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ANNUAL REPORT-LEFROY  
EL 1/95 - ALLSTATE EXPLORATIONS NL  
J PURVIS

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ALLSTATE EXPLORATIONS NL

## LEFROY EL 1/95

## ANNUAL REPORT 1998-99



Volunteer Gold Mine 1898

*(Reproduced courtesy of Queen Victoria Museum)*

# 99-4335

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J PURVIS

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J.G. Purvis

May 1999

**LEFROY JOINT VENTURE  
EL 1/95  
ANNUAL REPORT 1998-99**



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## 1. SUMMARY

The 80 sq km EL 1/95 (Lefroy) covers the Lefroy Goldfield in Northern Tasmania. In 1998-99 Allstate completed 725m of diamond drilling at the old Volunteer Gold Mine.

Hole L3 (232m) tested the original target of hole L1 which went off-course last year. L3 passed within a few metres of the target point between 7 and 8 Levels in the old mine, but intersected only cataclasite of the 9m wide Volunteer Reef Fault. This assayed 0.3g/t Au over 0.95m. The reef itself had been removed by post-vein movements of the fault.

The best gold value in L3 was 2.02g/t over 0.6m from a quartz-arsenopyrite veined fault 6m above the Volunteer Reef Fault. This upper fault is believed to represent the West Volunteer Branch Reef.

L4 was drilled to test 85m west of L1 at a similar RL. The target was a flat-lying panel of quartz interpreted to extend west from the 1.15m Volunteer Reef intersection to beneath the plunge axis of the known gold shoot. L4 was also designed to test the West Volunteer Branch Reef directly beneath the West Volunteer Mine workings.

L4 deviated unexpectedly in azimuth and had to be terminated at 202.5m, 90m short of the expected target depth. Hole L4A was cut from L4 at 110m using a chrome barrel and was successfully completed at 400.5m.

L4A intersected the West Volunteer Branch Reef as two quartz-arsenopyrite veins 3.2m apart. The upper vein was only 15cm wide and assayed 0.72g/t Au, 0.22% As. The lower (main) vein was 0.4m wide and assayed 6.37g/t Au, 0.48% As.

The Volunteer Reef Fault was intersected at 267.5-270.2m in L4A, but again no reef was present. The cataclasite contained some thin dismembered quartz veins and the best gold value was 0.23g/t over 0.8m.

Due to a marked flattening in dip of the Volunteer Reef Fault the RL of the L4A intersection was 21m higher than expected. The flattening dip indicates the fault and the West Volunteer Branch Reef will likely join about 40m below L4A. The upper junction of the reefs was the site of some of the best mineralization and reef development in the old mines. The lower junction is recommended for drilling by wedging from the upper part of L4. The hole would also further test the quartz panel concept that was the original justification for L4.

The Monarch Reef at the southern end of the field offers possibilities for open-cuttable ore and is recommended for testing with a limited series of short RC holes.

While the results of this years drilling are disappointing, they at least prove that significant gold values can be located by drilling around and beneath the known reefs at Lefroy – something that has not been demonstrated before.

Given the lack of systematic testing by the old miners and subsequent explorers it is almost certain there is gold ore to be found at Lefroy. This will take a considerable amount of drilling because of the discrete nature of the gold shoots and widespread

evidence of post-vein movements on the reef faults. Not all reefs have been disrupted by these movements and consequently these are attractive exploration targets. Such reefs include the Chum and Native Youth.

Apart from the hole to be wedged from L4 and the Monarch Mine testing, future drilling at Lefroy should follow a comprehensive search for the missing old mine plans and records, including advertising for material held privately. Lack of this information has hampered exploration to date.

With over 30 reef lines as potential targets an upgraded overview of the entire field especially its structural geology and mining patterns, is needed to assist drill planning. A mix of RC and diamond drilling would provide effective testing whilst cutting costs.

Although it is important to look at the field as a whole, the northern end centred on the big-producing Pinafore-Chum and Native Youth reef systems appears the most prospective.

## 2. INTRODUCTION

The Lefroy Goldfield lies 12 km east of George Town near the north coast of Tasmania. Gold was discovered at Lefroy in 1869 and most mining took place in the period up to 1904. Recorded production is 187,000 oz of gold (Keele 1996b), but records of the mining are very poor and it is probable total production exceeds 200,000 oz. Of the recorded production, 182,000 oz came from quartz reefs hosted by the monotonous Early Ordovician sandstone-siltstone-shale sequence, part of the Mathinna Group.

The goldfield is covered by EL 1/95 (Lefroy) of 80 skm. See Figure 1. The EL is held by Lefroy Gold Mines Pty Ltd, a 100% subsidiary of Central Kalgoorlie Gold Mines NL. In July 1997 Allstate Explorations NL entered into a joint venture with Lefroy Gold Mines to earn 60% equity in the EL through staged expenditure totalling \$700,000 over four years. To date Allstate has spent \$290,154 and carried out 1,510m of diamond drilling.

Lefroy Gold Mines were initially attracted to Lefroy by the lack of previous systematic exploration, particularly drilling. Potential for further high-grade quartz vein-hosted gold deposits and bulk low-grade open-cut resources was recognised, but only the latter target type was tested by Lefroy Gold Mines.

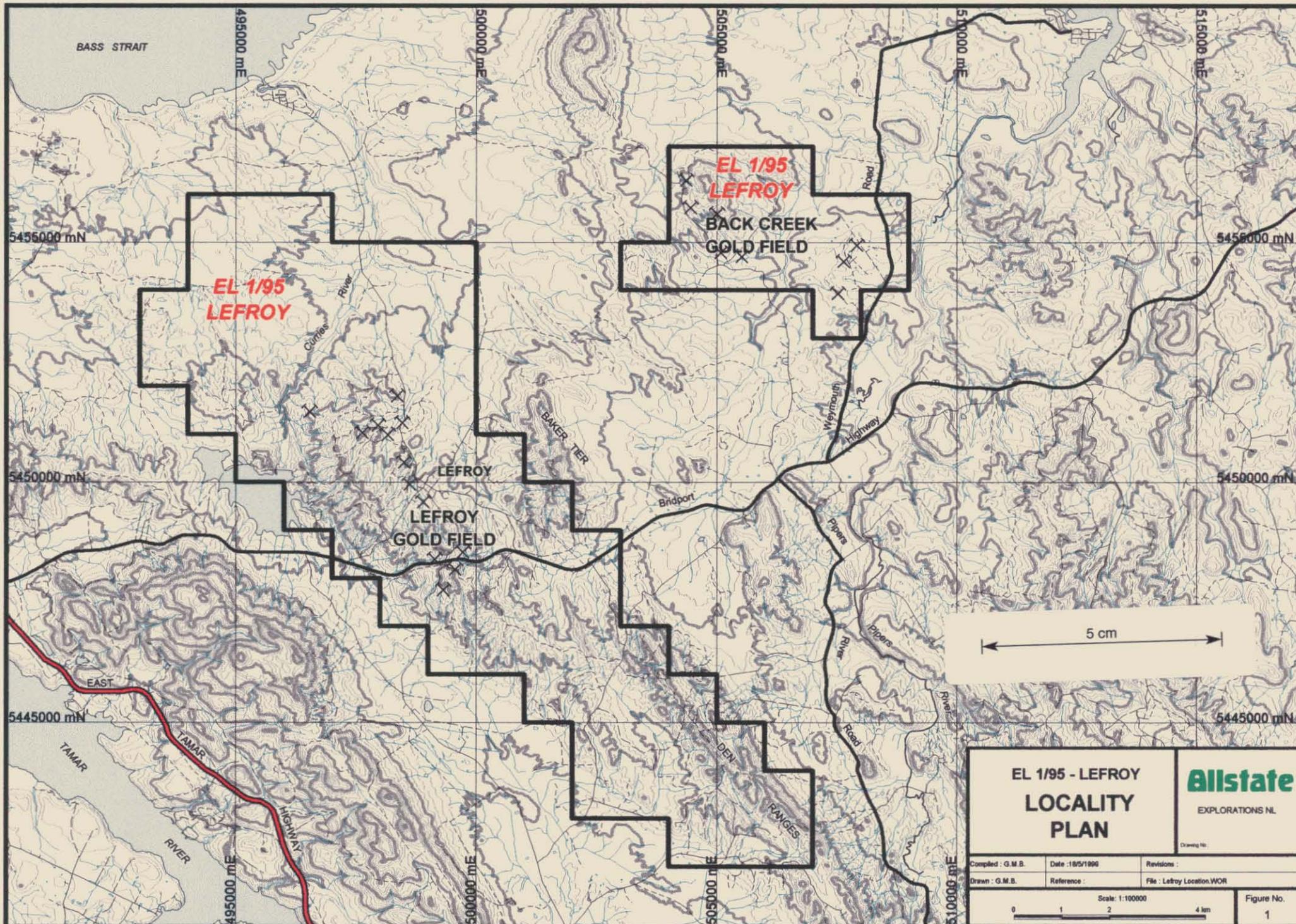
Allstate switched the search focus to further high-grade ore in the known reefs. In 1997-98 drillhole L1 was sited to test the depth potential of the mined shoot in the Volunteer Reef. However, the hole deviated and although it did get a quartz reef intersection of 1.15m, it was beneath the plunge-line of the shoot and poorly mineralized (1.87g/t Au). Hole L2 tested the Chum and Pinafore reefs, also with poor results (Purvis, 1998a).

This report details the exploration undertaken at Lefroy by Allstate in the period May 1998 to May 1999. Work concentrated on further testing of the Volunteer Reef with two new holes: L3 to 232m to test the original intended target of L1, and L4/L4A to 400.5m to test both the Volunteer and West Volunteer reefs. A total of 725m was drilled.

It had been intended to also drill targets at the north end of the Lefroy field outlined in the 1997-98 report. However, following the drilling of L3 it was decided instead to test a target a short distance to the west while the rig was in the vicinity. For geological reasons, L4 tested deeper than initially planned.

Lithochemical samples were collected from the drillholes to aid in regional correlations with sedimentary rocks of similar age, particularly those hosting the Beaconsfield Gold Mine 18km to the SW of Lefroy.

In addition, the large mullock dump at the Volunteer Mine was bulk sampled and the material sent to AMDEL in South Australia for analysis.



<b>EL 1/95 - LEFROY</b>		<b>Allstate</b> EXPLORATIONS NL
<b>LOCALITY PLAN</b>		
Compiled : G.M.B.	Date : 18/5/1996	Revisions :
Drawn : G.M.B.	Reference :	File : Lefroy Location.WOR
Scale: 1:100000		Figure No.
0 1 2 4 km		1

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### 3. LAND TENURE

EL 1/95 (Lefroy) covers 80 skm and is due to expire on 19 May 2005. The EL is held by Lefroy Gold Mines Pty Limited, a 100% owned subsidiary of Central Kalgoorlie Gold Mines NL.

See Figure 1.

In October 1994 Lefroy Gold Mines was granted two EL's surrounding Lefroy. EL 21/94 (Bell Bay) encompassed 219 skm and EL 22/94 (Pipers River) 202 skm. The contiguous EL 1/95 (Lefroy) of 30 skm covering the main goldfield area was granted to Lefroy Gold Mines in May 1995. All licences carried tenure periods of 10 years.

In October 1996, EL 21/94 (Bell Bay) and EL 22/94 (Pipers River) were reduced to 77 skm and 67 skm respectively.

In July 1997 Allstate Explorations NL entered into a joint venture agreement with Lefroy Gold Mines on all three EL's whereby Allstate is required to spend at least \$200,000 by 31 July 1999, and a further \$500,000 by 31 July 2001 to earn 60% equity.

In October 1997, 90 skm was relinquished from the Bell Bay and Pipers River licences. Immediately following the reduction the remaining ground in all three tenements was amalgamated into the current single consolidated EL 1/95 (Lefroy), comprising two areas totalling 80 skm. The amalgamation was ratified by the Director of Mines on 14 January 1998.

EL 1/95 comprises Crown Land, State Forest-Multiple Use Forest Land, part of the Lefroy RAP, part of the Den Ranges RAP, and private property.

Within the licence area but excluded from it are:

- \* 20 ha of Crown Reserves
- \* 0.5 skm of the Curries River Reservoir
- \* 664 ha of Mining Leases (mainly in the Back Creek area).

#### 4. GEOLOGY

The Lefroy Goldfield is hosted by Early Ordovician sediments of the Mathinna Group, a thick deep-water turbiditic sequence. Exposure is poor as the rocks weather readily. The Palaeozoic sequence is extensively covered by Tertiary basalt and Tertiary-Quaternary gravels and sands. See Figures 2 & 3.

The Mathinna Group at Lefroy comprises a folded and cleaved sequence of quartz-mica sandstones, siltstones and grey-black shales, striking NW and dipping at low to moderate angles to the SW. These rocks have been described by Powell & Baillie (1992) as being in the transitional zone between the basal formation of the Mathinna Group - the Stoney Head Sandstone - and the overlying formation to the NE - the Turquoise Bluff Slate.

At Lefroy the sediments are affected by conspicuous chlorite-sericite alteration, strong enough to cause regional-scale magnetic depletion centred on the goldfield. Within this depleted area there are local magnetic lows, some of which appear directly associated with mined gold shoots (eg: at the Volunteer and Reward reefs). However, widespread shallow drilling of alteration anomalies found they were unmineralized (Purvis, 1997).

Recent Allstate work shows this early widespread chlorite-sericite alteration is overprinted by localised silica-sericite alteration related to structures hosting the gold-bearing reefs. However, it is believed the earlier alteration had an important precursor role in the location of the goldfield, possibly by reducing the competency of the host rocks so that they later became a locus for the mineralized structures.

The auriferous quartz reefs are hosted by large east-west D2 faults dipping steeply north or south. Some of these structures (eg: the Chum, Pinafore and Volunteer) are 1-2km long with crush zones to 30m wide. Disruption or destruction of the reefs by post-vein fault movements is common. At least 30 parallel reefs are known, arranged like rungs of a ladder over a distance of 4.5km along the NW strike of the sediments (see Figure 3).

The widespread alteration and mineralization at Lefroy are considered indicative of deep-seated fluid conduits beneath the area.

About 165,000 oz of gold (90% of total production) has come from just four reefs: the Chum, Pinafore, New Native Youth and Volunteer. Within the reefs gold occurs in high-grade shoots and historically, mined grades were around 30g/t Au. Almost all known (now mined out) shoots were less than 130m deep and only minor gold was found below 150m, although in two mines (Pinafore and Volunteer) the reefs were tested by underground development to depths of 370-380m.

Arsenopyrite, pyrite and trace chalcopyrite are associated with the gold mineralization. The arsenopyrite-gold association is particularly notable. Old reports on the goldfield (eg: Montgomery, 1897) mention stibnite as the most common associate, but only minute traces of antimony have been detected in modern assaying of auriferous reef quartz. However, much of the arsenopyrite is bladed and may have been mistaken for stibnite.

## 5. RESULTS

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### 5.1 DRILLING OF VOLUNTEER REEF

#### 5.1.1 Hole L3

The geological section of hole L3 is shown with hole L1 in Figure 6. The detailed log of L3 is in Appendix 1.

In 1997-98 hole L1 aimed to test down-plunge beneath the worked gold shoot in the old Volunteer Mine. The difficult drilling conditions now so apparent at Lefroy (see Section 6) were not anticipated and the hole deviated. The weakly-mineralized intersection on the reef obtained by L1 (1.15m @ 1.87g/t Au), was 70m lower than planned and just below the plunge-line of the shoot. See Figure 5.

This year hole L3 was directed at the original L1 target, making due allowance for deviation. On 23<sup>rd</sup> February 1999 L3 was collared at 5448130N, 499812E, 41m north along section from the collar of L1 and angled at -58° to 350° AMG (see Figure 4 and Photograph 1). L3 was successfully completed at 232m on 17<sup>th</sup> March, after passing within 6m of the target point midway between 7 and 8 Levels in the old mine.

L3 intersected the Volunteer Reef Fault at 189.6-201.15m, as a large zone of puggy cataclasite with minor partially dismembered quartz-chlorite veins to 10cm thick and rare arsenopyrite. The Volunteer Reef Fault deforms the S1 cleavage in the host sandstones and shales, and is clearly D2 (or later) in age.

Although the intersection was only 75m above the reef encountered in L1, no quartz reef was present in L3. The reef had evidently been removed by post-vein movements on the fault, a feature commonly noted by the old miners working the Volunteer Reef. The best assay result from the Volunteer Reef Fault in L3 was 0.95m @ 0.3g/t Au, from the only interval with elevated arsenic: 915 ppm.

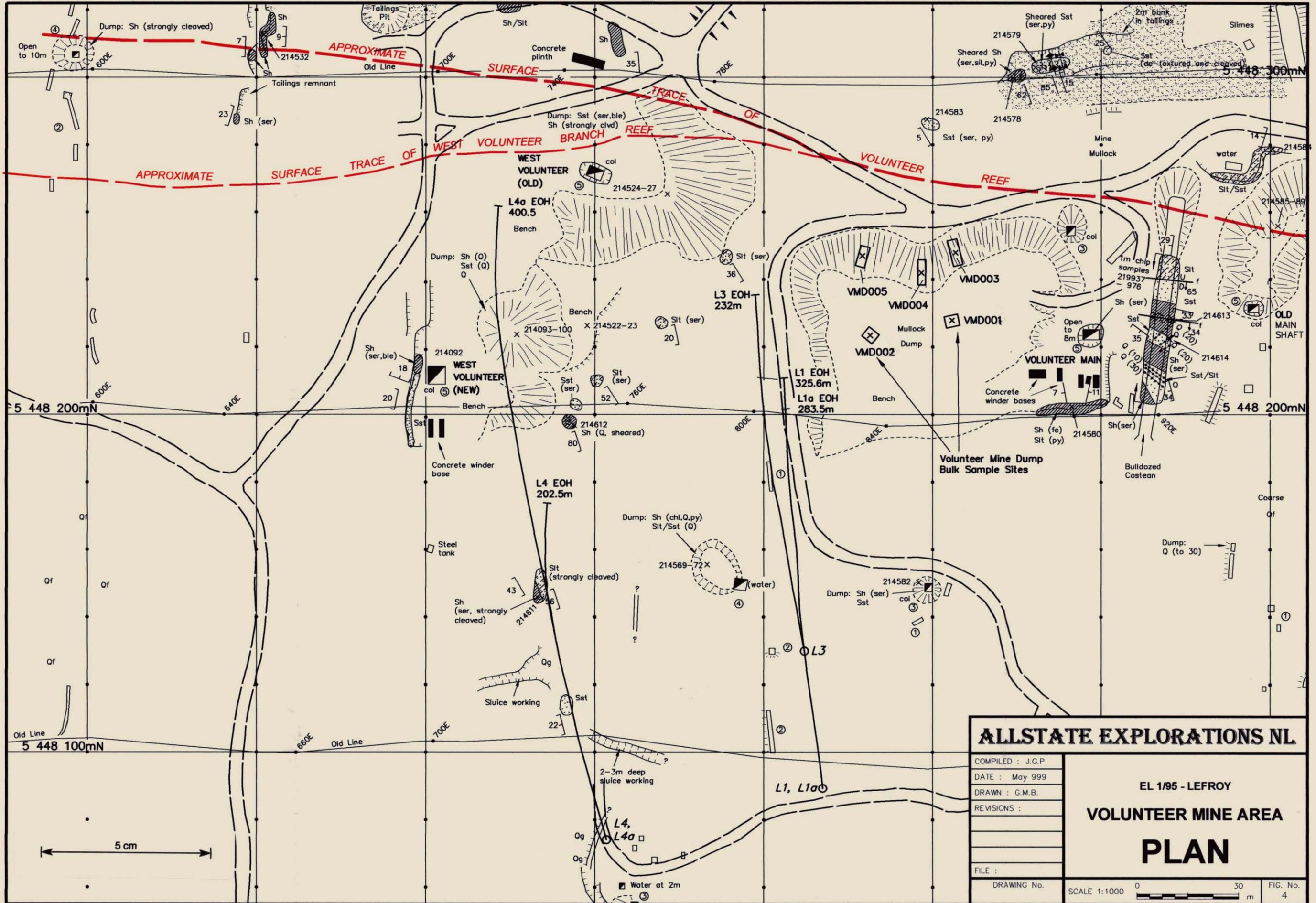
The highest gold assay in L3 was 0.6m @ 2.02g/t Au (and 0.54% As), from a fault at 182.95-183.55m containing quartz-arsenopyrite veins up to 10cm thick. This mineralized fault is believed to be the West Volunteer Branch Reef.

No other samples from L3 exceeded 0.05g/t Au.

Orientated core measurements were made during the drilling of both L3 and L4 / 4A. These readings are plotted on the sections.



*Photograph 1: Hole L3 in progress at Volunteer Mine, March 1999*



<b>ALLSTATE EXPLORATIONS NL</b>	
COMPILED : J.G.P	EL 1/95 - LEFROY <b>VOLUNTEER MINE AREA</b> <b>PLAN</b>
DATE : May 999	
DRAWN : G.M.B.	
REVISIONS :	
FILE :	
DRAWING No.	SCALE 1:1000
	FIG. No. 4

### 5.1.2 Hole L4 / L4A

See Figure 7 for the geological section. The logs are in Appendices 2 & 3.

