeper drilling in the Tasmania Mine.

The other diamond drill holes all provided sections of part of the sequence.

S4 (64.5m) was drilled shallowly to the east from near the mouth of the Dyke Tunnel adit. It spent its time passing almost down dip of the sequence passed through in the Dyke Tunnel adit, intersecting the polymict conglomerate unit with two interbedded units of monomict shale breccia and monomict shaley siltstone breccia. Both breccias are probably originally soft-sediment deformed rocks with subsequent tectonic deformation exploiting these earlier surfaces. The hole does not break through into the quartzite.

S3 (124.1m) and S6 (146.5m) were both drilled westwards towards the Powerline adit (sub-parallel to the dominant vein orientation). S6 did not extend deep enough to break through the sandstone and siltstones of the Eaglehawk Gully Formation. The core from S3 above the polymict conglomerate at the end of hole was whole core assayed though Pease (1984) logs describe a similar sequence as the other holes with the polymict unit overlain by shales which are in turn overlain by sandstones which are probably Transition Sequence rocks. Faulting is described throughout the sandstones but none specifically on the contact with the shales, though the latter are very foliated and locally sheared as is the polymict conglomerate. S3 appears to have been the most effective test of the mineralised system at Salisbury Hill with quartz veining described and gold grades to a best of 1.1 meters @ 0.537g/t Au.

The sheared weathered polymict conglomerate forms the depressed floor at the mouth of the Dyke Tunnel, to the south of the nose of the ridge. Dump samples from the adit at the southern end of the field and shaft at the northern are of further mafics. The samples from the shaft are of "altered dolerite, possibly similar to some clasts in the polymict conglomerate" (Bottrill in appendix 1). The sample from the bottom adits mullock heap is a basaltic tuff or agglomerate (Bottrill, op. cit.).

Immediately west of this depression is a low hill with scattered quartzose sandstone. The same rock outcrops in the gravel quarry behind this hill where it is strongly foliated and interbedded with grits

and pebbly conglomerates. With its dark quartz veinlets, it closely resembles quartzites from the end of the Dyke Tunnel adit as well as similar quartzites associated with grits and microconglomerates further south. The rocks are interpreted to be Salisbury Hill Formation rocks with foliation and veining a product of the rocks' position in the hangingwall to a thrust. It is possible that they may be an earlier unit of quartz sandstone deposited prior to the deposition of the polymict conglomerate and shales. The polymict conglomerate unit is known to contain clasts of quartz sandstones.

Further west of the hill the Corn Hill Beds outcrop on Daakes Hill.

If the sandstones outcropping on the low hill and in the quarry are Ordovician the reverse fault along the western side of Cabbage Tree Hill should pass between the sandstone and the Corn Hill Beds. Reverse faulting between and within the polymict conglomerate and shales and the quartzites (i.e. as intersected in the Dyke Tunnel Adit) does not appear to have moved units a significant distance. However, the fault appears to have acted as an effective fluid conduit.

The most intriguing result comes from S5 drilled to test the Johnson Creek Fault arsenic soil anomaly. The hole, drilled towards the north-northeast, intersected a sequence of siltstones and shales with two beds of quartz pebble conglomerate before passing through a thin bed of reddish dolomite and two beds of polymict conglomerate. The hole is interpreted by Goldfields to have passed through the Johnson Creek Fault. The only structure likely to represent this fault is that zone around the dolomite. A dextral movement on an east-west fault in this position would explain the intersection of polymict conglomerate further east than the quartz pebble conglomerate. The inference here is that the quartz pebble conglomerate is from the Salisbury Hill Formation. Given the low relief of the area the quartz pebble conglomerate does not appear to be extensive and may be a discrete and different unit. There is no gold associated with this structure.

Previous mapping interpreted the existence of two east-west trending dextral wrench faults, one north of the Powerline adit (but south of the Dyke Tunnel adit, the other between S1 and S2 (see figure 3 in Pease, 1984). Projecting the known geology (from drill core, outcrop and adits) to the same RL indicates that such faulting is not necessary if the reverse fault has a north-northwest strike.

The rocks to the east of Salisbury Hill are essentially unexposed. Drilling by BHP in the late 1960's is equivocal. The black shale on the dumps of the Victoria and Duchess of York mines is probably from lode slate driven on in both workings.

The interpreted geology of the Salisbury Hill area is shown on figure 2 and discussed in section 6.5.5.

6.5.4 Mafic and Ultramafic Rocks in EL 20/94.

Mapping in the Middle Arm Gorge at the mouth of the Eaglehawk Gully revealed that the basalt dyke shown on previous mapping is in fact partly peperitic with at least some blocks probably also hyaloclastic. This places the age of the mafic at the same age as those rocks surrounding it or slightly higher stratigraphically, i.e. lower Eaglehawk Gully Formation. No evidence for volcanism in the Denison Group in the area has previously been reported. The unit is referred to as informally as the Eaglehawk Gully basalt.

Mapping at Salisbury Hill also uncovered mafic/ultramafic volcanics on a number of dumps.

There are other reported occurrences of mafic rocks in the area. There is an "andesite" body outcropping to the west of the West Tamar Highway. This unit is referred to informally as the West Tamar Highway basalt. Gulline's mapping shows a diorite body to the south of Salisbury Hill surrounded by Cambrian sediments.

Samples were collected from each of these essentially four localities (Eaglehawk Gully, West Tamar Highway, Salisbury Hill and the diorite).

Three samples of coherent (213425, 213426 and 213550) Eaglehawk Gully andesite as well as two samples of peperitic breccia (213423 and 213424) and a single sample of derived sandstone (213422) from Middle Arm Creek were collected. One sample was also sent for dating (213550). Results of the dating are awaited.

Three samples of apparently coherent West Tamar Highway basalt (213433, 213436 and 213549) were collected with one sample (213549) also sent for dating.

Four samples were collected from the dumps at Salisbury Hill. Three were collected from the top shaft (213421, 213427 and 213430) and two from the lower adit (213428 and 213429).

A single sample of diorite (213575) was also collected.

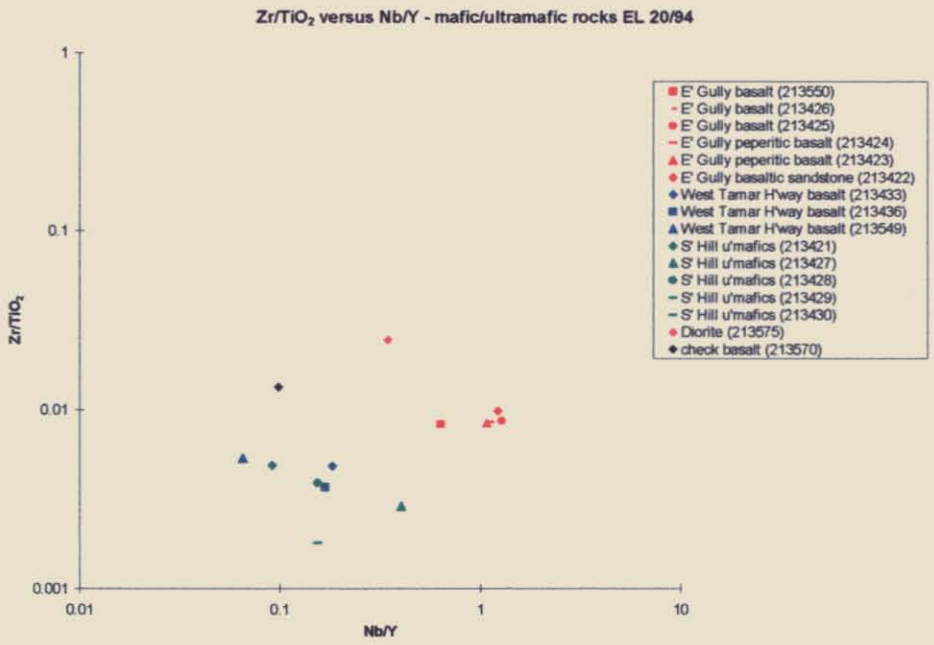
The 15 samples were analysed (along with a known standard) by Analabs in Welshpool, W.A., for the following:

- whole rock (SiO_2, TiO_2, Al_2O_3, FeO, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5 and LOI) using XRF
- LREE elements La, Ce, Pr, Nd, Sm, Eu, Gd, Dy, Er, Yb, Ga, Th and Sc using ICP-MS.
- Ti, Zr, V, Nb, Rb, Y, Ba, Sr, Sn and Cr using XRF.
- Ni and Co by AAS following an acid digest.

Results are presented in table 2. Sample descriptions and locations are given in appendix 2. A Zr/TiO_2 vs Nb/Y plot is presented in figure 12.

	Andesitic Sandstone (EGA)	Eaglehawk Gully Andesite				Dated Sample	Salisbury Hill Ultramafics Plag Phyric	Fxtal Sst	Px Phyric	Px Phyric	Serp	West Tamar Highway Andesite		Dated Sample	Eastern Diorite	Control Sample (Basalt)
	213422	213423	213424	213425	213426	213550	213421	213427	213428	213429	213430	213433	213436	213549	213575	213570
SiO_2*	45.47	55.99	54.58	55.17	55.32	53.29	50.18	55.22	48.37	46.49	53.58	49.40	51.55	51.34	62.42	52.05
TiO_2*	2.51	2.18	2.31	3.01	2.95	3.30	0.51	0.14	0.59	0.69	0.28	0.66	0.62	0.82	0.44	1.03
Al_2O_3*	17.21	14.34	15.14	19.22	18.87	21.80	16.13	14.42	17.92	19.00	14.65	19.58	16.89	16.85	17.35	19.47
Fe_2O_3*	20.91	13.80	14.95	10.26	10.69	11.84	10.44	5.94	12.45	13.13	7.47	10.19	10.84	11.13	5.46	10.21
MnO*	0.10	0.09	0.09	0.06	0.05	0.06	0.17	0.10	0.16	0.17	0.13	0.18	0.11	0.14	0.09	0.16
MgO*	9.30	11.64	11.16	6.20	5.89	5.24	10.00	14.47	7.84	7.44	11.67	5.19	7.48	6.93	3.71	2.33
CaO*	0.58	0.38	0.49	0.29	0.46	0.16	7.28	4.49	10.83	9.77	7.02	10.29	9.08	7.72	2.96	8.13
Na_2O*	0.06	0.57	0.47	4.06	3.94	1.31	1.66	3.17	1.33	2.21	1.66	4.24	2.72	4.31	3.54	4.59
K_2O*	3.45	0.70	0.56	1.51	1.54	2.79	3.59	2.04	0.41	1.07	3.54	0.16	0.65	0.62	3.96	1.72
P_2O_5*	0.41	0.31	0.25	0.22	0.28	0.21	0.03	0.01	0.10	0.03	0.01	0.12	0.05	0.13	0.07	0.31
Total*	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
LOI	6.27	9.33	11.24	8.26	8.29	10.68	2.44	6.54	6.11	7.1	2.92	5.54	4.29	3.12	2.81	7.69
Ba	364	114	85	146	128	194	999	1640	113	250	447	96	413	246	690	414
Rb	46	18	23	27	28	56	107	36	11	25	106	5	14	14	94	54
Sr	23	17	20	51	55	19	50	85	83	165	41	92	163	197	98	273
Th	3.31	1.91	2.25	1.61	2.08	2.24	0.3	0.11	1.08	1.35	0.34	1.24	1.05	3.61	8.08	10.02
Zr	247	184	197	261	252	274	25	4	23	26	5	32	23	44	108	137
Ti (calc)	14148	11810	12410	16666	16306	17805	2997	779	3357	3837	1619	3777	3597	4796	2578	5695
Ti (ass)	14100	11800	12400	16700	16300	17800	2967	847	3176	3727	1481	3729	3203	5103	2568	4971
Nb	34	30	28	42	38	41	2	2	2	2	2	2	2	2	10	3
Y	28	28	25	33	34	65	22	5	13	12	13	11	12	31	29	31
Sc	26	20	20	26	26	26	48	46	40	42	56	30	34	32	18	20
Ga	21.9	20.2	20.2	22.9	23.3	25.5	13.2	8.5	18.1	17.3	10.3	17.8	15.6	18.7	16.8	20
Ni	200	327	243	216	245	297	182	298	69	46	163	38	35	44	74	12
Co	74	70	69	64	65	111	59	55	55	36	40	32	42	37	12	27
Cr	302	314	333	410	407	426	342	891	168	150	207	102	55	125	62	20
V	263	198	249	325	293	313	257	215	327	376	178	264	287	302	74	272
Sn	<3	6	7	6	6		<3	7	3	4	<3	3	3	7	<3	<3
	213422	213423	213424	213425	213426	213550	213421	213427	213428	213429	213430	213433	213436	213549	213575	213570
La	46.51	46.67	78.89	58.70	65.27	107.27	3.11	2.95	17.17	22.32	2.00	21.30	17.33	27.05	82.70	125.97
Ce	48.07	38.78	46.19	43.65	53.21	60.07	3.08	1.83	15.22	19.42	1.75	17.37	14.15	21.64	54.07	98.88
Pr	43.53	36.47	48.19	42.07	50.78	67.33	3.53	2.16	13.53	17.16	2.07	14.57	11.98	18.62	46.55	75.78
Nd	39.20	34.00	42.55	38.53	47.07	59.30	4.19	2.18	12.73	16.08	2.35	13.07	10.72	16.92	34.51	59.63
Sm	29.69	27.08	28.13	30.21	36.46	46.35	5.73	2.08	9.90	12.50	3.13	10.42	8.33	13.54	20.31	35.94
Eu	23.55	25.21	24.65	29.64	34.76	44.04	6.79	1.52	9.97	11.63	3.05	9.97	9.70	12.60	11.77	26.18
Gd	22.01	22.78	21.24	25.87	30.50	41.70	8.49	3.09	8.49	10.42	4.63	8.88	7.72	13.51	16.22	23.55
Dy	16.92	16.00	14.15	17.85	20.62	32.31	9.54	3.08	6.15	7.69	5.23	6.46	6.46	12.00	12.92	16.62
Er	14.55	11.74	9.86	12.68	15.49	26.29	11.74	3.29	6.10	7.51	6.57	6.57	6.10	12.68	12.68	14.55
Yb	12.98	9.13	8.65	9.13	11.54	18.75	12.02	2.88	5.29	6.73	6.73	5.77	5.77	12.02	12.50	13.94
	213422	213423	213424	213425	213426	213550	213421	213427	213428	213429	213430	213433	213436	213549	213575	213570
Zr/TiO_2	0.010	0.009	0.010	0.009	0.009	0.009	0.005	0.003	0.004	0.004	0.002	0.005	0.004	0.006	0.025	0.014
Nb/Y	1.214	1.071	1.120	1.273	1.118	0.631	0.091	0.400	0.154	0.167	0.154	0.182	0.167	0.065	0.345	0.097

530039



In addition a number (7) of the samples were included in the samples studied by Dr Ralph Bottrill (appendix 1).

The mafic/ultramafic rocks will be discussed separately.

Eaglehawk Gully basalt.

The Eaglehawk Gully basalt (plates 1 and 2 in section 6.2 and plate 7) outcrops for ~25 metres along the side of the Flower Gully Road in Middle Arm Gorge immediately west of the Eaglehawk Gully itself. The upper and lower contacts are not seen in outcrop. The nature of the lower contact is indicated by the distinctive green sandstone outcropping in Middle Arm Creek ~50 metres to the north and occupying a position correlated with the base of the coherent mafic.

The upper contact occurs in the gully itself and is obscured.

The lower part of the unit where exposed is coherent. The upper half becomes brecciated with clasts to 30 centimetres. Some of these appear to be spalling i.e. are hyaloclastic. The breccia sample studied by Bottrill is described as peperitic and there is some scope for both textures to co-exist.

Petrologically the coherent basalt is described as containing "~10% small phenocrysts (~0.5-1mm in diameter), probably originally of pyroxene or olivine, but now completely altered to smectitic clay (montmorillonite?). The groundmass is opaque rich (leucoxene?), with abundant very fine grained sericitised(?) plagioclase laths and chlorite. There is an amygdule or argillised xenolith of country rock (~15 mm diameter). The rock is an altered, weakly porphyritic basalt" (Bottrill, appendix 1).

The brecciated sample is described as "a peperite or hybrid basalt/siltstone, derived from the extrusion of basalt into unconsolidated wet sediments".

Lithogeochemically the basalt is quite distinct. In the three coherent samples analysed, TiO_2 ranges from 2.72-2.97%, Zr from 252-274 ppm, Nb from 38-42 ppm and Y is 33, 34 and 65 ppm. (The latter value for Y is from 213550 which has elevated levels for the LREE's compared with the other two Eaglehawk Gully basalt samples and thus may be questionable).

These high Ti and Nb values give Ti/Zr ratios of between 63.9-65.0 and Nb/Y of 1.18, 1.27 and 0.63 (213550 sample). Analysis of the sandstone and brecciated samples gives comparable results allowing for their clastic nature.

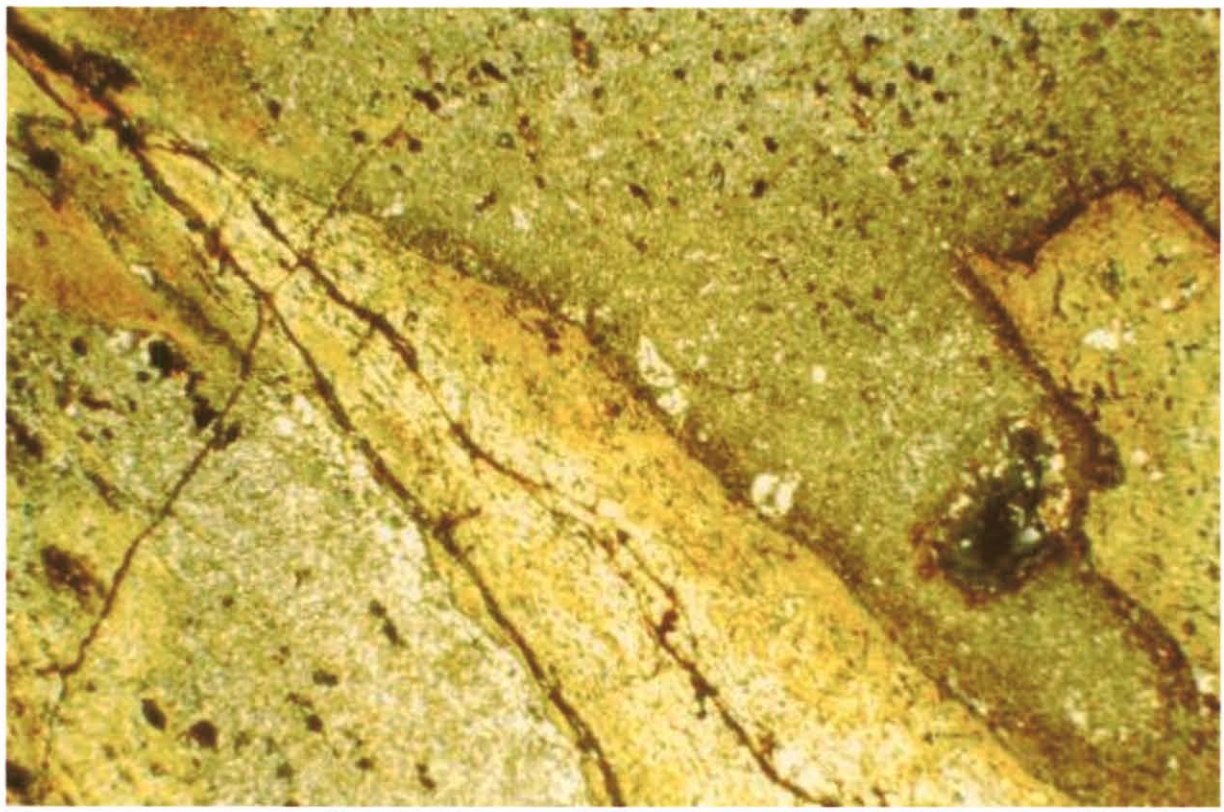


Plate 7 *Peperitic breccia, (Eaglehawk Gully basalt sample 213421) showing yellow, altered basalt intruding mudstone, with some local silicification (white).*

The Eaglehawk Gully basalt plots within the alkali basalt field on figure 11 though it may be more transitional between an alkaline and tholeiitic composition. Tectonically the basalt appears to best fit the within-plate basalt field with eruption perhaps accompanying an attempt at rifting.

Mafic rocks are reported from a similar stratigraphic position within the Denison Group on the Black Bluff Range (Pemberton et. al., 1991). The Tor Creek basalts lie just below the top of the Upper Pink Sandstone whilst the Black Bluff Range dolerite intrudes the upper part of the Lower Thin-bedded Sandstone. However, lithogeochemically

these latter rocks are quite distinct from the Eaglehawk Gully basalt. TiO_2 varies from 0.86-1.48% for the Tor Creek basalts and 1.03-2.17% for the Black Bluff Range dolerite. Zr is 99-180ppm for the Tor Creek basalt and 66-140 ppm for the Black Bluff Range dolerite. Nb is <=9 ppm for both the basalt and dolerite whilst Y is 17-47 ppm for the Tor Creek basalt and 22-58 ppm for the Black Bluff Range dolerite. Thus Nb/Y is (where calculable) 0.16-0.53 and Ti/Zr between 39.5-77.0 for the Tor Creek basalt and 92.9-147.8 for the Black Bluff Range dolerite. Although both occupy a similar and unusual stratigraphic position it is not possible to correlate these mafics with the Eaglehawk Gully basalt.

Trace element lithogeochemistry on samples from drill core through the mine sequence do not show any increase in Ti levels in the Eaglehawk Gully Formation indicating that the basalts influence does not extend the 2 kilometres to the mine.

West Tamar Highway basalt

Only one sample was studied petrologically (213436) (plate 8). "The rock groundmass is highly altered to a mixture of fine grained epidote, albite and chlorite, with only trace opaques. There are ~10-20% of pale green, ragged amphibole and chlorite aggregates (<1 mm), probably pseudomorphing clinopyroxene phenocrysts. Some dark green chloritic aggregates (<4 mm) may represent alteration of pore-filling material in an autobreccia or agglomerate, although such textures are not well

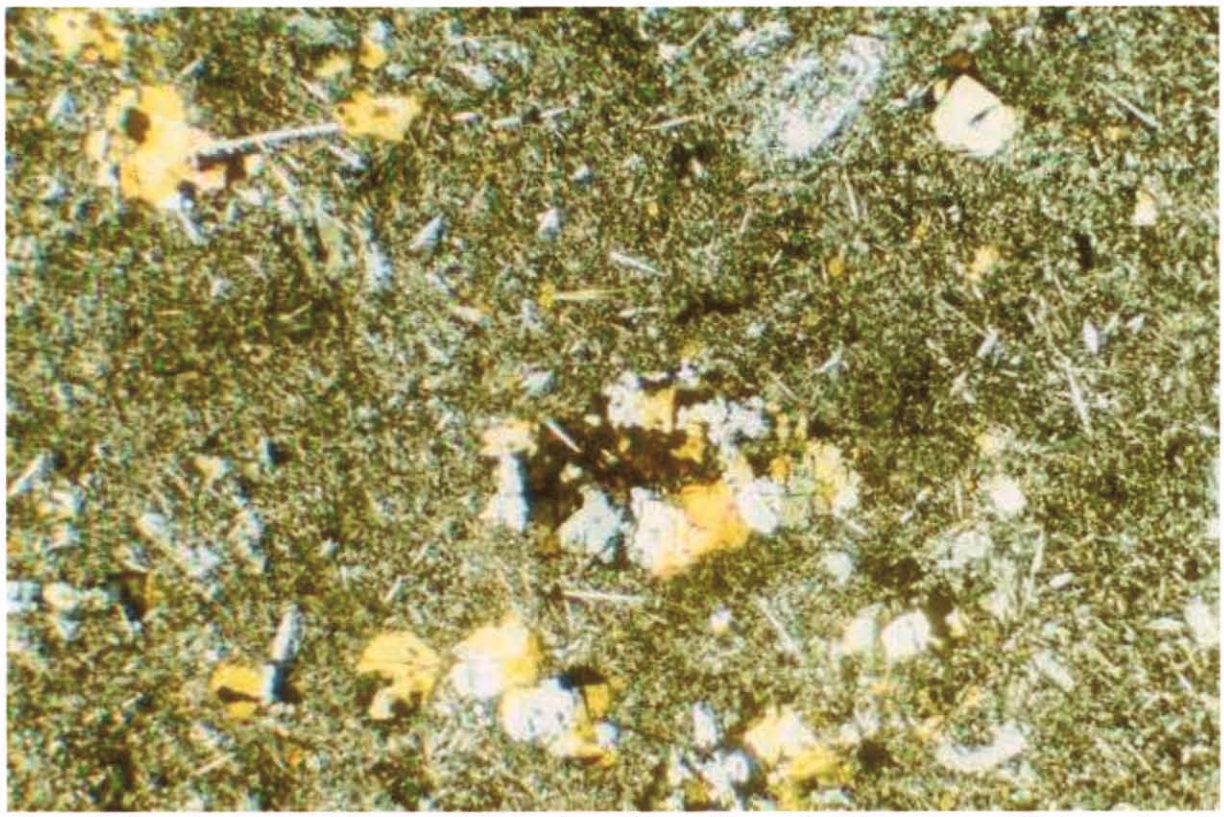


Plate 8 *Porphyritic, epidote-amphibole-altered basaltic rock (West Tamar Highway basalt sample 213549).*

preserved. The rock is an altered and metamorphosed basaltic tuff or agglomerate" (Bottrill).

Lithogeochemically the basalt plots very similarly to 213428, an "ultramafic" from the lower adit at Salisbury Hill. Ti ranges from 0.6-0.8%, Zr from 23-44 ppm, Nb at 2 ppm and Y from 11-31 ppm. Thus Ti/Zr ratios range from 109.0-156.4 and Nb/Y from 0.06-0.18 indicating that the rock is tholeiitic.

The West Tamar Highway basalt is not related to the Eaglehawk Gully basalt.

Salisbury Hill ultramafics

Three of the "ultramafics" from Salisbury Hill were studied petrologically. The lithogeochemical similarity between the West Tamar Highway basalt and 213428 extends to their petrology with Bottrill describing them in the same sentence as basalts.

The other two samples studied petrologically are both from mullock around the top of the upper shaft at Salisbury Hill. The dark porphyritic rock (213421) is described as an amphibolite consisting of plagioclase (40%) and hornblende (60%). 213427 is described as an amphibolitised dolerite with 40% plagioclase, 20% hornblende and 40% chlorite, amphibole and talc altered mafic phenocrysts (pyroxene and/or olivine).

Diorite

The diorite is intriguing, being shown on Gulline's mapping as an ovoid area of outcrop. No outcrop was found, however, the sample studied petrologically is from a large (~40 centimetres in diameter) piece of float.

The diorite sample is described petrologically as exhibiting a "medium to coarse grained, aphyric, granitic texture" and containing "~35% moderately sericitised and calcite-altered laths (~0.5-2 mm), ~20% mid-brown igneous hornblende (with green actinolite rims; ~0.5-2 mm), ~15% altered biotite (~0.5-3 mm), 15-20% granular, recrystallised quartz (~0.1-2 mm), ~10% albite (pinkish, altered K-spar?; 0.2-2 mm) and traces of opaques, apatite and zircon. The amphiboles are slightly altered to carbonates. This is an altered tonalite. If the albite was altered from K-spar, the rock may have originally been a granodiorite."

Another two samples (213452 and 213677) were collected from around the area of sub-cropping diorite. The samples were only studied petrologically. Bottrill describes 213677 as an amphibolite consisting of "~50% medium grained highly sericitised plagioclase laths (mostly ~0.5 mm long, rarely phenocrysts ~1 mm), and 45% brownish-green prismatic hornblende (~0.5 mm) and ~5% fine quartz aggregates (amygdules?). Trace opaques are present (limonite after pyrite?). It is an amphibolite ... similar to C108125 (UM2)" i.e. similar to 213421. 213452 is described similarly and also compared to 213421.

The significance of this similarity is that it helps tie the diorite to the trend of mafics/ultramafics which runs to the west of the nose of the Salisbury Hill ridge and is interpreted to occupy the basal position of the Cabbage Tree slice. That is, the diorite does not belong to the Cobblestone Creek slice.

6.5.5 Conclusions

A number of conclusions have been drawn from the mapping to date. These conclusions are open to revision should future mapping reveal new information relevant to these. However, at this stage they are considered sufficiently well founded to provide a working hypothesis.

Firstly the "unassigned" rocks west of the Cabbage Tree-Salisbury Hill strike ridges are correlated with the Corn Hill Beds, i.e. they are simply a strike extension of the rocks outcropping along Bulls Road. Although requiring fossil evidence to confirm this interpretation it is considered to be a much simpler geological interpretation than that shown on Mines Department mapping.

Correlating the "unassigned" rocks with the Corn Hill Beds necessitates the existence of a thrust fault between these (Siluro?)-Devonian rocks and the overlying sandstones, grits and conglomerates of the Ordovician Denison Group.

The thrust must pass in a north-northwesterly direction between Daakes Hill and the low hill with the gravel quarry on the western side of the Salisbury Hill prospect. Dark quartz veinlets and strong foliation are probably a result of the rocks lying in the hangingwall to this thrust.

Similarly the thrust must pass between Cabbage Tree Hill and Middle Arm Creek below Leviathan Hill. A fault outcropping at the western end of Middle Arm Gorge is considered to represent this faulting. The fault has quartz conglomerate on either side but just west of this the contact between the conglomerate and a weathered grey shale is a zone of strong weathering. The former fault is interpreted to be a splay off the major thrust faulted contact. A similar faulted contact is described from the 422' level of the Moonlight-cum-Wonder workings just north of the EL boundary.

Thus the basal thrust of the Cabbage Tree slice (the "mine sequence"), the Cabbage Tree thrust, passes just along the western edge of Cabbage Tree and Salisbury Hills and not further west under the flat country as mapped by Gee and Legge (1979). The location of this thrust to the south is less clear.

South of Daakes Hill there is clearly a dextral jog in the strike of all units which must be replicated by jogging of thrusting.

The quartzites outcropping along Bulls Road are very similar to rocks mapped further south by Ken Morrison (pers. comm.) as "tectonites". They are siliceous, foliated quartz sandstones with dark quartz veinlets. Just west of this outcrop on Bull's Road is the type locality of the Corn Hill Beds which are strongly foliated with a shallowly east dipping

foliation. A sub-horizontal fault is mapped on the western end of the type outcrop. The quartzites are very similar to the Denison Group (Cabbage Tree Conglomerate or Salisbury Hill Formation) on the basis of lithology. If the quartzites are correlates of the Denison Group the Cabbage Tree thrust must pass between the two outcrops. However, there are problems with this interpretation, particularly with the mafics/ultramafics/polymict conglomerate sequence on the western side of the Salisbury Hill prospect.

The diorite body mapped by Gulline et. al. (1973) is correctly located and is associated with further mafic/ultramafic volcanics (including amphibolite similar to the sample from the top shaft on the Salisbury Hill prospect i.e. 213428). There appears to be continuity between the mafics/ultramafics near the diorite and the zone of mafics/ultramafics which passes just west of the nose of the Salisbury Hill ridge i.e. the mouth of the Dyke Tunnel Adit. The northern end of this trend lies west of the Salisbury Hill and must thus lie at the base of the Cabbage Tree slice. Serpentinisation and dolomitisation towards the ends of S1 and S2 would occupy a similar position to that occupied by the same style of alteration intersected by B13 and B32 towards the base of the Cabbage Tree slice in the Beaconsfield Mine area. This alteration in S1 and S2 is associated with polymict conglomerate and probably also the trend of mafics/ultramafics. Intriguingly S2 intersected a 2 metre thick unit of siliceous sandstone at its base. The sandstone is similar to those of the Denison Group and may be the same body as outcrops on the low hill to the west of the sluiced area over the polymict conglomerate.

The greywacke sandstone mapped by Gulline et. al. (1973) as surrounding this diorite and to the immediate east appears to be incorrect as the limited outcrop/float is of sandstones identical to the Denison Group sediments.

Geologically it appears that the mafic/ultramafic/polymict conglomerate sequence trends in a north to north-northwesterly direction (allowing for the dextral jog on the Johnson Creek Fault) from just west of the Salisbury Hill prospect to the diorite body. This trend is essentially that suggested for the Cabbage Tree thrust. However, enhanced aeromagnetics (1989 Austirex data enhanced with AGC on a 2VD) indicates that the magnetic trend apparently associated with the diorite body trends almost due south for ~1km. Thus if the mafic/ultramafic/polymict conglomerate sequence is contiguous the Johnson Creek Fault marks a significant change in trend. The north-south trend is mirrored in the trend of the hill which lies just west of Salisbury Creek where the diorite float is found. If this mirroring of geology is true this places the Johnson Creek Fault essentially where the powerline track crosses this hill, i.e. where shown by Gulline et. al. (1973). However, the trend of the fault may be more east-west based upon the orientation of the fault at the mouth of the Powerline Adit and sharp southern edge of Peaked Hill. Gulline's interpretation appears to be influenced by the trend of a minor creek to the southeast of Salisbury Hill.

There has been an apparent overall dextral throw of 300-500 metres on the Johnson Creek Fault. Similarly oriented dextral structures in the Beaconsfield Mine (including the structure hosting the Tasmania Reef) have a normal component also (generally dipping southeasterly) i.e. south block down. It is unclear as to what component of dip-slip movement there has been on this structure but some would help explain the rotation of trend. This change in trend is expressed in bedding and cleavage being more easterly dipping than to the north.

If the sequence of mafics/ultramafics/polymict conglomerates is the same across the Johnson Creek Fault zone then the base of this unit defines the Cabbage Tree thrust. However, the fault here is only thrusting Cambrian(?) volcanics onto lower Ordovician sandstones of probably the Salisbury Hill Formation. Conversely the fault on the western side of these sandstones, places lower Ordovician rocks on top of Devonian Corn Hill Beds.

It is considered that the Johnson Creek Fault zone marks a zone where the reverse displacement on the Cabbage Tree Fault to the north is transferred to the Bulls Road Fault (new term here) to the south. The Cabbage Tree Fault, defined by the base of the magnetically anomalous mafics/ultramafics continues and apparently weakens to the south, being exploited by the north-south trending gully crossing Bulls Road at ~486500mE 5432000mN. This coincidence between this apparent transfer of displacement with the Johnson Creek Fault suggests that the Johnson Creek Fault was co-active with the thrusting. Such a relationship is also considered likely for the Tasmania Reef.

It is highly significant that this focus of structural deformation contains the Salisbury Hill prospect with high gold grades +10 g/t Au in shallowly west dipping veins. Such veins are generally not significantly mineralised. S5 was apparently drilled through the Johnson Creek Fault though this interpretation not certain. Regardless, if the fault is represented in core it is where the fault brings together two shaley units, a less favourable setting for Tasmania Reef gold mineralisation.

The Cobblestone Creek is perhaps more problematic. It is well defined to and in the north of the licence. It is intersected in drill core in the mine whilst its trend can be defined across Middle Arm Creek. South towards the Salisbury Hill prospect it is overlain by alluvium and farming. Occasional grits are mapped amongst the sandstones on the hill crossed by the powerline to the east of Salisbury Creek suggesting that these rocks are towards the base of the Cobblestone Creek slice. The upper part of the Cabbage Tree slice around the Salisbury Hill prospect appears to be characterised by finer grained sediments. Siltstones outcrop in the mouth of the Powerline adit and the upper part of S1 is finer grained.

A ~10 metre deep shaft at 487110mE 5433025mN contains weathered strongly foliated, siltstones and a strongly weathered clastic described by Bottrill in appendix 1 (213678) as probably Tertiary in age. The Cobblestone Creek thrust is interpreted to trend southwards along the

base of the western side of the hill crossed by the powerline track. The mafic volcanics at the base of the Cobblestone Creek slice further, correlates of those running through the Salisbury Hill prospect, are interpreted to have pinched out.

