98-4121

Rio Tinto Exploration Pty. Limited

A.C.N. 000 057 125

A member of the Rio Tinto Group

245001

EL 18/92 Mt Frankland
Fifth and Final Annual Report
for the Period from 6 October 1996 to 11 November 1997
Burnie SK55-03
~~Tasmania, Australia~~

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Date: November 1997

Submitted to: Chief Geologist - South East District

Copies to: Rio Tinto Exploration, GER - Bundoora
Rio Tinto Exploration, SE District - Bundoora
Mineral Resources Tasmania

Submitted by: Sarah Russell

Accepted by:

Rio Tinto Report No. 22684

98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

Abstract

EL 18/92 Mt Frankland was granted to Rio Tinto Exploration Pty Limited on 6 November 1992. The EL covers 177 km^2 centered on the Balfour Township in NW Tasmania. Rio Tinto's EL 4/94 (Balfour) lies within this licence. Following disappointing exploratory drilling in the neighbouring Balfour licence during 1997, a recommendation for relinquishment for both licences was submitted to Mineral Resources Tasmania. EL 28/92 was surrendered in full on 11 November 1997. This report constitutes the fifth annual and final report over the Mount Frankland area.

Work conducted during the reporting period included;

- Regional structural mapping.
- Rock sampling.
- Bedrock wacker sampling.
- Re-interpretation of geological and geographical data, resulting in a new orebody concept.

It was concluded that;

- High grade chalcopyrite veins occur at South Balfour with Ward (1911) describing the occurrence as a 20m wide zone of structural complexity and wall rock alteration. This trial working was not drilled by ACI (1969-1973).
- Bedrock wacker sampling at the south end of the Nelson Prospect has better delineated the zinc anomaly. Three parallel anomalies occur, the largest measuring 1.5km long.
- The geology of the area is structurally complex including the preserve of low angle reverse faults.
- Some potential for large scale copper orebodies exist in association with the Balfour Copper Trend. Potential for sediment hosted base metals exists at the Nelson Prospect.
- However Rio Tinto believes that the potential is insufficient to warrant further work following results of exploration drilling on the contiguous Balfour exploration licence.

It was recommended that;

- EL 28/92, Mount Frankland and EL 4/94, Balfour be relinquished.

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Tv ~~1035~~ 1196	EL 4/94 Balfour and EL 18/92 Mt. Frankland Balfour Copper Project Interpretive Geology Map	1:25 000
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1. Conclusions and Recommendations

The conclusions from the mapping data are:

- The area is structurally complex with variable fold geometry and fault history.
- Structural overprints affect lithology appearance eg high strain zones.
- Strong inferences of reverse faulting in the area; possible low angle reverse faults.
- Chlorite alteration maybe two phase - a footwall alteration to the major structural line of the Balfour Copper Trend and a regional metamorphic effect on lithologically different units i.e. the Chloritic Unit.
- The zinc wacker anomaly at Nelson has been better spatially defined. It is either vein/structure related or is linked to stratabound mineralisation.

Initially the following course of action was recommended:

- Diamond drill test South Balfour Mine for a copper orebody.
- Continue to expand the regional structural mapping exercise. In particular attempt to map at low water the Lindsay and Frankland Rivers - helicopter support may be necessary.
- Fully investigate the trial copper workings on the Doherty's Pimple Line; inspect the intersection of this line with the Balfour Copper Trend.
- Diamond drill test the zinc anomaly at the Nelson Prospect.

However following re-evaluation of the geology of the regional results of work on the Balfour (EL 4/94) Licence, no further work was recommended.

2. Introduction

EL 18/92 Mt Frankland was granted to Rio Tinto Exploration Pty Limited on 6 November 1992. The EL covers 177 km^2 centered on the Balfour Township in NW Tasmania. Rio Tinto's EL 4/94 (Balfour) lies within this licence. Rio Tinto's principal commodity of interest is copper. Rio Tinto submitted a recommendation to relinquish both EL 28/92 Mount Frankland and EL 4/93 Balfour in August 1997. Both licences were surrendered in full on 11 November 1997. This report constitutes the fifth annual and final report.

A NNW-SSE structural line called the Balfour Copper Trend (BCT) bisects EL 28/92 Mount Frankland and EL 4/94 , with prominent copper occurrences in the south of this licence and include the South Balfour Mine. An additional NW-SE line of copper showings occurs in the SE corner of this licence - known as the Doherty's Pimple Line.

A reappraisal of structural dynamics in conjunction with intrusive igneous episodes recognised the potential for large scale bulk mineable copper deposits

at Balfour. Potential orebodies are thought to have limited areal extent but plunge subvertically for 100's of metres

Exploration work was also carried out on the previously recognised zinc anomaly at the Nelson Prospect in the west of the licence.

3. Review of Previous Work

See Appendix 1.

4. Exploration Activities for the Period 6 October 1996 to 11 November 1997.

4.1 Geological Orebody Concept

Large scale orebodies by their nature involve large amounts of fluid generation, concentration, transportation, precipitation and preservation. Elements at Balfour which may justify the expectations for a large scale copper orebody include:

1. a large elongate high strain structural zone - the Balfour Copper Trend (30 km in length).
2. Multiphase episodes of deformation and igneous introduction - Penguin, Benambran and Tabberabbean Orogenies; Pre-Cambrian and Cambrian basalts and volcanics and Devonian granite intrusions.
3. Numerous copper mineral occurrences, some with extensive continuity - metal sources could include inferred buried granitic plutons and/or the Pre-Cambrian basalts.
4. The occurrence in the area of a 'triple point' of differing structural domains.

The target at Balfour is a large scale bulk mineable disseminated copper orebody . The combination of basalt-derived copper and granite driven mass fluid and rock flows within a structural focus could produce such an orebody. The geometry of a plastic flow behaving system would have rising 'spires' from a main 'reservoir(s)' which would give rise to steeply plunging ore shoots. At the pinnacles of these ore shoots would be narrow, high grade vein mineralisation. The erosion level at Balfour is high enough to suggest that the tops of the 'spires' have been exposed but not the main 'reservoir'. Rio Tinto's aim is to locate the spatial orientation of the ore shoots that will enable diamond drilling to intersect the 'reservoir'.

4.2 Regional Mapping

The Balfour area is regarded as being structurally complex particularly in the vicinity of the Balfour Copper Trend.

Previous mapping by Nic Turner concentrated on known mineralised areas along the Balfour Copper Trend. Thus there was a need for a broader view of the structure and deformation geometry of the area linked in with the known mineral occurrences and styles. Initial observations are:-

- The sediments of the area, whilst assumed to have undergone several orogenic building episodes, have open folds of ~100m amplitudes and ~500m wavelengths.
- Locally there are zones of tighter folding and steeper bed dips often associated with shearing.
- Several episodes of shearing and quartz veining have occurred some of which show reverse movement. Some of these faults/shears are low angle.
- The segregation of the dark grey/black siltstone (sandstones and/or shales) into separate lithological units is questionable. Variations in lithological appearance may be due to structural overprints rather than depositional environment variations.
- Nevertheless an attempt has been made to subdivide the informally termed 'Balfour Subgroup'. This subgroup would appear to underlie the currently known stratigraphy of the Rocky Cape Group.
- Youngest - Togari Group: Forrest Conglomerate, Black River Dolomite and basalts etc, unconformity

Oldest - Rocky Cape Group:
The Cowrie Siltstone
Balfour Subgroup
Chloritic Unit inc chloritic sands and silts
Siltstone Unit
The Combination Unit
The Scoured Channel Unit
The Wavy Laminar Unit
Quartz Arenite Unit

- Chlorite can be a major component of some lithologies; in some cases this a structural-related alteration overprint eg. Associated with The Balfour Copper Trend. A major chloritic unit in the north of the licence is believed to be related to a primary lithology with the chloritisation being a regional metamorphic overprint.
- Potentially significant pyrite mineralisation occurs in black siltstones of the above mentioned chlorite unit in the north of the licence. Pyrite occurs as:-
  a) cm-scale crystals with 1-2mm thick quartz rims.
  b) Very fine grained massive pyrite bands, parallel to bedding.
  c) Medium to fine grained stratabound zones of blebs and disseminations.

- Clean, quartz arenites tend to occur in the west of the licence and are believed to be the oldest unit of the 'Balfour Subgroup'.

Recent work undertaken by MRT including an aeromagnetic survey of NW Tasmania has identified separate structural domains. Some of these domains have curved boundaries with the implication being that they are thrust bounded (or at least reverse fault bounded). One of these structural domain boundaries is semi-coincident with the Balfour Copper Trend.

A highly interpretive geological map has been produced combining more than 250 visited exposures and Rio Tinto's 1993 aeromagnetic survey (Plan Tv 1035). Outcrop location data is included in Appendix 3). In addition three interpretative cross sections for the area have been completed (Plans Tv 1039, 1112, 1170). Large parts of the licence remain unmapped with geological interpretation based solely on the aeromagnetic data. Efforts should be made to map at low water the Lindsay and Frankland Rivers.

Data from Ward's (1911) report on the Mt. Balfour Mining Field has been transcribed onto a structural data map. (Plan Tv 1174).

4.3 Rock Sample Analyses

In conjunction with the mapping a further 62 rock samples were collected from EL 18/92 and EL 4/94 (Plan Tv 1171, Appendix 5; See Appendix 7 for analytical method). The 127 samples collected by Nic Turner were analysed for additional major elements. In addition 7 samples were sent for thin section analysis. The petrological report is included in Appendix 4. The aim of the rock sampling was twofold:-

a) establish element signatures for mineralisation and alteration associated with the Balfour Copper Trend
b) identify if any volcanic - related lithologies occur in the area.

The initial conclusions of the rock sampling are that there are no volcanic rocks in the area.

However a full lithogeochemical study has not been made. Observations made so far include :-

- No distinct multielement signature has emerged for the copper mineralisation. Generally elevated arsenic, silver, cobalt and nickel coincide with copper.
- Weak carbonate replacement has been modified by surface leaching. Considerable leaching of metals has occurred.

- Intrusive rocks occur as :-
  1. Epidiorite (pyroxene-hornblende microdiorite) : south of Pierpont Morgan, on the Heemskirk Link Road.
  2. Basalt/fine grained dolerite at the Clump.
  3. Small scale orange/brown weathered veins, presumably of basalt/dolerite, at the Clump and on the Balfour access track.
- Minor albitisation may have occurred south of the epidiorite on the Heemskirk Link Road.
- High levels of magnesium (>20% Mg) are found at the Development and Blocks prospects.
- A maximum value of 276ppm Sn is found associated with the high grade mineral at Murrays' Reward.
- Trial workings SW of Balfour (o/c sites 172 and 173) contain rocks with anomalous copper, lead and tungsten. Ward reports zinc values of mullock up to 7% Zn.
- A strong arsenic anomaly is found in samples from South Balfour workings.
- Gossanous material and pyritic quartz veins occur in dark siltstones/shales south of Pierpont Morgan on approximately the Balfour Copper Trend. More evidence for surface leaching.

4.4 Wacker Bedrock Sampling

The ill-defined zinc anomaly identified from the 1995 wacker bedrock sampling at the Nelson Prospect was followed up. A further 100 samples on four lines were collected - (Plan Tv 1175) See Appendix 7 for analytical method.

Number of Samples	Max. Depth	Min. Depth	Average	Max Zn (ppm)	Mean Zn (ppm)	Max Pb (ppm)	Mean Pb (ppm)
100	10.8	0.75	2.1	664	38	156	13

The detailed follow up showed three parallel zinc anomalies within an elevated zinc zone, the longest of which - the central one - ran for >1.5 km in a NNW direction. The host lithology is a dark grey siltstone, part of the Wavy Laminar Unit. The anomaly is cut off to the south by a change in rock type - a clean quartz arenite. It is possible that the anomalous zone is represented by :-

1. A series of sphalerite (+ galena) - quartz veins. The sample chip logging discounts against this.
2. A structural zone - the BCT also strikes NNW. The zinc anomaly in such a structural zone could be a more distal indicator of extensive copper mineralisation at depth as described in the orebody concept section.
3. Sediment hosted mineralisation.

5. Discussion

Mapping has identified a simpler stratigraphy based on field observations and airborne magnetics. There is no evidence for volcanic rocks within the Balfour Subgroup. The chloritic unit at the top of the subgroup probably allowed the passage of regional metamorphic fluids, which affected the chloritisation of mafic-bearing sandstones. Chloritic units which occur lower in the stratigraphy may be sheared zones related to the Balfour Copper Trend in which chloritisation was part of the alteration package eg Blocks and Development.

The source of the copper can be from the copper-rich basalts of the Togari Group which have been overthrusted by the Rocky Cape Group. However if these basalts have massive sulphides with them and if the Balfour Copper Trend is a reverse fault then is there the possibility of a Neves Corvo type orebody scenario existing.

South Balfour displays considerable wallrock alteration with the copper mineralisation. The arsenic values are an order of magnitude greater than other mineralisation in the area. This area was not drilled by ACI probably due to its relative remoteness (access is not a problem). Thus the trial workings were initially considered worthy of a diamond drilltest.

From Ward's 1911 report there is mention of a line of small scale copper trials on an NW-SE line known as Doherty' Pimple Line. From a review of competitor data it appears that no significant field checks or exploration has been carried out. In particular the intersection of Doherty's Pimple Line and the Balfour Copper Trend warrants further investigation.

The re-interpreted aeromagnetic image shows a series of NNW trending linear highs and lows over the Nelson prospect. One of these coincides with the interpreted direction of a zinc anomaly from wacker bedrock sampling. This NNW linear trend would appear to parallel the Balfour Copper Trend but also parallels stratigraphy. Thus it could be a bedding parallel shear zone or stratabound mineralisation. As a result the zinc anomaly should be diamond drilltested.

6. Rehabilitation

Exploration work that impacted on the environment included:-

Line cutting and wacker bedrock sampling.

Due to the nature of button grass plains only minor amounts of chainsaw work was required to clear lines. These lines will revegetate within 2 to 3 years.

An assessment for clearance of the environmental/performance bond will be carried out by Mineral Resources Tasmania in December 1997.

7. Expenditure

Expenditure from 1 October 1996 to 11 November 1997 was $36,223. Total expenditure for EL 28/92 Mount Frankland is $361,160.

8. References

Brown, AV (comp)	1989a	Geological atlas 1:50,000 series. Sheet 21(7916S). Smithton. Explan Rep Geol Surv Tasm.
Brown, AV	1989b	Eo-Cambrian - Cambrian in BURRETT CF and MARTIN EL (eds), Geology and mineral resources of Tasmania. Geol Soc Aust Spec Publ 15, pp 47-80.
Brown, AV (comp)	1989	Geological atlas 1:50,000 series. Sheet 21(7916S). Smithton. Explan. Rep. Geol Surv. Tas.
Corbett, KD	1989	Early Paleozoic deformation and tectonics - Tectonic models. in BURRETT CF and MARTIN EL (eds), Geology and Mineral Resources of Tasmania. Geol Soc Aust, Spec Pub 15 pp 175-181.
Kosseris, WC	1988	Combined annual/final report for the period ended 24/2/88. Exploration Licence 12/86, Montague area, Tasmania. BHP Minerals Report TCR88-2786.
Menpes, SA	1995	Third Annual Report For The Period Ending 10 October 1995. EL 18/92 Mt Frankland, Tasmania. *Rio Tinto Report No. 21361*
Parkinson, RG	1993	Mt Frankland EL 18/92. Report on Exploration for the First Year of Tenure 6/11/92 to 5/10/93. *Rio Tinto Report No. 19240*
Parkinson, RG	1994	Mt Frankland EL 18/92. Report on Exploration for the Second Year of Tenure 6/11/93 to 5/10/94. *Rio Tinto Report No. 20308*

Tear, SJ	1996	Annual Report for the Period Ending 5 October 1996. EL 18/92 Mt Frankland, Tasmania. *Rio Tinto Report No. 22429*
Turner, NJ	1989	Precambrian. The Rocky Cape Region and nearby inliers. in BURRETT CF and MARTIN EL (eds), Geology and Mineral Resources of Tasmania. Geol Soc Aust, Spec Pub 15, pp11-17
Turner, NJ (ed)	1992	Corinna 1:50,000 geological map. Field guide to selected rock exposures. Rep Div Mines Miner Res Tas 1992/06
Weir, DJ	1982	Rocky Cape EL 1/77. Progress Report July 1981. June 30 1982. *Rio Tinto Report 11604*

9. Location

Burnie	SK55-3	1:250,000
Sandy Cape	7815	1:100,000
Bluff Point	7815N	1:50,000
Balfour	7815S	1:50,000
Sumac	3244	1:25,000
Dempster	3243	1:25,000
Balfour	3242	1:25,000
Lily	3241	1:25,000
Sundown	3044	1:25,000
Temma	3043	1:25,000

10. Keywords

Tasmania * Rocky Cape Group * Proterozoic * Copper, Zinc * IP Survey * Regional Mapping * Wacker Bedrock Sampling * Rockchip Sampling.

11. DPO Register

77317, 82168, 82169, 82172, 82174

Table 1

Rio Tinto Exploration Limited
DPO Register EL 18/92 Mt Frankland

DPO Number	Lab Name	Lab Location	Office Date	Geologist	Sample Type	Number of Samples	250,000 Map Sheet	100,000 Map Sheet
82168	Analabs	Zeehan	21/10/96	S. Tear	Rock	36	Burnie SK55-03	7815
82169	Analabs	Zeehan	25/10/96	S. Tear	Rock	17	Burnie SK55-03	7815
82172	Analabs	Zeehan	11/11/96	S. Tear	Wacker	100	Burnie SK55-03	7815
82174	Analabs	Zeehan	13/12/96	S. Tear	Rock	10	Burnie SK55-03	7815
77317	Univ. New England	Zeehan	27/10/96	S. Tear	Thin Sections	7	Burnie SK55-03	7815

Table 2

EL 18/92 Mt Frankland
Expenditure Table

	1/10/96 - 11/11/97	TOTAL EXPENDITURE
Drilling	0	8,688
Contractors	3,904	76,149
Laboratory	3,436	23,051
Rent & Property	-338	15,165
Payroll & Benefits	9,246	104,068
Field & Transport	2,455	26,484
Travel & Accommodation	682	1,830
Computer Services	239	2,789
Professional	1,611	3,034
Office & Miscellaneous	5,997	8,848
District Administration	66	27,646
Regional Costs	3,226	45,106
Tenements	5,700	18,304
TOTAL	**36,224**	**361,162**

310000 mE
320000 mE
330000 mE
144.8°
144.9°
41.1°
41.2°
41.3°
5440000 mN
5430000 mN

Arthur River

Mt. Frankland EL18/92

THE CLUMP

EL4/94 Balfour

2M/76 Laan & Langsford

Frankland River

BALFOUR

1M/76 Laan & Langsford

MOUNT BALFOUR

MOUNT FRANKLAND

MOUNT HAZELTON

Ordnance Point

Southern Ocean

N

0 2 4

Kilometers

Projection: AMG Zone 55
Grid: AMG Zone 55 & Lat/Long AGD66

5 cm

Location Diagram

Welcome 7816	Circular Head 7919	Table Cape 8016
SK55-20 NW-Tas		
Sandy Cape 7815	Arthur River 7915	Hellyer 8015

Mapsheet Reference

Legend

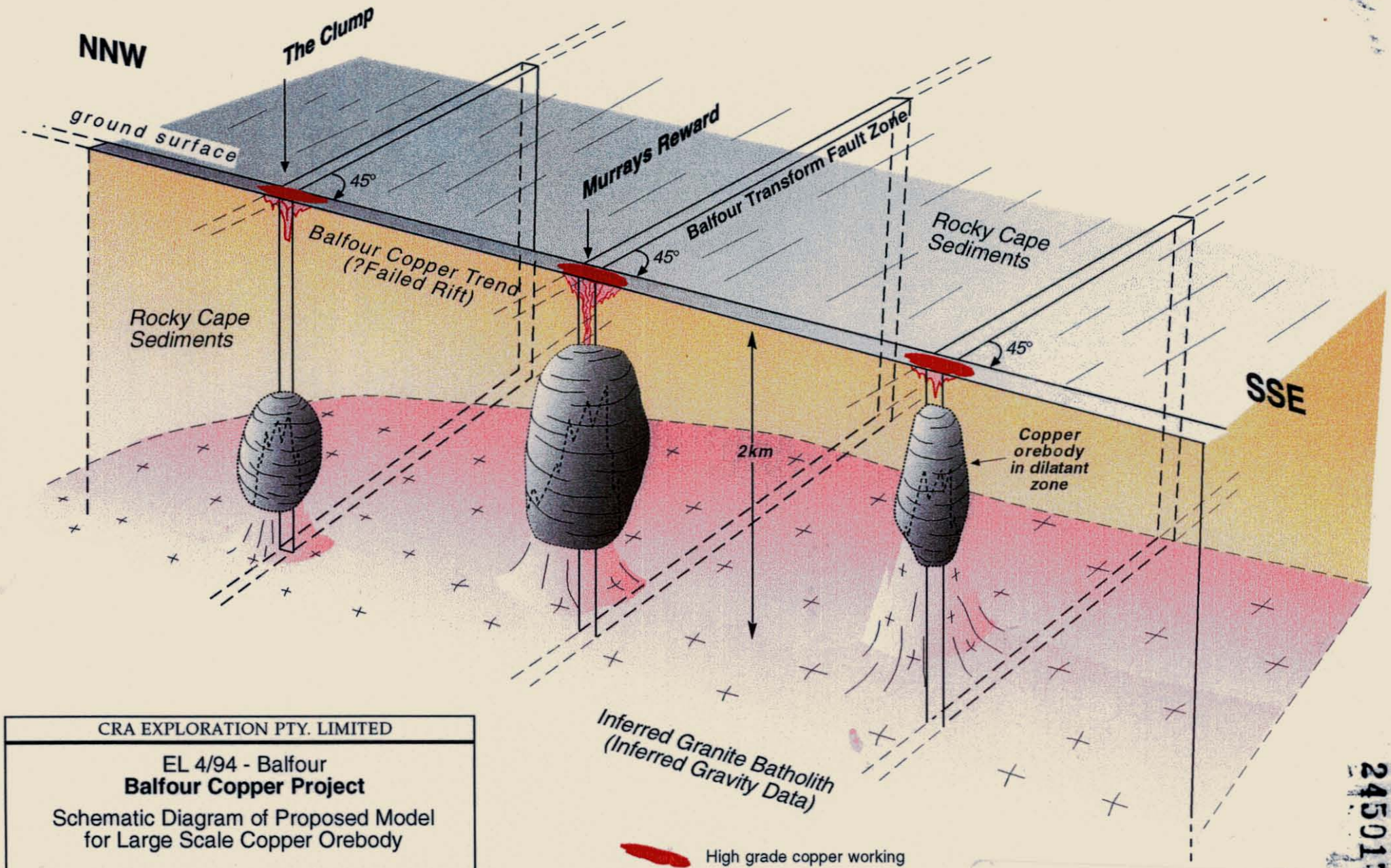
- Town
- Mountain
- EL Boundary
- Perennial Drainage
- Non-Perennial Drainage
- Highway
- Secondary Road
- Minor Road
- Track
- Railway
- Lake
- Swamp
- Urban

RIO TINTO EXPLORATION PTY. LIMITED

EL 18/92 Mt Frankland

Location Plan

Author: Simon Tear	Reference: NW SK55-20 or Burnie SK55-03
Drawn: Colin Pike	File Name: Tv1308.wor
Date: Mar 1998	Report No: 22684
Scale: 1:100,000	Plan No: Tv1308



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EL 4/94 - Balfour

Balfour Copper Project

Schematic Diagram of Proposed Model for Large Scale Copper Orebody

geol : S J Tear	scale: see note	report no: 22685
drawn: D Oliver	date: Oct 1996	plan no: Tv1206

245017

Major pyrite occurrence including bedded pyrite

Geology uncertain due to lack of magnetic coverage

SHEARED ZONE

THRUST ZONE

ROGER RIVER FAULT

Nelson Prospect Linear Line Anomalies

Deep Sealed Magnetic Feature

Deep Sealed Magnetic Feature

Distinctive Magnetic Zone

Mixed Black Siltstone & Quartz Unit

Magnetic Unit

Doherty's Pimple Line

B'

B

A'

A

C'

C

5 440 000m N

5 435 000m N

5 430 000m N

5 425 000m N

5 420 000m N

315 000m E

320 000m E

325 000m E

330 000m E

LEGEND

NEOPROTEROZOIC

- Kanunnah Sub Group
  - Undifferentiated Smithton Synclinorium Strata
  - Basalt (Spinks creek volcanics)
- Black River Dolomite
  - Black River dolomite with Forest conglomerate

Unconformity

- Probable Cownie Siltstone
  - Cownie Siltstone (Correlate)
  - Dark grey / black siltstone

MESOPROTEROZOIC

BALFOUR Group

- Banded siltstone unit with discrete chlorite bands (a distinctive magnetic feature)
- Chloritic sandstones & siltstones with dark grey / black siltstone shale beds. Chlorite usually as porphyry blobs. Occasional chlorite 'spot' bands.
- Combination Unit. Planar finely bedded siltstones & sandstones with occasional laminar bedded siltstones & shales.
- The Scoured Channel Unit. Non Planar bedded light grey sandstones & dark grey siltstones; Forms a distinct magnetic unit.
- The Wavy Laminar Unit. Finely laminated dark grey siltstones & shales often slightly contorted; can contain zones of white bedded quartz arenite beds generally <0.5m thick.
- Quartz arenite dominant continental shelf sequence (massive beds); with beds of intermixed quartz arenite & block siltstone / shale. (Detention Subgroup)

- Lithological Boundary
- Inferred Fault
- 160 Outcrop Location
- Inferred Thrust Fault
- Copper Bearing Reverse Faults including the Balfour Copper Trend & Doherty's Pimple Line.
- Quartz Lode

Data Sources :
CRAE Mapping : Simon Tear (1996) & N.Turner (1994)
Mt Balfour Mining Field (Ward 1911)
CRAE Airborne Magnetic Survey

Notes :
1. Up to 100m error on Copper Lodes as transcribed from Ward 1911.
2. No Air photograph interpretation has been incorporated into the interpretive map.
3. Refer to Mapping sites map for distribution of observed outcrops - large areas in the east & west of 18/92 remain uncovered.
4. Considerable surface leaching has removed copper sulphides from exposed & outcropping quartz-dolomite veins. Therefore quartz lodes may be copper-bearing reverse faults - see Ward (1911).
5. Up to 3km of sediment loss is represented by the unconformity of the Cownie Siltstone & the Black River Dolomite.

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ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

Rio Tinto Exploration Pty. Limited

EL 4/94 & 18/92 BALFOUR & Mt FRANKLAND
Balfour Copper Project
Interpretive Geology Map

245018

Ref.	SK55-03 Burnie		
Scale	1 : 25000	Drawn	C.Pike
Author	S.Tear	Report	22685
Date	21-1-97	Plan No	Tv1196 (.cdr)

5 cm

SW
A

NE
A'

EL 18/92 | EL 18/92 | EL 4/94 | EL 4/94 | EL 18/92 | EL 18/92

Bearing 058° AMG

Deep Seated Magnetic Feature

Siltstone sub-unit

Mt Balfour track

Hoemakirk link road

Regional Gravity High 800m to SE

Specimen Hill

ACI DDHs

CENTRAL MT BALFOUR MINE

Ⓐ ACI DDH37 2.53m @ 0.38% Cu from 204.9m

Ⓑ ACI DDH34 4.75m @ 0.22% Cu from 136.2m

DDH37 DDH34

Frankland River | Frankland River | Frankland River | Frankland River

200mRL

Sea Level 0m

-200mRL

-1000mRL

-2000mRL

Wavy Laminar Unit

Scoured Channel Unit

Combination Unit

Quartz Arenite Unit

Distinctive Magnetic Unit within Quartz Arenite Unit

Quartz Arenite Unit

Quartz Arenite Unit

Breccia Pipe?

BALFOUR COPPER TREND

Undifferentiated Upper Togari Group

Tertiary Basalt

? Sole Thrust ?

Inferred buried granite (gravity data)

Smithton Basalts

Basalt

Black River Dolomite

Forest Conglomerate

? unconformity ?

? Cowrie Siltstone ?