#### *Targeting Criteria*

Following the no-reef result in L3 it became evident that the quartz reef intersection in L1, although weakly-mineralized, was more significant than first realised.

The results of holes L1 and L3, combined with information in the old reports on the Volunteer Mine, suggest the pattern of stoping within the old shoot is essentially a map of residual quartz distribution within the Volunteer Reef Fault. What was probably once a continuous sheet of quartz has been torn apart and partially crushed by later fault movements.

Montgomery (1897) and Twelvetrees (1899) mention large "blanks" in the reef where little or no quartz was present, only the "lode formation" comprising the "crushed mullock" of the fault itself (as in L3). They also talk of sizeable isolated blocks of auriferous quartz within the fault, which were big enough to be stoped. These features were best seen on 2 Level in the old mine. Most of the worked reef apparently occurs in large gently west-plunging panels within the Reef Fault, as shown in Figure 5.

This pattern and the old descriptions suggests there is a very low-angle west-dipping structural control on the distribution of the mined quartz panels and the blanks between them. This attitude broadly parallels the overall dip of the stratigraphy and may be related to the widespread bedding-parallel faulting seen in all Lefroy drillcore. As documented in the drill logs this faulting commonly crushes all the various phases of quartz veining present, cuts and/or disturbs both the S1 and S2 cleavages, and is clearly very late-stage.

Thus the reef intersection in L1 may be indicating that a panel of reef quartz exists within the Volunteer Reef Fault around 1920m RL (-80m MSL), below the main old workings. If the panel extended at least 85m west of L1 it would lie on the down-plunge axis of the known gold shoot. This prospective position was chosen as the target for hole L4.

#### *Hole Planning*

L4 was also designed to test the West Volunteer Branch Reef. The gold shoot outline shown in Figure 5 actually comprises workings on two reefs, although this is not made clear on Montgomery's 1897 section on which Figure 5 is based. At about AMG 499825E near the western limit of the Volunteer Mine workings, the West Volunteer Branch Reef diverged from the main reef on the footwall margin of the Volunteer Reef Fault and

going west, traversed across the fault crush zone and into the hangingwall sediments.

The West Volunteer Branch Reef was very rich (producing 11,252 oz at a recovered grade of 133g/t Au prior to 1897 according to Montgomery), and was strongest (and richest) in the area of its junction with the Volunteer Reef. However, at depth and going west it gradually became thinner and eventually petered out in the West Volunteer Extended workings.

#### *Hole L4*

L4 was sited 64m west of L1 at 5448074N, 499753E, directed 345° AMG at -55°. As mentioned, the hole had two targets: the West Volunteer Branch Reef directly below its deepest workings and the main Volunteer Reef down the axis of the gold shoot at 1915m RL (-85m RL AHD and 5m lower than the L1 intersection to allow for a slight westerly plunge on the interpreted quartz panel).

The rocks in this area have an overall dip at low angles to the SW, so the geology in all the holes (L1, L3, L4) is essentially similar. However, at 135m downhole (in HQ size) L4 unexpectedly began swinging sharply to the east, going 10° in just 25m. Despite efforts to slow the swing, it continued and the hole was terminated at 202.5m with it 16° off course and still well short of target.

#### *Hole L4A*

L4 was cemented back to 88m and a new hole, L4A, was cut out of L4 at 110m using an HQ chrome barrel. The new hole avoided the easterly swing experienced by L4.

In L4A the West Volunteer Branch Reef was intersected as two veins of grey arsenopyrite-bearing quartz 3m apart. The upper vein was 15cm wide at 252.4-252.55m, assaying 0.72g/t Au and 0.22% As (see Photograph 3). The lower (main) vein was 40cm wide at 255.75-256.15m, with 30% included rock fragments in the quartz and assayed 6.37g/t Au, 0.48% As (see Photograph 2). Both veins were intersected at angles of 45°.

The main Volunteer Reef Fault was intersected at 267.5-270.2m, much closer to the West Volunteer Branch Reef than anticipated from their 50m separation on 3 and 4 Levels in the West Volunteer Mine (see Figure 7 and Photograph 4). Because of this the Volunteer Reef Fault intersection (1936m RL) was 21m higher than intended. A lower RL would have



*Photograph 2: West Volunteer Branch Reef 255.75 – 256.15m, Hole L4A (0.4m @ 6.37 g/t Au)*



*Photograph 3: Fractured grey quartz with arsenopyrite from the West Volunteer Upper vein of the West Volunteer Branch Reef, 252.4 – 252.55m, Hole L4A (0.15m @ 0.72 g/t Au)*

been a more satisfactory test of the quartz panel concept (see Figure 5). This concept has not been disproved.

As in L3, the Volunteer Reef was missing from the Reef Fault intersection in L4A, which again comprised puggy cataclasite, although this time thin dismembered quartz veins were more common. Arsenopyrite was again rare. The best intersection was only 0.8m @ 0.23g/t Au.

Because the Volunteer Reef Fault had a flatter southerly dip than expected, L4A was pushed on to test for branch reefs that may have dropped from the main structure. Two such lodges were intersected, as zones of fracturing with thin quartz-ankerite-arsenopyrite veins. The stronger of these, at 311.8-314.4m, assayed 0.61g/t Au over 1.6m. The weaker lower zone at 371.5-372.45m assayed only 0.03g/t Au. It correlates with the minor Cadet Reef seen at surface and which junctions with the Volunteer Reef further east.

## 5.2 INVESTIGATIONS OF HISTORICAL MINE DUMPS (P.B.Hills)

An initial objective of Allstate Explorations NL upon embarking on the Lefroy Joint Venture was to assess the potential of the historical mine dumps scattered across the Lefroy Goldfield as a source of low grade commissioning feed for the Beaconsfield Gold Mine.

A clause within the Lefroy Joint Venture Agreement allowed Allstate to investigate the potential of and ultimately remove up to 50,000 bank cubic metres (bcm) at a consideration to Lefroy Gold Mines of \$1 per bcm. The clause stated that expenditure in this regard did not constitute exploration expenditure for the purpose of the Joint Venture Agreement.

Stringent environmental constraints on exploration imposed by Mineral Resources Tasmania, Forestry Tasmania and the Department of Environment and Land Management, due to perceived heritage values of the dumps, effectively prevented a serious programme of investigation being carried out.

It was agreed, however, that an investigation of the Volunteer Main Dump could proceed as this had recently been vandalised by the illegal mining activities of a third party and heritage values had been largely destroyed. Work was carried out between June and August 1998.

The investigation involved the collection of five (5) large samples of dump material using an excavator. Samples comprised an unbiased bulk of all material from top to bottom at each of the five separate sites. Each sample filled a 205 litre drum. Three samples, 7-8m deep, were taken down the northern face of the dump and two down the walls of 5m deep pits dug in the dump's flat upper surface. The sample sites are shown in Figure 4 and in Photographs 5-7.

Samples were shipped to AMDEL Laboratories in Adelaide for bulk crushing and sampling. A composited sample from the assay rejects was further analysed metallurgically.

Assay results were uniformly disappointing. Each bulk sample was crushed to -6mm and duplicate 4kg sub-samples split out for pulverising and duplicate fire assay.

Results are shown in Table 1.

Simple metallurgical testing involved amalgamation of a composite of the assay rejects followed by cyanidation of the amalgamation residue to determine what percentage of the gold present might be readily recoverable.

Amalgamation recovered only 17% of the available metal. Cyanidation indicated that the material was substantially preg-robbing.

Full results of the testwork completed by AMDEL are included in Appendix 5.

**Table 1: Volunteer Mine Dump Sample Results**

Sample	Position	Split A Au(g/t)	Split B Au(g/t)	Ave. Au(g/t)
VMD001	0-5m pit, Top <del>West</del> EAST	1.37, 1.28	4.74, 2.63	2.51
VMD002	0-5m pit, Top East <del>WEST</del>	0.74, 0.75	0.75, 0.72	0.74
VMD003	0-7m scrape, Face East	0.66, 0.60	0.76, 0.75	0.70
VMD004	3-8m scrape, Face Centre	1.98, 2.52	2.01, 3.43	2.49
VMD005	3-8m scrape, Face West	0.07, 0.06	0.08, 0.06	0.07

Sample	As (ppm)	Fe (%)	Cu(%)	Pb (%)	Zn (%)	Ag (ppm)	S (%)
VMD001	1450	3.45	0.045	0.005	0.015	<2	0.27
VMD002	1200	3.10	0.020	0.005	0.020	<2	0.29
VMD003	1150	3.71	0.030	0.005	0.015	<2	0.17
VMD004	2800	3.71	0.040	0.005	0.015	<2	0.52
VMD005	450	3.87	0.010	0.010	0.025	<2	0.23



Photograph 4: Volunteer Reef fault, 267.5 – 270.2m, Hole L4A



Photograph 5: Northern Face of Volunteer Mine dump Sample site VMD 003 (Centre left) and VMD 004 (Centre right)



*Photograph 6: Sampling at site VMD 004, Volunteer Mine Dump*



*Photograph 7: Sample Pit VMD 001, Volunteer Mine Dump*

### 5.3 LITHOGEOCHEMISTRY

A total of 22 samples were collected at intervals down holes L4/L4A and despatched to Analabs for comprehensive lithogeochemical analysis. Sampling was directed at two main rock types: sandstones and black shales. Results are listed in Table 2 and in the drill logs in Appendices 2 & 3.

The sampling was done as part of Allstate's attempts to use lithogeochemistry to resolve questions of correlation within the Palaeozoic sediments of Northern Tasmania, particularly the Ordovician sequences. The Lefroy samples are from the Lower Ordovician Stoney Head Formation of the Mathinna Group. In Table 2 and Figures 8-13 they are compared to two Ordovician units at Beaconsfield: sandstones from the Lower Transition Beds of the Cabbage Tree Formation and black shales from the Grubb Shale, as well as the Ordovician Supply River Sandstone from Mt Careless 15km south of Beaconsfield.

Although the sample database is too small and geographically restricted to draw any firm conclusions, some comments can be made.

#### *Sandstones*

- # Average Cr is lower at Lefroy (90ppm versus 257 at Beaconsfield and 198 at Mt Careless).
- # Sr is much higher at Lefroy, averaging 158ppm versus 29 for Beaconsfield and 7 for Mt Careless. This result is not altered if an isolated 1080ppm value at Lefroy is removed: the average remains high at 90ppm.
- # P at Lefroy is double that of Mt Careless, 518ppm versus 264 (there is no P data for Beaconsfield).
- # Ba at Lefroy is higher (364ppm versus 136 at Beaconsfield and 84 at Mt Careless). The higher Ba and Rb at Lefroy appears to be reflecting the fact that the Lefroy sandstones contain more finer-grained material than the others.

#### *Black Shales*

- # Average Ti in the Lefroy shales (3030ppm) is identical to that for the sandstones (3022ppm). This is not the case at Beaconsfield where there is a marked increase in Ti with decreasing grain size, from 2265ppm in the sandstones to 4231ppm in the Grubb Shale. This trend is also present at Mt Careless, where Ordovician conglomerates average 601ppm Ti, sandstones 2641ppm and siltstones 4249ppm (Purvis, 1998b).
- # The black shale at Lefroy averages 871ppm Ba, which is significantly lower than the Grubb Shale at Beaconsfield (1278ppm).

- # The values for Cr (120ppm & 134ppm) and Sr (79ppm & 73ppm) are similar for the black shales at both Lefroy and Beaconsfield.
- # Although there is no P data for Beaconsfield, the Lefroy average is very high at 970ppm (including one sample of 3350ppm).

- # The black shale at Lefroy averages 871ppm Ba, which is significantly lower than the Grubb Shale at Beaconsfield (1278ppm).
- # The values for Cr (120ppm & 134ppm) and Sr (79ppm & 73ppm) are similar for the black shales at both Lefroy and Beaconsfield.
- # Although there is no P data for Beaconsfield, the Lefroy average is very high at 970ppm (including one sample of 3350ppm), again confirming the radiometric response.

**TABLE 2: LITHOGEOCHEMISTRY OF MATHINNA GROUP AT LEFROY**

<b>BLACK SHALES (6 samples)</b>																							
Sample	Description	Ti	Zr	Ti/Zr	V	Nb	Rb	Y	Nb/Y	Ba	Sr	Cr	Sn	W	P	Ni	Co	Be	Sc	Th	Ta	Hf	B
L4: 19.15-19.65m	Pyritic black shale	3180	155	20.5	188	15	161	23	0.65	1010	67	108	4	<10	560	42	20	2	8	<10	<20	<20	195
L4: 34.3-35.0m	Pyritic black shale	2300	115	20.0	124	10	130	19	0.53	895	86	69	5	<10	315	31	16	<2	10	<10	<20	<20	68
L4: 47.65-48.15m	Pyritic black shale	3500	141	24.8	178	14	165	20	0.70	1060	115	110	4	<10	535	49	20	<2	13	<10	<20	<20	80
L4: 65.6-66.1m	Pyritic black shale	2620	113	23.2	134	10	135	15	0.67	835	38	66	4	<10	315	45	18	<2	11	<10	<20	<20	60
L4: 156.5-157.2m	Pyritic black shale	3200	125	25.6	251	12	199	30	0.40	690	62	160	3	<10	745	69	24	2	14	11	<20	<20	52
L4A: 115.75-116.2m	Black shale	3380	139	24.3	271	13	198	34	0.38	735	106	209	<3	<10	3350	59	16	2	13	10	<20	<20	58
<b>Average</b>		<b>3030</b>	<b>131</b>	<b>23.1</b>	<b>191</b>	<b>12</b>	<b>165</b>	<b>23</b>	<b>0.55</b>	<b>871</b>	<b>79</b>	<b>120</b>	<b>4</b>	<b>&lt;10</b>	<b>970</b>	<b>49</b>	<b>19</b>	<b>&lt;2</b>	<b>11</b>	<b>&lt;10</b>	<b>&lt;20</b>	<b>&lt;20</b>	<b>85</b>
<b>GRUBB SHALE (BEACONSFIELD) 6 samples</b>																							
<b>Average</b>		<b>4231</b>	<b>218</b>	<b>19.8</b>	<b>120</b>	<b>14</b>	<b>192</b>	<b>39</b>	<b>0.37</b>	<b>1278</b>	<b>73</b>	<b>134</b>	<b>6</b>			<b>49</b>	<b>11</b>						
<b>SANDSTONES (15 samples)</b>																							
Sample	Description	Ti	Zr	Ti/Zr	V	Nb	Rb	Y	Nb/Y	Ba	Sr	Cr	Sn	W	P	Ni	Co	Be	Sc	Th	Ta	Hf	B
L4: 79.75-79.25m	Silty sandstone	3010	216	13.9	61	13	100	23	0.57	480	62	51	6	<10	480	25	9	<2	9	12	<20	<20	68
L4: 108.7-109.2m	Silty sandstone	3440	218	15.8	67	14	110	29	0.48	460	52	61	6	<10	575	27	10	2	11	16	<20	<20	72
L4: 135.75-136.25m	Qtzose sandstone	2060	258	8.0	33	8	56	23	0.35	220	133	36	4	<10	470	12	<5	<2	5	12	<20	<20	60
L4: 153.5-153.9m	Fine qtz-feld sst	3150	212	14.9	63	12	90	30	0.40	355	53	57	4	<10	735	30	9	<2	10	17	<20	<20	76
L4: 169.5-170.4m	Coarse qtzose sst	2750	368	7.5	40	10	45	26	0.38	170	48	49	5	<10	545	15	6	<2	6	24	<20	<20	70
L4: 189.0-189.7m	Silty sandstone	2500	309	8.1	35	10	58	24	0.42	215	55	40	5	<10	440	14	6	<2	6	20	<20	<20	68
L4: 199.0-199.7m	Fine qtzose sst	3060	232	13.2	46	12	104	28	0.43	400	122	57	10	<10	615	23	9	<2	9	17	<20	<20	68
L4A: 221.25-221.8m	Fine sandstone	3260	232	14.1	67	12	107	34	0.35	395	165	58	7	<10	520	20	13	<2	10	14	<20	<20	32
L4A: 242.2-243.1m	Fine sandstone	2890	245	11.8	57	11	89	21	0.52	330	73	272	4	<10	505	17	11	<2	8	14	<20	<20	<25
L4A: 273.4-273.9m	Qtzose sandstone	1780	235	7.6	31	10	54	25	0.40	190	124	37	5	<10	330	<10	<5	<2	5	13	<20	<20	<25
L4A: 283.0-283.7m	Silty sandstone	3920	254	15.4	92	16	160	35	0.46	570	53	222	3	<10	455	27	18	2	13	20	<20	<20	<25
L4A: 329.2-329.85m	Silty sandstone	4390	182	24.1	108	18	213	31	0.58	690	58	85	8	<10	470	33	19	3	16	19	<20	<20	26
L4A: 346.5-347.5m	Fine sandstone	2350	154	15.3	48	7	61	44	0.16	235	1080	90	5	<10	575	12	9	<2	8	10	<20	<20	<25
L4A: 365.5-366.5m	Fine sandstone	3990	200	19.9	88	15	146	34	0.44	510	88	71	6	<10	510	27	19	2	13	17	<20	<20	<25
L4A: 381.5-382.2m	Fine sandstone	2780	213	13.1	49	11	72	32	0.34	240	207	164	4	<10	545	16	11	<2	8	13	<20	<20	<25
<b>Average</b>		<b>3022</b>	<b>235</b>	<b>13.5</b>	<b>59</b>	<b>12</b>	<b>98</b>	<b>29</b>	<b>0.42</b>	<b>364</b>	<b>158</b>	<b>90</b>	<b>5</b>	<b>&lt;10</b>	<b>518</b>	<b>20</b>	<b>10</b>	<b>&lt;2</b>	<b>9</b>	<b>16</b>	<b>&lt;20</b>	<b>&lt;20</b>	<b>41</b>
<b>LOWER TRANSITION SANDSTONES (BEACONSFIELD) 10 samples</b>																							
<b>Average</b>		<b>2265</b>	<b>231</b>	<b>9.9</b>	<b>37</b>	<b>6</b>	<b>36</b>	<b>17</b>	<b>0.39</b>	<b>136</b>	<b>29</b>	<b>257</b>	<b>&lt;3</b>			<b>19</b>	<b>7</b>						
<b>SUPPLY RIVER SANDSTONE (MT CARELESS) 11 samples</b>																							
<b>Average</b>		<b>2641</b>	<b>311</b>	<b>8.5</b>	<b>43</b>	<b>9</b>	<b>40</b>	<b>28</b>	<b>0.33</b>	<b>84</b>	<b>7</b>	<b>198</b>	<b>4</b>	<b>&lt;10</b>	<b>264</b>	<b>13</b>	<b>6</b>	<b>&lt;2</b>	<b>6</b>	<b>&lt;10</b>	<b>&lt;20</b>	<b>&lt;20</b>	<b>115</b>