These mafic/ultramafic volcanics are interpreted to have been erupted in a fore arc setting, consistent with their emplacement onto the Western Tasmania terrane in an accretionary prism. The alkaline/transitional Eaglehawk Gully basalt may have erupted in an intra-arc setting.

The most significant conclusion appears to be the structural setting of the Salisbury Hill prospect.

7.0 EXPENDITURE

7.1 1997-98 EXPENDITURE

Geology	$35,130
Geochemistry	$6,109
Drafting	$3,000
Consumables	$1,500
Management	$3,655
EL 20/94 Total	**$49,344**

7.2 Future Expenditure

The expenditure commitment for 1998-99 will be $82,000. The BMJV intends to complete detailed regional mapping and sampling of prospective host geology during this period to ensure that when 50% relinquishment is made in line with the MRDA in October 1999, the area retained is the most prospective. Work to date has highlighted a number of prospects which the BMJV views with a high degree of interest. However, as none of these are sufficiently well developed to affect construction plans for the Beaconsfield Gold Mine Project over the coming year detailed high cost work such as drilling will be postponed until late 1999 or early 2000 when the companies are enjoying a cash flow.

Work over the coming summer will involve gridded mapping at Salisbury Hill, Peaked Hill and south of the Powerline Track. Work will also continue with the development of a lithogeochemical data base and analysis of mafic and ultramafic rock that outcrop across the licence. A high resolution helimagnetic survey is likely to be undertaken within the next 18 months to 2 years.

8.0 PROPOSED EXPLORATION

EL 20/94 is highly prospective for Tasmania Reef style gold mineralisation. It contains at least 5 kilometres of strike of the Cabbage Tree slice (host to the Tasmania Reef) with evidence of at least two major east to northeast striking faults cutting the strike ridge (at Salisbury Hill and Middle Arm Gorge). The licence also contains considerable of the Peaked Hill (west) and Cobblestone Creek (east) slices as well as a considerable area of Corn Hill Beds which are also potentially mineralised. Most significantly it contains evidence of significant gold mineralisation in the Salisbury Hill prospect.

- Regional mapping should be completed in those areas unmapped.
- Detailed grid based (100 metre infilled to 50 metre in areas of interest/anomalism) mapping should be carried out in conjunction with systematic soil sampling (Au and As analysis at a minimum) over all pre-Middle Devonian rocks.
- High resolution helimagnetics should be acquired over the licence. Considerable detail can be seen in the existing data set which could be better resolved with a closer spaced lower level survey.
- The Johnson Creek Fault transfer zone should be prospected with angled RC holes. This zone, adjacent to (and including?) the Salisbury Hill prospect, has excellent potential for Tasmania Reef style mineralisation. It is quite possibly the most favourable structure along the Cabbage Tree Hill-Salisbury Hill strike ridge. A small programme of RC drilling (~500 metres) should be sufficient for a first pass test of this structure.
- Further attention should be given to aeromagnetic highs where they coincide with interpreted thrust faults as the magnetism may indicate that altering fluids passed through the structure.

Some priority must be given to adequately assessing those areas likely to be relinquished in the 50% relinquishment due on October 28th 1999.

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Addendum

The following petrological descriptions and/or XRD analysis refer to a number of samples whose location is not clearly given.

WC1, WC2 and GC3 are samples of clay from the Powerline Adit. Their locations are shown on figure 8.

The remaining samples whose location is not given are as follows:

Sample Name	Sample No. in Appendix 1	B.M.J.V. Sample No.	AMG Northing	AMG Easting
UM1	C108124	213428	5433185	486725
UM2	C108125	213421	5433660	486550
UM3	C108126	213427	5433660	486550
EG1	C108127	213423	5436520	485570
EG2	C108128	213425	5436520	485570
WTH1	C108129	213436	5435610	487110

Grant MacDonald
Exploration Geologist
Beaconsfield Mine Joint Venture

98-4213A.

530053

APPENDIX 1

MINERALOGICAL / PETROLOGICAL INVESTIGATIONS: BEACONSFIELD MINE

(BOTTERILL)

98-4213A

530054

Ref: 69236 BEAC4.DOC

R. Bottrill 8359

4/9/98

Grant McDonald

Beaconsfield Mine JV

Beaconsfield TAS 7270

Dear Sir,

Mineralogical/Petrological Investigations: Beaconsfield Mine

Forty two samples were collected by yourselves and Mineral Resources Tasmania from the Beaconsfield Mine and environs for these petrological and mineralogical investigations. They can be mostly subdivided into five groups: carbonates, polymict conglomerates (Blyth Ck Formation?); clays, Salisbury Hill ultrabasics, and Salisbury Hill mafic rocks. The samples were registered as C108086-C108106, and C108114-C108129.

The samples were examined by X-ray diffraction and polarised light microscopy, and the report is enclosed.

An invoice will be forwarded for the photography.

Yours Sincerely,

R.S. Bottrill

Mineralogist-Petrologist

530055

Mineralogical/Petrological Investigations: Beaconsfield Mine

An unpublished report for Beaconsfield Mine JV

R.S. Bottrill 4/9/98

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1. Introduction

1.1 Carbonates

Carbonate minerals of varying appearance are widespread in the ~~Beaconsfield~~ Tasmania Mine, and seven samples were collected to identify the main types and assess their variability. The samples (C108086-108088 and C108102-108105) were examined, mostly by X-ray diffraction (XRD), with some polarised light microscopy.

1.2 Polymict conglomerates

A talcose mafic conglomerate sequence (Blythe Ck Formation), similar to that at Forsters prospect, Weld River, was found in DDH B30. Thirteen samples (C108089-108101 and C108114) were collected from this drill core and examined by polarised light microscopy and X-ray diffraction (XRD) to identify the principal constituent clasts and matrix. Some samples from the old Salisbury Hill diamond drill cores SH1 and SH2 (C108116, 117 and 120) were also found to be lithologically similar, and probably belong to the same formation. Samples 213678, from a shaft south of Salisbury Hill, and 213612, from Middle Arm Creek, south of Beaconsfield, are also described as the same lithology.

1.3 Salisbury Hill ultramafics

The old Salisbury Hill diamond drill cores SH1 and SH2 were sampled to test the carbonate zones for identification of the primary lithologies, specifically to test for primary dolomites. The rocks were, however, found to be carbonate-altered polymict conglomerates (see above) and ultramafics (C108115, C108118-119).

1.4 Salisbury Hill Clays

Three clays from the Powerline adit, Salisbury Hill (C108121-C108123), were submitted for clay analysis by XRD, to determine any indications of hydrothermal alteration.

1.5 Salisbury Hill mafic rocks

A number of mafic to intermediate volcanic and intrusive rocks from the Salisbury Hill and Eaglehawk Gully areas were submitted for petrographic descriptions and identification. Some corresponding geochemical analyses were also submitted to assist classification, and for comparison with other basalts in Tasmania.

2. Summary

2.1 Carbonates

The only carbonate identified in the Main lode is ankerite, whilst the veins and weakly mineralised "South lode" consisted mostly of ankerite with minor calcite. The "yellow limestone" contained both major calcite and ankerite; the other limestones contained mostly calcite with only minor to trace ankerite and siderite. Calcite and dolomite, probably mostly alteration minerals, are also common in the polymict conglomerates. Magnesite was found as alteration mineral in some carbonate-altered ultrabasic rocks and polymict conglomerates in the Salisbury Hill drillcores.

2.2 Polymict conglomerates

The clasts in the talcose conglomerate include: gabbro, dolerite, basalt, andesite, quartz wacke, carbonates, quartzites, quartz-mica schists, cherts and carbonate-altered ultramafics. The clasts proportions vary widely in different samples, from quartz-dominated to mafic/ultramafic-dominated. The clasts were mostly subrounded to well rounded, before deformation. The clasts are probably of Late Precambrian (siliceous metasedimentary rocks) to early Cambrian age (basic igneous rocks). They are mostly highly altered, perhaps related to Ca-Mg rich fluids circulating through underlying ultrabasic sequences, perhaps via the thrust postulated in the area.

The dolerites, basalts and andesites are of uncertain age, but may be Proterozoic to Late Cambrian. Some may correlate with the basaltic intrusives in the area, particularly the Eaglehawk Gully basalts and the Salisbury Hill dolerite.

The carbonate clasts are also of uncertain origin; some are definitely altered ultramafics and cherts, but some may also be original sedimentary dolomites or limestones. The arenites include Precambrian quartzites, but some resemble units of the Transition Beds.

The roundness, age and great variety of clasts indicate the unit is an altered, sheared conglomerate rather than a fault melange. The range of clasts fits descriptions of the local basement rocks in Gee and Legge (1979), therefore it is most likely Blythes Creek Formation equivalent: i.e. low in the sequence. This sequence may be related to the basic/ultrabasic conglomerate at Forsters Prospect, Weld River, near Geeveston, southern Tasmania, which however is more talcose and has less siliceous clasts.

2.3 Salisbury Hill ultramafics

The carbonate zones in these drillholes can be categorised into two groups: carbonate-altered conglomerates, and carbonate altered ultramafics.

The first group consist of polymict conglomerates, dominated by Precambrian siliciclastics, altered Precambrian-Cambrian mafic volcanics and cherts, and Cambrian

serpentinites. They are part of the Blythe Creek Beds, and are described with the above group. They have been highly carbonate-altered and moderately deformed.

The second group are serpentinites, variably sheared and altered to magnesite +/- talc-rich rocks. This alteration style appears to be unique in Tasmania. The serpentinites contain chromite and no calcite, indicating that they were not serpentines dolomites as at the Forster Prospect.

2.4 Salisbury Hill Clays

These clays are all kaolinite-rich, compatible with either low temperature argillic alteration, or deep lateritic Tertiary weathering (or a combination of the two). There are no minerals present entirely diagnostic of either genesis.

There is a superficial similarity to the argillically altered rocks from the Forster Prospect, but the latter clays contain halloysite rather than kaolinite. Both can be hydrothermal or pedogenic, but kaolinite is better crystallised and typically forms under slightly higher temperatures.

2.5 Salisbury Hill mafic rocks

These rocks are all altered basalts or possibly basaltic andesites, but have a considerable range of textures and chemical signatures. They are probably all Late Precambrian to Cambrian in age.

UM1 and WTH1 are moderately altered and metamorphosed, highly vesicular, basaltic tuffs or agglomerates; their petrology and geochemistry together does not fit well with any known Tasmanian basalts.

UM2, 213452 and 213677 are amphibolites, chemically similar to the Cambrian Low-Ti Basalts, but no such high grade metamorphosed equivalents are known elsewhere in Tasmania. They resemble the Precambrian amphibolites petrographically but not chemically.

UM3 is an altered dolerite, possibly similar to some clasts in the polymict conglomerate (see above). Chemically and petrographically, it appears distinct from other basaltic rocks in Tasmania.

EG1 is an altered porphyritic basalt; EG2 is a peperite or hybrid basalt/siltstone; chemically and petrographically, they are quite similar to each other and to the Early Cambrian Crimson Creek basalts. They may also be related to the basalt clast in the polymict conglomerates.

The "diorite" is a granodiorite or tonalite, possibly related to the allochthous Cambrian mafic-ultramafic sequences, although some Devonian diorites and granodiorites in northeastern Tasmanian are also chemically and texturally quite similar.

3. Sample Identification

Reg. No.	Description	Location/ID	Treatment
C108086	Main Lode	C57A, 352.7m	xr
C108087	Limestone	C37, 84.4m	xr
C108088	Minor Vein	C37, 143.4m	xr
C108089	Polymict Conglomerate	B30, 308.1m	xr
C108090	Quartzitic Conglomerate	C37, 296.7m	pt
C108091	Polymict Conglomerate	B30, 359m	xr
C108092	Dolerite clast	B30, 349.7m	pt,xr
C108093	Dolerite clast	B30, 338.4m	pt
C108094	Basalt clast	B30, 349m	pt
C108095	Ultramafic clast	B30, 274.4m	pt
C108096	Quartz wacke clast	B30, 354m	pt
C108097	Carbonate-Chert clast	B30, 289.5m	xr
C108098	Andesite clast	B30, 290.0m	pt
C108099	Dolerite clast	B30, 289.0m	pt
C108100	Andesite clast	B30, 349.6m	pt,xr
C108101	Gabbro clast	B30, 280.3m	pt
C108102	South Lode	375m level: S lode	xr
C108103	Limestone	375m level	xr
C108104	Calcite Pods	375m level	xr
C108105	Limestone	375m level	xr
C108106	Minor Vein	375m level	
C108114	Polymict Conglomerate	B30, 302m	pt
C108115	Talc-dolomite	SH1/150.4	pt
C108116	Polymict Conglomerate	SH1/165.7	pt
C108117	Polymict Conglomerate	SH2/210.9	pt
C108118	Dolomitised serpentinite	SH2/217.5	pt
C108119	Dolomitised serpentinite	SH2/221.3	pt
C108120	Polymict Conglomerate	SH2/227.4	pt
C108121	Clay	WC1	xr
C108122	Clay	WC2	xr
C108123	Clay	GC1	xr
C108124	Basalt	UM1	pt
C108125	Amphibolite	UM2	pt
C108126	Uralitised Dolerite	UM3	pt,xr
C108127	Basalt	EG1	pt
C108128	Hybrid basalt/siltstone ("peperite")	EG2	pt,xr
C108129	Basalt ("keratophyre")	WTH1	pt
213575	Tonalite ("Diorite")	Salisbury Hill Sth	pt
213452	Amphibolite	Salisbury Hill Sth	pt
213677	Amphibolite	Salisbury Hill Sth	pt
213678	Polymict Conglomerate	Salisbury Hill Sth	pt
213612	Polymict Conglomerate	Middle arm Ck	pt

xr: XRD, pt: petrographic description

4. Carbonates

The XRD results (Table 3) indicate the presence of five different carbonate minerals: ankerite, dolomite, calcite, magnesite and siderite. The Main Lode carbonate (C108086) contained only ankerite, whilst the weakly mineralised "South lode" on the 375m level (108102) contained mostly ankerite with minor calcite, although some coarse white calcite patches occur (C108104). The unmineralised vein carbonate (C108088) contains mostly ankerite with lesser calcite. The "yellow limestone" (C108087) contained mostly calcite (~50%) with major ankerite (~20%) and a trace of siderite. Limestones collected away from mineralisation on level 357m (C108103, C108105) contained mostly calcite with only minor to trace ankerite and siderite.

Carbonates (dolomite and calcite) are also present in the polymict conglomerates in DDH B30. They appear as veinlets, patches in the matrix, and also as a partial replacement of cherts and other rocktypes. Calcite-altered ultrabasic clasts occur (see C108095 below). Magnesite was found as an alteration mineral in some carbonate-altered ultrabasic rocks and polymict conglomerates in the Salisbury Hill drillcores.

XRD results indicate that there is some apparent chemical variation in the composition of the dolomites and ankerite, but they fall within quite distinct groups.

The results indicate a possible relationship between the ankerite/calcite ratio and proximity to mineralisation. Ankerite and siderite in limestone may result in part from hydrothermal alteration but some may be due to diagenetic recrystallisation of original ferroan, magnesian calcite.

5. Talc conglomerates

These samples were mostly clasts from the conglomerate in drillholes B30 and SH1 & 2, and were described principally petrographically, with some XRD backup (Table 3, 5). The matrix is composed of variable amounts of talc, sericite, calcite, chlorite, quartz, dolomite and plagioclase. Petrographic descriptions follow.

5.1 Descriptions

C108092 (B30): Altered dolerite clast

Hand Specimen

The rock sample is a dark grey, medium grained, rounded clast with doleritic texture, with no obvious inhomogeneity or foliation.

Microscopic petrography

The polished thin section (Fig. 5.1) indicates that the rock is equigranular, moderately foliated and composed mostly of sub-equal amounts of fine to medium grained (0.5-1.5 mm) plagioclase and mafics (altered to chlorite, talc and mica). There is about 3-5% leucoxene. The ore minerals observed are traces of pyrite (<1%) and chalcopyrite. It is probably a metasomatised dolerite or microgabbro.

C108093 (B30): Altered dolerite clast

Hand Specimen

The rock sample is a mottled, weakly foliated, pale grey, medium grained, equigranular rounded clast.

Microscopic petrography

The polished thin section (Fig. 5.2) indicates that the rock is non-foliated, but with weak primary layering, fine-medium grained (~1-1.5 mm) and non-porphyritic. It is composed mostly of plagioclase (~60%) and mafics (~40%), with only trace opaques. The plagioclase is albite, mostly with cores of talc (albitised mafics?) and mafics (altered pyroxenes and biotite?) are altered to talc, chlorite, smectite? and sericite. There are some quartz-carbonate microveins present. The rock is a metasomatised dolerite or microgabbro.

C108094 (B30): Altered basalt clast

Hand Specimen

This rounded clast is a mid-dark grey/green, fine grained rock, with no obvious inhomogeneity or foliation.

Microscopic petrography

The polished thin section (Fig. 5.3) indicates that the rock contains rare phenocrysts, <1 mm, altered to quartz, carbonate, pyrite and chalcopyrite. The matrix is composed mostly of variolitic to spherulitic, fine grained plagioclase laths (~60%, sericitised, <0.5 mm), mafics (~30%, altered to chlorite, talc and carbonate), quartz (~5%, small blebs: amygdules?) and leucoxene (~1%). The ore minerals observed are traces of pyrite and chalcopyrite. The rock is probably an altered basalt.

C108095 (B30): Carbonate-altered ultramafic clast

Hand Specimen

This rounded clast is a pale grey rock with pinkish streaks, is fine grained, with no obvious foliation, and exhibits minor black specks.

Microscopic petrography

The polished thin section (Fig. 5.4) indicates that the rock is composed mostly of fine grained calcite (0.1-0.5 mm), with patches of phyllosilicates (talc, chlorite and mica) and trace chromite (~1%, shattered, partly replaced by chlorite). The rock is probably a type of ophicalcite (a calcite-altered ultramafic).

There are some carbonate microveins present.

The ore minerals observed are traces of pyrite and chalcopyrite.

C108096 (B30): Quartz wacke clast

Hand Specimen

The rock sample is medium grey, fine-medium grained rounded clast, with no obvious inhomogeneity or foliation.

Microscopic petrography

The polished thin section (Fig. 5.5) indicates that the rock is composed mostly of fine grained quartz sand (<0.2 mm) with minor lithics (~5%, phyllite and schist), but no obvious feldspars. The matrix (~15%) is variably cherty, micaceous and carbonate rich, with trace pyrite. There are some quartz-carbonate microveins, surrounded by

carbonate alteration. The rock is compositionally borderline, but could be described as a silty sublitharenite or a quartz wacke.

This rock is similar to some of the arenaceous units in the Transition Beds of the Denison Group, Beaconsfield (Lewis, 1998).

C108097 (B30): Clast: silicified carbonate/carbonated chert?

Hand Specimen

The rock sample is coarse grained, mottled pink and grey, rounded clast, ~12 mm diameter, with no obvious foliation.

The sample was a little too small for polished thin section preparation, but XRD (Table 3) indicates that the rock contains, in order of abundance: quartz, calcite, dolomite, chlorite, talc and mica. It may be a carbonate altered chert, or a silicified carbonate.

C108098 (B30): Andesite clast

Hand Specimen

The rock sample is a fine grained, pale grey, rounded clast with black specks (microphenocrysts), and no obvious foliation.

Microscopic petrography

The polished thin section (Fig. 5.6) indicates that the rock is non foliated and contains ~10% plagioclase phenocrysts (albitised, <1 mm), ~10% perthitic K-spar glomerocrysts, and ~5% mafic phenocrysts (altered to serpentine, talc and smectite). The groundmass is composed mostly of fine grained plagioclase laths (<0.3 mm, sericitised), with some granophyric quartz-feldspar aggregates (~5%, small blebs: amygdules?) and leucoxene. The rock is probably an altered andesite.

C108099 (B30): Dolerite clast

Hand Specimen

The rock sample is a mid grey, medium grained rounded clast, with no obvious foliation or inhomogeneity.

Microscopic petrography

The polished thin section (Fig. 5.7) indicates that the rock is equigranular and composed mostly of sub-equal amounts of fine to medium grained (0.5-1 mm)

plagioclase and mafics (mostly < 1 mm, with phenocrysts to 3 mm; altered to chlorite, talc, smectite and mica), and ~1% leucoxene. It has a moderate foliation, defined by smeared, altered mafics. It is probably a metasomatised dolerite or microgabbro.

C108100 (B30): Clast: Andesite/Basalt ?

Hand Specimen

The rock sample is a rounded clast, ~30 mm diameter, off white with a greenish rim and a porphyritic texture (phenocrysts <3 mm) , with no obvious foliation.

Microscopic petrography

The polished thin section (Fig. 5.8) indicates that the clast contains ~25% albitised plagioclase phenocrysts (<3 mm) and ~15% mafic phenocrysts, altered to talc and smectite?. The groundmass is composed mostly of fine grained, recrystallised spherulitic plagioclase laths (<0.3 mm, sericitised), interstitial mafics (altered to sericite, chlorite, talc?, carbonate? and quartz?), and skeletal leucoxene ~5%). There are some small blebs (amygdules?, <1 mm) of polycrystalline quartz. The greenish altered rim is rich in sericite (or talc?) and chlorite. There are some carbonate microveins present. The rock is probably an altered basaltic andesite or basalt.

C108101 (B30): Gabbro clast

Hand Specimen

The rock sample has a rounded clast, ~30 mm diameter, of a medium grey, coarse grained, equigranular mafic igneous rock, in a fine grained dark grey-green matrix, with no obvious foliation or inhomogeneity.

Microscopic petrography

The polished thin section (Fig. 5.9) indicates that the main clast is composed of sub-equal amounts of medium-coarse grained (<5 mm) albitised plagioclase and mafics (altered to chlorite, talc and smectite?), with trace opaques. It is non foliated, with possible weak primary layering, and is probably a metasomatised gabbro, similar to C108093.

Other clasts present in the conglomerate include: chert, quartzite (Precambrian), quartz-mica schist (Precambrian), dolerite? and andesite; all rounded to lenticular. The matrix is composed of fine grained talc, smectite?, quartz and carbonate, with a trace of pyrite. Smaller, phyllosilicate-rich clasts are commonly smeared into the foliation.

C108114 (B30): Polymict Conglomerate

Hand Specimen

The rock sample is a polymict conglomerate with various grey to white clasts in a fine grained dark grey-green matrix.

Microscopic petrography

The polished thin section (Fig. 5.10) indicates that the rock is composed of rounded to lenticular clasts of various rocks in a talcose matrix. Clasts include quartzite, quartz-mica schist, chert, altered ultrabasics (chlorite and talc rocks), and carbonates. Many siliceous clasts are highly carbonate-altered.

The matrix is composed of fine grained talc, sericite, smectite? and carbonate, with minor quartz. Smaller, phyllosilicate-rich clasts are commonly smeared into the foliation.

The ore minerals observed (in clasts and matrix) are traces of pyrite and chalcopyrite.

C108116 (Salisbury Hill SH1/165.7 m): Polymict conglomerate

This rock in hand specimen is a grey, sheared, polymict, granule conglomerate with quartzose and lithic clasts < 5 mm in diameter. Some quartz veins are present.

In thin section (Fig. 5.12, 5.13) the rock exhibits various rounded to lenticular clasts, mostly 2 - 5 mm, with dominant chert, plus micaceous sandstone, quartz, quartzite, mafic volcanics, andesites(?) and a trace of serpentinite, with minor leucoxene and chromite. Some of the chert is black and highly carbonaceous. The mafic volcanics are fine grained, plagioclase rich and highly carbonate altered (basalts?). The andesitic clasts are felsic, plagioclase-phyric and with a micaceous felsic groundmass. The matrix is mostly altered to vein-style carbonates (~ 40% of the rock). Quartz is present as dismembered veins, also partly altered to carbonates.

The rock is highly altered to carbonates (ferroan magnesite with minor dolomite and trace ferroan calcite: XRD). The magnesite may be replacive of serpentinite.

C108117 (Salisbury Hill SH2/210.9 m): Polymict conglomerate

This rock is a mottled cream - off white colour, with small black specks of iron oxides.

In thin section (Fig. 5.14) the rock is a breccia, consisting of clasts of mesh-textured serpentine (lizardite?, ~15%), chert (~5-10%, carbonate altered), quartz arenite (<5%, carbonate altered) and coarse grained carbonates in a matrix of fine to medium grained granular carbonate. The carbonate (magnesite?) comprises about 75% of the rock. The serpentine is altering to a fibrous carbonate. A trace of chromite, as broken fragments,

indicates that the rock is ultrabasic-derived. There is also a trace of pyrite. Quartz is present as dismembered veins, also partly altered to carbonates.

The rock was probably an ultrabasic-derived polymict conglomerate, but is now highly altered (hydrated, sheared and carbonatised) to a serpentine-magnesite rock. It is less siliceous than the sequence in B30, and could possibly be a serpentinite/siliceous conglomerate contact breccia.

C108120 (Salisbury Hill SH2/227.4m): Polymict Conglomerate

This rock is a breccia or sheared conglomerate, with white quartzose clasts, and grey lithic clasts, < 12 mm long.

In thin section (Fig. 5.18) the rock exhibits clasts of chert, quartzite, quartz-mica schist, mudstone, altered mafics and serpentinite. The serpentinite contains serpentine and sparse chromite, whilst the altered mafics contain leucoxene in a chlorite-carbonate (?dolomite) matrix. The sepentinite clasts are mostly smeared into the foliation. The chert clasts are variably carbonaceous. Carbonate alteration and veining are abundant (~25%; dolomite and magnesite?), and opaque-rich stylolites occur.

This is a carbonate-altered polymict conglomerate with a large mafic-ultramafic component.

213678: Polymict Conglomerate

This rock is a of a ochreous yellow-brown colour, with variable rounded to angular clasts to 5 cm, in a limonitic matrix, with no apparent foliation.

In thin section (Fig. 5.30) the rock is a breccia, consisting of angular to subrounded clasts of mudstone, siltstone, cherts, quartz schist and quartz arenite, in a matrix of very fine semi-opaque limonite. Some of the siliceous clasts contain angular quartz grains in a cherty matrix, as in silcretes. No trace of chromite was observed, although it is hard to detect in the limonitic matrix. No mafics were confirmed.

The rock resembles the polymict conglomerate, but no unequivocal ultramafic material was observed. The doleritic clasts are indefinite but may represent Jurassic dolerite. The lack of a foliation and the presence of silcrete-like particles also suggests another origin, perhaps as a Tertiary ferricrete.

213612: Polymict Conglomerate

This rock is a moderately foliated polymict conglomerate, with white, yellow, and grey lithic clasts, < 12 mm long, and quartzose clasts < 10 mm, in a fine yellow matrix.

In thin section (Fig. 5.31, 5.32) the rock exhibits clasts of chert, greywacke, quartzite, quartz-mica schist, arenites, mudstone, altered mafics and serpentinite. The serpentinite contain serpentine and sparse chromite, whilst the altered mafics contain leucoxene in a chloritic matrix. The sepentinite clasts are mostly smeared into the foliation. The chert clasts are variably carbonaceous.

This is a carbonate-altered polymict conglomerate with a large mafic-ultramafic component.

5.2 Discussion of polymict conglomerate petrography

The clasts in the talcose conglomerate include: gabbro, dolerite, basalt, andesite, quartz wacke, carbonates, quartzites, quartz-mica schists, cherts and carbonate-altered ultramafics. The clasts proportions vary widely in different samples, from quartz-dominated to mafic/ultramafic-dominated. The clasts are mostly subrounded to well rounded, except for smaller, phyllosilicate-rich clasts which are commonly lenticular and smeared into the foliation.

The clasts are mostly highly altered (to talc, chlorite, carbonates, etc.). The alteration appears to be partly post-depositional, related to Ca-Mg rich fluids circulating through underlying ultrabasic sequences, perhaps via the thrust postulated in the area.

The clasts are probably of Late Precambrian (siliceous metasedimentary rocks) to early Cambrian age (basic igneous rocks).

The basalts/andesites are of uncertain age, but may be Proterozoic to Late Cambrian(?). Some may correlate with the basaltic intrusives in the area (see below), but this is difficult, due to the high degree of alteration of the clasts, and the variability of both groups. Basaltic clasts C108094 and C108100 may be correlated with the Eaglehawk Gully basalts (C108127-128); both groups are Fe-Ti-oxide-rich (suggesting a high titanium content) and are phenocryst-poor and feldspathic. C108092, a dolerite is also Ti-oxide poor and may be related. These may be Crimson Creek equivalents, based on geochemistry (below). Most of the dolerite clasts, however, appear Ti-poor (only minor Fe-Ti-oxides occur in C108093, 099 and 101) and are possibly correlatable with the Salisbury Hill dolerite (UM3: C108126).

The carbonate clasts are also of uncertain origin; some are definitely altered ultramafics and cherts, but some may also be original sedimentary dolomites or limestones. Some of the arenites resemble the arenaceous units in the Transition Beds of the Denison Group, Beaconsfield (Lewis, 1998), but others are more metamorphosed and may be Precambrian.

The roundness, age and great variety of clasts indicate the unit is an altered, sheared conglomerate rather than a fault melange. The range of clasts fits descriptions of the local basement rocks in Gee and Legge (1979), therefore it is most likely Blythes Creek Formation equivalent: i.e. low in the sequence.

This sequence may be related to the basic/ultrabasic conglomerate at Forsters Prospect, Weld River, near Geeveston, southern Tasmania, which however is more talcose and has less siliceous clasts.

6. Salisbury Hill ultramafics

6.1 Descriptions

C108115 (Salisbury Hill SH1/150.4 m): Talc-carbonate rock

This is a pale flesh-coloured massive rock, cut by thin black and brown vein networks.

In thin section (Fig. 5.11) the main rock framework is mostly fine grained talc, containing medium grained radiating talc aggregates. This is overprinted by dolomite, as medium grained equant - rounded porphyroblast, aggregates and veins. There is a trace of chromite, as angular fragments, indicating that the serpentinite is an altered ultrabasic. Some pyrite is also present. Thin irregular/ptygmatic quartz veinlets are present. No foliation is present.

The rock is a highly talcose and dolomitised ultrabasic, formed by hydration, shearing, carbonatisation and silicification.

C108118 (Salisbury Hill SH2/217.5 m): Carbonate-altered serpentinite

This is a variegated cream - red - black - green rock, with dolomite and serpentine zones cut by hematite veinlets.

In thin section (Fig. 5.15) the rock exhibits mesh-textured and foliated serpentine (lizardite and antigorite?, ~ 20%) clasts, with patches and veins of talc. XRD also indicated minor chlorite. This was strongly overprinted by porphyroblasts and irregular patches of carbonates (relatively pure magnesite and trace calcite: XRD, ~ 70% carbonate), these being partly brecciated and veined by fibrous quartz. A trace of chromite was observed, partly mylonitised and altered to magnetite and hematite, indicating an ultrabasic origin or component.

The rock is similar to the ultrabasic-rich polymict conglomerate (C108117) although this sample contains no definite siliceous clasts, but it could still be an altered ultrabasic conglomerate. It is now highly altered (hydrated, sheared and carbonatised) to a serpentine-magnesite rock.

C108119 (Salisbury Hill SH2/221.3 m): Carbonate-altered serpentinite

This rock is an apple green serpentine, sheared with white dolomite veins, and black magnetite/haematite schlieren.

In thin section (Fig. 5.16, 5.17) the rock comprises mostly mesh-textured serpentine (lizardite?), with zones of talc and carbonates (relatively pure magnesite and trace calcite: XRD, ~ 25% carbonate), and stringers of brecciated magnetite and hematite. The magnesite occurs as irregular patches, porphyryblasts and veins of fine to coarse grainsize; the porphyroblasts are rounded to equant-euhedral. Minor chromite was observed, as sparse grains partly altered to magnetite and hematite.

The serpentinite is a hydrated and carbonate- altered ultrabasic.

6.2 Discussion: Ultramafics

This sequence of rocks appears to consist of ultrabasics, variably sheared and altered to talc, serpentine and magnesite-rich rocks. This alteration style appears to me to be unique in Tasmania.

The ultrabasic-rich polymict conglomerates described above are similar, especially C108117, and it is possible that the Salisbury Hill ultrabasic rocks represent quartz-poor conglomerates of the Blythe Creek Beds. Field relationships may help resolve this.

7. Salisbury Hill clays

7.1: Description & ID

C108121 (WC1): Cream Clay?

C108122 (WC2): Cream Clay?

C108123 (GC1): Green Clay?

These clays were analysed by X-ray diffraction, and the results are attached (Table4).

7.2 Discussion: Clays

Theses clays are all kaolinite-rich, compatible with either low temperature argillic alteration, or deep lateritic Tertiary weathering (or a combination of the two). There are no minerals present entirely diagnostic of either genesis. The green clay (GC1) is highly micaceous/illitic, probably due to the presence of fine grained (chromian?) muscovite.

There is a superficial similarity to the argillically altered rocks from the Forster Prospect, but the latter clays contain halloysite rather than kaolinite. Both can be hydrothermal or pedogenic, but kaolinite is typically formed under slightly higher temperatures.

530072

8. Salisbury Hill mafic rocks

8.1 Descriptions

C108124 (UM1): Basalt?

This rock is a mottled medium -dark green in colour, with dark brown rounded spots < 0.5 mm in diameter, and some white calcite veins. It appears to be a vesicular, brecciated lava: probably a basaltic or andesitic tuff or agglomerate, with clasts ~ 5 - 20 mm diameter.

In thin section (Fig. 5.20) the rock exhibits very complex textures, and is strongly porphyritic, amygdular and autobrecciated. It has ~40-50% of plagioclase phenocrysts, variably altered to epidote and prehnite(?). There are also about 10-15 % of pale green, rounded to euhedral clinopyroxene phenocrysts and glomerocrysts, <~2 mm, variably altered to brown smectite aggregates (montmorillonite?). The groundmass is mostly fine grained chlorite, epidote, amphibole(?) and carbonates, with only trace opaques. Irregular, cuspate chlorite patches (~ 5%) with perlitic fractures derive from volcanic glass shards. Common (~10%) irregular to lenticular aggregates of fine grained to radiating albite(?) appear to represent metamorphosed zeolite-filled amygdules. Other vesicles or amygdules are filled with chlorite or chalcedony. A trace of muscovite +/- quartz aggregates (<~1 mm) may represent country rock clasts caught up in laharic (mass flow) deposits(?). There is also abundant quartz-carbonate (at least partly calcite) veining and replacement.

The rock is an altered and metamorphosed, highly vesicular, basaltic tuff or agglomerate, probably Precambrian to Cambrian in age.

C108125 (UM2): Amphibolite

This rock has a dark grey to black in colour, and is aphyric (evenly crystalline), and unfoliated, with grains <0.5 mm.

In thin section (Fig. 5.21) the rock exhibits a medium grained, foliated (lineated) amphibolitic texture and composition. The groundmass contains ~40% medium grained highly sericitised plagioclase laths (~0.5 mm long), and ~60% brownish green prismatic hornblende (~0.5 mm). Opaques are absent. It is an amphibolite, probably Cambrian or Precambrian in age.

C108126 (UM3): Amphibolitised Dolerite

This rock is an even grained/aphyric, crystalline rock with a medium grainsize, a mid green-grey speckled appearance, and little or no foliation.

In thin section (Fig. 5.22) the rock exhibits a medium grained, aphyric, doleritic texture and constitution. The groundmass contains ~40% moderately sericitised and calcite-altered plagioclase laths (~0.5 -1 mm), ~40% unidentified mafics, ~20% mid-brown igneous hornblende (with colourless tremolitic rims) and a small trace of quartz. The mafics are completely altered to chlorite, amphibole and talc, but may have been originally pyroxene and/or olivine. No opaques were evident. There are rare quartz-chlorite veinlets.

This is an altered dolerite, probably Precambrian to Cambrian in age.

