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E.L. 35/81

A REPORT ON
THE THIRD STAGE OF ALLUVIAL EXPLORATION AT
LEFROY, TASMANIA
JANUARY - MARCH, 1985.

PREPARED FOR EPOCH MINERALS EXPLORATION NL

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SUMMARY

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1. Exploration at Lefroy, Tasmania has outlined alluvial gold reserves of 200,000 cubic metres at an average grade of 0.5 gms/metre.
 2. These reserves are in long sinuous gullies averaging 30 - 40 metres in width. The gold bearing wash averages 0.8 metres in thickness and underlies from 1 - 2 metres of overburden. (Maximum depths 5 metres). The deposits are scattered over a wide area south, east and north of the Township of Lefroy.
 3. The deposits lend themselves to low cost mining using portable mobile plant with direct feeding from the mining pit via excavator. Oversize should be screened off into the mined pit along with overburden. Undersize wash should be pumped to a plant comprising a trommel and jigs for concentration of the wash. Jig tailings should be returned to the pit. The jig concentrate should be taken to a central site for clean up.
 4. If the deposit could be mined and treated at a rate of 50 metres per hour over a 40 hour week for 46 weeks a year, then the reserves outlined to date would take 2½ years to treat.
 5. The potential profit at a gold price of A\$ 400.00 per ounce would be \$ 170,000 per annum if the plant is amortized over 4 years. The capital cost of the project if the excavator is leased is likely to be under \$ 100,000 for a 50 metre per hour plant. Operating costs are likely to be around \$ 4.00 per metre.
 6. The cut-off economical price at a grade of 0.5 gms/metre is A\$ 250.00 per ounce. The cut-off economical grade is 0.3 gms/metre at a gold price of A\$ 400 per ounce.



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7. Reconnaissance exploration has outlined a number of other areas at Curries River, Moonlight Flat, Back Creek where detailed exploration is warranted. The Back Creek area in particular is prospective and could add up to another 1 - 2 years life to the Lefroy operation. If that is the case, then it would not be unreasonable to anticipate a total profit over 4 years of \$ 700,000. from mining in this part of Tasmania.



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1. INTRODUCTION

- 1.1 This report summarises the third stage of exploration at Lefroy, Tasmania. The work performed was designed to test in more detail the Upper Blanket Creek Area and the Chum Creek Area and their respective tributaries. Testing was also extended downstream on Sludge Creek from Area 1 to its confluence with Blanket Creek. In addition general reconnaissance exploration was carried out along the Curries River upstream from the Beachford Road and on various creeks between Lefroy and Back Creek and on various mining Leases at Back Creek.
- 1.2 The aim of the programme was to try to triple the known reserves of economical alluvial wash available, from the 70,000 cubic metre proven in Area 1, to approximately 200,000 cubic metre. This latter figure would be considered reasonable reserves upon which to base a small scale alluvial mining operation.
- 1.3 The exploration work involved the digging of a further 349 test pits using an excavator. Samples of alluvial wash encountered in the pits were treated in a test plant and further reduced by panning. The final concentrate was assayed in total for free gold.
- 1.4 The digging of the test pits was carried out over two separate periods each of 2 weeks duration. The first period was in early January, 1985 and the second in early February, 1985. The pits were dug under contract, by H.G. and A.A. Reid. Sample collection and testing was carried out almost continuously from mid January to end of March, 1985. Duplicate samples were taken in areas of interest.
- 1.5 Work was carried out in both the Mining Leases at Lefroy and within the surrounding Exploration Licence.
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2. FIELD PROCEDURES

2.1 The test pits were of two types -

(a) Semi detailed - on lines 100 - 200 metres apart across alluvial valleys and suspected ancient alluvial terraces or shallow leads, where alluvial gold had been indicated by Stage 1 reconnaissance exploration (refer Murdoch Geosciences Report 835).

(b) Reconnaissance - on single lines across alluvial valleys not previously tested or in areas where alluvial terraces or shallow leads were suspected.

2.2 The objective of the semi-detailed work was to outline available reserves in areas considered prospective, in particular in those Areas 2, 3 and 4 as defined in Report 835; and also downstream from Area 1, which was semi-detailed by Stage II Alluvial Exploration (refer Murdoch Geosciences Report 1008).

2.3 The objective of the reconnaissance work was to determine whether any alluvial gold occurred along the Curries River and its tributaries upstream from the Beachford Road; along the various creeks between Lefroy and Back Creek. Permission was also obtained to dig lines of reconnaissance holes on various Mining Leases at Back Creek to see if it was worthwhile gold occurred. Negotiations with the Lease Holders could then be undertaken, to make up any shortfall in the target reserves.

2.4 On most lines the test pits were dug at 20 metre intervals. In some areas of greatest interest, or where thick wash was encountered, the spacing was decreased to 15 metres and in other areas of more speculative interest, the spacing was increased to 30 and even 50 metres.

2.5 Each pit is identified by one or two letters to designate the general area in which it occurs, followed by a number to identify the pit itself.



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- 2.6 Almost all the pits were dug through the complete alluvial section, with only a few failing to terminate in positively identifiable bedrock, (either Palaeozoic Mathinna Beds or Tertiary basalts). However, in a number of pits bedrock was not encountered before the hole either failed, due to inflow of ground water, or the maximum reach of the excavation being achieved. In one instance near the Pinafore Lead, the excavation was unable to dig through a shallow cemented layer.
- 2.7 Generally the near surface alluvial layers comprise soil (0 - 0.3 metres thick) and then clays or sandy clays. This material contains no free gold and is included as overburden (symbol o/b used in the description of alluvial lithologies in Appendix 1). In digging the test pits, the overburden was stacked to one side of the pit and used to refill the hole after its completion.
- 2.8 The overburden is generally underlain by a light grey gravelly to sandy clay. However, each different lithology encountered was placed in a separate pile or dump at the discretion of the site Geologist. The depth to each varying lithology was measured using a tape measure lowered from the surface.
- 2.9 Each dump was identified by its hole number followed by a letter to identify the specific dump. The letter A was used for the deepest alluvial lithology, with the letter B, C etc used to identify progressively shallower lithologies. As most of the alluvial gold present is concentrated in the lowest 300mm of wash, dump A is generally the most prospective, and the one most often sampled and tested. In some instances very weathered bedrock difficult for the site Geologist to identify was labelled dump A. In such cases dump B was the most prospective. In other areas where the wash was either thicker or dump B material also appeared auriferous, samples from dump B as well as dump A were taken for testing.
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- 2.10 Details of the lithologies and depths encountered in each pit are given in Appendix I. All lithologies have been field checked and where necessary the field geologists description have been corrected by the author.
- 2.11 Sample of prospective coarse alluvial wash were collected in cut down 200 litre drums. A measured 0.045 loose cubic metre was collected. Random samples were taken for checking on a weighbridge and generally found to have a net weight of 70 - 90 kg. A measured bank cubic metre of wash from one hole was also collected and weighed (approximately 2,000 kg). The samples tested are considered to be about $\frac{1}{28}$ of a bank cubic metre.
- 2.12 Later duplicate samples were taken from areas where the initial samples indicated either potentially economical or sub-economical grades.
- 2.13 In total 282 samples were collected. They were carted by 4WD and trailer to Valken Mining Pty. Ltd. test plant at Lefroy. (Location see Plate 1096/2). Each sample was separately wet screened to remove + 6mm material and the undersize passed over a Wilfry Table.
- 2.14 Of the original 70 - 90 kg sample, approximately half is + 6mm. The remainder was concentrated on the table to about 2 kg sample. The table tails were periodically checked by panning for losses and the tails from the duplicate samples passed over a set of spirals, (hired from Vickers), to see if additional fine gold could be saved. The check panning indicated some fine gold losses did occur from the table, but they were found to be minor. (0.03 gms/cubic metre). The spiral concentrate retained 0.02 gms of gold per cubic metre of sample treated. The average of 0.025 gms/cubic metre represents about 5% of the grade of the average economic sample.
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- 2.15 The 2kg concentrate from each sample was panned down to a $\frac{1}{2}$ kg sample and the panning tails kept and re-concentrated over the table as five separate samples. Panning losses captured on the second pass were found to be minimal. (Under 0.01 gms/cubic metre).
- 2.16 The $\frac{1}{2}$ kg samples were bagged and forwarded to Maroochydore, where they were examined in a panning dish, further concentrated to 50 gram samples, dried, screened to remove + 2mm gravel, weighed and re-bagged. Samples with more than 2 - 3 specs of visible gold were forwarded to Australian Laboratory Services in Brisbane for fire assay of the total concentrate. Poorer samples have been stored for assay later if so required. The Maroochydore panning tailings were collected and re-concentrated on a centrifugal gold wheel. The concentrate of the panning losses was also check assayed.
- 2.17 The assay results of free gold obtained from the laboratory were multiplied by the weight of the dried concentrate to determine the amount of gold (in micro-grams) in the sample. This figure was further multiplied by 28 to determine the amount of gold (in micro-grams) per cubic metre. This figure is expressed in gms per cubic metre in Table 1 below.
- 2.18 It is possible that losses of gold (particularly fine gold) can occur in the sampling procedure used. However, the system of re-checking tailings etc. does minimise these losses. The assays of the various tailings concentrates show that the gold loss on the first pass and collected by the double checking comprises only 5% of the gold collected in the first pass. Losses of this order are considered low and similar to those normally occurring in an alluvial production plant.



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3. ALLUVIAL GEOLOGY

3.1 The alluvial wash encountered is of 3 types.

- (a) A basal brown wash generally associated with ancient channels or terraces.
- (b) A younger light grey wash generally associated with alluvial ancient channels on the present day alluvial flood plain.
- (c) A darker grey finer gravel wash, thought to be the youngest present, and confined to the present day creek beds.

3.2 The brown wash comprises rounded cobbles and small boulders of quartz contained within a matrix of brown clay, silts, sands and finer gravel. This wash is most common within the ancient water courses situated away from the present water course (in leads or terraces). It also occurs within fossilised channels occurring below the present alluvial plain. However, it is generally discontinuous here, having been eroded by more recent streams.

3.3 The light grey wash is also generally coarse gravel comprising quartz cobbles and boulders in matrix of light grey quartz gravels, sands and clays. In many alluvial areas this wash is the basal alluvial section. However, where the older brown wash occurs, it tends to overlie it.

3.4 The variation in colour between these two types of wash is generally the result of differing clays in the matrix. The coarser grained particles of both wash types comprise quartz almost entirely. The grey wash is more common in areas of light green-grey weathered phyllite bedrock and the brown wash is often underlain by more ferruginous phyllites and slates.



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- 3.5 The young dark grey wash is confined to recent creek beds. It is generally finer grained, with more angular quartz in a dark grey matrix. The dark colour coming from the washed soils content from the surrounding hillsides. A lot of the quartz in this wash comes from eroded Pleistocene gravel deposits which occur on the hill tops.
- 3.6 All different types of wash can be overlain by a light grey gravelly sandy clay section which can carry gold, but generally of insufficient quantities to justify its ultimate treatment.
- 3.7 In most alluvial areas the wash section is generally 0.7 - 1.0 metre thick, and is overlain by an average 1 - 2 metres of overburden. The overburden includes the gravelly clay and nearer surface mottled grey and brown clays and soils.
- 3.8 The bedrock is predominantly soft and highly cleaved Palaeozoic phyllite and slates. At times the bedrock grades to harder cleaved mudstones or siltstones. The bedrock is soft and most of the channels follow major shear zones. Consequently there are few meanders within the channels which would help to trap the alluvial gold. Some concentration of gold in stream confluences and in ponded areas is apparent.
- 3.9 However, the main concentrating mechanism at Lefroy has been the Tertiary Basalts, which were harder to erode than Palaeozoic rocks. The basalts have tended to pond the channels upstream from their contact, decreasing stream velocities and allowing deposition of the heavy minerals within the basal gravels.
- 3.10 Where the alluvial channels have eroded the basalt, good grades can still be obtained for some distance downstream, apparently concentrated at stream confluence and in areas of ponding, where the basalts were locally easier to erode.



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- 3.11 The Tertiary Basalts appear to post date the oldest brown wash channels, but appear to have predated both the grey wash channels. In the basalt area the wash tends to gradually contain more cobbles and boulders of basalt and less quartz. The wash tends to be darker brown as the matrix gradually contains a higher percentage of basaltic clays.
- 3.12 The oldest leads continue under the Tertiary basalt and gradually become deeper (deep leads). Such channels are expensive to explore and mine and hence have yet to be investigated. However, advances in drillhole mining of deep leads and in reverse circulation sampling may make such areas prospective once a cash flow has been achieved from shallower alluvial mining.
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4. DATA PRESENTATION

- 4.1 A series of plans of the Lefroy/Back Creek gold fields have been prepared.
- 4.2 Plan 1096/1 : This is a 1:25,000 plan of E.L. 35/81 - Stoney Head. This plan shows the locations of Plans 1096/2 and 1096/3, discussed below and the general area covered by the Exploration Licence and existing Mining Leases at Lefroy and Back Creek.
- 4.3 Plan 1096/2 : This is a 1:10,000 plan of the Lefroy gold field showing the location of the more detailed 1:2,000 plans, (1096/3, 1096/4, 1096/5, 1008/3 and 1008/4). Also shown on this plan is the general location of lines of reconnaissance holes in Areas W, X, Y, Z and AB - AE, which were dug outside the area covered by the 1:2,000 plans.
- 4.4 Plan 1096/3 : This is a 1:10,000 plan of the Back Creek Area showing the Mining Leases present in that area; the location of the reconnaissance drill lines AA and BA - BN, and the known leads. Please note that this plan is incorrectly orientated to the east and not north.
- 4.5 Plan 1096/4 : A 1:2,000 plan of the Lefroy township area, including Sludge Creek and Morning Star Creek. (Areas N, V, M and O). This plan is essentially an update of plan 1008/2, drawn up at the completion of the Stage II Exploration programme.
- 4.6 Plan 1096/5 : A 1:2,000 plan of Upper Blanket Creek Area, to the south of Lefroy. (Areas R, S, T and U).
- 4.7 Plan 1096/6 : A 1:2,000 plan of Chum Creek and Lower Blanket Creek to the north of Lefroy. (Areas D, E, F, FB, G, H, I, J, K and L).