Nb/Y vs Ti/Zr for Black Shale at Lefroy and Grubb Shale at Beaconsfield

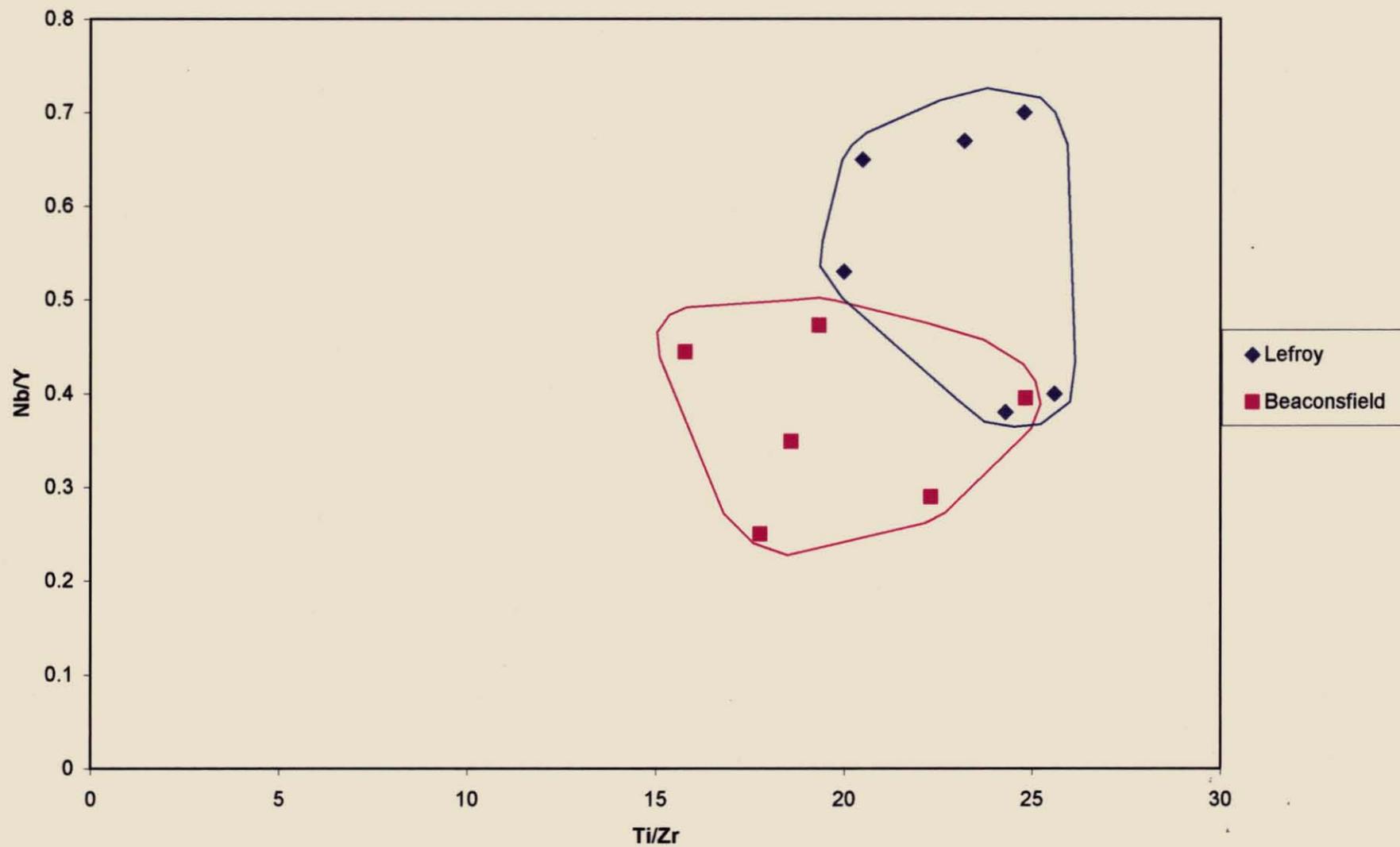


FIGURE 8

585024

**Nb/Y vs Ti/Zr for Stoney Head Sandstone at Lefroy, Lower Transition Sandstone at Beaconsfield and Supply River Sandstone at Mt Careless**

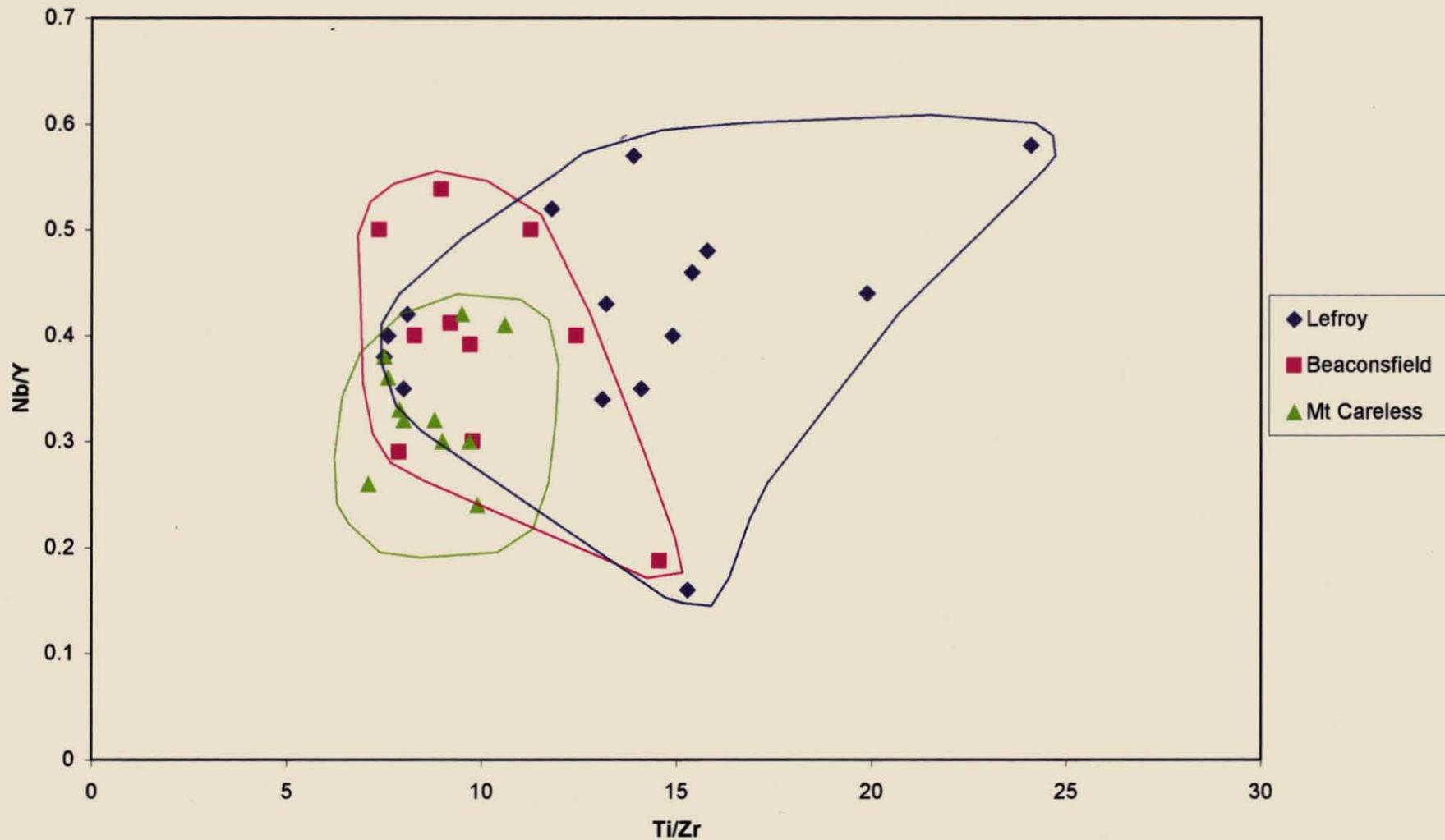


FIGURE 9

585025

Cr vs Ti/Zr for Black Shale at Lefroy and Grubb Shale at Beaconsfield

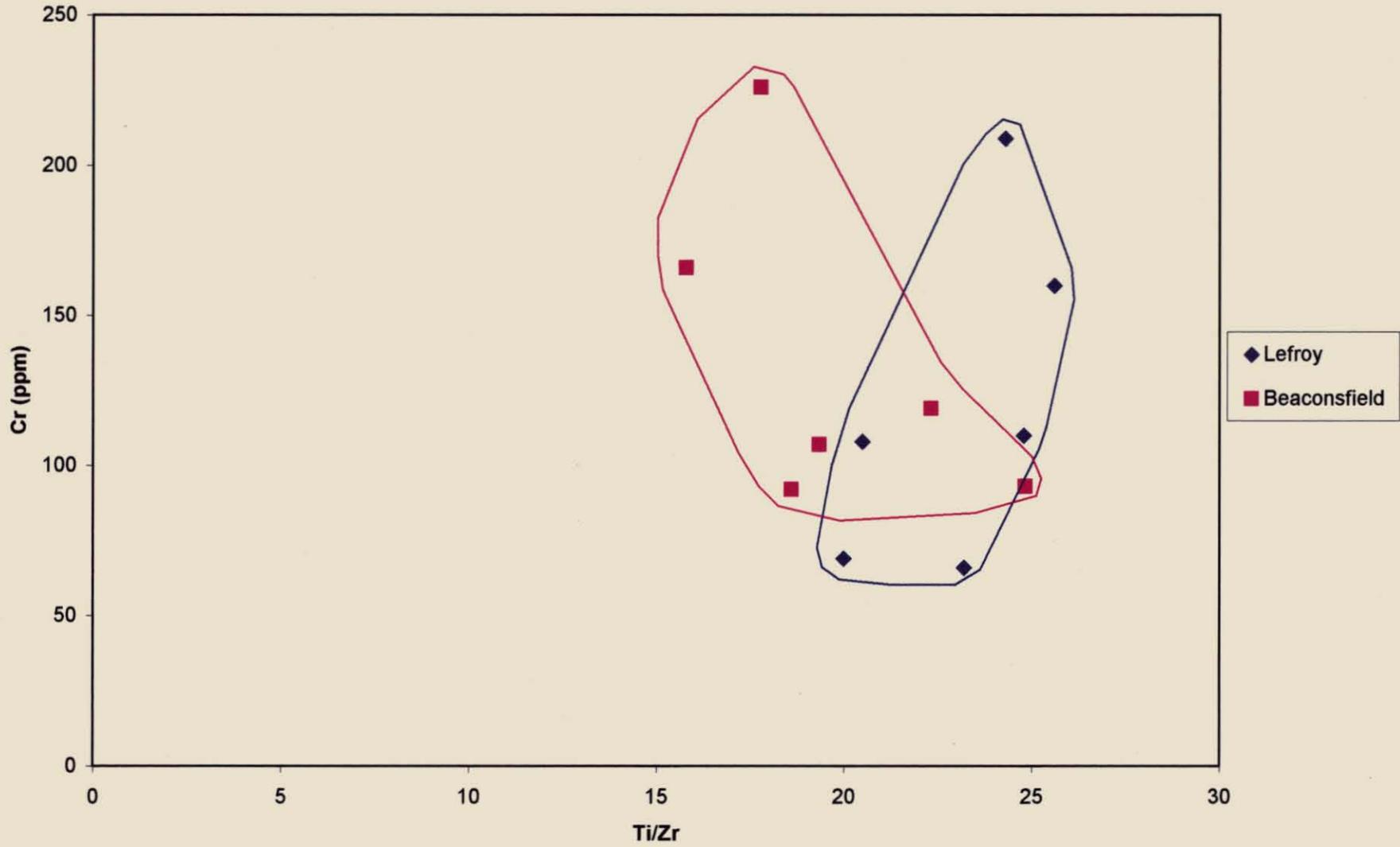


FIGURE 10

585026

**Cr vs Ti/Zr for Stoney Head Sandstone at Lefroy, Lower Transition Sandstone at  
Beaconsfield and Supply River Sandstone at Mt Careless**

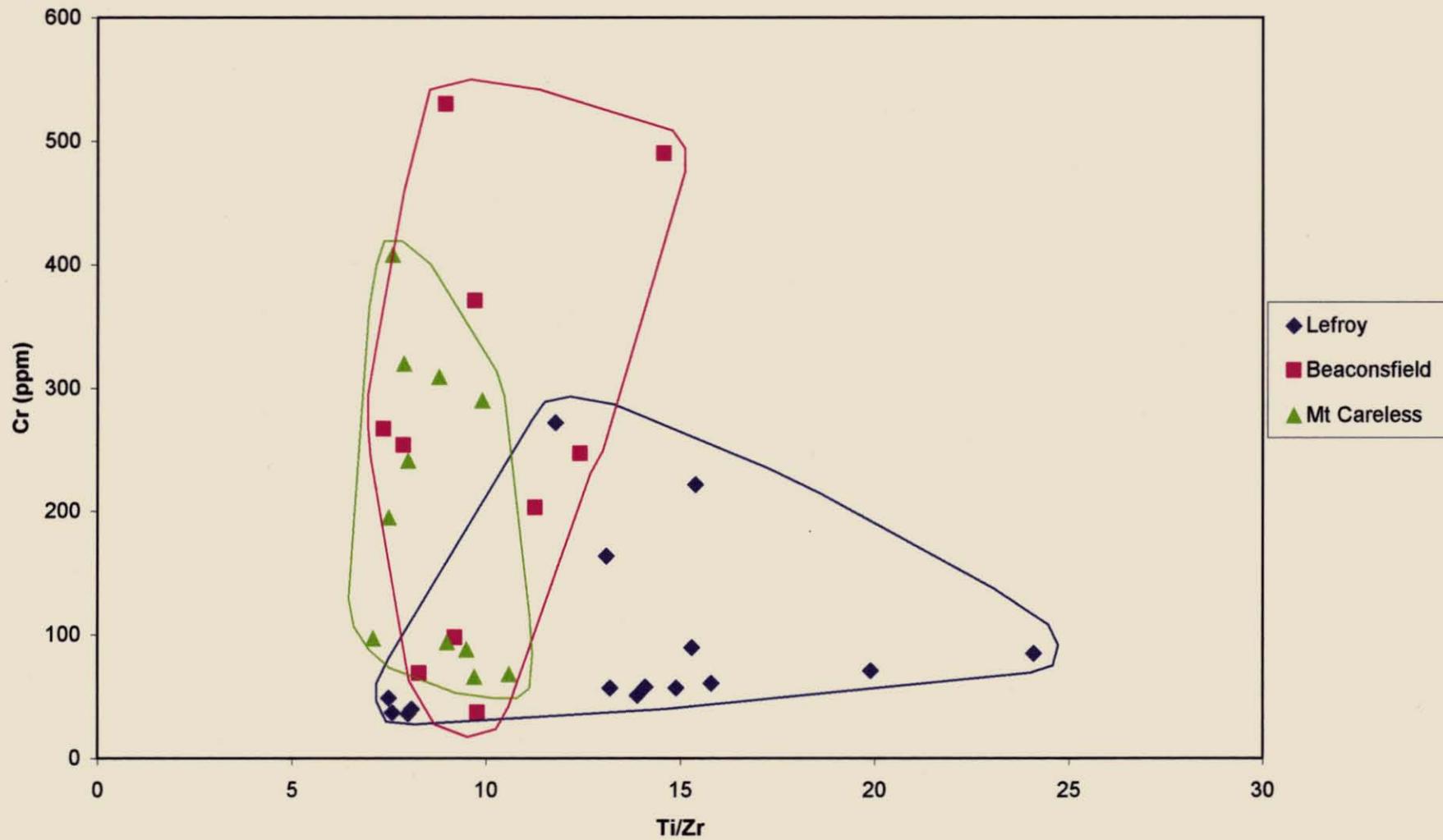


FIGURE 11

V vs Ba for Black Shale at Lefroy and Grubb Shale at Beaconsfield

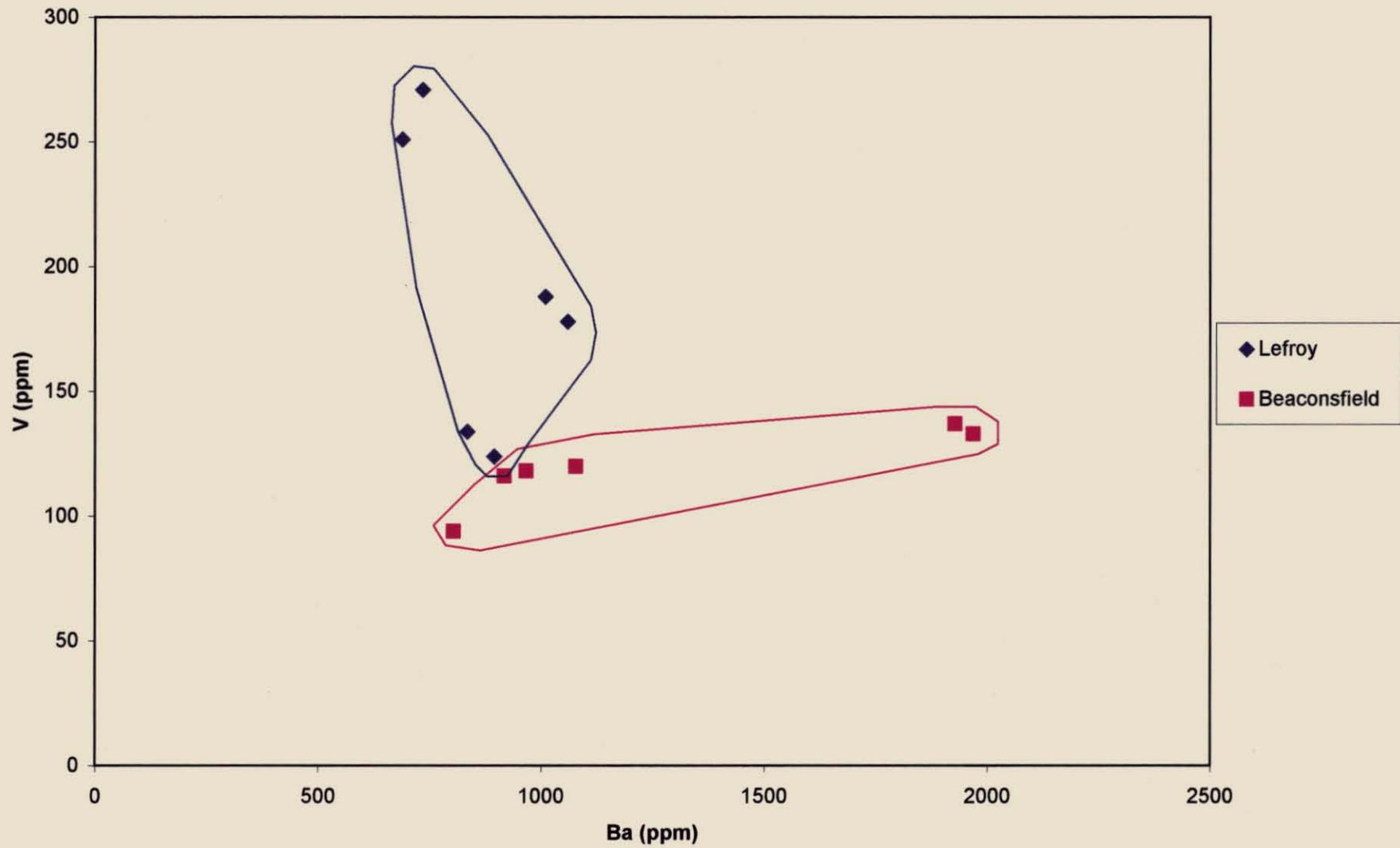


FIGURE 12

535028

**Ba vs V for Stoney Head Sandstone at Lefroy, Lower Transition Sandstone at Beaconsfield and Supply  
River Sandstone at Mt Careless**

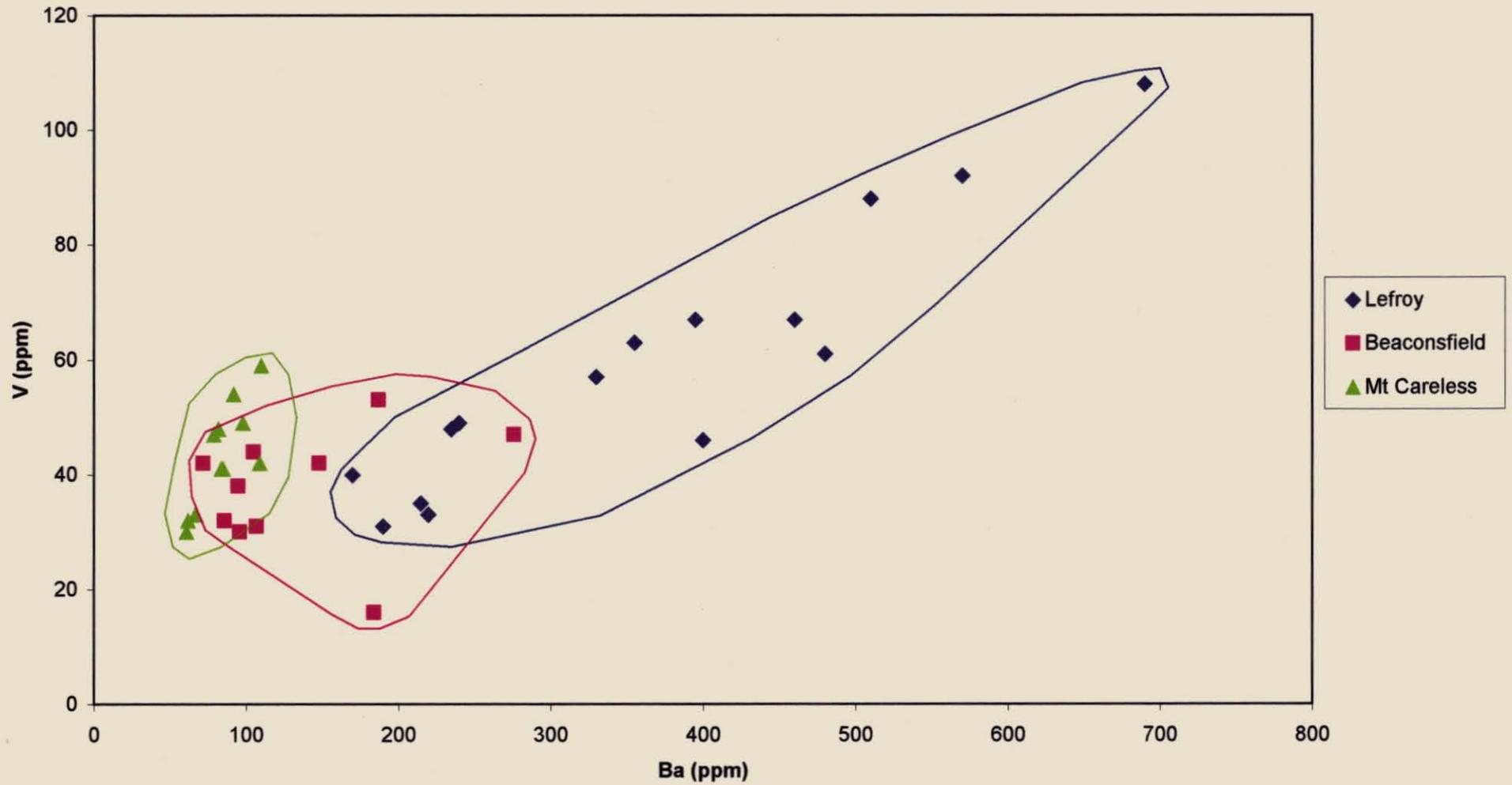


FIGURE 13

585029

## 6. DRILLHOLE DEVIATION AT LEFROY

The diamond drillholes put down by Allstate at Lefroy have all shown a consistent tendency to steepen with depth and swing to the right (east). The deviation has occurred even when chrome barrels have been used in both NQ3 and HQ3 size (triple tube gear is used because of poor ground conditions in the target zones).