C108127 (EG1): Basalt

This rock is of a pale brown colour, with ~10% mafic phenocrysts (~1 mm in size) and some larger, dark brown patches (amygdules?).

In thin section (Fig. 5.23) the rock exhibits ~10% small phenocrysts (~ 0.5 - 1 mm in diameter), probably originally of pyroxene or olivine, but now completely altered to smectitic clay (montmorillonite?). The groundmass is opaque rich (leucoxene?), with abundant very fine grained sericitised(?) plagioclase laths and chlorite. There is an amygdule or argillised xenolith of country rock (~15 mm diameter).

The rock is an altered, weakly porphyritic basalt, probably Precambrian to Cambrian in age.

C108128 (EG2): "Peperite": hybrid basalt/siltstone

This rock is a brecciated rock with irregular, angular to lenticular, dark green, very fine grained clasts (~1 - 3 cm long), in a fine grained, buff coloured, silty matrix.

In thin section (Fig. 5.24) the green zones (~50%) are very fine grained and highly chloritic basalt, with irregular skeletal to cuspate, banded quartz grains (<0.5 mm; altered agate-filled vesicles) and ultrafine leucoxene. The buff zones are siliceous, micaceous, clayey and sandy, hornfelsed siltstone, with some locally coarser recrystallised quartz at basalt contacts. Clay mineralogy indicates chlorite/vermiculite, suggestive of altered biotite, and indicative of some metasomatism and hornfelsing by the intruding basalt.

The rock is a peperite or hybrid basalt/siltstone, derived from the extrusion of basalt into unconsolidated wet sediments, probably Cambrian in age.

C108129 (WTH1): "Keratophyre" (Altered basalt?)

This rock exhibits light and dark green phenocrysts (~ 1 mm in size) and some small, irregular pores (~1 mm in size) in a medium grained matrix with a mid green epidote colour.

In thin section (Fig. 5.25, 5.26) the rock groundmass is highly altered to a mixture of fine grained epidote, albite and chlorite, with only trace opaques. There are ~10-20% of pale green, ragged amphibole and chlorite aggregates (<1 mm), probably pseudomorphing clinopyroxene phenocrysts. Some dark green chloritic aggregates (<4 mm) may represent alteration of pore-filling material in an autobreccia or agglomerate, although such textures are not well preserved.

The rock is an altered and metamorphosed basaltic tuff or agglomerate, probably Precambrian to Cambrian in age.

213575 "Diorite" (Tonalite or granodiorite?)

This rock is an even grained/aphyric, granitic rock with a medium to coarse grainsize, a pale green-red mottled appearance, and a possible weak foliation defined by mafics.

In thin section (Fig. 5.27) the rock exhibits a medium to coarse grained, aphyric, granitic texture. It contains ~35% moderately sericitised and calcite-altered plagioclase laths (~0.5 - 2 mm), ~20% mid-brown igneous hornblende (with green actinolitic rims; ~0.5- 2 mm), ~15% altered biotite (~0.5 - 3 mm), ~15-20 % granular, recrystallised quartz (~0.1 - 2 mm), ~10% albite (pinkish, altered K-spar?; 0.2 - 2 mm) and traces of opaques, apatite and zircon. The amphiboles are slightly altered to carbonates.

This is an altered tonalite. If the albite was altered from K-spar, the rock may originally have been a granodiorite, probably Cambrian in age.

213452: Amphibolite

This rock has a mid to dark grey colour with white mottling suggesting feldspar phenocrysts (<2 mm). It is medium grained and strongly foliated.

In thin section (Fig. 5.28) the rock exhibits a medium grained, foliated (lineated) amphibolitic texture and composition. The groundmass contains ~50% medium grained highly sericitised plagioclase laths (mostly ~0.5 mm long, with some ~2 mm), and ~45% brownish-green prismatic hornblende (~0.5 mm) and ~1% fine quartz aggregates (amygdales?). Hornblende wraps around the coarse feldspars which probably represent phenocrysts. Lenticular sericitic patches or schlieren may represent smeared out feldspars. Trace opaques are present (limonite after pyrite?).

It is an amphibolite, probably Cambrian or Precambrian in age, similar to C108125 (UM2), but more porphyritic.

213677: Amphibolite

This rock has a dark grey colour with a medium grained (<1 mm), amphibolitic appearance.

In thin section (Fig. 5.29) the rock exhibits a medium grained, foliated (lineated) amphibolitic texture and composition. The groundmass contains ~50% medium grained highly sericitised plagioclase laths (mostly ~0.5 mm long, rarely phenocrysts ~1 mm), and ~45% brownish-green prismatic hornblende (~0.5 mm) and ~5% fine quartz aggregates (amygdules?). Trace opaques are present (limonite after pyrite?).

It is an amphibolite, probably Cambrian or Precambrian in age, similar to C108125 (UM2).

8.2 Geochemistry: mafic rocks

Although the igneous rocks described above are all highly altered, they mostly show little sign of significant veining or stylolitisation, so we can assume that immobile trace elements (Table 2) should give good representations of the original rocktypes. On the standard Zr/TiO_2 vs Nb/Y plot (Fig. 1), these rocks all plot in the basalt field, although there is a reasonable spread of values. Sample UM2 could be a basaltic andesite on this plot, but petrographically, this rock is quite mafic and highly metamorphosed, indicating the potential for remobilisation of Ti, etc. The Zr/TiO_2 vs Ga plot (Fig. 2) is similar. On both these plots, UM1 and WTH1 plot very closely, while EG1 and EG2 also plot close to each other. Chromium analyses would assist with these classifications.

Rare earth spidergrams (Fig. 3) show a range of pattern types:

- UM3 has a relatively low, flat pattern. This pattern has strong similarities with the Cambrian high-Mg andesites from the Dundas Trough, and this is compatible with its Ti/Zr values (Brown, 1986; Fig. 4).

- UM2 is light rare earth depleted, with a REE pattern and Ti/Zr values similar to the Cambrian low-Ti basalts of the Dundas Trough (Brown, 1986), or perhaps the Suite 5 (Miners Ridge basalts) of the Mt Read Volcanics (Crawford et al. 1992).

- The other samples (EG1, EG2, WTH1 and UM1) are all heavy rare earth depleted, similar to MRV suites 3 (Que Hellyer Volcanics) and 4 (Henty Fault wedge and Henty dyke swarm basalts), and the Crimson Creek tholeiites (Brown, 1986, Crawford et al. 1992). The Ti/Zr contents of samples EG1 and EG2 correspond well with the Crimson Creek basalts (Fig. 4), but UM1 and WTH1 differ considerably, and are probably different to all the above rocks. This may need some further work to confirm the correlations.

8.3 Discussion: mafic rocks

UM1 and WTH1 are altered and metamorphosed, highly vesicular, basaltic tuff or agglomerate; they are petrographically similar to volcaniclastic units in the Crimson Creek Formation, and some unclassified Cambrian basalts near the Weld River, southern Tasmania. Their geochemistry, however, does not fit well with any known Tasmanian basalts.

UM2 may be a Cambrian or Precambrian amphibolites, with a superficial resemblance to some in the Bowry Formation. It is chemically similar (especially in REE and Ti/Zr) to the Cambrian Low-Ti Basalts of the Dundas Trough (Brown, 1986), but not the Precambrian Bowry Formation amphibolites. It may be a highly metamorphosed equivalent to the Cambrian Low-Ti Basalts, but none are known elsewhere. Samples 213452 and 213677 are petrographically similar, and similar rocks of uncertain origin were described from the Flowery Gully area by G. Everard (in Gulline, 1981). The texture indicates prolonged medium-high grade burial metamorphism, unusual for Cambrian rocks in Tasmania.

UM3 is an altered dolerite, possibly similar to some in the polymict conglomerate (see above). It is also petrographically similar to an enigmatic hornblende dolerite/appinite dyke in Cambrian rocks near the Weld River, southern Tasmania, but this is chemically dissimilar (similar to Crimson Creek basalts: Boyd, 1996). Chemically, it appears related to the high-Mg andesites, although it is notably higher in Al and lower in Fe, but these are petrographically distinct (commonly basaltic pyroxenites: Brown, 1986). I know of no other similar rocks in Tasmania.

EG1 is an altered porphyritic basaltic tuff or agglomerate; EG2 is a peperite or hybrid basalt/siltstone; they are quite similar to each other and to the Early Cambrian Crimson Creek basalts (Brown, 1986). They may also be related to the basalt clast in the polymict conglomerate (above).

The "diorite" is a granodiorite or tonalite, possibly related to the allochthous Cambrian sequences. Similar rocks of uncertain origin were described from the Flowery Gully area by G. Everard (in Gulline, 1981).

Based on whole rock geochemistry (particularly immobile and rare earth elements), these rocks are all basalts, although some may be possibly basaltic andesites, with a range of different geochemical signatures.

9. Supplementary samples

C108090: Cabbage Tree Conglomerate

Hand Specimen

The rock sample is a quartzitic conglomerate, with white quartz pebbles in a siliceous grey matrix, with minor pyrite and no obvious foliation.

Microscopic petrography

The polished thin section indicates that the rock is composed mostly of quartz sand and fine gravel in a matrix of fine grained quartz, carbonate, graphite and mica. It has only a small lithic component (micaceous quartzite), and no detectable feldspar.

The ore minerals observed are pyrite (<2%) and chromite (<1%, partly altered to fuchsitic mica).

C108102: "South Lode"

Hand Specimen

The rock sample is a breccia with angular, coarse grained white clasts in a fine grained pale grey sulphidic matrix.

Microscopic petrography

The breccia consists of coarse grained sparry ankerite clasts (20 mm) in a matrix of micritic ankerite, with minor quartz and sulphides. The sulphides are arsenopyrite (~2%), pyrite (~1%), and traces (<1%) of galena, sphalerite (red-yellow) and chalcopyrite. There are also traces of rutile, zircon and tourmaline. No gold was observed.

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Table 1: Sample Listing

Table 2: Whole rock analyses

Table 3: XRD analyses: Beaconsfield carbonates and conglomerates

Table 4: XRD analyses: Salisbury Hill clays

Table 5: XRD analyses: Salisbury Hill DDHs , etc.

Fig. 1: Zr/TiO_2 vs Nb/Y plot

Fig. 2: Zr/TiO_2 vs Ga plot

Fig. 3: REE plot

Fig. 4: Ti vs Zr plot

Fig. 5: Photomicrographs:

	Sample	Photo. No., optics	Field of view (mm)	Rocktype	Description
Fig. 5.1	C108092	47.3 XPL*	11 x 7	Dolerite clast	Highly talc-chlorite altered, foliated dolerite.
Fig. 5.2	C108093	47.4 XPL	11 x 7	Dolerite clast	Talc-chlorite altered, layered microgabbro
Fig. 5.3	C108094	45.10 XPL	3 x 4.4	Basalt clast	Altered, spherulitic basalt.
Fig. 5.4	C108095	47.13 PXPL	3 x 4.4	Ultramafic clast	Ophicalcite : carbonate-altered ultramafic, with chromite-phyllosilicate clots in calcite matrix.
Fig. 5.5	C108096	45.13 XPL	3 x 4.4	Quartz-wacke clast	Carbonate altered, micaceous quartz wacke.
Fig. 5.6	C108098	47.6 XPL	11 x 7	Andesite clast	Plagioclase-Kspar-mafic phyric andesite.
Fig. 5.7	C108099	47.7 XPL	11 x 7	Dolerite clast	Talc-chlorite altered and foliated dolerite
Fig. 5.8	C108100	47.8 XPL	11 x 7	Andesite/basalt clast	Altered, highly porphyritic (plagioclase, mafics), oxide-rich andesite or basalt.

Fig. 5.9	C108101	46.12 XPL	3 x 4.4	Polymict Conglomerate	Talc-chlorite altered ultramafic, deformed between chert and arenite clasts
Fig. 5.10	C108114	46.9 XPL	3 x 4.4	Polymict Conglomerate	Clasts of basalt (near centre), quartz arenite, chert and ultrabasics(?) in a carbonate-altered matrix.
Fig. 5.11	C108115	47.9 XPL	11 x 7	Talc-dolomite	Ultrabasic rock, altered to a talc-dolomite aggregate.
Fig. 5.12	C108116	46.3 PXPL	1.7 x 1.1	Polymict Conglomerate	Chromite (centre) in carbonate-chlorite altered ultramafic clast..
Fig. 5.13	C108116	46.4 PXPL	3 x 4.4	Polymict Conglomerate	Oxide-rich basaltic clast (near centre), plus clasts of chert, quartz arenite, ultramafics(?), etc.
Fig. 5.14	C108117	46.5 PXPL	3 x 4.4	Polymict Conglomerate	Chromite (dark) and quartz and chert, in a carbonate-rich matrix.
Fig. 5.15	C108118	45.21 PPL	3 x 4.4	Dolomitised serpentinite	Chromite-bearing magnetite-rich layers in a sheared ultramafic, altered to magnesite-serpentine.
Fig. 5.16	C108119	46.1 PPL, RL**	1.1 x 0.7	Dolomitised serpentinite	Oxide-rich schlieren, as above, showing chromite (mid grey) altering to magnetite (pale grey) and haematite (white), in serpentine and magnesite (dark grey).
Fig. 5.17	C108119	45.29 PPL	1.7 x 1.1	Dolomitised serpentinite	Chromite (dark red) altering to magnetite and haematite (black), in serpentine / magnesite (off white).
Fig. 5.18	C108120	46.14 PXPL	3 x 4.4	Polymict Conglomerate	Clasts of chromite-bearing chloritised ultramafics (near centre), quartz arenite, chert, carbonaceous chert (black), and basalt in a carbonate-altered matrix.
Fig. 5.19	C108120	46.15 XPL	3 x 4.4	Polymict Conglomerate	Clasts of basalt (RHS), quartz schist, carbonate-chert (LHS) and ultrabasics(?) in a carbonate-altered, stylolitised matrix.
Fig. 5.20	C108124	45.14 XPL	11 x 7	Basalt	Highly altered porphyritic, amygdular basaltic breccia.
Fig. 5.21	C108125	45.17 PPL	11 x 7	Amphibolite	Amphibolite, showing green-brown lineated hornblende and colourless plagioclase.
Fig. 5.22	C108126	47.11 PXPL	3 x 4.4	Uralitised Dolerite	Highly altered dolerite, with actinolite - altered brown igneous hornblende, grey sericitised plagioclase, and pale green chloritised mafics.
Fig. 5.23	C108127	45.1 PXPL	3 x 4.4	Basalt	Highly altered porphyritic basalt.
Fig. 5.24	C108128	45.5 XPL	11 x 7	Peperitic breccia	Peperitic breccia, showing yellow, altered basalt intruding mudstone, with some local silicification (white).

Fig. 5.25	C108129	45.8 XPL	3 x 4.4	Basalt	Porphyritic, epidote-amphibole-altered basaltic rock.
Fig. 5.26	C108129	45.7 PPL	3 x 4.4	Basalt	Altered basaltic rock (tuff?), illustrating breccia texture.
Fig. 5.27	213575	46.16 XPL	3 x 4.4	Tonalite	Altered tonalitic rock, showing yellow, sericitised plagioclase, cloudy albite, white-grey-cream quartz, dark, foliated altered biotite, and red-yellow-blue amphiboles.
Fig. 5.28	213452	46.2 XPL	3 x 4.4	Amphibolite	Amphibolite, with fine grained and phenocrystic plagioclase, and coloured, lineated amphiboles.
Fig. 5.29	213677	46.19 XPL	3 x 4.4	Amphibolite	Amphibolite, with even grained, granular, off white plagioclase, and coloured amphiboles.
Fig. 5.30	213678	46.22 XPL	3 x 4.4	Polymict Conglomerate	Breccia, non-foliated, with angular-subrounded cherty clasts (including silcrete?) in a dark, limonitic matrix.
Fig. 5.31	213612	46.24 XPL	3 x 4.4	Polymict Conglomerate	Clasts of chromite-bearing chloritised ultramafics (?), quartz arenite, chert, carbonaceous chert (black), and basalt in a carbonate-altered matrix.
Fig. 5.32	213612	46.25 PPL	3 x 4.4	Polymict Conglomerate	Clasts of foliated, chromite-bearing chloritised ultramafics (near centre), quartz arenite, chert, etc. in a carbonate-altered matrix.

* XPL : Crossed-polarised light; PPL : Plane-polarised light; PXPL: Part-crossed polars;

** RL: Reflected light, other transmitted light.

530081

Table 2: Selected major and trace elements (analyses supplied by BMJV).

Field No.	UM1	UM2	UM3	EG1	EG2	WTH1
Reg. No.	C108124	C108125	C108126	C108127	C108128	C108129
wt. %						
SiO_2	45.70	48.85	51.62	50.50	50.93	49.64
TiO_2	0.56	0.50	0.13	1.97	2.76	0.60
Al_2O_3	16.94	15.70	13.46	12.93	17.74	16.26
Fe_2O_3	11.77	10.16	5.55	12.45	9.47	10.44
MnO	0.15	0.17	0.09	0.08	0.06	0.11
MgO	7.41	9.73	13.53	10.50	5.72	7.20
CaO	10.24	7.09	4.20	0.34	0.27	8.74
Na2O	1.26	1.62	2.96	0.51	3.75	2.62
K2O	0.39	3.49	1.91	0.63	1.39	0.63
P_2O_5	0.09	0.03	0.00	0.28	0.20	0.05
Total	94.51	97.34	93.45	90.19	92.29	96.29
LOI	6.11	2.44	6.54	9.33	8.26	4.29
ppm						
La	17	3.1	3	47	59	17
Ce	15	3.1	1.8	39	44	14
Pr	14	3.5	2.2	36	42	12
Nd	13	4.2	2.2	34	39	11
Sm	9.9	5.7	2.1	27	30	8.3
Eu	10	6.8	1.5	25	30	9.7
Gd	8.5	8.5	3.1	23	26	7.7
Dy	6.2	9.5	3.1	16	18	6.5
Er	6.1	11.7	3.3	12	13	6.1
Yb	5.3	12	2.9	9	9	5.8
ppm						
Ga	16	13	8.5	20	23	15.6
Ti	3357	2997	779	11810	16546	3597
Zr	23	25	4	184	261	23
Nb	2	2	2	30	42	2
Y	13	22	5	28	33	12
Ti/Zr	146	120	195	64	63	156
P_2O_5/TiO_2	0.161	0.060	0.000	0.142	0.072	0.083
Zr/TiO_2	0.004	0.005	0.003	0.009	0.009	0.004
Nb/Y	0.15	0.09	0.4	1.07	1.27	0.17

TASMANIA DEVELOPMENT AND RESOURCES

Mineral Resources Tasmania

Client: R.S. Bottrill
Sample Location: Beaconsfield
Analysis: Approximate Mineralogy
Method: X-Ray Diffraction

Results (approx wt %)

Sample	*>80%*	*60%-80%*	*40%-60%*	*25%-40%*	*15%-25%*	*10%-15%*	*5%-10%*	*<5%*
108086	Ankerite					Pyrite		Quartz, Mica
108087			Calcite		Ankerite, Mica	Quartz		Pyrite, ?Siderite
108088 (vein)		Ankerite		Calcite				Quartz
108089			Mica			Quartz, Chlorite, Dolomite	Talc, Plagioclase	Stilpnomelane, Calcite
108091				Talc	Calcite, Chlorite, Quartz		Mica	Plagioclase, Dolomite
108092				Talc, Mica*	Plagioclase, Chlorite			Stilpnomelane, Quartz, ?Rutile
108094				Plagioclase, Talc	Chlorite	Mica		Quartz, Calcite
108095	Calcite						Talc, Chlorite	Quartz, Mica
108097				Quartz	Mica, Chlorite	Talc	Plagioclase, Dolomite	Stilpnomelane, Calcite
108100				Quartz, Mica	Chlorite, Talc		Dolomite	Calcite, Plagioclase
108102		Ankerite				Arsenopyrite	Pyrite	Quartz, Talc, Mica, Calcite
108103	Calcite						Quartz	Ankerite, Mica, Siderite
108104	Calcite							Quartz, Ankerite
108105	Calcite						Quartz	Ankerite, Siderite, Mica, Hematite

* probably Biotite

108097 (pink) - Quartz, Calcite, Dolomite, Chlorite, Talc, Mica*, ?Plagioclase, ?Stilpnomelane

KN Woolley

Analyst: R.N. Woolley
Date: 8 February 1998

TASMANIA DEVELOPMENT AND RESOURCES

Mineral Resources Tasmania

Client: R.S. Bottrill
Sample Location: Beaconsfield
Analysis: Approximate Mineralogy
Method: X-Ray Diffraction

Results (approx wt %)

Sample	*>80%*	*60%-80%*	*40%-60%*	*25%-40%*	*15%-25%*	*10%-15%*	*5%-10%*	*<5%*
108121	Kaolinite						Quartz	Crandallite-type[1], Mica[2], Goethite, ?Sjogrenite-type
108122	Kaolinite							Mica[2], Goethite, Quartz
108123			Kaolinite, Mica[2]				Quartz	Goethite, ?Gibbsite

[1] possibly Plumbogummite
[2] probably Illite

R N Woolley

Analyst: R.N. Woolley
Date: 5 March 1998

TASMANIA DEVELOPMENT AND RESOURCES

Mineral Resources Tasmania

Client: R.S. Bottrill
Sample Location: Beaconsfield
Analysis: Approximate Mineralogy
Method: X-Ray Diffraction

Results (approx wt %)

Sample	*>60%*	*40%-60%*	*25%-40%*	*15%-25%*	*10%-15%*	*5%-10%*	*<5%*
108116		Quartz		Mica	Magnesite (2.756Å)	Plagioclase	Dolomite (2.891Å), Chlorite, Calcite[2] (3.026Å)
108118	Magnesite (2.743Å)				Quartz	Serpentine	Talc, Magnetite, Hematite, Chlorite, Calcite[2] (3.035Å)
108119	Serpentine		Magnesite (2.742Å)			Talc	Quartz, Magnetite, Calcite[2] (3.034Å)
108125	Amphibole			Mica		Chlorite	Plagioclase
108126			Plagioclase, Chlorite[1]	Amphibole			Calcite (3.034Å), Mica, Talc, Quartz
108128		Chlorite-Vermiculite	Chlorite		Quartz		
213580			Calcite	Plagioclase	Ankerite (2.904Å), Mica	Quartz, Chlorite	Stilpnomelane/Chlorite-Vermiculite

Major Peaks: Magnesite 2.742Å; Siderite 2.795Å; Dolomite 2.888Å; Ankerite 2.906Å; Calcite 3.035Å

[1] possibly some Vermiculite interlayering

[2] ~0.5%

R.N. Woolley

Analyst: R.N. Woolley
Date: 26 August 1998

Table 5

3503

Fig. 1: immobile elements, Beaconsfield volcanics

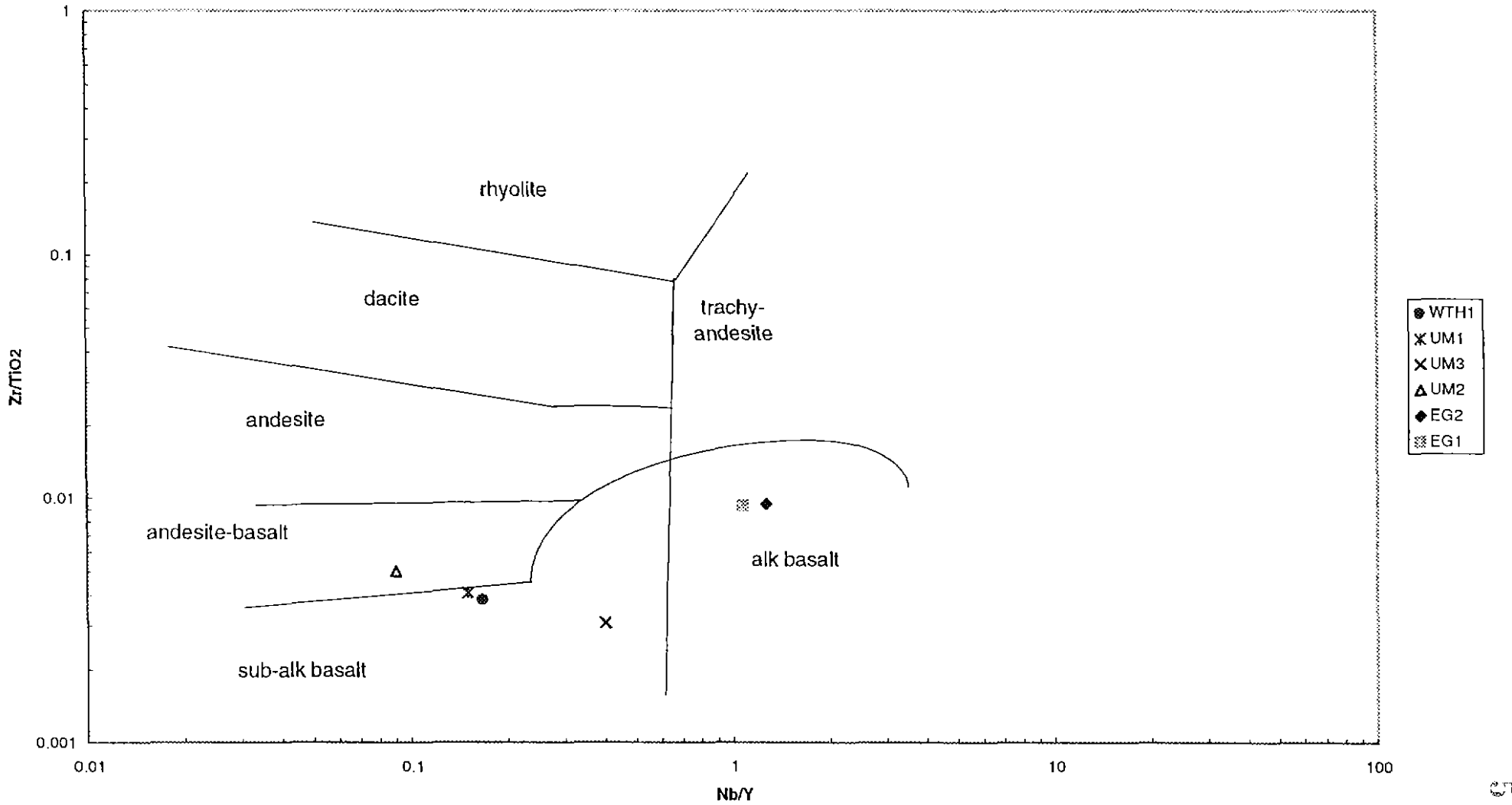

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Fig. 2: immobile elements, Beaconsfield volcanics

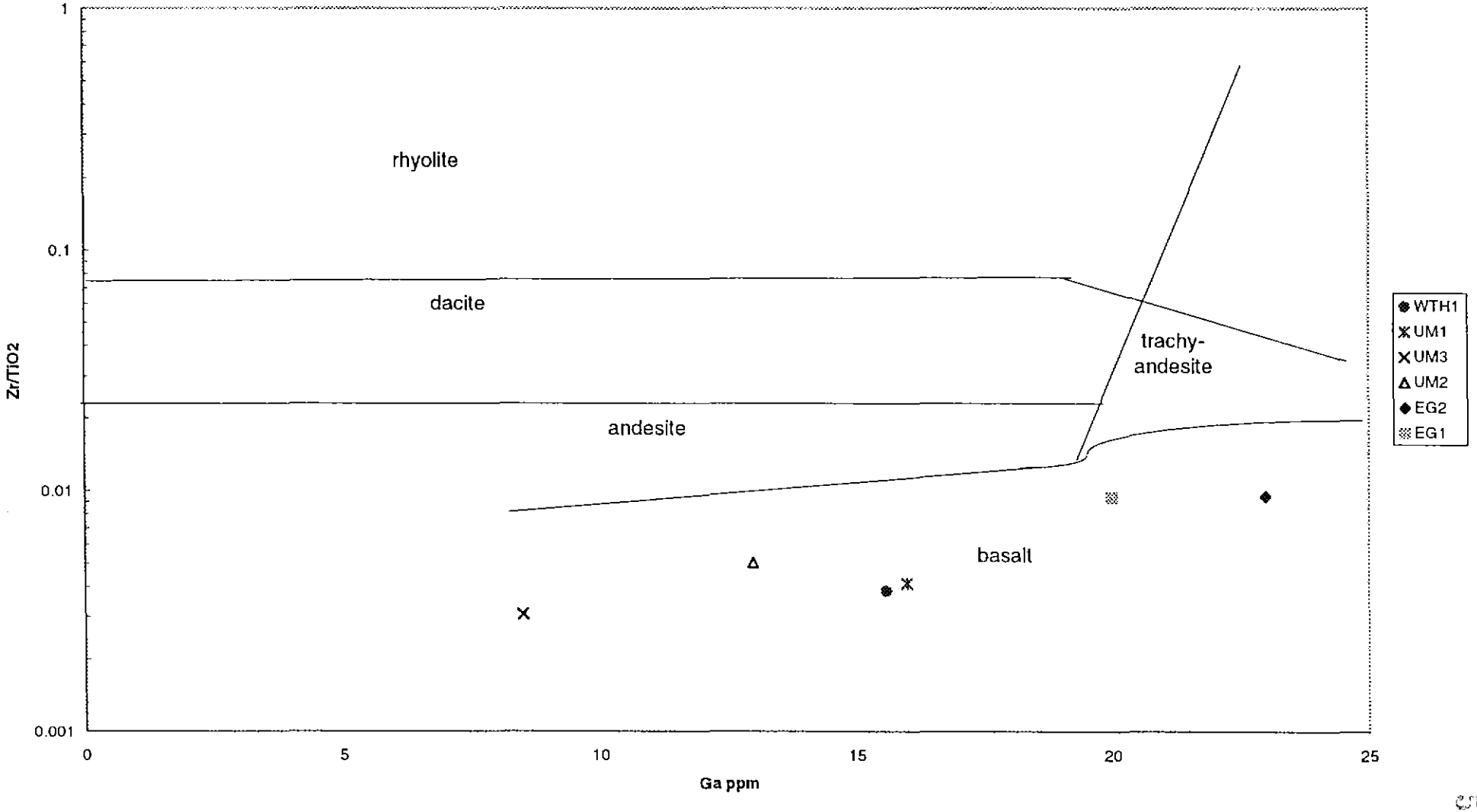


fig 3 Chart 1

Fig. 3: REE, normalised, Beaconsfield volcanics

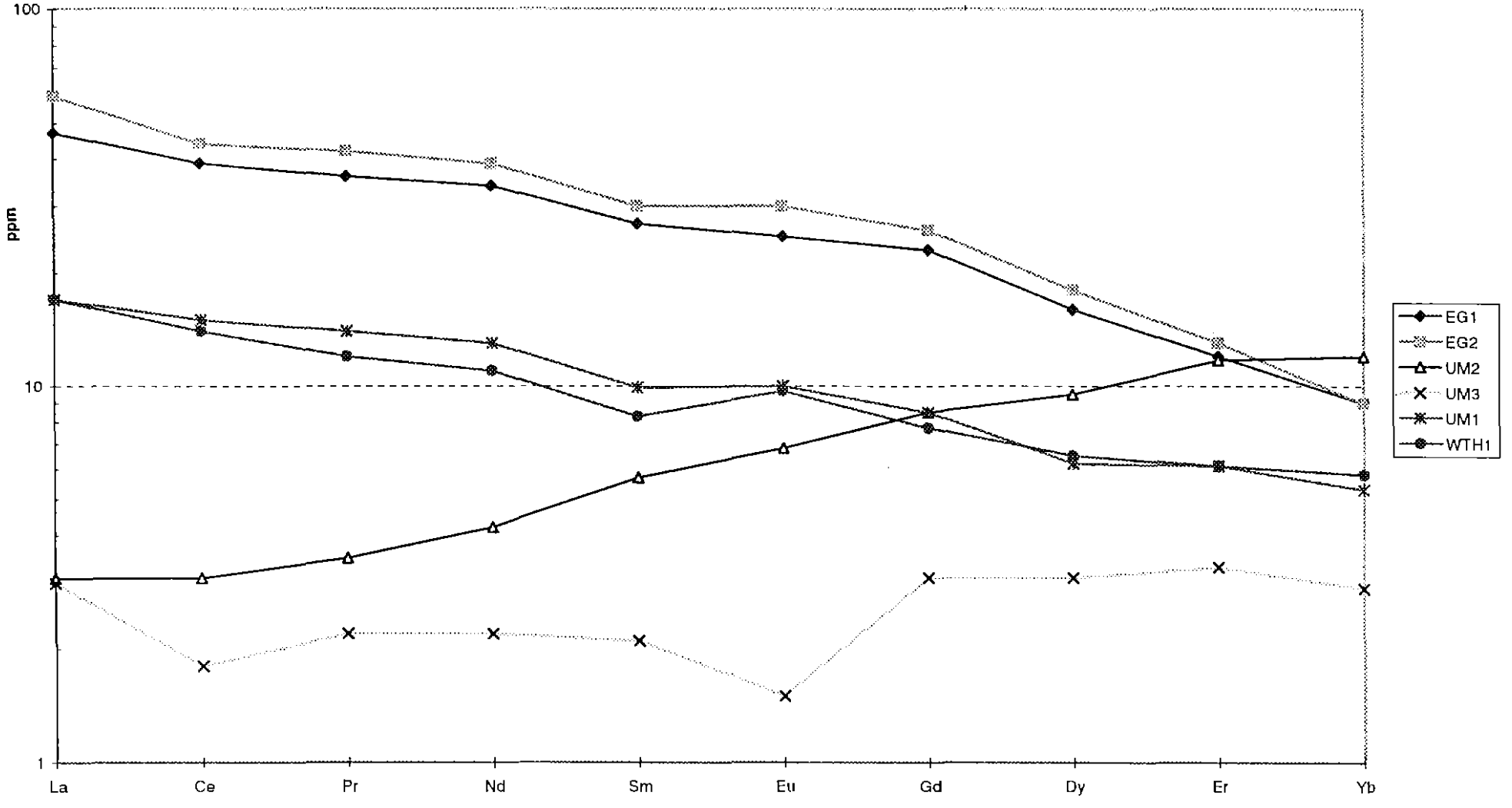
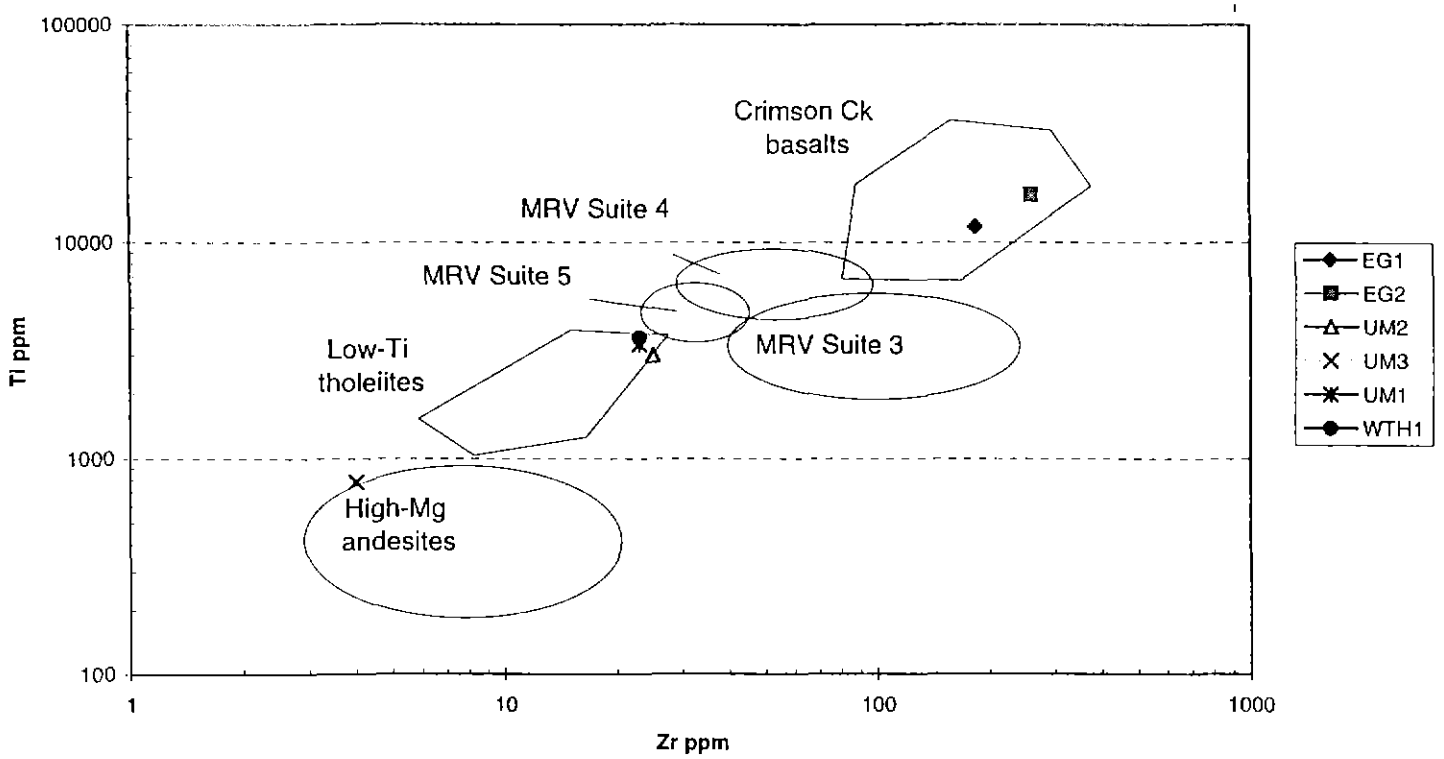
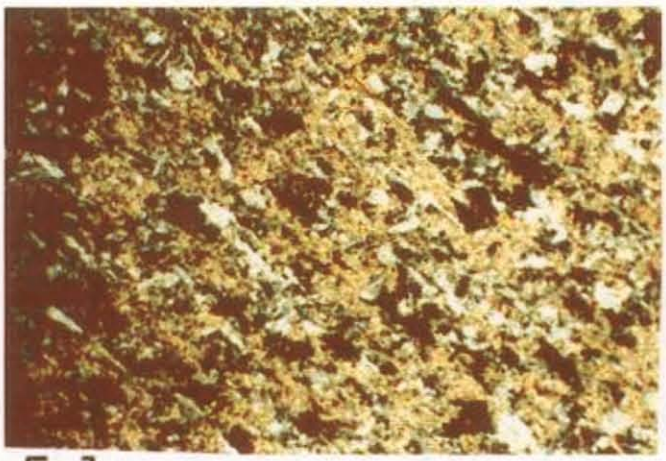