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4.8 Individual test pits are shown at their respective positions on plans 1096/4 - 6 inclusive, along with the various lithologies encountered and grades of that wash in gms/cubic metre. Areas considered potentially economical on the basis of the test pit results are outlined and the cubic metreage and average grade calculated.



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5. TEST HOLE RESULTS

5.1 Full details of the amount of free gold recovered from each of the samples tested are given in Table 1 below. The total amount of gold present is given in milligrams and the grade in gms/cubic metre. Samples having the grades in excess of 0.2 gms/m³ are marked with an * below.

TABLE 1 - GOLD ASSAY RESULTS

	<u>Gold in Sample</u>		<u>Average Gold Grade</u> <u>gms/m³</u>	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
AA1-A	5.80		0.16	
BA1-A	12.97		0.36	*
BA3-A	6.10		0.17	
BA3-B	16.18		0.45	*
BB1-A	2.80		0.08	
BB2-A	5.19		0.15	
BB4-A	6.90		0.19	
BC4-A	3.90		0.11	
BD1-A	16.62		0.46	*
BD2-A	11.58		0.32	*
BE4-A	1.40		0.04	
BE6-A	43.80		1.22	*
BE12-A	14.09		0.39	*
BF4-A	0.70		0.02	
BG3-A	12.45		0.35	*
BG10-A	41.72		1.17	*
BL1-A	3.00		0.05	
D1-A	1.33		0.04	
D2-A	0.46		0.01	
D31-A	2.18		0.06	
D32-A	6.14		0.17	
D43-A	7.59		0.21	*
D45-A	7.18		0.20	*
D48-A	1.30	2.50	0.04	0.07
D49-A	3.20		0.09	



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5.1 (continued)

	<u>Gold in Sample</u>		<u>Average Gold Grade</u>	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
D47-A	3.20		0.09	
D55-A	0.70		0.02	
D57-B	2.23		0.06	
D410-A	1.12		0.03	
D410-B	2.20		0.06	
D411-A	9.82		0.28	*
D411-B	13.89		0.39	*
D412-A	2.50		0.07	
E1-A	2.22		0.06	
E2-A	0.43		0.01	
F12-A	3.68		0.10	
F13-A	4.84	1.29	0.13	0.04
F14-A	19.89	24.19	0.56	0.68 *
F14-B	1.90		0.05	
F22-A	0.93		0.03	
F23-A	0.39	2.92	0.01	0.08
F24-A	0.92		0.3	
FB13-A	1.36		0.04	
FB21-A	9.05		0.25	*
FB22-A	2.44		0.07	
FB23-A	0.64		0.02	
G12-A	4.70		0.13	
G15-A	1.00		0.03	
H4-A	16.50		0.64	*
H5-A	0.24		0.01	
H7-A	2.83		0.08	
H11-A	18.87	27.02	0.53	0.76 *
H24-A	3.68		0.06	
H25-A	8.68		0.24	*
H32-A	5.24	3.72	0.15	0.10
H33-A	3.94	0.99	0.11	0.03
H41-A	0.33		0.01	



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5.1 (continued)

	<u>Gold in Sample</u> (milligrams)		<u>Average Gold Grade</u> gms/m ³	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
H51-A	1.10		0.03	
H52-A	1.30	2.81	0.04	0.08
H59-A	5.49	5.08	0.15	0.14 *
H62-A	1.09	1.70	0.01	0.05
H65-A	16.50	12.99	0.46	0.36 *
H65-B	4.50		0.13	
H68-A	4.20	17.69	0.12	0.49 *
J4-A	3.50	3.46	0.10	0.10
K15-A	3.80		0.11	
L11-A	8.70	9.17	0.24	0.26 *
L12-A	25.09	1.51	0.70	0.04 *
L13-A	23.01	9.30	0.64	0.26 *
L13-B	10.36		0.29	*
L21-A	5.39	1.85	0.15	0.05
L23-A	3.70	1.83	0.10	0.05
L24-A	9.23		0.26	*
L25-A	7.55	1.19	0.21	0.03 *
L31-A	0.32		0.42	*
L32-A	15.90		0.42	*
L33-A	48.18		1.35	*
L34-A	8.55	11.16	0.24	0.31 *
L41-A	19.21	27.41	0.54	0.77 *
L42-A	18.70	12.79	0.52	0.36 *
L42-B	3.20		0.09	
L43-A	28.76		0.08	*
L44-A	9.08		0.25	*
L44-B	2.50	3.21	0.07	0.09
L45-A	4.58	13.77	0.13	0.39 *
L410-A	6.60	4.95	0.18	0.14
L411-A	3.92	2.69	0.10	0.07
M6-A	1.90		0.05	
M33-A	3.30	13.91	0.09	0.39 *



5.1 (continued)

	<u>Gold in Sample</u> (milligrams)		<u>Average Gold Grade</u> <u>gms/m³</u>	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
M34-A	4.77	4.21	0.13	0.12
M35-A	4.30	12.43	0.12	0.35 *
M36-A	3.30	3.00	0.09	0.08
M38-A	2.70	0.72	0.07	0.02
M41-A	1.90		0.05	
M47-A	3.20		0.09	
M48-A	7.82		0.22	*
R12-A	4.59		0.13	
R13-A	1.46	0.81	0.04	0.02
R21-A	4.66	1.57	0.13	0.04
R22-A	2.90	0.37	0.08	0.01
R23-A & B	0.34	9.39	0.01	0.26 *
R31-A	2.29	6.74	0.06	0.19
R33-A	1.46	0.81	0.04	0.02
R35-A	3.48		0.10	
S13-A	29.56	96.05	0.83	2.69 *
S22-A	1.32	4.83	0.04	0.13
S24-A	15.44	29.37	0.43	0.82 *
T14-A	2.37	2.58	0.07	0.07
T15-A	2.71		0.08	
T16-A & B	0.40	0.54	0.01	0.01
T18-A	6.62	1.78	0.19	0.05
T24-A	64.94	2.81	1.82	0.08 *
T24-B	1.46	2.81	0.04	0.08
T24/T25A	62.97		1.76	
T25-A	19.37	12.17	0.54	0.34 *
T25-B	3.09	2.24	0.09	0.06
T28-A	1.30	0.90	0.04	0.02
T28-B	2.82	5.80	0.08	0.16
T32-B	17.70		0.49	
T33-A	7.78	15.10	0.22	0.42 *
T33-B	16.23		0.45	*



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5.1 (continued)

	<u>Gold in Sample</u> (milligrams)		<u>Average Gold Grade</u> gms/m ³	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
T34-A	6.85	6.98	0.19	0.20 *
T35-A	4.14		0.12	
T35-B	4.81		0.13	
T43-A	6.90	26.57	0.19	0.74 *
T45-A & B	6.72	19.36	0.19	0.54 *
T46-A	2.30		0.06	
T46-A	2.10		0.06	
T52-A	3.1	1.13	0.09	0.03
T53-A	3.17	36.9	0.09	1.03 *
T54-A	11.06		0.31	*
T55-A	24.30		0.68	*
T55-A	11.16		0.31	*
T57-A	7.48		0.21	*
T62-A	17.62		0.49	*
T62-B	87.93		2.46	*
T71-A	4.10	6.32	0.11	0.18
T72-A & B	12.78		0.36	*
T73-A	18.05	4.19	0.50	0.12 *
T74-A	12.39	4.12	0.35	0.11 *
T75-A	3.17	13.43	0.09	0.38 *
T82-A	4.10		0.11	
T83-A	7.68		0.21	*
T85-A	5.0		0.14	
T86-A & B	4.1	7.80	0.11	0.22 *
U14-A	3.05		0.08	
U25-A	4.60		0.13	
U25-B	1.95		0.05	
U32-A	1.72		0.05	
U33-A	1.68		0.05	
U34-A	6.94		0.19	
U41-A & B	31.00		0.87	*
U42-A	18.72		0.52	*



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5.1 (continued)

	<u>Gold in Sample</u> (milligrams)		<u>Average Gold Grade</u> <u>gms/m³</u>	
	<u>Original</u>	<u>Duplicate</u>	<u>Original</u>	<u>Duplicate</u>
U52-A	4.80		0.13	
U55-A	0.90		0.02	
X13-A	11.40		0.32	*

5.2 Other samples that were concentrated, but considered of too low grade to warrant assay were -

AB1-A, AC2-A

BA2-A, BA4-B, BF4-B, BJ1-A, BK1-A, BN2-A

D44-A, D53-A, D58-A

G13-A, G14-A

K14-A, K21-A, K22-A, K31-A

L49-A

R12-A, R25-A

U13-A, U23-A, U26-A, U31-A

W3-A, W5-A

X14-A, X21-A, X22-A, X41-A, X42-A, X44, X46-A

Y11-A

Z1-A, Z2-A, Z3-A, Z3-C, Z4-A, Z5-A, Z6-A, Z8-A, Z8-B, Z9-A



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5.3 The best grades occur in the following areas -

- (a) Upper Blanket Creek Area - Most of area T and S and part of Area U. (See Plan 1096/5).
- (b) Sludge Creek and Morning Star Creek - Area L downstream from Area I, and Area M included within Area I.
- (c) Chum Creek - Parts of Area H (Pinafore Lead). Parts of Area F. Area D appears to be generally lowgrade.
- (d) Reconnaissance samples X13-A on Curries River; AA1-A in the Moonlight Flat Area and a lot of samples from Back Creek all contained worthwhile concentrates of alluvial gold, which opened up a number of additional areas considered worthy of detailed exploration at a later date.

Within most of the areas listed above, there can be considerable variation in grade between the original and duplicate samples for each test pit. This is not uncommon in alluvial areas and it is really only the average that can be taken into consideration over a large tonnage. In the pilot plant study at Area P, the grade over a 13 tonne sample was found to be 0.8 gms/bulk cubic metre compared to 0.42 gms/cubic metre if we take the average for each of the test pits on that particular line. At site 080 a 4.7 tonne sample gave a grade of 0.20 gms/bulk cubic metre compared to an average of 0.30 gms/metre indicated from the two test pits. A bulk grade nearly 100% higher than the test pit grade in one case and nearly 33% lower in the other case.

5.4 The only practical approach in calculating alluvial reserves and deciding which areas ought to be mined is to take into consideration only those broad areas where the majority of holes have indicated grades from the sample(s) taken in excess of 0.2 gms/metre.



162022

- 021
- 5.5 In this approach some low grade samples will be included in the calculation of reserves. But if the pit is in a high grade trend then the wash around the hole may warrant mining anyway. Similarly some holes may have provided samples of a higher grade than will be ultimately found by mining around their area of reference.
- 5.6 However, we feel that over the large number of samples tested, the average for the richer parts of the field should be fairly representative of ultimate mining grade in those areas.
- 

022

6. RESERVE CALCULATION

- 6.1 For the purpose of calculating the available reserves of economical alluvial wash, the area has been split into a number of zones which includes grouping of holes generally indicating grades in excess of 0.2 gms/cubic metre.
- 6.2 In each zone the volume of wash is calculated by multiplying the length of the zone by the average thickness of wash, and the average width of the zone. The average thickness and width were initially calculated for each line of test pits within the zone and then for the zone itself.
- 6.3 The average grade was calculated again for each line of test pits using a weighted average based on the volume of wash that that particular sample represented. The average grade for the zone was calculated again using a weighted average based on the volume of wash represented by each line of test pits.
- 6.4 The reserve calculations are given in Appendix II. Each zone has been labelled for easy identification. The extent of each zone taken into consideration is shown at its respective position on Plates 1096/4 - 6.

The reserves are divided into two categories -

- (a) High grade - overall averaging 0.5 gms/cubic metre.
- (b) Low grade - overall averaging 0.2 gms/cubic metre.

- 6.5 The calculated highgrade reserves at Lefroy are as follows -

<u>Zone</u>	<u>Volume (cubic metres)</u>	<u>Grade (gms/m³)</u>
<u>Plan 1096/5</u>		
T1	52,200	0.57
T2	14,600	0.46
U1	6,800	0.79
S	7,300	1.22



6.5 (continued)

<u>Zone</u>	<u>Volume (cubic metres)</u>	<u>Grade (gms/m³)</u>
<u>Plan 1096/4</u>		
P 1 and 2	11,200	0.8
N	7,500	0.55
V	18,600	0.32
O	10,800	0.33
M	12,000	0.42
<u>Plan 1096/7</u>		
P3	2,000	0.49
<u>Plan 1096/5</u>		
L	35,300	0.51
F	3,600	0.62
H	18,400	0.42
D	4,800	0.35
<u>TOTAL</u>	<u>205,000</u>	<u>0.50 gms/m³</u>

Plus indicated high grade parts of Curries River, Moonlight Flats and Back Creek still to be explored in detail.