The deviation problems are believed to stem from three main factors:

1. Testing the east-west reefs requires drilling along-strike in the host sediments.
2. The strong cleavage in these sediments.
3. The softening of the rocks by the chlorite-sericite alteration.

Deviation is worst in unbroken cleaved sandstone intervals, rather than in the numerous broken and faulted sections often dominated by greasy altered shale. It has proved possible to partially control the deviation by the use of chrome barrels with back-end reamers, and varying bit types. Deviation characteristics and their control are:

1. All holes steepen. The steepening rate is much the same in HQ3 as in NQ3. The rate can be increased by using step-faced bits and pressure, and decreased by using a chrome barrel with back end reamer.
2. All holes swing to the right. Above 100m there is a slight tendency to drift left before the right swing becomes established. The right swing is usually gradual, but in good ground (sandstone-dominated sections) it can accelerate sharply in both HQ3 and NQ3 (with the latter even when a chrome barrel is used –eg: the 40° east swing in the basal 250m of L2 when a NQ chrome barrel was employed).
3. The right swing tends to be more in NQ3 than HQ3. In NQ3 a chrome barrel with back-end reamer makes no difference to the swing rate, but in HQ3 a chrome barrel with reamer definitely reduces it.
4. Applying pressure to increase penetration rate increases the deviation, either the steepening or the swing. Holes must be drilled with rod weight (less at depth).

These factors need to be taken into account when planning diamond drillholes at Lefroy. Allowance has to be made for the gradual steepening and right-hand swing, with a chrome barrel and back-end reamer used when entering zones where substantial sections of good ground are anticipated. Holes should be drilled HQ3 size as far as possible.

The deviation problems highlight that the 23 AX-sized holes drilled at Lefroy in 1935-38 by the Mines Department and designed to be straight, would have gone nowhere near their planned targets (Blake 1937 & 1938). It is likely that most of these holes failed to hit their target reefs which probably explains why none intersected economic gold values.

## 7. DISCUSSION

### 7.1 VOLUNTEER MINE AREA

In hole L4A the separation between the West Volunteer Branch Reef and the Volunteer Reef Fault is only 11m. One hundred metres up-reef on 3 and 4 Levels in the old West Volunteer Mine the separation is 50m.

This closing is largely due to a marked flattening in dip of the Volunteer Reef from  $-80^{\circ}$  S above 3 Level to  $-55^{\circ}$  S below 4 Level. As can be seen in Figure 7 there are clear indications the two reefs may join again about 40m below L4A, around 1900m RL.

The upper junction of the two reefs is in the workings of the old Volunteer Mine 100m east of L4A. It is worth reading Montgomery's 1897 description of the West Volunteer Branch Reef in this vicinity:

"In the lowest levels of the West Volunteer the lode seems to pinch and become quite a small fracture in the rock, hardly at all faulting the country strata, becoming the small break seen in the West Extended Volunteer levels south of the shaft. Where it joins the main Volunteer lode, however, it becomes a strong reef and appears to fault the strata."

Obviously the West Volunteer Branch Reef was also very high grade here, judging from the extensive stoping seen in Figure 5 and the fact that the average recovered grade from the reef was 133g/t Au.

Both the upper and lower quartz-arsenopyrite veins representing the West Volunteer Branch Reef in L4A occupy strong D2 faults on either side of a block or horst of siltstone-shale within the sandstone-dominated sequence. The main (lower) vein or reef has a true width of 30cm (and a grade of 6.4g/t Au). The L4A intersection 25m below the lowest level in the old mine, hardly fits Montgomery's description of a "small fracture in the rock".

Two possibilities are:

- a) The lowest level of the West Volunteer Mine (6 Level) was excavated on the thinner and less-mineralized upper vein in L4A, which lies 2-3m east of the main branch reef.
- b) The West Volunteer Branch Reef is improving again with depth below the old workings.

The latter seems more likely. The cross-cut south from the West Volunteer shaft on 6 Level would have to have cut across the main branch reef position in order to get to the easterly vein, so it is unlikely the old miners developed on the wrong one.

More importantly, an improvement in the West Volunteer Branch Reef with depth as it approached a junction with the Volunteer Reef below L4A, could perhaps be expected given that Montgomery describes the Branch Reef as being strongest at its upper junction with the Volunteer Reef.

The postulated lower junction of the two reefs is clearly a drill target. It should be feasible to test it by wedging a branch hole from the upper part of L4 and using a step-face bit to increase the steepening. The hole would also further test the quartz panel concept that was the original justification for L4.

It is interesting to note that amongst all the signs of compressional thrusting and crushing at Lefroy, the anastomosing reef patterns made by the Volunteer and West Volunteer reefs are classic indications of extension.

## 7.2 DISRUPTION OF THE ORE SHOOTS

The L4A result shows that it is possible to intersect significant gold values in unmined sections of the reefs. This has not been demonstrated before at Lefroy. Almost certainly there is good-grade gold ore yet to be found in the numerous strong and extensive reef lines, because the amount of systematic testing to date has been so limited.

A problem becoming apparent at Lefroy is the extent of post-vein movement on the hosting east-west D2 reef faults. The old records, and now the Allstate drilling, show that many reefs are extensively dislocated, crushed and in places totally destroyed by this faulting.

Explorers not only have to find gold shoots within the reef lines, they also have to find these shoots after they have been dislocated by faulting. It is important to realize that testing such targets requires a greater than normal amount of drilling.

Major lines that have not been extensively disrupted by post-vein faulting, such as the Chum and Native Youth, are attractive exploration targets.

## 7.3 FUTURE DRILL PLANNING

Under the JV Agreement Allstate has to spend over \$400,000 on Lefroy in the next two years. The vast majority of this will necessarily be spent on drilling.

With the exception of the holes recommended in 7.1 and 7.5, before further drilling is done at Lefroy the opportunity should be taken to acquire:

- a) a more-complete knowledge of the reefs from the old records and
- b) a better overall picture of the structural geology of the goldfield.

The first can be done by a systematic search of Mines Department and other public sources, but most particularly by advertising directly to local people for data such as the missing mine plans and records.

The skeletal Lefroy plans available today were made by Government geologists copying data from mine drawings during their infrequent visits. The original mine plans are now totally missing from all public archives but almost certainly some exist in private hands. Mines as big as the Pinafore probably employed a surveyor and draftsman at times, and would have had files, sample assay ledgers and plans. No such data has been seen by Allstate.

Knowledge of the structural geology, particularly in relation to possible controls on ore shoot location, needs to be collated and upgraded (building on ideas presented last year – Purvis, 1998a). The aim being to improve the prediction of sites along the reef lines where unmined shoots might be anticipated.

Construction of a perspex sectional model of the goldfield is recommended as one way of displaying all available structural and mining information to best effect.

Although it is important to look at the goldfield as a whole, the northern area centred on the rich Pinafore-Chum and Native Youth reef systems looks the most prospective. The majority of Lefroy's gold came from this 1.5km x 1km area which hosts all the better past producers with the exception of the Volunteer and Land O'Cakes. Like the Volunteer / Land O'Cakes system, the Chum-Pinafore reefs lie on strong east-west linears of regional extent visible on the magnetics and radiometrics (Keele, 1996a).

Reducing drilling costs will also be an important part of the future testing programme. Two ways this can be done are by making careful allowance for deviation and by using rigs with mixed RC/coring capability. The near-surface rocks at Lefroy are difficult to core due to the weathering overprint on the altered and faulted sediments.

To depths in the vicinity of 50-75m, RC pre-collaring would in many cases provide more reliable samples than HQ triple-tube diamond holes (eg: recoveries in the Mathinna Group sediments down to 52m in L2 averaged only 41%). The 1995 CKGM drilling showed that RC becomes ineffective below 100m because of water inflows.

#### 7.4 VEIN STYLES

In the Allstate drillholes much of the veining in the Mathinna Group rocks appears to be late-stage, post-dating the development of the S1 cleavage.

Two main vein types are common:

A) *Quartz±chlorite±carbonate.*

The carbonate is usually some form of Fe-bearing calcite. This veining can be up to 50cm thick and is parallel or sub-parallel S0/S1. It is commonly hosted by strongly chloritized shale bands and sometimes contains minor pyrite but is barren of gold.

B) *Quartz±ankerite.*

This veining is orthogonal to S0/S1 and much thinner than Type A, usually occurring as veinlets or veins of 2-3cm (uncommonly +10cm). The vast majority of this vein style is non-sulphidic and barren but it is related to the mineralized veining, commonly occurring in and around such veins and their host structures.

Type A veins pre-date Type B, with the latter most common in zones of (quartz)-sericite alteration that overprint the chloritization associated with Type A.

*Mineralized Veining*

The gold-bearing veins are readily identifiable. They are characterized by grey quartz, arsenopyrite (lesser pyrite) and a high level of fracturing or brecciation – see Photograph 3. Arsenopyrite is a 1:1 gold indicator at Lefroy. A substantial content of included disoriented cleaved wallrock fragments is also diagnostic of this vein type (eg: West Volunteer Branch Reef in L4A – see Photograph 2). In very high grade mineralized veins chalcopyrite is apparently a notable accessory and sometimes caused the old miners problems when treating the ore (Stubs, 1899). The veins contain minor carbonate, usually pale ankerite.

The wallrocks in which mineralized veins occur are characterized stronger cleavage, quartz-sericite-kaolin-bleaching alteration, disseminated arsenopyrite (often bladed), minor pyrite and numerous quartz-ankerite veinlets. Particularly notable is the arsenopyrite (which is often greater in the wallrocks than in the veins themselves, and is concentrated within any included rock fragments), and the conspicuous hydrothermal kaolin (which occurs in seams to 3mm thick on fractures and cleavage – see Appendix 4).

The auriferous veins always occur in D2 structures that cross-cut and fold the adjacent S1 cleavage. Their relationship to the S2 cleavage is not clear in core but the very late stage post-vein crushing on these structures, so characteristic of the entire goldfield, demonstrably cuts across and destroys S2. This crushing event is not restricted to the mineralized reef faults, but commonly forms thin vein-destroying crush seams that parallel S1 and cut across S2.

## 7.5 MONARCH MINE SHALLOW ORE POTENTIAL

In early February 1997 CKGM drilled a fence of four shallow (20-24m) -60° holes across the Monarch Reef line at the southern end of the goldfield, using a hybrid RAB/RC system. The Monarch Reef is shown on Figure 3.

Hole LGR 54 (24m) intersected 5m @ 1.5g/t Au from 13-18m, in a zone of strong quartz veining in oxidized and altered sandstone-shale. Values were spread throughout the interval, but duplicates showed variations suggestive of moderately coarse gold:

		<u>Au g/t</u>	
LGR 54:	13-14m:	1.23,	1.91
	14-15m:	4.14,	2.44
	15-16m:	0.65	
	16-17m:	0.50	
	17-18m:	1.33,	1.70

Although recommended to CKGM for follow-up, this was not done (Purvis, 1997). LGR 54 remains the only test across the Monarch line, which is 200-300m long and in accessible country SW of the Volunteer.

There is modest potential here for a shallow gold resource. Testing could be easily done and is recommended using a series (5) of short (40m maximum) RC holes.

## 8. CONCLUSIONS

1. The L4A intersection on the West Volunteer Reef has demonstrated for the first time that significant gold mineralization can be located by drilling unmined sections of the known reef lines at Lefroy.
2. The West Volunteer Reef is expected to improve markedly in grade and width at its junction with the Volunteer Reef Fault 40m below L4A.
3. Given the lack of systematic testing by the old miners and subsequent explorers it is almost certain there is gold ore still to be found at Lefroy. Because the gold shoots have been disrupted by the extensive post-vein movements on the reef faults, the ore search will involve a greater than normal amount of drilling.
4. The work completed to date has significantly improved the understanding of structure and ore controls. However, the knowledge of the reefs and their old mining patterns, and the goldfield's overall structural geology, needs upgrading to improve the effectiveness of drill planning.

## 9. RECOMMENDATIONS

1. A hole is recommended to be wedged from L4 to test the interpreted intersection of the Volunteer and West Volunteer reefs at about 1900m RL.
2. About 200m of RC drilling in a series of shallow holes be put down to test the potential for shallow gold ore at the old Monarch Mine.
3. Any other drilling should be preceded by a determined effort to locate the missing old mine plans and records, by advertising for material held privately and a comprehensive search of public archives.
4. The old mining information, plus data on the structural geology of the field, needs to be collated. It is recommended it be displayed by constructing a perspex sectional model of the entire goldfield.
5. Drilling costs in future should be reduced by using a combination of RC and diamond drilling.

## 10. EXPENDITURE (P.B.Hills)

### 10.1 1998-99 EXPENDITURE

Expenditure on Lefroy EL 1/95 in the period May 1998 to May 1999 was **\$163,328**, bringing the total spent on the EL since its granting in May 1995 to **\$652,041**. The total includes \$20,568 expended on investigations of the Volunteer Dump. This expenditure is not allowable in determining compliance with the Lefroy Joint Venture Agreement but still constitutes expenditure under the *Mineral Resources Development Act, 1995*.

Expenditure details for 1998-99 are as follows:

#### *Category*

Drilling (inc. Rehabilitation)	\$89,933
Geology (inc. Dumps)	\$47,608
Geochemistry (inc. Dumps)	\$11,109
Administration	\$10,178
Other (Drafting, Survey, etc.)	\$ 4,500
<b>Total</b>	<b>\$163,328</b>

### 10.2 1999-2000 EXPENDITURE

The following table illustrates expenditure by Lefroy Gold Mines P/L and the Lefroy Joint Venture since the granting of the original licences Bell Bay EL 21/94 and Pipers River EL 22/94 in October 1994.

	EL 21/94	EL 22/94	EL 1/95	Total
Commitment to Date	(164,600)	(148,800)	(305,000)	<b>(618,400)</b>
Expenditure to Date	87,002	68,708	650,598	<b>806,308</b>
Surplus / (Deficit)	(77,598)	(80,092)	345,598	<b>187,908</b>
Commitment 1999 - 2000	Nil	Nil	(160,000)	<b>(160,000)</b>
Requirement 1999 - 2000	Nil	Nil	Nil	<b>Nil</b>

\* Figures recalculated from original statutory submissions prior to Lefroy Joint Venture Agreement.

As illustrated, there is no statutory requirement for expenditure on EL 1/95 to maintain the tenement in good standing during the coming year. No further work will be undertaken at Lefroy during the current calendar year. Future work programmes will be determined after detailed examination of all data gathered thus far. The position of the tenement is now such that expenditure is driven more by the terms of the Lefroy Joint Venture Agreement than by Statutory Commitments.

**11. REFERENCES**

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**APPENDIX 1**

**Log of Hole L3**

# LEFROY JOINT VENTURE

## Diamond Drill Core Log

**Hole No.** : L3

**Date Started** : 23rd February 1999

**Drilled by** : Diamond Drilling (Tas.)

**Date Completed** : 17th March 1999

**Logged by** : J.G.Purvis

### Collar

**Northing** : 5 448 129.85  
**Easting** : 499 811.98  
**R.L.** : 2172.47  
**Dip** : -57.75  
**Bearing** : 350 (AMG)

### Hole Details

**Final Depth** : 232m  
**Hole Length** : 232m  
**Core Size** : HQ3

**Purpose** To test original target of hole L1, on the Volunteer Reef between 7 & 8 levels in the old Volunteer Mine.

**Summary Results** Hole passed through planned target point. Volunteer Reef Fault intersected 189.6 - 201.15m, but no quartz reef present.

From	To	Length	Description	Au	Ag	Cu	Pb	Zn	As
182.95	183.55	0.6	Mineralized fault: shale pug, 2% py-asy & qtz-asy veins to 10cm	2.02	<1	23	19	80	5400
194.65	195.6	0.95	Best result in Volunteer Reef Fault: puggy cataclasite, rare qtz veins	0.30	<1	33	31	130	915

**Comments** All casing withdrawn. 3m HQ rod with steel cap left in top of hole.

585041



## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L3

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From	To	Description	Unit	Code	From	To	Int	Rec	Rec (%)	Assays (ppm)									
										From	To	Int	Au	Au @	Cu	Pb	Zn	Ag	As
0.0	5.5	TRICONED - NO CORE.	OPN	nil	0.0	5.5	5.5	0.00	0										
					5.5	8.5	3.0	1.4	47										
5.5	17.0	SILTSTONE, SANDSTONE & greasy BLACK SHALE.	SSH	sit	8.5	11.5	3.0	1.0	33										
		Qtz-mica siltst/sst, grey and sericitic. Oxidized to 8m.			11.5	14.5	3.0	2.0	67										
		Broken by common high-angle faults, strongest 8.2-8.5m			14.5	18.5	4.0	1.5	38										
		11.2-11.5m, 14.3-15m & 16.5-17m (latter with 10cm of			18.5	20.0	1.5	0.35	23										
		puggy cataclasite). Sericite alteration strongest in faults			20.0	22.5	2.5	0.95	38										
		Rare veining: vein qtz frags in faults at 15m & 17m. So			22.5	23.1	0.6	0.4	67										
		((CA): 55 at 6m, 65 at 14m, 80 at 16.7m. S1 cleavage //			23.1	24	0.9	0.65	72										
		So at 8.6m & 25/CA (same sense as So) at 13.8m. Down			24.0	25.5	1.5	1.5	100										
		hole facing in siltst at 11m. Minor dissem & fracture py.			25.5	27.0	1.5	1.35	90										
					27.0	28.4	1.4	1.4	100										
17.0	46.3	BLACK SHALE. Graphitic, pyritic & cleaved. Minor thin	SSH	bsh	28.4	33.0	4.6	4.4	96										
		sericitic siltst beds. Generally fractured & broken. So			33.0	34.8	1.8	1.8	100										
		((CA): 55 to 34m, 30 at 38.5m, 45 at 43.3m. Strong S1			34.8	37.0	2.2	2.1	95										
		cleavage //So & weak spaced S2 cleavage (25 at 39m,			37.0	39.7	2.7	2.6	96										
		in opposite sense to S1). Orientation at 37m: So 35/CA			39.7	42.6	2.9	2.9	100										
		(dips 25 to 017 AMG), S1 50/CA (dips 9 to 350 AMG).			42.6	43.8	1.2	0.9	75										
		Uphole-fining grading at 36m & 38m. Small-scale folding			43.8	45.0	1.2	1.1	92										
		& warping of So, increasing below 30m & strongest			45.0	46.5	1.5	0.5	33										
		around major fault on basal contact at 44.5-46.3m. Rare			46.5	48.0	1.5	1.35	90										
		qtz veining: zone of qtz net-veining at 18.5-19m & 1.5cm			48.0	49.8	1.8	0.5	28										
		qtz-py vein at 31.5m. 2-3% dissem py, often in qtz-py			49.8	51.0	1.2	0.9	75										
		segregations as tiny 'spots' or poddy vein-like stringers			51.0	52.5	1.5	1.2	80										
		along So/S1 -latter contain several slugs of massive py			52.5	54.0	1.5	0.85	57										
		(largest: 6cm x 1.5cm at 30.2m).			54.0	55.5	1.5	0.55	37										
					55.5	57.0	1.5	1.05	70										
46.3	93.0	FAULTED SILTSTONE, SANDSTONE & SHALE: (D2	DFT	flt	57.0	58.5	1.5	0.7	47										
		THRUST ZONE?) Strongly cleaved grey sericitic qtz-			58.5	59.7	1.2	1.0	83										
		mica siltst-sst & grey-black greasy shale, with extensive			59.7	60.7	1.0	0.6	60										
		cleavage-// intervals of strong crushing & shattering.			60.7	61.7	1.0	0.85	85										