**Fig. 4: Beaconsfield mafic volcanics,
with fields from Brown (1986) and Crawford et al (1986)**





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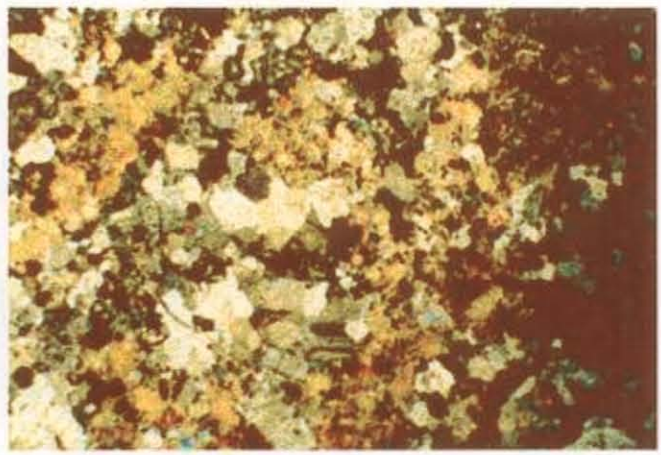

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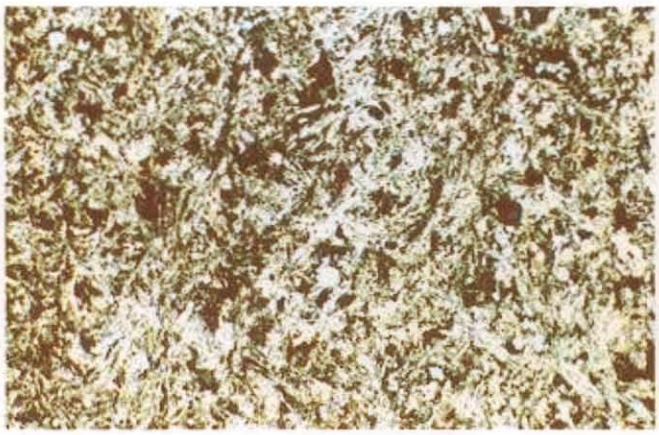

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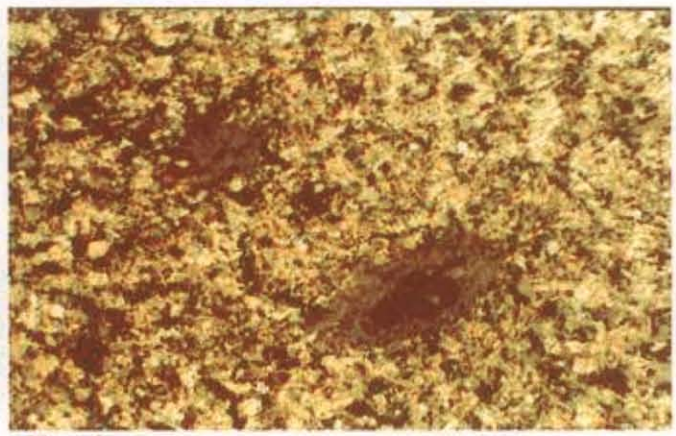

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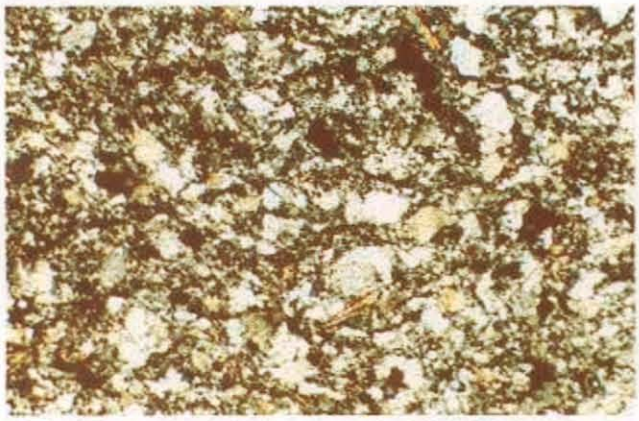

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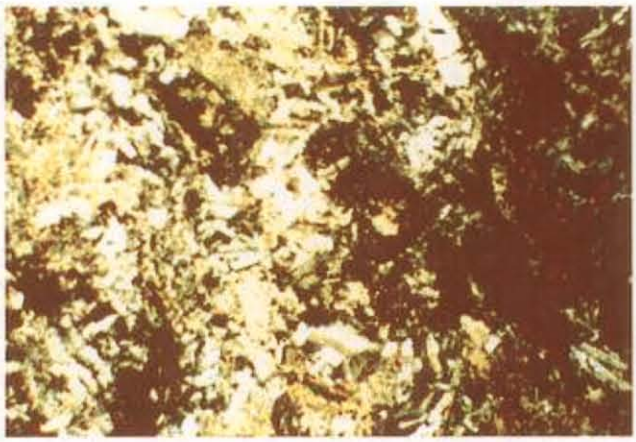

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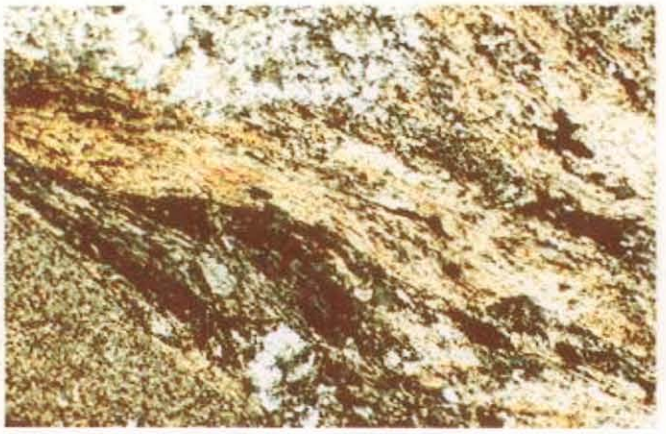

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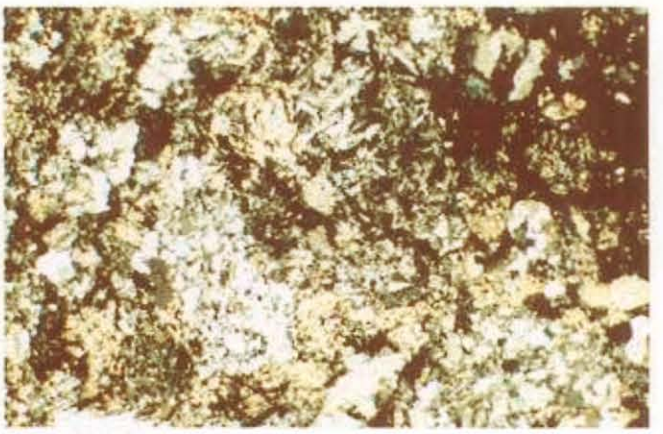

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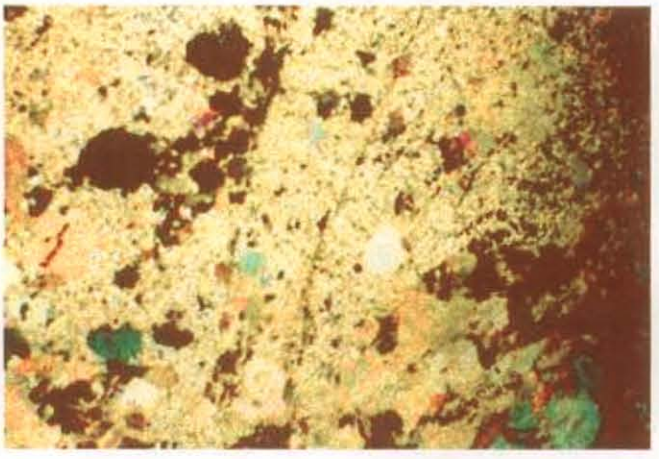

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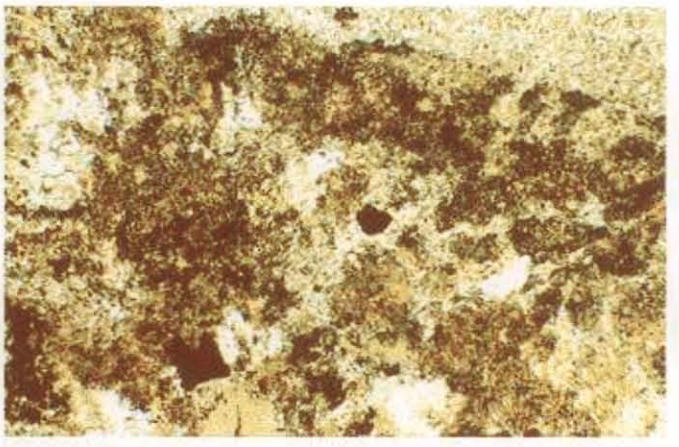

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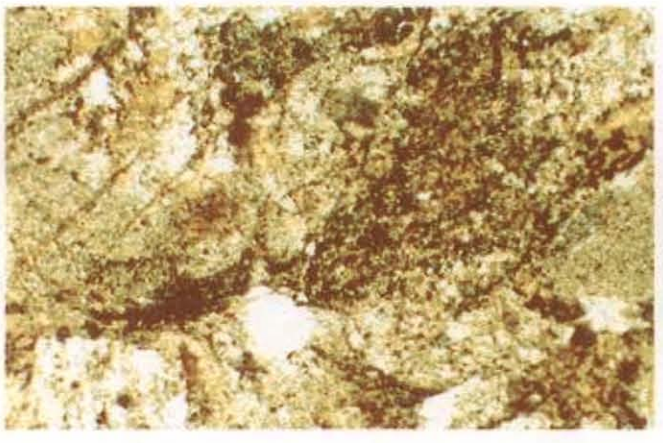

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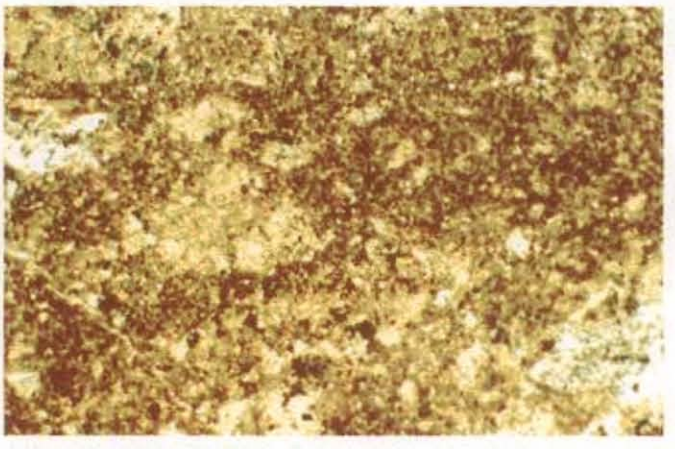

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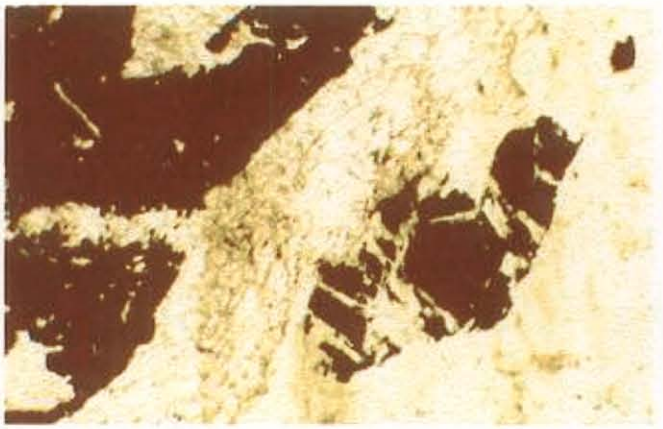

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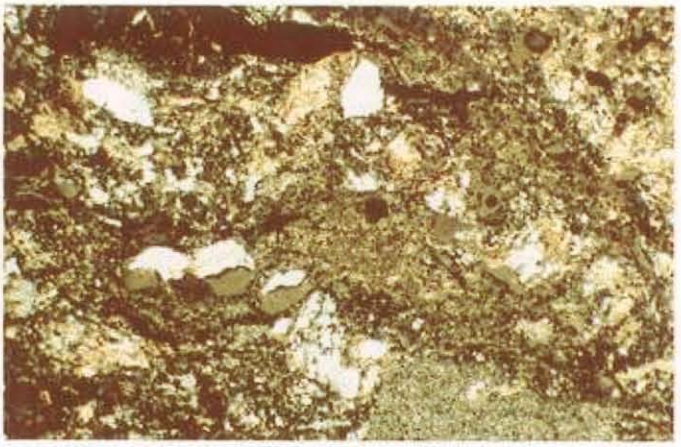

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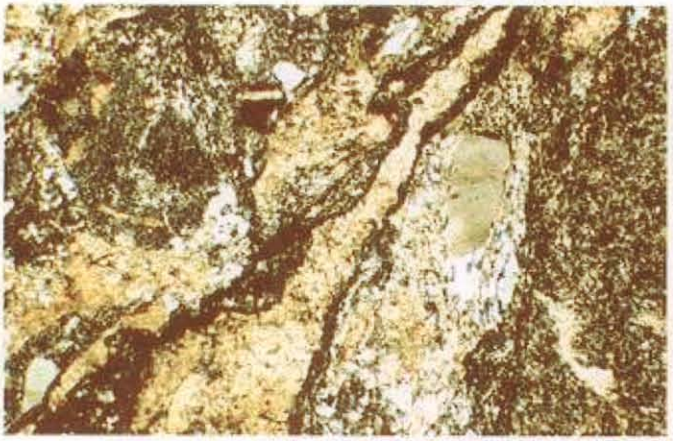

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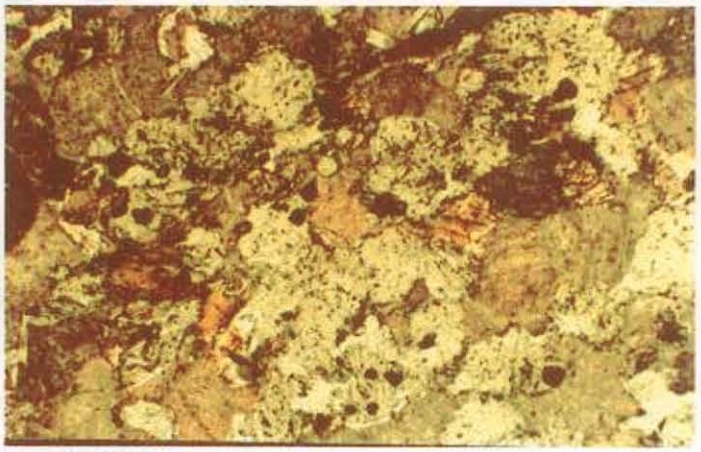

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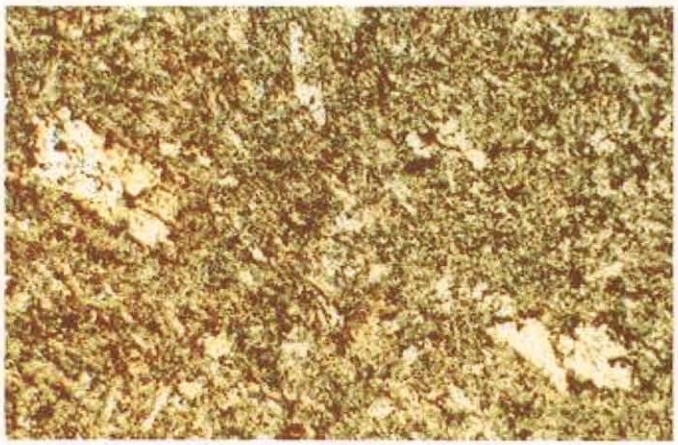

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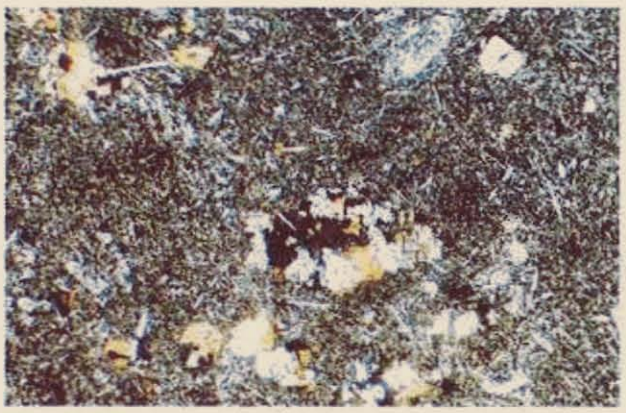

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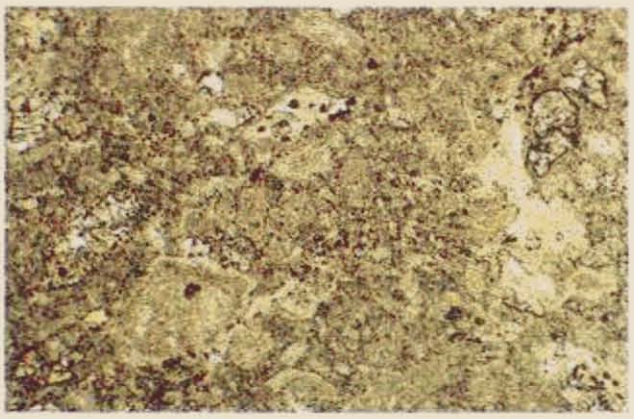

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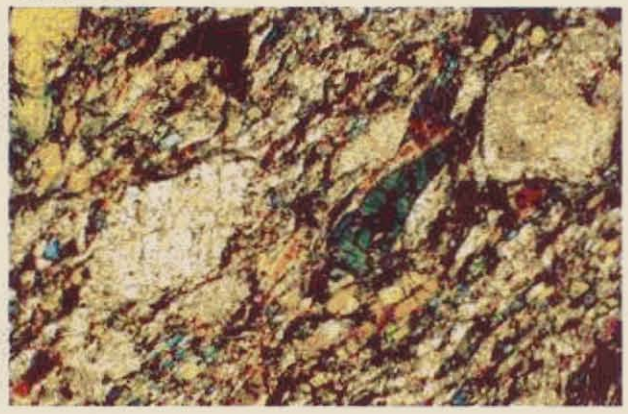

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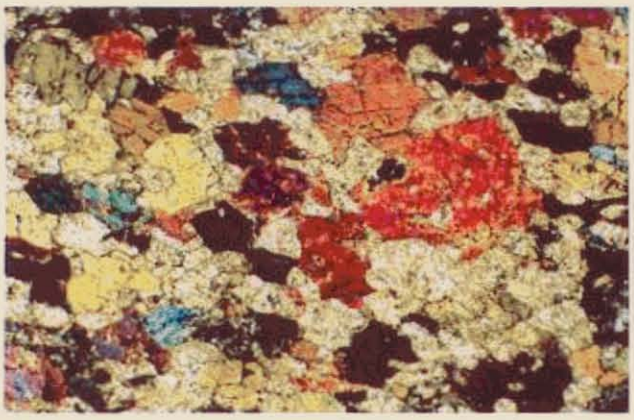

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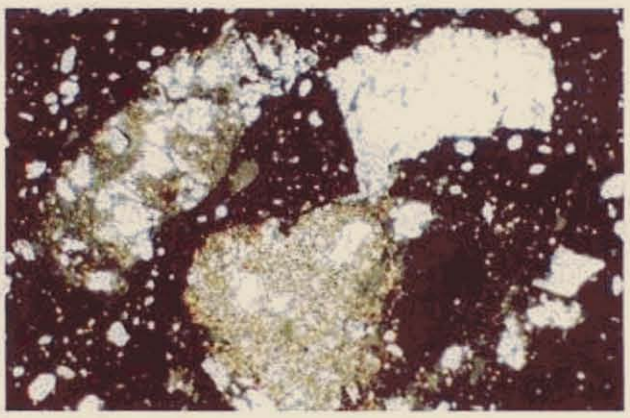

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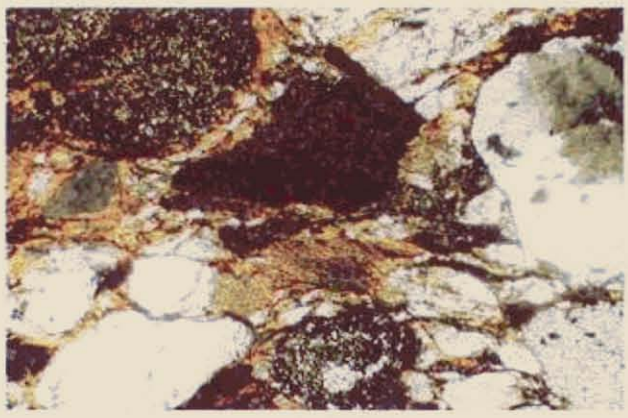

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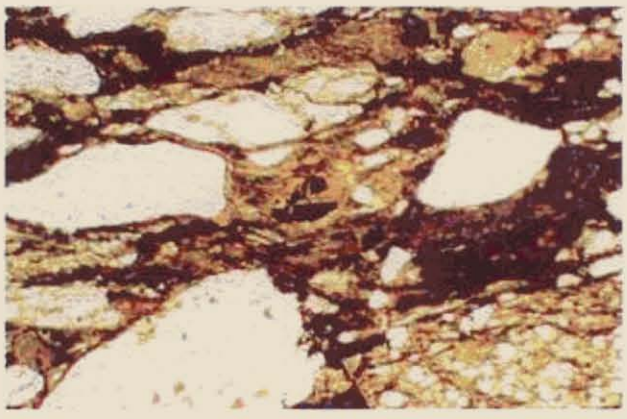

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APPENDIX 2

ROCK SAMPLE LEDGER

Number	DDH or informal name	From/ AMG northing	To/ AMG easting	Description	trace	LREE	gold	TS
213401	mouth E Gully	5436497	485593	v hmt rich q vn bx w hmt infilling			y	
213402	mouth E Gully	5436493	485593	ferruginous slt w q vng			y	
213403	Rising Sun	5436537	485480	0.5 m wide colloform banded q vn w ankerite +5-10% py			y	
213404	Rising Sun	5436537	485480	0.5 m wide colloform banded q vn w ankerite +5-10% py			y	
213405	Rising Sun	5436537	485480	grab sample of sulphidic material from 213403/404			y	
213406	Rising Sun	5436560	485467	smoky gy q vng as bx of sid slt w ~2% dsd py			y	
213407	Rising Sun	5436560	485467	smoky gy q vng as bx of sid slt w ~2% dsd py			y	
213408	EGW1	5436444	485258	50mm tensional q vn, sdc and graphitic			y	
213409	EGW2	5436444	485258	50mm tensional q vn, sdc and graphitic			y	
213410	EGW3	5436444	485258	similar to 213409 but more bxd q vng			y	
213411	EGW4	5436444	485258	similar to 213409 but more fibrous q vng			y	
213412	EGW5	5436444	485258	similar to 213409 but more fibrous q vng			y	
213413	EGR80.1-80.45	5436405	485275	q vn in road cut, 350 mm wide			y	
213414	EGR 17.9	5436357	485217	q vn in road cut, 10-20 mm wide			y	
213415	EGR 18.1	5436357	485218	q vn in road cut, 10-20 mm wide			y	
213416	EGR 18.5	5436357	485219	q vn in road cut, 10-20 mm wide			y	
213417	EGJR 1	5436110	485810	v hmt q vn bx			y	
213418	EGJR 2	5436150	485830	hmt w bxd q vn and botryoidal texture			y	
213419	EGJR 4	5436150	485830	v hmt q vn bx w hmt infilling			y	
213420	EGW (west weir)	5436432	485257	v graphitic and polymict breccia of Cabbage tree cong.			y	
213421	SHR2/UM2	5433660	486550	almost black but flecked porphyritic rock (plag)	y	y		y
213422	sst in MACG	5436555	485550	dark green wavy bedded sst w leucoxene	y	y		
213423	EGR412.0/EG1	5436520	485570	basaltic breccia (hyalo? peperitic?), weathering ol gn	y	y		y
213424	EGR 423.2	5436520	485570	basaltic breccia (hyalo? peperitic?), weathering ol gn	y	y		
213425	EGR421.7/EG2	5436520	485570	ol gn weathering plag hornblende? phyric basalt	y	y		y
213426	EGR 418.3	5436520	485570	ol gn weathering plag hornblende? phyric basalt	y	y		
213427	SH top/UM3	5433660	486550	plagioclase rich volcanic, possibly v'clastic	y	y		y
213428	SH bot ad/UM1	5433185	486725	dark green pyroxene phyric mafic	y	y		y
213429	SH bottom adit	5433185	486725	dark green pyroxene phyric mafic	y	y		
213430	SH top shaft	5433660	486550	serpentinised pyroxene phyric mafic/ultramafic	y	y		
213433	Wilf's far	5436000	486890	mod dk gn plag (1mm 8%) and ocl pyroxene (5 mm) phyric mafic	y	y		
213436	WTHG/WTH1	5435610	487110	mod dk gn plag (1mm 8%) and ocl pyroxene (5 mm) phyric mafic	y	y		y
213441	104	5433665	487550	20 mm fibrous quartz, leached in sst			y	
213442	227	5433560	487550	5-10 mm quartz vn in pale sid fg sst			y	
213443	268	5433530	487545	5-10 mm quartz vn in pale sid fg sst			y	
213444	350/1	5433455	487525	ferruginous lode cap			y	
213445	350/2	5433455	487525	ferruginous lode cap w grit			y	
213446	350/3	5433455	487525	ferruginous lode cap w some sub-ang quartz			y	
213447	350/4	5433455	487525	ferruginous lode cap			y	

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213448	350/5	5433455	487525	dk gy stockworked/silicified sst			y	
213452	227	5432450	486730	feldpsar crystal rich rock, my fol, v'clastic?				y
213460	480	5433330	487565	feeruginous as for lode cap but w quartz grit			y	
213474		5433625	485885	biscuity limonitic quartz			y	
213475		5433740	485890	assorted limonitic quartz			y	
213476		5433800	485870	assorted limonitic quartz			y	
213478		5434065	485930	assorted quartz, hmt			y	
213479		5434060	485900	assorted quartz, hmt			y	
213480		5434110	485820	assorted quartz, hmt			y	
213482	B32	1024.1	1024.6	med dk gy sst w mn q pebbles	y			
213483	B32	1041.9	1042.6	clast rich (clast support) cong w 10% dk gy clasts	y			
213484	B32	1064.5	1065.2	clast rich (clast support) cong w 10% dg gy clasts	y			
213485	B32	1080.3	1081	med bn to med dk gy sst	y			
213486	B32	1125.2	1126	clast rich cong <5% dk gy clasts	y			
213487	B32	1140.8	1141.5	clast rich cong <5% dk gy clasts w mn py	y			
213488	B23	558.6	559.4	magc dk gnish gy wy calcareous slt, fossiliferous	y			
213489	B23	607.5	608.3	gnish gy my calcareous slt, msv	y			
213490	B32	1170.5	1171.2	clast rich q pebble cong w dsd py in mx, clasts to 30mm	y			
213491	B32	1159.5	1160.3	calst rich q pebble cong w dsd py in mx, clasts to 30mm	y			
213492	B23	220.3	221.0	lt gy lst w v dk gy shaley/slt mx	y			
213493	B23	273.7	274.3	lt gy lst w v dk gy shaley/slt mx	y	y		
213494	B23	348.7	349.3	lt gy lst w v dk gy shaley/slt mx	y	y		
213495	B32	923.5	924.4	dk gnish gy sst my calcareous	y			
213496	B32	929.7	930.5	dk gnish gy sst my calcareous	y			
213497	B32	946.8	947.5	dk gnish gy sst my calcareous	y			
213498	B32	959.4	960.5	dk gnish gy sst my calcareous	y			
213499	B32	978.6	979.3	dk gnish gy sst my calcareous	y			
213500	B32	987.5	988.2	clast supported q pebble cong w cb in mx w 10% dk shale clasts	y			
213501	B32	1003.6	1004.6	80% q pebble cong to 10mm w 20% dk gy sst	y			
213502	B32	1008.5	1009.1	80% dk gy sst w 20% pebbly cong, clasts to 10mm	y			
213503	B23	632.5	633.2	msv gnish gy sst non calcareous	y			
213504	B23	660.4	661.3	dk gnish gy calcareous sst, rhythmically bedded w more & less cb (~70% total cb)	y			
213505	B23	651.4	652.3	dk gnish gy calcareous sst, rhythmically bedded w more & less cb (~70% total cb)	y			
213506	B32	791.5	792.5	org bn wed sface (due to cb) but fresh is lt gnish gy cak slt	y			
213507	B32	840.5	841.5	mod to gnish gy calcareous slt	y			
213508	B32	891.9	892.7	gnish gy calcareous slt	y			
213509	B26	641.7	647.3	msv gnish gy sst wy calcareous typical of z	y			
213510	B26	650.7	651.6	msv gnish gy sst wy calcareous typical of z	y			
213511	B26	679.3	680.2	dk gy msv sst	y			
213512	B26	691.7	692.8	clast rich dk gy pebbly cong w clasts to 30mm, inc 10% dk shale, & mod dk gy slt	y			
213513	B26	701.8	702.8	clast rich dk gy pebbly cong w clasts to 20mm, inc 10% dk shale, & mod dk gy slt	y			

213514	B26	715.4	716.5	v dk gy fg sst, msv, ocl gritty bands	y			
213515	B26	725.3	726.3	v dk gy sst w ocl more gritty z	y			
213516	B26	739.3	740.3	dk gnish gy sst	y			
213517	B26	748.2	748.7	evenly graded cong v dk gy clasts 85% qtzose to 15mm, 15% bk shale clasts	y			
213518	B26	761.0	762.0	evenly graded cong v dk gy clasts 85% qtzose to 15mm, 15% bk shale clasts	y			
213519	B26	792.5	793.0	v dk gy w 60% pebbly cong bands, 40% sst w ocl q pebbles	y			
213520	B26	815.6	816.6	more diffusely bedded v dk gy q pebble cong w z of grits & sst	y			
213521	B26	838.3	839.3	q pebble rich cong w dominantly qtzose clasts to 20mm	y			
213522	B26	858.0	859.0	q pebble rich cong msv clast support w qtzose clasts to 20mm	y			
213523	B26	863.3	864.2	d gnish gy pyritic (1% t/o as dsn) shaley slt	y	y		
213524	B26	874.6	875.5	med dk gy shaley slt - not obv calc	y			
213525	B23	194.4	195.0	v dk gy shale non calc	y	y		
213526	B23	185.6	186.4	v dk gy shale non calc	y			
213527	B23	161.9	162.4	v dk gy shale non calc	y	y		
213528	B23	120.8	121.3	v dk gy shale non calc	y	y		
213529	B23	128.1	128.5	v dk gy shale non calc	y			
213530	B32	1181.0	1181.9	gnish gy slt, non calc, wy bedded	y	y		
213531	B32	1195.5	1196.4	med gy finely laminated shaley slt	y	y		
213532	B32	1207.6	1208.5	off white lst w lt apple gn slt in stylolitic bands	y	y		
213533	B32	1224.4	1225.3	med gy wy calc slt w lt apple gn colour in part (serp?)	y			
213534	B32	1251.5	1252.4	pinky/red dolomite (?) w fine calc vnt	y			
213535	B32	1246.0	1246.5	sepentinite w magnetite in fine calc vnts	y			
213536	B32	621.7	622.8	gnish gy calc slt w elongate nodular bands of p gy lst typical of z	y			
213537	B32	578.6	579.5	p gy lst w v dk gy shale mx as stylolites typical of z	y			
213538	B32	534.6	535.5	p gy lst w v dk gy shale mx as stylolites typical of z	y			
213539	B32	494.0	494.8	p gy lst w v dk gy shale mx as stylolites typical of z	y	y		
213540	B32	695.4	696.3	wy calcareous dk gnish gy slt, 15mm q > calc vn typical of z	y			
213541	B32	666.4	667.3	p gy lst w grnish gy slt, mx as wayy beds & typical of z	y			
213542	B30	385.8	386.8	v dk gy carbonaceous shale	y			
213543	B32	767.0	767.9	gnish gy sy calc slt w 60% cb in rhythmic bands	y			
213544	B32	729.9	730.8	lt gnish gy slt my calc slt	y			
213545	B23	384.0	384.7	gnish gy slt w rhythmic bands cb ~ 50%	y			
213546	B23	461.0	461.9	gnish gy & dk gnish gy rhythmic calc slt w more cb bands	y			
213547	B23	443.0	443.9	gnish gy & dk gnish gy rhythmic clac slt w more cb bands	y			
213548	B23	427.2	428.1	more cb rich p gy cb w med gy slt z, rhythmic bedding	y			
213549		5436690	486485	green pyroxene phyric basalt	y	y		
213550		5436520	485570	weathered olive green plag phyric basalt	y	y		
213551	B30	407.5	408.3	mod gy calc slt w mod dk gy slt mx	y			
213552	B13	608.7	609.6	q pebble cong with clasts to 20mm predom qtzose w only mn dk clasts	y			
213553	B13	629.6	630.5	q pebble cong with clasts to 20mm predom qtzose w only mn dk clasts w mn py	y			
213554	B13	571.6	572.5	dk gy sst/grit	y			