6.6 Low grade reserves -

U2	4,600	0.22
T3	12,000	0.17
J	4,200	0.20
Q	18,000	0.18
FAD	30,000	0.22
<u>TOTAL</u>	<u>68,800</u>	<u>0.22 gms/m³</u>



024

7. LIKELY INCOME, COSTS AND PROFITS

- 7.1 The next step at Lefroy is to look at available alluvial treatment plants in Tasmania, (ex Tin mining operations), and determine whether any of these are worth buying and to compare them with similar units available in mainland states. Whichever way, it should be possible to set up a second hand revamped portable style plant on site for under \$ 100,000. Such a plant could be suitable for treating around 50 cubic metres per hour.
- 7.2 The cost of the operation depends upon the plant size and throughput and whether or not the wash can be fed straight to the plant from the pit or whether it has to be stockpiled and rehandled by a Loader.

In a reasonably portable operation it should be possible to get the cost of land clearing, construction of by-pass drains, removal and stacking of top soil, mining and reclaiming overburden and the stockpiling of wash to around \$ 1.20 per metre of wash. The cost of picking up from the stockpile and feeding it into the plant should be around \$ 0.65 per metre. The cost of treating the wash in the plant should be around another \$ 0.80 per metre. Final reclamation is costed at \$ 0.25 per metre. Overheads and supervision is costed at \$ 0.50 per metre. Royalties to the Tasmanian Government and Valken Mining will add another \$ 0.60 per metre. The total direct cost is likely to be around \$ 4.00 per metre. However, if the wash can be fed straight to the plant from the pit there should be a considerable saving.

- 7.3 A hydraulic excavator would be needed for the operation and this is best leased. If stockpiling of wash is necessary, then a loader will be also required.
- 

025

7.4 If a weekly throughput of 1,800 metres can be achieved, the life of the operation is around $2\frac{1}{2}$ years. Other areas could add another 1 - 2 years to this operation. On a 1,800 tonnes per week throughput, 29 ounces of gold should be won for a gross income of around \$ 11,600 per week, assuming a gold price of A\$ 400.00 per ounce. (\$ 534,000 per annum).

If total costs can be kept to \$ 4.00 per metre or \$ 8,000 a week, then the weekly profit should be \$ 4,400. In a 46 week year this is equivalent to around \$ 200,000. If the capital costs of \$ 100,000 are amortized over 4 years, the net profit per annum would be reduced to \$ 175,000. (175% on capital invested).

7.5 On the above figures the existing Lefroy reserves could provide an overall profit close to \$ 500,000 over $2\frac{1}{2}$ years. Additional potential reserves in the area could perhaps extend the life of the operation by another 1 - 2 years. Over say 4 years that mining could be carried out on this general area a total profit of around \$ 700,000 might not be considered unreasonable.



026

8. CONCLUSION

- 8.1 In the author's opinion, the mining of alluvial gold at Lefroy is considered to be worthwhile and likely to provide a profit of around \$ 500,000 over 2½ years at a capital amortization rate of 25% per annum. Profits are likely to be in excess of 100% of capital invested.
- 8.2 The above figures however, are dependant upon establishing a portable mining operation for under \$ 100,000 capital cost (earthmoving equipment to be leased). The financial success of the operation is dependant upon getting the cost of treatment per metre down to the minimum and by selective mining of higher grade areas only.
- 8.3 At a gold price of A\$ 400.00 per ounce and an operating cost of \$ 4.00 per metre, the cut-off economical grade is 0.3 gms/metre. At a grade of 0.5 gms/metre, the cut-off economical gold price is A\$ 250.00 per ounce.



APPENDIX I - TEST PIT RESULTS

162028

Hole AA1

0 - 1.3 o/b
 1.3 - 1.8 A : Grey fine wash
 1.8 - 2.5 Grey clay (weathered phyllite)
 2.5+ Br : Phyllite

Hole AA2

0 - 2.2 o/b
 2.2 - 3.2 Grey gravelly clay
 3.2+ Br : Phyllite

Hole AB1

0 - 3.0 o/b
 3.0 - 4.2 fine grey wash
 4.2+ Br : Phyllite

Hole AB2

0 - 2.15 o/b
 2.15 - 2.45 A : Grey sandy gravel
 2.45 - 4.0 A : Grey sandy gravel
 4.0+ Br : Slate

Hole AC1

0 - 2.7 o/b
 2.7+ Br : Phyllite

Hole AC2

0 - 1.5 o/b
 1.5 - 2.5 gravelly clay
 2.5 - 2.8 A : Grey wash
 2.8+ Br : Phyllite



028

Hole AD1

0 - 1.0 o/b
 1.0 - 2.2 A : Grey clayey gravel and fine wash
 2.2+ Br : Phyllite

Hole AD2

0 - 2.8 o/b
 2.8+ Br : Phyllite

Hole AE1

0 - 4.2 o/b
 4.2 - 5.2+ Red brown basaltic clay

Hole AE2

0 - 2.5 o/b
 2.5 - 4.0 Grey clay with some gravel
 4.0+ Red brown basaltic clay

Hole AE3

0 - 2.3 o/b
 2.3 - 3.1 Mottled brown grey gravelly clay
 3.1 - 4.3+ Red brown basaltic clay



029

162030

Hole BA1

0 - 2.5 o/b
 2.5 - 2.8 A : Coarse grey and brown wash
 2.8 - 4.6 Grey clay (weathered basalt)
 4.6+ Weathered basalt

Hole BA2

0 - 1.5 o/b
 1.5 - 2.2 Grey sandy fine wash
 2.2 - 3.3 C : Grey wash
 3.3 - 4.4 Grey sandy gravel
 4.4 - 4.55 B : Grey wash
 4.55 - 5.3 Grey sand and gravel
 5.3 - 5.5 A : Cemented wash
 (Bedrock not reached)

Hole BA3

0 - 1.3 o/b
 1.3 - 1.5 C : Grey wash
 1.5 - 1.8 Grey gravelly clay
 1.8 - 3.5 B : Coarse grey sandy wash
 3.5 - 3.8 A : Weathered slate
 3.8+ Br : Slate

Hole BA4

0 - 1.8 o/b
 1.8 - 2.5 B : Coarse grey wash
 2.5 - 2.6 A : Very coarse quartz boulders
 2.6+ Br : Slate

Hole BB1

0 - 2.8 o/b
 2.8 - 3.3 Coarse grey wash
 3.3+ Grey clay (weathered basalt)



Hole BB2

0 - 0.9 o/b
 0.9 - 1.6 B : Hardpan (grey wash)
 1.6 - 2.4 A : Brown wash
 2.4 - 4.1 Brown basaltic clay
 4.1+ Weathered basalt

Hole BB3

0 - 5.6 Basaltic clay
 5.6+ Grey basalt clay

Hole BB4

0 - 1.7 o/b
 1.7 - 2.2 A : Grey wash
 2.2+ Grey clay (Ext weathered basalt)

Hole BB5

0 - 1.4 o/b
 1.4 - 2.4 Brown wash
 2.4 - 3.4 Grey clay
 3.4 - 4.5+ Red brown clay (Ext weathered basalt)

Hole BB6

0 - 1.3 o/b
 1.3 - 1.6 Red brown wash
 1.6 - 3.8+ Brown grey clay (Ext weathered basalt)

Hole BB7

0 - 3.7 o/b
 3.7+ Weathered basalt



031

162032

Hole BB11

0 - 0.8 o/b
 0.8 - 1.4 Coarse brown wash
 1.4+ Br : Phyllite

Hole BB12

0 - 1.0 o/b
 1.0+ Br : Phyllite

Hole BB13

0 - 1.0 o/b
 1.0+ Br : Phyllite

Hole BC1

o - 2.3 o/b
 2.3 - 2.7 A : Fine grey brown wash
 2.7+ Br : Shale

Hole BC2

0 - 1.3 o/b
 1.3 - 2.2 Brown grey gravelly clay
 2.2 - 2.4 A : Brown grey sand and fine wash
 2.4+ Br : Slate

Hole BC3

0 - 0.9 o/b
 0.9 - 1.5 A : Grey wash
 1.5+ Br : Brown

Hole BC4

0 - 1.6 o/b
 1.6 - 2.7 A : Grey sandy gravel
 2.7+ Br : Slate



032

162033

Hole BC5

0 - 2.9 o/b
 2.9 - 3.2 Grey clayey sand
 3.2+ Br : Slate

Hole BD1

0 - 3.4 o/b
 3.4 - 4.2 A : Coarse grey wash
 4.2+ Br : Slate

Hole BD2

0 - 3.3 o/b
 3.3 - 3.9 A : Grey brown wash
 3.9+ Br : Shale

Hole BD3

0 - 1.3 o/b
 1.3+ Br : Shale

Hole BD4

0 - 0.8 o/b
 0.8 - 0.9 Grey brown wash
 0.9+ Br :

Hole BE1

0 - 1.6 o/b Brown gravelly clay
 1.6+ Br : Grey clay (weathered basalt)

Hole BE2

0 - 2.5 o/b Grey clay
 2.5 - 4.3 Weathered basalt
 4.3+ Br : Basalt



033

162034

Hole BE3

0 - 1.2 o/b
 1.2 - 2.3 Grey gravelly clay
 2.3 - 3.0 Brown clay
 3.0 - 5.4 Brown basaltic clay (Ext weathered basalt)
 5.4+

Hole BE4

0 - 1.3 o/b
 1.3 - 4.0 B : Grey gravelly clay
 4.0 - 5.3 A : Brown basaltic clay (Ext weathered basalt)

Hole BE5

0 - 2.6 o/b
 2.6+ Br : Slate

Hole BE6

0 - 1.6 o/b
 1.6 - 2.3 A : Coarse wash
 2.3+ Br : Phyllite

Hole BE11

0 - 1.0 o/b
 1.0 - 2.0 A : Grey wash
 2.0+ Br : Brown Phyllite

Hole BF1

0 - 0.9 o/b
 0.9 - 1.0 Grey gravelly clay
 1.0+ Br : Phyllite

Hole BF2

0 - 2.3 o/b
 2.3 - 2.5 A : Grey brown wash
 2.5+ Br : Phyllite



162035

Hole BF3

0 - 1.4 o/b
 1.4 - 1.7 Grey brown wash
 1.7+ Br : Phyllite

Hole BF4

0 - 1.7 o/b
 1.7 - 2.3 Grey wash
 2.3 - 3.5 B : Coarse grey wash
 3.5 - 4.7 A : Grey gravelly sand
 4.7+ Br : Slate

Hole BF5

0 - 1.8 o/b
 1.8 - 2.2 A : Grey brown wash
 2.2+ Br : Shale

Hole BG3

0 - 0.9 o/b
 0.9 - 1.4 A : Coarse brown wash
 1.4+ Br : Brown Phyllite

Hole BG4

0 - 2.0 o/b
 2.0 - 4.5 Brown clayey sand
 4.5+ Br : Brown Phyllite

Hole BG5

0 - 2.5 o/b
 2.5+ Br : Shale

Hole BG6

0 - 1.8 o/b
 1.8+ Br : Shale



162036

Hole BG7

0 - 2.0 o/b
 2.0+ Br : Shale

Hole BG8

0 - 3.0 o/b
 3.0+ Br : Shale

Hole BG9

0 - 1.8 o/b
 1.8 - 3.7 Brown grey gravelly clay
 3.7+ Br : Brown Phyllite

Hole BG10

0 - 3.2 o/b
 3.2 - 3.3 Coarse wash
 3.3 - 4.4 Ferruginous sand
 4.4+ Br : Brown Phyllite.