525043

**LEFROY JOINT VENTURE**  
**Diamond Drill Core Log**

Hole L3

Page 4 of 7

From	To	Description	Unit	Code	From	To	Int	Rec	Rec (%)	Assays (ppm)									
										From	To	Int	Au	Au @	Cu	Pb	Zn	Ag	As
		Strongest crush zones at 48-54m & 87.6-93m, also			61.7	63.0	1.3	0.4	31										
		61.6-65m & 67.7-69.4m, with many others <1m. Crush			63.0	64.2	1.2	1.1	92										
		zones at 80-80.7m & 87.6-93m disrupt S1 cleavage &			64.2	64.9	0.7	0.6	86										
		are D2 structures (the others may be). Common slicken-			64.9	66.0	1.1	1.05	95										
		sides on foliation planes & augen texture in places. All			66.0	67.8	1.8	0.9	50										
		rocks greasy & softened by sericite-chlorite alteration			67.8	68.9	1.1	1.4	127										
		(strongest in faulted zones). Angles (/CA): at 54m So/			68.9	69.4	0.5	0.45	90										
		S1 60 (weak S2 25 in opp sense); at 67.7m So/S1 50			69.4	70.6	1.2	0.95	79										
		(S2 35 opp sense); at 78m S1 40; at 82.2m S1 55 (S2			70.6	71.7	1.1	1.0	91										
		30 opp sense). Uphole-fining grading at 72.1m.			71.7	72.6	0.9	0.85	94										
		<i>Orientation: at 66m So/S1 35, dips 86 to 318 AMG.</i>			72.6	73.6	1.0	1.0	100										
		Occasional veins & veinlets of qtz (+ cb-chlorite), most			73.6	74.9	1.3	0.7	54										
		assoc with crush zones & broken up. At 58.6-59m: qtz-			74.9	75.9	1.0	0.9	90										
		ankerite veinlet swarm 20/LCA in opp sense to So. 80-			75.9	77.4	1.5	1.5	100										
		82m: several qtz veins to 7cm thick. 86.3-86.6m: 30cm			77.4	79.0	1.6	1.4	88										
		qtz-chlorite vein //S1. 89-89.2m: 3 high-angle qtz-chlor>			79.0	79.6	0.6	0.65	108										
		cb veins to 10cm. Trace to 1% dissem py, best in shale.			79.6	81.0	1.4	1.4	100										
		Basal contact 90/LCA - lower margin of basal fault.			81.0	82.5	1.5	1.5	100										
					82.5	84.0	1.5	1.5	100										
93.0	146.9	SILTY SANDSTONE with SHALE bands. Strongly cleaved	SSH	sst	84.0	85.3	1.3	1.1	85										
		grey fine qtz-mica sericitic sst with common bands of grey-			85.3	86.9	1.6	1.45	91										
		black greasy highly chloritic or graphitic shale.			86.9	87.7	0.8	0.7	88										
		139-146m: sst slightly calcareous with flecked texture -			87.7	89.2	1.5	1.35	90										
		bioturbation? Ground conditions much better than in unit			89.2	90.8	1.6	1.5	94										
		above with only mild breaking & no crushing. Chlorite-			90.8	92.3	1.5	1.35	90										
		sericite alteration, with greasy white clay on foliation in			92.3	93.8	1.5	1.5	100										
		places, but alteration & cleavage weaker than in unit above.			93.8	95.3	1.5	1.5	100										
		Angles (/CA): At 104.5m So/S1 55, S2 25 in opp sense;			95.3	96.8	1.5	1.4	93										
		At 111m So 60, S1 50, S2 25 (opp sense); At 126m So/S1			96.8	98.4	1.6	1.5	94										
		60, S2 20 (same sense); At 140m S1 55.			98.4	99.9	1.5	1.5	100										
		<i>Orientations: At 94m So 50 (dips 10 to 298 AMG), S1 42</i>			99.9	101.4	1.5	1.45	97										
		<i>(dips 18 to 268 AMG); At 135m So/S1 63 (dips 48 to 140</i>			101.4	103.0	1.6	1.55	97										
		<i>AMG), S2 25 (dips 87 to 240 AMG).</i>			103.0	104.5	1.5	1.5	100										

535044

**LEFROY JOINT VENTURE**  
**Diamond Drill Core Log**

Hole L3

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From	To	Description	Unit	Code	From	To	Int	Rec	Rec (%)	Assays (ppm)										
										From	To	Int	Au	Au®	Cu	Pb	Zn	Ag	As	
		Uphole-fining grading: 95m, 101.6m, 111-112m & 132m.			104.5	105.7	1.2	1.05	88											
		Common qtz-chlor or qtz-cb (rare ankerite) veins, former			105.7	106.9	1.2	1.2	100											
		//So/S1 & hosted by deformed shales, latter orthogonal			106.9	108.0	1.1	1.05	95											
		to S1. Veins most numerous 115-139m, to 25cm wide			108.0	109.4	1.4	1.4	100											
		at 133.6m. 105.4-106m: qtz-cb vein 30/CA with 40%			109.4	110.9	1.5	1.5	100											
		rock frags. Minor dissem py, locally 1-2% in shales			110.9	112.4	1.5	1.5	100											
		(eg: 116-121m, in deformed qtz-veined graphitic shale).			112.4	113.9	1.5	1.5	100											
					113.9	115.5	1.6	1.55	97											
146.9	189.6	SILTY SANDSTONE, SHALE BANDS & OCCASIONAL	SSH	sst	115.5	117.0	1.5	1.45	97											
		FAULTS. Sericitic qtz-mica-feld-lithic sst with bands of			117.0	118.5	1.5	1.5	100											
		greasy grey-black chloritic shale. Less shale at depth as			118.5	120.0	1.5	1.45	97											
		grainsize increases. Uphole-fining grading at 170m &			120.0	121.1	1.1	1.05	95											
		177m. Sericite-chlorite alteration stronger than above,			121.1	122.6	1.5	1.45	97											
		with white clay on fractures. Cleavage stronger, with augen			122.6	124.1	1.5	1.45	97											
		texture in places & strong S2. Angles (/CA): At 151m S1			124.1	125.6	1.5	1.45	97											
		55; at 158m So/S1 55, S2 50 (same sense); At 166m So/			125.6	126.5	0.9	0.85	94											
		S1 50, S2 30 (similar sense); At 174m & 186m S1 70.			126.5	128.0	1.5	1.45	97											
		Orientation at 162m: So/S1 59 (dips 58 to 157 AMG).			128.0	129.0	1.0	1.15	115											
		Broken at intervals by thin faults, crush seams & fracts //			129.0	130.5	1.5	1.55	103											
		CA. Faults typically high-angle, either cut or deform S1 (ie:			130.5	132.0	1.5	1.4	93											
		are D2), with zones to 0.5m of puggy cataclasite or			132.0	133.5	1.5	1.45	97											
		shattering flanked by intervals to 2m with occasional			133.5	135.0	1.5	1.5	100											
		crush seams & qtz-chlor veins. Strongest faults: 146.85-			135.0	136.5	1.5	1.4	93											
		147.35m (35/CA); 155.2-156.1m (55/CA, x-cuts So/S1 at			136.5	138.0	1.5	1.45	97											
		top contact of 20cm qtz vein 75/CA); 172.7m (20cm pug).			138.0	139.5	1.5	1.55	103											
		MINERALIZED FAULT 65-80/CA at 182.95-183.5m: 0.4m			139.5	141.0	1.5	1.5	100	182.95	183.55	0.6	2.00	2.05	23	19	80	<1	5400	
		shale pug (2% py-asy & broken qtz-ank veinlets), with			141.0	142.5	1.5	1.4	93											
		10cm qtz-asy vein-bx at top & 4cm qtz-asy vein at base.			142.5	144.0	1.5	1.45	97											
		Common qtz-chlor-cb (minor ankerite) veining to 20cm			144.0	145.5	1.5	1.55	103											
		thick, largest sub-// S1 & assoc with faults: 15cm qtz vein			145.5	147.0	1.5	1.45	97											
		at 167.2m; qtz-chlor-ank vein 20/CA at 168-168.3m; ank			147.0	148.5	1.5	1.45	97											
		veinlets 5/CA 176-176.3m; qtz-ank veinlets 183.6-184.2m.			148.5	150.0	1.5	1.5	100											
		Minor dissem pyrite, rare in qtz veins. 1-2% py in shales			150.0	151.5	1.5	1.5	100											

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**LEFROY JOINT VENTURE**  
**Diamond Drill Core Log**

Hole L3

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From	To	Description	Unit	Code	From	To	Int	Rec	Rec (%)	Assays (ppm)									
										From	To	Int	Au	Au <sup>®</sup>	Cu	Pb	Zn	Ag	As
		158-159m & 186.6-187.6m. Abrupt basal contact along S1, 60/CA. Sst graphitic in basal 3m.			151.5	153.0	1.5	1.45	97										
					153.0	154.5	1.5	1.55	103										
					154.5	155.9	1.4	1.2	86										
189.6	201.15	VOLUNTEER REEF FAULT.	DRF	flt	155.9	157.5	1.6	1.4	88										
		Major D2 zone of crushing & shattering in very strongly cleaved & sericite>chlorite altered grey sandstone with minor black shale. Minor qtz veins & disseminated py.			157.5	158.7	1.2	1.05	88	189.6	191.15	1.55	<0.01		29	17	61	<1	13
					158.7	160.2	1.5	1.5	100	191.15	192.45	1.3	<0.01		14	16	58	<1	5
					160.2	161.7	1.5	1.55	103	192.45	193.4	0.95	<0.01	<0.01	54	26	191	<1	5
		Much of zone is puggy cataclasite with disorientated cleaved frags. Abrupt contacts along warped So/S1: upper 60/CA, lower 85/CA with graphitic slickensides.			161.7	163.2	1.5	1.5	100	193.4	194.65	1.25	<0.01		11	18	39	<1	<1
		Details: 189.6-191.15m:			163.2	164.6	1.4	1.4	100	194.65	195.6	0.95	0.3	0.3	33	31	130	<1	915
		20cm fault at top with vein qtz frags & minor py, then 10cm qtz-chlor vein 35/CA with 50cm core lost at lower margin (prob pug). Rest badly broken sst with crush seams & 10cm qtz-chlor vein (60/CA, minor py) at 190.9m.			164.6	165.9	1.3	1.3	100	195.6	196.6	1.0	<0.01		33	22	262	<1	8
					165.9	167.2	1.3	1.35	104	196.6	197.6	1.0	<0.01		12	21	52	<1	<1
					167.2	168.0	0.8	0.6	75	197.6	198.6	1.0	<0.01	<0.01	15	21	53	<1	<1
					168.0	169.5	1.5	1.5	100	198.6	199.6	1.0	<0.01		12	15	52	<1	2
					169.5	171.0	1.5	1.45	97	199.6	200.6	1.0	<0.01	<0.01	50	24	100	<1	34
					171.0	172.5	1.5	1.5	100	200.6	201.15	0.55	0.04	0.04	26	22	109	<1	49
		191.15-192.45m:			172.5	174.0	1.5	1.25	83	201.15	202	0.85	0.05	0.05	14	11	57	<1	14
		Weakly fract sst with minor graphitic content & trace py.			174.0	174.6	0.6	0.6	100										
		192.45-193.4m:			174.6	176.1	1.5	1.4	93										
		Altered & graphitic crush zone. Numerous broken qtz-chlor veins to 5cm. 1% py in crushed rock, trace in qtz.			176.1	177.6	1.5	1.6	107										
		193.4-194.65m:			177.6	179.1	1.5	1.4	93										
		Strongly altered fract sst, cleaved 50/CA, trace py.			179.1	180.0	0.9	0.95	106										
		Much greasy white clay on fract.			180.0	181.2	1.2	1.2	100										
		194.65-200.6m:			181.2	182.7	1.5	1.55	103										
		Intensely crushed zone: puggy cataclasite. Small intervals of highly shattered regularly-cleaved sst. Some crushed graphitic shale above 196.3m & below 199.6m otherwise highly sericitic>>chloritic. Shearing 40-60/CA. So/S1 70/CA at 196.2m, S1 85/CA at 198.8m. Rare broken qtz-ank veins to 3cm. Minor py, to 1% in graphitic sections.			182.7	183.4	0.7	0.55	79										
					183.4	184.5	1.1	1.1	100										
					184.5	186.0	1.5	1.5	100										
					186.0	186.3	0.3	0.3	100										
					186.3	187.5	1.2	1.1	92										
					187.5	189.0	1.5	1.5	100										
					189.0	190.5	1.5	1.0	67										
		200.6-201.15m:			190.5	191.2	0.7	0.75	107										
		Fractured sericitic sst, minor py.			191.2	192.0	0.8	0.8	100										
		10cm crush zone at base.			192.0	193.2	1.2	1.15	96										

525040

**LEFROY JOINT VENTURE**  
**Diamond Drill Core Log**

Hole L3

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From	To	Description	Unit	Code	From	To	Int	Rec	Rec (%)	Assays (ppm)										
										From	To	Int	Au	Au <sup>®</sup>	Cu	Pb	Zn	Ag	As	
201.15	232.0	Grey fine SILTY SANDSTONE, SILTSTONE & bands of GREY-BLACK SHALE. Qtz-mica sst to 209.5m & below 229.7m, elsewhere dominantly siltst & shale. Sst at 208-209.5m has markings suggestive of bioturbation. Some shales graphitic & pyritic, others greenish & strongly chloritic. Moderate chlor-sericite alteration as above Volunteer Reef Fault, with chlor locally strong in shales, esp those with qtz veins. Weak carbonatization of sst. Ground conditions good - some breaking along foliation esp in finer-grained rocks. Moderate to strong S1 cleavage //So, increasing in strength towards base - some augen texture below 229.5m. S2 cleavage in the opp sense is stronger than before (poss due to increase in finer-grained rocks). Angles (/CA): at 204m S1 73; at 210m So/S1 65; at 219m & 226m So/S1 70, S2 15 (in opp sense to S1). Orientation: At 215.5m, So 56 (dips 51 to 159 AMG), S1 63 (dips 57 to 190 AMG). Occasional qtz veins (with minor cb-chlor, trace ankerite & py), usually either orthogonal to So/S1 or sub-//CA. Largest veins: 215.65-216.4m (strong irreg poddy qtz-cb-chlor vein with minor py, 5-10/CA & to +7cm wide); 220.3-220.55m (25cm qtz-chlor-cb vein, trace py, 60/CA, //S1); 226.5-227.7m (2cm qtz-ank vein //CA). Trace to minor dissem py, except: 209.5-212.6m 1-2% py dissem in shales; 217.7-218.5m 2-3% bedded dissem py in graphitic shale 223-226m 1% py in siltst. Aspy on fract with ankerite veinlets at 201.3m. Minor aspy in 1cm qtz-ank vein 50/CA (opp sense to S1) at 210.5m.	SSH	silt	193.2	194.4	1.2	1.2	100											
					194.4	195.0	0.6	0.55	92											
					195.0	196.2	1.2	1.25	104	210	211	1.0	<0.01	<0.01	46	13	190	<1	36	
					196.2	197.5	1.3	1.15	88											
					197.5	198.7	1.2	1.0	83	215.6	216.4	0.9	<0.01	<0.01	18	14	50	<1	75	
					198.7	199.9	1.2	1.2	100											
					199.9	201.1	1.2	0.9	75	226.5	227.7	1.2	<0.01		30	23	94	<1	<1	
					201.1	202.4	1.3	1.15	88											
					202.4	203.5	1.1	1.15	105											
					203.5	205.0	1.5	1.6	107											
					205.0	206.5	1.5	1.45	97											
					206.5	208.0	1.5	1.5	100											
					208.0	209.5	1.5	1.5	100											
					209.5	211.0	1.5	1.45	97											
					211.0	212.5	1.5	1.5	100											
					212.5	214.0	1.5	1.45	97											
					214.0	215.5	1.5	1.5	100											
					215.5	217.0	1.5	1.45	97											
					217.0	218.5	1.5	1.55	103											
					218.5	220.0	1.5	1.5	100											
					220.0	221.5	1.5	1.45	97											
					221.5	223.0	1.5	1.55	103											
					223.0	224.5	1.5	1.5	100											
					224.5	226.0	1.5	1.5	100											
					226.0	227.5	1.5	1.5	100											
					227.5	229.0	1.5	1.5	100											
					229.0	230.5	1.5	1.5	100											
					230.5	232.0	1.5	1.5	100											
		<b>END OF HOLE</b>																		
					Laboratory: Analabs, Cooee.						Method:		F650	F650	A102	A102	A102	A102	A102	H102

525047

585048

A N A L A B S



Our reference : BU016055  
Your reference : 114159  
Project code : 9908104423  
Date received : 25/03/99  
Date reported : 31/03/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
  
Beaconsfield Mine Joint Venture  
PO Box 58  
BEACONSFIELD  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 12  
First Sample : 182.95-183.55  
Last Sample : 200.6-201.15

Invoice to:  
Peter Hills  
  
Beaconsfield Mine Joint Venture  
PO Box 58  
BEACONSFIELD  
  
TAS 7270

Electronic Data Transmission :  
Modem Y 31/03/99  
Facsimile / /  
Disk Report Y / /

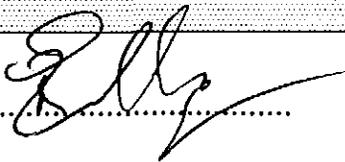
Preliminary Reports :  
29/03/99 Report

**HOLE L3**

Results to:

Results to:

Remarks :

Authorised by .....  
On behalf of:   
Rob Chapman  
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.  
A subsidiary of Scientific Services Limited





585051

A N A L A B S



Our reference : BU016134  
Your reference : 114160  
Project code : 9903731081  
Date received : 09/04/99  
Date reported : 19/04/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
  
Beaconsfield Mine Joint Venture  
PO Box 58  
BEACONSFIELD  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 4  
First Sample : 201.15-202.0  
Last Sample : 226.5-227.7

Invoice to:  
Peter Hills  
  
Beaconsfield Mine Joint Venture  
PO Box 58  
BEACONSFIELD  
  
TAS 7270

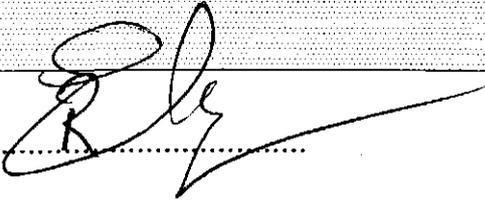
Electronic Data Transmission :  
Modem Y 19/04/99  
Facsimile / /  
Disk Report Y / /

HOLE L3

Results to:

Results to:

Remarks :

Authorised by  
On behalf of:   
Rob Chapman  
Laboratory Manager





585054

**APPENDIX 2**

**Log of Hole L4**

# LEFROY JOINT VENTURE

## Diamond Drill Core Log

**Hole No.** : L4

**Date Started** : 24th March 1999

**Drilled by** : Diamond Drilling (Tas.)

**Date Completed** : 14th April 1999

**Logged by** : J.G.Purvis

### Collar

**Northing** : 5 448 074.04  
**Easting** : 499 753.43  
**R.L.** : 2168.82  
**Dip** : -55  
**Bearing** : 344.7 AMG

### Hole Details

**Final Depth** : 202.5m  
**Hole Length** : 202.5m  
**Core Size** : HQ3

### Purpose

To test Volunteer Reef and West Volunteer Reef Branch down plunge below the gold shoot at 1915m RL.

### Summary Results

L4 aborted at 202.5m (90m short of target) due to excessive swing to the east. Hole cemented and recommenced at 110m as L4A using a chrome barrel.

From	To	Length	Description	Au	Ag	Cu	Pb	Zn	As	S
------	----	--------	-------------	----	----	----	----	----	----	---

### Comments

585053



## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4

Page 3 of 10

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
0	13.0	SSH	sst	SANDSTONE & SHALE. Grey qtz-mica-lithic sst & grey shale. Some soft-sediment disruption with shale rip-ups in sst & vice-versa.	Mildly oxidized to 5m, leached & friable to base Sericitic alt makes rocks soft & greasy.	Badly broken. Strong S1 cleavage //So 35-40/CA	Qtz veinlets at all angles to 4.5m. Qtz veins to 5cm 8.5-11.5m.	Limonite stains above 5m & trace dissem py below 5m.
13.0	73.2	SSH	bsh	STRONGLY CLEAVED GRAPHITIC BLACK SHALE. Minor thin sericitic siltstone interbeds. Minor oxidation on fract's at 71-73m may indicate old working in this vicinity.	Greasy due to sericitic alt.	Very strong S1 & S2 cleavages. S1// or sub-// So, 50-60/CA except S1//CA 44-45m due to F2 fold. S2 20-30/CA, usually opp sense to S1. S2 microfolds So 46-49m. <i>Orientations: At 48.6m So/S1 45/ CA (dips 12 to 327 AMG), S2 25/ CA (dips 88 to 200 AMG); At 63m So 50/CA (dips 61 to 145 AMG), S1 40/CA (dips 73 to 215 AMG).</i> Badly broken at intervals, mainly above 46m due to numerous thin high-angle crush seams assoc with zones of stronger cleavage, eg: 13-16m; 28.7-31m; 35-46.5m (centred on intensely cleaved zone 41-47m assoc with F2 fold, with the principal fault at 44.5m. Basal contact abrupt (So) 60/CA.	Strong qtz-py veinlets in 10cm crush zone at 24.1m, 55/CA //S1. Abund qtz(+py) veinlets 43-46m in S1 in F2 fold axis, these cut through & fragmented by the faults (crush seams). 58.6-60.7m: abund qtz veins to 5cm // S1. 57.1m: 10cm qtz-veined shear 60/CA (//S1).	1-5% py (av 2-3%), dissem (bedded in places) & in small spotty or vein-like qtz-py segregations //S1 (these dismembered by S2). Occasional massive py nodules to 3.5 x 1.5cm (at 52.1m). 28.7m: 4cm py vein //S1 66.6m: 2cm py vein //S1
73.2	81.1	SSH	sit	SILTSTONE, SANDSTONE & SHALE. Altered & cleaved grey qtz-mica fine sst & siltstone, with interbeds of grey-black shale. Rock breaks easily along cleavage.	All rocks soft & greasy due to sericitic>chlorite alt.	Strongly cleaved (S1//So, 50-60/ CA), with augen texture in places. Downhole-facing current bedding at 80m. Abrupt basal contact 60/CA, //S1.		73.2-75m: 2-3% py, in tiny qtz-ser segregations 75-75.5m: 3-5% py, in qtz-py veinlets all angles Below 75.5m: Trace py.