Balfour Subgroup

Schematic Stratigraphy for the Balfour Area

Late Middle - early Late Cambrian

unconformity

Neoproterozoic Togari Group

- Smithton Dolomite
- Kanunnah Subgroup (Siltstones with basalt & dolomites)
- Black River Dolomite
- Forest Conglomerate

unconformity

Mesoproterozoic Rocky Cape Group

- Jacob Quartzite
- Irby Siltstone
- Detention Subgroup
- Cowrie Siltstone
- Balfour Subgroup

1. Chloritic Unit
2. Combination Unit
3. Scoured Channel Unit
4. Wavy Laminar Unit
5. Quartz Laminar Unit

Lithological boundary

Bedding trace

Fault

Quartz-Tourmaline-Cassiterite veins

Copper ore shoot (Balfour Copper Trend)

245010

5 cm

0 500 1000m

Horizontal Scale = 1:25 000

0m 100 200 300 400 500m

Vertical Scale 1:10 000

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ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

CRA EXPLORATION PTY LIMITED

EL 18/92 - Mt Frankland
EL 4/94 - Balfour

BALFOUR COPPER PROJECT

Regional Cross Section A - A'

MURRAYS'REWARD

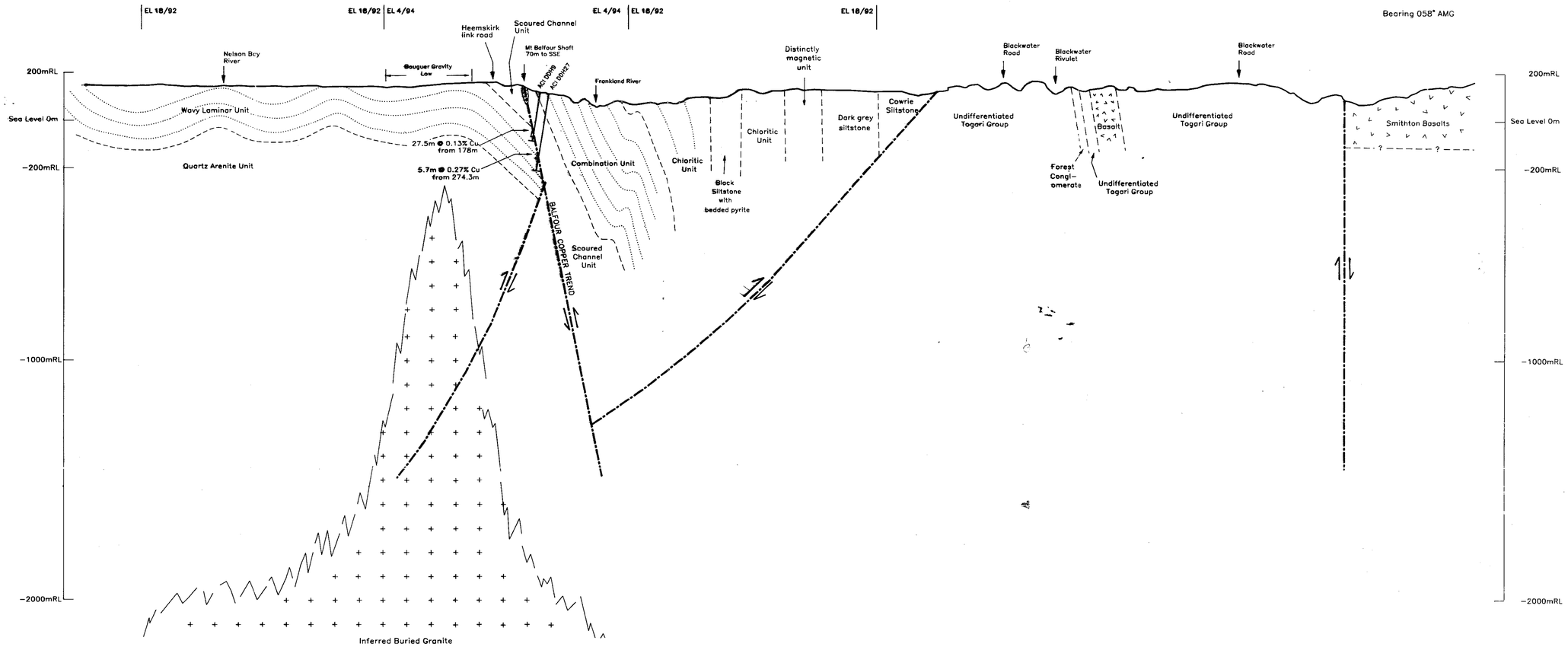
AUTHOR	DRAWN	DATE	SCALE	REPORT
S J Tear	D Oliver	Jan 97	1:25000	22684 22685
REF. Burnie SK55-03		SUB-DIR	PLAN No. (Dbe)	Tv1039

SW
B

NE
B'

Bearing 058° AMG

EL 18/92 | EL 18/92 | EL 4/94 | EL 4/94 | EL 18/92 | EL 18/92



Schematic Stratigraphy for the Balfour Area

- Late Middle – early Late Cambrian
- *unconformity*
- Neoproterozoic Togari Group
  - Smithton Dolomite
  - Kanunnah Subgroup (Siltstones with basalt & dolomites)
  - Black River Dolomite
  - Forest Conglomerate
- *unconformity*
- Mesoproterozoic Rocky Cape Group
  - Jacob Quartzite
  - Irby Siltstone
  - Detention Subgroup
  - Cowrie Siltstone
  - Balfour Subgroup
- 1. Chloritic Unit
- 2. Combination Unit
- 3. Scoured Channel Unit
- 4. Wavy Laminar Unit
- 5. Quartz Laminar Unit

- Lithological boundary
- Bedding trace
- Fault
- Quartz–Tourmaline–Cassiterite veins
- Copper ore shoot (Balfour Copper Trend)

0 500 1000m

Horizontal Scale = 1:25 000

0m 100 200 300 400 500m

Vertical Scale 1:10 000

98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

245020

5 cm

CRA EXPLORATION PTY LIMITED

EL 18/92 – Mt Frankland
EL 4/94 – Balfour

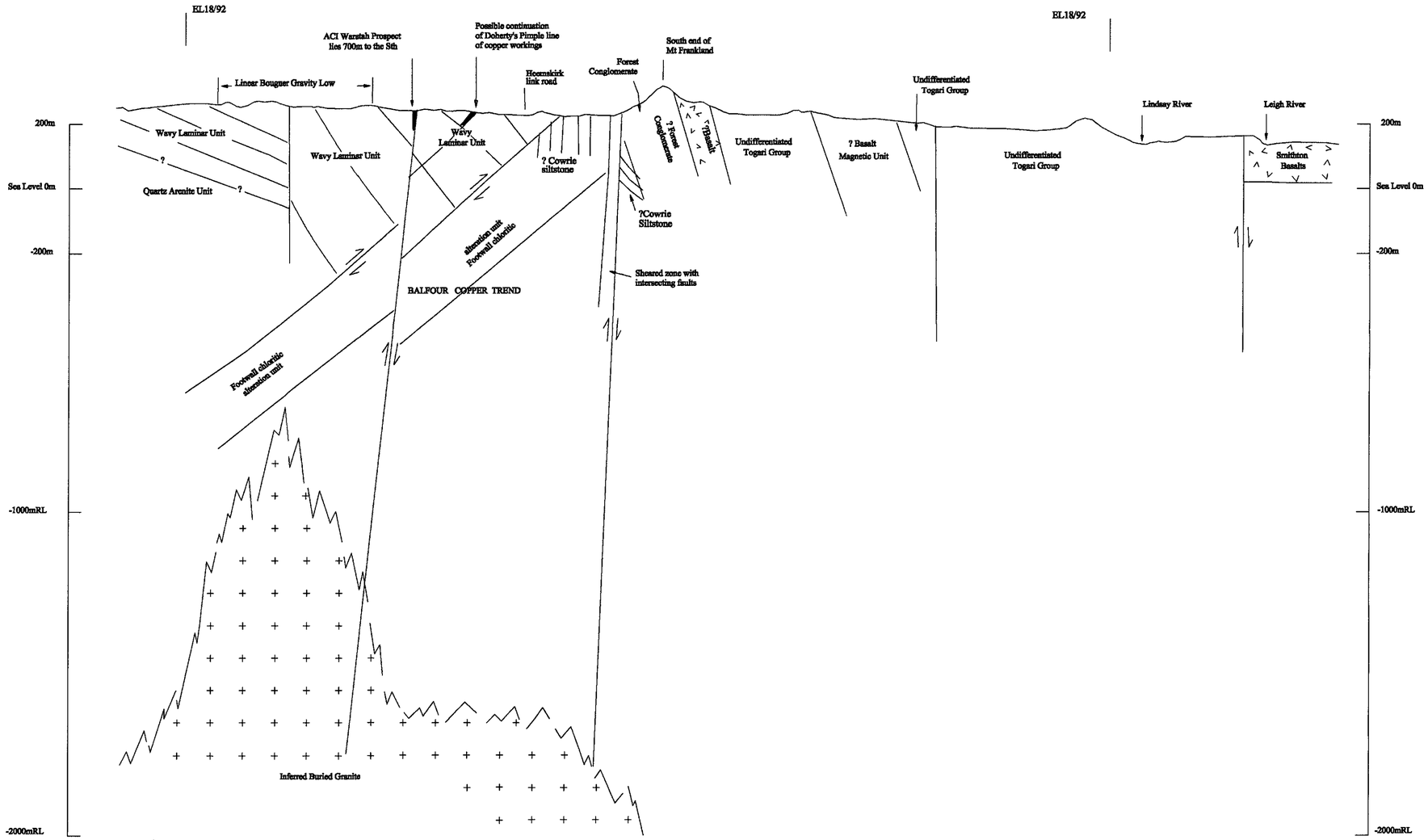
BALFOUR COPPER PROJECT

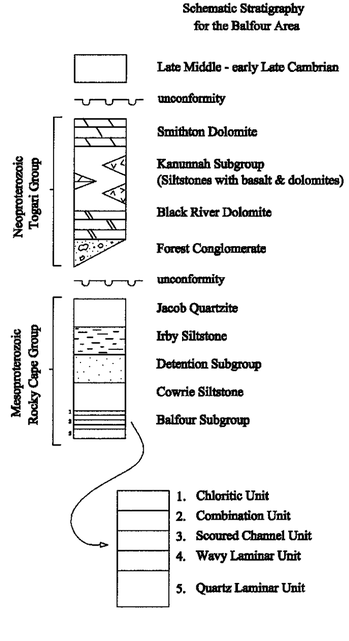
Regional Cross Section B – B'
'The Clump'

AUTHOR	DRAWN	DATE	SCALE	REPORT
S J Tear	D Oliver	Jan 97	1:25000	22684 22685
REF. Burnie SK55-03		SUB-DIR	PLAN No. (Film)	Tv1112

C

C'





Lithological boundary

Bedding trace

Fault

Quartz-Tourmaline-Cassiterite vei

Copper ore shoot (Balfour Copper Trend)

98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

245021

5 cm

0 500 1000m

Horizontal Scale = 1:25 000

0m 100 200 300 400 500m

Vertical Scale 1:10 000

RIO TINTO EXPLORATION PTY LIMITED

EL 18/92 - Mt Frankland

EL 4/94 - Balfour

BALFOUR COPPER PROJECT

Regional Cross Section C - C'

AUTHOR	DRAWN	DATE	SCALE	REPORT
S J Tear	D Oliver	Jan 97	1:25000	22684 22685

REF. Burnie SK55-03 SUB-DIR PLAN No. (file) Tv1170

315000E 320000E 325000E 330000E

5440000N 5435000N 5430000N 5425000N 5420000N

EL 18/92 MT FRANKLAND

EL 18/92 BALFOUR

Lode 156^/dip not known
qtz lim ridge
bifurcates & terminates at south end

Lode 120/55 NE chloritised slate

Gossan & indurated slate

NS adit from NW. E-W lode tunnelled from east at depth 540' good ore intersected. Lode 135^/80NE additional non ore structures dip 60^ SW

Lode 100^/40^N - can be variable

contact

MT BALFOUR MINE
75' wide dipping NE. Lode 100^/40^N
Trials only (note in south drive at times can dip NW eg the branch lode

Mean strike of lode 124^

Mean strike of lode 145^

Western lode 142^ dips to west
(can be sub horizontal) with a silicic & hematitic footwall

10m thick lode dominantly siliceous
Tunnelled with good ore at depth
Siliceous lode with good ore cpy + cov
Tunnelled with good ore at depth

Lode 160^ strike overlapping lenses of
variable strikes; py + chlorite + silica

2m qtz vein with py + cpy +/-chlorite
significant for the massive nature of the vein

major

Small unconfirmed massive qtz lode with cpy

Surface trend of yellow decomposed ?ore material
with poss py + chlorite + cpy - Tunnelled (not seen
by Ward) chloritised pyritic slate

Lode outcrop in creek bed

Development Prospect (ACI drilling)
Good ore - bends suddenly to west
chalcocite abundant

Blocks (ACI drilling) Good ore
siliceous chloritic
cpy-py-cav +/- sericite

Qtz vein with cavities after py

Blocks (ACI)
lode 140^
strike
Good ore
waterlogged

Lode 161^
strike
4m wide-water

Qtz +py veining
10m wide

Black graphitic slate

5' of slate with qtz - py - cpy

Shaft & tunnel, slate 165^/80^W dip
dips east at start of tunnel (abnormal)
75m? wide mineral zone ore vein(s?) strike
030^
position approximate

21m mineral zone with chloritised & hematised country rock

Harpers Tunnel
(approx
position)

Indefinite ore in tunnels
slate strikes 160^/70^ E

CENTRAL MT BALFOUR MINE

Dark qtzite + black indurated slate
+py, qtz veinlets, chlor irregular structures

Good ore
Lode strikes 150^ vert dip
30m mineral zone, ser alteration

Qtz+py lode strikes 145^
mineralised slate

SPECIMEN HILL
tin tungsten lodes

MURRAYS REWARD MINE

Minor ga+py in contorted slate

Discovery outcrop in creek

Minor galena in qtz lode

1.5m qtz vein with py reports of minor gold

100' wide zone of ? barren qtz veins

4m wide lode striking 145^ SW dip ENE trending adit passed through lode zone terminating in py black slate
Three shafts sunk, waterlogged.
Complex lode material & structure
ser_chlor slate, qtz gangue
7% Zn disseminated py
+ald+cpy+sph+ga
(Drilled by CRAE 1982?)

Adit driven ENE terminated in soft black pyritic slate

Narrow qtz veins of over large width (?20m)
no visible sulphides

Tunnel
banded slate & sst
130^/48^ NE
lode +/-cpy

Qtz-ser-chlor-py lode +/- galena up to 50' wide

PIERPOINT MORGAN PROSPECT
(ACI Drilling)
Late strikes 151^, strikes W (?)
Tunnelled - 10m wide lode with graphite slate in hangingwall

Lode strikes 125^

Indefinite lode
silicified sandstone with semi-massive py

Lode 140 deg honeycombed qtz with limonite + py

Lode 140 deg. Qtz lens with limonite +hematite.
2m lode 128/70 SW
with copper ore

Small vein
140^/SW dip
Qtz-ser-chlor-py

major

2m lode 151^/dips SW
conplex structural & irregular fractures

(30m long or 30m wide zone?)
Qtz lode vein strikes 160^/v steep to west in mineralised & chloritised slate +/- cpy. Cpy with Ga & sph
Beds strike a few deg west of north
dipping 25^-45^E

ACI WARATAH PROSPECT
Main Lode cpy+py+cov

Qtz Lode of py-cpy
5' wide, strike 146 ^

Untested lode
142^ strike

4' lode with cpy +/- country rock alteration.
123/75W

SOUTH BALFOUR MINE
Rich ore
Sheeted fracture zone complex structure with cpy-cov-py and altered country rock 40' width
000/83W

Qtz lode 140^
Ferroan dolomite-qtz -py-cpy-cov-mag chlorite alteration of country rock

Cpy+ trace Cov in qtz vein

132^/48^W pyrite in qtz + qtzite

168^/75^W Qtz-py-cpy-cov lode

140^/40^W country rock alteration abundant

Limonite patch

Qtz lode152^

Set and qtz vein ridge

Qtz vein o/c

Qtz-chlor-Ser alteration with py+cpy+cov abundant
Dipping 73^ SW in hanging wall
61^ SW in footwall.
Quartzite host dips east
Slate in hangingwall dips west

Vein well defined with massive py+/- cpy

Altered country rock only
Sandstone with qtzite+py

Untested quartz vein
Intersheared with country rock

KEY

Shear

Quartz vein

Fabric Cleavage

Fold hinge

Quartz (Chalcopyrite) Lode (Ward, 1911) - margin of error +100m

Shaft / mine

Green - N. Turner mapping
Red - M. Donnelly mapping

Scale 1 : 25,000
0 500 1000 1500 2000 metres

98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

245922

RIO TINTO EXPLORATION PTY. LIMITED

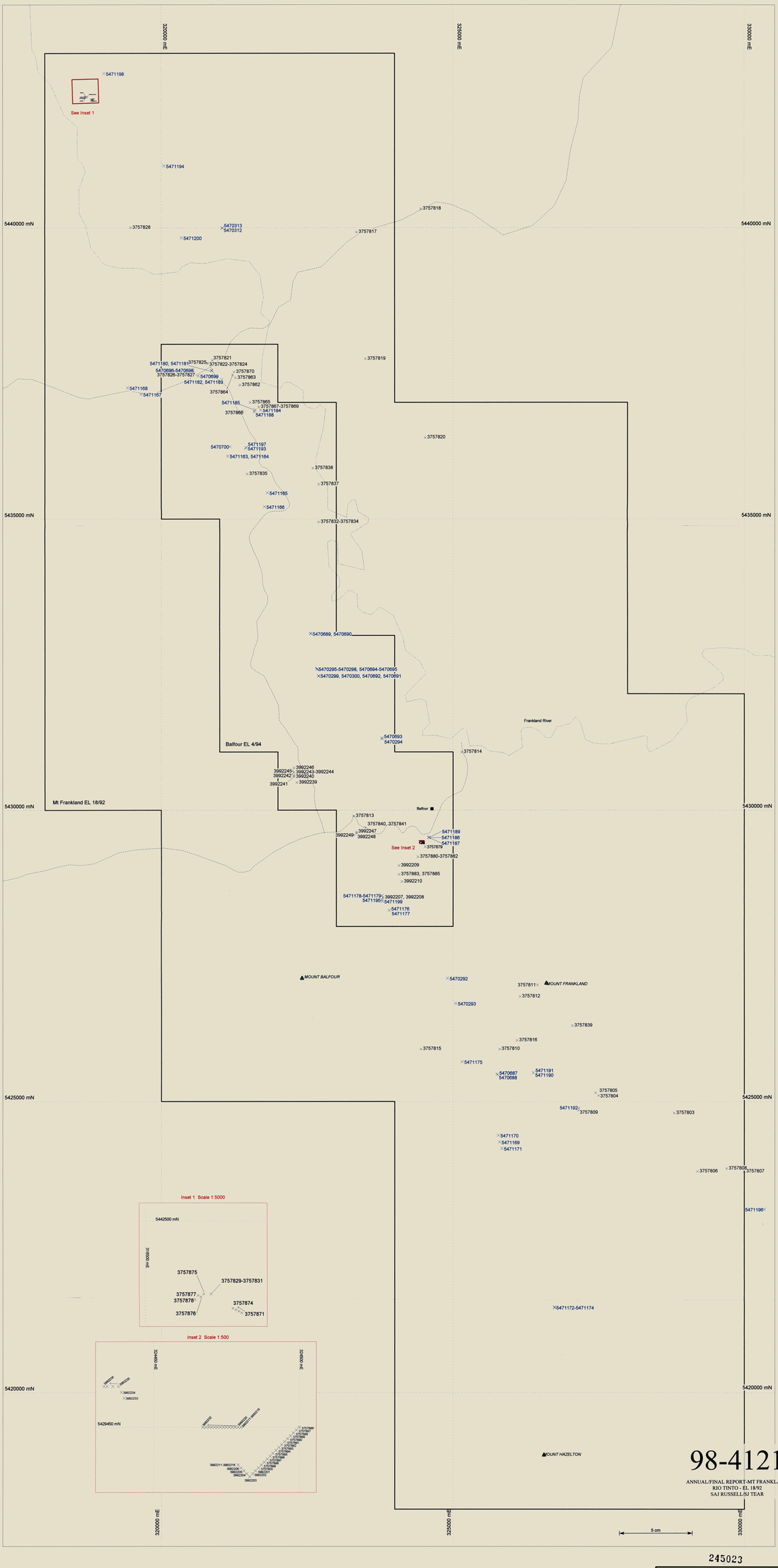
Balfour Copper Project

EL4/94 Balfour and EL18/92 Mt Frankland

Structural Data Map

Author : S. J. Tear	Ref : 'Burnie' 1:250,000 (SK55-05)
Drawn : Exploration Graphics	Revised :
Date : October 1997	Report No : 22685
Scale : 1 : 25,000	Plan No : TV1174

5 cm



98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

245023

Legend

- Mountains
- EL Boundary
- Rivers
- Tracks
- 5471235 × Rock Sample Site and Number (S Tear)
- 3757875 × Rock Sample Site and Number (N Turner)

500 0 500 1000 1500 metres

Projection: AMG Zone 55
Horizontal Datum: AGD 1966
Vertical Datum: AHD 1971

Location Diagram (Map Area: Burnie, Hobart)

RIO TINTO EXPLORATION PTY. LIMITED

Balfour Copper Project

EL 18/92 Mt Frankland and EL 4/94 Balfour

1996 Rock Samples

Author: S. Tear	Ref: Burnie SK55-03 or NW SK55-20
Drawn: N. Waterman	File Name: Tv1171.wor
Date: 12-1-1996	Report No: 22695
Scale: 1:25000	Plan No: Tv1171

320700 mE | 320800 mE | 320900 mE | 321000 mE | 321100 mE | 321200 mE | 321300 mE | 321400 mE | 321500 mE | 321600 mE | 321700 mE | 321800 mE | 321900 mE | 322000 mE | 322100 mE

5430900 mN
5430800 mN
5430700 mN
5430600 mN
5430500 mN
5430400 mN
5430300 mN
5430200 mN
5430100 mN
5430000 mN
5429900 mN

5430600 mN: 9 -5 41 -5 9 8 28 594 30 28 102 358 64 288 38 269 -5 25 26 11 39 48 33 -5 9

5430300 mN: -5 -5 5 -5 -5 -5 -5 6 -5 -5 15 664 297 143 34 51 389 122 -5 5 6 25 7 -5 -5

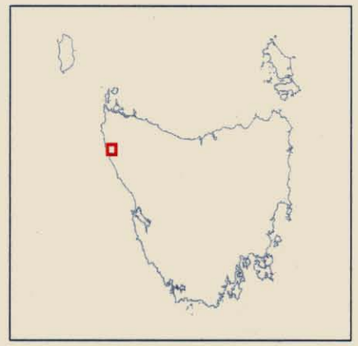
5430100 mN: -5 -5 6 -5 7 8 -5 -5 -5 -5 6 -5 -5 -5 -5 -5 86 10 17 8 21 15 -5 -5 5 -5

EL 18/92
Mt. Frankland

EL 4/94
Balfour

245024

Location



LEGEND

>300ppm Zn

100-300ppm Zn

5 cm

RIO TINTO EXPLORATION PTY. LIMITED

EL 18/92 Mt. Frankland

Nelson Prospect
Bedrock Wacker Sampling - Zinc Anomaly

Author: S. Russell	Reference: SK55-03 Burnie
Drawn: C.Pike	File Name: Tv1175.wor
Date: March 1998	Report No: 22685
Scale: 1:5000	Plan No: Tv1175

Appendix 1

Review of Previous Work

Review of Previous Work

Prior to Current Tenement

Note: This summary of previous exploration activities within the Balfour area is not all inclusive and only lists the more significant efforts omitting those that have contributed no new information of note.

BHP SPL 392 and 410 (1964-1970?)

BHP drill tested the Specimen Hill Sn-W prospect (1km south-west of Balfour) with seven vertical diamond holes. No results are available for the three angle holes planned to test Cu mineralisation at Murrays Reward Prospect (immediately west of Balfour).

Pickands Mather & Co International EL12/65 (1965-1971)

Pickands Mather & Co geochemically sampled an extensive area of the Rocky Cape Group and drilled a number of strong magnetic anomalies, mainly discordant magnetite lodes, in the sequence west of Balfour. The magnetite lodes were thin (10 to 15m) with no significant base metals, although minor thin, low grade Pb, Ag, Zn and Cu mineralisation was encountered in places.

Australian Consolidated Industries Ltd (ACI) EL 16/68 (1968-1974)

ACI tested Cu prospects centred on old Cu workings along a 17km strike length of the Balfour Cu Trend. In total 37 diamond drill holes were drilled at eight prospects. However a majority of the holes were drilled to test the Cu mineralised quartz lode at Murrays Reward. A resource of 0.5mt @ 0.8% Cu was defined.

Esso Australia Ltd EL 2/73 (1973-1974)

Esso flew a Catalina borne INPUT EM survey on 800m spaced lines over most of the Rocky Cape Group south of the Arthur River. A helicopter based follow up of a selection of anomalies explained virtually all as being due to pyritic and/or graphitic shales. No drilling was undertaken.

CRA Exploration Pty. Limited EL's 1/77, 1/79, 12/80, 36/80, 4/83 and 61/83 (1977-1983)

CRAE (later joined in joint venture by Geopeko Limited), carried out regional panned concentrate sampling for Sn over much of the Rocky Cape Group. Follow up work involved:

- Eight diamond holes at Specimen Hill and one at Mt Hazelton (10 km SSE of Balfour) to test magnetic targets with accompanying geochemical responses
- Two diamond holes to test strong magnetic anomalies within quartzites and mudstones near the coast west of Balfour (the Little Eel and Possum Creek prospects) with the best intersection being 3m @ 2% Pb and 13 g/t Ag
- Surface testing of other magnetic anomalies within the Rocky Cape Group, particularly those to the east of the Interview Granite, with no positive results.

In the early 1980's attention was focussed on the base metal potential of the region, particularly Pb/Zn within the Cowrie Siltstone unit east of Balfour. One diamond hole was drilled to test a

coincident magnetic and EM response with weak base metal soil geochemistry at the Red Prospect near the Arthur River, 25 km NNW of Balfour.

During Current Tenement

The following work was carried out during the first three permit years:

- Review of key open-file competitor and CRAE reports pertinent to the Rocky Cape Group in the Balfour Region.
- Digital capture and assessment of all available CRAE and competitor rock, soil and stream sediment geochemistry data. Cu values were generally not anomalous, reflecting the high degree of leaching in the Rocky Cape region.
- Detailed geological mapping to provide a stratigraphic and structural framework.
- Acquisition and analysis of 135 float and outcrop samples from various localities. Samples were assayed at Analabs, Burnie for Ag, As, Cu, Pb, Zn, Fe and Mn by AAS and Au by fire assay. The only significantly elevated results were returned from dump samples at old workings and other locations along the Balfour Cu Trend. Best values include 2.3% Cu in a massive chloritic rock and 0.8% As and 1.03 ppm Au in a quartz-pyrite rock from the Balfour South Workings. Results show a consistent Cu-As-Au association for mineralisation in the discordant Cu lodes along the Balfour Cu Trend.
- Acquisition of seven E-W lines of ground magnetic data between 5420000mN and 5427000mN to define the position of the Balfour Pyrrhotitic Siltstone. One line of data was collected to confirm the presence of a magnetic break near 5426000N.
- Acquisition, processing and interpretation of 2705 line km of detailed airborne magnetic and radiometric data (generally 100m line spacing, 60m mean terrain clearance). The magnetic data was used to identify fault-related, magnetically quiet zones along the Balfour Pyrrhotitic Siltstone horizon, and to provide other geological information. Although deep leaching was known to occur within the survey area, the radiometric data also provided useful geological information.
- Soil geochemical traverses over the Balfour Pyrrhotitic Siltstone (103 hand-augured C-horizon soil samples at 25m or 50m intervals). Samples were assayed by AAS (aqua regia-perchloric acid digest) at Analabs Burnie for Ag, As, Cu, Pb, Zn, Fe and Mn. Cu values did not exceed 34 ppm, and were frequently less than 10 ppm.
- Acquisition of four 200m spaced soil geochemical traverses over "The Gap Prospect", a fault associated, magnetically quiet zone along the Balfour Pyrrhotitic Siltstone magnetic trend (177 hand-augured C-horizon soil samples at 25m intervals along four 200m-spaced lines. Samples were assayed at Analabs Burnie by AAS for Ag, As, Bi, Co, Cu, Mo, Ni, Pb, V, Zn, Fe and Mn. A very weak Cu anomaly was identified.
- 1995 (Menpes): work on the Nelson Prospect included:- griding (11.85 line km), mapping, rock sampling (11), ground magnetics (11.6 km), soil and wacker bedrock sampling (57 and 215 respectively) IP (3 lines for 5.6 line km). Main conclusion were no anomalous copper values. However an open Zn-Pb anomaly 400m long and up to 150m wide was discovered in the south of the Nelson Prospect.
- 1996 (Tear): Work included a review of CRAE and previous competitor IP data and a reinterpretation of CRAE's airborne magnetic data.