Hole BG11

0 - 3.1 o/b
 3.1 - 3.8 Ferruginous sand
 3.8+ Br : Phyllite

Hole BI1

0 - 5.0 o/b
 5.0+ Basaltic clay

Hole BI2

0 - 2.5 o/b
 2.5+ Basaltic clay

Hole BI3

0 - 5.0 o/b
 5.0+ Basaltic clay

Hole BJ1

0 - 2.1 o/b
 2.1 - 3.2 A : Grey wash
 3.2+ Br

Hole BJ2

0 - 3.4 o/b
 3.4 - 3.8 Fine brown wash
 3.8 - 4.2 Mottled grey brown sandy gravelly clay
 4.2+ Br : Brown Phyllite

Hole BK1

0 - 1.5 o/b
 1.5 - 2.8 Grey clayey sand
 2.8 - 3.2 A : Fine grey wash
 3.2 - 4.2 White clay (weathered phyllite)
 4.2+ Br : Phyllite

Hole BK2

0 - 1.3 o/b
 1.3 - 2.4 Grey clayey sand
 2.4 - 2.8 Mottled grey brown wash
 2.8 - 4.4 Grey clay
 4.4+ Br : Brown Phyllite



037

162038

Hole BL1

0 - 1.0 o/b (Basaltic clay)
 1.0 - 1.4 Grey gravelly clay
 1.4 - 2.0 A : Brown and grey wash
 2.0 - 2.5 White clay (Weathered Phyllite)
 2.5+ Br : Phyllite

Hole BM1

0 - 1.25 o/b
 1.25 - 1.6 A : Brown grey wash
 1.6+ Br : Phyllite

Hole BM2

0 - 1.3 o/b
 1.3 - 1.6 A : Grey brown fine wash
 1.6+ Br : Phyllite

Hole BN1

0 - 1.4 o/b
 1.4 - 2.5 Grey gravelly sandy clay
 2.5 - 3.05 C : White gravelly clayey sand
 3.05 - 3.6 B : Brown gravelly clayey sand
 3.6 - 3.9 A : Grey sandy wash
 3.9 - 5.0 Grey clay (Weathered Phyllite)
 5.0+ Br : Phyllite

Hole BN2

0 - 2.2 o/b
 2.2 - 3.0 B : Grey gravelly sandy clay
 3.0 - 3.8 A : Grey brown wash
 3.8 - 4.3 Grey clay (Weathered Phyllite)
 4.3+ Br : Phyllite



038

Hole D31

0 - 1.1 o/b
 1.1 - 1.3 B : Gravelly clay
 1.3 - 2.1 A : Coarse wash
 2.1+ Br

Hole D32

0 - 1.5 o/b
 1.5 - 2.8 Gravelly clay
 2.8 - 3.0 B : Fine grey wash
 3.0 - 4.0 A : Brown wash
 4.0+ Br : Phyllite

Hole D41

0 - 1.6 Tailings
 1.6 - 2.5 A : Grey wash
 2.5 - 2.7 Sand
 2.7+ Br : Brown Phyllite

Hole D42

0 - 1.1 o/b
 1.1 - 2.3 A : Grey wash - coarse towards bottom
 2.3+ Br : Brown Phyllite

Hole D43

0 - 1.5 o/b
 1.5 - 3.1 A : Grey wash
 3.1+ Br : Brown Phyllite

Hole D44

0 - 1.2 o/b
 1.2 - 2.8 Tailings clay with occasional gravel
 2.8 - 5.0 A : Clayey sand - thin zone of gravels at base
 5.0+ Br : Brown Phyllite



039

162040

Hole D45

0 - 1.2 Tailings sand
 1.2 - 1.9 Grey fine sandy clay and fine gravel
 1.9 - 2.1 Grey sandy clay and gravel
 2.1 - 3.5 A : Grey wash and sandy clay
 3.5 - 4.4 Grey clayey sand layer
 4.4+ Br : Brown Phyllite

Hole D46

0 - 1.4 o/b
 1.4 - 3.4 Grey gravelly clay
 3.4 - 4.3 Gravelly clay and gravel screenings
 4.3+ Br : Grey brown Phyllite

Hole D47

0 - 2.0+ o/b
 Bedrock not encountered (hole failed)

Hole D48

0 - 1.0 o/b
 1.0 - 2.7 Grey clay with some gravel
 2.7 - 2.9 A : Brown wash
 2.9+ Br : cemented quartz gravel

Hole D49

0 - 1.5 o/b
 1.5 - 3.2 Grey gravelly clay
 3.2 - 4.2 A : Brown wash
 4.2+ Br : Phyllite



162041

Hole D410

0 - 1.2 o/b
 1.2 - 1.8 C : Light grey sandy clay
 1.8 - 3.5 Grey sandy clay
 3.5 - 4.0 B : Grey wash
 4.0 - 4.2 A : Brown grey wash
 4.2+ Br : Phyllite

Hole D411

0 - 2.8 o/b
 2.8 - 4.3 B : Grey brown wash
 4.3 - 4.8 A : Coarse grey brown wash
 4.8 - 5.0 Sand
 5.0+ Br : Brown phyllite

Hole D412

0 - 1.8 o/b
 1.8 - 2.5 A : Fine grey wash
 2.5 - 2.8 Clay
 2.8+ Br : Grey green phyllite

Hole D51

0 - 2.6 o/b (includes gravelly grey clay)
 2.6+ Br : Phyllite

Hole D52

0 - 1.2 o/b
 1.2 - 1.9 Grey clayey wash
 1.9 - 2.2 Grey clay
 2.2+ Br : Phyllite



162042

Hole D53

0 - 1.5 o/b (includes surface gravel)
 1.5 - 1.8 A : Grey wash
 1.8+ Br : Phyllite

Hole D54

0 - 1.9 o/b
 1.9+ Br : Phyllite

Hole D55

0 - 1.6 o/b
 1.6 - 2.1 Grey gravelly clay
 2.1 - 3.3 B : Grey wash
 3.3 - 3.5 Clay
 3.5 - 4.1 A : Brown wash
 4.1+ Br : Brown phyllite

Hole D56

0 - 3.0 o/b
 3.0 - 3.5 Grey clay and gravel
 3.5+ Br : Phyllite

Hole D57

0 - 3.2 o/b
 3.2 - 4.7 B : Grey wash
 4.7 - 5.2 A : Coarse grey wash
 5.2+ Br : Phyllite

Hole D58

0 - 3.2 o/b
 3.2 - 3.6 A : Grey wash
 3.6+ Br : Weathered phyllite

162043

Hole F11

0 - 1.2 o/b
 1.2 - 2.6 Grey gravelly clay
 2.6+ Br : Phyllite

Hole F12

0 - 1.5 o/b
 1.5 - 2.6 Grey gravelly clay
 2.6+ Br : Phyllite

Hole F13

0 - 1.2 o/b
 1.2 - 2.8 A : Grey wash
 2.8+ Br : Phyllite

Hole F14 (in creek)

0 - 1.7 o/b
 1.7 - 2.6 B : Grey gravelly clay
 2.6 - 3.4 A : Coarse grey wash
 3.4+ Br : Green phyllite

Hole F15

0 - 0.6 o/b
 0.6 - 1.0 B : Grey brown fine wash
 1.0 - 2.7 A : Gravelly light grey clay
 2.7+ Br : Weathered phyllite

Hole F21

0 - 1.7 o/b
 1.7 - 2.8 A : White gravelly clay
 2.8+ Br : Weathered green phyllite



162044

043

Hole F22

0 - 0.9 o/b
 0.9 - 1.1 B : Gravelly clay
 1.1 - 1.8 Brown and grey clay
 1.8 - 2.0 A : Coarse brown grey wash
 2.0 - 2.7 Grey clay (weathered bedrock)
 2.7+ Br : Brown grey weathered slate

Hole F23

0 - 2.3 o/b
 2.3 - 2.9 B : Coarse brown and grey wash
 2.9 - 3.9 Grey clay
 3.9 - 4.4 A : Grey wash
 4.4+ Br : Phyllite

Hole F24

0 - 0.6 o/b
 0.6 - 0.9 Gravel
 0.9 - 1.7 A : Mottled grey and brown wash
 1.7+ Br : Weathered phyllite

Hole FB11

0 - 1.0 o/b
 1.0 - 1.6 B : Gravelly clay
 1.6 - 3.5 A : White gravelly clay
 3.5+ Br : Phyllite

Hole FB12

0 - 1.8 o/b
 1.8 - 3.1 D : Clayey wash
 3.1 - 3.7 C : Brown wash
 3.7 - 4.7 B : Dark brown wash
 4.7 - 5.2 A : Sandy coarse wash
 5.2+ Br



162045

Hole FB13

0 - 1.0 o/b
 1.0 - 1.6 A : Grey wash
 1.6+ Br

Hole FB21

0 - 2.5 o/b
 2.5 - 3.5 B : Brown wash, some clay sections
 3.5 - 4.4 A : Brown wash
 4.4+ Br

Hole FB22

0 - 1.4 o/b
 1.4 - 1.8 B : Coarse grey wash
 1.8 - 3.4 Gravelly clay
 3.4 - 4.1 A : Brown wash
 4.1+ Br : Slate

Hole FB23

0 - 1.9 o/b
 1.9 - 2.6 Grey wash
 2.6 - 3.7 Grey clay
 3.7 - 4.3 Brown wash
 4.3+ Br : Phyllite

Hole FB24

0 - 2.3 o/b
 2.3 - 3.2 Grey sandy clay
 3.2 - 3.4 B : Wash
 3.4 - 4.3 Clay
 4.3 - 4.7 A : Grey brown wash
 4.7+ Br : Phyllite



162046

Hole G11

0 - 1.6 o/b
 1.6+ Br : Slate

Hole G12

0 - 2.4 o/b
 2.4 - 2.7 C : Grey wash
 2.7 - 2.9 Grey clay
 2.9 - 3.1 B : Grey wash
 3.1 - 4.0 Grey sand and some gravel
 4.0 - 4.5 A : Brown sand
 4.5+ Br : Brown slate

Hole G13

0 - 2.5 o/b
 2.5 - 3.8 Grey clay and gravel with wash in southern side of
 the hole
 3.8 - 4.7 A : Coarse grey wash
 4.7+ Br : Brown slate

Hole G14

0 - 1.0 o/b
 1.0 - 2.9 Grey gravelly sand
 2.9 - 4.9 A : Grey gravelly wash
 Did not intersect Bedrock

Hole G15

0 - 2.7 o/b
 2.7 - 3.3 B : Coarse grey wash
 3.3 - 3.65 Grey sand and some gravel
 3.65 - 3.9 A : Grey wash
 3.9+ Br : Brown phyllite

Hole G16

0 - 3.85 o/b
 3.85+ Br : Phyllite

162047

046

Hole H11

0 - 1.2 o/b
1.2 - 2.8 A : Coarse brown wash
2.8+ Br : Phyllite

Hole H12

0 - 2.3 o/b
2.3+ Br : Phyllite

Hole H13

0 - 1.9 o/b
1.9 Br : Brown siltstone

Hole H14

No wash encountered
Bedrock is brown weathered phyllite

Hole H15

0 - 1.5 o/b
1.5+ Br : Weathered brown siltstone

Hole H21

No wash

Hole H22

No wash

Hole H23

0 - 1.5 o/b
1.5 - 1.6 Grey brown gravelly clay
1.6+ Br : Siltstone



047

162048

Hole H24

0 - 1.2 o/b
 1.2 - 1.9 A : Brown clay wash
 1.9+ Br : Phyllite

Hole H25

0 - 1.0 o/b
 1.0 - 2.0 A : Gravelly clay grading into coarse grey wash
 2.0 - 2.2 Grey sand
 2.2+ Br : Brown siltstone

Hole H31

0 - 1.6 o/b (surface gravel and then clay)
 1.6+ Br : Phyllite

Hole H32

0 - 0.5 o/b (surface gravel and clays)
 0.5 - 1.3 B : Grey wash
 1.3 - 1.6 A : Coarse brown wash
 1.6+ Br : Brown weathered phyllite

Hole H33

0 - 1.4 o/b
 1.4 - 2.2 A : Brown clayey wash
 2.2 - 2.4 White clay (weathered phyllite)
 2.4+ Br : Phyllite

Hole H34

0 - 1.4 o/b
 1.4 - 3.2 A : Mottled red brown and grey gravelly clay
 3.2+ Br : Phyllite



048

162049

Hole H41

0 - 1.4 o/b
 1.4 - 2.3 A : Coarse brown wash
 2.3+ Br : Brown, weathered phyllite

Hole H51

0 - 5.2 o/b
 5.2 - 5.5 Cemented brown gravelly sand
 5.5 - 5.7 Grey clay
 5.7 - 6.2 A : Brown gravelly clay
 6.2+ Did not intersect Bedrock

Hole H52

0 - 1.0 o/b
 1.0 - 4.7 Hardpan overlying white clay
 4.7 - 5.1 B : Brown wash
 5.1 - 5.7 Grey clay
 5.7 - 6.3 A : Brown wash
 6.3+ Did not intersect Bedrock

Hole H53

0 - 1.0 Surface gravel
 (couldn't dig through)

Hole H54

0 - 1.5 o/b (red soil)
 1.5+ Br : Basaltic clay

Hole H55

0 - 1.0 red soil
 1.0+ Br : Basaltic clay



162050

Hole H56

0 - 1.2 red soil
1.2+ Basaltic clay

Hole H57

0 - 1.5 White gravelly clay
1.5 - 2.9 Mottled brown grey clay
2.9+ Weathered Basalt

Hole H58

0 - 0.5 o/b
0.5 - 1.5 A : Hardpan and some gravel
1.5 - 2.6+ Brown Basaltic clay

Hole H59

0 - 1.8 o/b
1.8 - 2.3 A : Brown grey wash
2.3 - 3.0 Br : Basaltic clay

Hole H510

0 - 1.0 o/b
1.0 - 1.5 Grey hardpan
1.5 - 4.0 Br : Red brown basaltic clay

Hole H511

0 - 1.0 o/b
1.0 - 2.5+ Br : Brown basaltic clay

Hole H512

0 - 0.5 o/b
0.5 - 3.9 Red grey clay with some gravel
3.9+ Br : Weathered basalt



050

162051

Hole H513

0 - 1.6 o/b
 1.6 - 1.7 A : Grey brown gravelly clay
 1.7 - 3.8 Clay (weathered phyllite)
 3.8+ Br : Brown phyllite

Hole H61

0 - 0.2 o/b
 0.2 - 0.6 B : Gravel
 0.6 - 1.1 Hardpan
 1.1 - 2.2 Grey gravelly clay
 2.2 - 2.6 A : Brown and grey clayey wash
 2.6 - 4.8 Red and white mottled clay (extremely weathered
 basalt)
 4.8+ Br : Weathered basalt