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213555	B13	497.8	498.7	grit w ns (5%) dk gy sh clasts	y			
213556	B13	453.2	454.1	dk gnish gy sst	y			
213557	B13	417.0	418.0	"wet beds" cong, rdd, clast supported w 25% dk gy sh clasts	y			
213558	B13	406.0	406.9	dk gy sst	y			
213559	B13	380.2	381.1	med gy msv my calc slt	y			
213560	B13	364.0	364.9	dk gnish gy msv my calc slt	y			
213561	B13	316.7	317.6	gnish gy msv slt non calc	y			
213562	B13	260.2	261.0	dk gnish gy slt non calc	y			
213563	B13	199.3	200.0	gnish gy slt, my calc with rhythmic cb bedding	y			
213564	B13	148.2	149.0	calc slt with rhythmic cb, some hmt cb beds	y			
213565	B13	753.3	754.2	limestone, off white	y			
213566	B13	823.3	824.2	limestone, off white with ocl silty stylolites	y	y		
213567	B13	738.4	739.3	limestone, off white	y	y		
213568	B13	796.7	797.5	impure calcareous sst/slt	y			
213569	B13	724.3	725.2	q pebble cong (sub cdd to 10mm) with dsd py & cr	y			
213571	B49	59.0	60.5	finely laminated shaley slt	y	y		
213572	B49	48.3	49.2	msv qtzose greywacke sst	y			
213573	B48	73.1	74.3	msv qtzose greywacke sst	y			
213574	B48	40.0	41.1	finely laminated shaley slt	y	y		
213575	"diorite"	5432250	486625	"diorite"	y	y		y
213576	E sst	5435400	487220	green quartz wacke sst w trilobite fossils	y			
213577	MAC750	5437545	485500	black shaley slt	y	y		
213578	E sst	5435430	487240	green quartz wacke sst w trilobite fossils	y			
213580	B30	243.2	243.5	pale gn limestone (slt mx) with SC fabric?	y			
213581	B30	245.3	245.4	calc shale ~ 0.5m above contact w poly cong - SC fabric?	y			
213582	B30	246.4	246.5	calc shale at contact w poly cong	y			
213583	B30	303.0	303.1	clast bn q wacke with ocl q	y			
213584	B30	314.8	314.9	clast bn q wacke with ocl q	y			
213585	B30	336.6	336.7	polymict cong	y			
213586	B30	368.2	368.3	polymict cong	y			
213587	B30	377.7	378.2	polymict cong	y			
213588	B30	375.8	375.9	clastic bn wacke with ocl q	y			
213589	B30	271.2	271.3	polymict cong	y			
213590	B30	383.5	383.6	bk carbonaceous shale with SC fabric?	y			
213591	B30	331.3	331.4	polymict cong	y			
213612	MAC745	5437535	485505	polymict cong w quartz clasts and mafics, slt				
213621	SH1	5433450	487000	black carbonaceous shale	y	y		
213622	DM3	5437106	484244	micaceous dk gy slt	y	y		
213623	CHA2	5431740	485780	dk gy shale	y	y		
213624	Derwent adit	5432470	485400	v dk gy carbonaceous shale	y	y		
213625	Derwent adit	5432470	485400	v dk gy carbonaceous sandstone	y	y		

213626	DM2	5437065	484210	v dk gy carbonaceous sandstone	y	y		
213627	CHA1	5431740	485780	finely laminated dk gy slt	y	y		
213628	SH3	5432835	485990	dk gy shale w cephalopods	y	y		
213629	CHB2	5431800	485835	quartzose sandstone	y	y		
213630	CHA1	5431740	485780	quartzose sandstone	y	y		
213631	ceph slt	5432450	485310	cephalopod bearing dk gy shaley slt	y	y		
213632	S5	64.3	66.8	dk gy shaley slt	y	y		
213633	S5	80.4	81	dk gy shaley slt	y	y		
213634	S5	30.5	31.5	med gy soft sed deformed shaley slt	y	y		
213635	CHB2	5431740	485835	v dk gy carbonaceous slt	y	y		
213636	Daakes	5433285	485860	dk gy shaley slt	y	y		
213637	Daakes	5434260	485630	dk gy shaley slt, wed	y	y		
213638	MAC	5437570	485700	dk gy shaley slt	y	y		
213639	MAC	5437550	485600	dk gy shaley slt	y	y		
213640	WG-34	5428430	487200	dk gy sil slt	y	y		
213641	WG-36	5428870	486680	p gy quartzose sst	y	y		
213642	WG-37	5428720	487130	med gy fissile slt	y	y		
213667	CHE1	5431915	486040	bucky limonitic quartz			y	
213668	SH2	5433450	487000	bucky limonitic quartz			y	
213669	PT1	5432680	485600	bucky limonitic quartz			y	
213670	CHB1	5431770	485820	bucky limonitic quartz			y	
213671	CHD	5431880	485990	bucky limonitic quartz			y	
213672	15455	5432800	485915	"lode cap"			y	
213673	Derwent adit	5432470	485400	bucky and fibrous quartz			y	
213674	Derwent adit	5432470	485400	acid mine drainage seeping out of adit			y	
213675	CHH2.5	5432030	486330	bucky quartz			y	
213677	195	5432165	486670	plagioclase phyric rock				
213678	15438	5433025	487115	strongly weathered clastic with angular cherty clasts				
213592	SHR 5	5433585	486690	silicified sandstone			y	
213593	SHR 7	5433616	486663	silicified sandstone			y	
213594	SHR 10	5433610	486655	silicified sandstone			y	
213595	SHR 14	5433500	486500	silicified and q vnd grit			y	
213596	SHR 16	5433520	486350	q stockworked sst			y	
213597	SHR 17	5433420	486350	q stockworked sst			y	
213598	SHR 20	5433200	486190	sst w dark irreg q vnt's			y	y
213599	SHR 20A	5433465	486860	asstd q w some lode slate			y	y

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APPENDIX 3

LITHOGEOCHEMICAL RESULTS SPREADSHEET

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BEACONSFIELD MINE: LITHOGEOCHEMISTRY

Lithological unit	Sample No.	Location DDH/informal name	Location From/Northing	Location To/Easting	Ti	Zr	Nb	Rb	Y	Ba	Sr	Sn	V	Ni	Cr	Co	Ti/Zr	Nb/Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ga	Th	Sc	P	La/Sc	Eu/Sm	La/Lu	Th/Co	La/Co
Corn Hill Beds	213623	CHA2	5431760	485800	4080	151	18	227	26	739	19	7	131	38	107	5	27.0	0.69	37.1	77.75	8.84	32.7	5.7	1.19	4.2	0.58	3.6	0.69	1.9	0.3	2	0.3	28.1	19.39	14	399	2.65	0.21	123.7	3.88	7.42
shales	213627	CHA1	5431760	485800	4092	156	15	238	25	762	19	9	117	10	101	<5	26.2	0.60	30.13	65.77	7.61	28.4	5	1.06	3.6	0.49	3.2	0.61	1.7	0.26	1.8	0.3	27.6	17.16	12	282	2.51	0.21	100.4	NR	NR
	213635	CHB2	5431760	485800	3377	167	13	150	32	1235	16	6	111	53	84	8	20.2	0.41	42.44	90.45	9.71	36.6	6.9	1.52	5.9	0.79	5.4	1.05	2.8	0.42	2.6	0.4	16.9	13.63	8	519	5.31	0.22	106.1	1.70	5.31
	213628	SH3	5432800	485585	4063	188	17	200	28	4132	14	6	142	27	93	<5	21.6	0.61	8.15	19.97	2.44	9.7	1.9	1	1.9	0.32	2	0.41	1.3	0.2	1.4	0.2	23.8	10.46	12	61	0.68	0.53	40.8	NR	NR
	213631	Ceph silt	5432400	485200	4187	218	20	206	33	4965	26	4	106	13	79	9	19.2	0.61	40.1	84.62	9.44	35.3	6.3	1.99	4.8	0.61	4.4	0.83	2.2	0.35	2.4	0.4	25.3	18.83	10	77	4.01	0.32	100.3	2.09	4.46
Ave					3980	176	16.6	204.2	28.6	2366.6	18.8	6.4	121.4	28.2	92.8	<6	22.9																									
Std Dvn					329	27.4	2.7	34	3.6	2023	4.5	1.8	14.8	17.9	11.6	NR	3.6																									
Corn Hill Beds	213629	CHB2	5431760	485800	3140	218	12	117	24	881	14	7	68	26	90	10	14.4	0.50	22.3	50.06	5.63	21	3.9	0.85	3.2	0.47	3	0.58	1.6	0.25	1.7	0.3	15	12.46	6	343	3.72	0.22	74.3	1.25	2.23
sandstones	213630	CHA1	5431760	485800	3302	408	13	98	28	381	24	7	64	26	111	10	8.1	0.46	43.45	90.69	10.26	37.6	6.6	1.17	4.5	0.32	3.4	0.63	1.6	0.27	1.7	0.3	13.8	16.48	6	192	7.24	0.18	144.8	1.65	4.35
Ave					3221	313	12.5	107.5	26	631	19	7	66	26	101	10	11.2																									
Grubb Shale	213528	B23	120.8	121.3	3757	202	15	156	43	1928	183	7	137	73	92	9	18.6	0.35	36.08	73.44	8.54	32	5.7	1.1	4.9	0.65	4.1	0.8	2.2	0.34	2.4	0.4	18.1	12.85	10	640	3.61	0.19	90.2	1.43	4.01
	213529	B23	128.1	128.5	3930	221	11	162	44	1969	124	6	133	72	226	16	17.8	0.25																							
	213527	B23	161.9	162.4	4471	283	16	177	36	805	35	4	94	32	166	5	15.8	0.44	39.76	79.34	9.03	33.7	6.2	1.27	5.1	0.68	4.1	0.78	2.2	0.33	2.2	0.4	20.4	17.35	10	480	3.98	0.20	99.5	3.47	7.96
	213526	B23	185.6	186.4	4495	181	15	222	38	967	30	4	118	46	93	18	24.8	0.39																							
	213525	B23	194.4	195	4314	223	17	198	36	918	19	8	116	37	107	11	19.3	0.47	43.04	85.97	9.75	36.2	6.2	1.34	5.1	0.67	4.3	0.85	2.4	0.37	2.5	0.4	22.9	16.83	12	440	3.59	0.22	107.6	1.53	3.91
	213542	B32	385.8	386.8	4420	198	11	238	38	1078	49	10	120	37	119	7	22.3	0.29																							
Ave					4231	218	14.2	192.2	39.2	1278	73	6.5	120	49.5	134	11	19.8	0.37																							
Stddvn					311.5	35.5	2.56	33.1	3.5	527	65.6	2.35	15.2	18.4	52.7	5.1	3.27	0.09																							
Flowery Gully	213492	B23	220.3	221	129	<5	<3	6	6	42	137	<3	<5	<5	17	<5	25.8	NR																							
Limestone	213493	B23	273.7	274.3	120	<5	<3	7	<3	39	175	<3	<5	<5	20	<5	24	NR	1.68	3.07	0.36	1.5	0.3	0.09	0.4	0.06	0.4	0.08	0.3	<0.05	0.2	<0.01	<0.5	0.39	<2	180	NR	0.30	NR	NR	NR
	213494	B23	348.7	349.3	260	9	<3	12	4	52	187	<3	7	<5	12	<5	28.9	NR	2.89	5.01	0.59	2.3	0.5	0.11	0.5	0.08	0.5	0.11	0.3	<0.05	0.3	<0.01	1.1	0.68	<2	60	NR	0.22	NR	NR	NR
	213551	B32	407.5	408.3	<100	<5	<3	<5	3	48	145	<3	<5	<5	17	<5	20	NR																							
	213539	B32	494	494.8	168	<5	<3	6	5	47	147	<3	<5	<5	8	<5	33.6	NR	2.5	3.98	0.51	2.2	0.5	0.1	0.5	0.06	0.5	0.12	0.3	<0.05	0.3	<0.01	<0.5	0.6	<2	100	NR	0.20	NR	NR	NR
	213538	B32	534.6	535.5	132	<5	<3	12	<3	39	157	<3	<5	<5	17	<5	26.4	NR																							
	213537	B32	578.6	579.5	227	<5	<3	10	<3	40	206	<3	<5	8	26	<5	45.4	NR																							
Ave					162.3	NR	NR	8.3	3.86	43.9	164.9	NR	NR	NR	16.7	NR	NR	0.84																							
Stddvn					59.8	NR	NR	3	1.21	5.15	25.3	NR	NR	NR	5.7	NR	NR	0.22																							
Eaglehawk Gully	213545	B23	384	384.7	2179	149	6	46	21	143	77	<3	27	7	61	<5	14.6	0.29																							
Formation	213548	B23	427.2	428.1	1632	194	7	33	15	93	115	3	27	<5	106	6	8.4	0.47																							
	213536	B32	621.7	622.8	2268	207	8	55	23	152	84	5	36	5	137	<5	11.0	0.35																							
	213541	B32	666.4	667.3	881	78	<3	16	9	60	146	<3	12	<5	31	<5	11.3	NR																							
	213562	B13	260.2	261	3290	243	9	75	28	183	24	5	83	24	311	6	13.5	0.32																							
	213561	B13	316.7	317.6	3206	333	9	32	26	78	23	3	47	15	311	8	9.6	0.35																							
	213488	B23	558.6	559.4	3040	257	9	57	29	141	33	5	53	19	342	8	11.8	0.31																							
	213489	B23	607.5	608.3	2504	254	6	31	19	88	25	6	36	10	74	8	9.9	0.32																							
	213506	B32	791.5	792.5	2176	197	4	39	26	99	43	8	41	17	57	10	11.0	0.15																							
	213507	B32	840.5	841.5	2841	170	8	70	21	151	34	4	52	19	248	18	16.7	0.38																							
	213508	B32	891.9	892.7	2613	221	7	44	20	102	27	3	58	16	67	10	12.7	0.35																							
	213563	B13	199.3	200	3180	251	9	64	30	141	55	3	59	25	93	14	12.7	0.30																							
	213544	B32	729.9	730.8	2071	161	4	53	19	112	71	<3	33	14	138	<5	12.9	0.21																							
	213543	B32	767	767.9	2036	136	5	44	21	117	78	5	34	10	56	<5	15.0	0.24																							
	213560	B13	364	364.9	3749	358	9	65	23	111	41	4	64	10	100	<5	10.5	0.39																							
	213509	B26	641.7	642.3	3722	310	9	52	24	114	42	<3	56	14	256	16	12.0	0.38																							
	213510	B26	650.7	651.6	2650	200	6	52	23	150	32	3	51	13	62	12	13.3	0.26																							
	213497	B32	946.8	947.5	3613	219	9	65	25	111	38	3	68	13	69	7	16.0	0.36																							
	213505	B23	651.4	652.3	3899	295	11	96	31	233	46	4	76	20	79	16	13.2	0.35																							
	213504	B23	660.4	661.3	1662	86	3	37	18	101	146	<3	25	7	73	<5	19.3	0.17																							
	213495	B32	923.5	924.4	2680	186	9	54	21	102	39	3	44	9	56	7	14.4	0.43																							
	213496	B32	929.7	930.5	2531	222	6	46	19	95	105	4	45	9	128	7	11.4	0.32																							
	213564	B13	148.2	149	3193	195	6	95	28	187	71	5	53	18	168	8	16.4	0.21																							
	213547	B23	443	443.9	3857	301	9	102	33	239	36	5	56	18	97	6	12.8	0.27																							
	213546	B23	461	461.9	3289	206	7	78	30	213	53	4	58	15	212	<5	16.0	0.23																							
	213540	B32	695.4	696.3	3900	300	12	85	33	198	28	5	56	16	313	9	13.0	0.36																							
	213503	B23	632.5	633.2	2886	213	5	40	23	100	14	3	58	13	73	<5	13.5	0.22																							
Ave					2802	220	7.2	56.6	23.6	134	56.5	<4	47.8	<13.6	138	<8.2	13.1	0.31																							
Std dvn					773	68.7	2.3	21.7	5.61	47.7	36.2	NR	14.9	NR	96	NR	2.46	0.08																							
Salisbury Hill Formation	213556	B13	453.2	454.1	1252	128	<3	19	10	107	19	3	31	28	37	7	9.78	NR																							
sandstones	213514	B26	715.4	716.5	1208	164	<3	16	6	184	18	4	16	10	267	<5	7.37	NR																							
	213515	B26	725.3	726.3	1576	176	7	25	13	96	14	4	30	22	530	7	8.95	0.54																							
	213516	B26	739.3	740.3	2366	210	9	41	18	276	14	4	47	49	203	<5	11.3	0.50																							
	213485	B32	1080.3	1081	3088	318	9	54	23	187	18	<3	53	30	371	11	9.71	0.39																							
	213559	B13	380.2	381.1	3262	414	9	44	31	105	85	<3	44	7	254	<5	7.88	0.29																							
	213558	B13	406	406.9	1733	209	6	36	15	86	18	<3	32	12	69	<5	8.29	0.40																							
	213511	B26	679.3	680.2	2973	204	3	37	16	148	21	<3	42	14	490	7	14.6	0.19																							
	213498	B32	959.4	960.5	2822	227	8	40	20	72	42	<3	42	11	247	<5	12.4	0.40																							
	213499	B32	978.6	979.3	2373	258	7	53	17	95	37	4	38	6	98	12	9.20	0.41																							
Ave					2265.3	231	<6.4	36.5	16.9	135.6	28.6	<3	37.5	18.9	256.6	<6.9	9.95	0.39																							
Std dvn					775	82.7	NR	13	6.94	63.5	22	NR	10.6	13.5	168	nr	2.23	0.11																							
Salisbury Hill Formation	213517	B26	748.2	748.7	189	15	<3	5	3	129	5	<3	10	12	603	6	12.6	NR																							
conglomerates	213518	B26	761	762	415	24	<3	11	4	66	7	<3	12	12	116	7	17.3	NR																							
	213483	B32	1041.9	1042.6	283	11	<3	6	3	189	10	3	11	9	67	<5	23.9	NR																							
	213484	B32	1064.5	1065.2	1258	262	<3	5	6	50	9	3	24	12	1437	<5	4.80	NR																							
	213519	B26	792	793	1950	360	6	25	11	78	8	4	41	41	2428	12	5.42	0.55																							
	213520	B26	815.6	816.6	758	104	<3	10	6	85	19	<3	15	21	295	<5	7.29	NR																							
	213557	B13	417	418	577	122	<3	8	3	112	37	<3	10	7	517	<5	4.73	NR																							
	213512	B26	691.7	692.8	651	112	<3	11	4	178	37	<3	11	<5	223	<5	5.81	NR																							
	213513	B26	701.8	702.8	1676	359	<3	12	8	108	8	<3	34	13	843	6	4.67	NR																							
	213500	B32	987.5	988.2	353	19	<3	12	5	82	31	<3	14	6	326	7	18.6	NR																							
	213501	B32	1003.6	1004.6	759	48	<3	22	8	123	98	<3	18	27	95	18	15.8	NR																							
	213502	B32	1008.5	1009.1	1091	215	<3	12	4	52	9	<3	14	10	932	8	5.07	NR																							
	213482	B32	1024.1	1024.6	2542	265	9	48	23	146	18	6	47	29	596	<5	9.59	0.39																							
	213555	B13	497.8	498.7	238	15	<3	5	4	33	11	<3	8	20	659	9	15.9	0.75																							
	213554	B13	571.6	572.5	976	164	4	13	5	90	7	3	18	36	38	11	5.95	0.8																							
Ave					913	140	NR	13.7	6.5	101.4	20.9	NR	19.1	<18.2	611.7	<9.3	10.50																							
Std Dvn					690	125	NR	11.1	5.1	45.7	24	NR	12.1	NR	633	NR	6.30																							
Cabbage Tree	213552	B13	608.7	609.6	450	51	<3	8	3	32	<5	<3	11	37	1361	<5	8.8	NR																							
Conglomerate	213553	B13	629.6	630.5	353	35	<3	11	5	43	5	<3	8	30	1009	9	10.1	NR																							
	213521	B26	838.3	839.3	504	61	<3	8	3	40	8	<3	14	39	1536	9	8.3	NR																							
	213522	B26	858	859	494	53	<3	8	5	34	12	4	13	19	737	<5	9.3	NR																							
	213486	B32	1125.2	1126	859	121	<3	9	5	30	5	3	14	13	926	7	7.1	NR																							
	213487	B32	1140.8	1141.5	387	39	<3	5	4	26	11	<3	5	23	258	<5	9.9	NR																							
	213491	B32	1159.5	1160.3	827	121	<3	14	4	39	9	4	19	24	575	<5	6.83	NR																							
	213490	B32	1170.5	1171.2	452	42	<3	7	4	36	8	<3	13	21	666	<5	10.8	NR																							
Ave					541	65.4	NR	8.75	4.13	35	<7.9	NR	12.1	25.8	884	NR	8.9	NR																							
Std dvn					193	35.3	NR	2.7	0.83	5.6	NR	NR	4.2	8.96	418	NR	NR	NR																							
Blyths Creek Formation	213523	B26	863.3	864.2	3492	213	12	136	34	411	82	6	92	42	142	14	16.4	0.35	39.59	85	9.31	34.6	6.2	1.2	4.3	0.48	2.9	0.57	1.6	0.27	1.9	0.3	20.2	14.36	12	430	3.30	0.19	132.0	1.03	2.83
shale	213530	B32	1181	1181.9	4044	246	13	136	37	402	79	6	112	121	107	24	16.4	0.35	37.05	81.51	9.18	34.5	6.3	1.25	4.3	0.46	3	0.56	1.6	0.28	2	0.3	21	13.39	12	450	3.09	0.20	123.5	0.56	1.54
	213531	B32	1195.5	1196.4	3515	195	12	153	32	485	93	4	98	47	17	18	18.0	0.38	38.98	84.11	9.43	35.8	6.4	1.26	4.2	0.44	3.1	0.58	1.5	0.28	2	0.3	23.9	14.82	12	420	3.25	0.20	129.9	0.82	2.17
Ave					3683	218	12.3	152	34.3	433	84.7	5.3	100.7	70	88.7	18.7	17.0	0.36																							
Std dvn					312	25.9	0.6	26.6	2.5	45.5	7.4	1.2	10.3	44.2	64.5	5	0.93	0.01																							
Blyths Creek Formation	213567	B13	738.4	739.3	110	5	<3	10	<3	128	165	5	<5	<5	12	<5	22	NR	1.5	3.02	0.33	1.3	0.3	0.07	0.2	<0.05	0.2	<0.5	0.1	<0.05	0.1	<0.01	0.6	0.43	<2	140	NR	0.23	NR	NR	NR
limestone	213565	B13	753.3	754.2	144	5	<3	8	<3	52	199	<3	<5	<5	12	<5	28.8	NR																							
	213568	B13	796.7	797.5	115	<5	<3	<5	3	65	90	6	<5	9	26	<5	23	NR																							
	213566	B13	823.3	824.2	294	13	<3	12	3	100	235	<3	8	<5	9	<5	22.6	NR	4.2	9.21	0.99	3.7	0.7	0.16	0.7	0.1	0.7	0.14	0.4	0.06	0.3	<0.01	1.4	1.24	<2	190	NR	0.23	NR	NR	NR
	213532	B32	1207.6	1208.5	477	23	<3	23	<3	88	229	<3	11	<5	18	<5	20.7	NR	5.63	12.06	1.31	4.9	0.9	0.19	0.8	0.12	0.8	0.16	0.5	0.07	0.4	<0.01	2.5	1.98	2	200	2.815	0.21	NR	NR	NR
	213533	B32	1224.4	1225.3	224	12	<3	9	4	55	122	<3	8	13	18	<5	18.7	NR																							
Ave					227	<10.5	NR	11.2	NR	81.3	173	NR	NR	NR	15.8	NR	22.6	<0.96																							
Std dvn					141.5	NR	NR	6.2	NR	29.6	58.7	NR	NR	NR	6.1	NR	3.4	nr																							
Blyths Creek Formation	213569	B13	724.3	725.2	332	32	<3	7	3	111	35	<3	9	23	470	5	10.4	NR																							
conglomerate																																									
Blyths Creek Formation	213535	B32	1246	1246.5	<100	<5	<3	<5	<3	19	199	3	<5	1837	1585	71	20	NR																							
serpentinite																																								
Blyths Creek Formation	213534	B32	1251.5	1252.4	<100	<5	<3	<5	4	27	304	<3	6	755	1755	29	20	NR																							
dolomite																																							
Cambrian shale	213577	MAC750	5437550	485600	4393	197	15	188	29	3523	23	5	124	27	90	<5	22.3	0.52	43.7	87.3	9.43	33.9	5.6	1.6	4.3	0.53	3.6	0.7	2	0.32	2.2	0.4	23	17.79	10	220	4.37	0.29	109.3	NR	NR
(Cobblestone Ck	213638	MAC	5437570	485700	4505	205	18	159	34	469	16	6	133	173	169	35	22.0	0.53	17.92	43.81	5.24	20.7	4.1	0.91	3.4	0.45	3	0.57	1.7	0.29	2	0.3	21.5	8.79	10	250	1.79	0.22	59.7	0.24	0.50
slice)	213639	MAC	5437550	485600	3933	177	15	141	28	464	12	6	118	115	120	20	22.2	0.54	19.89	45.01	5.36	20.9	4.1	0.88	3.3	0.43	2.9	0.57	1.7	0.28	2	0.3	20.5	8.46	10	262	1.99	0.21	66.3	0.42	0.99
Ave					4277	193	16	163	30.3	1485	17	5.7	125	105	126	<28	22.2																							
Std Dvn					303	14.4	1.7	23.7	3.2	1764	5.6	0.58	7.55	73.5	39.9	NR	0.17																							
Cambrian sandstone	213576	E sst	5435150	487300	4733	374	11	51	38	237	10	5	113	230	1236	22	12.7	0.29																							
(Cobblestone Ck	213578	E sst	5435150	487300	4404	308	11	55	28	232	10	3	100	234	1112	30	14.3	0.39																							
slice)																																								
Ave					4569	341	11	53	33	235	10	4	107	232	1174	26	13.5																							
Unassigned shales	213636	Daakes (sth) shale	5434250	485600	4493	221	21	185	37	4309	18	4	96	15	96	16	20.3	0.57	46.51	99.21	10.5	39.4	7.4	2.18	6.1	0.79	5.1	0.96	2.5	0.39	2	0.4	23.5	18.6	12	55	3.88	0.29	116.3	1.16	2.91
	213637	Daakes (west) shale	5433600	485850	3839	311	15	129	34	887	24	4	74	16	74	13	11.7	0.44	56.54	116.11	12.43	45.1	8	1.84	5.9	0.72	4.7	0.83	2.1	0.33

530101

APPENDIX 4

DRILL LOGS OF S1, S2, S4-S6

530102

GRAPHIC CORE LOG

Scale 1:1000

By G MacDONALD

Date

Page 1 of 1

Hole No. S1 Depth m

Project SALISBURY HILLE PROSPECT.

Section

Collar co-ords E N RL

Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
			0-8.2 ywish gy., weathered msv qtzose sst
			8.2-12.8 polymict cong ± clasts sst aa + arg qtz [PTO]
			12.8-14.5 v.p. org (wed) sst + grits of arg qtz (30%) (70%)
		~50°	14.5-16.9 fossilif slt ± fossils leached gly but to ~10mm apparently shells/tr lo?
20			16.9-68.4 Calc? slt/Cg sst weathered to cream colour ~~Fine~~ fining negligible vng.
40			
60			
			68.4-90.5 d gy shaley top to sst ± ~10% → 2% (dt)
		vn ~0.6cm ± 20° cb (fe) py ch	255'6" - 264" (0.8m) as fine anastomosing surface rest blichy but lo py
80		also bx + lost core	94.2-96.7 d gy aPD slt as for 90.5-92.7 but uncertain to whether this is correct pos: vert cavity - suspect from ov cavity. [PTO]
FAULT		CAVITY	90.5-92.7 d gy slt ± py" (~3% t/o) in frac 0-10° to core axis.
major flt intrud - posit driven on in old wkings.			92.7-94.2
Arb typical pebble bed			to faintly bdd @ 50°-60°
Upper (above 15m) congl are different. 100		typical pebbly beds.	96.7-112.5 tod gnish gy msv sst ± three pebbly cong beds (~20cm thick) as shown. ~1/20cm Sm smoky q vn' v. 70 ca ~ 0°
		typical pebbly cong shaley top 121.2-124 bc ± cb vng	112.5-115.9 95% pebbly cong 5% d gnish gy slt/sst clasts 90% rdd q-qtzite poss also vn - all rdd also 10% d gy mst + gnish gy slt/sst M-lo ± poss chert
140			115.9-121.2 Gritty sst ± mn pebbly cong beds - apparently fining v slaty top (80°) to unit of q ± cb (bx? - qtd? mt?) vnd d gnish gy sst. Ang bxd crushform bedded cb vng (2 gen) in last 1 metre ov qtz dol" unit
160		ang bxd gy sandy flt 20°-40°	121.2-160.8 ywish gg (above ~150.8) then increasingly mod reddish bn silicified ± gnish yw cb in zones. Some rock ap in S2 ov serpentinite but srp not here. Pervasive cb suggestive of fracture control in part Silicification probly later stage ± mt [PTO]
582'8" POH		160.3-160.8 flt as for 160.3-160.8 - possibly caved in from uphole.	160.8-582'8" polymict bx now sy foliated (clasts - originally sub ang to subrdd slt > sst in shales) in fuchsite altd mx. Top ~1m is bxd stressed q vn ± ~40% d gy mx - shaley in slt dominant bx. Probly flt remob of original q vnd flt/ contact.

Sst/Q cng

Sm Upper Transition

Similar Lower Transition

Silt/sst dolomitic sst/slt - Mcgranic

rdd Slt bx ± shaley mx Cg

8.2-12.8 Polymict cong - individually each conglomerate bed could, in its weathered state, be interpd as a RL bx but the repetitiveness of these supports a primary origin. The qtz appears as sub ang to ~5mm + could be vn material.

12.2 - 160.8 Sid dolomitic sst (cont) xtalline cb = occ ∑ of rdd q grains Textures suggests either primary cb recrystallised or cb Alt° of sst/slt? Silicification as veining fracture fill/ diffuse ∑ assd Mt. Redder zones jasperoidal in part but also hmt cb.

530104

GRAPHIC CORE LOG		Hole No. S2	Depth m
Scale	1: 100b	Project	
By	G MacDonald	Section	
Date		Collar co-ords	E N RL
Page	of	Az. °G °M	Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
20			Similar unit to ~ 35 – 70 ī recognisable clasts slt/sst but wtd
40			gly bx sst. Sub ang to sub rdd clasts of dk grnish gy + dk yy slt + sst, matrix supported, poorly sorted gritty/sandy mx ~ interbedded more sandy zones. As soft sed bx. Now exploited by py + calc
60			
80			consistently gritty zone interbedded pebbly cong beds + sst
86.8			
100			fairly consistently gritty ī rdd q >> v. dk gy shale? clasts + v dk gy mx – else d gy pad
120		py shear ~50°	some conglomeratic beds bec ī lge (to 20mm) rdd clasts as if slump bx
140			v dk gy sst + grit rdd qtz + ~ 5% almost blk sub ag pelitic clasts
160			
180			176.00 – 209.8 d gy shaley slt Sy fol'n dip ~ 45° some soft sed fldg ~ 177.5 Sand pervasive fg spotting
200		shear wky calcareous grad contact	q grnish bx + mod reddish bn cb (crystalline) overgrowth by wk hmt + pale s.l.c. heathen assd ī Mt ī Some q grains v.l. in part
220			209.8 – 217.2 S.l.c.fied dolomitic? sst?
240			217.2 – 226.8 Serpentinite ī myriad bx calc + mt vnt ī two included zones of s.l.c. dolomitic sst. Grad upper + lower contacts (AO)
260			226.8 – 233.0 Bx adj to ov serp apparently polymict – pr marg bat now sy fol then contorted graphitic shale from ~228.5 – 230.5 Then s.l.c.fied ī pyrite in dsn + in fracture fill vnt
EOH 283			

sst conglomeratic – lo/wood slump bx

weathered

fresh

similar Lower Transition pyritic slt → grit

slt calc near base

slt

sandy dolom slt +Mt

sandy dolom sst +Mt

= grad (AO)

= grad (AO)

530105

GRAPHIC CORE LOG		Hole No. S4	Depth m
Scale 1:1000		Project	
By G MacDonald		Section	
Date		Collar co-ords E	N RL
Page 1 of 1		Az. °G °M	Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast ϕ & Structure	Description
weathered			
4		← ftt described in prev log	0-22.3 Monomict bx ± sub ang to sub rdd clasts of dk gy shale ± shaly slt in a graphitic sg foliated mx. Poorly sorted soft sed bx now enhanced + exploited by def^n
dk gy sh		± fn gy 10-20° ca ← contact gradational	
20		± fn ~20°	22.3 – 42.0 Polymict bx/conglomerate ± m sub ang (now sub rdd) clasts um > dk grish gy slt + sh + ocl lst (? cb altd um^c) + qtz in sg foliated serp ± chl ± sh mx.
40			
dk gy sh gy slt			42.0 – 45.2 Monomict d grish gy slt / shaley slt ± wt cb bx infill vng. Interpd to be original sedimentary bx now exploited + enhanced by deformation.
60		foliation/defn increasing downhole	
69.5 EOH			45.2 – ~50.0 Polymict bx/cong as above. Originally ^ Sub ang (now sub rdd) to sub rdd clasts um > sh/shaley slt + ocl lst clasts ~10% mx is serpentinite ± either shaley or chloritic component. Moderately foliated. Poorly sorted as if proximal slump bx initially. Much cb (calc) alt^n of clasts + mx gly as fine irreg vnt + frac fill vng.
			~50.0 – 64.5 Polymict bx/cong as above. Major difference between this zone + above is degree of deformation. Fn @ ~10-20° ca. From 56.4 – 56.7 is clast^s of more felsic um (gabbroic?)

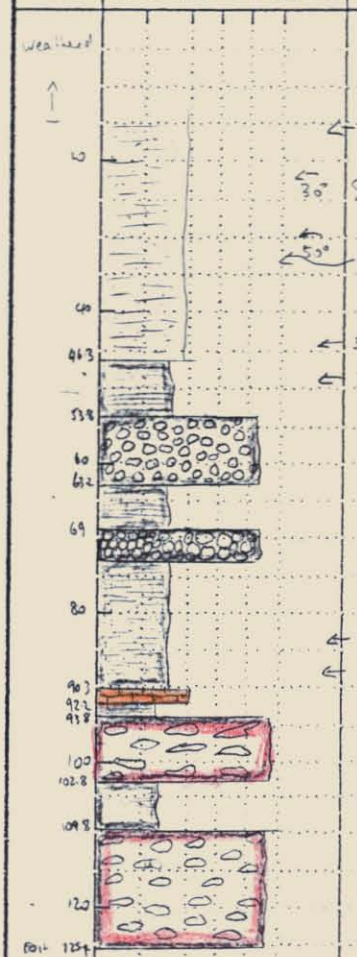
monomict slt bx/cong | polymict um > slt/sh/lst | sh bx/cong

polymict um > slt + qtz vein

dk gy sh

530106

GRAPHIC CORE LOG	Hole No. SS.	Depth m
Scale 1:1000	Project	
By G MacDonald	Section	
Date	Collar co-ords E N RL	
Page of	Az. °G °M Incl. °	



Description

~ 15.5 mgy weathered (as below)

15.5 – 46.3. d grish gy to mod gy ~~shaley~~ siltstone.

46.3 – 53.8 v dk gy mst

53.8 – 63.2 Qtz pebble cong in dk gy mx.

69.0 – 73.0 Qtz pebble conglomerate. ~ 95% qtz ē grish gy mx clastic textures ~~off~~ not obv except for occl rdd shaley clasts – prob sim of recryst. Typical of LT pebbly congs. – some mm Cr stng

73.0 – 90.3 med gy shaley siltstone. gly mgly fol

90.3 – 92.2 ~~Silicous~~ dolomite – typical of that seen elsewhere at Salsbury Hill Overprinting silica + Mt vng.