Appendix 2

1996 Geological Mapping-Data Maps

315000E 320000E 325000E 330000E

5440000N 5435000N 5430000N 5425000N 5420000N

EL 18/92 MT FRANKLAND

EL 18/92 BALFOUR

Mapping by S. Tear

Mapping by M. Donnelly

Mapping by N. Turner

Scale 1 : 25,000

0 500 1000 1500 2000 metres

5 cm

98-4121

ANNUAL/FINAL REPORT-MT FRANKLAND
RIO TINTO - EL 18/92
SAJ RUSSELL/SJ TEAR

245029

RIO TINTO EXPLORATION PTY. LIMITED

Balfour Copper Project

EL4/94 Balfour and EL18/92 Mt Frankland

1996 Mapping: Bedding Measurements

Author : S. J. Tear	Ref : 'Burnie' 1:250,000 (SK55-05)
Drawn : Exploration Graphics	Revised :
Date : October 1997	Report No : 22685
Scale : 1 : 25,000	Plan No : TV1176

245030

Appendix 3

Outrcop Location Data

245031

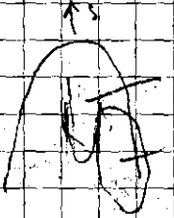
Balfour Mapping 14/10/96

Murrays reward. 5 line km.

South end in Black Siltstone

Fold hinge 20° to 148°

Shear 007/40 E



Bedding 167/80°E

fold hinge 8° to 348° in Black Siltstone

Shear fabric 146°/80°E

fold hinge 54° to 169°

other side of Vein

245032

(2) Black siltstone with fine sandstone beds.
near vertical bedding 166°/90.
younging westwards
cleavage/bedding parallel.
qtz cleavage 152°/90.

@ V (mummy)

(3) lode ⊙/c
qtz Weathered black silt ~ 158/6
qtz vein. 038/90
chloritic shale

(4) 30m on from (3)
chloritic siltstones
with stylonitic qtz veins
some finely laminated black siltstone
younging west

Qtz veins

155/90. straight

028/90 straight, beaded boudins
Added
vertical boudinage

Fabric 124°/90°-NE.
?Southern

⑤ Veining in ?chloritic rocks
?chloritised black siltstone

170°/90°.

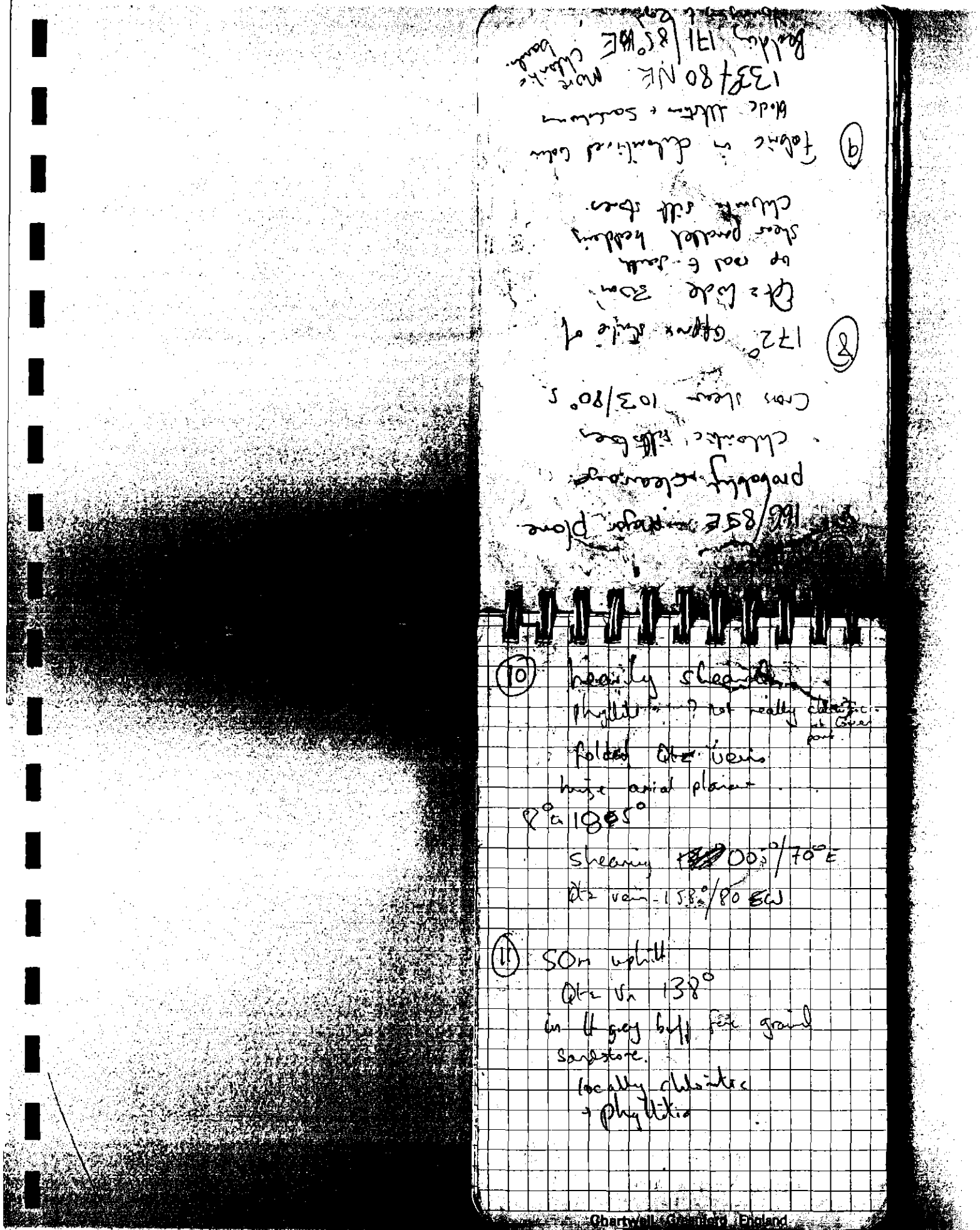
150°/90. 10 cm intervals

0.5 m Qtz veins ~ parallel to trend.

⑥ Chloritic phyllites in
Trear Creek.
Site of original bulldozer find.

245033

245034



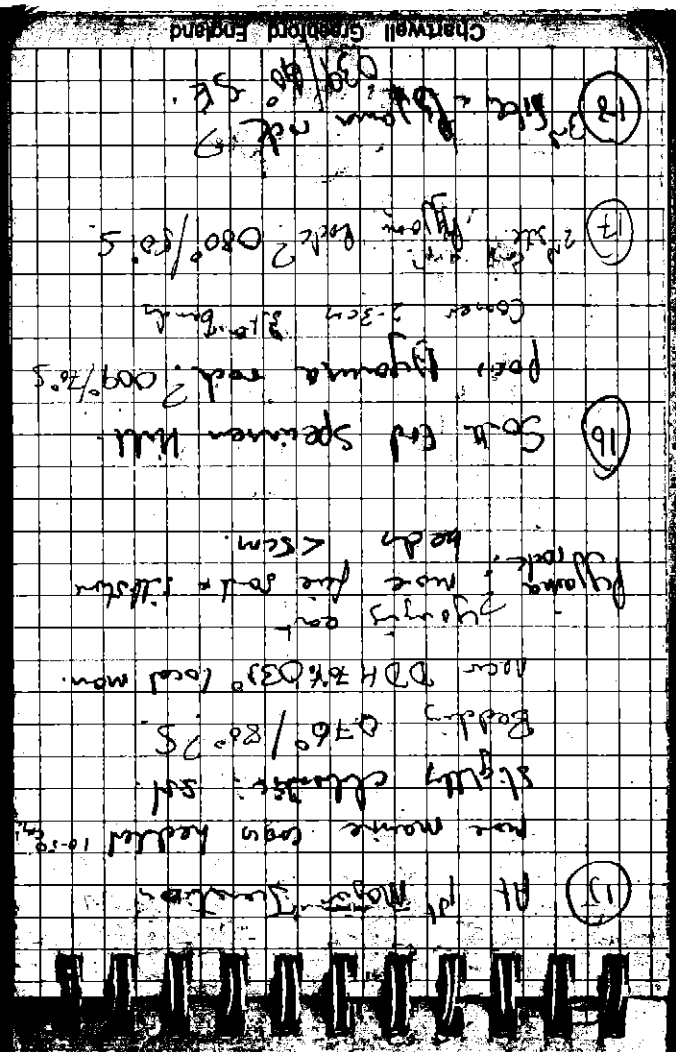
(10) heavily sheared
phyllite ? not really clastic
folded qtz veins
large axial planar
8° to 185°
shearing 200°/70°E
qtz vein 158°/80 EW

(11) 50m uphill
Qtz vn 138°
in Upper bed fine grained
sandstone.
locally chloritic
+ phyllitic

(9) 172° Calm. Rock of
Cliff = Lake Zone
up mod E-dip
steep parallel bedding
cleavage still there.

(8) Fabric = dolerite dike
black, white + sandstone
123/80 NE more chloritic
Beddings 131/85°NE bands

Chartwell, Grantham, England



(12) End of Track

Sandstone + fine sandstone interbedded with more massive set, youngs eastwards.

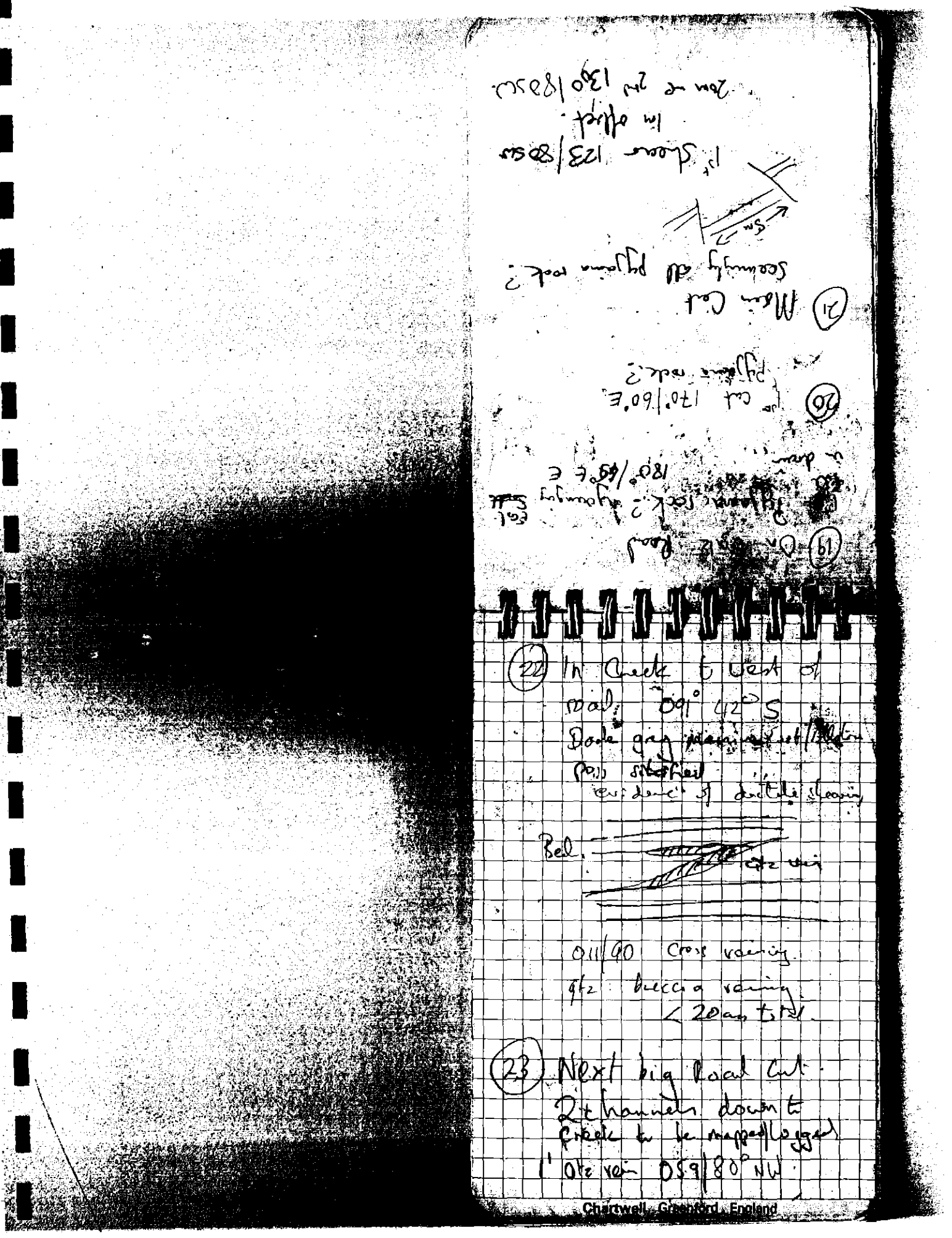
Bd. 179° steep dipping

(13) over hill p.
dacing by dillsite...

Fine Sandstone - locally chlorotic.
005°/70°E Youngs east
Good cross bedding 1/2m scale
v/ fine-grained

(14) Across creek Dk Grey phyllitic
Sand/siltstone ?Chlorotic
B 050°/80E-70E
thin sst beds in silt stone.

245036



(19) Dark [illegible] pool
Pillow neck? Flowing [illegible]
180°/40° E
[illegible]

(20) Joint cut 170°/60°E
pillow neck?

(21) More Cut
Seemingly all pillow rock?

[illegible]
1st Sheet 123/88SW
1m offset.
2m or 2m 130/83SW

(22) In Creek to West of road 091° 42° S
Dark grey [illegible]
Pillow structures
evidence of ductile shearing

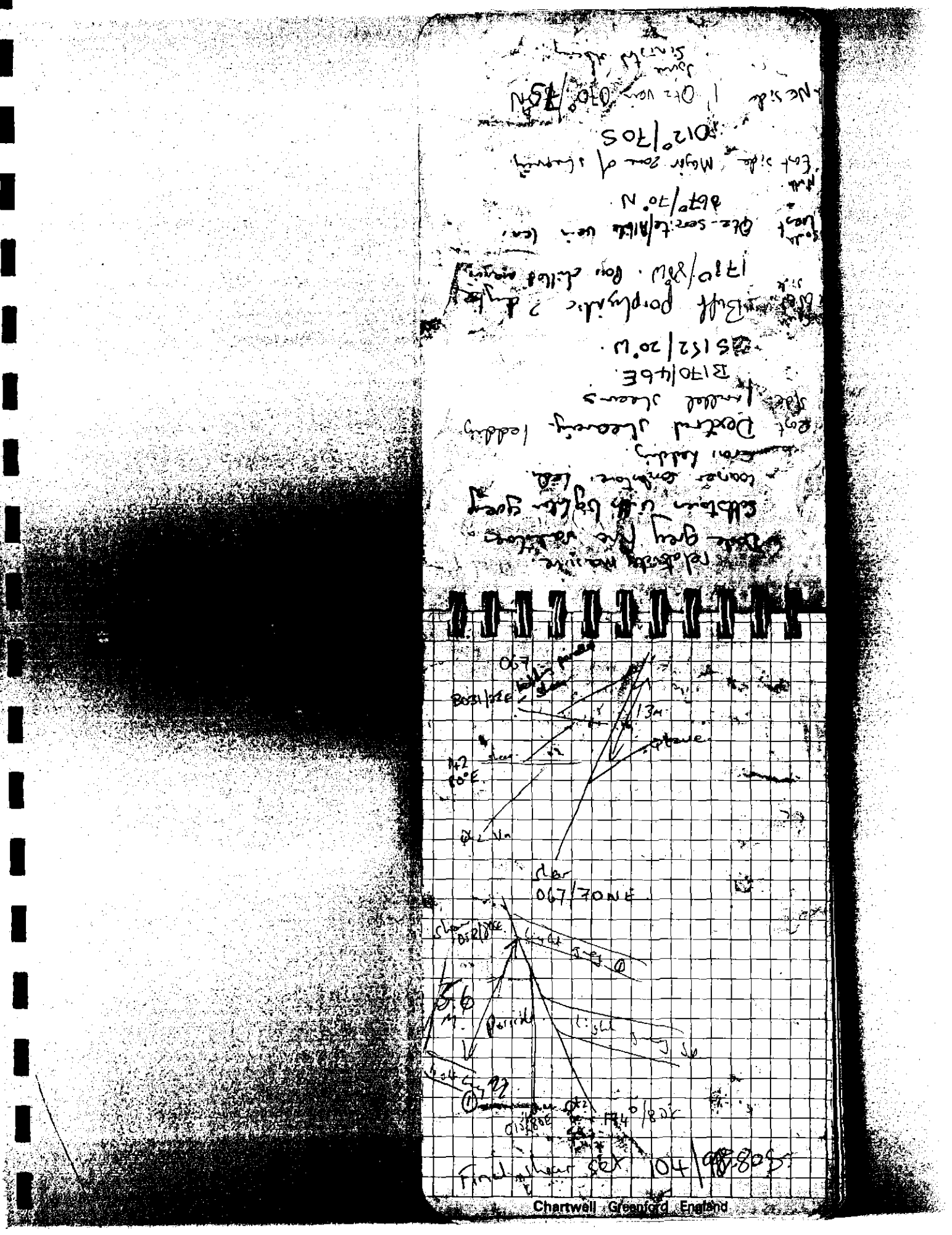
Red [illegible]

011/40 Cross veining
qtz breccia veining
< 20cm thick

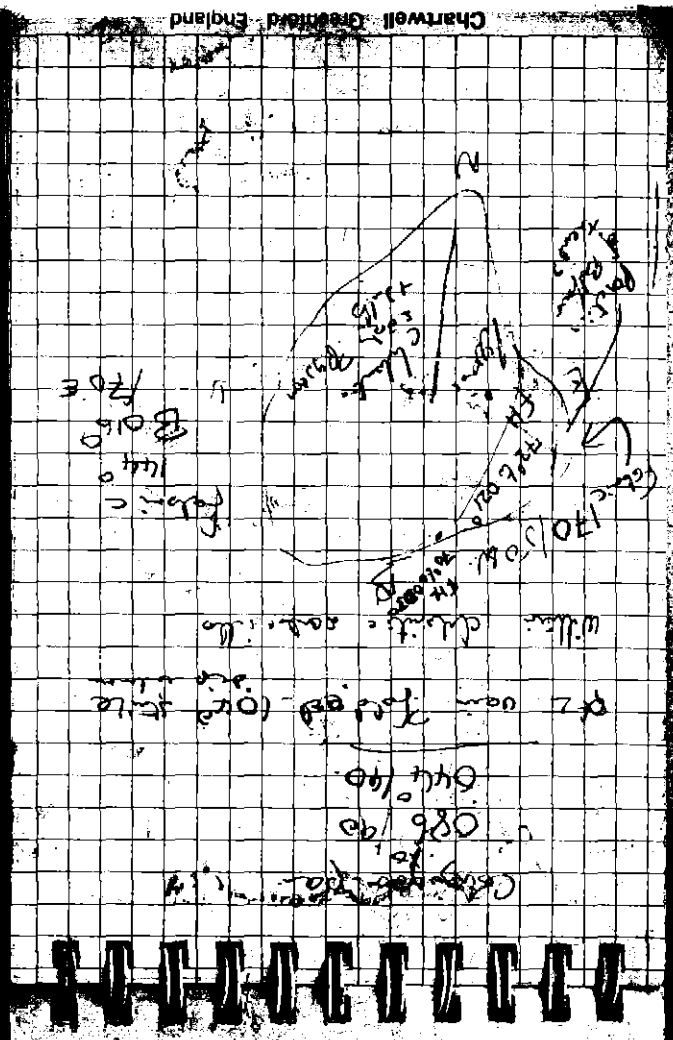
(23) Next big road cut.
2 channels down to
Creek to be mapped/logged
1' Qtz vein 059/80° NW

Chartwell, Greenford, England

245037



245038



(25) Pyjama Rock?
B171 / 73° E.
young to east.

(26) 12° to 154°? fold
hinge in Obisian

12/10/96. 13 line km.

(27) White vein qtz
float blocks up to
½m size

(28) S. Murray's Reward
on trail
Folded Pyjama rock.?

C-S

S.

245040

(29) FH 72° E 206°

Un calcareous
Calcareous siltstone
(strongly chloritic by
creek.)

Bedding 016/85W.
slaty fabric 178°
Sheared bedding à la pyjama rock?
Cross bedding in chloritic siltstone

(30) V regular chloritic
silts + sands
144
fabric 0
B 174/80E like pyjama?
pyjama rock

Conjugate 132°
Shears 045

fabric of 120° obs:
parts of the 132° shear
direction

(31) Dark Grey/Black Pyritic
Micaceous Siltstone
?Tidal scratchings

Fabric ① 174°
② 147°

Thin qtz stringers vein 169°/75W
75W

(32) Cross Cut line:
West end
Thinly bedded/laminated sub planar
Black silts + sands
↑ Qtz ↑ 146/70E
Qtz

Thin veinlet systems 126°/90°
Bedding 158°/85E
Thinly laminar
Qtz lode near top of slope
at top of slope more
chloritic/altered laminar
calc+sandstone
haematitic staining
over hill + down other
side heavily altered
limonitic clay altered
laminar unit 162°/80U
Mine
? soil creep.?

33 chloritised laminar
Silt+sandst
small qtz stringers
D033/90 D170/90
D351/80 D270/80 Pyrite

Bedding 001/70E

3 156/80E B
partially chloritic loaders
Thin sandstone + siltstone
qtz stringer 060°/90
West side of road. Contact line
more laminar nearer road.
Qtz veining
Bedding 161°/90 at road
chlorite spots on East side
of road.

33 Reg 325200E
542630N
abundant Qtz on both
sides of path?

245042

(36) Group cut here.

Qtz Vn 154/52°W. } Conjugate pair?
100/73° S

↑ Dextral movement of 10cm.

Chloritic Sppted chloritic with + sands chloritic spots in both sandstones

B028/85E
At base ↑ of hill

Planar but not laminated with milder developed chloritic spots.

↓ Dying out near top possibly more laminar rear spots more prevalent in top siltstone beds

B178/80E near top.

B 018/80E near top. Itm away

v planar possibly laminar

Qtz Vn 146/90
chloritic 146°
179/33°W

B at top 013°/75°E.

Qtz lode on road
2-3m +

Over Road on ont side
Qtz Vn or bedding 116/90.
Black/DK grey siltstone shale
Bedding ↑↓?
Fg in this Strip Variable.

(37) Sample [illegible] siltstone [illegible]

(37) 385390E
5425900N.
albitised qtz flood
o/c pen laminar
sands + silts.
177°/90.

(38) at Creek
chloritic
sands + silts
reasonably planar
B 176/90
Sinistral staining on 010
plane
strongly chloritic bands.
50m up trail
mic laminar + blk + lt grey
sands + silts
bedding well defined.
Pen fold hinge 50° to 030°

(39) Hearnsleigh Link Road.
well laminated carbonaceous
sheared appearance.
B 155/64E.
Occ bigger 3cm sandstone
bands.
Recumbent flame folds
in places - sheared bedding
Shear 062/70N.
022/80W.
Qtz lenses + veins

Chartwell Greenford England

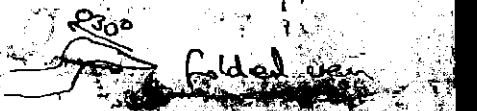
Shear 055/90.-
108/50° S.

Major shear 056/80 SE

1-2m wide

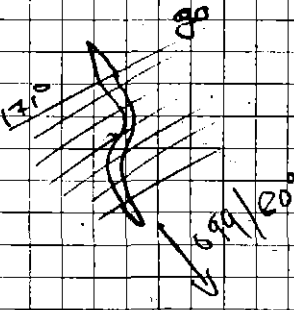
Qtz veins
2m wide
at N end of outcrop
followed by chloritic
sheared sandstone
not very chloritic in
places - some dip
at north end B171/90.

(40) Excavated trench NE road,
Qtz Vn 0.5m 023/90



10cm qtz vein 006/80E
in chloritic sed of
sands & silts.
B171/90.

Tension gash.



at base of hill
V chloritic silt-stn.
planar bands c/w
2-3cm sst bands
006/80E

245045

(41) Excavated creek
Planar chloritic
silts and sands
B 072 037/72° E
small scale 093/7N
S 06P/65SE
037/75SE
B 015/82E
Qtz Vn 130/90
15cm.
folded + sheared chloritic
silts at portal under road
Chlorite 047
continues along road to Buffalo
Gas ~1100m

(42) Chloritic silts + sands
Fabric - 153°
B 015/85E - lamination
locally almost laminated
localised ripples
077/80N
024/80W } Conjugate sets

(43) chloritic silts + sand
almost laminar like

(44) Planar, possibly non chloritic
silts + sand
B 151/90 Dark grey silts
+ sands

245046

(45) Grey weathered - planar siltstones & sandstones
Non-pyritic
? Transitional

(46) Pyritic Dk grey blocky siltstone
big Quarry
B162/90
some silt bands.
chlorite porphyroblasts 1-2mm.
? silicified.

(47) Blk/Dk Grey silts and light grey sands
laminae in places
scoured bedding

locally pyritic nodules
Syncline axis
scoured bedding
B163/90
Dental sheet 055/90
3m exposed

(48) Some degree of scoured bedding
some laminae some planar
Dk grey silts + sandstone
Qtz vein 104/70 S Dan 3W offset 30cm.
bedding 008°/85°E
Many qtz bedding bands

(49) Massive looking Dk grey / Blk
Siltstone
pyritic silt (Dk grey) bands
almost a shale
B 121/78°S —
Massive looking
Minor Qtz V. 022/75E
partly sheared
locally pyritic
same as big quarry

(50) Scoured bedded
Dk siltstone + Lt grey sandstone
Significant fold
B 100/80 S.
005/30 E
Pos Shear related drag fold

Major Shear 146/90
Brecciated
Steep outcrop side of road
at mid end of cut
more massive set. — ? weathering fabric
B 146/56E
scoured bedded silt + sand

(51) Ridge of small flaser beds < 1m. tight fold hinges
1-2m + massive white qtz veins
Slightly contorted via folding (15° & 164° Fol.)

(52) more chloritic & weathered siltstone sandstone.

(53) very broadly bedded chloritic ... very broken

(54) Scouring. Scoured bedding
13/10/96. 7km.

(55) Chloritic schistose rock on scarp @ 53
<1m dales green chloritic bands in a
wavy bedded sequence
of chloritic silts & sands.
Foliation 136/90.
probable cleavage.

(56) Massive Quartzite.
Qtz veins
098/53S. 052/90
052/70SE 107/46S.
046/75NW.
075/90.
035/40NW.

going up till poles int
scoured bedding sandstone + siltstone
B 160/70E
bedding not planar in place
still scoured bedding
so relation laminated

further uphill.
Qtz-cpy float
+ more qtzite.

(57) Mine shaft - 20m deep.
Spoil of large qtz veins
>1m blocks. Pivot direction.
with chlorite
in a strongly chloritic
Protocatc rock.
hematite staining of rocks common
+ radiating hematite

245049

(58) Near Blacks Mine ?
cross cut line
(chloritic units — possible tuff relicts)

Foliation 174/70° W.

Major foliation (? Bedding) 150°/90° ?

If grey ? sericitic silts + sandstones
chloritic zones.

(59) West end cross track
DDH 056° Dip. 58°
From Drillholes NE.

17 paces start of chloritic s/c
(previous 9+2+6?)
5067/10.

↑ chloritic silts? + non chlor sst

24 paces to the track.

(59) next cut line NW
another drillhole
10 paces E NE of track coming
out line 044° 60°
Coloured in s/c some form
of chloritic sst/siltstone

(60) Along track from 59
30m Qtzite

(61) 3rd + perhaps final cut
line.
Site of proj. the DDH
but 2nd shaft definitely
opg one in qtz
+ Wadrock.

245050

Vein emplaced in dip which could be vertical with hanging wall chloritised conglomerate sills - ?volcaniclastics

10m on from shaft chloritised sediments fold hinge 56° & 352°

40m on. chloritic sediments

Qtz vns.
030/90 — ??
158/70W. } Conjugate pair
012/90 } more prevalent

(62) Development.
B 104/70E.
Fabric/cleavage 160

Orientation for veining
Shale 112/56S hinges of qtz
fold hinge 66°↳170°

(63) Plane 160°/75W.
044/85NW
In Trench near dog-leg.
V. sheared chloritic schists
Vn.
Black/dk Grey date on uphill side.
qtz-dol with cpy + Cov-
vein 136° 1.2m width

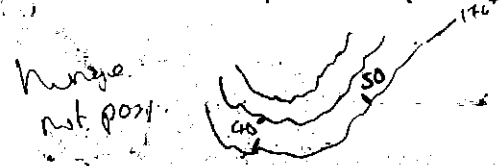
245051

(64) Peters Ridge
scoured Bedding
with qtzite

(65) Pairs drag folds of
scoured bedded rocks

fractures 102/90.
F F 090/70N

5m up rock folded



10m up rock more F
sandstone bands
+ v. thin laminae
not planar

(66) Fine laminae non planar
siltstone + fine sandstone bands
partly convoluted bedding

(67) not as for 66.
3m Qtz vein with altered west
margin - ent margin not visible
limonite-chlorite altered margin
followed by DK grey black siltstone
planar bedding
grading into a scoured type lithology

(68) Scoured lithology

Introduction of non planar laminar zone at top towards crack
QU 103/81S Dextral offset.
fracture 130/90.
" / 043/70 SE.
Not 30 scoured = looking 30cm sandstone bands continuous over crack + round bend.