Hole H62

0 - 1.0 o/b
 1.0 - 1.5 A : Hardpan - grey and brown wash
 1.5 - 3.5 Mottled red brown and grey clay
 3.5+ Br : Weathered basalt

Hole H63

0 - 1.0 o/b
 1.0 - 1.5 Grey gravelly hardpan
 1.5 - 3.5 Mottled brown red and grey clay
 3.5+ Br : Weathered basalt

Hole H64

0 - 1.5 Clay (containing weathered basalt boulders)
 1.5+ Br : Weathered basalt



Hole H65

0 - 0.5 o/b
 0.5 - 1.3 Fine grey gravel
 1.3 - 1.7 B : Red brown and grey gravelly clay
 1.7 - 3.3 A : Coarse grey and brown wash
 3.3+ Br

Hole H66

0 - 1.0 o/b
 1.0 - 2.0 Basalt boulders and dark brown clay
 2.0 - 2.5 Dark brown clay
 2.5+ Br : Weathered basalt

Hole H67

0 - 3.0 o/b
 3.0+ Br : Mottled grey and brown iron-rich hardpan

Hole H68

0 - 0.2 o/b
 0.2 - 1.0 B : Grey wash
 1.0 - 3.3 A : Brown clay and gravel with gravel channel
 3.3+ Br : Phyllite

Hole H69

0 - 2.2 o/b
 2.2+ Brown grey clay (Bedrock not encountered)

Hole H610

0 - 1.0 A : Brown surface wash
 1.0 - 2.2 Light grey brown clay
 2.2+ Brown Siltstone



052

162053

Hole H611

0 - 1.3 Brown gravelly clay
 1.3 - 1.6 A : Grey brown fine wash
 1.6 - 2.8 Light brown clay (weathered bedrock)
 2.8+ Br : Brown siltstone

Hole I11

0 - 1.3 o/b
 1.3+ Br : Weathered basalt

Hole I12

0 - 1.8 o/b
 1.8+ Br : Weathered basalt

Hole J4

0 - 1.7 o/b
 1.7 - 2.2 A : Brown and grey wash
 2.2+ Br : Basalt

Hole J5

0 - 2.0 o/b
 2.0 - 4.7 Brown grey clay with some gravel
 4.7+ Br : Basalt

Hole K11

0 - 0.1 o/b
 0.1+ Br : Basalt

Hole K12

0 - 0.6 A : Brown surface gravel
 0.6+ Br : Basalt



053

162054

Hole K13

0 - 0.9 o/b
 0.9 - 1.5 A : Fine brown grey wash
 1.5+ Br : Basalt

Hole K14

0 - 2.1 o/b
 2.1 - 2.8 A : Coarse grey brown wash
 2.8+ Br : Basalt

Hole K15

0 - 1.5 o/b
 1.5 - 1.7 o/b - laterite layer
 1.7 - 3.0 A : Coarse brown grey wash
 3.0+ Br : Basalt

Hole K21

0 - 2.3 o/b
 2.3 - 2.95 A : Grey wash
 2.95+ Br : Basaltic clay

Hole K22

0 - 2.4 o/b
 2.4 - 3.1 B : wash
 3.1 - 3.4 A : wash
 3.4+ Br : Basalt

Hole L42

0 - 0.8 o/b
 0.8 - 1.7 B : Grey brown wash
 1.7 - 2.2 A : Brown basaltic wash, coarser towards base
 2.2+ Basaltic clay



054

Hole L11

0 - 1.1 o/b
 1.1 - 1.7 A : Brown basaltic wash
 1.7+ Br : Basaltic clay

Hole L12

0 - 1.6 o/b
 1.6 - 1.8 A : Brown grey clayey wash
 1.8 - 2.4 Brown basaltic clay (extremely weathered basalt)
 2.4 - 4.5 Bouldery basalt layer
 4.5+ Basalt

Hole L13

0 - 1.5 o/b
 1.5 - 2.0 B : Grey brown wash
 2.0 - 2.7 A : Brown basaltic wash
 2.7+ Br : Basalt

Hole L14

0 - 1.5 o/b
 1.5 - 2.8 B : Brown grey basaltic wash
 2.8+ Br : Basalt

Hole L15

0 - 1.5 o/b
 1.5+ Br : Basalt

Hole L21

0 - 1.5 o/b
 1.5+ Br : Basalt



055

162056

Hole L22

0 - 0.8 o/b
 0.8 - 1.7 Brown grey gravelly clay
 1.7 - 3.2 A : Fine brown basaltic wash
 3.2+ Br : Basalt

Hole L23

0 - 0.6 B : Surface gravel
 0.6 - 2.0 clay
 2.0 - 2.9 A : Heavy basaltic wash
 2.9+ Br : Basalt

Hole L24

0 - 2.2 o/b
 2.2 - 3.3 B : Grey wash
 3.3 - 3.6 A : Basaltic wash
 3.6+ Basalt

Hole L25

0 - 1.3 o/b
 1.3 - 2.6 Basaltic wash
 2.6+ Basalt

Hole L31

0 - 1.3 o/b
 1.3 - 1.6 Brown basaltic wash
 1.6+ Br : Basalt

Hole L32

0 - 1.0 o/b
 1.3 - 2.0 A : Brown basaltic wash
 2.0+ Br : Basalt



056

162057

Hole L33

0 - 1.3 o/b
 1.3 - 3.0 Grey brown basaltic wash
 3.0+ Br : Basalt

Hole L34

0 - 0.9 o/b
 0.9 - 1.5 A : Grey brown wash
 1.5+ Br : Basalt

Hole L41

0 - 0.5 o/b
 0.5 - 1.6 ob - grey clay some gravel
 1.6 - 2.8 o/b - grey fine wash and gravelly clay
 2.8 - 4.2 A : Coarse basaltic wash
 4.2+ Br : Basalt

Hole L43

0 - 3.8 o/b (includes laterite layer at 0.9m)
 3.8 - 5.0 A : Grey brown wash
 5.0+ Br : Basalt

Hole L44

0 - 1.0 o/b - sand
 1.0 - 1.9 o/b - laterite
 1.9 - 2.5 B : Brown grey fine wash
 2.5 - 3.7 Grey clay with some gravel
 3.7 - 5.2 A : Grey brown basaltic wash
 5.2+ Br : Basalt



057

162058

Hole L45

0 - 2.0 o/b
2.0 - 2.3 C : Fine brown grey wash
2.3 - 3.2 Grey clay (slightly gravelly)
3.2 - 4.2 B : grey brown fine wash
4.2 - 5.4 A : Basaltic wash
5.4+ Br : Weathered basalt

Hole L46

0 - 0.5 o/b (sand)
0.5+ Br : Weathered basalt

Hole L47

0 - 0.8 o/b
0.8+ Br : Basalt

Hole L48

0 - 0.8 o/b
0.8+ Br : Basalt

Hole L49

0 - 1.3 o/b
1.3 - 2.7 A : Grey brown wash and brown clays
2.7+ Br : Basalt

Hole L410

0 - 2.0 o/b
2.0 - 2.7 A : Grey brown wash
2.7+ Br : Basalt



058

Hole L411

0 - 2.0 o/b
 2.0 - 2.7 Grey brown gravelly sand
 2.7 - 3.1 A : Grey wash with basalt boulders
 3.1+ Br : Basalt

Hole M31

0 - 2.6 o/b
 2.6+ Br : Weathered basalt

Hole M32

0 - 2.4 o/b
 2.4+ Br : Basalt

Hole M33

0 - 0.6 surface gravel and clays
 0.6+ Br : Weathered basalt

Hole M34

0 - 0.8 o/b
 0.9 - 1.4 A : Grey brown gravelly clay
 1.4 - 2.9 Mottled brown and grey clay (weathered basalt)
 2.9+ Br : Basalt

Hole M35

0 - 1.0 o/b
 1.0 - 1.8 Brown clay with gravel at base
 1.8 - 2.1 Coarse brown and grey wash
 2.1+ Br : Basalt

Hole M36

0 - 1.2 o/b
 1.2 - 1.9 A : Coarse brown and grey wash
 1.9+ Br : Basalt



Hole M37

0 - 0.9 o/b
 0.9 - 1.8 Brown grey gravelly clay
 1.8 - 3.0 Br : Basalt

Hole M38

0 - 0.8 o/b
 0.8 - 1.3 Grey brown gravelly clay
 1.3 - 1.8 A : Coarse brown wash
 1.8 - 3.8 White clay (weathered phyllite)
 3.8+ Br : Phyllite

Hole M39

0 - 0.6 A : Surface gravel
 0.6 - 3.5 Brown grey gravelly clay
 3.5+ Br : Basalt

Hole M41

0 - 0.4 o/b
 0.4 - 2.2 A : Fine grey surface gravel
 2.2+ Basalt

Hole M42

0 - 0.6 o/b
 0.6 - 1.8 Brown clay (extremely weathered basalt)
 1.8+ Br : Basalt

Hole M43

0 - 1.0 Basaltic clay
 1.0+ Br : Weathered basalt



162061

060

Hole M44

0 - 1.0 Basaltic clay
 1.0 - 2.4 Puggy clay (extremely weathered basalt)
 2.4+ Br : Basalt

Hole M45

0 - 1.4 o/b (Basaltic colluvium boulders)
 1.4+ Basaltic clay (weathered basalt)

Hole M46

0 - 1.5 o/b
 1.5 - 2.2 A : Fine grey brown wash
 2.2+ Br : Basalt

Hole M47

0 - 1.4 o/b (surface gravel and clay)
 1.4 - 2.9 A : Basaltic wash with material up to boulder size
 2.9+ Br : Weathered basalt

Hole M48

0 - 0.2 o/b (soil)
 0.2 - 1.6 Surface gravel
 1.6 - 2.0 A : Quartz basalt wash
 2.0 - 2.8 Br : Weathered basalt
 2.8+ Br : Basalt

Hole R11

0 - 0.8 o/b
 0.8 - 1.5 A : Grey gravelly clay to fine wash
 1.5+ Br : Phyllite

Hole R12

0 - 1.3 o/b
 1.3 - 1.7 A : Coarse grey wash
 1.7+ Br : Phyllite



162062

061

Hole R13

0 - 1.2 o/b
 1.2 - 1.9 B : Clayey gravel
 1.9 - 2.4 A : Grey clayey gravelly wash
 2.4+ Br : Phyllite

Hole R14

0 - 0.9 o/b
 0.9 - 2.4 Fine grey wash
 2.4+ Br

Hole R15

0 - 1.4 o/b
 1.4 - 2.0 Grey clay and gravel
 2.0+ Br : Phyllite

Hole R16

0 - 1.9 o/b
 1.9+ Br : Phyllite

Hole R21

0 - 1.2 o/b
 1.2 - 1.9 B : Grey wash
 1.9 - 2.2 A : Brown wash
 2.2+ Br : Phyllite

Hole R22

0 - 1.0 o/b
 1.0 - 1.3 A : Coarse grey wash
 1.3 - 2.7 White clay (weathered phyllite)
 2.7+ Br : Phyllite



162063

062

Hole R23

0 - 0.9 o/b
 0.9 - 1.3 B : Grey wash
 1.3 - 3.2 A : White gravelly clay, some wash (weathered phyllite)
 3.2+ Br : Phyllite

Hole R24

0 - 1.2 o/b
 1.2 - 3.2 Grey clay
 3.2+ Br : Phyllite

Hole R31

0 - 2.0 o/b
 2.0 - 2.8 B & A : Grey wash
 2.8+ Br : Phyllite

Hole R32

0 - 1.0 o/b
 1.0 - 2.8 Grey sandy clay, some gravel
 2.8 - 3.2 Grey wash gravelly sand
 3.2+ Br : Phyllite

Hole R33

0 - 0.7 o/b
 0.7 - 2.1 A : Coarser grey wash
 2.1+ Br : Phyllite

Hole R34

0 - 0.8 o/b
 0.8 - 1.1 Fine grey wash
 1.1 - 2.4 Grey gravelly clay
 2.4 - 2.8 Fine grey wash
 2.8+ Br : Phyllite



063

162064

Hole R35

0 - 1.1 o/b
 1.1 - 1.8 Grey gravelly clay
 1.8 - 2.5 A : Fine grey wash
 2.5+ Br : Phyllite

Hole R36

0 - 1.0 o/b
 1.0+ Br : Weathered phyllite

Hole S11

0 - 1.0 o/b
 1.0 - 2.8 A : Grey gravelly clay
 2.8+ Br : Phyllite

Hole S12

0 - 2.0 o/b
 2.0+ Br : Phyllite

Hole S13

0 - 1.2 o/b
 1.2 - 1.9 A : Coarse grey brown wash clay
 1.9+ Br : Phyllite

Hole S21

0 - 0.8 o/b
 0.8 - 2.0 Grey gravelly clay
 2.0+ Br : Phyllite

Hole S22

0 - 0.5 o/b
 0.5 - 0.9 A : Coarse grey and brown wash
 0.9+ Br : Phyllite



162065

064

Hole S23

0 - 1.5 o/b
 1.5+ Br : Siltstone

Hole S24

0 - 1.2 o/b
 1.2 - 1.8 B : Grey wash
 1.8 - 2.0 A : Coarse brown wash
 2.0+ Br : Phyllite