585057

## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4

Page 4 of 10

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
81.1	102.1	DFT	flt	MAJOR D2 FAULT ZONE (THRUST?) Major crush zones in qtz-mica sst with bands of grey-black partly graphitic shale. Much of interval comprises crumbly puggy cataclasite, graphitic in places. This interspersed with fractured & shattered zones with deformed (often folded) S1 cleavage. Faulting centred at 82.25-93.7m & 97-101m	Strongly sericitized.	Crushing (& ground conditions) worst 82.25-83.5m, 84.8-86.7m, 88-93.7m, 97-99.2m, 100.3-101.3m. Crush zones // & x-cut S1. Crush seam at 100.3m //S2 (40/CA). Strong cleavage: where not deformed by crushing, S1 50-60 /CA & S2 65/CA (opp sense to S1) Orientation at 96m: S1 50/CA (dips 10 to 010 AMG).	Numerous partly-broken qtz>ank veins (to 20cm & high angle to CA) in & around lower faulted zone (35% qtz 98-99.5m) 101-101.9m: set of qtz-ank veins to 4cm, <40/CA (orthogonal to S1). Only minor veining in the upper faulted zone & this largely broken up.	Minor dissem py (rarely in qtz or qtz-ank veins), except: 1-2% dissem py in shales at 94-95.3m & 99.6-101m.
102.1	120.2	SSH	sst	SANDSTONE, minor SILTSTONE & SHALE Grey cleaved qtz-mica sst with thin bands of siltstone & greasy grey-black shale. Rock is softish & breaks easily (moderately broken).	Fairly strong sericite-chlorite alt, with greasy white clay on cleavage & the numerous fract.	Strongly cleaved (some augen texture). S1 50-65/CA (//So). Shales have strong S2 25-50/CA in opp sense to S1. Up-hole fining grading in sst 104-107m. Several crush seams. Strongest faults assoc with F1 fold axis at 114.5m, comprising crush bands 114.1-114.35m & 114.8-115.1m, both //S1 65/CA. Basal contact abrupt 20/CA (cuts S1, same sense).	Qtz>chl-ank veins to 5cm in crush zone at 114.1-114.35m. Elsewhere, occasional ank veinlets & qtz-ank veins to 2.5cm, usually x-cutting S1.	Trace to minor dissem py, rarely in qtz veins. 1-2% py 115.2-116.2m in black shale band.
120.2	126.9	DFT	flt	MAJOR D2 FAULT In med gr grey qtz-mica sst with bands of black graphitic shale. Strongly deformed & folded S1 cleavage in shattered sst to 122.3m, below this a large puggy crush	Fairly strongly sericitized Some white clay on fractures.	Crushing 50-80/CA, strongly deforms S1 & in places also x-cuts the S2 cleavage visible in shales. At 126.8m: S1 68/CA, S2 50/CA in opp sense.	Numerous irreg micro-veinlets of ank or qtz in sst, little in shale.	Minor dissem py.

525058

# LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4

Page 5 of 10

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
				zone in sst & shale, with small uncrushed intervals.		Basal contact abrupt, 80/CA.		
126.9	202.5	SSH	sst	SANDSTONE with bands of SHALE. Predominantly grey cleaved qtz-mica (+feld) sst, ranging from fine silty sst to coarse gr massive qtzose sst. Occasional bands of strongly cleaved grey & black shale, lesser siltstone. Ground conditions much better than those higher in the hole: rock is harder, less altered, fractured or faulted.	Weak to moderate chlorite>sericite alt, with chlorite strong in shales & sericite strongest in uppermost 10m. Alt weakens with depth below 165m.	Sst commonly forms graded beds to 1.5m thick, all facing uphole. Occasional current bedding in finer sst. Well-developed S1 cleavage //So weakening with depth below 165m S2 cleavage well-developed in shales. Angles: S1/So 45-70/CA averaging 58-65/CA. S2 25-45/CA, averaging 35-45/CA, all in opp sense to S1/So. Orientations: At 150m So/S1 65/CA (dips 27 to 263 AMG), S2 30/CA (dips 28 to 023 AMG); At 180m So/S1 63/CA (dips 8 to 040 AMG) Small F1 fold at 181.3m. Small D2 fault 85/CA at 184.3m.	Mildly veined: qtz-chlor veins //S1 to 15cm, & qtz-ank veins to 10cm (at 171.7m) orthog to S1 Occasional small faults assoc with zones of veining (post-date & crush the veins). 129.3m: 10cm laminated qtz-cb-graphite vein //S1 154.6-156.4m: Common post-cleavage qtz-chlor veins in chloritic shales with warped So/S1 & minor crush zones. Similar zone 177.5-178.9m.	Trace to minor dissem py, except: 131-132m: 1% py 156-157.5m: 1-2% py 164-165m: 1% py 174.6-176m: 1-2% py, coarsely cubic in sst. Qtz veins usually non-py
				<b>END OF HOLE</b>				

525059



# LEFROY JOINT VENTURE

## Diamond Drill Core Log - Assays & Recoveries

Hole L4

Page 7 of 10

RECOVERIES						SAMPLING				ASSAYS (ppm)												
From	To	Interval	Recov'd	Recov'd	RQD	From	To	Int	Type	Ti	Zr	V	Nb	Rb	Y	Ba	Sr	Cr	Sn	W	P	
			(%)	(%)	(%)																	
43.8	44.9	1.1	0.95	86		19.15	19.65	0.5	Pyritic black shale	3180	155	188	15	161	23	1010	67	108	4	<10	560	
44.9	45.8	0.9	0.75	83		34.3	35.0	0.7	Pyritic black shale	2300	115	124	10	130	19	895	86	69	5	<10	315	
45.8	47.1	1.3	1.2	92		47.65	48.15	0.5	Pyritic black shale	3500	141	178	14	165	20	1060	115	110	4	<10	535	
47.1	48.6	1.5	1.5	100		65.6	66.1	0.5	Pyritic black shale	2620	113	134	10	135	15	835	38	66	4	<10	315	
48.6	49.6	1.0	0.95	95		156.5	157.2	0.7	Pyritic black shale	3200	125	251	12	199	30	690	62	160	3	<10	745	
49.6	51.0	1.4	1.4	100		78.75	79.25	0.5	Silty sandstone	3010	216	61	13	100	23	480	62	51	6	<10	480	
51.0	52.5	1.5	1.5	100		108.7	109.2	0.5	Fine sst > siltstone	3440	218	67	14	110	29	460	52	61	6	<10	575	
52.5	54.0	1.5	1.45	97		135.75	136.25	0.5	Qtzose sandstone	2060	258	33	8	56	23	220	133	36	4	<10	470	
54.0	54.9	0.9	0.9	100		153.5	153.9	0.4	Fine qtz-feld sst	3150	212	63	12	90	30	355	53	57	4	<10	735	
54.9	56.4	1.5	1.55	103		169.5	170.4	0.9	Coarse qtzose sst	2750	368	40	10	45	26	170	48	49	5	<10	545	
56.4	57.9	1.5	1.5	100		189.0	189.7	0.7	Silty sandstone	2500	309	35	10	58	24	215	55	40	5	<10	440	
57.9	59.4	1.5	1.45	97		199.0	199.7	0.7	Fine qtzose sst	3060	232	46	12	104	28	400	122	57	10	<10	615	
59.4	60.8	1.4	0.25	18		149.9	150.3	0.4	Grey shale & siltstone	4520	151	123	18	217	30	845	59	95	7	<10	395	
60.8	61.4	0.6	0.6	100		Laboratory: Analabs, Perth. Method:				X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401
61.4	63.0	1.6	1.55	97		From	To	Int	Type	Ni	Co	Be	Sc	Th	Ta	Hf	B					
63.0	64.5	1.5	1.5	100																		
64.5	66.0	1.5	1.5	100		19.15	19.65	0.5	Pyritic black shale	42	20	2	8	<10	<20	<20	195					
66.0	67.5	1.5	1.5	100		34.3	35.0	0.7	Pyritic black shale	31	16	<2	10	<10	<20	<20	68					
67.5	69.0	1.5	1.5	100		47.65	48.15	0.5	Pyritic black shale	49	20	<2	13	<10	<20	<20	80					
69.0	70.0	1.0	0.7	70		65.6	66.1	0.5	Pyritic black shale	45	18	<2	11	<10	<20	<20	60					
70.0	71.5	1.5	1.5	100		156.5	157.2	0.7	Pyritic black shale	69	24	2	14	11	<20	<20	52					
71.5	73.0	1.5	1.3	87		78.75	79.25	0.5	Silty sandstone	25	9	<2	9	12	<20	<20	68					
73.0	74.5	1.5	1.4	93		108.7	109.2	0.5	Fine sst > siltstone	27	10	2	11	16	<20	<20	72					
74.5	75.7	1.2	1.1	92		135.75	136.25	0.5	Qtzose sandstone	12	<5	<2	5	12	<20	<20	60					
75.7	77.2	1.5	1.4	93		153.5	153.9	0.4	Fine qtz-feld sst	30	9	<2	10	17	<20	<20	76					
77.2	78.5	1.3	1.05	81		169.5	170.4	0.9	Coarse qtzose sst	15	6	<2	6	24	<20	<20	70					
78.5	80.0	1.5	1.4	93		189.0	189.7	0.7	Silty sandstone	14	6	<2	6	20	<20	<20	68					
80.0	81.5	1.5	1.5	100		199.0	199.7	0.7	Fine qtzose sst	23	9	<2	9	17	<20	<20	68					
81.5	83.0	1.5	1.25	83		149.9	150.3	0.4	Grey shale & siltstone	41	25	3	19	16	<20	<20	38					
83.0	84.0	1.0	0.8	80		Laboratory: Analabs, Perth. Method:				I104	I104	I104	I104	I104	I104	I104	I151					

535061



LEFROY JOINT VENTURE

Diamond Drill Core Log - Assays & Recoveries

Hole L4

Page 9 of 10

RECOVERIES					SAMPLING			ASSAYS (ppm)														
From	To	Interval	Recov'd	Recov'd RQD	From	To	Int															
			(%)	(%)																		
124.1	125.6	1.5	1.25	83																		
125.6	127.1	1.5	1.5	100																		
127.1	128.5	1.4	1.2	86																		
128.5	130.0	1.5	1.45	97																		
130.0	131.5	1.5	1.25	83																		
131.5	133.0	1.5	1.5	100																		
133.0	134.5	1.5	1.45	97																		
134.5	136.0	1.5	1.6	107																		
136.0	137.5	1.5	1.5	100																		
137.5	139.0	1.5	1.55	103																		
139.0	140.5	1.5	1.45	97																		
140.5	142.0	1.5	1.55	103																		
142.0	143.5	1.5	1.5	100																		
143.5	145.1	1.6	1.6	100																		
145.1	146.7	1.6	1.5	94																		
146.7	148.3	1.6	1.55	97																		
148.3	149.8	1.5	1.55	103																		
149.8	151.3	1.5	1.5	100																		
151.3	152.8	1.5	1.45	97																		
152.8	154.3	1.5	1.5	100																		
154.3	155.9	1.6	1.4	87																		
155.9	157.4	1.5	1.55	103																		
157.4	159.0	1.6	1.55	97																		
159.0	160.5	1.5	1.5	100																		
160.5	162.0	1.5	1.55	103																		
162.0	163.5	1.5	1.45	97																		
163.5	165.0	1.5	1.5	100																		
165.0	166.5	1.5	1.5	100																		
166.5	168.0	1.5	1.45	97																		
168.0	169.5	1.5	1.5	100																		

585063



585065

A N A L A B S



Our reference : BU016187  
Your reference : 114161  
Project code : Lefroy EL1/95  
Date received : 19/04/99  
Date reported : 30/04/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 12  
First Sample : 41-43  
Last Sample : 101-101.9

Invoice to:  
Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

Preliminary Reports :  
22/04/99 Report

HOLE LA

Results to:

Results to:

Remarks :

Authorised by .....  
On behalf of:

Rob Chapman  
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.

A subsidiary of Scientific Services Limited





525068

A N A L A B S



Our reference : BU016220  
Your reference : 114162  
Project code : EL 1/95 LEFROY  
Date received : 26/04/99  
Date reported : 30/04/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 7  
First Sample : 120.2-121  
Last Sample : 126-126.9

Invoice to:  
Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

Preliminary Reports :  
28/04/99 Report

HOLE 44

Results to:

Results to:

Remarks :

Authorised by  
On behalf of:

Rob Chapman  
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.

A subsidiary of Scientific Services Limited





525071

A N A L A B S



Our reference : BU016221  
Your reference : 114163  
Project code : LE 1/95 LEFROY  
Date received : 26/04/99  
Date reported : 18/05/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St. Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 4  
Number of Samples : 7  
First Sample : 78.75-79.25  
Last Sample : 199.0-199.7

Invoice to:  
Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

HOLE LA

Results to:

Results to:

Remarks:

Authorised by .....  
On behalf of:

Rob Chapman  
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.

A subsidiary of Scientific Services Limited









525076

**APPENDIX 3**  
**Log of Hole L4A**

# LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole No. : L4A

Date Started : 20th April 1999

Drilled by : Diamond Drilling (Tas.)

Date Completed : 5th May 1999

Logged by : J.G.Purvis

Collar : 110m in hole L4

### Hole Details

Northing : 5 448 131.1m

Final Depth : 400.5m

Easting : 499 738.8m

Hole Length : 290.5m

R.L. : 2075.7m

Core Size : HQ3 110-312.8m; NQ3 312.8-400.5m

Dip : -59.5

Bearing : 350 AMG

**Purpose** To complete the test of Volunteer and West Volunteer reefs initiated by hole L4.

**Summary Results** West Volunteer Reef intersected at 256m (0.4m @ 6.37g/t Au). Volunteer Reef Fault intersected as zone of intense crushing at 267.5 - 270.2m, but little vein quartz present (best assay: 0.8m @ 0.23g/t Au).

From	To	Length	Description	Au	Ag	Cu	Pb	Zn	As
252.4	252.55	0.15	West Volunteer Reef - upper branch: grey quartz vein with aspy	0.72	<1	18	38	50	2170
255.75	256.15	0.4	West Volunteer Reef - lower branch: vein qtz with 30% rock frags	6.37	<1	31	76	129	4850
269.4	270.2	0.8	Volunteer Reef Fault: rock cataclasite with dismembered qtz veins	0.23	<1	48	26	98	700

### Comments

Hole L4A cut from cemented hole L4 using chrome barrel, after L4 deviated off target. All casing withdrawn from hole. 3m HQ stem pipe with steel cap left in top of hole.

525077



## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4A

Page 3 of 11

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
110.0	120.6	SSH	sst	SANDSTONE WITH SHALE BANDS. Cement filling of L4 to 115m. Sst grey, qtz-mica, fine to medium grained. Shale grey & black (latter graphitic & pyritic). Breaks easily along S1.	Sericite-chlorite alt (shales very greasy), with white clay on fract & cleavage.	Strong cleavage: S1//So 60-70/CA S2 (only visible in shales) 30/CA (opp sense to S1). S1 warped in basal 30cm. Strong fault (crush zone) assoc with F1 fold axis in sericitized grey shale 115-115.5m.	Minor. Qtz-ank veinlets orthogonal to S1, & qtz+-chl veins //S1 incl 5cm qtz-chl vein at 114.75m.	Gen trace to minor dissem py. 2% py in black shale band 115.5- 116.5m. 1-2% py 119.7-120.6m.
120.6	127.4	SSH	flt	MAJOR D2 FAULT. Zone of strong shattering, crushing & marked contortion of So/S1 in grey qtz-mica sst. Intervals of puggy cataclasite, esp in greasy grey-black shales in basal 2m.	More strongly sericitized than surrounding rocks. Common white clay on fracts in the sst.	Contacts abrupt: upper 30/CA (cuts S1 same sense); lower 85/CA.	Qtz-ank microveinlets x-cutting S1 in sst.	Minor dissem py. Very rare aspy.
127.4	252.4	SSH	sst	SANDSTONE WITH LESSER SILTSTONE- SHALES. Fine to coarse grained grey sst, ranging from relatively pure qtzose types to qtz-mica sst (sometimes weakly carbonaceous), to qtz-feld-mica-lithic sst. Much lesser greasy grey & black shale & siltstone, as isolated 5-20cm beds or conc in 1-5m bands where sst minor. Black shale often graphitic & pyritic. Sst bioturbated at 152m & current-bedded at 193m. To 220m, sst in graded beds up to 1.5m thick. Ground conditions much improved over those higher in hole: sst gen hard & unbroken, finer rocks tend to break readily along S1 cleavage.	"Background" chlorite> sericite alt, weakening slightly with depth. Common white greasy clay on fract, esp those assoc with faults & zones of qtz-ank veining (eg: at 171m).	Graded beds fine uphole until 30cm fract & qtz-ank veined zone at 171m. Grading then fines downhole to fold axis in shale at 181.8-185.1m assoc with zone of crush seams 60-80/CA in opp sense to So/S1 (70-85/ CA), crushes warp both S1 & S2. Grading is uphole 185-220m. F1 fold axis 237-238.2m. Well developed S1 cleavage //So 55-65/CA, weakening slightly with depth. S2 cleavage visible in some finer-grained rocks, 35/CA (opp sense to S1) except //CA from 211m to small fault (60/CA //S1) at 236.6m.	Common qtz veining. Larger are qtz (+chl-cb> py), av >3cm (to 15cm at 151.3m), sub-// S1 & are gen hosted by chloritized shale. Smaller veins & veinlets are qtz-ank (av <3cm, to 5cm) & orthogonal to S1 130m: 7cm qtz-graph-py vein in shear 55/CA //S1 165.7m: 20cm zone of qtz-ank-py veinlets 30/ CA (orthogonal to S1). 171m: 30cm of qtz-ank net-veinlets (rare aspy). 238.3m: 10cm qtz-py-	Trace to minor dissem py, locally to 2% (esp in black shales). 129.5-133m: 1% py>po 156.5-158.7m: 2% py. Trace aspy in fold axis at 182-185m & rare aspy in 30cm zone of qtz-ank veinlets at 171m

525079

## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4A

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From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
						Orientations: At 188m So/S1 60/CA (dips 1 to 003 AMG), S2 30/CA (dips 31 to 040 AMG); At 209m S1 55/CA (dips 8 to 304 AMG); At 238.8m So/S1 62/CA (dips 10 to 323 AMG), S2 25/CA (dips 64 to 083 AMG). Minor small faults, strongest: 177.55-177.8m: 70/CA (opp sense to S1) with 5cm qtz-ank-py vein. 189.3-189.45m: 55/CA (opp sense to S1).	graph vein 50/CA //S1.	
252.4	252.55	DRF	min	MINERALIZED QUARTZ VEIN (WEST VOLUNTEER BRANCH REEF - UPPER) Unbroken 15cm grey qtz vein with recemented breccia texture (strongest at base). Minor white cb.	Some pale green sericite in fract's in qtz.	Vein 45/CA (opp sense to S1). Vein marks fault between qtzose sst above & greasy black shale below. 2cm graphitic crush zone with qtz frags, at base of vein.	Veinlets of grey qtz-cb extend 15cm into upper sst. Irreg ank veinlets extend 15cm into lower shale.	2% aspy>py in vein. 1-2% aspy>py in upper sst (15cm). 2-3% py>aspy in lower shale (15cm)
252.55	255.75	SHH	slt	FRACTURED & CLAY-ALTERED SILTSTONE-SHALE. Dk grey carbonaceous siltstone-shale with minor qtz-mica sst.	Much white clay on fract's (clay seams to 3mm). Sericitized & greasy.	Numerous fractures, local shattering - rock is softish & breaks easily. So/S1 65/CA. 255.1m: 5cm crush zone with vein qtz frags, 55/CA x-cuts S1.	Common thin veinlets of qtz-ank, orthogonal to So/S1.	Minor dissem py. Rare aspy below 254.5m
255.75	256.15	DRF	min	MINERALIZED QUARTZ VEIN (WEST VOLUNTEER BRANCH REEF - LOWER) Slightly broken grey vein qtz with 30% cleaved sediment rock frags to 3cm. Trace ank.	Smaller rock frags are silicified.	Vein fills D2 fault between greasy grey shale (above) & sst (below). Contacts abrupt: upper 30/CA (opp sense to So/S1), lower 45/CA (10cm crush with qtz veinlets in sst, x-cuts & folds So/S1).		3-4% aspy-py & rare cp.