(69) no planar laminar unit hints of scoured bedding

(70) Sand Blade fissile siltstone band in laminar non planar silts + sands
B 170°/70E

(71) Laminar non planar silts + sands with 30cm silt bands
B 175°/50°E
right way (way up is not visible) ?!
Fabric/cleavage 145°/75° NW
Small scale veining 041/70 SE.

B.

Laminae
Sand dunes

245053

(72) QV 115/58 S.

in weathered black rotted substrate

Depressingly massive siltstone with lt grey silt beds c 1m. platy/pitch on scale of slickensides.

48° to 258

Heanskite Link Road

(73) QV 145/70 SE

laminar subplanar

dk silts + light sands

B 146/30 NW

No sst > 3cm.

S 022/50°E

B after slacker going South

177/20 E

Plastic type of [illegible]

(74) laminar subplanar [illegible]

finely bedded dk silt + lt sand

some convoluted bedding

small slump 270/90

B 158/44 E

probably right way up

South end of cutting,

occ 30cm sst layers.

immediately followed by major shear

004/5 subvertical 75cm wide.

followed by laminar silt sand

(75) not so obvious laminar sub parallel material

may be more weathered.

more Mg rich dk grey silt stone with lighter grey fine silt bands + lenses.

occ 3-5cm sst bands

245054

(76) Mineralised o/c.
Shear zone with
gossan + pyritic
qtz. in a very
Bladdday altered/coated
Slide/Cliffe cleavage,
S/Q v 136/52NW reinforced
QV 116/90 — true
Gossan.
continues as laminar
sub planar ns sst & 3cm thick
to Creek.

5-10m shear
zone
. Clays
Pyrite + qtz veins

(77) laminar sub planar to planar
silts & sands
finish of Scoured bedding

OCC meter bedded,
perhaps coarse channel sands
B 167/60°E

(78) laminar planar to
sub planar bedding
OCC sandstone 30-50cm
beds. Small decimetre scour
080/90.
Varying colours Dk grey silts
to lt grey silts
V2 wavy down beds no
more large cut beds.
For 20m then disappears.
2m thick bed
Some convoluted bedding.

245055

79

laminated unit – well
sheared pervasive shear
sericitic alteration pervasive
S? major plan 136°/82°SW.
bedding cleaves 32° & 136°
worth sampling for gold

0m

10m shear zone
minor shear + QV 144°/75°NE
drag fold on shear

10m minor shear + QV 154/85°SW

12m large QV 2.5m 160/75W.
Minor Py.

12.5 laminar sltst.

37.5m Altered sulphidic zone
Silicified laminar sulphidic unit

42.5 poss sheared bedding
worth for 2m

44.5 ?chloritised
sheared + broken
sandstone bed
?silicified

not laminar / planar

very Silicified looking
sltst

60m shear zone 160°
Chloritic ?silt
chlorite spots

100m @ 326400E
5425450N

+20m bedding.

17/10/96

(80) Frankland River
South side

B 119/45 NE.

Millimetric scale interbedded planar fine sst & siltstone
light grey, possibly chloritic siltstone interbedded (green hue)
locally massive sst beds.
Main qtz veining.

(81) NE side of river
More fine grained sandstone only <1mm scale occ silt interbeds
Planar with thin bioturbated
Small cores taken.
moving back uphill - more strongly chloritic - locally recrystallised & bioturbated

B114/80 NE

Foliation 173°/85 W

Jointing found approx -

Bedding 173°/82 W

(82) Bedding planes

(81) Bedding 027°/82 W

With bedding & foliation 32° & 027°

(83) B 176/25 E

Planar Sands + silts

(24) 4m thick chloritic planar Sands + silts with abundant chloritic spots. Thin silt/clay relatively massive. no turbidites.

Thin section Sample.

B 164/53 E.

(85) Chlorite
< 2mm
QV 048 [illegible] 018/79W.
At MT [illegible] Junction
Road
B 148/75 NE.

(86) chloritic spotted sediments but well rolled ie totally Granitic no fresh rock.

(87) Shear plane 150°/44 SW.
hanging wall chloritic - movement SW.
footwall - well bedded planar
B 150/44 SW Dk grey silts and sandstone
Shear is bedding ∥ to silts + sands
Minor - Qtz veins with shear
10m thick unit
more intensely sheared + folded
less spotted chlorite visible

B 120/80 SW. Post tectonic Contact
Post shear 4p8° between
Dk Sands + silts + chlorite Grit
mass

(88) More distinctly bedded chlorite rock - chlorite beds rather than spots (not present
Weakly developed foliation 018°.
B 149°/85 SW.

(89) Dk grey black silt stones + DCC
+ more fine layers
Sandstone B 166/80E
Colour & Intensity of bedded
2m from footwall but with ? chlorite - spots
Pipe [illegible]
Chlorite shear [illegible] 110.
Contact [illegible]

(90) 325 km from Frankland River
Inter-bedded sandstone silts
Very rolled moderate quite
pervasive chloritic - spotted
zones occurs associated with
chlorite; small scale evidence
of folding + faulting
B 170/36 W.
cleavage 11° to 330°
QV 172/28° W.

B 172°/66° E Poss
QV 104/80 S. fold hinge
QV 172°/66° E
QV 030/52° W.

South of Frankland River
bimodal units continue up from
river but more often limonitic
some beds < 1cm scale seam chloritic

(91) Bedded well bedded planar
sand + silts - quite limonitic
spotted layers assumed to be chlorite
porosity even low chloritic bands
BIB 042° NE
fabric/cleavage 156°/70° E
Shear zone on school cover
174°
B after 141°/68° NE
pods begins to look more chloritic
no spots though.
Dark + light laminae in places.

(92) 8129/65 NE Right way up
Dk grey siltstone + lighter sandstones
not necessarily chloritic but very
scattered well bedded Locally
laminae, v. planar
marked change in vegetation
over the Bolton plain.

from river

245059

(94) Sheared zone with marine looking Dk grey siltstone with Qtz veining + Cracks
QV 107/62°S :- 145/70 SW

(94) Orientated Section 114/81 N
Black phyllitic siltstone with chloritoblastic porphyroblasts
Perhaps siltstone some fine sst beds 20.5cm
Thin QVs 109/90.
along road 20m.
more marine siltstone
Zones of interbedded siltstone + silt.
planar + cross bedding
QV 130°/70°SW

(95) Quarry B 131/67 NE
Grey slate - planar well bedded
Grey siltstone + sandstone
Flattish fold large

2 Some shear planes Major 127/35 SW
Some Cossan material on

Minor parasitic fold
Little beds showing dextral movement

QV 010°/77°E = Qtz filled vein
QV 043/80 dip in each siltstone beds
QV 193/75 W = Qtz stringers
QV 74/65 W = Qtz stringers

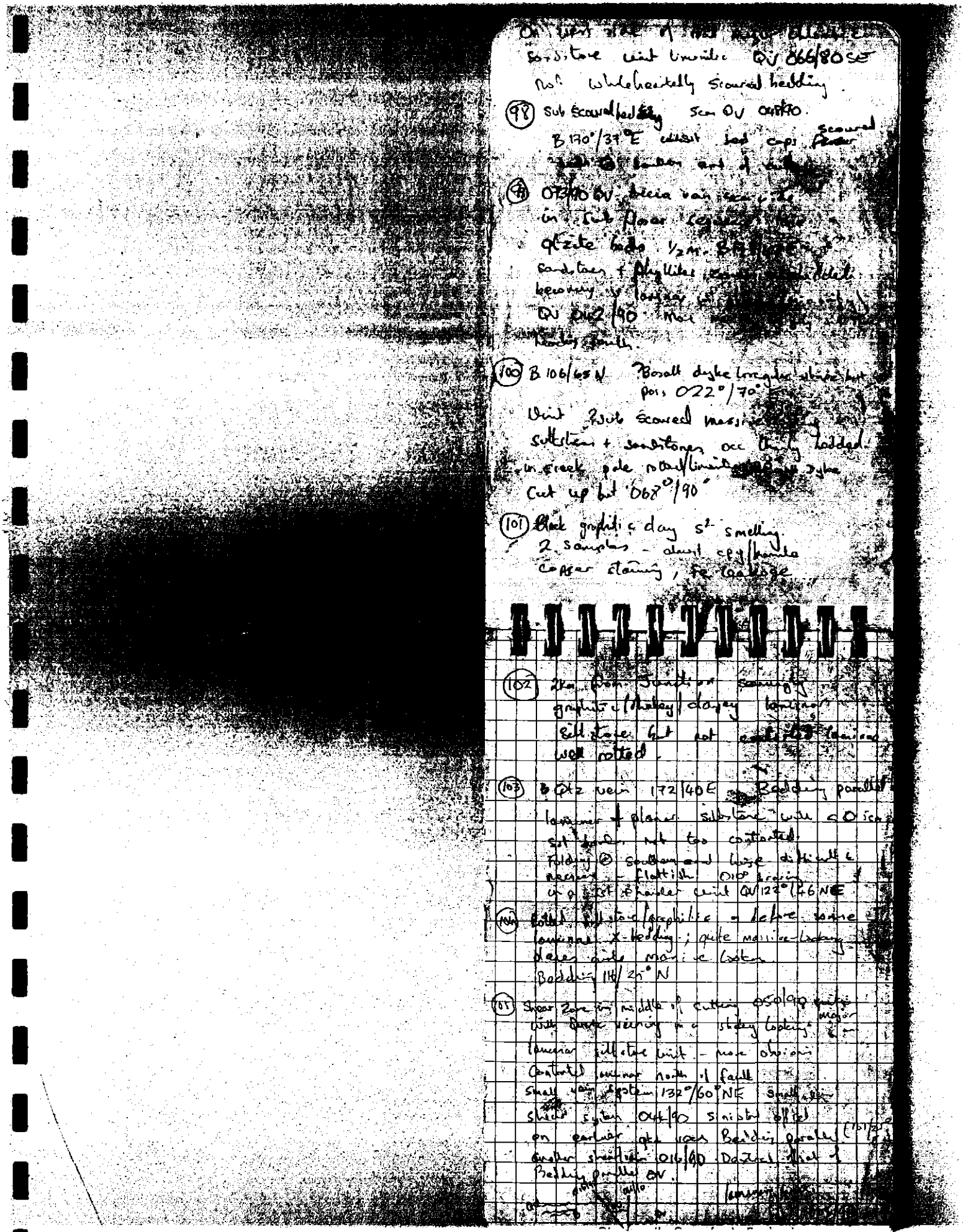
Some Major shear 156/64 W 142/60 SW
130/62 SW

Offsetting shear 033/90. Dextral.
Pyritic cross cutting veins in the core of quarry 096/90.

(96) Major shear zone 127/80 SW in slate. Offsetting shear 072/80 S

main shear
offset shear
Some

(97) Sheared with chloritic sub



245061

at Southern end of dc more pyritic massive siltstone + some sign of flaser bedding - underlain laminated unit

(106) 2.95 km from Junction
Sheared/clay gouge 142/20 NE - with some bedding at 114/30 NE
Jointing/fabric 054/[illegible]PONW
Siltstone laminar unit occ harder dark fine silt bands
some veining in middle of o/c dismembered shear + clay gouge 169/90. QV 060PONW
Shear with Qtz sheeted side 172/55°W
sheeted side dips 60°. E side
Another sheeted shear 032/64°NW pair joint
Major shear 081°/90. Sample
Another shear 073°/90°
" " 069/90.
Qtz veining throughout southern part of o/c. Is vein qtz breccia veining.

(107) 3.25 km from Junction
semi massive dark siltstone — probably part of the slightly contorted laminar unit.
Major shear in middle of o/c 133/90. 1m wide
With Qtz vein lenses
offshoot Qtz veining 103/85S
B south of fault 090/41°N
small shear/kink band 130/80NE
deep gully zone

fold hinge towards south end of dc 060/10W
Becoming more massive [illegible] dips W
unclear if fold hinge no idea of orientation

(108) small outcrop of fissile black shale with white quartzite band - contorted [illegible]
fissility 122/75 SW probably flat bedding

(109) Dark siltstone + white qtzite - folded + distorted bedding
laminae
possibly scoured bedding
Qtz vein/shear 164/90

(110) laminar wavy bedded dk siltstones + sandstones
B161/70° E
Becoming more massive siltstone going South
100m Upgoing ditch left road. 174/90 QV.
dip & strike 203/60 SE · or 015/60 E

(111) Dark siltstone possibly laminar B154/22E

(112) laminated siltstone passes into quartzite dominant + siltstone sequence
↑ pos chloritic
fracture poss joint 087°/75N.
reasonably well bedded but light in colour
becomes more dk siltstone dominant going South; small shear 092/90
↑ not necessarily the one
Mixture sandstone/siltstone/shale

245062

(113) laminated silt stone with occ qtz veins

Small quarry/dam on east side of road laminated silts partly non planar slightly anticlinal at east flow point overlain by qtzite with qtz veining sheared.

B 154/42E

18/10/96. MT BALFOUR

(114) laminated silt stone + sst with occ sandstone 30cm band also silicic qtzite veins 2x 10cm wide. Bedding ft 005/80E

(115) Wht sugary qtzite o/c B plane 151/24NE around a bedding 1m up track sheared laminar carbonaceous siltstone QV 033/90. 2x 1m long o/c B Variable - well folded/sheared chlorite

(116) White qtzite; multi planed planes 094/75S, 045/60NW QSS/64SE ft B. 003/75E 167/38E, ftB

(117) White qtzite, B? 165/50E. 1m QV 165/90. 1m another set QV plunging 30° to 057

(118) Top 1m steep dipping 057/90 S White qtzite B 161/70E

(119) 166/70W Sheared small shear in White qtzite bedding B 177/30E

(120) White qtz + silt stone laminar bands off track dominant 2nd dominant S 033/90, 170/90. B+S 165/90 B 083/30S? 063/40SE S 143/75NE massive outs with occ x bedded laminated white qtzite Cook + Lennon

(121) B 168/60E. Massive qtzites minor QV 022/90 occ chloritic silt stone laminae mica

(122) B 149/66NE Bedded qtzites

123 B013/40E fully sill. Loading Road
Massive Diabase Junction

124 downhill before main dam
QV 154/90 ⇔ B149/90 - Shearing?
QV 109/70 N B173/60E ✓
Some siltstone bands

125 50m into shear domain
J070/90 035/70SE
Shearing visible
in pockets x bedded Qtzites
+/- Siltstone bands.

126 at base of first Domain
B180/50E Siltstone bands

127 at base of 2nd Domain
B170/40E Lamination of siltstone
J020/90.
028/90. Soil creep

128 B130/40SW Qtzites bed with siltstone laminations / beds,
J055/90. 147/50NE

Hermitage Road.

129 094/32E B laminated x-bedded quartzites
QV 130/62° SW. probably in place
J022/85SE
o/c undulating sandstone/siltstone + ?3 beard shaley sequence

o/c in folded B102/46E
Suggestion of scoured bedding
- strong possibility.

130 Major Cutting / Quarry
Non planar laminar siltstone + sandstone
Some convolution of beds due to folding
/shearing B072/28°N Laminations Poles.
Minor shear 048/90 + 151/90
008/90 Breccia/shear + Quartz - Minor
could be a 3rd joint direction

131 S140/90 Contorted wavy bedded laminated
siltstone and shales just 163/80W
relatively flat dipping beds 080 strike
Fernquin shear 142 - Sheared
Small fold closure 008°/90 } Synclinal
shape

245064

(6) 50m [illegible] Sediments, [illegible]
Sheared type bedding in laminar
thin planar siltstone B126/40NE
Small shear plane 048/90; J018/80W.
B104/38N with [illegible] +154/65W.
[illegible] of (6)
QV 060/90.

(132) QV 042/90 167/90 116/90. Junction 13km.
[illegible] offsets
in laminar non-planar siltstones
Flattish bedding. B110/11°N
176/90 major Qv + shear zone
poss chloritic in parts.

(133) B 011/25E laminated/thin non planar siltstone
laminite soil + sandstones
Small QV 001/70W + 116/70N
SK Side Cuts — NE one measured
— SW one sample.
by vehicle. Major Qtz Vein System
2 × 30cm veins 172/90°
+ a much bigger 1m vein
over 3-4m wide zone.

(134) B170/11° Sst dominant laminar non planar
beds : different weathering patterns

(135) QV 038/90 + 102/70S
in marine sediments siltstone + sandstone
possible tuff bed light green sandstone
0.3m wide strike 102°
possibly sheared bedding — shallow dip
flat undulating folds.

(136) Mixed Sequence
At South end of [illegible] OK - appears folded
1] A sort of laminar siltstone with possibly sheared
2] White quartzite - fairly sheltered vertical
with black shale interbeds. 005°/85°E
3] A laminar non planar siltstone + sandstone
with pale shaley with thin stringers
042/75NW.
4] 10cm white vein with shaley
with qtz + then OK shaley laminar unit.
B138/50°NE QV 020/70°W.
5] fractured non planar laminar unit
B114/80N

(137) Flat dipping laminar sediments beg laminated
Schistose qtzite (rusty) 282.5km from junction
30cm on from vehicle more distinct sheared
beds right way up.

(138) 112/6°S Siltstones + sandstones more
qtzite bedding.

(139) Massive white qtzite quarry. 5.3km.

(140) B124/32NE laminar non planar siltstone · limonitic laid.

(141) Seemingly more sandstone dominant laminar non planar siltstone
Major Qtz vein/shear zone.
171/85E banded Qtz vein
+ continuous veins
Overall shear is 5m wide

Bedding Before 123/13°N
After 129/13°N

(142) Sandstone abundant laminar non planar
Siltstone one 1.2cm set bases appear
chloritic B144/30NE
small QV 023/85W
More sandstone at base of o/c
QV 159/90 with brown weathered
QV10 018/80E brown weathered vein.
Ultramafic

(143) B123/82N laminar non planar dark siltstone more silty than previous
Nelson Bay River

(144) Out of pos planar laminar - may be scoured bedding
B 119/70N

(145) Filled in Quarry
laminar non planar material
Poss scoured bed material
+ dense chloritic rock - mafic sill.

4KM

(146) Back to road Ballcourt
Massive bedded dk grey siltstone
Shear QV 103/65N B162/32°W NOTE
" QV 167/85E
" 036/75SE
at flow on
Some degree of laminar bedding
20m localised sheared QV 104/75°N not on
West of gullies (1) Lacking pre shear
30m Shear 087/85S Black siltstone both
+ many laminae. sides of shear.
BOUDIN NW

Chartwell Greenford England

245066

50m Bedding ?Overturned 125/58 SW.
Bedding parallel shear + QV.
folded + sheared moving upstream

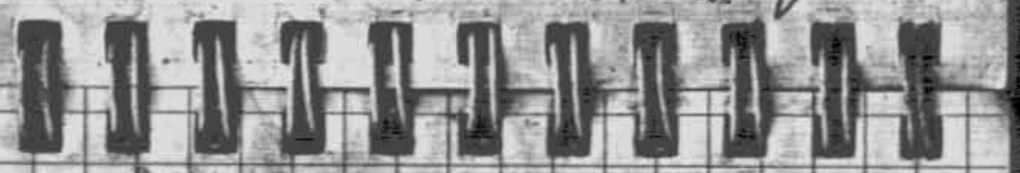
75 QV shear with drag fold 142°/85NE
Overlain by Qtzite
underlain by planar laminar
siltstone.
Small QV 073/75 NW

100m Qtzite in creek 112/32° SW.
Qtzite all around.
Some sort of cross fault
between dry cutting at 75m
+ creek @ 115m

(147) Blk grey massive looking silt stone
B156/48° W.

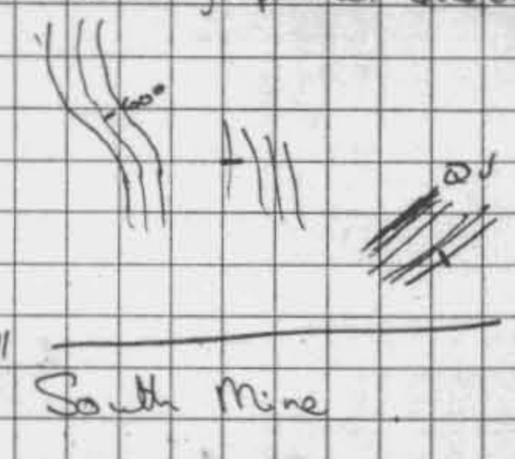
(148) B112/34S. massive siltstone & moderately
well bedded.
some dark qtzites.
?Non planar laminar?
Progressing uphill 50+m
into quartzite (solite)

(149) First obvious appearance of siltstone mixed material in gutter B131/55 SW



siltstone mixed in with quartzites
which do appear to weather white -
may from 149 to 164 siltstone + qtzite

(150) Folded Zone. 20m bedding parallel Qtz vein
B 120°/40.
B 061/85°S.



Confusing.

19/10/96. South Mine

(151) o/c on side track.
laminated planar siltstone band
within calcite qtzite.
Pole bedding 164/~60E

(152) 50m along track non planar wavy laminar
siltstone B146/50° NE occ 10-15cm
sandstone beds - can be with chloritic spots
locally disturbed by folding/faulting
not necessarily fully siltstone dominated

(153) o/c on side of hill laminar non planar
siltstone B015/60E Small limestone 154/90.
major chloritic altered zone ~155/90.
3-4m wide, rock sauce on both sides

(154) Road licken coloured qtz [illegible]
near adit samples
mine dump lacks any wallrock
exclusive vein qtz.

(155) Road cut over Qv.
Qv · 142/80 Sw intersects with 074/90.

142. Qv

tension gashes
166/80W.

laminated non planar silt/fine
same each side of mineral zone.
140 is main mineralised direction
dips steep 80° to west.
some hints of scoured bedding.
B015/50°E
slaps 104°/75S. - similar to mine.
148/75 SW - dented + similar around.
↑ drag folding NW. SE similar around.

(155) @ 325850E 5424150N
trial cut buggy barwork qtz
veining - Sampled
140° strike 80SW

(156) Weathered laminar non planar a/c
difficult to tell if sand or silt
dominant B.170/75E
Sandstone channels 30cm wide + 30cm
maybe planar set cross a/c.

(157) Following gentle ridge many
small Qtz cuts confirm vein
presence Qtz vein marked with
very kinked inclination - weathered
out dolomite.

(158) On track a/c B172/65E
Laminar non planar wavy beds
possible vein a/c but badly
weathered

(159) White qtzite + laminar non planar
bands. poor exposure B141/70NE

(160) B161/70E in laminar silty siltstones
with occ 2-5cm qtzite bands.
poss alteration

245068

(161) South Balfour Mine

(162) Laminar non planar a/c 164/70E.
Minor QV 098/75S + 133/70 SW.
weathered + truncate fine ridge.

(163) laminar siltstone B 088/10 ie
folded in contact with
chloritised laminar siltstone
ie vein etc laminae

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ca Tennant Road

(164) J112/46N in B:090/34S. weathered gtzite. flagging + Som.

(165) B095/10S. Qtzite
fracture 074/80N } conjugate pair
024/90
J 031/90E
J 135/90.

(166) Fracture 110/75N. 007/15E
J 045/90

(168) B 163/17SW Qtzite.

(167) B160/30 SW Qtzite
J 160/70NE

(169) B 141/40 SW Qtzite

(170) QV 094/90 meandering in Qtzite
multiple thin vein.

(171) B 140/32 SW

QV conjugate 042/90
QV 062/90 stringers
QV 087/60S
parallel to joints
QV 134/90 stringers
all set by 087 joints

(172) Cut line laminar non planar siltstone
Minimal QV

(173) Cut line laminar non planar siltstone
Minimal QV.

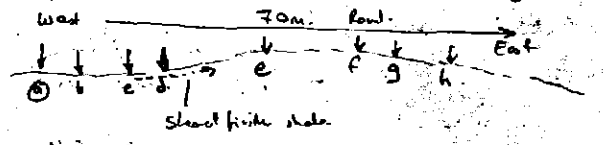
60 line km. to date

245069

20/10/96

The Clump

(174) 1st Cross Cut from Main Road



a = planar laminated sandstone + siltstone B84/50NE

b = shear 075/90.

c = dk grey planar looking siltstone almost shale - 3m wide - fault on East side.

d = poor mineral/shear zone limonitic staining shear zone. Circa 141°
shale/silt is laminar + planar.

e = limonitic zone fracture zone - no wide
qtz vein. S086/80N. Sheared zone

Weathered clays.
still planar, silt stone B128/80NE.
Small QV 097/90.

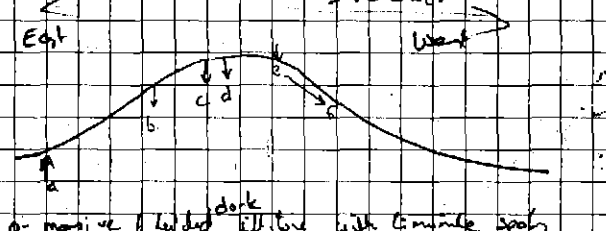
f = contact between dk grey planar siltstone and limonitic sheared material
Cont at 148°/90 - 2 shear 2 Samples
shale = hanging wall

on east side = tradgy massive black siltstone Qv 031/90 laminated shale bearing, laminar + planar

(g) = B132/78 NE - laminar + planar siltstone

(h) = B124/85SW laminar planar siltstone +/- sandstone lenses/bands.

(175) 2nd Cut line



a = massive + laminated dark siltstone with limonite spots B130/14NE
locally planar + laminated grey argill. occ black clay/shale. Lithic rock massive bedding + QV 214/75SW.

b = black siltstone with white porphyroblasts
not so well laminar or planar
massive looking.

c 025 Woodland Cornwall Holdings

d) [illegible] Siltstone
pinkish/brown ± pass planar
V. little exposure from d onwards; still
limonitic clay post thro' the lay

e) Black/dk grey sheared looking siltstone
QV stringers 102/80 SW. S
130/70 SW.
Planes 161/90, diffuse 6 Tell

(F) red to black grey sandstone/siltstone
bedded ± planar B138/45 NE
↑ ? variable
shearing not finite at bottom of tell
laminae ± planar.

(176) dominant foliation - around
shear parallel bedding 100/90
West side of structure
3cm QV 034/90 [illegible] stringers
002/70E
[illegible]
Shear 135/90 + 118/70SW
~3m [illegible]

(177) Adit
Major shear minor QV
Moderate - dip 70° to East
drive NNW. Shear zone adit 190°
[illegible]
followed by sheared rock/clay
20-25m - followed massive
black siltstone.
Plane 153/90
pitch 53°N bedding
pitch 55°S
Big quartz vein 079/90

(178) Cross cut [illegible]
honeycomb manic bleaching siltstone
pen shear mineralised 115°/70N
Qtz vein stringers 083/90
B 133/60NE fg stringers
QV 100/90 S 089/90
B on roof 127/53NE
[illegible] fault plane siltstone
[illegible] clayey 137/90

B 141/60 E

180 Cont line as before.
Sand stone 149/90 + 019/70E
30cm Qtz vein 140/80 NE
Qtz vein 073/90 } Part
164/90 } Conjugate
Qtz vein 162/90
146/90 Conjugate pair

181 Laminar + planar siltstone + sandstone
B 180/62° NE photographed
fold hinge 35°↳330°

182 B 126/70 NE fairly weakly laminated siltstone generally a more massive type of siltstone

183 Check 1911. Seams of dolerite veering round hanging wall
& vein/shear zone for Mt Bulga mine
Sample

184 B 120/67 NE
QV/stringers 001/90
well bedded siltstone
Sample
laminated fine planar bedding

185 3 Qtz Chlorite veins/lenses
Ten ellipses - long axis 111/70 S.
Chlorite rich wall rock in laminated planar siltstone + sandstone
B 082/75 N
Fold axis kink bands 117° strike
F/H 40° to 302°
20m wide 014/70E Qtz veining

186 Rotated sheared black shale + siltstone/sandstone showing 016/90
Main fabric direction dips
Bf 080/55NW - shear sheared
B 068/55NW
EW shear 010/80E

187 up to 1m wide banded qtz/chert and interbedded shale. Massive
B 140/38 NE

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245072

(188) Qtz 077/90 2-3cm vein sinistral offset. also 134/90 stringers flat bedding 016/25 SE

(189) B 014/60SE Black siltstone with thin silt beds

(190) Murtagh Record:-
chloritic unit in planar laminated material. - due to shearing?
Blk siltstone strong lam near sheared non planar - possibly bedding.
Main shear 174°/72°E.

Hearnlink Cole road
after site 79.

(191) V. fissile chloritic shale, unit 3 sheared fabric 151/90.

(192) B 163/90. Planar laminar calc siltstone + phyllites, dark chloritic altn at western end pl. v. fissile in places + slaty - possibility of sheared bedding, increase in intensity of folding towards end.
Note: limonitic fracture, and thin crack chloritic coatings in float.