Hole T11

0 - 0.8 o/b
 0.8 - 1.05 B : Brown clayey wash
 1.05 - 2.05 A : Brown wash
 2.05+ Br : Phyllite

Hole T12

0 - 0.8 o/b
 0.8 - 1.1 A : Grey wash
 1.1+ Br : Phyllite

Hole T13

0 - 2.0 o/b
 2.0 - 3.2 A : Grey gravelly wash at base
 3.2+ Br : Phyllite

Hole T14

0 - 2.6 o/b
 2.6 - 3.0 B : Grey gravelly clay
 3.0 - 4.5 A : Brown wash
 4.5+ Bedrock not encountered



162066

065

Hole T15

0 - 2.9 o/b
 2.9 - 3.6 B : Grey gravelly clay
 3.6 - 4.3 A : Fine grey brown wash and gravelly clay
 4.3+ Br : Phyllite

Hole T16

0 - 0.9 o/b
 0.9 - 3.5 B : Brown grey gravelly clay
 3.5 - 4.0 A : Coarser grained grey wash
 4.0+ Br : Phyllite

Hole T17

0 - 1.0 o/b
 1.0 - 2.7 C : Gravelly clay
 2.7 - 2.9 B : Grey brown wash
 2.9 - 5.4 A : Coarse grey wash
 5.4+ Bedrock not encountered

Hole T18

0 - 1.0 o/b
 1.0 - 2.0 C : Fine grey wash
 2.0 - 3.5 B : Grey clay gravel
 3.5 - 4.7 A : Grey wash
 4.7+ Br : Slate

Hole T19

0 - 1.1 o/b
 1.1 - 4.0 A : Clay with some gravels
 4.0+ Br : Phyllite

Hole T21

0 - 1.0 o/b
 1.0 - 3.0 Brown gravelly clay
 3.0+ Br : Phyllite



162067

066

Hole T22

0 - 1.5 o/b
 1.5 - 2.8 B : Fine grey brown wash with sand zones
 2.8 - 3.5 A : Brown wash
 3.5+ Br : Phyllite

Hole T23

0 - 1.5 o/b
 1.5 - 2.0 Coarse grey wash
 2.0 - 2.2 B : Grey sand
 2.2 - 3.3 A : Coarse grey wash (thin brown wash at base)
 3.3+ Br : Phyllite

Hole T24

0 - 1.8 o/b
 1.8 - 2.3 C : Grey sandy wash
 2.3 - 3.2 B : Brown wash
 3.2 - 3.8 A : Grey wash
 3.8+ Br : Phyllite

Hole T25

0 - 0.7 o/b
 0.7 - 1.7 B : Grey clayey to fine wash
 1.7 - 2.5 A : Coarse grey wash
 2.5+ Br : Phyllite

Hole T26

0 - 1.9 o/b
 1.9 - 2.3 A : Grey wash
 2.3+ Br : Phyllite

Hole T27

0 - 0.7 o/b
 0.7 - 1.5 B : Gravelly clay
 1.5 - 2.5 A : Fine grey brown wash
 2.5+ Br : Phyllite



067

162068

Hole T28

0 - 0.6 o/b
 0.6 - 2.0 B : Brown gravelly clay
 2.0 - 2.3 A : Grey brown wash
 2.3 - 2.8 Light grey clay (weathered phyllite)
 2.8+ Br : Phyllite

Hole T31

0 - 0.9 o/b
 0.9 - 1.5 B : Brown grey gravelly clay
 1.5 - 3.2 A : Grey gravelly clay
 3.2 - 3.4 B : Brown and grey clay (weathered phyllite)
 3.4+ Br : Phyllite

Hole T32

0 - 1.2 o/b
 1.2 - 2.4 Brown clay little gravel; grey clay
 2.4 - 3.1 B : Brown wash
 3.1 - 4.0 A : Altered iron rich siltstone
 4.0+ Br : Phyllite

Hole T33

0 - 1.7 o/b
 1.7 - 2.9 A : Brown and grey wash
 2.9+ Br : Brown slate

Hole T34

0 - 1.6 o/b
 1.6 - 2.1 B : Fine grey brown wash with clay bands
 2.1 - 3.4 A : Coarse grey wash
 3.4+ Br : Slate



162069

068

Hole T35

0 - 1.4 o/b
 1.4 - 2.1 A : Fine grey wash
 2.1+ Br : Slate

Hole T36

0 - 1.9 o/b
 1.9 - 2.9 A : Fine grey wash coarser towards base
 2.9+ Br : Siltstone

Hole T41

0 - 1.0 o/b
 1.0 - 2.1 A : Brown grey gravelly clay with wash bands
 2.1+ Br : Phyllite

Hole T42

0 - 1.4 o/b
 1.4 - 2.2 A : Grey wash
 2.2+ Br : Brown Siltstone

Hole T43

0 - 1.8 o/b
 1.8 - 2.4 A : Grey wash
 2.4+ Br : Phyllite

Hole T44

0 - 2.2 o/b
 2.2 - 2.5 A : Grey gravelly clay
 2.5+ Br : Phyllite



162070

069

Hole T45

0 - 1.6 o/b
 1.6 - 2.5 B : Brown wash
 2.5 - 2.7 A : Coarser grey wash
 2.7+ Br : Phyllite

Hole T46

0 - 2.6 o/b
 2.6 - 3.4 A : Brown wash
 3.4+ Br : Phyllite

Hole T47

0 - 2.7 o/b
 2.7 - 3.4 A : Grey sandy gravel
 3.4+ Br : Phyllite

Hole T51

0 - 0.65 o/b
 0.65 - 1.0 Gravelly clay
 1.0 - 2.1 Grey clay
 2.1+ Br : Mudstone

Hole T52

0 - 0.8 o/b
 0.8 - 2.0 B : Fine dark brown clay wash
 2.0 - 3.4 A : Grey wash
 3.4+ Br : Phyllite

Hole T53

0 - 1.4 o/b
 1.4 - 2.0 B : Grey gravelly clay
 2.0 - 3.0 Grey clay
 3.0 - 4.2 A : Grey wash
 4.2+ Br : Phyllite



162071

070

Hole T54

0 - 0.4 o/b
 0.4 - 1.0 Brown clay, some gravel
 1.0 - 2.5 Grey clay, some gravel
 2.5 - 2.9 A : Coarse grey wash
 2.9+ Br : Phyllite

Hole T55

0 - 0.7 o/b
 0.7 - 1.8 A : Grey brown wash
 1.8 - 2.2 Grey brown sandy clay
 2.2+ Br : Grey Phyllite

Hole T56

0 - 1.3 o/b
 1.3 - 1.8 A : Grey wash
 1.8+ Br : Phyllite

Hole T57

0 - 1.8 o/b
 1.8 - 2.1 A : Fine brown wash
 2.1 - 2.4 Grey sandy clay (weathered phyllite)
 2.4+ Br : Phyllite

Hole T58

0 - 2.8 o/b (brown and grey clays, thin gravel)
 2.8+ Br : Phyllite

Hole T61

0 - 1.4 o/b
 1.4 - 1.8 A : Grey wash
 1.8 - 3.3 Grey clay (weathered basalt)
 3.3+ Br : Weathered basalt



162072

071

Hole T62

0 - 1.9 o/b
 1.9 - 2.4 A : Grey brown wash
 2.4 - 3.2 Grey brown clay (weathered basalt)
 3.2+ Br : Weathered basalt

Hole T71

0 - 1.4 o/b
 1.4 - 2.4 A : Grey wash
 2.4 - 4.2 Grey clay (weathered basalt)
 4.2+ Br : Basalt

Hole T72

0 - 1.7 o/b
 1.7 - 2.1 B : Grey wash
 2.1 - 2.5 A : Brown wash
 2.5 - 4.0 Grey clay (weathered basalt)
 4.0+ Br : Weathered basalt

Hole T73

0 - 1.4 o/b
 1.4 - 2.7 A : Grey wash
 2.7 - 3.2 Grey clay (weathered basalt)
 3.2+ Br : Basalt

Hole T74

0 - 0.8 o/b
 0.8 - 1.1 A : Grey wash
 1.1+ Br : Basalt

Hole T75

0 - 1.2 o/b
 1.2 - 2.4 B : Grey wash, some clay
 2.4 - 2.9 A : Grey brown wash
 2.9+ Br : Grey extremely weathered basalt



162073

072

Hole T81

0 - 1.0 o/b
 1.0 - 4.1 Grey gravelly clay
 4.1+ Br : Ferruginous siltstone and shale

Hole T82

0 - 0.4 o/b
 0.4 - 3.2 A : Grey wash
 3.2+ Br : Phyllite

Hole T83

0 - 2.8 o/b
 2.8 - 4.0 B : Fine Grey wash
 4.0 - 4.5 A : Grey sandy gravelly clay
 4.5+ Br : Phyllite

Hole T84

0 - 0.7 o/b
 0.7 - 2.4 A : Grey gravelly wash
 2.4 - 3.8 B : Grey clay (weathered phyllite)
 3.8+ Br : Phyllite

Hole T85

0 - 1.0 o/b
 1.0 - 2.3 B : Grey brown gravelly clay
 2.3 - 3.2 A : Grey brown wash
 3.2+ Br : Phyllite

Hole T86

0 - 1.3 o/b
 1.3 - 2.4 Coarse grey wash
 2.4 - 3.2 Coarse brown wash
 3.2+ Br : Phyllite

162074

073

Hole T87

0 - 1.0 o/b
 1.0 - 1.5 Grey wash
 1.5+ Br : Phyllite

Hole U11

0 - 0.4 o/b
 0.4+ Br : Basalt

Hole U12

0 - 1.7 o/b
 1.7 - 2.2 A : Coarse grey wash
 2.2+ Br : Weathered basalt

Hole U13

0 - 0.4 o/b
 0.4 - 0.7 A : Coarse grey wash
 0.7+ Br : Basalt

Hole U14

0 - 1.0 o/b
 1.0 - 2.2 A : Grey browner wash
 2.2+ Br : Basalt

Hole U21

0 - 2.0 o/b
 2.0+ Br : Weathered basalt

Hole U22

0 - 1.1 o/b
 1.1 - 2.3 A : Grey brown wash
 2.3+ Br : Basalt

162075

074

Hole U23

0 - 0.8 o/b
 0.8 - 1.1 A : Finer grey wash
 1.1+ Br : Basalt

Hole U24

0 - 1.1 o/b
 1.1 - 1.7 B : Brown and grey wash
 1.7 - 2.7 A : Coarse grey brown wash
 2.7+ Br : Basalt

Hole U25

0 - 0.9 o/b
 0.9 - 1.3 B : Fien grey wash
 1.3 - 1.7 A : Grey wash
 1.7+ Br : Basalt

Hole U26

0 - 1.2 o/b
 1.2 - 2.2 A : Grey brown wash
 2.2+ Br : Phyllite

Hole U31

0 - 0.9 o/b
 0.9 - 1.4 A : Brown fine wash
 1.4+ Br : Grey extremely weathered basalt

Hole U32

0 - 1.1 o/b
 1.1 - 1.7 B : Fine grey brown wash
 1.7 - 2.3 A : Coarser grey brown wash
 2.3+ Br : Basalt

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075

Hole U33 (in creek)

0 - 0.9 o/b
 0.9 - 1.5 A : Darker grey wash
 1.5+ Br : Basalt

Hole U34

0 - 2.1 o/b
 2.1 - 2.4 B : Grey brown wash
 2.4 - 4.0 A : Grey brown sandy gravel
 4.0+ Br : Grey clay (edge of flow)

Hole U35

0 - 2.5 o/b
 2.5 - 2.8 B : Fine brown grey wash
 2.8 - 4.2 A : Grey gravelly sandy clay
 4.2+ Br : Grey clay

Hole U41

0 - 1.4 o/b
 1.4 - 2.0 B : Darker grey wash
 2.0 - 2.6 A : Brown grey wash
 2.6+ Br : Grey weathered basaltic clay

Hole U42

0 - 1.5 o/b
 1.5 - 2.2 B : Fine brown grey wash
 2.2 - 2.5 A : Coarser brown grey wash
 2.5+ Br : Grey weathered basaltic clay

Hole U43

0 - 1.1 o/b
 1.1 - 4.2 A : Grey brown gravelly clay
 4.2+ Br : Grey weathered basalt



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076

Hole U51

0 - 1.6 o/b
 1.6 - 1.8 A : Grey wash
 1.8+ Br : Phyllite

Hole U52

0 - 0.7 o/b
 0.7 - 1.1 A : Grey wash
 1.1 - 1.6 Grey clay (weathered phyllite)
 1.6+ Br : Phyllite

Hole U53

0 - 1.1 o/b
 1.1 - 1.2 A : Grey wash
 1.2 - 2.1 B : Weathered phyllite, some gravel.
 2.1+ Br : Phyllite

Hole U54

0 - 1.1 o/b (gravelly clay)
 1.1 - 1.4 Fine brown and grey wash
 1.4 - 1.8 Phyllite clay, some gravel
 1.8+ Br : Phyllite

Hole U55

0 - 1.2 o/b
 1.2 - 1.6 A : Grey brown wash
 1.6 - 1.8 Grey clay (weathered phyllite)
 1.8+ Br : Phyllite