525080

## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4A

Page 5 of 11

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
256.15	267.5	SSH	sst	PARTLY FRACTURED & CRUSHED SANDSTONE. Grey to dk grey qtz-mica-feld-lithic sst, partly carbonaceous to 259m. Dk grey shale in places below 264m.	White clay on fractcs, most common in sst. Increasingly strong sericitization below 263m.	So/S1 90/CA at top 40/CA at base Fractured & crushed at intervals, increasing with depth. Stronger crushes: 256.6m (10cm, 40/CA, 4cm qtz-ank vein); 259.2m (10cm 90/CA); 263.9m (20cm, 50/CA, x-cuts S1, 10cm bx qtz-ank vein); 265.7m (20cm, 70/CA, x-cuts S1); 266.2m (20cm, 65/CA, x-cuts & warps S1). <i>Orientation: At 263.1m S1 60/CA (dips 30 to 290 AMG).</i>	Common qtz>cb veins to 10cm above 261m (some crushed, // & x-cutting S1). 261-266m numerous veinlets qtz-ank x-cutting S1.	Minor dissem py. Rare aspy in 10cm qtz-ank-py vein at 263.1m.
267.5	270.2	DRF	flt	VOLUNTEER REEF FAULT: INTENSELY CRUSHED ZONE IN BLACK SHALE & GREY SANDSTONE. Crumbly cataclasite (puggy in places), after black graphitic pyritic shale, grey shale & sst HW: soft greasy sericitized grey shale with several crush seams back to 266.2m. FW: (to 271m) harder sericitized qtzose sst with abund qtz-ank microveinlets x-cutting S1	Strong sericitization. Much white clay on fractures in FW to 271m	Fault is D2: So/S1 is contorted. Abrupt contacts; upper broken but high-angle, lower 60/CA (cuts S1 but similar sense). Strong S1 in FW is gently warped to 271m.	Below 268.5m common dismembered poddy qtz veins to 3cm, largest // shearing but some x-cutting qtz-ank veinlets. 20% veining at 268.7-269.4m (qtz & qtz-ank) & 269.9-270.2m (qtz & qtz-chl).	1-3% dissem py in perfect cubes to 2mm, 3%py in black shale 269-269.5m. Rare aspy below 268.3m No sulphides in qtz veining.
270.2	311.8	SSH	sst	SANDSTONE, minor SHALE & SILTSTONE Grey silty to coarse gr qtz-mica sst with minor beds to 25cm of grey-black shale> siltstone.	Mod to locally strong chlorite>>sericite alt. This overprinted above 274m & around fractures //CA at 280-281.4m & 294.5-295.5m, by silica-sericite-white clay alt	Several graded sst beds fine uphole above 300m. Well-developed S1 cleavage 60-70/CA, stronger in zones of silica-sericite alt. S2 cleavage visible in some shales, 30/CA in opp sense to S1.	Patchy qtz-ank veinlets & microveinlets, orthog to S1, abundant above 272.5m & 280-281.4m. At 276.5-280m & below 297.8m, common qtz-chlor veins sub-// S1, to	Minor dissem py. Rare aspy to 271m, & assoc with fractcs //CA 280-281.4m & 294.5-295.5m.

585081

## LEFROY JOINT VENTURE

## Diamond Drill Core Log

Hole L4A

Page 6 of 11

From	To	Unit	Code	DESCRIPTION	ALTERATION	STRUCTURE	VEINING	MINERALIZATION
					assoc with qtz-ank veining & enhanced cleavage development.	<i>Orientation at 290m: S1 70/CA (dips 6 to 317 AMG).</i>	25cm thick (at 298m). This veining very strong	
					Fine spotting of shales at 306.7m & 311.7m.	Mildly broken by low-angle fract. Small fault 310.7-311m.	309.5-311.8m in broken chloritized shales.	
311.8	314.4	DRF	qvn	ZONE OF STRONG QUARTZ-ANKERITE VEINING (LODE ZONE). Veined zone 20-30/CA, orthogonal to S1 in altered qtz-mica sst with minor black shale.	Silica-sericite-bleaching alt of sst.	Strong S1 50-60/CA. Broken along small fault 15/CA (opp sense to S1) at 313.4- 314.1m (alt strongest here)	Numerous qtz-ank veins & veinlets (abund net- veining 313-314m). Centred on 5cm 20/CA qtz-cb-ank-asy vein at 312.55-312.75m.	312.7-314m: 1-2% asy>py dissem & on fracts, mainly in sst rather than the veins. Trace to minor py>asy elsewhere.
314.4	316.2	SSH	sst	Grey SILTY SANDSTONE, with beds of siltstone & shale.	Weak chlorite alt.	So/S1 60/CA. Basal contact along So, 60/CA.	Minor thin qtz-ank veinlets 20-30/CA.	Trace dissem py.
316.2	321.7	SSH	bsh	SHALE. Dk grey to black carbonaceous shale, graphitic in places.	Fine spotting to 317m.	At 318.5m So 65/CA, S2 25/CA in opp sense. So folded & disrupted 320.2-320.8m	3 qtz veins //S1, to 3cm.	Minor dissem py in grey shale to 320m, then 2% py in black shale.
321.7	371.5	SSH	sst	SILTY SANDSTONE. Pale grey uniform fine to med gr qtz-mica (+feld-lithic) sst, with minor siltstone & shale, mainly above 333m. From 333-358m almost entirely sst. Finer-grained sections commonly show soft-sediment deformation (micro-folds & slumps) as well as scour & fill, & current bedding (eg: 324-328m, 338-342m, 350- 351m). Occasional graded beds in sst. Rip-up clasts of sst in siltst 351.5-352.5m.	Weak chlorite-sericite alteration.	Largely unbroken. Sedimentary facings are upheld to 338.5m & downhole below 360m (no facings 339-360m). S1//So 60-70/CA. S1 weaker below 360m. Weak S2 15-35/CA only visible in some shales. <i>Orientations: At 343.5m S1 67/CA (dips 2 to 359 AMG); At 370.5m So 58/CA (dips 26 to 284 AMG).</i>	Upper contact marked by zone of strong qtz-cb veining extending to 322.7m (50% veins at all angles to 20cm thick) Almost no veining 333- 358m.	1% dissem py to 323m (none in qtz veins). Minor to 1% py to 332m. Trace py below 332m.

525082



# LEFROY JOINT VENTURE

## Diamond Drill Core Log - Assays & Recoveries

Hole L4A

Page 8 of 11

RECOVERIES						SAMPLING			ASSAYS (ppm)															
From	To	Interval	Recov'd	Recov'd	RQD	From	To	Int	Au	Au	Cu	Pb	Zn	Ag	As									
			(%)	(%)	(%)					®														
110.0	112.4	2.4	2.4	100		252.25	252.4	0.15	0.43	0.40	24	37	63	<1	1430									
112.4	114.8	2.4	2.0	83		252.4	252.55	0.15	0.76	0.69	18	38	50	<1	2170									
114.8	115.6	0.8	0.5	62		252.55	252.7	0.15	0.64		34	18	141	<1	905									
115.6	118.4	2.8	2.7	96																				
118.4	119.6	1.2	1.15	96		255.05	255.75	0.7	0.39	0.34	43	31	126	<1	325									
119.6	122.2	2.6	2.15	83		255.75	256.15	0.4	5.70	7.05	31	76	129	<1	4850									
122.2	123.4	1.2	1.15	96		256.15	256.7	0.55	0.07	0.06	21	18	82	<1	135									
123.4	125.7	2.3	1.55	67																				
125.7	127.1	1.4	0.9	64		263.9	264.1	0.2	0.08		24	27	107	<1	220									
127.1	129.2	2.1	1.9	90																				
129.2	130.3	1.1	0.95	86		266.2	266.9	0.7	<0.01	<0.01	50	32	105	<1	60									
130.3	133.4	3.1	2.9	94		266.9	267.5	0.6	<0.01		47	26	105	<1	65									
133.4	136.4	3.0	2.95	98		267.5	268.1	0.6	<0.01		91	27	236	<1	55									
136.4	139.4	3.0	2.85	95		268.1	268.7	0.6	0.01	0.01	76	26	215	<1	70									
139.4	142.3	2.9	2.8	97		268.7	269.4	0.7	0.11		55	21	165	<1	435									
142.3	145.3	3.0	2.9	97		269.4	270.2	0.8	0.24	0.22	48	26	98	<1	700									
145.3	148.3	3.0	3.0	100		270.2	271.1	0.9	<0.01		14	21	46	<1	30									
148.3	151.3	3.0	3.0	100																				
151.3	154.3	3.0	3.0	100		279.9	280.6	0.7	0.05		10	21	35	<1	275									
154.3	157.3	3.0	2.85	95		280.6	281.4	0.8	0.02	0.02	12	19	48	<1	100									
157.3	158.9	1.6	1.6	100																				
158.9	161.9	3.0	2.95	98		311.8	312.8	1.0	0.12		29	27	79	<1	355									
161.9	162.8	0.9	0.85	94		312.8	314.4	1.6	0.61	0.60	16	16	69	<1	2320									
162.8	165.8	3.0	3.0	100																				
165.8	168.8	3.0	2.9	97		371.5	372.45	0.95	0.03	0.02	15	22	55	<1	140									
168.8	171.8	3.0	2.95	98																				
171.8	174.8	3.0	2.9	97																				
174.8	177.8	3.0	2.95	98																				
177.8	180.8	3.0	2.8	93																				
180.8	183.8	3.0	3.0	100																				
						Analabs, Cooee. Method:			F650	F650	A102	A102	A102	A102	A102									

525084

# LEFROY JOINT VENTURE

## Diamond Drill Core Log - Assays & Recoveries

Hole L4A

Page 9 of 11

RECOVERIES						SAMPLING				ASSAYS (ppm)												
From	To	Interval	Recov'd	Recov'd (%)	RQD (%)	From	To	Int	Type	Ti	Zr	V	Nb	Rb	Y	Ba	Sr	Cr	Sn	W	P	
183.8	186.9	3.1	3.0	97		115.75	116.2	0.45	Black shale	3380	139	271	13	198	34	735	106	209	<3	<10	3350	
186.9	188.0	1.1	1.05	95		221.25	221.8	0.55	Fine sst	3260	232	67	12	107	34	395	165	58	7	<10	520	
188.0	190.5	2.5	2.3	92		242.2	243.1	0.9	Fine sst	2890	245	57	11	89	21	330	73	272	4	<10	505	
190.5	193.5	3.0	3.0	100		273.4	273.9	0.5	Qtzose sst	1780	235	31	10	54	25	190	124	37	5	<10	330	
193.5	196.3	2.8	2.9	104		283.0	283.7	0.7	Silty sst	3920	254	92	16	160	35	570	53	222	3	<10	455	
196.3	199.3	3.0	3.0	100		329.2	329.85	0.65	Silty sst	4390	182	108	18	213	31	690	58	85	8	<10	470	
199.3	201.5	2.2	2.1	95		346.5	347.5	1.0	Fine sst	2350	154	48	7	61	44	235	1080	90	5	<10	575	
201.5	204.5	3.0	2.95	98		365.5	366.5	1.0	Fine sst	3990	200	88	15	146	34	510	88	71	6	<10	510	
204.5	206.9	2.4	2.35	98		381.5	382.2	0.7	Fine sst	2780	213	49	11	72	32	240	207	164	4	<10	545	
206.9	209.0	2.1	1.9	90																		
209.0	212.0	3.0	3.0	100																		
212.0	215.0	3.0	3.0	100		Laboratory: Analabs, Cocee. Method:				X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401	X401
215.0	218.0	3.0	2.95	98		From	To	Int	Type	Ni	Co	Be	Sc	Th	Ta	Hf	B					
218.0	221.0	3.0	3.0	100																		
221.0	224.0	3.0	3.05	102		115.75	116.2	0.45	Black shale	59	16	2	13	10	<20	<20	58					
224.0	225.8	1.8	1.8	100		221.25	221.8	0.55	Fine sst	20	13	<2	10	14	<20	<20	32					
225.8	228.8	3.0	3.0	100		242.2	243.1	0.9	Fine sst	17	11	.2	8	14	<20	<20	<25					
228.8	231.8	3.0	2.95	98		273.4	273.9	0.5	Qtzose sst	<10	<5	<2	5	13	<20	<20	<25					
231.8	234.8	3.0	3.1	103		283.0	283.7	0.7	Silty sst	27	18	2	13	20	<20	<20	<25					
234.8	237.2	2.4	2.35	98		329.2	329.85	0.65	Silty sst	33	19	3	16	19	<20	<20	26					
237.2	238.8	1.6	1.7	106		346.5	347.5	1.0	Fine sst	12	9	<2	8	10	<20	<20	<25					
238.8	241.9	3.1	3.0	97		365.5	366.5	1.0	Fine sst	27	19	2	13	17	<20	<20	<25					
241.9	245.0	3.1	3.0	97		381.5	382.2	0.7	Fine sst	16	11	<2	8	13	<20	<20	<25					
245.0	250.0	5.0	5.0	100																		
250.0	253.0	3.0	2.9	97																		
253.0	254.2	1.2	1.05	87																		
254.2	256.0	1.8	1.85	103																		
256.0	259.0	3.0	3.0	100																		
259.0	262.0	3.0	3.0	100																		
262.0	263.1	1.1	1.0	91		Laboratory: Analabs, Cocee. Method:				I104	I104	I104	I104	I104	I104	I104	I151					

585085





525088

A N A L A B S



Our reference : BU016311  
 Your reference : 114167  
 Project code : EL 1/95 LEFROY  
 Date received : 14/05/99  
 Date reported : 25/05/99

**Analabs Pty. Ltd.**  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (03) 6431 6837  
 Facsimile : (03) 6431 8890

Gerald Purvis  
  
 Allstate Explorations NL  
 PO Box 58  
 Beaconsfield  
  
 TAS 7270

Number of pages of results : 2  
 Number of Samples : 5  
 First Sample : LAA 263.9-264.1  
 Last Sample : LAA 312.8-314.4

Invoice to:  
 Gerald Purvis  
  
 Allstate Explorations NL  
 PO Box 58  
 Beaconsfield  
  
 TAS 7270

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

Preliminary Reports :  
 17/05/99 Report  
 18/05/99 Report

Results to:

Results to:

Remarks :

Authorised by .....  
 On behalf of:   
  
 Rob Chapman  
 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.

A subsidiary of Scientific Services Limited





585091

A N A L A B S



Our reference : BU016286  
Your reference : 114166  
Project code : 9912148964  
Date received : 10/05/99  
Date reported : 26/05/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Gerald Purvis  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 4  
Number of Samples : 15  
First Sample : LA 19.15-19.65  
Last Sample : LAA 381.5-382.2

Invoice to:  
Gerald Purvis  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

Preliminary Reports :  
25/05/99 Report

Results to:

Results to:

Remarks:

Authorised by .....  
On behalf of:

Rob Chapman  
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.

A subsidiary of Scientific Services Limited









585096

A N A L A B S



Our reference : BU016279  
Your reference : 114165  
Project code : EL 1/95, LEFROY  
Date received : 07/05/99  
Date reported : 18/05/99

**Analabs Pty. Ltd.**  
ACN 004 591 664  
14 Thirkell St. Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 8  
First Sample : L4A: 266.2-266.9  
Last Sample : L4A: 371.5-372.45

Invoice to:  
Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

Results to:

Results to:

Remarks :

Authorised by .....  
On behalf of:

Rob Chapman  
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.

A subsidiary of Scientific Services Limited





585099

A N A L A B S



Our reference : BU016253  
Your reference : 114164  
Project code : EL 1/95, LEFROY  
Date received : 03/05/99  
Date reported : 06/05/99

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (03) 6431 6837  
Facsimile : (03) 6431 8890

Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

Number of pages of results : 2  
Number of Samples : 6  
First Sample : 252.25-252.4  
Last Sample : 256.15-256.7

Invoice to:  
Peter Hills  
Project Geologist  
  
Allstate Explorations NL  
PO Box 58  
Beaconsfield  
  
TAS 7270

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

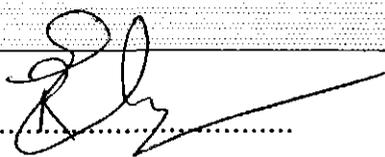
Preliminary Reports :  
04/05/99 Report

Results to:

HOLE LAA

Results to:

Remarks :

Authorised by .....  
On behalf of: 

Rob Chapman  
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.

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585102

**APPENDIX 4**

**XRD Analysis of Clay Sample  
171m, L4A (R. Bottrill)**

DEPARTMENT OF INFRASTRUCTURE ENERGY AND RESOURCES

Mineral Resources Tasmania

Client: G. Purvis, Allstate Exploration

Sample Location: Lefroy

Analysis: Approximate Mineralogy

Method: X-Ray Diffraction

Results (approx wt %)

Sample	>80%	60%-80%	40%-60%	25%-40%	15%-25%	10%-15%	5%-10%	2%-5%	<2%
Hole L4A 171m	Kaolinite							Smectite	Quartz, Mica, Ankerite

Peak overlap may interfere with identifications

Minerals present in trace amounts, or amorphous minerals, may not be detected

Analyst: R.N. Woolley

Date: 18 May 1999

525103

585104

**APPENDIX 5**

**Report on Testing of Mullock Samples  
(AMDEL)**

Telephone (Aust): (08) 8416 5200  
(Int): 61 8 8416 5200  
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Osman Place  
Thebarton  
South Australia 5031  
AUSTRALIA

PO Box 338  
Torrensville Plaza  
South Australia 5031  
AUSTRALIA

26 August 1998

585105

Allstate Exploration NL  
PO Box 58  
BEACONSFIELD TAS 7270

Attention: Peter Hills

## REPORT N056LH98

### TESTING OF MULLOCK SAMPLES

YOUR REFERENCE:	Fax 30 June 1998
SAMPLE IDENTIFICATION:	VMD 001 to VMD 005
MATERIAL:	Mullock samples
LOCATION:	Beaconsfield, Tasmania
DATE RECEIVED:	30 June 1998
PROJECT MANAGER:	P G Capps 



**P G Capps**  
Senior Metallurgist

PGC:msm

## 1. INTRODUCTION

Allstate Exploration NL submitted to Amdel five samples of material taken from an old mullock heap. Amdel was requested to carry out a program of testwork to determine the grade of each of the individual samples and the gold extraction characteristics of a composite sample.

## 2. SAMPLES TESTED AND SAMPLE PREPARATION

Five samples designated VMD001 to VMD005 were received, each comprising approximately 300kg of -150mm crushed rock and contained in 200L drums. The samples were damp, requiring air drying to reduce the moisture content to a sufficiently low level to allow crushing and riffing.

Each sample was crushed in total to nominally -6mm. Three sub-samples of 4kg each were riffled from the crushed material and oven dried. Two of the sub-samples were pulverised and assayed for Au by duplicate fire assay, while one sub-sample was also assayed for As, Fe, Cu, Pb, Ag and S by ICP-OES.

### HEAD SAMPLE ASSAYS

Sample	Au, g/t			As ppm	Fe %	Cu ppm	Pb ppm	Zn ppm	Ag ppm	S %
	A	B	Ave							
VMD001	1.37,1.28	4.74,2.63	2.51	1450	3.45	450	50	150	<2	0.27
VMD002	0.74,0.75	0.75,0.72	0.74	1200	3.10	200	50	200	<2	0.29
VMD003	0.66,0.60	0.76,0.75	0.70	1150	3.71	300	50	150	<2	0.17
VMD004	1.98,2.52	2.01,3.43	2.49	2800	3.71	400	50	150	<2	0.52
VMD005	0.07,0.06	0.08,0.06	0.07	450	3.87	100	100	250	<2	0.23

## 3. GOLD RECOVERY FROM COMPOSITE SAMPLE

A composite sample was prepared by blending 4kg of each of the individual samples. The composite was crushed 100% -2mm and riffled into charges of 1kg for the subsequent testwork.

Several charges were ground at 60% solids for different periods of time in a batch rod mill. The size distributions were plotted against mill revolutions to determine the revolutions required to achieve products of  $P_{80} 500\mu\text{m}$  and  $P_{80} 75\mu\text{m}$ .

One charge was ground to  $P_{80} 500\mu\text{m}$  to simulate cyclone underflow material, then amalgamated with mercury in a rolling bottle to remove liberated native gold that would be expected to be recovered in a gravity circuit. The mercury was separated and assayed to determine its gold content.

Amalgamation recovered 0.16g/tAu from a calculated head value of 0.94g/t Au, indicating 'gravity recoverable' gold to be approximately 17%. The calculated head assay of 0.94g/t Au was derived from the gold in mercury plus the calculated value for the cyanide leach feed (0.78g/t Au), and compares with the assayed head value for the composite sample of 1.10g/t Au.