(193) laminar + planar siltstone + sandstone, planes with chloritic siltstone quite fissile in places fabric
Hz bedding 158/90.
chloritic siltstone much more fissile in thin bands
appears to be a fabric of 118°
looks like chloritised siltstone/sandstone planar + laminar

(194) B 169/90 chloritic slate/phyllite
v. fissile at creek
possible sericitic tuffs
with disseminated pyrite

245073

Balfour - Mapping Bk 2.
20/10/96.
Hoarsekirk Link road.

(195) Dk grey possibly chloritic phyllite.
probable bedding 162/60W.
dominant plane - angular sharp rock
after 10m passes into a more sheared
fissile + weathered clayey slate - possibly
chloritic. lt grey. with darker grey
shale bands some of which are
laminar. even black shale
after 20m more greyish shale/slate
B. 130/60W Black shale laminars
possibly after 30m a more chloritic
unit. judged only on weathering

(196) Possibly non-planar laminar unit with
Rusty zones bedding a little contorted
but 168/80W +/- Quartzite beds.

(197) laminar, planar siltstones (slate)
very blocky. B/02/43S.
J 179/78W + 145/80SW.

? Shear fabric in creek 107/80? possibly bedding.

At east end of drainage B 122/70SW
slight less marine - laminar + planar
siltstone

(198) Sort of laminated + planar siltstone
possibly sheared - bedding in part.
B. 025/14°E.
~~near vertical bedding 117/80S~~ ??

245074

Balfour Mapping 6/12/96.

Lyndsay River.

(199) B161/20E

Planar laminated sands + silts.

With some minor scale scouring

C 053/62SE + 40cm mudstone band.

bedding/change lineation. 10° t 068°

J 089/90.

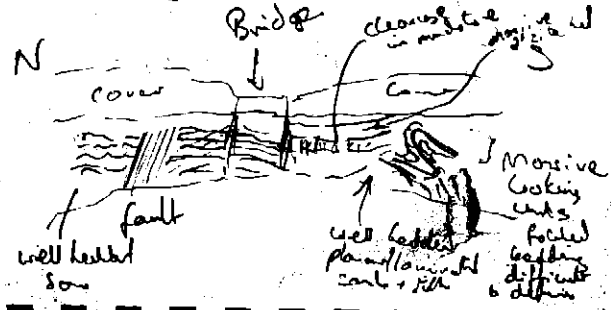
130/75SW

fault 0.3m wide. 089/68S

fold hinge. 10° t 067

stony joint on N side of ~~Bridge~~ fault 137/78 NE

Bedding sub horiz. ? change in lithology



Flower Water Level needed

Fold hinge for tightly folded zone 65° t 236°

(200) Star Pidcet + Page - ? RAE?

Rather slaty-looking siltstone/sandstone

B 170/10°W

Planar bedded (Pos laminations)

cleavage (or jointing) 097°/75S

chloritic porphyroblasts - minor veining

2cm QV 099/61°S ~~possibly~~ may have been folded

strange O/C.

Gives a limonitic stained soil on weathering

(201) Thinly bedded sands + silts - weathered

B 128/17°NE

157/71°W Joint or cleavage.

(202) South of Creek weathered zone with qtz veining 095/62S. Vuggy qtz.
5m wide zone relatively weakly veined. Pattern Leds.
2 blocks fine size of vuggy qtz with Pyrite - Sanded.
Rock appear to have planar bedding but become quite platy in places.
?B 072/29S

Major o/c north of Creek.
of North and [illegible] cycles and Sericite vein 092/51S 5-10m wide quite limonitic in places - pods
Pervasive alteration locally.
B 066/12NW cleavage 104/56S Qtz vein parallel.
Shear plane 056/43°SE also 101/55°S in middle of o/c.
Some rock seen quite silty planar bedded pass laminar in places.
bedding on cleavage bisects 12° & 104°
generally massive dark grey siltstones with only occ laminar bands.

Minor quartz vein following generally N-S trending weakly cleaved zone closer spaced cleavage that's been folded at South end of o/c.
Kink Band 5°E 078°
?

(203) B 054/30SE o/c in drainage ditch
Thinly planar bedded siltstone (fine grained) with bits of minor disturbance
Distinctive Burrows white weathered out
platy bedding.

(204) B 054/40SE planar laminar bedded slaty unit. Correct age approx slaty up stratigraphy in side creek - good o/c
Fine Grain 12/80NE
Small brake. Fold hinge difficult to measure 60°E 022

245076

208 Silty cm/mm scale Sediment
Unit right way up.
B030/44° SE
Slickenides 30° & 064°.
Dextral movement

Sediment unit possibly only a silty unit of the slate.
but 20m thick at least.
Localised silicification of bands.
FH 43° & 187° kink band. fold
qtz vein as well.
With planar bedding.

206 a more planar laminar unit
but with potential to become mm/cm
sediment unit.
B087/24 S

207 B095/18°S Planar laminar slate.
U planar + U laminar in places.
right way up.
(Poss wavy laminar in places)

208 B090/16 S. planar laminar slate.
as before.

209 B 124/34 SW
planar laminar slate. V slaty
in places.
Pos shear zone 113/90
tree/grass roots growing on d/c
10° & 140° pos kink bands
several

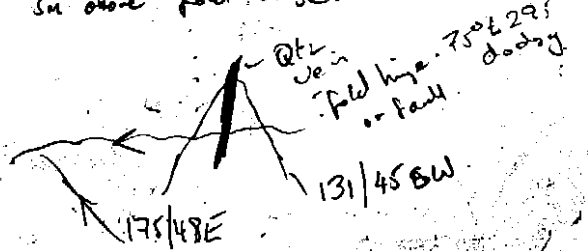
210 near Balfour Tun.
In Creek
Black/dk grey silt-stone Wavy laminar.
Shear zone. 0.9m wide 176/52E.
with qtz veins
folded qtz vein
176/52E
153°/90°

245077

On south side of creek / overfold / bedding

location of fault 80m downstream from Rod. B (from south over 20m) folded
106/20 S.
056/20 SE
099/60 S.
127/70 SW
044/30 SE

going up creek - evidence of tectonism at base of cross cut creek
1st Qtzite approx. B158/45E
5m above fold hinge.



Cross cut creek meanders 066°

Up the Cross cut creek

120m (white Qtzite B155/76W. interbedded with Blade silt/sandstone / white Qtzite

+25m B 028/46E white Qtzite with < 15cm blade silt/sandstone

+30m 10-20cm Qtzite (white) 10-20 Dk grey silt/clay/sandstone

+50m B060/40SE

+70m B193/50E lot of the major Qtzite bands < 1m

+80m B100/37S Sand+silt ? poor exposure but well bed qtzite bands ↑ fairly rare

+90m B104/35S shattered/bleached and qtzite pebbles/cobbles

+105m 5m from Rod. B157/72°W. Sandstone massive rarely bedded thick silt/clay with massive qtzite beds

245078

TRANKLAND ROAD

(211) +175m. just before left hand bend
Blocky chlorite porphyroblasts in light grey/green sericitic shale? or Sandstone.

(212) + 315m. just before R/H Bend
B140/27NE
Rolled "block" siltstone probably planar with chlorite spots.
(211) less weathered?
cleavage 158/80E. 168/80E
Minor Qtz vein stockwork at Northern end of o/c.
also more chloritic bands at northern end, but passes into the grey clay after siltstone, no chlorite spots. (well not so obviously!)
QV 126/80SW
066/80SE. 2 Main directions Dk grey
Limonitic Shear 136/34NE hard grey spotted with Qvartz. Footwall chloritic bands +3 cm (lt grey

(213) +550m. just before Right hand bend.
B075/30NW
Blade/Dk grey Cm scale bedded siltstone (planar) locally more massive rolled siltstone/with limonite. Appear folded with northern and more massive thicker rolled siltstone - sheared.
B137/38NE
→ 082/70S

(214) +715m Chloritic grey siltstone (massive looking) with small bands of fine grained grey qtzite.
B.143/67NE
C 003/90.
Before right hand bend that leads down to Crater Creek.

(215) at Creek
+870m
Grey Siltstone with many scale bands some chloritic B.136/40NE

In creek shaft west side Findlay Fm
cc.s/siltstone dk grey/grey
Fabric 154/75SW. Joint or cleavage.
Creek East side.
Qv 168/40SW
B 134/32NE
B 139/60NE.
down stream of hole.
C 149/80W
Big hole in Creek pon shaft.

(216) +1015m uphill after creek + left hand level.
B137/47 NE
Black shale/siltstone findly laminated overlain by dark grey findly laminated siltstone pos shearing in middle of ok. C1140/80NE.

(217) +1150m
B133/60 NE
Black siltstone with abundant

Pyrite as :-
- bedding parallel massive bands <1-5cm.
- large cubes/porphyroblasts up to 3cm long
- Fine diseam bands
- Pyr Qtz vein bedding parallel.
- Diseam small scale porphyroblasts

Siltstone appears findly planar laminate + locally more massive.
Re-investigate + Sample
plowed off o/c . minimal exposure best looks for 100m

(218) +1550m
B136/40 NE
Pyritic black siltstone.
bedding parallel Pyr Qtz veins
Asbestos

(219) +1737m.
Finely bedded/planar laminated
Sands+ silts B122/44NE
Fabric (clasts) 096/80N.
in QV Shear Zone

(220) +2235m. – Road Junction
Back 100m B127/37NE.
Grey siltstone with fine
laminae - rather diffuse through
of the road Junction boulders
of a siltstone/sandstone laminar
but with diffuse bdys.

(221) 2515m. Weathered o/c
B138/48NE
Chlorite porphyroblasts.

(222) +2650m
B154/40NE
J 076/90
chlorite porphyroblasts in highly
altered calcitic siltstones

(223) +2810m
B124/50N
Laminite + weathered siltstone/sandstone
chlorite spots + bands at SE end
diminishing northwards (B117/46N)
Becoming a more clastic
fine sandstone @ 3040m.

End of Day
7 line kms.

7/12/96
Frankford Road.

(224) +3150m. Cleaved sandstone with
Chloride spots + altered mafics (locally
partly recrystd.) May have been olivine mafic

Di Amalt + basic bedding.
Fabric 142° steep angle
? sub horiz bedding?
In part igneous looking.
Boulders (small) of breccia/agglomerate/
Conglomerate on NE side of outlier.

(225) +3300m.
B133/18°NE
Quartzite/sandstone +/- chloritic
Mudst/porphyroblasts + chloritic bands.
C or J 175/90.
Light grey silts/siltstones
Blocky nature

+3495m
(226) B129/16°NE planar/laminar well
bedded sandstones (not necer. any
chlorite
J076/80SE or shear direction

(227) +3700m.
Flatlying grey planar bedded silts.
Fabric 140° steep probable cleavage

Pale Beds are planar but reasonably well bedded
generally < 3mm thick
Blocky nature to rock
Becoming a white/buff coloured rock with
small bands + lenses of darker material
Dip plane 095/70S

(228) +3890m.
More limonitic with a flood
Flat lying slightly pyritic silt
cleavage 004/?
J 056/80SE well rock alteration ? veining
Rusty/limonitic clay track - ? alteration.
locally chloritic

(229) +4100. B142/18SW
Qtz shear zone 166/?90°SE? 5cm back from vehicle
Increase in amount of chlorite (Fuchsite visible
in Qtz) visibility very poor
locally V. strongly chloritic
Qtz stringers in chlorite 120/90.

(230) +4320m. Open area
Grey massive looking gneiss qtz 2mm 048/90.

245082

some degree of planar
siliceous looking. no limonitic sst
B144/10 SW

(231) +4940 by track to right.
Grey massive looking qtzite/sst.
Spec. cleavage 022/80NW. +/- qtz vein.
2cm qtz vein 163/70W.

tourmaline

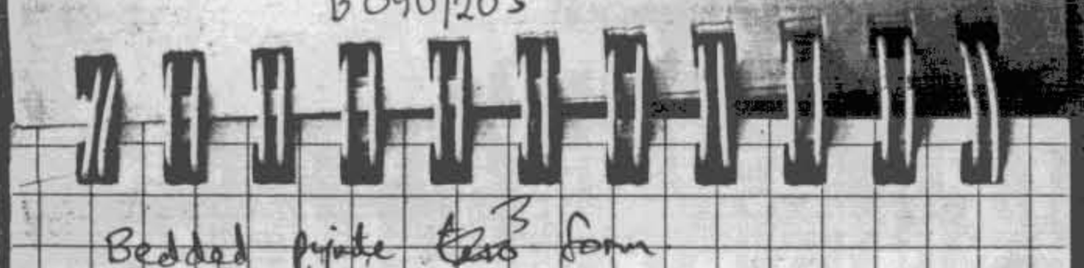
B051/11NW

(232) +5280m.
Dk grey phyllitic cmst siltstone/sst.
planar bedding. B011/40W
qtz. veining 059/90.
JorC 020/70E.

locally pyritic in fine bedded pyrite layer

Outcrop on other side of road by qtzite.

(233) 5350m
Follow track int to West - Big mound of black slate.
25m Bedded Pyrite o/c
B090/20S



Bedded pyrite type 3 form
3) Fine disem mauves up 4cm thick
3) Coarse pyrite consists upto 0.7cm
The two coexist
3) Fine grained massive bands < in
a planar sst + siltstone

(234) +5575m.
B052/18SE
Lt grey gritstone. reasonably well bedded
(possibly + dolerite spots)
becoming darker grey
pos cleavage 172/70W.

(235) +5800.
25m upturned trees
Massive grey sandstone siltstone
pos bedding. 125/68SW. - Difficult to be sure.
Qtz vein <0.1cm 027/90.
Shear plane 060/76NW.
(a) 5800 limonitic sst. Shear plane sst.

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245083

(236) B 129/52°NE + 591Jm.
laminar sandst i.lbs.
Possible planar - ost division
laminar or ripple cross lams.
with ?20·Jm of sandstone beds
overlying ...

(237) White lt grey qtzite/sandstone
at Road Junction
Flattish bedding assumed.

(238) White/lt grey sst/qtzite
B133/23 NE

(239) B105/22N
Dolerite planar massive bedded
siltstones/sandstones +/- limonite.
Sod.

(240) Black/dk grey massive siltstone
+100m from logging hut junction
+/- disseminated pyrite nodules 114/28N.

(241) B 150/20 NE ?0/C.
Planar Bedded Bands of ost/siltstone with
with diagenetic chloritic bands.
600m on from hut Junction
Turn round back to Junction.
at 6440m.

(242) + 250m
B 153/32 NE
Black / Dark Grey Silt stone. massively bedded.
J 027/80 W.

Car park area @ 825m
Track probably ceases @ 1115m,
continue of foot.
Pass 100m on from Carpark Chloritic
sandstone - v.f. dodging

100m back from car & Road Junction
Black/dk grey siltstone Pyritic.
as before
163/30 W. Some cubic pyrite.
J 071/90.
Pass C 007/80E

245084

Along side track.

(243) +120m Not sure if o/c or pile of boulders. B167/34E. probably olivine chloritic planar bedded sandstone ± chlorite - Logan has & rock not porphyroblasts.

(244) +325m. Rotted sandstone ...possibly was chloritic. Flaked off o/c no obvious bedding apparent & be flat. chloritic porphyroblasts.

(245) +540m at Creek seemingly less chlorite more of a white silt/qtzite. B 129/46 NE.

(246) Pontbren chloritic sandstone with chloritic porphyroblasts

J041/820 ESE. B 134/54 NE
J 160/626.
J 122/765 +695m.

(247) +950m.
limonitic silt - chloritic silt
pyrite (+ chlorite)
± siltstone in hands — P3 ?

B 130/31 NE

planar bedded laminated chloritic sandstone/siltstone

(248) +1275m
heavily limonitic silt
well bedded planar + laminar.
B 139/52 NE.

(249) +1550m. B142/50NE
well laminated planar, chloritic sandstone - partially chloritised limonitic siltstone

(250) Dk grey/black massive bedding
+2000m siltstone. Lighter grey Alt bedding
local planar bedded bedding
at bit scoured B/149/8[redacted]NE
right way up.

(251) massive bedding dk grey black
siltstone.

log across road @ 2500m.

---

(252) Fissile dolomitic siltstone +
sandstones may have been
planar bedded now slightly
(wavy laminar).
Murray, Pevard

---

(18) Scoured beds. mm/cm scale.
Right way up

(17) more of a wavy laminar
than small mm scale scoured unit.

Small scale scoured units parallel,
B068/55° NW
Bn registered clearance 111/80N

(16) Sheared + locally tightly folded.
B012/70E
5m further East B133/80NE
C 130/80E
Very sheared
20m further East B042/70SE
C 110/80N Wavy laminar

(Site 173) @ NE End strat
seemingly planar - partially
scoured & partially wavy laminar
Bn @ E-W dolerite vein 082/80E
Good Qtz vein with egg.
B153/80E
B017/80E 10m on top of hill

245086

(253) - tr'd 22.1. bearing 017°
Cross cutting ? cleavage / bedding
+ veins 120°/70 SW.
in creek below adit rom
B147/30 NE planar laminar
siltstone (Black)

(254) laminar siltstones + Sandstone
B.144/42 NE.

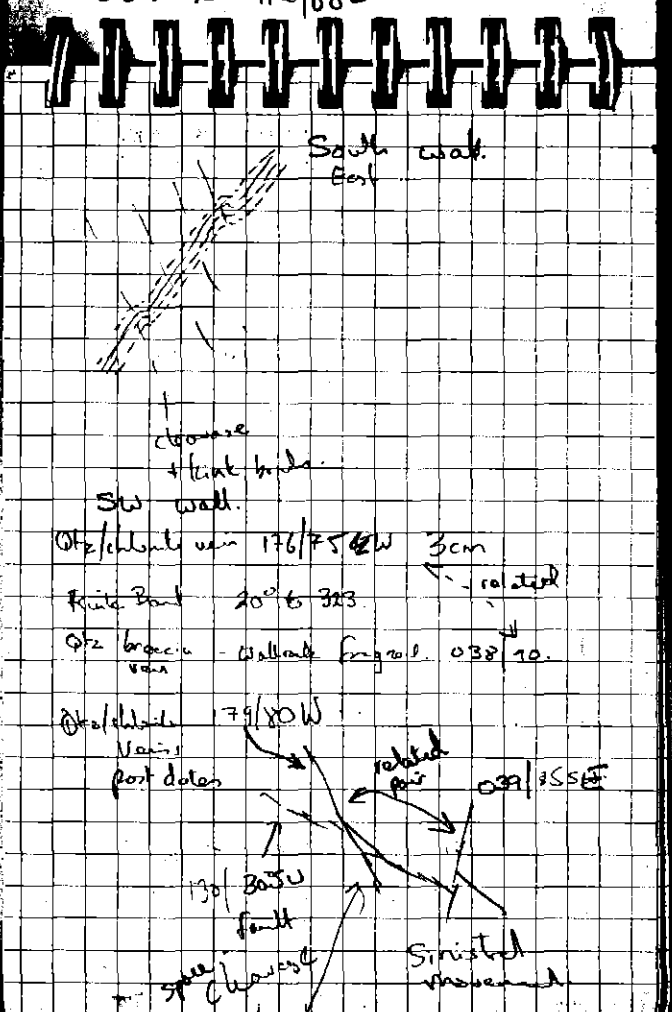
II

8/12/96

Big quarry Site.
33° to 105° - kink band SW wall
7° & 309° " " SE wall

SE

cleavage 112/68S. SE wall.



Planar partially laminar siltstone
+ fine sst.
Very flaky. right way up.
Qtz pyrite vein on NE wall 124/90.

The Clump

255 Weathered dc of black/dk grey siltstone slightly wavy but definitely planar.
Qtz stringer veins 158/90.
Bedding 084/?80° to N.
dashed
with a Qtzite 30° to 80° bed.

256 057/40NW Qtzite beds.

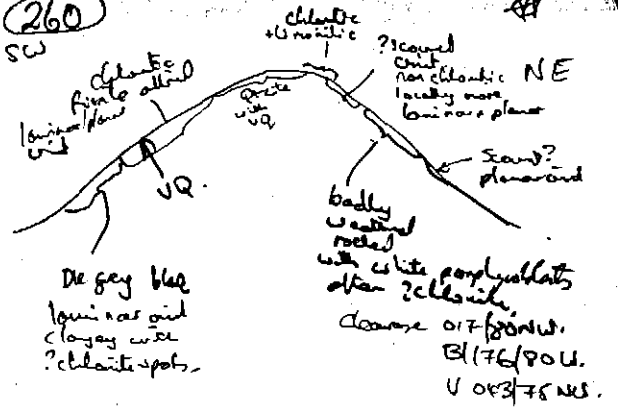
257 Gully Prospect
old bulldozed track line bearing 082° at end at easterly loop.
Qtz on track

258 Revegetated area
but with wavy laminar d/c
Right way up.
B073/10. S bedding variable folded unit.
small network of Qtz veins
022/80NW
067/70N
139/80NE

259 On top of Central Mt Bulkeley
Contact
SW
NE
Qtz
Fine grained laminar planar siltstone
Bed 135/80NE
Chloritic fissile units. Locally more sandy + siltstone beds. Minor in sand laminae.
Flaggy flaky fissile Dkgrey non laminar planar siltstone
Bedding 007/80W
Cleavage 029/60NW

245088

260



261 FH 30° & 138°
Specimen Hill.

262 324500E, 542730ON
CRA Lias in Grey soil/clay
∴ Wavy laminar or scour silt

Appendix 4

Thin Section Report - P. Ashley

PETROGRAPHIC REPORT ON SEVEN ROCK SAMPLES FROM NORTH-WEST TASMANIA

for

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SUMMARY

Seven rock samples from the Rocky Cape Group of north-west Tasmania were submitted for identification and petrographic description. For one sample (5473301) two oriented thin sections were prepared in order examine foliation relations and a polished thin section was prepared from sample 5473305. Ordinary thin sections were prepared from the remaining five samples.

Summary descriptions of the samples are listed below:

5473301 TS:
Summary: Moderately foliated dark grey graphitic slate, dominated by fine grained quartz and muscovite and containing pseudomorphs after former porphyroblasts of andalusite and corundum. Andalusite, and to a large extent corundum, have been pseudomorphed by retrograde muscovite and quartz. The rock contains two generations of thin, syn-tectonic quartz veins.

5473302 TS:
Summary: Fine grained phyllite, developed from a bedded siltstone-shale. The rock preserves bedding laminations, but has a moderate cross-cutting foliation and a weakly developed crenulation. It has been metamorphosed to low grade (chlorite grade, greenschist facies), with formation of a quartz-sericite-chlorite assemblage, with a few porphyroblasts of pyrite and a little leucoxene. There is no strong evidence for the rock to be a sheared volcaniclastic, but the precursor sedimentary material could have had a felsic volcanic provenance.

5473303 TS:
Summary: Fine grained phyllitic rock, originally a shale-siltstone of possible felsic to intermediate volcanic provenance. It is now dominated by a quartz-sericite-chlorite assemblage, with scattered pseudomorphic aggregates of quartz plus chlorite after former metamorphic porphyroblasts of ?andalusite.

5473304 TS:
Summary: Medium grained altered pyroxene-hornblende microdiorite. The original mineral assemblage has been largely replaced by a low grade metamorphic alteration assemblage of tremolite-actinolite, chlorite, clinozoisite, albite, sericite and a little titanite. The rock also contains a trace of disseminated pyrite. A few sub-planar crack-seal textured quartz veins cut the sample.

5473305 PTS:
Summary: Intensely altered schistose chlorite-quartz rock (possibly representing some form of precursor intermediate to mafic igneous composition), variably replaced by medium grained carbonate (probably ankerite/siderite), with syn-tectonic quartz veining and minor disseminations of chalcopyrite and pyrite. The rock has been slightly weathered, leading to the formation of goethite staining and possibly a little Mn oxide.

5473306 TS:
Summary: Fine grained low grade metamorphosed and moderately foliated shale-siltstone. The rock may have had a felsic igneous provenance and retains minor detrital quartz and feldspar. However, it has been mostly recrystallised into a foliated fine grained assemblage of quartz, sericite, subordinate carbonate (probably siderite) and a little chlorite. Carbonate forms prominent porphyroblasts stained brown by the development of supergene hematite/goethite.

5473307TS:

Summary: Brecciated quartz-rich siltstone, with strong replacement of clasts by fine grained chlorite. The breccia matrix is also dominated by fine grained chlorite, but contains some vein quartz material. A little pyrite was deposited with the vein quartz, but has subsequently been weathered out and replaced by goethite boxworks and staining. The rock is viewed as a type of tectonic breccia, with hydrothermal influx of Mg and Fe during and following brecciation.

Samples 5473301-3 and 5473306-7 represent low grade metamorphosed and variably altered and deformed sedimentary rocks of shale-siltstone type. 5473304 is an altered microdiorite, obviously representing an intrusive, and 5473305 is an intensely altered and mineralised rock of uncertain affinity, but possibly of intermediate to mafic igneous type.

The metasedimentary rocks are dominated by quartz plus fine grained muscovite (sericite), with local chlorite and carbonate. Sample 5473301 contains pseudomorphs after metamorphic porphyroblasts of andaulsite and corundum (with a trace of the latter being preserved) and 5473303 also contains pseudomorphs after former porphyroblasts of ?andalusite. These porphyroblastic developments may be a result of the bulk composition of the rocks being rich enough in Al to allow formation of the aluminous metamorphic minerals. Subsequently, there has been retrogression of these phases to form sericite, quartz and chlorite. The metasedimentary rocks are weakly to moderately foliated, with some also showing weak cross-cutting crenulations. Precursor materials for the metasedimentary rocks were evidently of felsic to intermediate igneous in composition (i.e. relicts of fine grained detrital quartz and feldspar and the fact that white mica is a characteristic alteration/metamorphic mineral). However, there is no unequivocal evidence that any of the metasedimentary rocks was directly volcaniclastic.

Sample 5473304 is interpreted to have originally been a pyroxene-hornblende microdiorite, also containing a little quartz and K-feldspar. It may be intrusive into the metasedimentary sequence. It has undergone the same type of low grade metamorphism as the metasedimentary rocks, but perhaps because of its more massive nature, has not developed a foliation. It has developed a low grade metamorphic alteration assemblage of tremolite-actinolite, chlorite, clinozoisite, albite, sericite and titanite. Sample 5473305 is difficult to classify in terms of primary composition due to intense alteration and mineralisation. However, the general chlorite-quartz-carbonate alteration assemblage, plus the presence of scattered aggregates of leucoxene (interpreted to be pseudomorphs after former igneous FeTi oxides) is taken to imply a relatively mafic igneous precursor. This rock has been replaced by chlorite + quartz + leucoxene, then flooded by masses of Fe-bearing carbonate (ankerite/siderite), quartz-veined and mineralised with disseminated chalcopyrite and pyrite. The style and origin of this Cu mineralisation is speculative, based on one handspecimen, but it is clearly of low-medium temperature hydrothermal type, possibly emplaced syn-tectonically.

Although the mineral assemblages found in many samples are entirely consistent with having formed under low grade (e.g. greenschist facies) metamorphic conditions, the presence of former pophyroblasts of ?andalusite and corundum imply slightly higher grade (plus appropriate aluminous rock composition). However, some samples (e.g. 5473305, 5473307) have intense chloritisation (plus some carbonate, quartz veining and sulphides) and there is development of carbonate porphyroblasts in 5473306. These attributes are clearly of hydrothermal alteration origin and are associated with fracturing and brecciation in 5473305 and 5473307. The cause of the hydrothermal alteration and mineralisation is not apparent from evidence in the sample suite.

5473301 TS: NW of the Clump on Blackwater Rd. site 94

Summary: Moderately foliated dark grey graphitic slate, dominated by fine grained quartz and muscovite and containing pseudomorphs after former porphyroblasts of andalusite and corundum. Andalusite, and to a large extent corundum, have been pseudomorphed by retrograde muscovite and quartz. The rock contains two generations of thin, syn-tectonic quartz veins.

Handspecimen: The rock is composed of a moderately foliated, dark grey slate with abundant small (generally <1.5 mm) bladed porphyroblasts showing a weak preferred orientation, and less common porphyroblasts with a hexagonal morphology up to 2.5 mm across. It is likely that the rock is rich in quartz and muscovite and that the dark grey colour is due to finely divided graphite (the sample marks paper). The porphyroblasts may be aluminosilicate phases, but appear to be retrogressed (?sericitised). It is possible that there are two sets of thin quartz-rich veins in the sample, both of which are cross-cutting to the foliation, but which themselves are locally crenulated. The sample is essentially non-magnetic.