92.2 – 93.8

92.2 – 97.7 Polymict cong (1m) ē bnd dk gy sh. Ntw in bx but ~ 80% um cong ē fuchsite(?) in shear surfaces @ ~ 45° ca. typical Um – sh blw ~ d dolo – cf S2 + S1. Most shale between 97.7 – 102.8

~~97.7 – 102.8~~

102.8 – 109.8 dk gy mst, mgy foliated Some core loss. Upper contact is somewhat grad ? lower contact sharp. Graphitic slates in part

109.8 – 125.4 Polymict conglomerate

530107

GRAPHIC CORE LOG		Hole No. S6	Depth m
Scale	1:1000	Project	
By	G MacDonald	Section	
Date		Collar co-ords E	N RL
Page	1 of 1	Az. °G °M	Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
			Recent sediments? clays & ag frags scree
			33 - 33.7 Lt gy mst
		sy fol/shd cont fr @ 60° 12.7-13 fo	← sm shear 16.6m & blw (as sm fltg)
60			
			← sm shear at base - fltg?
40			slt 33.7 - 36.5 Weathered d yw slt
			36.5 - 54.8 Bx Sub ag clasts of slt
			& fg sst in cy mx V weathered -
			in bc so relying on prev bags Some ang
60			vn qtz bnr in vn or z's silicification
			54.8 - 56.5 clayey silt
		gradational contact	56.7 - 74.1 Bx as above lower contact
			arbitrary as essentially gradational &
			some carg bands ⇒ unit
weathered 80			74.1 - 128.4 Slt - fg sst, Weathered to ~ 87m
	msst & vn	90.1 - 91.3	Variably calcareous & lst bands from 108 - 127
		lower part Upper transition beds ? correlate.	
100			
120			
		sandy calcareous beds.	
fol bl ~122.0		sy fol bc 128 - 128.4	fossil sh fr - possible concret
			between ov lst bearing slt & m essentially
			non lst bearing slt ← but actually probably no sig separation on this
			128.4 - 146.5 Dk grnish gy fg sst to slt & fg.
140		vng - no sed' ← fol's 60°	only minor cc component. Core has been split
			so now V bc bnr my fol ~ 60-65° ca
			Dk colour due to more carbonaceous mx
			& in fine partings defining fn. Occ mx
			qtzcb vn to 10cm

slt - fg sst, usually calcareous at base

breccia - ang clasts slt, fg sst - qtz, - some layers of proximal bx

mudstone

scree

APPENDIX 5

ASSAY RESULTS

530109

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014302
Your reference : **WCAO 458611**
Project code : Channel samples
Date received : 12/02/98
Date reported : 16/09/98

Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Number of pages of results : 1
Number of Samples : 33
First Sample : PAWC 2.0
Last Sample : SHR 20A

Invoice to:
Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Electronic Data Transmission :
Modem Y 16/09/98
Facsimile / /
Disk Report / /

Preliminary Reports :
17/02/98 Report
17/02/98 Report

Results to:

Results to:

Remarks :

This is an unadulterated reissue of a report, reprinted at client request.
Regards
Richard

Authorised by .....
On behalf of:

Richard Newman
Laboratory Manager

FAXED 16/9/98

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

A subsidiary of Scientific Services Limited

530110

ANALABS

Our reference : BU014302
Your reference : **WCAO 458611**
Project code : Channel samples
Report date : 16/09/98
Report status : Final
Page : 1 of 1

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Au	Au(R)	Ni	Cr	As	As
PAWC 2.0	<0.01	--	23	2212	81	N.A.
PAWC 3.5	<0.01	--	39	1735	92	N.A.
PAWC 5.0	<0.01	--	37	2194	97	N.A.
PAWC 6.0A	<0.01	--	81	2620	87	N.A.
PAWC 7.0B	0.08	--	52	3120	<50	21
PAWC 8.0B	3.24	--	70	2124	192	N.A.
PAWC 14.5	<0.01	--	46	2622	70	N.A.
PAWC 16.0	<0.01	--	51	2105	144	N.A.
PAWC 17.5	<0.01	<0.01	52	2010	101	N.A.
PAWC 19.0	0.03	0.03	41	1800	141	N.A.
PAEC 0.5	<0.01	--	7	584	<50	<1
PAEC 1.0	<0.01	--	23	102	<50	7
PAEC 2.0	<0.01	--	15	455	<50	9
PAEC 3.5	0.01	--	20	147	<50	25
PAEC 5.0	<0.01	--	12	415	<50	5
PAEC 7.4-9.2	<0.01	--	21	66	<50	<1
PASC 8.0	0.02	0.02	401	2837	663	N.A.
PASC 10.0	0.28	0.25	387	1162	2893	N.A.
PASC 12.0	0.50	0.49	336	756	1420	N.A.
PASC 13.0	0.64	--	274	359	1624	N.A.
PASC 17.0	0.25	0.27	117	1749	526	N.A.
PWRC 6.0B	0.02	0.03	92	3947	268	N.A.
PAOCR 1	1.72	--	N.A.	N.A.	1395	N.A.
PAOCR 2	1.11	1.06	N.A.	N.A.	252	N.A.
PAOCR 3	<0.01	--	N.A.	N.A.	<50	12
SHR 5	<0.01	--	N.A.	N.A.	<50	10
SHR 7	<0.01	--	N.A.	N.A.	<50	<1
SHR 10	<0.01	--	N.A.	N.A.	<50	3
SHR 14	<0.01	--	N.A.	N.A.	<50	<1
SHR 16	<0.01	<0.01	N.A.	N.A.	<50	<1
SHR 17	<0.01	--	N.A.	N.A.	<50	4
SHR 20	<0.01	--	N.A.	N.A.	<50	6
SHR 20A	<0.01	--	N.A.	N.A.	<50	<1
Method	F630	F630	A102	A102	A102	H102
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.01	0.01	3	5	50	1
Upper Method				A103		

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530111

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014302 Order number : WCAO 458611

Scheme code : S033 - Drillcore/Rock; Dry, Jaw crush, Fine pulv, Ring

---

Sample preparation. Drillcore,Rock samples; Dry,
Jaw crush, Fine pulverise, Ringmill, <3.5kg

Scheme code : F630 - 30g fire assay, Lead collection, AAS

Fire assay, Lead collection, Aqua Regia digest,
AAS, 30g sample.

Scheme code : G102 - Triple acid digest, Geochemical samples

Triple acid digest, (HCl,HNO3,HClO4), Geochemical
samples.

Scheme code : A102 - AAS analysis

AAS analysis of sample after G102 digest.

Scheme code : H102 - Hydride AAS analysis

Hydride AAS analysis after G102 digest.

530112

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014819
Your reference : **WCAR455003**
Project code : Diamond Drill Core
Date received : 26/06/98
Date reported : 14/07/98

Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Number of pages of results : 2
Number of Samples : 29
First Sample : 15000
Last Sample : 213620

Invoice to:
Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Electronic Data Transmission :
Modem / /
Facsimile / /
Disk Report / /

Results to:

213441 – 213620 EL 20/94

Results to:

Remarks : Re-issue of report.
Variable gold assay repeats indicate the presence of coarse gold.

Authorised by .....
On behalf of:

Richard Newman
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

530113

A N A L A B S

Our reference : BU014819
Your reference : **WCAR455003**
Project code : Diamond Drill Core
Report date : 14/07/98
Report status : Final
Page : 1 of 2

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Cu	Pb	Zn	Ag	As	As
15000	5	7	2	<1	<50	1
15442	11	12	58	1	<50	18
15447	63	187	2772	<1	1838	N.A.
15448	77	3825	833	1	2479	N.A.
15449	7	9	47	<1	113	N.A.
15450	6	6	12	<1	<50	31
16007	14	12	22	1	2780	N.A.
16008	7	82	29	<1	<50	35
16009	29	20	46	1	>5000	N.A.
16011	4	7	23	<1	167	N.A.
16013	35	<3	75	1	<50	24
16014	7	<3	193	1	<50	27
16015	8	22	102	1	723	N.A.
✓ 213441	5	5	<2	<1	<50	10
✓ 213442	3	6	<2	<1	<50	1
✓ 213443	4	8	<2	<1	<50	<1
✓ 213444	15	17	56	<1	104	N.A.
✓ 213445	17	15	42	1	<50	48
✓ 213446	22	16	40	<1	<50	33
✓ 213447	21	32	132	1	160	N.A.
✓ 213448	7	7	5	<1	<50	6
✓ 213460	16	24	57	1	171	N.A.
✓ 213474	7	6	5	<1	<50	3
✓ 213475	5	<3	2	<1	<50	1
✓ 213476	3	3	<2	<1	<50	<1
✓ 213478	6	<3	2	<1	<50	<1
✓ 213479	4	<3	<2	<1	<50	<1
✓ 213480	6	4	<2	<1	<50	<1
213620	8	29	20	<1	<50	<1
Method	A102	A102	A102	A102	A102	H102
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	2	3	2	1	50	1
Upper Method		A103				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530114

A N A L A B S

Our reference : BU014819
Your reference : **WCAR455003**
Project code : Diamond Drill Core
Report date : 14/07/98
Report status : Final
Page : 2 of 2

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	As	Au	Au(R)	Au(R2)	Au(R3)	
15000	N.A.	0.73	0.79	1.14	0.82	
15442	N.A.	<0.01	--	--	--	
15447	N.A.	0.04	--	--	--	
15448	N.A.	0.06	0.05	--	--	
15449	N.A.	<0.01	<0.01	--	--	
15450	N.A.	0.01	--	--	--	
16007	N.A.	3.45	3.38	12.50	5.85	
16008	N.A.	<0.01	--	--	--	
16009	0.65	1.88	2.20	4.00	--	
16011	N.A.	0.06	--	--	--	
16013	N.A.	0.01	--	--	--	
16014	N.A.	0.04	--	--	--	
16015	N.A.	4.76	6.82	3.93	18.78	
213441	N.A.	<0.01	--	--	--	
213442	N.A.	<0.01	--	--	--	
213443	N.A.	<0.01	<0.01	--	--	
213444	N.A.	0.04	--	--	--	
213445	N.A.	<0.01	--	--	--	
213446	N.A.	<0.01	--	--	--	
213447	N.A.	<0.01	--	--	--	
213448	N.A.	<0.01	--	--	--	
213460	N.A.	<0.01	--	--	--	
213474	N.A.	<0.01	--	--	--	
213475	N.A.	<0.01	--	--	--	
213476	N.A.	<0.01	<0.01	--	--	
213478	N.A.	0.03	<0.01	<0.01	--	
213479	N.A.	<0.01	--	--	--	
213480	N.A.	<0.01	--	--	--	
213620	N.A.	<0.01	--	--	--	
Method	A103	F630	F630	F630	F630	
Units	%	ppm	ppm	ppm	ppm	
Detection Limit	0.01	0.01	0.01	0.01	0.01	

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530115

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014819 Order number : WCAR455003

Scheme code : S033 - Drillcore/Rock; Dry, Jaw crush, Fine pulv, Ring

---

Sample preparation. Drillcore,Rock samples; Dry,
Jaw crush, Fine pulverise, Ringmill, <3.5kg

Scheme code : G102 - Triple acid digest, Geochemical samples

Triple acid digest, (HCl,HNO3,HClO4), Geochemical
samples.

Scheme code : A102 - AAS analysis

AAS analysis of sample after G102 digest.

Scheme code : H102 - Hydride AAS analysis

Hydride AAS analysis after G102 digest.

Scheme code : G103 - Triple acid digest, Ore Grade samples

Triple acid digest, (HCl,HNO3,HClO4), Ore grade
samples.

Scheme code : A103 - AAS analysis

AAS analysis of sample after G103 digest.

Scheme code : F630 - 30g fire assay, Lead collection, AAS

Fire assay, Lead collection, Aqua Regia digest,
AAS, 30g sample.

530116

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014422
Your reference : **WCAP 458617**
Project code : Rock Chip
Date received : 13/03/98
Date reported : 25/03/98

Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Number of pages of results : 2
Number of Samples : 21
First Sample : 213401
Last Sample : E DIORITE S HILLS

Invoice to:
Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Electronic Data Transmission :
Modem / /
Facsimile / /
Disk Report / /

Preliminary Reports :
24/03/98 Report

Results to:

213401 - 213420 EL 20/94

Results to:

Remarks :

Authorised by .....
On behalf of:

Richard Newman
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

530117

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014422
Your reference : **WCAP 458617**
Project code : Rock Chip
Report date : 25/03/98
Report status : Final

ANALYTICAL DATA

Sample	Au	Au(R)	Pb	Zn	As	S
213401	<0.01	--	--	--	--	<0.01
213402	0.01	0.02	--	--	--	<0.01
213403	0.28	0.25	--	--	--	3.11
213404	0.29	0.30	0.61	--	0.56	2.50
213405	0.82	--	0.78	1.15	1.09	6.51
213406	0.09	--	--	--	--	0.21
213407	0.17	0.19	0.63	--	1.21	0.55
213408	<0.01	0.01	--	--	--	0.11
213409	<0.01	<0.01	--	--	--	0.04
213410	<0.01	--	--	--	--	0.15
213411	<0.01	--	--	--	--	0.11
213412	<0.01	--	--	--	--	0.05
213413	<0.01	--	--	--	--	<0.01
213414	<0.01	--	--	--	--	<0.01
213415	<0.01	--	--	--	--	<0.01
213416	<0.01	<0.01	--	--	--	<0.01
213417	0.30	0.29	--	--	--	0.02
213418	0.50	0.50	--	--	--	0.07
213419	0.01	<0.01	--	--	--	<0.01
213420	<0.01	--	--	--	--	0.20
E DIORITE S HILLS	N.A.	--	--	--	--	N.A.
Method	F630	F630	A103	A103	A103	V821
Units	ppm	ppm	%	%	%	%
Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530118

A N A L A B S

Our reference : BU014422
Your reference : **WCAP 458617**
Project code : Rock Chip
Report date : 25/03/98
Report status : Final
Page : 2 of 2

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Cu	Pb	Zn	Ag	As	As
213401	12	4	24	<1	<50	5
213402	21	3	38	<1	<50	15
213403	670	3051	1812	4	1519	N.A.
213404	156	>5000	4228	5	>5000	N.A.
213405	391	>5000	>5000	7	>5000	N.A.
213406	16	207	1720	<1	67	N.A.
213407	18	>5000	384	7	>5000	N.A.
213408	11	76	69	<1	74	N.A.
213409	7	47	38	<1	<50	22
213410	4	38	27	<1	<50	47
213411	2	49	4	<1	<50	17
213412	2	27	16	<1	<50	28
213413	10	4	12	<1	<50	34
213414	29	16	49	<1	<50	25
213415	6	9	12	<1	<50	8
213416	<2	5	4	<1	<50	49
213417	76	300	9	<1	364	N.A.
213418	191	342	11	1	99	N.A.
213419	12	<3	35	<1	<50	8
213420	6	6	28	<1	<50	7
E DIORITE S HILLS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	A102	A102	A102	A102	A102	H102
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	2	3	2	1	50	1
Upper Method		A103				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

As a part of Scentific Services Limited

530119

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014422 Order number : WCAP 458617

Scheme code : S033 - Drillcore/Rock; Dry, Jaw crush, Fine pulv, Ring

---

Sample preparation. Drillcore,Rock samples; Dry, Jaw crush, Fine pulverise, Ringmill, <3.5kg

---

Scheme code : F630 - 30g fire assay, Lead collection, AAS

Fire assay, Lead collection, Aqua Regia digest, AAS, 30g sample.

Scheme code : G102 - Triple acid digest, Geochemical samples

Triple acid digest, (HCl,HNO3,HClO4), Geochemical samples.

Scheme code : A102 - AAS analysis

AAS analysis of sample after G102 digest.

Scheme code : G103 - Triple acid digest, Ore Grade samples

Triple acid digest, (HCl,HNO3,HClO4), Ore grade samples.

Scheme code : A103 - AAS analysis

AAS analysis of sample after G103 digest.

Scheme code : V821 - Total Sulphur Analysis

Leco tube furnace, Total Sulphur.

Scheme code : H102 - Hydride AAS analysis

Hydride AAS analysis after G102 digest.

ANALYSIS DESCRIPTION

530120

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Date received : 24/04/98
Date reported : 26/05/98

Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Number of pages of results : 21
Number of Samples : 109
First Sample : 213421
Last Sample : NORTH DRIVE

Invoice to:
Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Electronic Data Transmission :
Modem / /
Facsimile / /
Disk Report / /

Results to:

Results to:

Remarks :

Authorised by .....
On behalf of:

Richard Newman
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

530121

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 1 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO
213421	48.85	0.50	15.70	10.16	0.17	9.73
213422	42.83	2.36	16.21	19.70	0.09	8.76
213423	50.50	1.97	12.93	12.45	0.08	10.50
213424	48.81	2.07	13.54	13.37	0.08	9.98
213425	50.93	2.78	17.74	9.47	0.06	5.72
213426	51.06	2.72	17.42	9.87	0.05	5.44
213427	51.62	0.13	13.48	5.55	0.09	13.53
213428	45.72	0.56	16.94	11.77	0.15	7.41
213429	43.41	0.64	17.74	12.26	0.16	6.95
213430	52.12	0.27	14.25	7.27	0.13	11.35
213433	46.97	0.63	18.62	9.69	0.17	4.93
213436	49.64	0.60	16.26	10.44	0.11	7.20
213549	50.05	0.80	16.43	10.85	0.14	6.76
213550	47.92	2.97	19.60	10.65	0.05	4.71
213570	48.17	0.95	18.02	9.45	0.15	2.16
213575	61.10	0.43	16.98	5.34	0.09	3.63
213482	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213483	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213484	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213485	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213486	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213487	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213488	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213489	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213490	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213491	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213492	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213493	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213494	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213495	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213496	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213497	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213498	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213499	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213500	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213501	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213502	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213503	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213504	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213505	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213507	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213508	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213509	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213510	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213511	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213512	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213513	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213514	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213515	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	X408
Units	%	%	%	%	%	%
Detection Limit	0.05	0.01	0.05	0.01	0.01	0.01

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530122

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 2 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO
213516	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213517	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213518	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213519	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213520	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213521	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213522	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213523	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213527	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213528	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213529	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213530	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213531	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213532	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213533	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213534	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213535	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213536	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213537	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213538	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213539	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213540	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213541	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213542	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213543	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213544	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213545	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213547	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213548	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213551	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213552	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213553	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213554	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213555	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213556	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213557	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213558	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213559	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213560	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213561	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213562	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213563	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213564	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213565	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213566	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213567	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213568	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	X408
Units	%	%	%	%	%	%
Detection Limit	0.05	0.01	0.05	0.01	0.01	0.01

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530123

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 3 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO
213569	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213571	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213572	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213573	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213574	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213576	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213577	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213578	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	X408
Units	%	%	%	%	%	%
Detection Limit	0.05	0.01	0.05	0.01	0.01	0.01

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530124

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 4 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	CaO	Na2O	K2O	P2O5	LOI100	La
213421	7.09	1.62	3.49	0.03	2.44	0.98
213422	0.55	0.06	3.25	0.39	6.27	14.65
213423	0.34	0.51	0.63	0.28	9.33	14.70
213424	0.44	0.42	0.50	0.22	11.24	24.85
213425	0.27	3.75	1.39	0.20	8.26	18.49
213426	0.42	3.64	1.42	0.26	8.29	20.56
213427	4.20	2.96	1.91	<0.01	6.54	0.93
213428	10.24	1.26	0.39	0.09	6.11	5.41
213429	9.12	2.06	1.00	0.13	7.10	7.03
213430	6.83	1.61	3.44	<0.01	2.92	0.63
213433	9.78	4.03	0.15	0.11	5.54	6.71
213436	8.74	2.62	0.63	0.05	4.29	5.46
213549	7.53	4.20	0.60	0.13	3.12	8.52
213550	0.14	1.18	2.51	0.19	10.68	33.79
213570	7.52	4.25	1.59	0.29	7.69	39.68
213575	2.90	3.47	3.88	0.07	2.81	26.05
213482	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213483	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213484	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213485	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213486	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213487	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213488	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213489	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213490	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213491	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213492	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213493	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213494	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213495	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213496	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213497	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213498	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213499	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213500	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213501	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213502	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213503	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213504	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213505	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213507	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213508	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213509	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213510	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213511	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213512	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213513	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213514	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213515	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	M104
Units	%	%	%	%	%	ppm
Detection Limit	0.01	0.05	0.01	0.01	0.01	0.05

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530125

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 5 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	CaO	Na2O	K2O	P2O5	LOI100	La
213516	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213517	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213518	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213519	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213520	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213521	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213522	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213523	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213527	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213528	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213529	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213530	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213531	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213532	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213533	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213534	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213535	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213536	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213537	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213538	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213539	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213540	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213541	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213542	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213543	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213544	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213545	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213547	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213548	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213551	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213552	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213553	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213554	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213555	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213556	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213557	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213558	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213559	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213560	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213561	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213562	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213563	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213564	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213565	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213566	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213567	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213568	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	M104
Units	%	%	%	%	%	ppm
Detection Limit	0.01	0.05	0.01	0.01	0.01	0.05

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530126

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 6 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	CaO	Na2O	K2O	P2O5	LOI100	La
213569	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213571	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213572	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213573	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213574	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213576	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213577	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213578	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X408	X408	X408	X408	X408	M104
Units	%	%	%	%	%	ppm
Detection Limit	0.01	0.05	0.01	0.01	0.01	0.05

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530127

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 7 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ce	Pr	Nd	Sm	Eu	Gd
213421	2.50	0.41	2.5	1.1	0.49	2.2
213422	39.08	5.05	23.4	5.7	1.70	5.7
213423	31.53	4.23	20.3	5.2	1.82	5.9
213424	37.55	5.59	25.4	5.4	1.78	5.5
213425	35.49	4.88	23.0	5.8	2.14	6.7
213426	43.26	5.89	28.1	7.0	2.51	7.9
213427	1.49	0.25	1.3	0.4	0.11	0.8
213428	12.37	1.57	7.6	1.9	0.72	2.2
213429	15.79	1.99	9.6	2.4	0.84	2.7
213430	1.47	0.24	1.4	0.6	0.22	1.2
213433	14.12	1.69	7.8	2.0	0.72	2.3
213436	11.50	1.39	6.4	1.6	0.70	2.0
213549	17.59	2.16	10.1	2.6	0.91	3.5
213550	48.84	7.81	35.4	8.9	3.18	10.8
213570	80.39	8.79	35.6	6.9	1.89	6.1
213575	43.96	5.40	20.6	3.9	0.85	4.2
213482	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213483	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213484	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213485	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213486	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213487	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213488	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213489	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213490	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213491	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213492	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213493	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213494	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213495	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213496	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213497	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213498	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213499	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213500	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213501	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213502	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213503	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213504	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213505	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213507	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213508	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213509	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213510	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213511	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213512	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213513	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213514	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213515	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.05	0.05	0.1	0.1	0.05	0.1

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530125

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 8 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ce	Pr	Nd	Sm	Eu	Gd
213516	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213517	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213518	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213519	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213520	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213521	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213522	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213523	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213527	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213528	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213529	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213530	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213531	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213532	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213533	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213534	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213535	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213536	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213537	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213538	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213539	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213540	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213541	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213542	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213543	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213544	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213545	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213547	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213548	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213551	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213552	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213553	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213554	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213555	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213556	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213557	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213558	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213559	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213560	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213561	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213562	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213563	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213564	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213565	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213566	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213567	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213568	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.05	0.05	0.1	0.1	0.05	0.1

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530129

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 9 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ce	Pr	Nd	Sm	Eu	Gd
213569	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213571	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213572	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213573	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213574	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213576	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213577	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213578	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.05	0.05	0.1	0.1	0.05	0.1

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530139

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 10 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Dy	Er	Yb	Ga	Th	Sc
213421	3.1	2.5	2.5	13.2	0.30	48
213422	5.5	3.1	2.7	21.9	3.31	26
213423	5.2	2.5	1.9	20.2	1.91	20
213424	4.6	2.1	1.8	20.2	2.25	20
213425	5.8	2.7	1.9	22.9	1.61	26
213426	6.7	3.3	2.4	23.3	2.08	26
213427	1.0	0.7	0.6	8.5	0.11	46
213428	2.0	1.3	1.1	18.1	1.08	40
213429	2.5	1.6	1.4	17.3	1.35	42
213430	1.7	1.4	1.4	10.3	0.34	56
213433	2.1	1.4	1.2	17.8	1.24	30
213436	2.1	1.3	1.2	15.6	1.05	34
213549	3.9	2.7	2.5	18.7	3.61	32
213550	10.5	5.6	3.9	25.5	2.24	26
213570	5.4	3.1	2.9	20.0	10.02	20
213575	4.2	2.7	2.6	16.8	8.08	18
213482	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213483	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213484	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213485	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213486	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213487	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213488	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213489	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213490	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213491	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213492	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213493	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213494	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213495	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213496	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213497	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213498	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213499	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213500	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213501	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213502	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213503	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213504	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213505	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213507	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213508	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213509	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213510	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213511	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213512	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213513	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213514	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213515	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.5	0.05	2

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530131

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 11 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Dy	Er	Yb	Ga	Th	Sc
213516	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213517	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213518	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213519	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213520	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213521	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213522	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213523	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213527	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213528	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213529	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213530	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213531	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213532	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213533	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213534	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213535	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213536	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213537	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213538	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213539	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213540	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213541	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213542	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213543	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213544	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213545	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213547	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213548	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213551	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213552	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213553	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213554	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213555	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213556	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213557	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213558	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213559	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213560	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213561	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213562	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213563	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213564	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213565	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213566	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213567	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213568	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.5	0.05	2

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530132

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Dy	Er	Yb	Ga	Th	Sc
213569	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213571	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213572	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213573	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213574	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213576	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213577	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213578	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.5	0.05	2

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530133

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ti	Ti	Zr	V	Nb	Rb
213421	2967	--	25	257	<3	107
213422	>10000	1.41	247	263	34	46
213423	>10000	1.18	184	198	30	18
213424	>10000	1.24	197	249	28	23
213425	>10000	1.67	261	325	42	27
213426	>10000	1.63	252	293	38	28
213427	847	--	<5	215	<3	36
213428	3176	--	23	327	<3	11
213429	3727	--	26	376	<3	25
213430	1481	--	5	178	<3	106
213433	3729	--	32	264	<3	5
213436	3203	--	23	287	<3	14
213549	5103	--	44	302	<3	14
213550	>10000	1.78	274	313	41	56
213570	4971	--	137	272	3	54
213575	2568	--	108	74	10	94
213482	2542	--	265	47	9	48
213483	263	--	11	11	<3	6
213484	1258	--	262	24	<3	5
213485	3088	--	318	53	9	54
213486	859	--	121	14	<3	9
213487	387	--	39	5	<3	5
213488	3040	--	257	53	9	57
213489	2504	--	254	36	6	31
213490	452	--	42	13	<3	7
213491	827	--	121	19	<3	14
213492	129	--	<5	<5	<3	6
213493	120	--	<5	<5	<3	7
213494	260	--	9	7	<3	12
213495	2680	--	186	44	9	54
213496	2531	--	222	45	6	46
213497	3513	--	219	68	9	65
213498	2822	--	227	42	8	40
213499	2373	--	258	38	7	53
213500	353	--	19	14	<3	12
213501	759	--	48	18	<3	22
213502	1091	--	215	14	<3	12
213503	2886	--	213	58	5	40
213504	1662	--	86	25	3	37
213505	3899	--	295	76	11	98
213506	2176	--	197	41	4	39
213507	2841	--	170	52	8	70
213508	2813	--	221	58	7	44
213509	3722	--	310	56	9	52
213510	2650	--	200	51	6	52
213511	1973	--	204	42	3	37
213512	651	--	112	11	<3	11
213513	1676	--	359	34	<3	12
213514	1208	--	164	16	<3	16
213515	1576	--	176	30	7	25
Method	X401	X408	X401	X401	X401	X401
Units	ppm	%	ppm	ppm	ppm	ppm
Detection Limit	100	0.01	5	5	3	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530134

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ti	Ti	Zr	V	Nb	Rb
213516	2366	--	210	47	9	41
213517	189	--	15	10	<3	<5
213518	415	--	24	12	<3	11
213519	1950	--	360	41	6	25
213520	758	--	104	15	<3	10
213521	504	--	61	14	<3	8
213522	494	--	53	13	<3	8
213523	3492	--	213	92	12	138
213525	4314	--	223	116	17	198
213526	4495	--	181	118	15	222
213527	4471	--	283	94	16	177
213528	3757	--	202	137	15	156
213529	3930	--	221	133	11	162
213530	4044	--	246	112	13	136
213531	3515	--	195	98	12	183
213532	477	--	23	11	<3	23
213533	224	--	12	8	<3	9
213534	<100	--	<5	6	<3	<5
213535	<100	--	<5	<5	<3	<5
213536	2268	--	207	38	8	55
213537	227	--	<5	<5	<3	10
213538	132	--	<5	<5	<3	12
213539	168	--	<5	<5	<3	6
213540	3900	--	300	56	12	85
213541	881	--	78	12	<3	16
213542	4420	--	198	120	11	238
213543	2036	--	136	34	5	44
213544	2071	--	161	33	4	53
213545	2179	--	149	27	6	46
213546	3289	--	206	58	7	78
213547	3857	--	301	56	9	102
213548	1632	--	194	27	7	33
213551	<100	--	<5	<5	<3	<5
213552	450	--	51	11	<3	8
213553	353	--	35	8	<3	11
213554	976	--	164	18	4	13
213555	238	--	15	8	<3	5
213556	1252	--	128	31	<3	19
213557	577	--	122	10	<3	8
213558	1733	--	209	32	6	36
213559	3262	--	414	44	9	44
213560	3749	--	358	64	9	65
213561	3206	--	333	47	9	32
213562	3290	--	243	63	9	75
213563	3180	--	251	59	9	64
213564	3193	--	195	53	6	95
213565	144	--	5	<5	<3	8
213566	294	--	13	8	<3	12
213567	110	--	5	<5	<3	10
213568	115	--	<5	<5	<3	5
Method	X401	X408	X401	X401	X401	X401
Units	ppm	%	ppm	ppm	ppm	ppm
Detection Limit	100	0.01	5	5	3	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530135

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
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Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ti	Ti	Zr	V	Nb	Rb
213569	332	--	32	9	<3	7
213571	4639	--	193	130	14	184
213572	2960	--	418	63	9	75
213573	3064	--	435	65	9	81
213574	4430	--	204	134	13	208
213576	4733	--	374	113	11	51
213577	4393	--	197	124	15	188
213578	4404	--	308	100	11	55
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X401	X408	X401	X401	X401	X401
Units	ppm	%	ppm	ppm	ppm	ppm
Detection Limit	100	0.01	5	5	3	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530136

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
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Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Y	Ba	Sr	Sn	Cr	Ni
213421	22	999	50	<3	342	182
213422	28	364	23	<3	302	200
213423	28	114	17	6	314	327
213424	25	85	20	7	333	243
213425	33	146	51	6	410	216
213426	34	128	55	6	407	245
213427	5	1640	85	7	891	298
213428	13	113	83	3	168	69
213429	12	250	165	4	150	46
213430	13	447	41	<3	207	163
213433	11	96	92	3	102	38
213436	12	413	163	3	55	35
213549	31	246	197	7	125	44
213550	65	194	19	<3	426	297
213570	31	414	273	<3	20	12
213575	29	690	98	<3	62	74
213482	23	146	18	6	596	29
213483	3	189	10	3	67	9
213484	6	50	9	3	1437	12
213485	23	187	18	<3	371	30
213486	5	30	5	3	926	13
213487	4	26	11	<3	258	23
213488	29	141	33	5	342	19
213489	19	88	25	6	74	10
213490	4	36	8	<3	666	21
213491	4	39	9	4	575	24
213492	6	42	137	<3	17	5
213493	<3	39	175	<3	20	<5
213494	4	52	187	<3	12	<5
213495	21	102	39	3	56	9
213496	19	95	105	4	128	9
213497	25	111	38	3	69	13
213498	20	72	42	<3	247	11
213499	17	95	37	4	98	6
213500	5	82	31	<3	326	6
213501	8	123	98	<3	95	27
213502	4	52	9	<3	932	10
213503	23	100	14	3	73	13
213504	18	101	146	<3	73	7
213505	31	233	46	4	79	20
213506	26	99	43	8	57	17
213507	21	151	34	4	248	19
213508	20	102	27	3	67	16
213509	24	114	42	<3	256	14
213510	23	150	32	3	62	13
213511	16	148	21	<3	490	14
213512	4	178	37	<3	223	<5
213513	8	108	8	<3	843	13
213514	6	184	18	4	267	10
213515	13	96	14	4	530	22
Method	X401	X401	X401	X401	X401	A104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	3	10	5	3	5	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530137

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Y	Ba	Sr	Sn	Cr	Ni
213516	18	276	14	4	203	49
213517	<3	129	5	<3	603	12
213518	4	66	7	<3	116	12
213519	11	78	8	4	2428	41
213520	6	85	19	<3	295	21
213521	3	40	8	<3	1536	39
213522	5	34	12	4	737	19
213523	34	411	82	6	142	42
213525	36	918	19	8	107	37
213526	38	805	35	4	93	46
213527	36	1928	183	7	166	32
213528	43	1969	124	6	92	73
213529	44	402	79	6	226	72
213530	37	485	93	4	107	121
213531	32	88	229	<3	17	47
213532	<3	55	122	<3	18	<5
213533	4	55	122	<3	18	13
213534	4	27	304	<3	1755	755
213535	<3	19	199	3	1585	1837
213536	23	152	84	5	137	5
213537	<3	40	206	<3	26	8
213538	<3	39	157	<3	17	<5
213539	5	47	147	<3	8	<5
213540	33	198	28	5	313	16
213541	9	60	146	<3	31	<5
213542	38	1078	49	10	119	37
213543	21	117	78	5	56	10
213544	19	112	71	<3	138	14
213545	21	143	77	<3	61	7
213546	30	213	53	4	212	15
213547	33	239	36	5	97	18
213548	15	93	115	3	106	<5
213551	<3	48	145	<3	17	<5
213552	3	32	<5	<3	1361	37
213553	5	90	7	3	1009	30
213554	5	33	11	<3	38	36
213555	4	107	19	3	659	20
213556	10	112	37	<3	37	28
213557	3	86	18	<3	517	7
213558	15	105	85	<3	69	12
213559	31	111	41	4	254	7
213560	23	78	23	3	100	10
213561	26	183	24	5	311	15
213562	28	183	24	5	311	24
213563	30	141	55	3	93	25
213564	28	187	71	5	168	18
213565	<3	52	199	<3	12	<5
213566	3	100	235	<3	9	<5
213567	<3	128	165	5	12	<5
213568	3	65	90	6	26	9
Method	X401	X401	X401	X401	X401	A104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	3	10	5	3	5	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

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ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Y	Ba	Sr	Sn	Cr	Ni
213569	3	111	35	<3	470	23
213571	39	963	23	8	108	45
213572	30	411	15	3	76	24
213573	31	306	34	6	255	25
213574	37	699	31	8	118	55
213576	38	237	10	5	1236	230
213577	29	3523	23	5	90	27
213578	28	232	10	3	1112	234
NORTH DRIVE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X401	X401	X401	X401	X401	A104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	3	10	5	3	5	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530139

A N A L A B S

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Co					
213421	59					
213422	74					
213423	70					
213424	69					
213425	64					
213426	65					
213427	55					
213428	55					
213429	36					
213430	40					
213433	32					
213436	42					
213549	37					
213550	111					
213570	27					
213575	12					
213482	<5					
213483	<5					
213484	<5					
213485	11					
213486	7					
213487	<5					
213488	8					
213489	8					
213490	<5					
213491	<5					
213492	<5					
213493	<5					
213494	<5					
213495	7					
213496	7					
213497	7					
213498	<5					
213499	12					
213500	7					
213501	18					
213502	8					
213503	<5					
213504	<5					
213505	16					
213506	10					
213507	18					
213508	10					
213509	16					
213510	12					
213511	7					
213512	<5					
213513	6					
213514	<5					
213515	7					
Method	A104					
Units	ppm					
Detection Limit	5					

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530140

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
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Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Co					
213516	<5					
213517	6					
213518	7					
213519	12					
213520	<5					
213521	9					
213522	<5					
213523	14					
213525	11					
213526	18					
213527	5					
213528	9					
213529	16					
213530	24					
213531	18					
213532	<5					
213533	<5					
213534	29					
213535	71					
213536	<5					
213537	<5					
213538	<5					
213539	<5					
213540	9					
213541	<5					
213542	7					
213543	<5					
213544	<5					
213545	<5					
213546	<5					
213547	6					
213548	6					
213551	<5					
213552	<5					
213553	9					
213554	11					
213555	9					
213556	7					
213557	<5					
213558	<5					
213559	<5					
213560	<5					
213561	8					
213562	6					
213563	14					
213564	8					
213565	<5					
213566	<5					
213567	<5					
213568	<5					
Method	A104					
Units	ppm					
Detection Limit	5					

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530141

ANALABS

Our reference : BU014576
Your reference : **WCAP302252**
Project code : Core
Report date : 26/05/98
Report status : Final
Page : 21 of 21

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Co					
213569	<5					
213571	20					
213572	17					
213573	<5					
213574	15					
213576	22					
213577	<5					
213578	30					
NORTH DRIVE	N.A.					
Method	A104					
Units	ppm					
Detection Limit	5					

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530142

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014576 Order number : WCAP302252

Scheme code : S002 - Drying

Sample preparation. Drying.