The amalgamation residue, representing 'gravity tailing', was leached at 0.05% NaCN, pH 10.5 and 40% solids for 24 hours in a mechanically agitated beaker. Solution samples were taken periodically for Au assay and free cyanide titration. Cyanide and lime were added as necessary at each sampling time to maintain the required leach conditions. At the end of the leach period the residue was filtered, washed and dried and fire- assayed for Au. Gold extractions and the calculated head assay were determined from residue and solution assays.

Detailed results for the cyanide leach test are contained in Appendix 1. Although gold dissolution during the first 2 hours was reasonable, the sample demonstrated strong preg-robbing characteristics. As a result, gold was adsorbed by a component of the sample (carbonaceous ?) to the extent that the measured gold extraction decreased from 28% at 2 hours to 17% at 24 hours.

It is possible that carbon-in-leach cyanidation might overcome the preg-robbing characteristics, although no tests were undertaken to examine this aspect.

525108

**APPENDIX 1:**  
**CYANIDE LEACHING OF MULLOCK COMPOSITE**  
**AMALGAMATION RESIDUE**

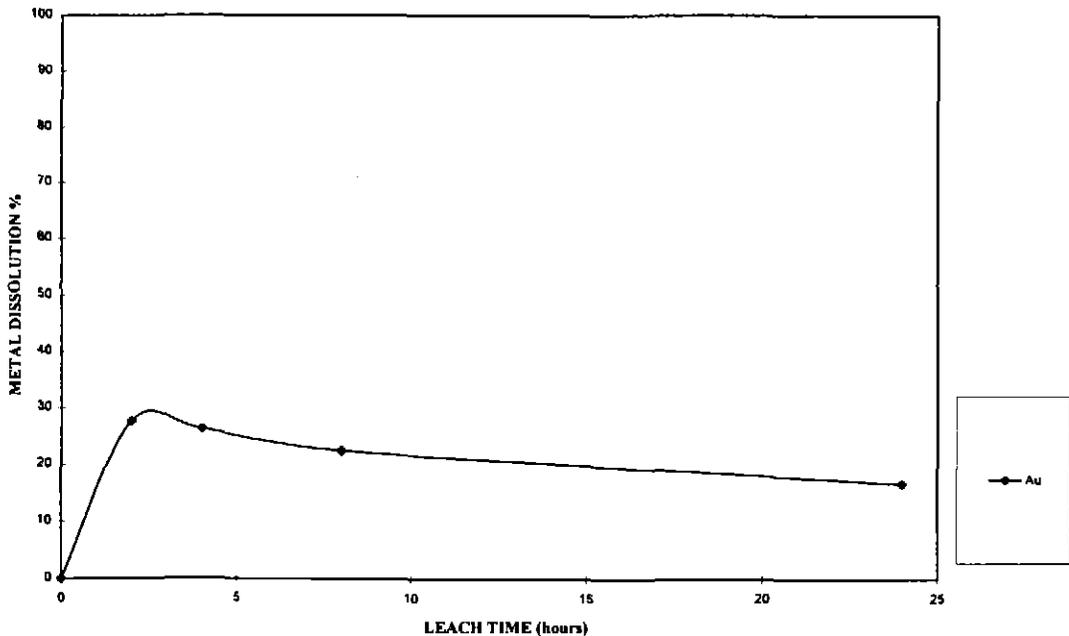
525100

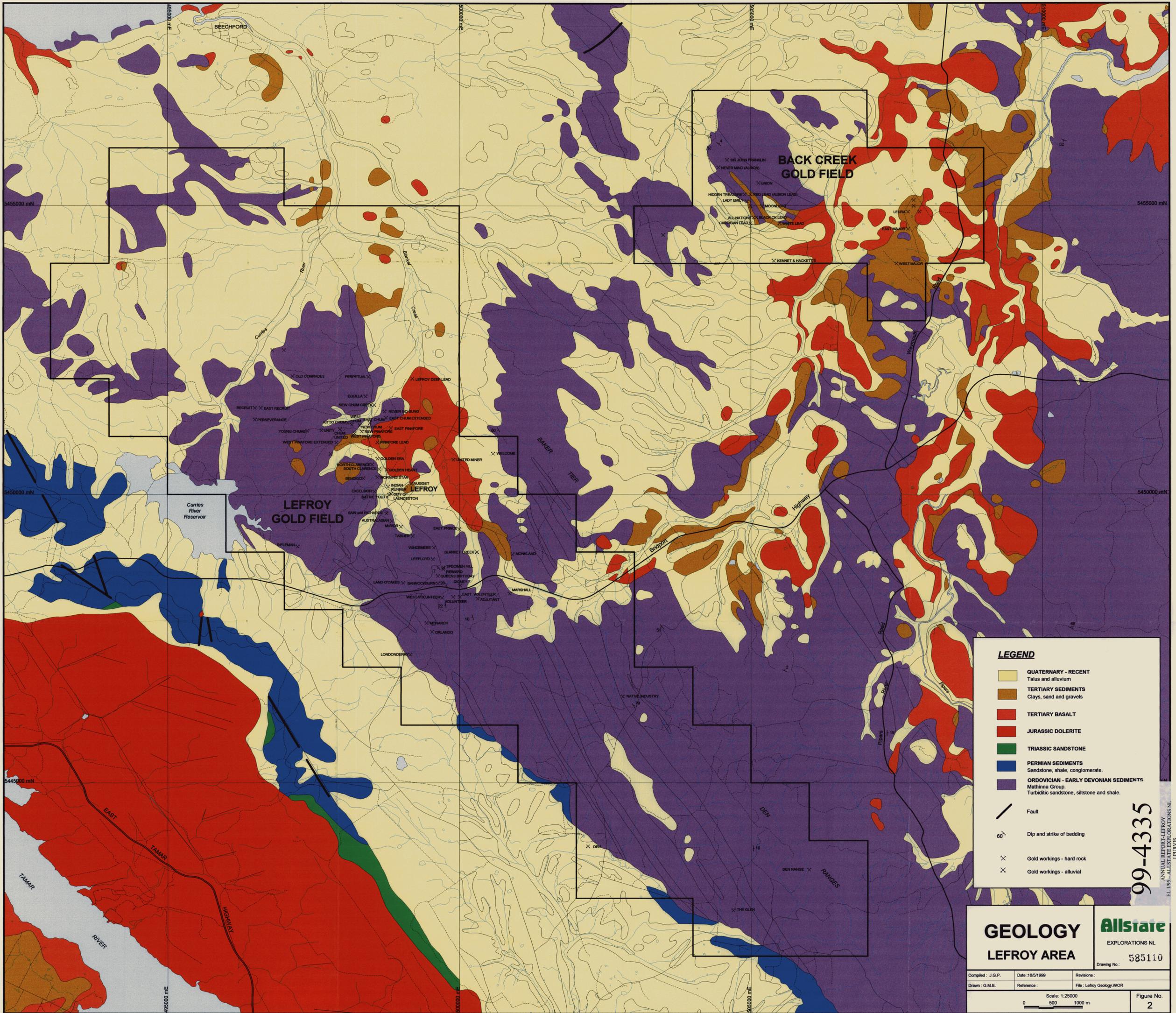
AGITATION CYANIDE LEACH TEST

Test No.		CY 01								
Sample Tested		MULLOCK COMPOSITE - Amalgamation Residue								
Sample Weight. (g)		1000.0								
Target Parameters		Grind Size 80% - 0.075mm			NaCN conc (%) 0.050		pH 10.5			
Leach Time (hours)		0	2	4	8	24				
Solids Assays (ppm)		Calc Head	Head			Final Residue				
Au		0.78				0.66				
Solution Assays (mg/L)										
Au			0.14	0.13	0.11	0.08				
Metal Dissolution (%)										
Au			28	26	23	17				
Leach Conditions										
Slurry density (%w/w)		40	39	39	39	40				
NaCN conc (pre-adjustment)		0.000	0.054	0.046	0.040	0.039				
NaCN conc (post-adjustment)		0.073	0.054	0.050	0.071					
NaCN added (kg/t)		1.1	1.1	1.2	1.7	1.7				
NaCN [1] consumed (kg/t)			0.3	0.4	0.5	1.0				
CaO [2] added (kg/t)		0.4	0.5	0.5	0.5	0.5				
pH (pre-adjustment)		8.8	10.3	10.5	10.7	11.0				
pH (post-adjustment)		10.6	10.6	10.5	10.8					
Dissolved Oxygen (mg/L)		7.6	8.9	9.0	9.0	9.0				
 CYANCALC V 4.1 file ref: CYN056		printed 25/08/98 Job No. N056LH98 Technician SS Test Date 13/8/98		<b>Comments</b>						

[1] Cumulative NaCN consumed (kg/t) : NaCN added - (NaCN in leach solution + NaCN removed in samples)

[2] Cumulative CaO addition relates to a pure reagent and allows for test additions of lime with an activity/concentration of 55.7 %.





**LEGEND**

- QUATERNARY - RECENT  
Talus and alluvium
- TERTIARY SEDIMENTS  
Clays, sand and gravels
- TERTIARY BASALT
- JURASSIC DOLERITE
- TRIASSIC SANDSTONE
- PERMIAN SEDIMENTS  
Sandstone, shale, conglomerate.
- ORDOVICIAN - EARLY DEVONIAN SEDIMENTS  
Mathinna Group.  
Turbiditic sandstone, siltstone and shale.
- Fault
- Dip and strike of bedding
- Gold workings - hard rock
- Gold workings - alluvial

**GEOLOGY**  
**LEFROY AREA**

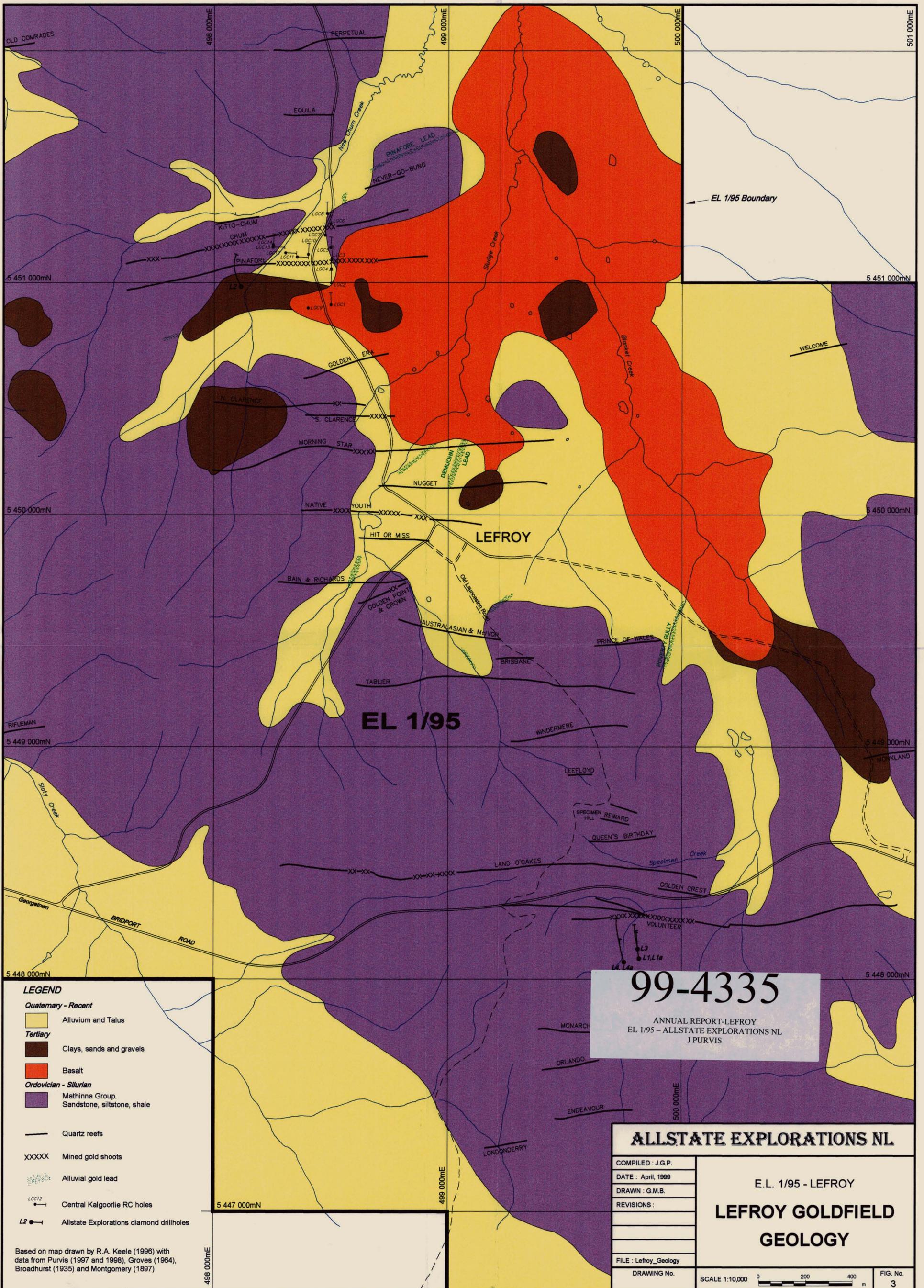
**Allstate**  
EXPLORATIONS NL  
585110

Compiled : J.G.P.	Date : 18/5/1999	Revisions :
Drawn : G.M.B.	Reference :	File : Lefroy Geology.WOR
Scale : 1:25000 0 500 1000 m		Figure No. 2

99-4335

ANNUAL REPORT-LEFROY EXPLORATIONS NL  
EL 195-ALLIANCE EXPLORATIONS NL  
J PURVIS

5 cm



**LEGEND**

**Quaternary - Recent**

- Alluvium and Talus

**Tertiary**

- Clays, sands and gravels
- Basalt

**Ordovician - Silurian**

- Mathinna Group. Sandstone, siltstone, shale

— Quartz reefs

XXXXX Mined gold shoots

⋯ Alluvial gold lead

LCCT2 Central Kalgoorlie RC holes

L2 Allstate Explorations diamond drillholes

Based on map drawn by R.A. Keele (1996) with data from Purvis (1997 and 1998), Groves (1964), Broadhurst (1935) and Montgomery (1897)

**99-4335**

ANNUAL REPORT-LEFROY  
EL 1/95 - ALLSTATE EXPLORATIONS NL  
J PURVIS

**ALLSTATE EXPLORATIONS NL**

COMPILED : J.G.P.	<b>E.L. 1/95 - LEFROY</b> <b>LEFROY GOLDFIELD</b> <b>GEOLOGY</b>	
DATE : April, 1999		
DRAWN : G.M.B.		
REVISIONS :		
FILE : Lefroy_Geology		
DRAWING No.	SCALE 1:10,000	FIG. No. 3

0 200 400 m

5 cm

535111

WEST

EAST



99-4335

ANNUAL REPORT-LEFROY  
EL 1/95 - ALLSTATE EXPLORATIONS NL  
J PURVIS

KEY

- Stopping on Volunteer Reef
- Stopping on West Volunteer Branch Reef
- Intersection on Volunteer Reef/Reef Position
- Intersection on Volunteer Branch Reef

NOTE:  
Compiled from Montgomery (1897)  
and Twelvretres (1897)

585112

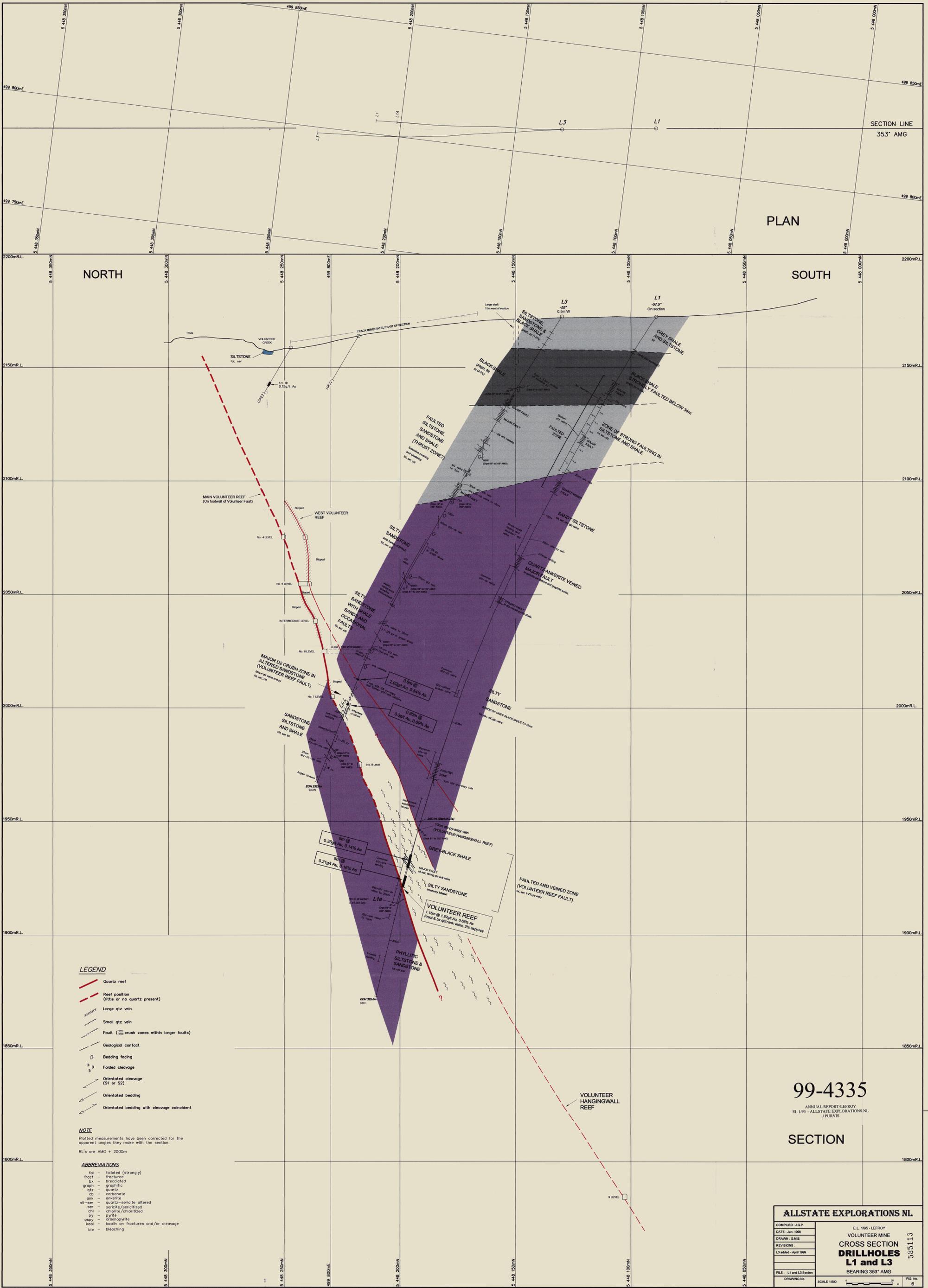
ALLSTATE EXPLORATIONS NL

COMPILED : J.G.P.  
DATE : April '98  
DRAWN : G.M.B.  
REVISIONS :  
FILE :

E.L. 1/95 - LEFROY  
**VOLUNTEER MINE**  
**LONGITUDINAL**  
**SECTION**  
LOOKING NORTH

DRAWING No. SCALE 1:1000 0 30 5  
FIG. No. 5





PLAN

NORTH

SOUTH

SECTION LINE  
353' AMG

- LEGEND**
- Quartz reef
  - Reef position (little or no quartz present)
  - Large qtz vein
  - Small qtz vein
  - Fault (with crush zones within larger faults)
  - Geological contact
  - Bedding facing
  - Folded cleavage
  - Orientated cleavage (S1 or S2)
  - Orientated bedding
  - Orientated bedding with cleavage coincident

**NOTE**  
Plotted measurements have been corrected for the apparent angles they make with the section.  
RL's are AMG + 2000m

- ABBREVIATIONS**
- fol - foliated (strongly)
  - fract - fractured
  - bx - brecciated
  - graph - graphitic
  - qtz - quartz
  - cb - carbonate
  - ank - ankerite
  - sil-ser - quartz-sericite altered
  - ser - sericite/sericitized
  - chl - chlorite/chloritized
  - py - pyrite
  - asp - arsenopyrite
  - kool - kaolin on fractures and/or cleavage
  - ble - bleaching

99-4335

ANNUAL REPORT-LEFROY  
EL 195 - ALLSTATE EXPLORATIONS NL  
J PURVIS

SECTION

<b>ALLSTATE EXPLORATIONS NL</b>	
COMPILED - J.G.P.	E.L. 195 - LEFROY
DATE - Jan 1998	VOLUNTEER MINE
DRAWN - G.M.B.	<b>CROSS SECTION</b>
REVISIONS:	<b>DRILL HOLES</b>
L3 added - April 1999	<b>L1 and L3</b>
	BEARING 353' AMG
FILE - L1 and L3 Section	585113
DRAWING No.	SCALE 1:500
	FIG. No. 6