Thin Section:

a) Primary mineralogy and textures: Two thin sections were cut from the sample, one parallel to the foliation and the other at rightangles. The rock retains a relict detrital texture, manifest by angular to sub-rounded grains of quartz up to 0.05 mm across. These are set in a foliated, recrystallised matrix rich in fine grained flaky muscovite, with dark turbid pigmentation due to ultrafine graphitic material. There are a few prismatic to subrounded detrital grains of brown tourmaline up to 0.05 mm across. The relict detrital texture is more evident in the section cut normal to the foliation. The relatively fine grainsize of the detrital phases and the presence of graphitic material imply that the rock was originally a black (organic-bearing) shale-siltstone.

b) Alteration and structure: The rock has been metamorphosed and deformed, with development of a moderate foliation, metamorphic porphyroblasts, quartz veining and retrograde alteration effects. The majority of the rock has recrystallised to a moderately foliated, fine grained aggregate of quartz and muscovite (in which most of the quartz is probably relict detrital), with a little tourmaline and graphite. Bladed porphyroblasts up to 1.5 mm long have developed throughout, but have been subsequently pseudomorphed by fine grained muscovite and quartz. These pseudomorphs locally enclose grains of tourmaline and have diamond-shaped to squarish outlines; they are interpreted to represent former andalusite porphyroblasts. Scattered larger porphyroblasts with prominent hexagonal morphology are also present. These are up to 2.5 mm across and are also largely retrogressed to fine grained muscovite and quartz. A relict radiating pattern is present in these aggregates, along with traces of tourmaline and remnants of the original porphyroblastic mineral. The latter has high relief and low birefringence and is interpreted to be corundum. The rock also contains scattered ovoid aggregates up to 0.5 mm across which are dominated by fine grained leucoxene (?anatase).

Former andalusite porphyroblasts have a weak preferred orientation in the plane of the foliation, which is mainly defined by preferred orientation of muscovite flakes. At least two generations of veining have occurred; both types appear to cut porphyroblasts and both have been crenulated and recrystallised. Veins are up to 0.5 mm wide with early recrystallised quartz + muscovite types, being cut by recrystallised quartz-rich types. Muscovite in the pseudomorphic aggregates after andalusite and corundum appears to be randomly orientated.

c) Mineragraphy and paragenesis: No sulphide minerals have been noted in the sample.

Mineral Mode: Approximate modal proportions are: quartz 60%, muscovite 35%, graphite 2%, leucoxene, tourmaline and corundum each 1%.

Interpretation and Comments: The original rock is interpreted to have been an organic-bearing black shale-siltstone. It was evidently rather clay-rich and aluminous. Subsequently, it was metamorphosed, with development of porphyroblasts of andalusite and subordinate corundum, due to the aluminous rock composition. Since andalusite porphyroblasts developed a weak preferred orientation, it is assumed that it developed syn-tectonically, along with foliated muscovite. Syn-tectonic quartz-dominated veining also occurred, probably largely after porphyroblast development. Later, there was retrograde alteration (hydration, with possible introduction of K), with complete alteration of andalusite and almost complete alteration of corundum to fine grained muscovite and quartz. The retrograde muscovite is not foliated. It is considered most likely that development of porphyroblastic andalusite and corundum is due to low to medium grade regional metamorphism of an appropriately aluminous rock. The presence of graphite may have facilitated nucleation of andalusite and corundum porphyroblasts.

5473302 TS: From Blocks Mine. Site 61.

Summary: Fine grained phyllite, developed from a bedded siltstone-shale. The rock preserves bedding laminations, but has a moderate cross-cutting foliation and a weakly developed crenulation. It has been metamorphosed to low grade (chlorite grade, greenschist facies), with formation of a quartz-sericite-chlorite assemblage, with a few porphyroblasts of pyrite and a little leucoxene. There is no strong evidence for the rock to be a sheared volcaniclastic, but the precursor sedimentary material could have had a felsic volcanic provenance.

Handspecimen: The rock is a pale greenish, rather lustrous phyllite with a moderate foliation and a weak cross-cutting crenulation. It appears to be strongly sericitic, but with abundant quartz and minor chlorite. There are also a few isolated grains of quartz up to 1 mm across. Exterior surfaces and some foliation planes are stained by goethite, due to weathering oxidation of pyrite. The sample is essentially non-magnetic.

Thin Section:

a) Primary mineralogy and textures: In the section, relict bedding laminations are well-preserved, with individual laminae being on a scale of 0.5 mm to about 10 mm in thickness. Bedding is defined by differences in grainsize and mineralogy. Many beds are weakly graded, with more silty bases (showing local possible load casts into underlying shaly material) and shaly tops. The silty material contains abundant angular to subangular grains of detrital quartz up to 0.05-0.1 mm across, intergrown with sericite, chlorite and traces of tourmaline. The more shaly component of the rock is dominated by fine grained sericite, intergrown with quartz and accompanied by a little chlorite. Fine grained disseminated leucoxene (?anatase) occurs throughout and may be the result of alteration of former detrital FeTi oxide grains. Alternatively, leucoxene may simply be a diagenetic/low grade metamorphic phase.

b) Alteration and structure: The rock is dominated by a low grade metamorphic mineral assemblage of quartz and sericite, with minor chlorite. A moderate foliation is defined by preferred orientation of sericite and chlorite flakes and is at a moderate angle (40°) to the bedding plane. Incipient development of crenulation is defined by slight bending of the foliation plane. Rare porphyroblasts of pyrite up to 1 mm across occur sparsely and are accompanied by fibre quartz "pressure shadows". The sample also contains a few thin (<0.05 mm) anastomosing quartz veins which cut across foliation. Due to weathering effects, patchy goethite staining occurs in places.

c) Mineragraphy and paragenesis: The rock contains a few grains of porphyroblastic pyrite up to 1 mm across. These are interpreted to have grown during diagenesis or low grade metamorphism and prior to, or during, foliation development. There is no association between pyrite occurrence and quartz veining.

Mineral Mode: Approximate modal proportions are: quartz 50%, sericite 40%, chlorite 7%, leucoxene and goethite each 1% and traces of pyrite and tourmaline.

Interpretation and Comments: The rock is a psammopelitic phyllite, originally a bedded siltstone-shale. The low grade mineral assemblage of quartz-sericite-chlorite is consistent with chlorite grade of the greenschist facies and may have been partly developed from the breakdown of feldspar (although no relicts remain), but it is more likely that the original sediment contained a large detrital quartz + clay fraction. There is no strong evidence that the rock is a sheared volcaniclastic, although the mineral assemblage is not inconsistent with a felsic volcanic provenance for the sedimentary material. Because of the good preservation of sedimentary bedding laminations, this sample is distinctly more "sedimentary" than sample 5473303 which lacks well defined relict bedding laminae.

245097

5473303 TS: Site 84 - Blackwater Rd. Chlorite spots in sericite rock.

Summary: Fine grained phyllitic rock, originally a shale-siltstone of possible felsic to intermediate volcanic provenance. It is now dominated by a quartz-sericite-chlorite assemblage, with scattered pseudomorphic aggregates of quartz plus chlorite after former metamorphic porphyroblasts of ?andalusite.

Handspecimen: The rock is composed of a pale greenish to creamy coloured, weakly foliated and weakly laminated sericitic phyllite, containing scattered prominent spots up to 1.5 mm across which are zoned from quartz-rich centres to chloritic rims. The weak laminations may represent original sedimentary bedding and the weak foliation is at a high angle (~70°) to this lamination. The sample is essentially non-magnetic.

Thin Section:

a) Primary mineralogy and textures: In the section, there is little evidence for the preservation of primary textures and minerals. It is possible that a small proportion of slightly larger quartz grains (up to 0.05 mm across0 could be original detrital grains. A weak, diffuse lamination is present and defined by slightly greater or less amounts of sericite. There are also one or two pseudomorphic aggregates up to 2 mm across now composed of fine grained quartz and sericite which have diffuse tabular outlines and which could represent former feldspar grains. The rock contains a tiny trace of ?detrital green tourmaline.

b) Alteration and structure: The rock is dominated by a low grade metamorphic mineral assemblage of quartz, sericite and chlorite, with minor disseminated aggregates of leucoxene throughout. Chlorite mainly occurs as small aggregates scattered throughout the sericite + quartz matrix. A weak foliation is defined by preferred orientation or sericite and this foliation is at a high angle (~60-70°) to the vague laminations. A dominating characteristic of this sample is the occurrence of disseminated aggregates of fine grained chlorite and quartz, locally with minor sericite. These aggregates are up to 1.5 mm across and commonly have granular quartz-rich cores and chlorite-rich margins. The aggregates have squarish to diamond-shaped or ovoid outlines and are interpreted to be pseudomorphs after a former aluminosilicate phase, probably andalusite. These porphyroblasts appear to have had random orientation.

c) Mineragraphy and paragenesis: No sulphides are evident in the section, although tiny spots of goethite in the handspecimen may represent the oxidised remnants of rare pyrite grains.

Mineral Mode: Approximate modal proportions are: quartz 45%, sericite 40%, chlorite 14%, leucoxene 1% and a trace of tourmaline.

Interpretation and Comments: The rock may represent a metamorphosed shale-siltstone of rather aluminous bulk composition. Vague laminations preserved in the sample may represent original sedimentary bedding. It is possible that there is a little detrital quartz, tourmaline and former feldspar, with the latter now replaced by quartz and sericite. Metamorphism may have been of relatively low grade, regional character, with development of a weak, sericite-defined foliation and the formation of scattered porphyroblasts of ?andalusite. Subsequently, there has been retrograde alteration, with replacement of ?andalusite by quartz and chlorite. The Fe and Mg necessary to make this reaction possible could have been present in the rock matrix and were not necessarily introduced during alteration. There is no strong evidence for the sample to be of volcanic origin, although its composition is not inconsistent with a felsic to intermediate igneous provenance for the sediment. The chloritic spots are not considered to be of volcanic origin, but represent retrogressed metamorphic porphyroblasts. Sericite has not been replaced by chlorite and both of these minerals appear to be in equilibrium.

5473304 TS: Site 79 Epidote.

Summary: Medium grained altered pyroxene-hornblende microdiorite. The original mineral assemblage has been largely replaced by a low grade metamorphic alteration assemblage of tremolite-actinolite, chlorite, clinozoisite, albite, sericite and a little titanite. The rock also contains a trace of disseminated pyrite. A few sub-planar crack-seal textured quartz veins cut the sample.

Handspecimen: The sample is a medium grained, relatively equigranular altered intermediate igneous rock, possibly of dioritic composition. It appears to be moderately altered, with development of chlorite, actinolite and possible epidote. A trace of fine grained pyrite is disseminated in the sample and there is a little goethite staining on fracture surfaces due to incipient weathering effects. A few sub-planar quartz veins up to 1.5 mm wide cut the rock which is very weakly magnetic.

Thin Section:

a) Primary mineralogy and textures: In the section, relict igneous texture is moderately well preserved, despite rather strong alteration effects. It is likely that the rock was originally rich in tabular plagioclase grains up to 2 mm in length, intergrown with former tabular pyroxene grains (e.g. augite) up to 2.5 mm across. Both of these interpreted primary igneous minerals have been completely replaced by alteration minerals and only their pseudomorphic shapes remain. Green-brown hornblende is a subordinate primary igneous phase which is preserved and it may have partly rimmed former pyroxene grains. In interstitial positions are small aggregates of intergrown quartz and K-feldspar (microcline), with a typical grainsize of 0.1-0.3 mm. These aggregates locally include small grains of apatite and altered biotite. Disseminated throughout the rock are subhedral to anhedral grains of FeTi oxide up to 1 mm across. These may include primary igneous ilmenite and titanomagnetite, but they have been partly altered.

b) Alteration and structure: Alteration is pervasive and rather strong. All plagioclase has been replaced by fine grained masses of granular clinozoisite, commonly intergrown with albite, sericite, chlorite and a little tremolite-actinolite. Pyroxene has been completely replaced (along with some of the hornblende) to fine to medium grained pseudomorphic masses (locally semi-fibrous) of pale green tremolite-actinolite and chlorite, locally with traces of titanite. Biotite has been totally replaced by chlorite ± titanite and the igneous FeTi oxides partly replaced by titanite ± chlorite. Interstitial quartz and K-feldspar have remained unaltered. The rock retains a massive texture, but has been weakly fractured, with subsequent emplacement of a few sub-planar quartz-rich veins up to 1.5 mm wide. These veins may have developed during alteration and display crack-seal textures (indicating incremental opening and healing). Quartz is commonly intergrown with minor clinozoisite and tremolite-actinolite in these veins.

c) Mineragraphy and paragenesis: The rock contains a trace of fine grained disseminated pyrite, interpreted to have been formed during alteration. It has been locally replaced by goethite as a result of weathering oxidation.

Mineral Mode: Approximate modal proportions are: tremolite-actinolite 45%, chlorite 13%, albite and clinozoisite each 10%, quartz, K-feldspar, hornblende and sericite each 5%, FeTi oxide and titanite each 1% and traces of apatite and goethite.

Interpretation and Comments: The original rock is interpreted to have been a pyroxene-hornblende microdiorite, based on relict textures and mineralogy. It also contained minor interstitial quartz and K-feldspar. The rock underwent pervasive, rather strong alteration, probably as a result of low grade metamorphism (greenschist facies) to develop an assemblage of tremolite-actinolite, chlorite, clinozoisite, albite, sericite and minor titanite. A trace of pyrite also formed during alteration. Fracturing occurred during alteration, with emplacement of crack-seal textured quartz-rich veins.

5473305 PTS: Site 63 Development Prospect.

Summary: Intensely altered schistose chlorite-quartz rock (possibly representing some form of precursor intermediate to mafic igneous composition), variably replaced by medium grained carbonate (probably ankerite/siderite), with syn-tectonic quartz veining and minor disseminations of chalcopyrite and pyrite. The rock has been slightly weathered, leading to the formation of goethite staining and possibly a little Mn oxide.

Handspecimen: The sample is a heterogeneous, strongly altered and mineralised rock. It contains domains of grey, fine grained chloritic schistose material, enveloped in irregular domains of brown to orange-red medium grained carbonate (?ankerite/siderite). Disseminations and patches of chalcopyrite and a trace of pyrite occur sparsely throughout. The sample is essentially non-magnetic. Slight weathering has occurred, with alteration of carbonate to goethite and possibly Mn oxides.

Thin Section:

a) Primary mineralogy and textures: In the section, the sample is heterogeneous, with rather sheared domains up to several millimetres across being dominated by chlorite and quartz, with apparent replacement by extensive masses of medium grained brownish carbonate. These phases are the products of hydrothermal alteration and there is little strong evidence for the preservation of relict textures or minerals. In the chlorite + quartz domains, there are scattered aggregates of fine grained leucoxene (?anatase) up to 0.4 mm across which could be pseudomorphous after former igneous FeTi oxide grains. If this is accepted, then the relative abundance of these aggregates implies that the original rock could have been of intermediate to mafic composition.

b) Alteration and structure: Alteration effects are intense. Domains rich in fine to medium grained flaky pale green chlorite and fine granular quartz have a weak to moderate foliation, defined by preferred orientation of chlorite flakes. These domains contain scattered leucoxene aggregates as well as deformed, partly recrystallised small vein-like masses and irregular aggregates of quartz. There appears to have been extensive replacement of the chlorite + quartz assemblage by masses of medium grained pale brown carbonate (including a little quartz). Typical grainsize range of the carbonate is 0.2-1 mm. In turn, both the carbonate-rich masses and the chlorite + quartz assemblage have been cut by a few deformed and partly recrystallised quartz veins. The carbonate is partly altered to goethite (and ?Mn oxide), with the implication that it is a Fe (? and Mn)-bearing type (e.g. ankerite/siderite). The alteration of the carbonate is responsible for the brown and orange-red colouration of the handspecimen. Sulphide-rich aggregates and disseminations occur sparsely throughout the sample, in the carbonate masses, chlorite + quartz domains and in quartz veins.

c) Mineragraphy and paragenesis: The rock contains about 2-3 volume % of sulphides disseminated throughout. Chalcopyrite is the more abundant, forming irregular masses up to 2 mm across. Pyrite is a minor phase and locally forms composites with chalcopyrite. The latter appears to have been introduced after deformation, or at least mobilised and precipitated into late, interstitial positions. Typically it occurs interstitial to carbonate and deformed quartz, and locally occurs in fractures in pyrite. Both sulphides have been slightly replaced by goethite.

Mineral Mode: Approximate modal proportions are: carbonate 45%, quartz 30%, chlorite 20%, chalcopyrite 2%, pyrite, leucoxene and goethite (Mn oxide) each 1%.

Interpretation and Comments: It is difficult to assign a precursor lithology to this sample due to intense alteration effects. However, the chlorite + quartz + leucoxene assemblage could have formed from the replacement of a former intermediate to mafic igneous rock, by strong leaching of alkalis and alkaline earths. It appears as though phases of deformation were accompanied by strong introduction of carbonate (ankerite/siderite) (replacing chlorite), with quartz veining and development of minor sulphides. The latter, dominated by chalcopyrite and minor pyrite, are distributed throughout the altered and veined rock.

5473306 TS: Site 194 sericitic tuff

Summary: Fine grained low grade metamorphosed and moderately foliated shale-siltstone. The rock may have had a felsic igneous provenance and retains minor detrital quartz and feldspar. However, it has been mostly recrystallised into a foliated fine grained assemblage of quartz, sericite, subordinate carbonate (probably siderite) and a little chlorite. Carbonate forms prominent porphyroblasts stained brown by the development of supergene hematite/goethite.

Handspecimen: The sample is composed of a fine grained, moderately foliated quartz-sericite rock, with scattered brown spots up to 1 mm across. The latter appear to be composed of goethite, but some retain a rhombic shape, suggestive that they may be, or have been, a carbonate mineral. The sample is essentially non-magnetic.

Thin Section:

a) Primary mineralogy and textures: In the section, the rock is dominated by a fine grained, moderately schistose aggregate of quartz and sericite, with subordinate amounts of carbonate, commonly as porphyroblasts up to 0.8 mm across. There are vestiges of relict detrital texture preserved, manifest in scattered small subangular grains of quartz and minor plagioclase up to 0.1 mm across, together with traces of leucoxene and green tourmaline. However, the remainder of the rock has been thoroughly recrystallised and moderately foliated.

b) Alteration and structure: The rock has been strongly replaced by alteration minerals and has developed a moderate foliation. Much of the original mineral assemblage (assumed to have been rich in quartz and feldspar) has been replaced by fine grained granular quartz and fine flakes of sericite. The preferred orientation of the latter defines the foliation which can be seen to have been weakly crenulated. The rock also contains pale brownish carbonate (probably siderite) disseminated throughout, some intergrown with fine grained quartz and sericite, but most occurring as ovoid to rhombic porphyroblasts up to 0.8 mm across. These porphyroblasts are commonly elongate in the plane of the foliation and have replaced the quartz + sericite assemblage; their development is regarded as syn-tectonic. Carbonate porphyroblasts have been subsequently slightly stained by hematite and goethite due to incipient weathering effects - these are responsible for the brown colour of the spots in handspecimen.

c) Mineragraphy and paragenesis: No sulphides have been observed in the sample.

Mineral Mode: Approximate modal proportions are: quartz 50%, sericite 35%, carbonate 11%, plagioclase 2%, chlorite 1% and traces of leucoxene, tourmaline and hematite/goethite.

Interpretation and Comments: The rock is a low grade metamorphosed and moderately foliated shale-siltstone. It contains a little detrital quartz and plagioclase (and traces of leucoxene and tourmaline), but has been mostly recrystallised to a foliated aggregate of fine grained quartz and sericite. There are common carbonate (probably siderite) porphyroblasts and a little chlorite. Carbonate may have developed syn-tectonically and reflects CO_2 flux through the rock. The composition of the sample is consistent with it having a felsic igneous provenance, e.g. from felsic volcanic material, but there are no preserved volcaniclastic textures.

5473307TS: Site 57 Trial shaft.

Summary: Brecciated quartz-rich siltstone, with strong replacement of clasts by fine grained chlorite. The breccia matrix is also dominated by fine grained chlorite, but contains some vein quartz material. A little pyrite was deposited with the vein quartz, but has subsequently been weathered out and replaced by goethite boxworks and staining. The rock is viewed as a type of tectonic breccia, with hydrothermal influx of Mg and Fe during and following brecciation.

Handspecimen: The sample is composed of a brecciated rock containing angular to sub-rounded clasts up to 4 cm across of pale to mid green chloritic altered fine grained ?sedimentary rock in a fine grained dark green chloritic matrix. The latter also contains a few masses of milky vein quartz up to 2 cm across. Goethite boxworks after pyrite are up to 2 mm across and are mainly associated with the patches of vein quartz. The sample is essentially non-magnetic.

Thin Section:

a) Primary mineralogy and textures: In the section, the rock has a heterogeneously brecciated appearance. It contains angular to sub-rounded clasts of massive to weakly laminated, partly recrystallised and quartz veined sedimentary rock, considered to represent a rather quartz-rich siltstone. The clasts are up to several centimetres across and a set in a hydrothermal matrix dominated by fine grained, locally foliated chlorite, with local masses of rather coarse grained vein quartz. The siltstone clasts are locally weakly foliated and contain dominant recrystallised quartz, with a typical grainsize of 0.05-0.1 mm; there are also traces of rutile and zircon. Textures imply that chlorite in the clasts is replacive and may have developed by alteration of former feldspar as well as from quartz. In places, chlorite has strongly replaced the clasts. A few thin quartz veins occur in the clasts and show evidence of having been strongly recrystallised.

b) Alteration and structure: Clasts in the breccia have been variably disaggregated and replaced by semi-massive fine grained chlorite, locally penetrating into the clasts along fractures. The breccia matrix is dominated by fine to medium grained chlorite which is foliated in places. Locally, chlorite is intergrown in bladed form with quartz. Tiny inclusions of rutile and zircon occur sparsely in chlorite. There are parts of the matrix which are composed of deformed vein quartz. The latter is coarse grained (up to 6 mm) and shows strain phenomena as well as some recrystallisation and replacement by chlorite. Matrix chlorite and vein quartz contain scattered goethite pseudomorphs after pyrite up to 1 mm across, mainly associated with the vein quartz. There is also a little goethite staining of chlorite due to weathering effects.

c) Mineragraphy and paragenesis: The rock contains irregularly distributed goethite pseudomorphs after former pyrite, mainly associated with the deformed vein quartz in the breccia matrix.

Mineral Mode: Approximate modal proportions are: quartz 60%%, chlorite 38%, goethite 1% and traces of rutile and zircon.

Interpretation and Comments: The original rock is interpreted to have been a rather even-grained, quartz-rich siltstone, but possibly containing considerable feldspar. The rock was heterogeneously deformed, with brittle failure and development of a tectonic breccia containing angular to sub-rounded clasts. Probably accompanying brecciation, there was introduction of Fe and Mg, resulting in strong chloritisation of the clasts and development of a chloritic matrix. Quartz veining also occurred after brecciation, with introduction of a little pyrite. Further deformation occurred, with formation of strain phenomena in vein quartz and development of foliation in the chloritic breccia matrix. Subsequently, supergene oxidation occurred, causing replacement of pyrite by goethite and the formation of minor goethite staining. There is no evidence that the rock was formerly of volcanic origin.