Hole U56

0 - 2.3 o/b
 2.3 - 2.45 A : Grey wash
 2.45 - 2.6 Br : Phyllite

077

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Hole U57

0 - 1.2 o/b
 1.2 - 1.4 A : Grey gravel clay
 1.4 - 3.0 Grey sand and clay
 3.0 - 3.5 Br : Phyllite

Hole V51

No wash
 Basalt bedrock

Hole V52

0 - 0.4 o/b
 0.4 - 1.8 A : Brown quartz, basalt wash
 1.8+ Br : Bedrock

Hole V53

0 - 1.2 o/b
 1.2+ Br : Basalt

Hole W1

0 - 1.8 o/b
 1.8 - 2.2 A : Grey to brown clayey wash
 2.2+ Br : Mudstone

Hole W2

0 - 1.5 o/b
 1.5+ Br : Pebbly mudstone

Hole W3 (in centre of creek)

0 - 1.5 o/b
 1.5 - 2.45 Light grey to brown clayey sand
 2.45 - 2.8 A : Grey clayey wash
 2.8+ Br : Mudstone

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Hole W4

0 - 0.7 o/b
 0.7 - 1.4 A : Grey brown gravelly clay with thin wash
 1.4+ Br : Mudstone

Hole W5

0 - 0.2 o/b
 0.2 - 1.1 C : Grey sandy and dome fine gravel
 1.1 - 3.0 B : Mottled brown and grey clays
 3.0 - 4.8 A : Brown and grey mottled wash
 4.8+ Br : Mudstone

Hole W6

0 - 0.2 o/b
 0.2 - 1.2 B : Grey sandy clay with minor gravel
 1.2 - 3.3 A : Mottled brown and grey clay, some gravel
 3.3+ Br : Mudstone

Hole W7

0 - 0.3 o/b
 0.3 - 0.6 Brown silty sandy clay
 0.6 - 2.4 Brown grey sandy clay and gravel
 2.4 - 3.1 A : Brown, grey sandy clay and wash
 3.1+ Br : Mudstone

Hole W11

0 - 2.9 o/b (mottled brown and grey clay)
 2.9+ Br : Mudstone

Hole W12

0 - 2.9 o/b
 2.9 - 3.7 A : Grey brown clay wash
 3.7+ Br : Grey shale



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Hole W13

0 - 2.0 o/b
 2.0+ Br : Shale

Hole W14

0 - 1.2 o/b
 1.2 - 2.1 A : Brown grey clayey gravel
 2.1+ Br : Mudstone

Hole W15

0 - 1.5 o/b
 1.5 - 2.5 A : Grey brown gravelly clay
 2.5+ BR : Mudstone

Hole W16

0 - 1.0 o/b
 1.0+ Br : Grey slate

Hole W21

0 - 2.4 o/b
 2.4 - 3.1 A : Grey clay wash
 3.1+ Br : Weathered grey slate

Hole W22

0 - 3.9 o/b
 3.9+ Br : Weathered brown grey slate

Hole W23

0 - 1.2 o/b
 1.2 - 1.9 B : Grey wash
 1.9 - 2.1 Clay
 2.1 - 3.2 A : Grey wash
 3.2+ Br : Blue grey slate

080

162081

Hole X11

0 - 2.0 o/b
 2.0 - 5.2 A : Grey brown sand
 Bedrock not encountered

Hole X12

0 - 4.6 o/b
 4.6 - 4.9 Dark grey wash
 4.9+ Br : Dark phyllite

Hole X13

0 - 1.0 o/b
 1.0 - 2.5 B : Gravelly clay
 2.5 - 3.2 A : Coarser grey wash
 3.2+ Br : Dark phyllite

Hole X14

0 - 0.9 o/b
 0.9 - 1.2 B : Grey fine wash to gravelly clay
 1.2 - 2.6 A : Grey brown gravelly clay
 2.6+ Br : Brown sandstone

Hole X21

0 - 2.0 o/b
 2.0 - 4.0 Grey sand
 4.0 - 6.0 Gravelly sand
 6.0+ Br : Dark slate

Hole X22

0 - 2.4 o/b
 2.4 - 2.8 B : Brown sand
 2.8 - 4.2 A : Fine wash, coarse at base
 4.2+ Br : Red brown siltstone

081

162082

Hole X23

0 - 2.7 o/b
 2.7+ Br : Light green phyllite

Hole X32

0 - 0.6 o/b
 0.6 - 1.5 A : Grey gravelly clay
 1.5+ Br : Green grey slate

Hole X41

0 - 1.6 o/b
 1.6 - 2.6 B : Gravelly clay
 2.6 - 3.7 A : Grey and brown wash
 3.7+ Br : Fawn grey siltstone

Hole X42

0 - 2.8 o/b
 2.8 - 3.0 A : Grey wash
 3.0 - 4.0 Grey gravelly clay
 4.0+ Br : Slate

Hole X43

0 - 1.1 o/b
 1.1 - 2.3 Clay - grey brown with minor gravel
 2.3+ Br : Phyllite/slate

Hole X44

0 - 5.5 o/b
 Did not encounter bottom

Hole X45

0 - 1.8 o/b
 1.8 - 2.0 Grey sand and fine wash
 2.0+ Br : Dark slate

162083

082

Hole X46

0 - 3.0 o/b
 3.0 - 3.8 A : Dark grey wash
 3.8+ Br : Slate/phyllite

Hole X47

0 - 2.7 o/b
 2.7 - 3.4 B : Dark sand and fine gravel
 3.4 - 4.2 A : Dark sand and gravel
 4.2+ Br : Dark phyllite/slate

Hole Y11

0 - 0.5 o/b
 0.5 - 1.8 A : Grey clayey wash
 1.8+ Br : Phyllite

Hole Y12

0 - 0.6 o/b
 0.6 - 2.0 A : Gravelly clay
 2.0+ Br : Phyllite

Hole Y13

0 - 0.9 o/b
 0.9 - 1.6 Grey clay wash
 1.6+ Br

Hole Z1 (in a depression)

0 - 1.0 o/b
 1.0 - 2.0 B : Gravelly clay
 2.0 - 2.8 A : Light grey wash
 2.8+ Br : Phyllite

162084

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Hole Z2

0 - 0.5 o/b
 0.5 - 1.1 Laterite layer
 1.1 - 1.8 A : Coarse brown wash
 1.8+ Br : Phyllite

Hole Z3

0 - 0.9 o/b
 0.9 - 1.8 C : Grey clayey sand and gravel
 1.8 - 3.0 B : Grey clayey gravel
 3.0 - 3.6 A : Coarse grey wash
 3.6+ Br : Phyllite

Hole Z4

0 - 1.0 o/b
 1.0 - 2.0 Grey clay, some gravel
 2.0 - 3.3 A : Grey wash
 3.3+ Br : Light grey slate

Hole Z5

0 - 1.6 o/b
 1.6 - 2.2 A : Grey gravelly clay
 2.2+ Br : Grey phyllite/slate

Hole Z6

0 - 1.0 o/b
 1.0 - 1.4 B : Grey gravelly clay
 1.4 - 1.7 Grey clay, some gravel
 1.7 - 2.1 A : Grey brown wash
 2.1+ Br : Light brown slate

Hole Z7

0 - 1.0 o/b
 1.0+ Br : Quartz sandstone

084

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Hole Z8

0	-	1.0	o/b
1.0	-	2.0	C : Grey brown sandy clay and gravel
2.0	-	2.6	B : Brown grey clayey sand and gravel
2.6	-	3.7	A : Brown grey sand with some wash
3.7+			Br : Grey phyllite and silicified siltstone

Hole Z9

0	-	0.9	o/b
0.9	-	1.8	A : Coarse grey wash
1.8+			Br : Phyllite

162086

085

APPENDIX II - RESERVES CALCULATIONS

<u>AREA</u>	<u>TESTPIT</u>	<u>WIDTH</u>	<u>DEPTH</u>	<u>LENGTH</u>	<u>METRES</u>	<u>GRADE</u>	<u>GOLD CONTENT</u> (gms)
T1	T2	: 40	X 0.8	X 95	= 3,040	@ 0.43	1,307
	T55	: 25	X 1.2	X 160	= 4,800	@ 0.50	2,400
	T54	: 25	X 0.5	X 160	= 2,000	@ 0.31	1,550
	T53	: 20	X 1.3	X 160	= 4,160	@ 0.56	2,330
	T43	: 40	X 0.8	X 205	= 6,560	@ 0.46	3,018
	T45	: 45	X 0.8	X 205	= 7,380	@ 0.38	2,804
	T32	: 25	X 0.8	X 180	= 3,600	@ 0.49	1,764
	T33	: 20	X 1.3	X 180	= 4,680	@ 0.32	1,498
	T22-25:	80	X 1.0	X 200	= 16,000	@ 0.82	13,120
Sub-total					52,220	@ 0.57	29,791
T2	T62	: 25	X 0.6	X 130	= 1,950	@ 1.47	2,866
	T72	: 25	X 0.7	X 130	= 2,275	@ 0.36	819
	T73	: 40	X 1.3	X 140	= 7,280	@ 0.31	2,257
	T74	: 20	X 1.1	X 140	= 3,080	@ 0.23	708
	Sub-total					14,585	@ 0.46
U	U1	: 20	X 1.3	X 200	= 5,200	@ 0.87	4,524
	U41	: 20	X 0.4	X 200	= 1,600	@ 0.52	832
	Sub-total					6,800	@ 0.79
S	S13	: 20	X 0.8	X 240	= 3,840	@ 1.76	6,758
	S24	: 20	X 0.62	X 280	= 3,472	@ 0.62	2,152
	Sub-total					7,312	@ 1.22
P	P63	: 20	X 0.7	X 150	= 2,100	@ 0.49	1,029
P	P1&2	: 30	X 1.25	X 300	= 11,250	@ 0.8	9,000
N		: 60	X 0.9	X 140	= 7,650	@ 0.55	4,158