Scheme code : S005 - Jaw Crushing to nominal 6mm to 12mm

Sample preparation. Jaw crushing to nominal 6mm to 12mm.

Scheme code : S009 - Sample volume reduction - riffle split

Sample preparation. Sample volume reduction - riffle split.

Scheme code : S021 - Dry, Ringmill 500g to 1.5kg

Sample preparation. Dry, Ringmill. 500g to 1.5kg.

Scheme code : X408 - Glass fusion, XRF, Silicate rock analysis

---

Glass fusion, XRF, Silicate rock analysis

Scheme code : G104 - Total acid digest, Geochemical samples

Total acid digest, (HF,HCl,HNO3,HClO4), Geochemical samples.

Scheme code : M104 - ICP-MS analysis, Base metals

ICP-MS analysis of sample after G104 digest, Base metals.

Scheme code : X401 - Pressed powder, XRF, Trace determination

---

Pressed powder, XRF, Trace determination.

ANALYSIS DESCRIPTION

530143

ANALABS

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Date received : 04/08/98
Date reported : 19/08/98

Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Number of pages of results : 6
Number of Samples : 37
First Sample : 213621
Last Sample : 213577

Invoice to:
Grant McDonald
Geologist
Geology
Beaconsfield Mine Joint Venture
P.O.Box 58
BEACONSFIELD

TAS 7270

Electronic Data Transmission :
Modem Y 19/08/98
Facsimile / /
Disk Report / /

Preliminary Reports :
17/08/98 Report

Results to:

Results to:

Remarks :

Authorised by .....
On behalf of:

Richard Newman
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

530144

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014974 Order number : WX2A072698

Scheme code : S002 - Drying

Sample preparation. Drying.

Scheme code : S005 - Jaw Crushing to nominal 6mm to 12mm

Sample preparation. Jaw crushing to nominal 6mm to 12mm.

Scheme code : S020 - Dry, Ringmill <500g

Sample preparation. Dry, Ringmill. < 500g.

Scheme code : G104 - Total acid digest, Geochemical samples

Total acid digest, (HF,HCl,HNO3,HClO4), Geochemical samples.

Scheme code : M104 - ICP-MS analysis, Base metals

ICP-MS analysis of sample after G104 digest, Base metals.

Scheme code : X401 - Pressed powder, XRF, Trace determination

---

Pressed powder, XRF, Trace determination.

Scheme code : A104 - AAS analysis

AAS analysis of sample after G104 digest.

Scheme code : X408 - Glass fusion, XRF, Silicate rock analysis

---

Glass fusion, XRF, Silicate rock analysis

ANALYSIS DESCRIPTION

530145

ANALABS

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 1 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	La	Ce	Pr	Nd	Sm	Eu
213621	37.54	80.96	9.32	34.5	6.3	1.37
213622	33.60	69.37	7.87	29.5	5.6	1.09
213623	37.10	77.75	8.84	32.7	5.7	1.19
213624	45.56	106.43	11.48	47.3	10.5	2.30
213625	30.97	63.02	6.91	25.6	4.7	0.90
213626	32.43	66.67	7.49	28.1	5.2	1.01
213627	30.13	65.77	7.61	28.4	5.0	1.06
213628	8.15	19.97	2.44	9.7	1.9	1.00
213629	22.30	50.06	5.63	21.0	3.9	0.85
213630	43.45	90.69	10.26	37.6	6.6	1.17
213631	40.10	84.62	9.44	35.3	6.3	1.99
213632	36.52	78.23	8.78	33.0	6.1	1.15
213633	35.64	75.67	8.49	31.6	5.8	1.20
213634	39.64	82.05	9.13	33.9	6.1	1.50
213635	42.44	90.45	9.71	36.6	6.9	1.52
213636	46.51	99.21	10.50	39.4	7.4	2.18
213637	56.54	116.11	12.43	45.1	8.0	1.64
213638	17.92	43.81	5.24	20.7	4.1	0.91
213639	19.89	45.01	5.36	20.9	4.1	0.88
213640	48.24	74.97	9.17	32.3	4.9	0.94
213641	44.90	77.66	9.70	36.0	6.2	1.22
213642	38.42	80.67	8.84	32.6	5.9	1.95
213493	1.68	3.07	0.36	1.5	0.3	0.09
213494	2.89	5.01	0.59	2.3	0.5	0.11
213523	39.59	85.00	9.31	34.6	6.2	1.20
213525	43.04	85.97	9.75	36.2	6.2	1.34
213527	39.78	79.34	9.03	33.7	6.2	1.27
213528	36.08	73.44	8.54	32.0	5.7	1.10
213530	37.05	81.51	9.18	34.5	6.3	1.25
213531	38.98	84.11	9.43	35.8	6.4	1.26
213532	5.63	12.06	1.31	4.9	0.9	0.19
213539	2.50	3.98	0.51	2.2	0.5	0.10
213566	4.20	9.21	0.99	3.7	0.7	0.16
213567	1.50	3.02	0.33	1.3	0.3	0.07
213571	48.30	98.83	10.96	40.3	7.2	1.50
213574	46.69	97.03	10.73	40.1	7.4	1.51
213577	43.70	87.30	9.43	33.9	5.7	1.60
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.05	0.05	0.05	0.1	0.1	0.05

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530146

A N A L A B S

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 2 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Gd	Dy	Er	Yb	Ga	Th
213621	4.9	4.1	2.3	2.4	27.6	18.24
213622	4.7	3.9	2.1	2.0	14.6	14.22
213623	4.2	3.6	1.9	2.0	28.1	19.39
213624	10.0	6.9	3.2	3.0	22.1	15.17
213625	4.0	3.1	1.7	1.6	12.1	12.58
213626	4.1	3.4	1.7	1.7	12.3	12.69
213627	3.6	3.2	1.7	1.8	27.6	17.16
213628	1.9	2.0	1.3	1.4	23.8	10.46
213629	3.2	3.0	1.6	1.7	15.0	12.46
213630	4.5	3.4	1.6	1.7	13.6	16.48
213631	4.8	4.4	2.2	2.4	25.3	18.83
213632	4.1	3.6	1.8	2.2	20.2	13.18
213633	4.1	3.7	1.9	2.2	19.9	12.88
213634	4.8	4.3	2.2	2.3	22.2	16.25
213635	5.9	5.4	2.8	2.6	16.9	13.63
213636	6.1	5.1	2.5	2.0	23.5	18.60
213637	5.9	4.7	2.1	2.1	14.8	16.33
213638	3.4	3.0	1.7	2.0	21.5	8.79
213639	3.3	2.9	1.7	2.0	20.5	8.46
213640	3.3	2.6	1.3	1.6	5.7	12.45
213641	4.7	3.8	1.6	1.5	5.3	11.14
213642	4.7	4.0	2.2	2.2	23.6	18.07
213493	0.4	0.4	0.3	0.2	<0.5	0.39
213494	0.5	0.5	0.3	0.3	1.1	0.68
213523	4.3	2.9	1.6	1.9	20.2	14.36
213525	5.1	4.3	2.4	2.5	22.9	16.83
213527	5.1	4.1	2.2	2.2	20.4	17.35
213528	4.9	4.1	2.2	2.4	18.1	12.85
213530	4.3	3.0	1.6	2.0	21.0	13.39
213531	4.2	3.1	1.5	2.0	23.9	14.82
213532	0.8	0.8	0.5	0.4	2.5	1.98
213539	0.5	0.5	0.3	0.3	<0.5	0.60
213566	0.7	0.7	0.4	0.3	1.4	1.24
213567	0.2	0.2	0.1	0.1	0.6	0.43
213571	5.6	4.5	2.3	2.4	24.3	19.21
213574	5.9	5.1	2.6	2.7	25.2	18.62
213577	4.3	3.6	2.0	2.2	23.0	17.79
Method	M104	M104	M104	M104	M104	M104
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.05

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

ANALABS

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 3 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	P	Ti	Zr	V	Nb	Rb
213621	105	4079	212	130	16	235
213622	456	3100	273	60	11	99
213623	399	4080	151	131	18	227
213624	564	3649	180	141	15	176
213625	439	2662	318	74	9	85
213626	478	2708	341	61	14	87
213627	282	4092	156	117	15	238
213628	61	4063	188	142	17	200
213629	343	3140	218	68	12	117
213630	192	3302	408	64	13	98
213631	77	4187	218	106	20	206
213632	258	2932	181	87	14	176
213633	258	3027	168	86	11	171
213634	302	3942	191	107	17	213
213635	519	3377	167	111	13	150
213636	55	4493	221	119	21	185
213637	105	3639	311	76	15	129
213638	250	4505	205	133	18	159
213639	262	3933	177	118	15	141
213640	1640	2586	705	34	10	48
213641	413	2204	365	30	9	46
213642	178	4197	208	117	18	205
213493	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213494	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213523	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213527	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213528	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213530	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213531	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213532	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213539	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213566	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213567	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213571	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213574	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
213577	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Method	X401	X401	X401	X401	X401	X401
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	30	100	5	5	3	5

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530148

ANALABS

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 4 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Tb	Ho	Tm	Lu	Sc	P
213621	0.67	0.82	0.36	0.4	14	N.A.
213622	0.65	0.75	0.32	0.3	8	N.A.
213623	0.58	0.69	0.30	0.3	14	N.A.
213624	1.30	1.21	0.46	0.5	12	N.A.
213625	0.53	0.60	0.25	0.3	6	N.A.
213626	0.52	0.65	0.27	0.3	6	N.A.
213627	0.49	0.61	0.26	0.3	12	N.A.
213628	0.32	0.41	0.20	0.2	12	N.A.
213629	0.47	0.58	0.25	0.3	6	N.A.
213630	0.52	0.63	0.27	0.3	6	N.A.
213631	0.61	0.83	0.35	0.4	10	N.A.
213632	0.47	0.71	0.32	0.4	12	N.A.
213633	0.48	0.70	0.32	0.4	12	N.A.
213634	0.59	0.84	0.35	0.4	10	N.A.
213635	0.79	1.05	0.42	0.4	8	N.A.
213636	0.79	0.96	0.39	0.4	12	N.A.
213637	0.72	0.85	0.33	0.3	6	N.A.
213638	0.45	0.57	0.29	0.3	10	N.A.
213639	0.43	0.57	0.28	0.3	10	N.A.
213640	0.35	0.48	0.22	0.3	4	N.A.
213641	0.59	0.65	0.24	0.2	2	N.A.
213642	0.63	0.77	0.33	0.4	10	N.A.
213493	0.06	0.08	<0.05	<0.1	<2	0.018
213494	0.08	0.11	<0.05	<0.1	<2	0.006
213523	0.48	0.57	0.27	0.3	12	0.043
213525	0.67	0.85	0.37	0.4	12	0.044
213527	0.68	0.78	0.33	0.4	10	0.048
213528	0.65	0.80	0.34	0.4	10	0.064
213530	0.46	0.58	0.28	0.3	12	0.045
213531	0.44	0.58	0.28	0.3	12	0.042
213532	0.12	0.16	0.07	<0.1	2	0.020
213539	0.08	0.12	<0.05	<0.1	<2	0.010
213566	0.10	0.14	0.06	<0.1	<2	0.019
213567	<0.05	<0.05	<0.05	<0.1	<2	0.014
213571	0.69	0.85	0.36	0.4	12	0.063
213574	0.80	0.97	0.40	0.4	12	0.049
213577	0.53	0.70	0.32	0.4	10	0.022
Method	M104	M104	M104	M104	M104	X408
Units	ppm	ppm	ppm	ppm	ppm	%
Detection Limit	0.05	0.05	0.05	0.1	2	0.005

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530149

A N A L A B S

Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 5 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Y	Ba	Sr	Sn	Cr	
213621	38	1631	21	6	78	
213622	33	383	21	7	77	
213623	26	739	19	7	107	
213624	74	1539	46	7	101	
213625	21	548	29	4	66	
213626	25	340	21	6	126	
213627	25	762	19	9	101	
213628	28	4132	14	6	93	
213629	24	881	14	7	90	
213630	28	381	24	7	111	
213631	33	4965	26	4	79	
213632	28	864	48	5	107	
213633	28	690	44	10	118	
213634	34	2114	24	5	91	
213635	32	1235	16	6	84	
213636	37	4309	18	4	96	
213637	34	887	24	4	74	
213638	34	469	16	6	169	
213639	28	464	12	6	120	
213640	32	262	64	4	475	
213641	29	238	36	3	76	
213642	32	5216	26	5	81	
213493	N.A.	N.A.	N.A.	N.A.	N.A.	
213494	N.A.	N.A.	N.A.	N.A.	N.A.	
213523	N.A.	N.A.	N.A.	N.A.	N.A.	
213525	N.A.	N.A.	N.A.	N.A.	N.A.	
213527	N.A.	N.A.	N.A.	N.A.	N.A.	
213528	N.A.	N.A.	N.A.	N.A.	N.A.	
213530	N.A.	N.A.	N.A.	N.A.	N.A.	
213531	N.A.	N.A.	N.A.	N.A.	N.A.	
213532	N.A.	N.A.	N.A.	N.A.	N.A.	
213539	N.A.	N.A.	N.A.	N.A.	N.A.	
213566	N.A.	N.A.	N.A.	N.A.	N.A.	
213567	N.A.	N.A.	N.A.	N.A.	N.A.	
213571	N.A.	N.A.	N.A.	N.A.	N.A.	
213574	N.A.	N.A.	N.A.	N.A.	N.A.	
213577	N.A.	N.A.	N.A.	N.A.	N.A.	
Method	X401	X401	X401	X401	X401	
Units	ppm	ppm	ppm	ppm	ppm	
Detection Limit	3	10	5	3	5	

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

530150

ANALABS

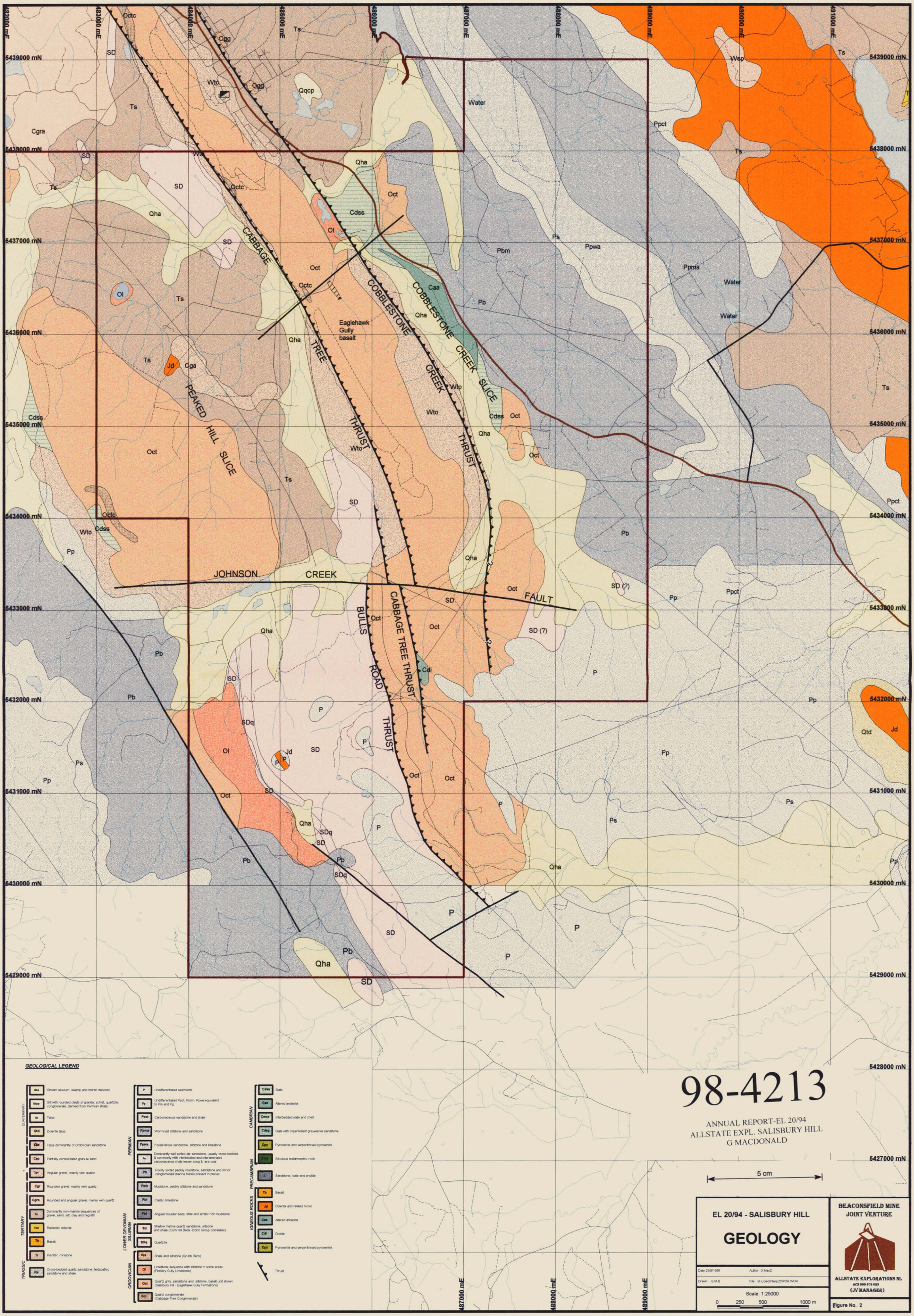
Our reference : BU014974
Your reference : **WX2A072698**
Project code : Rock
Report date : 19/08/98
Report status : Final
Page : 6 of 6

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

ANALYTICAL DATA

Sample	Ni	Co				
213621	32	13				
213622	32	9				
213623	38	5				
213624	24	22				
213625	34	6				
213626	29	6				
213627	10	<5				
213628	27	<5				
213629	26	10				
213630	26	10				
213631	13	9				
213632	105	17				
213633	120	27				
213634	65	15				
213635	53	8				
213636	15	16				
213637	16	13				
213638	173	36				
213639	115	20				
213640	8	8				
213641	8	10				
213642	55	18				
213493	N.A.	N.A.				
213494	N.A.	N.A.				
213523	N.A.	N.A.				
213525	N.A.	N.A.				
213527	N.A.	N.A.				
213528	N.A.	N.A.				
213530	N.A.	N.A.				
213531	N.A.	N.A.				
213532	N.A.	N.A.				
213539	N.A.	N.A.				
213566	N.A.	N.A.				
213567	N.A.	N.A.				
213571	N.A.	N.A.				
213574	N.A.	N.A.				
213577	N.A.	N.A.				
Method	A104	A104				
Units	ppm	ppm				
Detection Limit	5	5				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received



GEOLOGICAL LEGEND

QUATERNARY
- Qha — Stream alluvium, swamp and marsh deposits
- Qqcp — Silt with rounded clasts of granite, schist, quartzite, conglomerate, derived from Permian strata
- Qt — Talus
- Qtd — Dolerite talus
- Qtor — Talus dominantly of Ordovician sandstone
- Cap — Partially consolidated granule sand
- Cga — Angular gravel, mainly vein quartz
- Cgr — Rounded gravel, mainly vein quartz
- Cgra — Rounded and angular gravel, mainly vein quartz

TERTIARY
- Tx — Dominantly non-marine sequences of gravel, sand, silt, clay and regolith
- Tbd — Basanitic dolerite
- Tb — Basalt
- Ti — Pisolitic ironstone

TRIASSIC
- Rs — Cross-bedded quartz sandstone, feldspathic sandstone and shale

PERMIAN
- P — Undifferentiated sediments
- Pp — Undifferentiated Ppct, Ppmn, Ppwa equivalent to Pm and Pg
- Ppct — Carbonaceous sandstone and shale
- Ppma — Wormcast siltstone and sandstone
- Ppwa — Fossiliferous sandstone, siltstone and limestone
- Pv — Dominantly well sorted qtz-sandstone, usually cross-bedded & commonly with interbedded and interlaminated carbonaceous shale lesser cong & rare coal
- Pb — Poorly sorted pebbly mudstone, sandstone and minor conglomerate marine fossils present in places
- Pbm — Mudstone, pebbly siltstone and sandstone
- Pbl — Clastic limestone
- Pbd — Angular boulder beds, tillite and erratic rich mudstone

LOWER DEVONIAN SILURIAN
- Sd — Shallow marine quartz sandstone, siltsone and shale (Corn Hill Beds -Eldon Group correlates)
- SDq — Quartzite
- Dgs — Shale and siltstone (Grubb Beds)

ORDOVICIAN
- Ol — Limestone sequence with siltstone in some areas. (Flowery Gully Limestone)
- Oct — Quartz grits, sandstone and siltstone, basalt unit shown (Salisbury Hill - Eaglehawk Gully Formations)
- Octc — Quartz conglomerate (Cabbage Tree Conglomerate)

CAMBRIAN
- Cdss — Slate
- Cas — Altered andesite
- Cwcs — Interbedded slate and chert
- Cdsg — Slate with impersistent greywacke sandstone
- Cpy — Pyroxenite and serpentinised pyroxenite
- Csis — Siliceous metamorphic rock

PRECAMBRIAN
- C — Sandstone, slate and phyllite

IGNEOUS ROCKS
- Tb — Basalt
- Jd — Dolerite and related rocks
- Cas — Altered andesite
- Cdi — Diorite
- Cpy — Pyroxenite and serpentinised pyroxenite

Thrust

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

5 cm

EL 20/94 - SALISBURY HILL

GEOLOGY

Date: 25/9/1998 Author: G.MacD
Drawn: G.M.B File: SH_Geolinterp25WOR.WOR

Scale: 1:25000
0 250 500 1000 m

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 079 089
(JV MANAGER)

Figure No. 2

530151

483000 mE
484000 mE
485000 mE
486000 mE
487000 mE
488000 mE
489000 mE
5438000 mN
5437000 mN
5436000 mN
5435000 mN

Middle Arm Creek Stereo Plots

N
W
E
S

joints
veins
bedding
faults

Gritty sandstone with Cr staining
Foliated shale
Siltstone in float
213638
213577
213639
Polymict conglomerate interbedded with siltstone
Interbedded siltstone and polymict conglomerate
213612
Siltstone
Polymict conglomerate
Sandstones and minor grits (coarser rocks generally towards last)
Limestone
Collapsed adit
Siltstone
Siltstone and fine grained sandstone float
Dark greenish grey micaceous quartzwacke sandstones and dark grey shales/siltstones
213622
213626
Dark greenish grey micaceous quartzwacke sandstones and dark grey shales/siltstones
Dark greenish grey micaceous quartzwacke sandstone
Siltstone collapsing into sink hole
Limestone
Interbedded siltstone and sandstone
70
90
Quartzose sandstone and grits
Tan soil, minor float siltstone and polymict conglomerate
Scattered outcrop of basaltic andesite - series of distinctive step like excavations in bank
Basaltic andesite
Basaltic andesite
213549
Scattered outcrop of basaltic andesite
Foliated siltstone
Weathered well bedded siltstones after fine sandstones clayey zones probably after limestone. Fossiliferous
Tan bedded siltstones and sandstones
213406,407
Small pit (4mW,3mD,3m deep)
213422
Green basaltic andesite derived sandstone
213403, 404, 405
Basaltic andesite coherent and pepertic
Siltstone
Rising Sun (mirror adit)
Collapsed shaft adit
213423,424,425,426,550
213421
213402
Grits
Dark grey grits and sandstones
Sandstones
Finer bedded sandstones and siltstones
Small pit
213408,409,410,411,412
Weathered basalt?
Graphitic, pyritic, breccio-conglomerate
213420
Sandstones and Zebra bed
Grits, minor pebbly conglomerate and sandstone
213413
More conglomeratic - Wet Beds
Dark grey grits and sandstones
Conglomerate
213414, 415, 416
Pale grey clay after shale
Weathered sandstone ?
Float of sandstone and grit
Extensive mullock (siltstone) indicates adit 100m+ long
Track
213418,419
Collapsed adit
213417
Ferruginous botryoidal material on mullock heap
Shaft 50m+ deep
Eaglehawk Gully Stereo Plots
N
W
E
S
joints
veins
bedding
faults
Basaltic andesite
213433
Basaltic andesite
213436
Greenish grey quartzwacke sandstones with feldspar and lithics, occasional trilobite fossils
213575
Float
213576
Quartzose grits and sandstones

Sample_Number	Au__ppm_	As__ppm_	Cu__ppm_	Pb__ppm_	Zn__ppm_	Ag__ppm_	S___
213,620	<0.01	<1	8	29	20	<1	-
213,401	<0.01	5	12	4	24	<1	<0.01
213,402	0.02	15	21	3	36	<1	<0.01
213,403	0.27	1519	670	3051	1,812	4	3.11
213,404	0.3	5600	156	6100	4,228	5	2.5
213,405	0.82	10900	391	7800	11,500	7	6.51
213,406	0.09	67	16	207	1,720	<1	0.21
213,407	0.18	12100	18	6300	384	7	0.55
213,408	<0.01	74	11	76	69	<1	0.11
213,409	<0.01	22	7	47	38	<1	0.04
213,410	<0.01	47	4	38	27	<1	0.15
213,411	<0.01	17	2	49	4	<1	0.11
213,412	<0.01	28	2	27	16	<1	0.05
213,413	<0.01	34	10	4	12	<1	<0.01
213,414	<0.01	25	29	16	49	<1	<0.01
213,415	<0.01	8	6	9	12	<1	<0.01
213,416	<0.01	49	<2	5	4	<1	<0.01
213,417	0.3	364	76	300	9	<1	0.02
213,418	0.5	99	191	342	11	1	0.07
213,419	0.01	8	12	<3	35	<1	<0.01

GEOLOGICAL LEGEND

- Alluvium
- Permian Undifferentiated
- **Silurio Devonian** Corn Hill Beds
- **Ordovician** Flowery Gully Limestone
- **Ordovician** Eaglehawk Gully Formation Tan bedded siltstones and sandstones
- **Ordovician** Eaglehawk Gully Formation - Eaglehawk Gully basalt Basaltic andesite coherent and pepentic
- **Ordovician** Salisbury Hill Formation Conglomerates, grits, sandstones and siltstones
- **Ordovician** Cabbage Tree Conglomerate
- **Cambrian (?)** Blyths Creek Formation Sandstones, siltstones and shales
- **Cambrian (?)** Mafics and ultramafic volcanics, diorite
- Bedding and dip
- Cleavage and dip
- Joint and dip
- Outcrop
- Float
- Vein with dip
- 213575 Lithogeochemical/petrological samples
- 213575 Gold and samples

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

530152

EL 20/94 - SALISBURY HILL

FACT GEOLOGY (NORTH SHEET)

Date: 24/9/1998 Author: G. MacD.
Drawn: G.M.B. File: SH_NorthFACT.wor

Scale: 1:5000
0 75 150 300 m

5 cm

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 675 283
(JV MANAGER)

Figure No.: 3

485000 mE
486000 mE
487000 mE
488000 mE
5434000 mN
5433000 mN
5432000 mN
5431000 mN
5430000 mN
5429000 mN

213637 Dark grey siltstone with fine grained sandstone
213480
213478
Vein quartz float
Vein quartz float
213479
213476
Siltstone
213475
213474
Siltstone and sandstone
213596
213597
213595
213421,427,430
213593
213594
213592
213599
213668
213621
Dark grey siltstone
213636
Quartz grits and sandstone
213598
213428,428
213678
~10m deep shaft driven on siltstone and polymict (?) conglomerate with angular cherty clasts
Quartzose sandstone
Quartzose sandstone
Dark grey foliated siltstone with cephalopods
213628
Trench
Ferruginous siltstone
213672
Fine grained sandstone
Foliated siltstone
213669
Vein quartz blow
Fine grained sandstone
Siltstone
Foliated dark grey siltstone and shale and fine grained quartzose sandstone
Derwent Adit
Collapsed at mouth ~ 100m worth of muck on tip heap
213624,625
?
213673
674
Dark grey shaley siltstone (213624) and dark grey sandstone (213625)
213631
Clayey dark grey siltstone and shale
Corn Hill Beds Stereo Plots
N
W
E
S
joints
veins
bedding
faults
Quartzite strong space cleavage
213675
Quartzite
Siltstone
Dark grey siltstone
213667
Quartzose sandstone
Quartz vein float
213671
Sandstone
213629
Interbedded dark grey shale, siltstone and quartzose sandstone
213670
213635
213623,627,630
Foliated siltstone
Quartzite
Quartzose sandstone
Red weathering quartzose sandstone
Sandstone
Sandstone
Sandstone and grits
Siltstone
Siltstone and sandstone
213452
Diorite
Diorite
213575
213677
Amphibolite
Quartzose sandstone
Quartzose sandstone
Occasional rounded Permian lag, possibly over sandstones
213441
Siltstone and fine grained sandstone in float
213442
213443
Grits and sandstone with quartz stock
Small pit
213444,445,446,447,448
Pit 1.5m deep
"lode cap" over siltstone
"Lode cap" "paddock"
Trench
"lode cap"
213460
Sandstone
213641

Salisbury Hill Prospect Area Detail Shown on Figure 5

Sample_Number	Au__ppm_	As__ppm_	Cu__ppm_	Pb__ppm_	Zn__ppm_
213,441	<0.01	10	5	5	<2
213,442	<0.01	1	3	6	<2
213,443	<0.01	<1	4	8	<2
213,444	0.034	104	15	17	56
213,445	<0.01	48	17	15	42
213,446	<0.01	33	22	16	40
213,447	<0.01	160	21	32	132
213,448	<0.01	6	7	7	5
213,460	<0.01	171	16	24	57
213,474	<0.01	3	7	6	5
213,475	<0.01	1	5	<3	2
213,476	<0.01	<1	3	3	<2
213,478	0.003	<1	6	<3	2
213,479	<0.01	<1	4	<3	<2
213,480	<0.01	<1	6	4	<2

KEN MORRISON'S MAPPING

GEOLOGICAL LEGEND

- Alluvium
- Permian Undifferentiated
- Silurio Devonian — Corn Hill Beds
- Ordovician — Flowery Gully Limestone
- Ordovician — Eaglehawk Gully Formation — Tan bedded siltstones and sandstones
- Ordovician — Eaglehawk Gully Formation - Eaglehawk Gully basalt — Basaltic andesite coherent and peperitic
- Ordovician — Salisbury Hill Formation — Conglomerates, grits, sandstones and siltstones
- Ordovician — Cabbage Tree Conglomerate
- Cambrian (?) — Blyths Creek Formation — Sandstones, siltstones and shales
- Cambrian (?) — Mafics and ultramafic volcanics, diorite

42 Bedding and dip
42 Cleavage and dip
42 Joint and dip
Outcrop
Float
Vein with dip
213575 Lithogeochemical/petrological samples
213575 Gold and samples

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

5 cm

530153

EL 20/94 - SALISBURY HILL

FACT GEOLOGY
(SOUTH SHEET)

Date:24/9/1998 Author: G. MacD
Drawn: G.M.B. File: SH_SouthFACT.wor
Scale: 1:5000
0 75 150 300 m

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 679 023
(JV MANAGER)

Figure No.: 4

Sample_Number	Au__ppm_	Ni__ppm_	Cr__ppm_	As__ppm_
PAWC 2.0	<0.01	23	2212	81
PAWC 3.5	<0.01	39	1735	92
PAWC 5.0	<0.01	37	2194	97
PAWC 6.0A	<0.01	81	2620	87
PAWC 7.0B	0.08	52	3120	21
PAWC 8.0B	3.24	70	2124	192
PAWC 14.5	<0.01	46	2622	70
PAWC 16.0	<0.01	51	2105	144
PAWC 17.5	<0.01	52	2010	101
PAWC 19.0	0.03	41	1800	141
PAEC 0.5	<0.01	7	584	<1
PAEC 1.0	<0.01	23	102	7
PAEC 2.0	<0.01	15	455	9
PAEC 3.5	0.01	20	147	25
PAEC 5.0	<0.01	12	415	5
PAEC 7.4-9.2	<0.01	21	66	<1
PASC 8.0	0.02	401	2837	663
PASC 10.0	0.27	387	1162	2893
PASC 12.0	0.5	336	756	1420
PASC 13.0	0.64	274	359	1624
PASC 17.0	0.26	117	1749	525
PWRC 6.0B	0.03	92	3947	268
PAOCR 1	1.72	-	-	1395
PAOCR 2	1.09	-	-	252
PAOCR 3	<0.01	-	-	12
213592	<0.01	-	-	10
213593	<0.01	-	-	<1
213594	<0.01	-	-	3
213595	<0.01	-	-	<1
213596	<0.01	-	-	<1
213597	<0.01	-	-	4
213598	<0.01	-	-	6
213599	<0.01	-	-	<1

quartz pebble conglomerates, grits and sandstones on dump

Float of sandstones, grits and pebbly conglomerate

DDH S2 projected up dip (45°) to RL 80 m.a.s.l.

Serpentinised ultramafics and quartz sandstones

213421, 427 & 430

DDH S1 projected up dip (45°) to RL 80 m.a.s.l.

Salisbury Shaft and Drive at 260' level ~20 m.a.s.l.

213593

213594

213592

Old prospecting underlay shaft

Siliceous sandstones and grits

Main Shaft

Old Victoria Tunnel

dark grey siliceous pyritic sandstone and grit and graphitic shale ("lode slate"?) on dump

213596

213595

Scattered float of sandstones

"lode slate"

"Gossan"

Increasingly foliated shales and polymict conglomerate

"Nugget Chamber" (Twelvetrees, 1903)

Dyke Tunnel Adit (detail in figure 9)

Gladstone Reef

213599

Duchess of York (Gladstone)

Powerline, Duchess of York and Dyke Tunnel adits projected vertically

Salisbury Hill Structures

N

W

E

S

213597

Sluiced Area

Powerline Adit (detail in figure 8)

joints

veins

bedding

faults

quartz sandstones

quartz sandstone and grits

213598

Sandstone at mouth of adit

Coherent dark green mafics on dump

213428 & 429

GEOLOGICAL LEGEND

Salisbury Hill/Eaglehawk Gully Formations undifferentiated
Sandstones, grits and conglomerates in the west, and, sandstones and siltstones in the east

Polymict Conglomerate
Rounded clasts of gabbro, dolerite, basalt, andesite, quartz wacke, carbonates, quartzites, quartz-mica schists, cherts and carbonate altered ultramafics.