Appendix 5

Rock Chip Sample Ledger and Geochemical Assays

Sampno	Prospect	EL	DPO	Samptype	Report	AMGE	AMGN	Colour	Attn/Min	Texture	Fieldid	Comments	Na	Mg	Al	K	Ca	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As	Mo	Ag	Cd	Sn	Sb	Be	W	Au	Pb	Bi
5470687		18/92	82168	Rock	22684	325761	5425461	NDG	Py	Vg	Ccy	Rotted Shale	2900	1.57	3.92	0.195	0.075	655	33	17	1830	18.65	9	16	375	38	104	-10	0.6	-1	-3	-5	323	-10	-0.01	-10	-10
5470688		18/92	82168	Rock	22684	325762	5425462	BRO		Gs Fe We	Csg		1500	0.055	0.75	0.155	-0.005	470	17	-10	7880	39.07	8	-10	61	-5	25	-10	-0.5	-1	-3	-5	464	-10	-0.01	-10	-10
5470292	Pierpont M	18/92	82169	Rock	22684	324910	5427110	WG	Py	Vu	Ovq	Laminated black siltstone in footwall	500	0.086	0.145	0.03	-0.005	59	6	10	63	7.54	24	-10	146	27	135	-10	0.8	-1	-3	-5	22	-10	0.01	84	-10
5470293	Pierpont M	18/92	82166	Rock	22684	325050	5426680	DGN	Py	DS	Ssi		1550	0.72	5.83	3	0.06	4170	185	44	84	3.66	-5	24	69	39	34	11	-0.5	-1	9	-5	606	-10	-0.01	26	-10
5471167		18/92	82168	Rock	22684	319660	5437140	OB	Li	Sh Fe	Fz		2900	0.188	8.85	1.02	0.08	2440	54	47	37	4.41	-5	-10	62	5	28	-10	-0.5	-1	-3	69	483	-10	-0.01	16	-10
5471168		18/92	82169	Rock	22684	319425	5437250	DGLG		Lm	Ssi	With sandstone layers [non planar]	5350	0.528	9.81	4.22	0.08	4470	72	42	148	2.28	-5	-10	115	50	-5	-10	-0.5	-1	10	-5	824	-10	-0.01	63	-10
5471169	Waratah	18/92	82169	Rock	22684	325800	5424300	WLG	CoPy		Ovg	Mine dump material	600	0.165	0.325	0.075	-0.005	-10	2	10	42	2.72	6	-10	986	11	21	-10	2	-1	4	-5	19	-10	0.02	19	-10
5471170	Waratah	18/92	82168	Rock	22684	325780	5424415	DGVG	Cl	Lm	Ssi	Non-planar - near ?ore position	1450	1.17	6.07	0.235	0.03	2500	104	42	2830	14.12	-5	-10	21	55	23	-10	-0.5	-1	-3	-5	94	-10	-0.01	-10	-10
5471171	Waratah	18/92	82169	Rock	22684	325840	5424190	WB		Vq Fe	Csg		300	0.055	1.47	0.02	-0.005	237	12	29	47	19.41	-5	-10	676	-5	1610	-10	-0.5	-1	-3	-5	9	-10	0.13	22	-10
5471172	South Balfour	18/92	82169	Rock	22684	326750	5421460	WVG	CoPy	Vs	Ovq		650	1.27	1.32	0.075	4.18	136	7	-10	118	12.26	188	170	95800	93	1180	-10	8.2	-1	23	20	30	-10	0.03	10	-10
5471173	South Balfour	18/92	82168	Rock	22684	326751	5421461	DGVW	CICo	Vs	Ssi	Wallrock to South Balfour mine	1400	2.19	5.36	0.015	0.015	820	28	29	1120	15.86	-5	-10	3840	41	133	-10	1.7	-1	-3	-5	58	-10	0.06	-10	-10
5471174	South Balfour	18/92	82169	Rock	22684	326752	5421462	WVG	Py	Vu	Ovq		350	0.024	0.045	-0.01	0.005	67	-2	-10	65	11.41	129	12	1320	-5	2220	-10	2.8	-1	7	-5	13	-10	-0.01	-10	14
5471175		18/92	82168	Rock	22684	325160	5425680	DGV	Cl	VgLm	Ssi	Non planar	3350	2.59	7.99	2.89	0.095	3650	152	154	146	5.84	-5	68	15	119	7	-10	-0.5	-1	-3	-5	884	37	-0.01	14	-10
5471190		18/92	82168	Rock	22684	326380	5425490	LGV	Cl	Wa	El	Sandy texture	3600	0.397	4.35	1.43	0.01	1390	22	10	804	3.19	-5	-10	6	11	9	-10	-0.5	-1	-3	-5	160	-10	-0.01	15	-10
5471191		18/92	82168	Rock	22684	326381	5425491	DGDGGW	ClMh		Im	Epidiorite - equigranular with plag feldspar	17100	0.0238	6.81	1.03	4.28	7770	257	165	923	0.0629	27	76	92	87	-5	-10	-0.5	-1	-3	-5	349	-10	0.01	-10	-10
5471192		18/92	82168	Rock	22684	327160	5424880	WBLG	SeLi	Di	Eff		11200	0.983	4.46	1.79	0.865	1790	23	12	1250	0.0307	7	-10	7	56	-5	-10	-0.5	-1	-3	7	457	-10	-0.01	18	-10
5471194		18/92	82174	Rock	22684	320050	5441060	WG	LiSe	Fe	Ovq	Brecciated quartz vein	400	2.39	5.4	1.54	0.01	820	12	-10	161	2.29	-5	-10	12	34	8	-10	-0.5	-1	7	-5	153	-10	0.03	-10	-10
5471196		18/92	82174	Rock	22684	330350	5423150	WG	LiPy	Fe	Ovq	Limonitic quartz vein	450	0.024	0.69	0.22	0.01	121	10	-10	63	10.55	-5	-10	229	11	70	-10	0.5	-1	8	-5	60	-10	0.06	68	-10
5471198		18/92	82174	Rock	22684	319020	5442650	DGN	Py		Ssi	Massive stratabound pyrite	1050	0.191	2.62	1.41	0.045	595	60	19	49	21.63	102	47	32	20	434	-10	0.5	-1	-3	20	201	-10	0.04	126	-10
5471200		18/92	82174	Rock	22684	320350	5439825	LGG	SeDiPyPoCl	Bl	Ssi	Disseminated pyrite in fine siltstone - chloritised	1100	0.989	7.6	4.69	0.03	1340	53	38	217	6.19	17	13	66	57	349	-10	-0.5	-1	15	-5	765	-10	0.04	13	-10
5470312		18/92	82174	Rock	22684	321050	5439990	N	Py		Ssi	Massive siltstone pyrite blobs in 3mm band	850	0.202	2.95	1.48	0.1	522	64	20	169	13.01	32	95	96	27	19	11	0.5	-1	15	14	215	-10	0.06	42	-10
5470313		18/92	82174	Rock	22684	321051	5439991	N	Py		Ssi	Large cubes of pyrite with quartz rims	1550	1.94	6.78	2.57	0.04	817	66	36	422	12.15	6	35	30	82	324	-10	0.5	-1	3	-5	454	-10	0.03	109	-10
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Nic Turner's 1994 Rock Sampling																									
pno	peast	pnorth	ptype	pEL	pag	pal	pas	pau	pba	pca	pco	pcu	pfe	pk	pmg	pmn	pna	pni	ppb	psn	pTi	pv	pw	pzn	pcomments
3757862	321350	5437300	Rock		-1	6	21	-0.008		0.06	4	45	7.5	2.73	0.96	360	1850	3	5	7	3020	49	6	76	Laminated sandstone with pyrite
3757863	321275	5437425	Rock		-1	9.04	12	-0.008		0.16	5	16	3.28	4.92	0.93	239	4700	6	-3	8	4480	88	-5	68	Dark grey siltstone with limonite
3757864	321225	5437475	Rock		-1	3.09	35	-0.008		0.09	4	576	23.6	0.07	0.18	233	500	-3	13	3	1940	98	-5	66	Granular chlorite with pyrite
3757865	321525	5437000	Rock		-1	2.86	26	0.015		0.01	4	601	19.9	0.27	0.57	237	400	-3	-3	7	1150	33	-5	48	Chloritic siltstone with sulphide
3757866	321400	5436850	Rock		-1	0.41	639	0.068		0.01	169	1338	16.2	0.04	0.32	101	500	10	5	7	62	5	13	44	Pyrite in quartz gangue
3757867	321675	5436925	Rock		2	7.26	54	0.018		0.38	60	24800	20.4	0.28	6.11	4348	9450	56	-3	5	400	61	-5	149	Chalcopyrite in chloritic siltstone
3757868	321675	5436925	Rock		4	0.2	996	0.194		0.01	325	88400	22.6	0.02	0.17	102	400	55	34	38	29	3	15	71	Pyrite/chalcopyrite in quartz
3757869	321675	5436925	Rock		3	0.56	700	0.088		0.04	29	25200	14.4	0.02	3.18	5981	700	10	-3	5	24	3	14	56	Pyrite/chalcopyrite in quartz
3757870	321250	5437525	Rock		-1	6.25	129	0.014		0.28	13	280	18.7	0.56	2.93	3105	1450	10	16	-3	3200	129	-5	165	Chloritic siltstone with pyrite
3757871	318830	5442185	Rock		-1	4.76	696	0.012		0.4	81	122	3.39	1.53	3.59	373	650	85	28	9	2320	86	9	66	Dark grey siltstone with 3mm pyrite band
3757872	318820	5442190	Rock		-1	5.79	25	0.013		0.54	15	66	2.51	1.67	4.53	971	850	16	4	6	2710	79	9	78	Grey siltstone with 1-3mm pyrite bands
3757873	318810	5442195	Rock		-1	7.47	11	0.018		0.09	6	86	0.6	4.38	0.35	69	2350	5	13	7	3460	114	7	70	Grey siltstone
3757874	318800	5442200	Rock		-1	5.29	48	0.022		0.16	28	49	2.6	3.21	0.32	122	1600	42	17	9	2550	112	12	66	Grey to black siltstone with disseminated pyrite
3757875	318700	5442250	Rock		-1	5.92	39	0.022		0.25	55	84	3.23	3.33	0.51	229	2400	53	11	11	2810	110	-5	66	Black siltstone with ? fine pyrite
3757876	318690	5442240	Rock		-1	5.57	102	0.028		0.04	34	73	4.98	3.7	0.28	35	2000	51	29	12	2970	161	-5	56	Black siltstone rich in disseminated pyrite
3757877	318680	5442245	Rock		-1	6.22	4	0.018		0.01	3	24	0.22	3.66	0.29	21	1150	-3	17	8	4330	153	6	50	Black siltstone no visible pyrite
3757878	318670	5442230	Rock		-1	6.05	3	0.013		0.01	-3	11	0.16	3.58	0.28	20	1200	-3	14	8	4100	153	8	76	Black siltstone no visible pyrite
3757879	324524	5429375	Rock		4	6.32	144	-0.008		0.03	8	281	20.1	0.65	1.4	2043	600	4	74	16	2180	75	9	82	Green pyritic sandstone
3757880	324400	5429200	Rock		37	0.09	13800	0.03		0.01	-3	5896	19.4	0.02	0.01	599	350	-3	576	2433	-10	-2	164	3374	Pyrite grey ? sulphide quartz
3757881	324400	5429200	Rock		17	0.2	17700	-0.008		0.2	-3	6653	44.2	0.01	1.31	24000	400	-3	156	798	13	-2	3000	2222	Siderite with chalcopyrite ? sphalerite
3757882	324400	5429200	Rock		135	0.26	33100	0.024		0.07	10	16200	19.9	0.03	0.3	7328	350	-3	1532	9106	15	-2	1000	99400	Grey ? sulphide minor calcopyrite quartz
3757883	324075	5428900	Rock		10	1.87	6500	0.023		0.03	4	1306	5.9	0.94	0.46	576	800	-3	69	1757	305	14	121	582	Quartz vein with pyrite ? sphalerite
3757884	324075	5428900	Rock		1	4.74	140	0.012		0.04	-3	566	24.9	2.28	3.17	2460	1450	3	-3	32	5600	29	-5	1049	Black vitreous mineral / rock no sulphide apparent
3757885	324075	5428900	Rock		37	1.39	43100	0.048		0.01	15	2497	23.3	0.79	0.12	1062	700	-3	350	86000	225	10	82000	68	Quartz vein with pyrite ? sphalerite
3757886	324500	5429450	Rock		-1	10.06	181	-0.008		0.1	-3	138	3.39	5.22	0.58	129	3300	5	-3	16	3640	87	14	165	Pale siltstone with quartz veins
3757887	324499	5429449	Rock		-1	9.98	174	-0.008		0.07	-3	101	2.71	5.02	0.72	189	2800	9	-3	24	3000	87	16	122	Pale siltstone with quartz veins
3757888	324498	5429448	Rock		-1	8.46	260	0.01		0.04	-3	537	7.1	4.16	0.42	90	1650	-3	-3	15	2350	73	-5	27	Quartz vein with gossan
3757889	324497	5429447	Rock		-1	10.13	33	-0.008		0.07	-3	107	2.57	5.09	0.73	165	2500	9	-3	21	2610	83	15	28	Pale siltstone with quartz veins
3757890	324496	5429446	Rock		-1	9.96	167	0.013		0.1	-3	338	3	4.96	0.72	116	3450	13	3	14	3150	77	7	31	Pale siltstone with quartz veins
3757891	324495	5429445	Rock		-1	9.37	183	-0.008		0.09	-3	444	2.95	4.73	1.04	180	3000	16	4	23	3390	79	14	37	Sheared quartz / pale siltstone
3757892	324494	5429444	Rock		29	4	281	0.02		0.01	3	3101	2.83	1.79	0.72	257	850	7	12	44	1010	35	-5	48	Sheared quartz / pale siltstone
3757893	324493	5429443	Rock		15	4.67	99	0.01		0.01	4	274	2.16	2.12	0.88	281	800	8	4	45	1450	43	13	31	Sheared quartz / pale siltstone
3757894	324492	5429442	Rock		102	1.76	354	0.106		-0.01	41	354000	9.6	0.58	0.12	37	450	62	233	274	354	13	14	121	Very rich in covellite
3757895	324491	5429441	Rock		22	6.97	668	0.026		0.06	-3	25200	2.58	4	0.4	35	2350	24	75	62	2960	68	8	27	Sheared dark grey siltstone with malachite
3757896	324490	5429440	Rock		6	8.31	212	0.023		0.05	-3	526	1.13	4.46	0.6	121	2300	14	23	49	3860	70	29	24	Sheared quartz /grey siltstone breccia
3757897	324489	5429439	Rock		-1	9.92	29	0.041		0.05	-3	105	0.66	5.49	0.42	64	1950	19	17	29	3730	89	5	24	Dark grey siltstone with quartz veins
3757898	324488	5429438	Rock		-1	8.6	39	0.028		0.04	-3	96	1.77	4.42	0.52	160	1550	13	28	16	3270	75	10	24	Dark grey siltstone with quartz veins
3757899	324487	5429437	Rock		-1	9.09	48	0.016		0.07	-3	263	3.74	4.19	0.73	246	2350	15	48	13	2330	82	-5	34	Dark grey siltstone with quartz veins
3757900	324486	5429436	Rock		-1	10.67	32	0.023		0.2	-3	329	6.5	4.96	0.99	319	5400	18	230	17	3970	123	16	49	Dark grey siltstone with quartz veins
3992201	324485	5429435	Rock		-1	10.89	21	0.011		0.15	-3	130	2.77	5.49	0.68	180	4350	11	30	12	3660	97	8	28	Dark grey siltstone with quartz veins
3992202	324484	5429434	Rock		-1	9.18	29	0.011		0.09	-3	94	2.71	4.54	0.72	183	2750	9	25	11	2430	81	-5	30	Dark grey siltstone with quartz veins
3992203	324483	5429433	Rock		-1	8.75	10	0.013		0.07	-3	255	3.06	4.34	0.8	188	2350	11	23	14	3600	81	6	36	Dark grey siltstone with quartz veins
3992204	324482	5429434	Rock		-1	8.26	10	0.013		0.05	-3	209	3.42	4.13	0.65	138	1900	4	17	14	2580	74	-5	31	Dark grey siltstone with quartz veins
3992205	324481	5429435	Rock		-1	8.65	31	0.014		0.04	-3	293	3.33	4.25	0.72	156	1700	8	34	14	3540	77	5	34	Dark grey siltstone with quartz veins
3992206	324480	5429436	Rock		-1	8.82	36	0.017		0.16	-3	324	3.99	4.44	0.79	145	4500	5	20	13	2840	80	9	32	Dark grey siltstone with quartz veins
3992207	323800	5428500	Rock		14	1.02	23	-0.008		0.02	-3	83	4.05	1.93	1.69	416	650	-3	14500	701	347	6	5	327	Quartz vein with pyrite ? sphalerite
3992208	323800	5428500	Rock		79	5.99	118000	0.012		0.06	-3	420	10.6	3.75	0.54	106	2000	-3	481	16000	324	15	3000	82	Medium grained quartz muscovite granitic texture
3992209	324075	5429050	Rock		-1	0.27	467	-0.008		0.03	-3	147	2.25	0.06	0.05	28	500	-3	29	125	56	5	-5	16	Quartz vein with gossan
3992210	324125	5428775	Rock		-1	5.93	212	-0.008		0.04	-3	413	10.7	2.01	1.85	1508	1400	-3	-3	60	3520	65	34	73	Green siltstone with limonite
3992211	324479	5429437	Rock		-1	8.42	41	0.034		0.18	-3	812	5.7	4.3	0.8	129	4950	3	45	12	2540	71	-5	33	Dark grey siltstone with quartz veins
3992212	324479	5429437	Rock		-1	8.59	38	0.021		0.14	-3	465	3.05	4.34	0.82	138	4050	3	21	13	2850	76	6	33	Dark grey siltstone with quartz veins
3992213	324479	5429437	Rock		4	0.89	155	0.021		0.01	6	309	2.97	0.35	0.06	29	550	6	8	7	231	13	-5	14	Pyritic limonitic quartz vein
3992214	324479	5429437	Rock		-1	8.33	100	0.008		0.12	-3	260	3.15	4.25	0.73	163	3750	5	7	22	3130	74	6	32	Dark grey siltstone with quartz veins
3992215	324479	5429437	Rock		-1	8.52	39	0.011		0.15	-3	324	2.53	4.45	0.85	212	4450	3	26	17	3450	82	-5	34	Dark grey siltstone with quartz veins
3992216	324479	5429437	Rock		-1	8.88	65	0.01		0.1	-3	634	2.1	4.66	0.55	98	3450	-3	14	15	2910	90	13	22	Dark grey siltstone with quartz veins
3992217	324480	5429450	Rock		2	7.78	273	0.012		0.1	-3	349	3.66	3.87	1.18	304	2900	12	5	12	2270	64	6	42	Grey siltstone with disseminated pyrite
3992218	324480	5429450	Rock		10	8.1	715	0.02		0.05	9	652	5.2	3.72	1.31	340	1800	17	9	13	2150	68	9	48	Pale sandstone pyrite - rich
3992219	324480	5429450	Rock		-1	9.34	139	0.016		0.11	-3	136	2.06	5.48	0.84	186	3850	3	10	13	3300	72	-5	30	Dark grey siltstone with quartz veins
3992220	324479	5429450	Rock		-1	10.39	283	0.01		0.16	-3	96	1.42	5.95	0.84	119	5050	-3	22	123	3390	75	5	25	Dark grey siltstone with quartz veins
3992221	324478	5429450	Rock		1	8.4	110	0.016		0.07	-3	100	1.07	4.36	0.68	89	2400	-3	13	19	2740	59	5	19	Dark grey siltstone with quartz veins
3992222	324477	5429450	Rock		2	7.21	105	0.016		0.04	3	588	2.03	3.76	0.7	106	1700	3	16	16	2360	54	5	23	Dark grey siltstone with quartz veins
3992223	324476	5429450	Rock		1	8.78	130	0.016		0.08	-3	170	2.11	4.48	0.97	179	2950	3	16	15	2930	75	-5	25	Dark grey siltstone with quartz veins
3992224	324475	5429450	Rock		4	6.86	137	0.013		0.09	-3	278	1.73	3.71	0.77	104	2950	3	20	36	2570	57	-5	23	Dark grey siltstone with quartz veins
3992225	324474	5429450	Rock		-1	9.53	196	0.019		0.13	-3	221	2.49	5.04	1.01	161	4200	5	36	40	3190	81	-5	29	Dark grey siltstone with quartz veins
3992226	324473	5429450	Rock		-1	9.26	54	0.011		0.12	-3	282	2.33	4.89	0.82	156	3300	4	64	71	2430	77	8	182	Dark grey siltstone with quartz veins
3992227	324472	5429450	Rock		-1	8.76	104	0.008		0.1	-3	190	1.81	4.75	0.65	113	3300	-3	27	16	2620	75	10	29	Dark grey siltstone with quartz veins
3992228	324471	5429450	Rock		-1	8.55	59	0.01		0.1	-3	322	2.38	4.37	0.73	157	3200	4	15	13	2930	77	7	30	Dark grey siltstone with quartz veins
3992229	324470	5429450	Rock		-1	8.44	103	0.013		0.1	-3	406	4.01	4.21	0.9	215	2350	4	37	14	2530	78	-5	30	Dark grey siltstone with quartz veins
3992230	324469	5429450	Rock		-1	9.48	48	0.013		0.2	-3	311	2.96	4.55	1.86	275	5450	3	40	16	3580	69	-5	33	Dark grey siltstone with quartz veins
3992231	324468	5429450	Rock		-1	8.52	78	0.01		0.07	-3	354	0.72	4.77	0.53	31	2000	-3	9	6	2860	73	6	224	Dark grey siltstone with quartz veins
3992232	324467	5429450	Rock		-1	6.53	5	0.008		0.03	-3	88	0.26	3.85	0.3	11	1350	-3	-3	10	3300	52	7	19	Dark grey siltstone with quartz veins
3992233	324440	5429460	Rock		-1	7.64	29	-0.008		0.06	-3	54	3.08	3.76	0.57	353	2100	6	3	13	3020	61	7	27	Grey siltstone
3992234	324439	5429462	Rock		-1	9.88	34	0.009		0.15	-3	57	2.41	5.8	0.53	220	4750	-3	-3	12	2290	45	-5	21	Grey siltstone
3992235	324438	5429464	Rock		-1	9	29	-0.008		0.09	-3	57	2.28	4.83	0.52	193	2650	5	8	9	2810	64	-5	23	Grey siltstone
3992236	324436	5429464	Rock		-1	11.47	27	-0.008		0.2	-3	44	2.48	6.04	0.8	219	5650	8	14	11	3680	93	11	81	Grey siltstone
3992237	324434	5429464	Rock		-1	4.91	104	0.008		0.04	-3	200	11.7	0.6	1.57	1136	600	5	7	4	1480	39	7	61	Pale sandstone pyrite - rich
3992238	324433	5429464	Rock		-1	8.78	18	-0.008		0.07	-3	35	2.18	4.99	0.46	186	2700	6	9	10	3740	81	7	27	Grey siltstone
3992239	322325	5430475	Rock		-1	0.81	12	0.009		0.01	-3	12	0.55	0.64	0.06	62	500	-3	3	6	218	6	-5	17	Quartz arenite
3992240	322275	5430575	Rock		-1	0.04	3	-0.008		0.01	-3	6	0.31	0.03	0.01	22	400	-3	-3	3	93	-2	-5	19	Quartz arenite with scattered cavities
3992241	322275	5430600	Rock		-1	0.88	7	-0.008		0.04	-3	9	0.9	0.61	0.18	220	500	-3	-3	5	185	7	-5	51	Quartz arenite with disseminated pyrite
3992242	322250	5430625	Rock		-1	1.11	43	-0.008		0.01	-3	25	1.6	0.35	0.53	599	400	4	60	6	247	9	6	44	Quartz arenite with disseminated pyrite

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3992243	322275	5430650	Rock		-1	1.19	6	-0.008		0.01	-3	7	0.44	0.77	0.11	40	450	-3	-3	4	284	9	-5	22	Quartz arenite with disseminated pyrite
3992244	322275	5430650	Rock		-1	1.1	15	-0.008		0.01	-3	10	0.43	0.8	0.09	32	450	-3	9	6	382	9	-5	17	Quartz arenite with disseminated pyrite
3992245	322250	5430675	Rock		-1	1.32	117	-0.008		0.01	-3	28	0.96	0.99	0.18	161	500	3	-3	10	384	9	-5	20	Quartz arenite with disseminated pyrite
3992246	322275	5430725	Rock		-1	6.88	5	-0.008		0.04	-3	5	0.49	5.43	0.48	48	1150	-3	-3	13	1880	40	7	25	Dark grey siltstone
3992247	323350	5429625	Rock		-1	2.39	25	-0.008		0.01	-3	16	3.23	0.96	0.77	536	450	-3	-3	5	790	12	-5	31	Quartz arenite with pyrite
3992248	323350	5429600	Rock		-1	1.12	7	-0.008		0.01	-3	6	0.66	1.24	0.05	27	500	-3	-3	7	538	8	-5	20	Quartz arenite
3992249	323300	5429575	Rock		-1	5.06	8	-0.008		0.03	-3	5	2.73	3.96	0.92	515	900	3	-3	14	1530	26	-5	40	Quartz arenite
3757803	328800	5424800	ROCK	EL18/92	-1	6.98		-0.008		0.21	-3	5	1.31	4.52	0.39	100	2750	4	7	11	4330	61	-5	32	Black siltstone with disseminated chlorite
3757804	327500	5425100	ROCK	EL18/92	1	1.74	1800	0.019		0.09	66	7000	9.9	0.12	0.82	516	4000	20	8	7	622	16	-5	43	Quartz vein with associated chlorite and Cu
3757805	327450	5425150	ROCK	EL18/92	-1	6.28		-0.008		3.05	25	133	10.7	1.6	2.12	987	22300	15	6	5	8660	344	-5	101	Medium grained dolerite
3757806	329200	5423800	ROCK	EL18/92	-1	5.76		0.008		0.1	11	24	3.43	2.79	0.35	80	3500	12	93	7	3460	51	-5	41	Dark grey siltstone with disseminated pyrite
3757807	330000	5423800	ROCK	EL18/92	-1	7.37		-0.008		0.12	4	8	4.21	4.58	0.56	322	4500	7	8	11	4030	85	10	51	Planar banded greenish grey siltstone
3757808	329700	5423850	ROCK	EL18/92	-1	6.41	16	-0.008		0.06	3	12	1.81	4.28	0.37	87	2450	7	14	8	3940	70	6	23	Dark grey siltstone with pale sandstone bands
3757809	327150	5424850	ROCK	EL18/92	1	7.9		-0.008		0.07	9	4	2.48	3.86	0.63	63	9350	13	5	10	3320	59	6	67	Planar banded pale green spotted slate
3757810	325800	5425900	ROCK	EL18/92	-1	4.03		-0.008		0.02	-3	2	1.64	2.33	0.69	66	850	-3	-3	7	1720	21	-5	22	Cream to palest green slaty to phyllitic siltstone
3757811	326450	5427000	ROCK	EL18/92	-1	1.04	2	-0.008		0.01	-3	7	0.46	0.48	0.03	30	600	-3	4	5	380	7	-5	16	Darker and lighter banded pink quartz arenite
3757812	326150	5426800	ROCK	EL18/92	-1	5.66		-0.008		0.06	3	2	1.81	3.7	0.38	23	1000	3	3	9	2190	48	-5	11	Pink and green mica phyllite
3757813	323300	5429900	ROCK	EL4/94	-1	5.48	3	-0.008		0.04	-3	20	6.12	2.6	1.27	621	1100	-3	5	10	3030	57	10	31	Dark grey banded siltstone with limonitic seams
3757814	325150	5431000	ROCK	EL18/92	4	6.57		-0.008		0.04	5	14	1.95	3.7	0.81	167	1650	4	5	7	3410	61	6	26	Dark grey lustrous slate
3757815	324450	5425900	ROCK	EL18/92	-1	0.2	180	-0.008		0.03	-3	17	4.44	0.03	0.02	27	300	-3	5	8	206	4	-5	16	Quartz arenite with limonite on joints
3757816	326100	5426050	ROCK	EL18/92	-1	4.65		-0.008		0.03	-3	3	0.71	1.86	3.01	44	600	-3	3	4	1440	10	-5	17	Pale green mica phyllite with pyrite
3757817	323350	5439925	ROCK	EL18/92	-1	10.09		-0.008		0.1	8	70	2.91	4.64	1.01	101	3650	24	9	9	4380	116	9	42	Black pyritic siltstone
3757818	324450	5440325	ROCK	EL19/92	-1	8.36		-0.008		0.06	19	54	1.08	4.47	0.4	29	2000	17	56	8	3560	48	5	44	Black pyritic siltstone
3757819	323500	5437750	ROCK	EL18/92	-1	7.78	24	-0.008		0.05	-3	8	4.32	3.63	0.4	111	7950	7	39	10	4590	77	-5	56	Grey green siltstone
3757820	324525	5436400	ROCK	EL18/92	-1	7.02		-0.008		6.5	28	45	10.4	0.1	3.72	1064	23500	36	5	10	9520	365	6	115	Fresh basalt
3757821	320875	5437725	ROCK	EL4/94	1	3.56	39	0.034		0.04	8	1108	18.6	0.05	0.81	603	500	5	24	8	891	34	-5	71	Richly pyritic chloritic siltstone
3757822	320800	5437675	ROCK	EL4/94	-1	3.81	21	0.008		0.08	5	159	9.86	0.65	1.04	765	500	3	4	8	890	35	6	62	Granitoid veinlet - altered to greisen
3757823	320800	5437675	ROCK	EL4/94	-1	4.9	240	0.028		0.04	3	98	15.2	1	0.75	534	500	-3	10	11	1280	39	17	42	Oxidized (limonitic) sulphide veinlet
3757824	320800	5437675	ROCK	EL4/94	-1	7.5	4	-0.008		0.08	-3	21	1.28	4.84	0.43	250	2000	-3	5	8	3990	64	5	15	Porphyroblastic slate - thermal sericitised
3757825	320775	5437675	ROCK	EL4/94	-1	-0.01	2	-0.008		0.06	3	12	3.99	3.72	0.99	796	1500	-3	-3	10	2510	59	-5	30	Altered (? greisenised) siltstone
3757826	320550	5437500	ROCK	EL4/94	69	1.09		0.249		0.01	4	52100	22.9	0.1	0.26	147	300	9	12	9	248	5	7	22	Chalcopyrite covellite sulfates limonite
3757827	320550	5437500	ROCK	EL4/94	10	2.71		0.059		0.01	16	3571	26.3	0.02	0.79	601	450	23	44	7	888	18	5	26	Quartz chlorite pyrite assemblage
3757828	319475	5440000	ROCK	EL18/92	-1	7.6		-0.008		0.07	-3	44	4.03	4.66	0.49	301	2300	6	7	9	3760	66	-5	57	Dark grey spotted siltstone
3757829	318725	5442250	ROCK	EL18/92	-1	4.99	180	0.024		0.04	32	30	12.4	2.98	0.23	18	1300	42	38	8	2290	114	-5	33	Richly pyritic dark grey to black siltstone
3757830	318725	5442250	ROCK	EL18/92	2	2.81	1230	0.028		0.11	73	782	30.5	1.26	0.27	57	600	270	87	6	860	40	-5	67	Rounded pyrite in dark grey to black siltstone
3757831	318725	5442250	ROCK	EL18/92	-1	5.92		-0.008		0.1	-3	32	0.34	3.35	0.27	23	1600	-3	24	10	3620	118	6	15	Spotted richly carbonaceous siltstone (black)
3757832	322700	5434950	ROCK	EL4/94	3	0.29	10	0.048		1.15	17	65300	14.8	0.04	0.61	462	1750	14	20	65	20	-2	13	20	Quartz/carbonate vein with chalcopyrite etc
3757833	322700	5434950	ROCK	EL4/94	-1	4.16	9	-0.008		1.9	3	123	9.14	0.1	10.21	6700	2950	8	-3	5	1560	15	7	44	Schist - ? talcose
3757834	322700	5434950	ROCK	EL4/94	-1	2.98	3	-0.008		0.09	25	96	4.54	0.03	3.17	1023	350	10	-3	5	1030	17	-5	60	Strongly altered chloritic siltstone
3757835	321475	5435775	ROCK	EL4/94	1	0.94	11	-0.008		0.04	9	70	1.56	0.23	0.18	142	400	8	799	5	471	9	-5	755	Quartz sandstone with pyrite and sphalerite
3757836	315050	5428850	ROCK		-1	0.14		-0.008		0.01	-3	13	0.29	0.07	0.03	21	400	4	4	4	256	-2	-5	12	Open space quartz vein
3757837	322700	5435600	ROCK	EL4/94	-1	7.22		-0.008		0.07	15	31	9.9	2.43	1.11	498	4900	20	19	8	2240	50	5	99	Medium green sandstone with pyrite nodules
3757838	322600	5435875	ROCK	EL4/94	2	0.64	23	0.019		0.06	5	758	27.8	0.1	0.09	116	850	-3	102	13	698	15	8	22	Limonitic gossan and pyrite
3757839	327050	5426300	ROCK	EL18/92	-1	0.29	1	-0.008		0.01	-3	11	0.34	0.15	0.01	38	350	-3	4	6	153	2	-5	10	Reddish coarse grained quartz sandstone
3757840	323500	5429700	ROCK	EL4/94	-1	5.16		-0.008		0.01	4	16	6.44	1.18	2.05	1160	450	16	8	321	2360	49	7	65	Altered (? greisenised) fine grained sandstone
3757841	323500	5429700	ROCK	EL4/94	-1	2.89	7	-0.008		0.01	-3	11	5.52	0.13	1.79	1409	300	4	3	50	747	13	10	76	Granitoid veinlet - altered to greisen
3190573	355800	5357180	ROCK		-1		24	-0.005				8							225	-3				345	
3190574	355600	5357060	ROCK		-1		16	-0.005				15							83	14				230	
3190575	355600	5357060	ROCK		2		28	-0.005				9							210	-3				530	
3190576	356000	5357200	ROCK		-1		86	-0.005				10							205	-3				110	
3987404	355500	5357400	ROCK		-1			2028				34	39.2			630			173					549	
3987405	355500	5357400	ROCK		-1			130				6	2.8			266			12					83	
3987406	355500	5357400	ROCK		-1			14				2	8.2			3790			41					329	
3987407	355600	5357625	ROCK		-1			8				3	9.2			436			91					73	