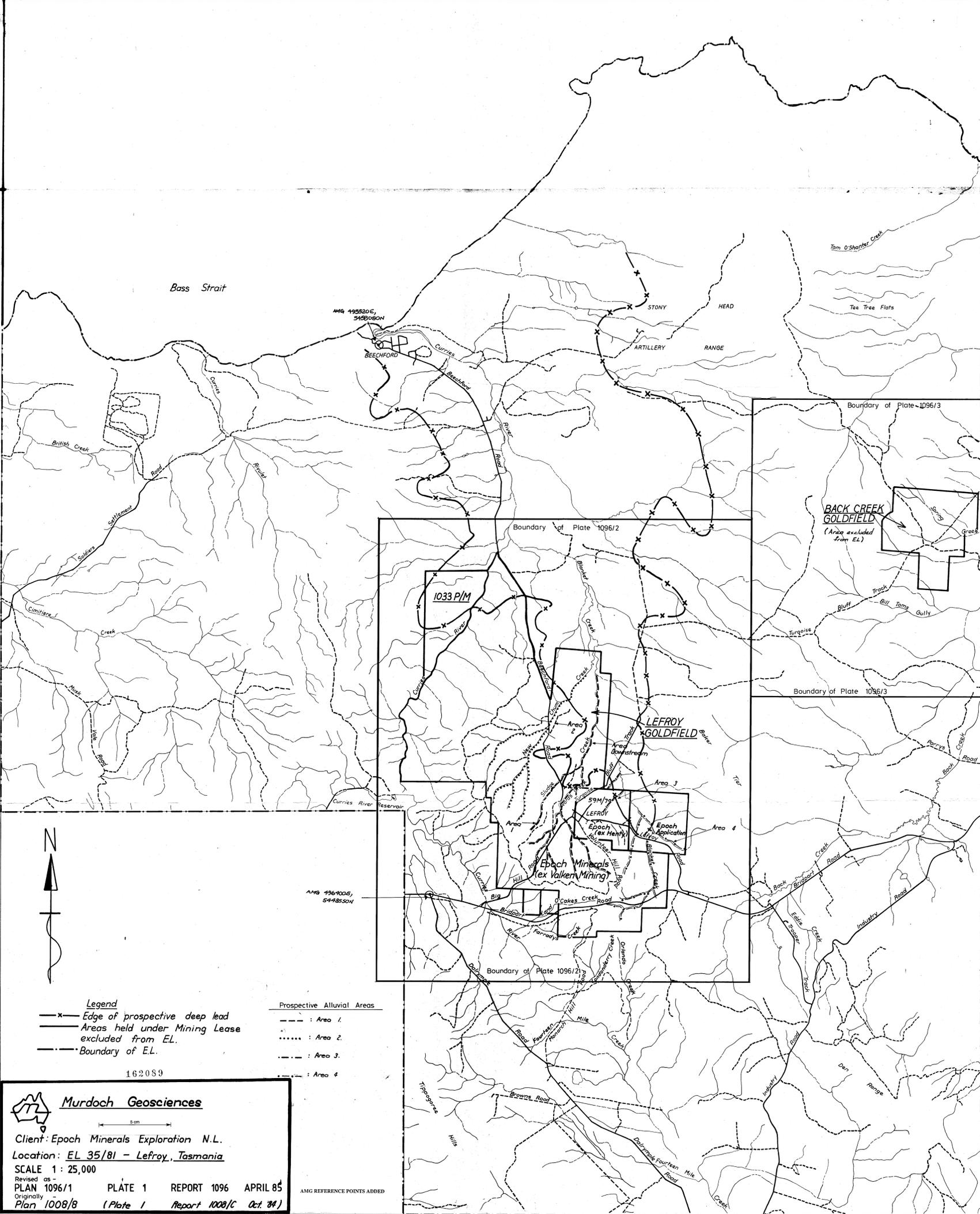


162087

086

AREA	TESTPIT	WIDTH	DEPTH	LENGTH	METRES	GRADE	GOLD CONTENT (gms)
H	H65	: 15	X 1.4	X 130	= 2,730	@ 0.42	1,146
	H68	: 20	X 2.0	X 130	= 5,200	@ 0.31	1,612
	H11	: 20	X 1.6	X 150	= 4,800	@ 0.64	3,072
	H25	: 20	X 0.4	X 150	= 1,200	@ 0.24	288
	H2-4	: 20	X 1.4	X 100	= 2,800	@ 0.43	1,204
	H32	: 20	X 1.2	X 70	= 1,680	@ 0.2	336
Sub-total					18,410	@ 0.42	7,658
F1	F	: 20	X 0.9	X 200	= 3,600	@ 0.62	2,232
D		: 20	X 2.0	X 120	= 4,800	@ 0.35	1,680
O	O41	: 20	X 0.7	X 160	= 2,240	@ 0.53	1,187
	O22-21:	30	X 0.4	X 180	= 2,160	@ 0.48	1,048
	O2	: 20	X 0.4	X 180	= 1,440	@ 0.10	144
	O61	: 25	X 0.5	X 170	= 2,125	@ 0.30	637
	O80	: 25	X 0.7	X 160	= 2,800	@ 0.20	560
Sub-total					10,765	@ 0.33	3,576
M	M24-27:	45	X 0.7	X 80	= 2,520	@ 0.45	1,134
	M21-23:	30	X 0.9	X 80	= 2,160	@ 0.31	670
	M35-32:	60	X 0.5	X 130	= 3,900	@ 0.20	793
	M1	: 20	X 1.0	X 170	= 3,400	@ 0.7	2,380
Sub-total					11,980	@ 0.42	5,032





Legend

- x— Edge of prospective deep lead
- Areas held under Mining Lease excluded from E.L.
- Boundary of E.L.

Prospective Alluvial Areas

- : Area 1.
- : Area 2.
- - - - : Area 3.
- : Area 4.

162089

Murdoch Geosciences

Client: Epoch Minerals Exploration N.L.

Location: EL 35/81 - Lefroy, Tasmania

SCALE 1 : 25,000

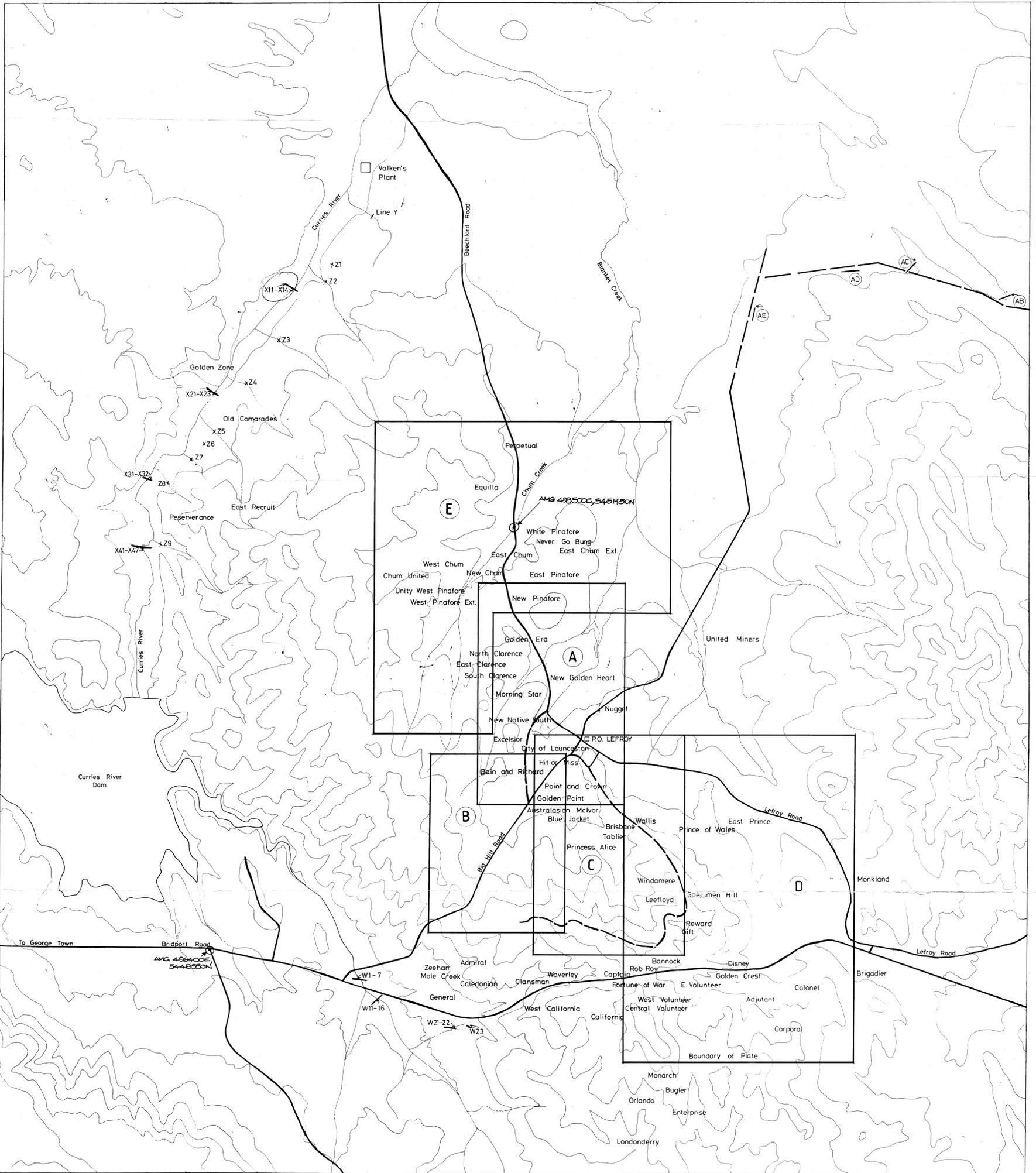
Revised as PLAN 1096/1 PLATE 1 REPORT 1096 APRIL 85

Originally Plan 1008/8 (Plate 1 Report 1008/C Oct 84)

AMG REFERENCE POINTS ADDED

5399

35-2405



Detailed 1:2,000 Plans

- Plan (A) Area 1: Lefroy Township (Sub Areas L, M, N, O, V)
- (B) Area 1: Upper Sludge Creek (Areas N, P)
- (C) Area 1: Golden Point (Area Q)
- (D) Area 2: Upper Blanket Creek (Areas R, S, T, U)
- (E) Area 3: Chum Creek and Lower Blanket Creek (Areas A, D, E, F, G, H, I, J, K, L)

— W1-7 : Lines of Test pits outside areas covered by Plans (A) to (E)

Princess Alice : Approx. location of known gold reefs



AMG REFERENCE POINTS ADDED

162090



MURDOCH GEOSCIENCES

Client : Epoch Minerals Exploration NL
Location : Lefroy Gold Field

Scale 1:10,000
PLATE 1096 / 2



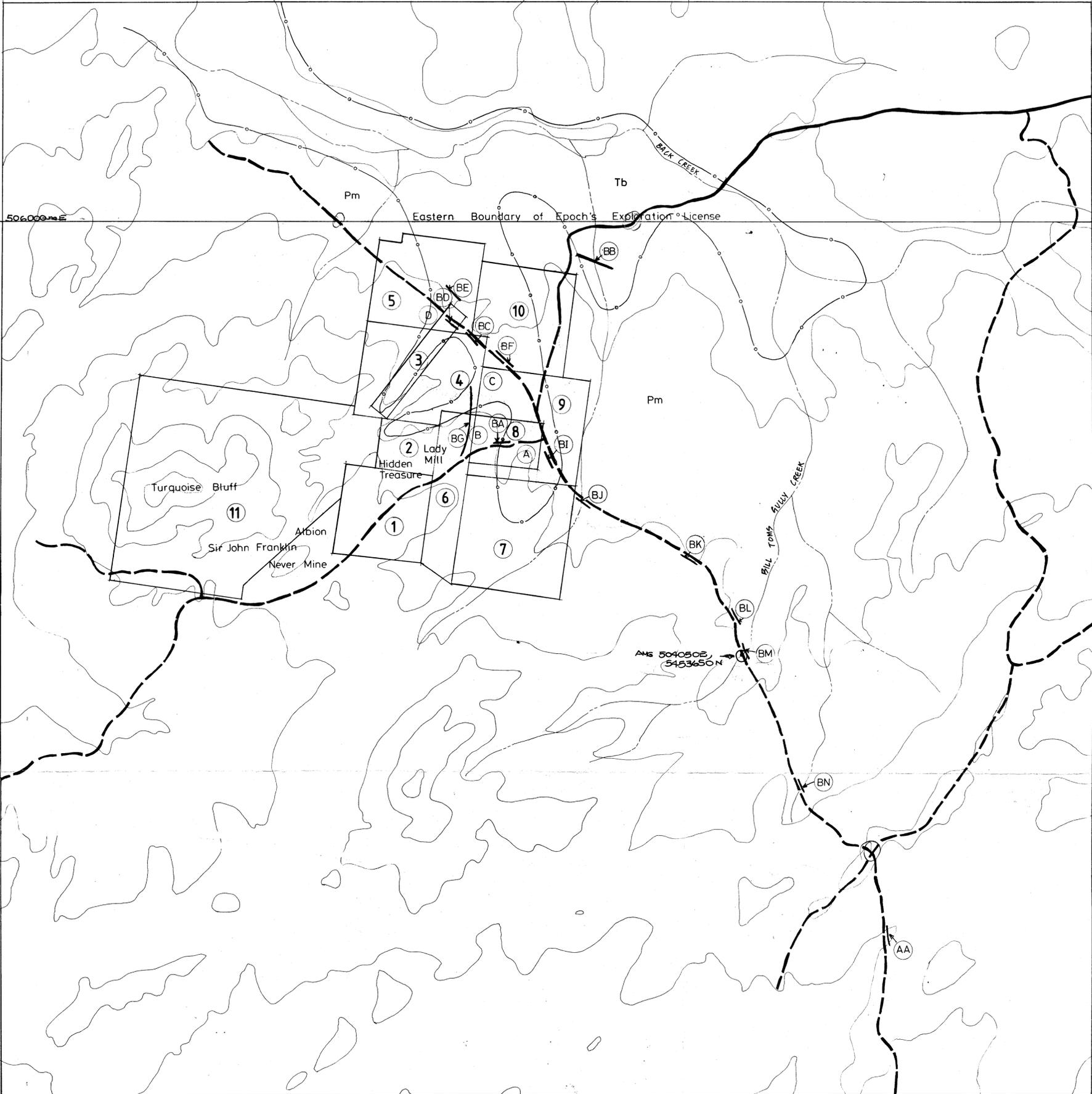
April 1985

85-2405

54100

506000 E

Eastern Boundary of Epoch's Exploration License



AMG 504050E, 5453650N

TITLES (mining leases)

- ① IM Gregory
- ② J. Allchin
- ③ 23M/83 R. Gregory & S. Mc Mahon
- ④ L. Gregory
- ⑤ C. McKenzie
- ⑥ L.J. Johnstone
- ⑦ S. Blyth
- ⑧ 24M/83 P. Crawford
- ⑨ P. Crawford
- ⑩ Johns
- ⑪ G.E. Johnstone

AMG REFERENCE POINTS ADDED

LEADS

- Ⓐ Cardigan
- Ⓑ Blackmans Lead
- Ⓒ Red Lead
- Ⓓ White Lead
- 'Albion' Known Reefs
- ⒷⒶ-ⒷⒾ Reconnaissance Lines of Testpits
- Approx. position of geological contact
- Tb Tertiary Basalt
- Pm Palaeozoic Mathinna Beds

Note 162091

This plan is orientated with North to left hand side of plan.



MURDOCH GEOSCIENCES

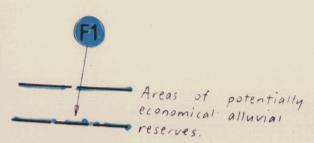
Client : Epoch Minerals Exploration NL
Location : Back Creek, Tasmania

Scale 1 : 10,000

PLATE 1096 / 3



April 1985

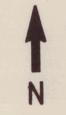


AMG REFERENCE POINTS ADDED



LEGEND

- x G12 - Testpit
- T - Tailings
- o/b - overburden
- C - clay
- S - sand
- G - gravel
- GS - gravel/sand
- GC - gravelly clay
- W - wash (grey)
- BW - wash (brown)
- fw - fine wash
- Br - Palaeozoic bedrock
- Bas - Basalt
- Tb - Tertiary Basalt
- Pm - Palaeozoic Mathinna Beds



162094
5404 85-2405

MURDOCH GEOSCIENCES

Client: Epoch Mineral Exploration N.L.
 Location: Area 3 - Chum Creek and Lower Blanket Creek - Lefroy
 Alluvial Mining Plan
 Scale 1: 2,000
 PLAN 1096-b May 1985