Shales and siltstones
Dark grey shales and siltstones

Mafic and ultramafic volcanics

Alteration

Serpentinite
with magnesite and magnetite veinlets

Dolomite
red dolomitisation

Bedding and dip

Cleavage and dip

Joint and dip

Normal fault or strike slip fault

Reverse fault

Outcrop

Float

Projected from drill core/old workings

Old workings

Vein with dip

213575 Lithogeochemical/petrological samples

213575 Gold and samples

DDH S5 projected vertically to -65 m.a.s.l.

Polymict conglomerates

Quartz pebble conglomerates

5 cm

98-4213
Annual Report
530154

EL 20/94 - SALISBURY HILL
SALISBURY HILL PROSPECT

GEOLOGY

Date:1/10/1998 Author: G. MacD.

Drawn :: g. MACd:/G.M.B. File:

Scale: 1:1000

0 25 50 m

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 879 023
(JV MANAGER)

figure 5

486 750mE

486 775mE

5 433 400mN

5 433 375mN

5 433 350mN

fg sst

sst

D

D1

36–067

88–007

ns joints eg 34–080, 86–187, 88–007

300–400mm bucky wt qtz vein at hip height until north of which the single vein rises and breaks into more lensoidal shallow west dippers eg 30–220, 30–266

vein rising but joins

E

E1

1.29 4.08 3.33 12.0 1.07

friable oxd sst/grits

ssts or fg sst

80–338

85–015

joints also 53–150, 35–064, 30–292, 75–100, 81–121

Vein driven on in this X–cut dips shallowly southwards

ferruginous qtz veining in roof

fg sst

RAB hole in roof

49–105

joints 55–222, 55–085

disjoint vn ferrug n roof

green (Cr? Ni?) stained clay 40–250, 50–260 – thrust?

friable oxidised grits/sst jts in sth wall of X–cut 48–105, 43–096

irreg ferrug qtz

vg

sst/grits friable/oxd

71–033

Qtz pebble conglomerate

78–033

88–089

ferruginous upper half more massive lower half – occupies most of wall

vein splits

buck vein approx. 300mm at waist high

51–056

45–061

now more massive vn

irregular mass ferrug qtz in east wall

West dipping vein in wall approx 200mm thick at shin height

sst/grits

200mm

Reef stays in walls of X–cut on both sides rising slightly and pinching to approx 100mm at end of X–cut

89–015

sst/grits

85–285

Veining eg

39–219, 39–254, 40–230, 87–164, 72–008, 88–351

Follows along wall from C3 to B

These channels and veins coalesce in the west wall becoming a mass of qtz veining. Approx half way up west wall mullock covered.

70–333

This veins stays shin high from C3 to B

grits

sst/grits

massive bucky qtz

contorted ferrung qtz with manganese staining

grits/sst poss alts in roof and back wall

87–000

sst/grits

86–191

84–030

39–258

Approx 4 'channels' ie joints ± qtz veining all dipping westerly eg 39–258

90–010

Joint cuts veining but does not dislocate vein

87–010

sst/grits

Adit mouth looking north

PAOCR2 (1.09g/t Au)

PAOCR3 (<0.01g/t Au)

PAOCR1 (<1.72g/t Au)

NS joints in qtz vein at adit mouth ie

82–188 79–120
91–009 41–253
88–354 33–258
83–170 70–135
80–025 50–125
86–128

The adit has been driven on two shallowly west dipping veins. One in top RHS (facing nth) approx. 150mm thick is at chest height on LHS, where it is approx 150mm, the other vein is at shin height on the RHS, disappearing by the LHS

Pale grey well bedded siltstone

72

28

80

87

55

PAEC 5.0 (1.7m @ <0.01 g/t Au)

PAEC 3.5 (1.4m @ 0.01 g/t Au)

PAEC 2.0 (1.2m @ <0.01 g/t Au)

PAEC 1.0 (1.5m @ <0.01 g/t Au)

PAEC 0.5 (1.2m @ <0.01 g/t Au)

PAEC 7.4 – 9.2 (1.8m @ <0.01 g/t Au)

Sandstones, grits and minor pebbly conglomerate

PAWC 2.0 (1.0m @ <0.01 g/t Au)

PAWC 3.5 (0.8m @ 0.01 g/t Au)

PAWC 5.0 (0.8m @ <0.01 g/t Au)

PAWC 6a (1.5m @ <0.01 g/t Au)
6b (1.6m @ 0.03 g/t Au)

PAWC 7b (1.6m @ 0.08 g/t Au)

PAWC 8B (1.8m @ 3.24 g/t Au)

PAWC 14.5 (1.8m @ <0.01 g/t Au)

PAWC 16 (1.8m @ <0.01 g/t Au)

PAWC 17.5 (1.8m @ <0.01 g/t Au)

PAWC 19.0 (2.1m @ 0.03 g/t Au)

PASC 2.0

PASC 8.0 (1.4m @ <0.02 g/t Au)

PASC 10.0 (1.5m @ 0.27 g/t Au)

PASC 12.0 (1.0m @ 0.50 g/t Au)

PASC 13.0 (1.0m @ 0.64 g/t Au)

PASC 17.0 (0.9m @ 0.26 g/t Au)

Powerline Adit – Poles to Structures

N

W

E

S

joints
veins
bedding
faults

MN

MN

MN

KEY

Better assay results from Hamlyn (1982)

Quartz vein/veining

0.5 < Au < 1.0

1.0 < Au < 2.0

2.0 < Au < 5.0

5.0 < Au

530155

5 cm

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

EL 20/94 - SALISBURY HILL

SALISBURY HILL PROSPECT

POWERLINE ADIT

COMPILED : G. MacD | DATE: September 1998

DRAWN : G.M.B. | FILE: Powerline Adit

SCALE 1:100 0 5 m

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 679 023
(JV MANAGER)

DRAWING No.

FIG. No. 8

486 670mE

486 680mE

5 433 450mN

5 433 440mN

Quartzite and minor grits

65

37°

"Wall" along fault HW

Major clayey fault slickensides sub–vertical

30

Polymict conglomerate, strongly sheared. (increasingly deformed ↑)

25

45°

Puggy fault with bunches of quartz

42

44

Dark grey siltstones and shales (increasingly deformed ↑)

Polymict conglomerate, friable, orange weathering, clearly polymict

Dark grey siltstones and shales, weathering to olive green

Polymict conglomerate? strongly weathered

LEGEND

SALISBURY HILL FORMATION

Quartzite. Siliceous quartz sandstone and grit

BLYTHS CREEK FORMATION

Polymict conglomerate. Weathering to orange but with recognisable clasts

Dark grey siltstones and shales, weathering to olive green

30 Foliation

30 Bedding

Shearing

Reverse fault

5 cm

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

EL 20/94 - SALISBURY HILL

SALISBURY HILL PROSPECT

DYKE TUNNEL ADIT

COMPILED : G. MacD. | DATE: September 1998

DRAWN : G.M.B. | FILE:

SCALE 1:100 0 0 m

DRAWING No.

FIG. No. 9

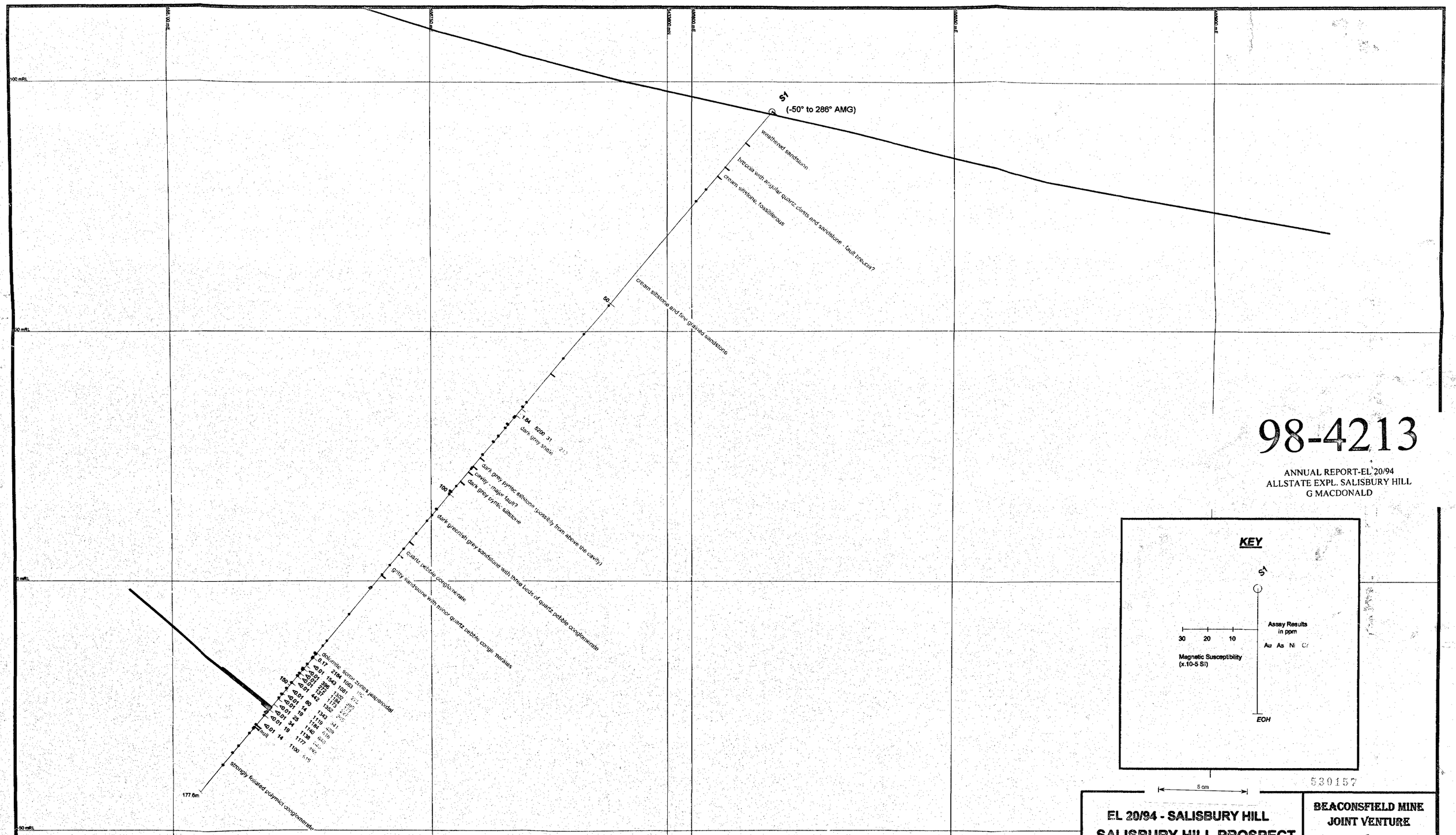
BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 679 023
(JV MANAGER)

520156

98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD



TOP LEFT

3

EL 20/94 - SALISBURY HILL

SALISBURY HILL PROSPECT

DRILL SECTION

DDH S1

(SECTION PLANE OF HOLE)

Date:24/9/1998 Author: G. MacD

Drawn: G.M.B. File: S1 drill section.WOR

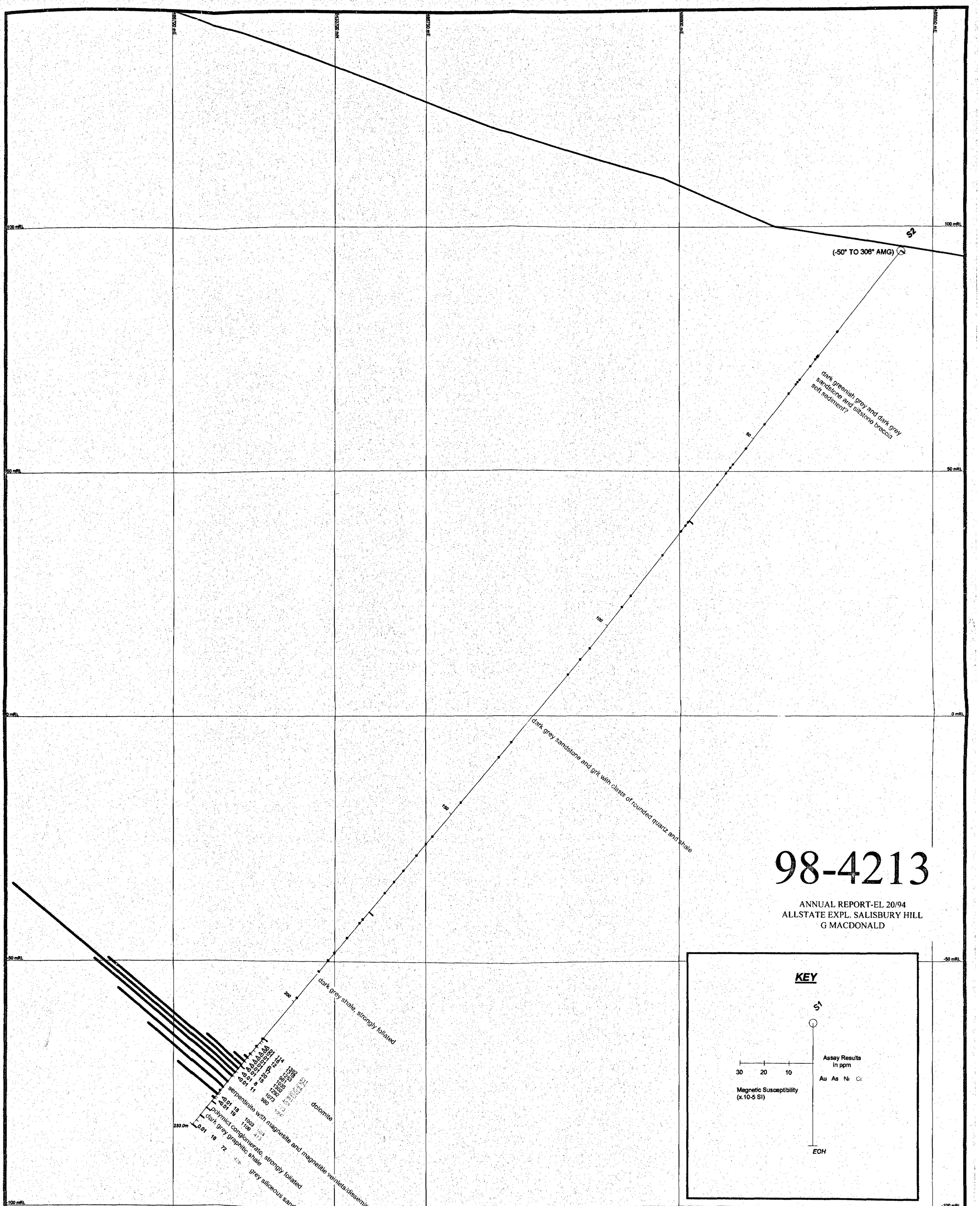
Scale: 1:500

0 7.5 15 30 m

BEACONSFIELD MINE JOINT VENTURE

ALLSTATE EXPLORATIONS NL
ACN 000 679 023
(JV MANAGER)

Figure No.: 10



98-4213

ANNUAL REPORT-EL 20/94
ALLSTATE EXPL. SALISBURY HILL
G MACDONALD

530158

TOP CENTRE

3

BEACONSFIELD MINE: LITHOGEOCHEMISTRY

Lithological unit	Sample No.	Location			Ti	Zr	Nb	Rb	Y	Ba	Sr	Sn	V	Ni	Cr	Co	Ti/Zr	Nb/Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ga	Th	Sc	P	La/Sc	Eu/Sm	La/Lu	Th/Co	La/Co
		Drill Hole	From/Easting	To/Northing																																					
Corn Hill Beds	213623	CHA2	5431740	485780	4080	151	18	227	26	739	19	7	131	38	107	5	27.0	0.69	37.1	77.75	8.84	32.7	5.7	1.19	4.2	0.58	3.6	0.69	1.9	0.3	2	0.3	28.1	19.39	14	399	2.65	0.21	123.7	3.88	7.42
shales	213627	CHA1	5431740	485780	4092	156	15	238	25	762	19	9	117	10	101	<5	26.2	0.60	30.13	65.77	7.51	28.4	5	1.08	3.6	0.49	3.2	0.61	1.7	0.26	1.8	0.3	27.6	17.16	12	282	2.51	0.21	100.4	NR	NR
	213635	CHB2	5431800	485835	3377	157	13	150	32	1235	16	6	111	53	84	8	20.2	0.41	42.44	90.45	9.71	36.6	6.9	1.52	5.9	0.79	5.4	1.05	2.8	0.42	2.6	0.4	16.9	13.63	8	519	5.31	0.22	106.1	1.70	5.31
	213626	SH3	5432695	485990	4053	158	17	200	28	4132	14	6	142	27	93	<5	21.6	0.61	8.15	19.97	2.44	9.7	1.9	1	1.9	0.32	2	0.41	1.3	0.2	1.4	0.2	23.8	10.46	12	51	0.68	0.53	40.8	NR	NR
	213631	Ceph silt	5432450	485310	4187	218	20	206	33	4965	26	4	106	13	79	9	19.2	0.61	40.1	84.62	9.44	35.3	6.3	1.99	4.8	0.61	4.4	0.83	2.2	0.35	2.4	0.4	25.3	18.83	10	77	4.01	0.32	100.3	2.09	4.46
Ave					3980	176	16.6	204.2	28.8	2366.6	18.8	6.4	121.4	28.2	92.8	<8	22.9																									
Std Dvn					329	27.4	2.7	34	3.6	2023	4.5	1.8	14.8	17.9	11.6	NR	3.6																									
Corn Hill Beds	213629	CHB2	5431800	485835	3140	218	12	117	24	881	14	7	68	26	90	10	14.4	0.50	22.3	50.06	5.83	21	3.9	0.85	3.2	0.47	3	0.58	1.6	0.25	1.7	0.3	15	12.46	6	343	3.72	0.22	74.3	1.25	2.23
sandstones	213630	CHA1	5431740	485780	3302	408	13	98	28	381	24	7	84	26	111	10	8.1	0.46	43.45	90.69	10.28	37.6	6.6	1.17	4.5	0.32	3.4	0.63	1.6	0.27	1.7	0.3	13.6	16.48	8	192	7.24	0.18	144.8	1.65	4.35
Ave					3221	313	12.5	107.5	26	631	19	7	66	26	101	10	11.2																									
Grubb Shale	213528	B23	120.8	121.3	3757	202	15	156	43	1928	183	7	137	73	92	9	18.6	0.35	36.06	73.44	8.54	32	5.7	1.1	4.9	0.65	4.1	0.8	2.2	0.34	2.4	0.4	18.1	12.85	10	640	3.61	0.19	90.2	1.43	4.01
	213529	B23	128.1	128.5	3930	221	11	182	44	1969	124	6	133	72	226	16	17.8	0.25																							
	213527	B23	161.9	162.4	4471	283	16	177	38	805	35	4	94	32	166	5	15.8	0.44	39.78	79.34	9.03	33.7	6.2	1.27	5.1	0.68	4.1	0.78	2.2	0.33	2.2	0.4	20.4	17.35	10	480	3.98	0.20	99.5	3.47	7.96
	213526	B23	185.6	186.4	4495	181	15	222	38	987	30	4	118	46	93	18	24.8	0.39																							
	213525	B23	194.4	195	4314	223	17	198	38	918	19	5	116	37	107	11	19.3	0.47	43.04	85.97	9.75	36.2	6.2	1.34	5.1	0.67	4.3	0.85	2.4	0.37	2.5	0.4	22.9	16.63	12	440	3.59	0.22	107.6	1.53	3.91
	213542	B32	385.8	386.8	4420	198	11	238	38	1078	49	10	120	37	119	7	22.3	0.29																							
Ave					4231	218	14.2	192.2	39.2	1276	73	6.5	120	49.5	134	11	19.8	0.37																							
Stddvn					311.5	35.5	2.56	33.1	3.5	527	65.6	2.35	15.2	18.4	52.7	5.1	3.27	0.09																							
Flowery Gully	213492	B23	220.3	221	129	<5	<3	6	8	42	137	<3	<5	<5	17	<5	25.8	NR																							
Limestone	213493	B23	273.7	274.3	120	<5	<3	7	<3	39	175	<3	<5	<5	20	<5	24	NR	1.68	3.07	0.36	1.5	0.3	0.09	0.4	0.06	0.4	0.08	0.3	<0.05	0.2	<0.01	<0.5	0.39	<2	180	NR	0.30	NR	NR	NR
	213494	B23	348.7	349.3	260	9	<3	12	4	52	187	<3	7	<5	12	<5	28.9	NR	2.89	5.01	0.59	2.3	0.5	0.11	0.5	0.08	0.5	0.11	0.3	<0.05	0.3	<0.01	1.1	0.68	<2	80	NR	0.22	NR	NR	NR
	213551	B32	407.5	408.3	<100	<5	<3	<5	3	48	145	<3	<5	<5	17	<5	20	NR																							
	213539	B32	494	494.8	168	<5	<3	6	5	47	147	<3	<5	<5	8	<5	33.6	NR	2.5	3.98	0.51	2.2	0.5	0.1	0.5	0.08	0.5	0.12	0.3	<0.05	0.3	<0.01	<0.5	0.6	<2	100	NR	0.20	NR	NR	NR
	213536	B32	534.8	535.5	132	<5	<3	12	<3	39	157	<3	<5	<5	17	<5	26.4	NR																							
	213537	B32	578.6	579.5	227	<5	<3	10	<3	40	206	<3	<5	8	26	<5	45.4	NR																							
Ave					162.3	NR	NR	8.3	3.88	43.9	164.9	NR	NR	NR	16.7	NR	NR	0.84																							
Stddvn					59.8	NR	NR	3	1.21	5.15	25.3	NR	NR	NR	5.7	NR	NR	0.22																							
Eaglehawk Gully	213545	B23	384	384.7	2179	149	6	46	21	143	77	<3	27	7	61	<5	14.6	0.29																							
Formation	213546	B23	427.2	428.1	1832	194	7	33	15	93	115	3	27	<5	106	6	8.4	0.47																							
	213536	B32	621.7	622.8	2268	207	8	55	23	152	84	5	36	5	137	<5	11.0	0.35																							
	213541	B32	666.4	667.3	881	78	<3	16	9	60	146	<3	12	<5	31	<5	11.3	NR																							
	213562	B13	260.2	261	3290	243	9	75	28	163	24	5	63	24	311	6	13.5	0.32																							
	213561	B13	316.7	317.6	3206	333	9	32	26	78	23	3	47	15	311	8	9.6	0.35																							
	213488	B23	558.6	559.4	3040	257	9	57	29	141	33	5	53	19	342	8	11.8	0.31																							
	213489	B23	607.5	608.3	2504	254	6	31	19	88	25	6	36	10	74	8	9.9	0.32																							
	213506	B32	791.5	792.5	2176	197	4	39	26	99	43	8	41	17	57	10	11.0	0.15																							
	213507	B32	840.5	841.5	2841	170	8	70	21	151	34	4	52	19	248	18	16.7	0.38																							
	213508	B32	891.9	892.7	2813	221	7	44	20	102	27	3	58	16	67	10	12.7	0.35																							
	213563	B13	199.3	200	3180	251	9	64	30	141	55	3	59	25	93	14	12.7	0.30																							
	213544	B32	729.9	730.8	2071	161	4	53	19	112	71	<3	33	14	138	<5	12.9	0.21																							
	213543	B32	767	767.9	2036	136	5	44	21	117	78	5	34	10	56	<5	15.0	0.24																							
	213560	B13	364	364.9	3746	355	9	65	23	111	41	4	64	10	100	<5	10.5	0.39																							
	213509	B26	641.7	642.3	3722	310	9	52	24	114	42	<3	58	14	258	18	12.0	0.38																							
	213510	B26	650.7	651.6	2550	200	6	52	23	150	32	3	51	13	62	12	13.3	0.26																							
	213497	B32	946.8	947.5	3513	219	9	65	25	111	36	3	68	13	69	7	16.0	0.36																							
	213505	B23	651.4	652.3	3899	295	11	98	31	233	46	4	76	20	79	16	13.2	0.35																							
	213504	B23	660.4	661.3	1662	86	3	37	18	101	146	<3	25	7	73	<5	19.3	0.17																							
	213495	B32	923.5	924.4	2680	186	9	54	21	102	39	3	44	9	56	7	14.4	0.43																							
	213496	B32	929.7	930.5	2531	222	6	46	19	95	105	4	45	9	128	7	11.4	0.32																							
	213564	B13	148.2	149	3193	195	6	95	26	167	71	5	53	18	168	8	15.4	0.21																							
	213547	B23	443	443.9	3857	301	9	102	33	239	36	5	56	18	97	6	12.8	0.27																							
	213548	B23	461	461.9	3289	206	7	78	30	213	53	4	58	15	212	<5	16.0	0.23																							
	213540	B32	695.4	696.3	3900	300	12	85	33	198	28	5	56	16	313	9	13.0	0.38																							
	213503	B23	632.5	633.2	2886	213	5	40	23	100	14	3	58	13	73	<5	13.5	0.22																							
Ave					2602	220	7.2	66.6	23.6	134	56.5	<4	47.8	<13.6	138	<8.2	13.1	0.31																							
Std dvn					773	68.7	2.3	21.7	5.61	47.7	36.2	NR	14.9	NR	96	NR	2.46	0.08																							
Salisbury Hill Formation	213558	B13	453.2	454.1	1252	128	<3	19	10	107	19	3	31	28	37	7	9.78	NR																							
sandstones	213514	B26	715.4	716.5	1208	164	<3	16	6	184	19	4	16	10	267	<5	7.37	NR																							
	213515	B26	725.3	726.3	1576	176	7	25	13	96	14	4	30	22	530	7	6.95	0.54																							
	213516	B26	739.3	740.3	2366	210	9	41	18	276	14	4	47	49	203	<5	11.3	0.50																							
	213485	B32	1080.3	1081	3088	318	9	54	23	187	18	<3	53	30	371	11	9.71	0.39																							
	213559	B13	380.2	381.1	3262	414	9	44	31	105	85	<3	44	7	254	<5	7.68	0.29																							
	213558	B13	406	406.9	1733	209	6	35	15	86	18	<3	32	12	69	<5	8.29	0.40																							
	213511	B26	679.3	680.2	2973	204	3	37	16	148	21	<3	42	14	490	7	14.6	0.19																							
	213498	B32	959.4	960.5	2822	227	8	40	20	72	42	<3	42	11	247	<5	12.4	0.40																							
	213499	B32	978.6	979.3	2373	258	7	53	17	95	37	4	36	6	98	12	9.20	0.41																							
Ave					2265.3	231	<6.4	36.5	15.9	135.6	28.6	<3	37.5	18.9	256.6	<6.9	9.95	0.39																							
Std dvn					775	82.7	NR	13	6.94	63.5	22	NR	10.6	13.5	168	nr	2.23	0.11																							
Salisbury Hill Formation	213517	B26	748.2	748.7	189	15	<3	5	3	129	5	<3	10	12	603	6	12.6	NR																							
conglomerates	213518	B26	761	762	415	24	<3	11	4	66	7	<3	12	12	116	7	17.3	NR																							
	213483	B32	1041.9	1042.6	283	11	<3	6	3	189	10	3	11	9	67	<5	23.9	NR																							
	213484	B32	1064.5	1065.2	1258	262	<3	5	6	50	9	3	24	12	1437	<5	4.80	NR																							
	213519	B26	792	793	1950	360	6	25	11	76	5	4	41	41	2428	12	5.42	0.55																							
	213520	B26	815.6	816.6	758	104	<3	10	6	85	19	<3	15	21	295	<5	7.29	NR																							
	213557	B13	417	418	577	122	<3	8	3	112	37	<3	10	7	517	<5	4.73	NR																							
	213512	B26	691.7	692.6	651	112	<3	11	4	178	37	<3	11	<5	223	<5	5.81	NR																							
	213513	B26	701.8	702.8	1578	358	<3	12	8	106	8	<3	34	13	843	6	4.67	NR																							
	213500	B32	957.5	958.2	353	19	<3	12	5	82	31	<3	14	6	326	7	18.6	NR																							
	213501	B32	1003.6	1004.6	759	46	<3	22	8	123	96	<3	18	27	95	18	16.8	NR																							
	213502	B32	1008.5	1009.1	1091	215	<3	12	4	52	9	<3	14	10	932	8	5.07	NR																							
	213482	B32	1024.1	1024.6	2542	265	9	48	23	146	18	6	47	29	596	<5	9.59	0.39																							
	213555	B13	497.6	498.7	236	15	<3	5	4	33	11	<3	8	20	659	9	15.9	0.75																							
	213554	B13	571.6	572.5	976	164	4	13	5	90	7	3	18	38	38	11	5.95	0.8																							
Ave					913	140	NR	13.7	6.5	101.4	20.9	NR	19.1	<18.2	611.7	<9.3	10.50																							
Std Dvn					690	125	NR	11.1	5.1	45.7	24	NR	12.1	NR	633	NR	6.30																							
Cabbage Tree	213552	B13	608.7	609.6	450	51	<3	8	3	32	<5	<3	11	37	1361	<5	8.8	NR																							
Conglomerate	213553	B13	629.6	630.5	353	35	<3	11	5	43	5	<3	8	30	1009	9	10.1	NR																							
	213521	B26	838.3	839.3	504	61	<3	8	3	40	8	<3	14	39	1536	9	8.3	NR																							
	213522	B26	858	859	494	53	<3	8	5	34	12	4	13	19	737	<5	9.3	NR																							
	213486	B32	1125.2	1126	859	121	<3	9	5	30	5	3	14	13	926	7	7.1	NR																							
	213487	B32	1140.8	1141.5	387	39	<3	5	4	26	11	<3	5	23	258	<5	9.9	NR																							
	213491	B32	1159.5	1160.3	827	121	<3	14	4	39	9	4	19	24	575	<5	5.83	NR																							
	213490	B32	1170.5	1171.2	452	42	<3	7	4	36	8	<3	13	21	868	<5	10.8	NR																							
Ave					541	65.4	NR	8.75	4.13	35	<7.9	NR	12.1	25.8	884	NR	8.9	NR																							
Std dvn					193	35.3	NR	2.7	0.83	5.6	NR	NR	4.2	8.96	418	NR	NR	NR																							
Blyths Creek Formation	213523	B26	863.3	864.2	3492	213	12	138	34	411	82	6	92	42	142	14	16.4	0.35	39.59	85	9.31	34.6	6.2	1.2	4.3	0.48	2.9	0.57	1.6	0.27	1.9	0.3	20.2	14.36	12	430	3.30	0.19	132.0	1.03	2.83
shale	213530	B32	1181	1181.9	4044	246	13	136	37	462	79	6	112	121	107	24	16.4	0.35	37.05	81.51	9.18	34.5	6.3	1.25	4.3	0.46	3	0.58	1.6	0.28	2	0.3	21	13.39	12	450	3.09	0.20	123.5	0.56	1.54
	213531	B32	1195.5	1196.4	3515	195	12	183	32	485	93	4	98	47	17	18	18.0	0.38	38.98	84.11	9.43	35.8	6.4	1.26	4.2	0.44	3.1	0.58	1.5	0.28	2	0.3	23.9	14.82	12	420	3.25	0.20	129.9	0.82	2.17
Ave					3683	218	12.3	152	34.3	433	84.7	5.3	100.7	70	58.7	18.7	17.0	0.36																							
Std dvn					312	25.9	0.5	26.6	2.5	45.5	7.4	1.2	10.3	44.2	64.5	5	0.93	0.01																							
Blyths Creek Formation	213567	B13	738.4	739.3	110	5	<3	10	<3	128	165	5	<5	<5	12	<5	22	NR	1.5	3.02	0.33	1.3	0.3	0.07	0.2	<0.05	0.2	<0.5	0.1	<0.05	0.1	<0.01	0.6	0.43	<2	140	NR	0.23	NR	NR	NR
limestone	213565	B13	753.3	754.2	144	5	<3	8	<3	52	199	<3	<5	<5	12	<5	28.8	NR																							
	213568	B13	796.7	797.5	115	<5	<3	<5	3	65	90	8	<5	9	28	<5	23	NR																							
	213566	B13	823.3	824.2	294	13	<3	12	3	100	235	<3	8	<5	9	<5	22.6	NR	4.2	9.21	0.99	3.7	0.7	0.16	0.7	0.1	0.7	0.14	0.4	0.06	0.3	<0.01	1.4	1.24	<2	190	NR	0.23	NR	NR	NR
	213532	B32	1207.6	1208.5	477	23	<3	23	<3	98	229	<3	11	<5	18	<5	20.7	NR	5.83	12.06	1.31	4.9	0.9	0.19	0.8	0.12	0.8	0.16	0.5	0.07	0.4	<0.01	2.5	1.98	2	200	2.815	0.21	NR	NR	NR
	213533	B32	1224.4	1225.3	224	12	<3	9	4	55	122	<3	8	13	16	<5	16.7	NR																							
Ave					227	<10.5	NR	11.2	NR	81.3	173	NR	NR	NR	15.8	NR	22.8	<0.96																							
Std dvn					141.5	NR	NR	6.2	NR	29.6	58.7	NR	NR	NR	6.1	NR	3.4	nr																							
Blyths Creek Formation	213569	B13	724.3	725.2	332	32	<3	7	3	111	35	<3	9	23	470	5	10.4	NR																							
conglomerate																																									
Blyths Creek Formation	213535	B32	1246	1246.5	<100	<5	<3	<5	<3	19	199	3	<5	1837	1585	71	20	NR																							
serpentinite																																								
Blyths Creek Formation	213534	B32	1251.5	1252.4	<100	<5	<3	<5	4	27	304	<3	6	755	1755	29	20	NR																							
dolomite																																								
Cambrian shale	213577	MAC750	5437545	485500	4393	197	15	188	29	3523	23	5	124	27	90	<5	22.3	0.52	43.7	87.3	9.43	33.9	5.6	1.6	4.3	0.53	3.6	0.7	2	0.32	2.2	0.4	23	17.79	10	220	4.37	0.29	109.3	NR	NR
(Cobblestone Ck	213538	MAC	5437570	485700	4505	205	18	159	34	469	16	6	133	173	169	36	22.0	0.53	17.92	43.81	5.24	20.7	4.1	0.91	3.4	0.45	3	0.57	1.7	0.29	2	0.3	21.5	8.79	10	250	1.79	0.22	59.7	0.24	0.50
slice)	213539	MAC	5437550	485600	3933	177	15	141	28	464	12	6	118	115	120	20	22.2	0.54	19.89	45.01	5.38	20.9	4.1	0.88	3.3	0.43	2.9	0.57	1.7	0.28	2	0.3	20.5	8.46	10	262	1.99	0.21	66.3	0.42	0.99
Ave					4277	193	16	163	30.3	1485	17	5.7	125	105	126	<28	22.2																							
Std Dvn					303	14.4	1.7	23.7	3.2	1764	5.6	0.58	7.55	73.5	39.9	NR	0.17																							
Cambrian sandstone	213576	E sst	5435400	487220	4733	374	11	51	38	237	10	5	113	230	1236	22	12.7	0.29																							
(Cobblestone Ck	213578	E sst	5435430	487240	4404	308	11	55	28	232	10	3	100	234	1112	30	14.3	0.39																							
slice)																																								
Ave					4569	341	11	53	33	235	10	4	107	232	1174	26	13.5																							
Unassigned shales	213636	Daakes (sth) shale	5434265	485850	4493	221	21	185	37	4309	18	4	96	15	96	16	20.3	0.57	46.51	99.21	10.5	39.4	7.4	2.18	6.1	0.79	5.1	0.96	2.5	0.39	2	0.4	23.5	18.6	12	55	3.86	0.29	116.3	1.16	2.91
	213637	Daakes (west) shale	5434260	485630	3639	311	15	129	34	887	24	4	74	16	74	13	11.7	0.44	56.54	116.11	12.43	45.1	8	1.84	5.9	0.72	4.7	0.83