Appendix 6

Nelson Prospect - Wacker Bedrock Sampling Results

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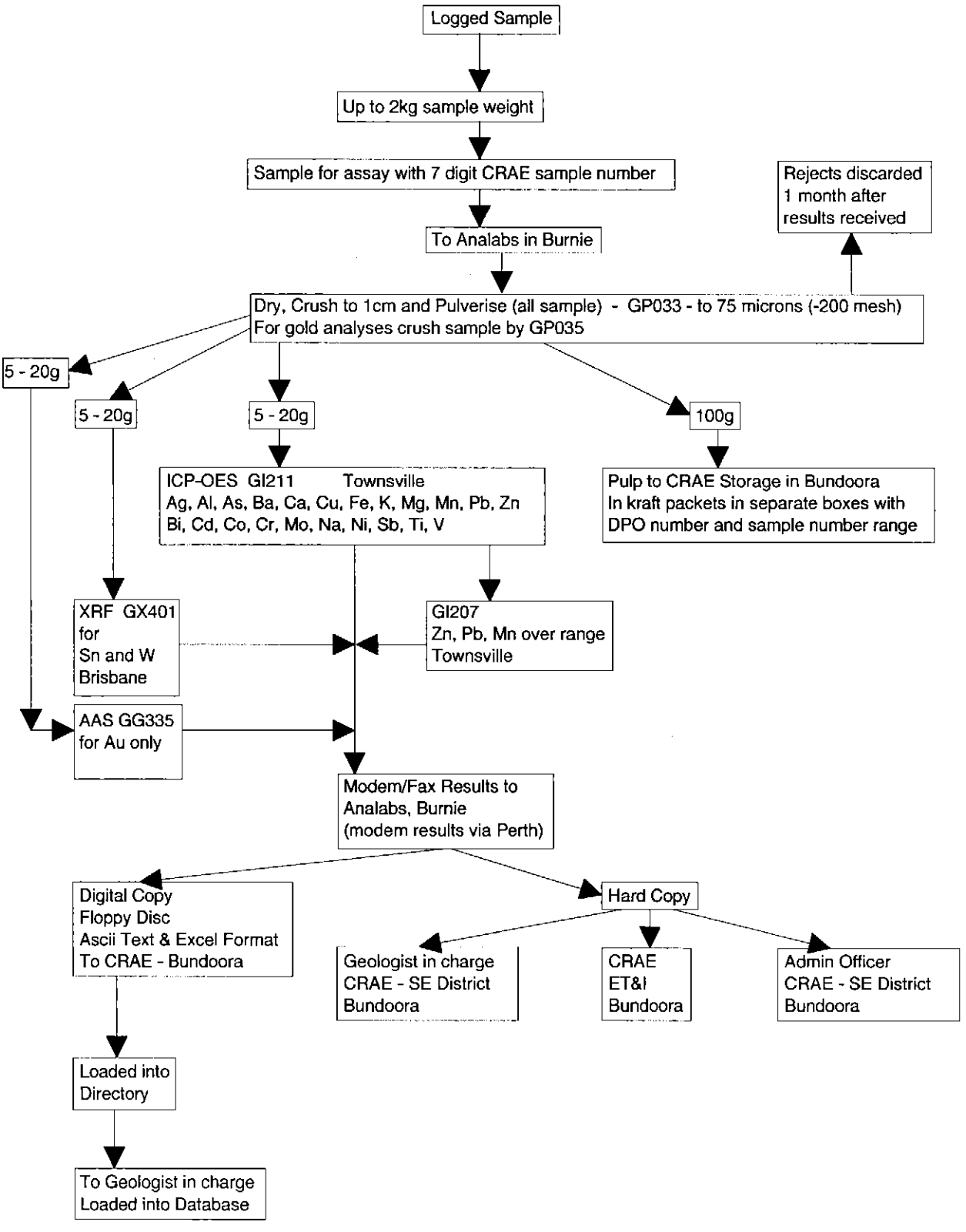
Sampno	Prospect	EL	DPO	Samptype	Report	LocalE	LocalN	AMGE	AMGN	Depth	Colour	Altn/Min	Texture	Fieldid	Mag Sus	Comments	Mg	Al	K	Ca	Ti	V	Cr	Mn	Fe	Cu	Zn	As	Sn	Ba	W	Au	Pb
5853011	Nelson	18/92	82172	Wacker	22684	321500	5430600	321500	5430600	2.5	W	Qz	Ma	Sss	25	Sand	0.013	0.135	0.065	0.005	422	3	11	91	0.315	-5	9	-5	3	30	-10	-0.01	-10
5853012	Nelson	18/92	82172	Wacker	22684	321475	5430600	321475	5430600	2	LGW	Qz	Ma	Sss	20	Sand	0.007	0.075	0.02	-0.005	600	2	12	25	0.35	-5	-5	-5	38	6	10	-0.01	-10
5853013	Nelson	18/92	82172	Wacker	22684	321450	5430600	321450	5430600	2	DGN			Ssi	25	Sand and quartzite	0.295	5.34	3.2	-0.005	2720	53	45	61	0.955	-5	33	-5	-3	385	-10	-0.01	-10
5853014	Nelson	18/92	82172	Wacker	22684	321425	5430600	321425	5430600	2.5	BG			Ssi	40	Sand and quartzite	0.118	2.4	1.33	-0.005	1310	21	47	44	0.6	13	48	-5	7	167	-10	-0.01	58
5853015	Nelson	18/92	82172	Wacker	22684	321400	5430600	321400	5430600	1.8	LBBG		Ib	Ssi	5	Poss steep bedding	0.37	6.33	2.59	-0.005	2610	40	50	119	1.67	44	39	-5	9	354	-10	-0.01	32
5853016	Nelson	18/92	82172	Wacker	22684	321375	5430600	321375	5430600	2.3	G		Ib	Ssi	10		0.331	3.97	2.62	-0.005	2990	38	17	50	0.655	-5	11	-5	4	326	-10	-0.01	-10
5853017	Nelson	18/92	82172	Wacker	22684	321350	5430600	321350	5430600	3.2	DG		Ib	Ssi	0		0.378	9.05	3.67	-0.005	3840	68	51	68	1.55	36	26	-5	3	468	-10	-0.01	19
5853018	Nelson	18/92	82172	Wacker	22684	321325	5430600	321325	5430600	2.4	DG		Ma	Ssi	19		0.442	6.38	3.56	0.03	3790	86	39	205	2.1	15	25	-5	12	473	-10	-0.01	-10
5853019	Nelson	18/92	82172	Wacker	22684	321300	5430600	321300	5430600	2	G			Sss	15		0.022	0.28	0.155	-0.005	375	3	13	37	0.38	-5	-5	-5	9	41	-10	-0.01	-10
5853020	Nelson	18/92	82172	Wacker	22684	321275	5430600	321275	5430600	5.6	DGG	Qz	IdVu	Ssi	2	Vuggy vein quartz	0.363	5.42	2.66	0.095	2610	44	35	86	1.65	11	269	-5	7	623	10	-0.01	30
5853021	Nelson	18/92	82172	Wacker	22684	321250	5430600	321250	5430600	2.2	DGGB		Lm	Ssi	8		0.113	2.12	1.16	0.025	1500	21	22	92	1.01	8	38	-5	13	165	-10	-0.01	19
5853022	Nelson	18/92	82172	Wacker	22684	321225	5430600	321225	5430600	4.5	GW	Qz	Ma	Sss	5	White quartzite fragments	0.249	4.21	2.29	0.035	2430	39	29	69	1.45	14	288	-5	10	395	-10	-0.01	36
5853023	Nelson	18/92	82172	Wacker	22684	321200	5430600	321200	5430600	3.1	GWB	Qz		Sss	20	White quartzite fragments and brown siltstone	0.112	1.93	1.28	-0.005	1550	22	30	47	0.645	-5	64	-5	11	181	-10	-0.01	55
5853024	Nelson	18/92	82172	Wacker	22684	321175	5430600	321175	5430600	5.1	G		Lm	Ssi	6	Distinctly wavy laminar	0.433	7.73	4.2	0.075	4190	71	53	93	1.47	8	355	-5	12	829	-10	-0.01	139
5853025	Nelson	18/92	82172	Wacker	22684	321150	5430600	321150	5430600	2.7	GB	Qz	Ma	Sss	20		0.07	1.35	0.745	-0.005	1230	14	15	39	0.55	-5	102	-5	8	118	-10	-0.01	18
5853026	Nelson	18/92	82172	Wacker	22684	321125	5430600	321125	5430600	2.5	BC		IbWe	Ssi	11	Weathered brown siltstone	0.244	4.25	2.58	0.01	2260	43	31	75	1.08	-5	28	-5	19	347	-10	-0.01	16
5853027	Nelson	18/92	82172	Wacker	22684	321100	5430600	321100	5430600	2	BN	Mn		Ssi	5	Poss quartzite with manganese alteration	0.157	2.66	1.73	-0.005	1720	26	25	69	0.79	-5	30	-5	10	222	-10	-0.01	-10
5853028	Nelson	18/92	82172	Wacker	22684	321075	5430600	321075	5430600	1.5	DGNB		LmWe	Ssi	20	Wavy laminar	0.357	6.28	3.78	0.01	2950	67	63	105	1.54	13	594	-5	5	481	-10	-0.01	34
5853029	Nelson	18/92	82172	Wacker	22684	321050	5430600	321050	5430600	1.8	NDGB	Mn		Ssi	8	with or without siltstone	0.354	5.52	3.7	0.015	3420	60	46	90	1.07	6	20	-5	11	478	-10	-0.01	-10
5853030	Nelson	18/92	82172	Wacker	22684	321025	5430600	321025	5430600	1.9	LGNB	Mn	We	Sss	20		0.111	1.93	1.14	-0.005	1250	23	18	34	0.485	14	8	-5	6	147	-10	-0.01	-10
5853031	Nelson	18/92	82172	Wacker	22684	321000	5430600	321000	5430600	2.2	DGNLG		Ma	Ssi	20		0.418	3.6	2.33	-0.005	2260	35	30	46	0.595	-5	9	-5	6	291	10	-0.01	-10
5853032	Nelson	18/92	82172	Wacker	22684	320975	5430600	320975	5430600	2	LGB			Sss	5		0.013	0.115	0.065	-0.005	334	-2	-10	35	0.41	-5	-5	-5	-3	30	-10	-0.01	-10
5853033	Nelson	18/92	82172	Wacker	22684	320950	5430600	320950	5430600	2	LGBN		Ma	Ssi	5	Strange brown mineral - ?sphalerite	0.608	6.78	4.84	0.04	3360	64	48	136	1.71	10	41	-5	8	794	-10	-0.01	20
5853034	Nelson	18/92	82172	Wacker	22684	320925	5430600	320925	5430600	1.6	LG			Sss	35	Sand	0.063	0.855	0.58	-0.005	348	10	33	28	0.325	-5	-5	-5	3	101	11	-0.01	-10
5853035	Nelson	18/92	82172	Wacker	22684	320900	5430600	320900	5430600	1.5	DG		Ma	Ssi	2	Mica fragments - amorphous siltstone	0.398	6.34	4.32	0.005	2940	62	36	74	0.94	-5	9	-5	8	449	11	-0.01	-10
5853036	Nelson	18/92	82172	Wacker	22684	320900	5430300	320900	5430300	2.2	W		Ma	Ssi	10	Sand	0.008	0.08	0.04	-0.005	1030	2	-10	20	0.23	-5	-5	-5	9	23	-10	-0.01	-10
5853037	Nelson	18/92	82172	Wacker	22684	320925	5430300	320925	5430300	1	LGW		Ma	Sss	2	Sand	0.056	0.815	0.52	-0.005	794	9	16	19	0.275	-5	-5	-5	5	88	-10	-0.01	-10
5853038	Nelson	18/92	82172	Wacker	22684	320950	5430300	320950	5430300	1.5	LBLG		Ma	Sss	6	Sand	0.29	3.51	2.45	-0.005	1400	33	21	59	0.77	-5	5	-5	5	381	17	-0.01	-10
5853039	Nelson	18/92	82172	Wacker	22684	320975	5430300	320975	5430300	1.2	B		We	Sss	0	Sand	0.088	0.975	0.61	0.02	789	6	10	62	0.57	-5	-5	-5	6	77	10	-0.01	-10
5853040	Nelson	18/92	82172	Wacker	22684	321000	5430300	321000	5430300	1	LG		Ma	Sss	10	Sand	0.103	1.09	0.73	-0.005	560	8	-10	27	0.305	-5	-5	-5	5	100	13	-0.01	-10
5853041	Nelson	18/92	82172	Wacker	22684	321025	5430300	321025	5430300	1	G		Ma	Sss	0	Sand	0.194	2.11	1.47	-0.005	1380	16	12	38	0.385	-5	-5	-5	22	175	11	-0.01	-10
5853042	Nelson	18/92	82172	Wacker	22684	321050	5430300	321050	5430300	1.1	LGW	Qz	Ma	Sss	5	Sand	0.121	1.4	0.865	-0.005	761	9	11	36	0.35	-5	-5	-5	6	187	-10	-0.01	-10
5853043	Nelson	18/92	82172	Wacker	22684	321075	5430300	321075	5430300	1.6	LGB		Ma	Sss	0	Sand	0.02	0.235	0.13	0.005	479	2	-10	38	0.39	-5	6	5	4	55	-10	-0.01	-10
5853044	Nelson	18/92	82172	Wacker	22684	321100	5430300	321100	5430300	1.5	W	Qz	Ma	Sss	5	Sand	0.006	0.035	0.03	-0.005	1040	2	17	39	0.445	-5	-5	-5	7	28	-10	-0.01	-10
5853045	Nelson	18/92	82172	Wacker	22684	321125	5430300	321125	5430300	1.5	LGW	Qz	Ma	Sss	25	Sand	0.03	0.415	0.245	-0.005	1140	6	18	49	0.4	-5	-5	-5	6	54	-10	-0.01	-10
5853046	Nelson	18/92	82172	Wacker	22684	321150	5430300	321150	5430300	1.5	DGG		Ib	Ssi	5	Planar laminated	0.484	7.24	4.7	0.03	4810	76	55	317	1.46	-5	35	-5	17	701	-10	-0.01	142
5853047	Nelson	18/92	82172	Wacker	22684	321175	5430300	321175	5430300	4.5	DGG	Mi	Ib	Ssi	0		0.602	9.06	5.22	0.115	4370	89	67	231	3.64	24	664	-5	11	1010	-10	-0.01	49
5853048	Nelson	18/92	82172	Wacker	22684	321200	5430300	321200	5430300	1.3	DGG		Ma	Ssi	0		0.583	8.71	5.17	0.05	4980	90	70	159	1.56	7	297	-5	12	686	13	-0.01	158
5853049	Nelson	18/92	82172	Wacker	22684	321225	5430300	321225	5430300	1.5	LGDG		Ma	Sss	5	Fine sandstone	0.207	3.27	1.98	-0.005	1930	25	21	80	1.06	24	143	-5	8	265	-10	-0.01	25
5853050	Nelson	18/92	82172	Wacker	22684	321250	5430300	321250	5430300	3	LG		Ma	Sss	10		0.443	5.18	3.48	0.01	1460	14	-10	180	0.975	-5	34	-5	10	393	-10	-0.01	-10
5853051	Nelson	18/92	82172	Wacker	22684	321275	5430300	321275	5430300	2.5	LG			Sss	5	V. fine sandstone	0.403	5.4	3.66	0.015	1160	12	-10	151	0.78	-5	51	-5	18	437	10	-0.01	-10
5853052	Nelson	18/92	82172	Wacker	22684	321300	5430300	321300	5430300	2.7	LGW		Ma	Sss	15	Poss. siltstone; granular quartzite	0.231	1.93	0.98	0.01	1300	20	15	50	0.67	-5	358	-5	7	133	-10	-0.01	-10
5853053	Nelson	18/92	82172	Wacker	22684	321325	5430300	321325	5430300	2.8	LGW		VqMa	Sss	22	Poss. siltstone; granular quartzite	0.115	1.71	0.965	0.005	1920	21	17	39	0.61	7	122	-5	12	130	-10	-0.01	14
5853054	Nelson	18/92	82172	Wacker	22684	321350	5430300	321350	5430300	2	LGW		Ma	Sss	5		0.02	0.285	0.145	-0.005	1090	4	-10	34	0.39	-5	-5	-5	8	35	-10	-0.01	-10
5853055	Nelson	18/92	82172	Wacker	22684	321375	5430300	321375	5430300	3	G			Sss	35	Sand (fine)	0.083	1.52	0.78	-0.005	2020	15	20	49	0.555	6	5	-5	5	123	12	-0.01	-10
5853056	Nelson	18/92	82172	Wacker	22684	321400	5430300	321400	5430300	3	LGG			Sss	34	Sand (fine)	0.071	1.1	0.57	-0.005	985	11	23	39	0.51	-5	6	-5	7	69	-10	-0.01	-10
5853057	Nelson	18/92	82172	Wacker	22684	321425	5430300	321425	5430300	2.5	DGB		We	Sss	0	Brown rotted sandstone	0.264	3.57	1.96	0.01	2750	35	33	88	0.965	-5	25	-5	13	303	-10	-0.01	-10
5853058	Nelson	18/92	82172	Wacker	22684	321450	5430300	321450	5430300	1.5	DGB		We	Ssi	3	Poss. wavy laminar siltstone	0.319	4.52	2.47	0.005	2790	43	43	90	0.93	15	7	-5	11	337	-10	-0.01	-10
5853059	Nelson	18/92	82172	Wacker	22684	321475	5430300	321475	5430300	2	BG		We	Sss	0		0.145	1.19	0.825	-0.005	872	6	17	60	0.5	-5	-5	-5	7	170	21	-0.01	-10
5853060	Nelson	18/92	82172	Wacker	22684	321500	5430300	321500	5430300	1.2	LGW			Sss	2	Sand	0.007	0.03	0.02	-0.005	1160	5	-10	26	0.32	-5	-5	-5	6	-5	-10	-0.01	-10
5853061	Nelson	18/92	82172	Wacker	22684	321500	5430100	321500	5430100	2	LGW			Sss	10	Sand	0.005	0.065	0.015	0.005	1480	2	-10	39	0.43	-5	-5	-5	8	-5	18	-0.01	-10
5853062	Nelson	18/92	82172	Wacker	22684	321475	5430100	321475	5430100	1.5	LGW			Sss	5	Sand	0.007	0.02	0.015	-0.005	1110	-2	-10	23	0.295	-5	5	-5	6	-5	-10	-0.01	-10
5853063	Nelson	18/92	82172	Wacker	22684	321450	5430100	321450	5430100	0.75	LBW		Vq	Sss	5	Sand	0.004	0.025	0.015	-0.005	223	-2	-10	24	0.3	-5	-5	-5	9	-5	-10	-0.01	-10
5853064	Nelson	18/92	82172	Wacker	22684	321425	5430100	321425	5430100	1.3	G			Sss	20	Sand; Poss. siltstone/sandstone	0.125	1.52	0.88	-0.005	2000	15	18	62	0.565	-5	-5	-5	7	76	12	-0.01	-10
5853065	Nelson	18/92	82172	Wacker	22684	321400	5430100	321400	5430100	1	DGG		Lm	Ssi	0	Not wavy laminar	0.549	8.25	3.62	0.015	2700	68	34	71	1.57	7	15	-5	15	497	-10	-0.01	-10
5853066	Nelson	18/92	82172	Wacker	22684	321375	5430100	321375	5430100	1.5	CDG		Ib	Ssi	0		0.547	6.68	3.89	0.015	3660	43	31	159	1.13	10	21	-5	8	538	-10	-0.01	14
5853067	Nelson	18/92	82172	Wacker	22684	321350	5430100	321350	5430100	1.5	LGG		Ma	Sss	10		0.15	1.85	1.12	-0.005	1100	16	12	43	0.51	-5	8	-5	12	139	-10	-0.01	-10
5853068	Nelson	18/92	82172	Wacker	22684	321325	5430100	321325	5430100	1.2	DGLG		Ib	Ssi	3	Near o/c; sandstone and siltstone	0.34	4.01	2.45	-0.005	2100	30	22	52	0.69	-5	17	-5	9	317	-10	-0.01	-10
5853069	Nelson	18/92	82172	Wacker	22684	321300	5430100	321300	5430100	2	NDGB		Ma	Ssi	3	With laminated sandstone sandstone frags	0.466	5.85	3.4	0.045	2550	47	33	80	2.46	15	10	10	10	601	14	-0.01	-10
5853070	Nelson	18/92	82172	Wacker	22684	321275	5430100	321275	5430100	10.8	DBGN	Py	Vq	Ssi	19	Disseminated pyrite in quartz vein	0.101	1.81	0.25	0.005	667	12	16	24	2.6	-5	86	17	5	313	19	-0.01	15
5853071	Nelson	18/92	82172	Wacker	22684	321250	5430100	321250	5430100	1.5	B		Ma	Sss	5	Sand	0.008	0.08	0.06	-0.005	741	-2	-10	37	0.455	-5	-5	-5	11	8	-10	-0.01	-10
5853072	Nelson	18/92	82172	Wacker	22684	321225	5430100	321225	5430100	1.2	LG		Ma	Sss	5	Sand	0.013	0.145	0.1	-0.005	622	-2	-10	24	0.275	-5	-5	-5	9	9	-10	-0.01	-10
5853073	Nelson	18/92	82172	Wacker	22684	321200	5430100	321200	5430100	1.3	B			Sss	5	Sand	0.03	0.32	0.175	-0.005	1230	5	-10	44	0.455	-5	-5	-5	7	20	13	-0.01	-10
5853074	Nelson	18/92	82172	Wacker	22684	321175	5430100	321175	5430100	1.8	DG			Ssi	9	Mixed sandstone and siltstone	0.2	1.92	1.08	-0.005	1060	11	15	64	0.585	-5	-5	-5	7	107	-10	-0.01	-10
5853075	Nelson	18/92	82172	Wacker	22684	321150	5430100	321150	5430100	1.5	BDG			Sss	9	Sand	0.37	1.72	0.85	-0.005	536	8	-10	40	0.345	-5	6	-5	5	219	-10	-0.01	-10
5853076	Nelson	18/92	82172	Wacker	22684	321125	5430100	321125	5430100	1.5	G			Sss	10	Sand	0.007	0.025	0.025	-0.005	560	-2	-10	30	0.385	-5	-5	-5	26	7	-10	-0.01	-10
5853077	Nelson	18/92	82172	Wacker	22684	321100	5430100	321100	5430100	2.5	DBG			Sss	10	Sand	0.137	2.06	1.14	-0.005	2140	17	17	33	0.48	-5	-5	-5	14	163	-10	-0.01	-10
5853078	Nelson	18/92	82172	Wacker	22684	321075	5430100	321075	5430100	1.8	B		We	Sss	14	Brown (red) sand	0.336	3.31	0.905	-0.005	1010	11	15	44	0.53	-5	-5	-5	14	151	12	-0.01	-10
5853079	Nelson	18/92	82172	Wacker	22684	321050	5430100	321050	5430100	1	DBB		We	Sss	4	Brown (red) sand	0.106	1.93	1.03	-0.005	879	12	13	25	0.375	-5	-5	-5	10	165	-10	-0.01	-10
5853080	Nelson	18/92	82172	Wacker	22684	321025	5430100	321025	5430100	2	DGB		We	Sss	29		0.062	0.735	0.36	-0.005	609	7	37	36	0.525	12	8	-5	10	60	-10	-0.01	-10
5853081	Nelson	18/92	82172	Wacker	22684	321000	5430100	321000	5430100	2	DB		We	Ccy	0		0.412	6.79	3.1	-0.005	2760	60	36	42	0.95	-5	7	-5	14	500	-10	-0.01	-10
5853082	Nelson	18/92	82172	Wacker	22684	320975	5430100	320975	5430100	1.2	BLBG		We	Sss	0	Sand	0.103	1.34	0.65	-0.005	784	10	17	40	0.565	-5	-5	-5	8	100	-10	-0.01	-10
5853083	Nelson	18/92	82172	Wacker	22684	320950	5430100	320950	5430100	1.5	DB			CV	2		0.1	1.55	0.75	-0.005	952	13	16	28	0.41	-5	6	-5	10	115	-10	-0.01	-10
5853084	Nelson	18/92	82172	Wacker	22684	320925	5430100	320925	5430100	1.5	BG			Sss	10	Sand with massive quartzite frags	0.012	0.145	0.085	-0.005	521	3	-10	30	0.385	-5	-5	-5	8	20	-10	-0.01	-10
5853085	Nelson	18/92	82172	Wacker	22684	320900	5430100	320900	5430100	2.5	G			Sss	2		0.111	1.14	0.65	-0.005	733	6	-10	32	0.435	-5	-5	-5	10	81	-10	-0.01	-10
5853086	Nelson	18/92	82172	Wacker	22684	320900	5429900	320900	5429900	1.2	DB		We	Sss	6	Sand	0.03	0.59	0.175	-0.005	609	5	12	25	0.36	-5	-5	-5	6	32	-10	-0.01	-10
5853087	Nelson	18/92	82172	Wacker	22684	320925	5429900	320925	5429900	1.5	BLG			Sss	10	Sand	0.025	0.3	0.18	-0.005	520	4	11	27	0.38	-5	-5	-5	30	34	-10	-0.01	-10
5853088	Nelson	18/92	82172	Wacker	22684	320950	5429900	320950	5429900	1.5	DB		We	Sss	0		0.141	1.51	0.885	-0.005	1180	13	13	22	0.36	-5	-5	-5	9	106	16	-0.01	-10
5853089	Nelson	18/92	82172	Wacker	22684	320975	5429900	320975	5429900	1.5	DB		We	Ssi	8	White quartzite frags	0.009	0.105	0.065	-0.005	437	-2	-10	29	0.39	-5	-5	-5	15	14	-10	-0.01	-10
5853090	Nelson	18/92	82172	Wacker	22684	321000	5429900	321000	5429900	1.5	DBDG		We	Sss	5	White quartzite frags/vein quartz	0.114	1.57	0.865	-0.005	1540	19	15	28	0.44	-5	-5	-5	14	148	-10	-0.01	-10
5853091	Nelson	18/92	82172	Wacker	22684	321025	5429900	321025	5429900	1.5	DB		WeVq	Sss	5		0.037	0.64	0.305	-0.005	569	5	10	29	0.395	-5	-5	-5	4	53	-10	-0.01	-10
5853092	Nelson	18/92	82172	Wacker	22684	321050	5429900	321050	5429900	1.5	GLG		Vq	Sss	10	Sand	0.023	0.415	0.16	0.01	768	3	-10	45	0.355	-5	8	-5	4	32	-10	-0.01	-10
5853093	Nelson	18/92	82172	Wacker	22684	321075	5429900	321075	5429900	2.5	G			Sss	20	Quartzite frags	0.024	0.525	0.27	-0.005	1140	5	15	32	0.415	-5	-5	-5	10	53	-10	-0.01	-10
5853094	Nelson	18/92	82172	Wacker	22684	321100	5429900	321100	5429900	1	DGN		Ib	Ssi	5		0.266	4.58	2.79	-0.005	2130	37	33	53	0.77	-5	-5	-5	10	448	-10	-0.01	-10
5853095	Nelson	18/92	82172	Wacker	22684	321125	5429900	321125	5429900	1.2	BG			Sss	20	Sand	0.016	0.915	0.365	-0.005	1070	5	12	26	0.345	-5	-5	-5	9	69	-10	-0.01	-10
5853096	Nelson	18/92	82172	Wacker	22684	321150	5429900	321150	5429900	2	G			Sss	9	Sand	0.037	0.52	0.295	-0.005	1510	7	-10	30	0.38	-5	-5	-5	11	46	-10	-0.01	-10
5853097	Nelson	18/92	82172	Wacker	22684	321175	5429900	321175	5429900	2	G			Sss	11	Sand	0.031	0.455	0.22	-0.005	1200	5	11	38	0.425	-5	-5	-5	7	38	-10	-0.01	-10
5853098	Nelson	18/92	82172	Wacker	22684	321200	5429900	321200	5429900	1.5	BG		Ma	Sss	6	Sand	0.076	1.02	0.575	-0.005	1090	9	12	50	0.575	-5	-5	-5	8	88	-10	0.03	-10
5853099	Nelson	18/92	82172	Wacker	22684	321225	5429900	321225	5429900	3	G		Ma	Sss	25	Sand	0.088	1.12	0.73	-0.005	2100	14	21	54	0.49	-5	-5	-5	13	73	-10	-0.01	-10
5853100	Nelson	18/92	82172	Wacker	22684	321250	5429900	321250	5429900	2.5	G			Sss	14	Sand	0.042	0.565	0.375	0.005	989	6	15	32	0.305	-5	6	-5	10	33	-10	-0.01	-10
5473577	Nelson	18/92	82172	Wacker	22684	321275	5429900	321275	5429900		G		Ma	Sss	10	Sand	0.069	0.87	0.545	0.01	1450	10	12	50	0.5	-5	-5	-5	8	47	-10	-0.01	-10
5473578	Nelson	18/92	82172	Wacker	22684	321300	5429900	321300	5429900		LG		Ma	Sss	5	Sand	0.071	0.975	0.65	-0.005	1450	10	-10	46	0.385	-5	-5	-5	9	70	24	-0.01	-10
5473579	Nelson	18/92	82172	Wacker	22684	321325	5429900	321325	5429900		BG		Wa	Sss	6	Sand	0.084	1.66	0.635	-0.005	1300	11	11	36	0.365	-5	-5	-5	10	47	-10	-0.01	-10
5473580	Nelson	18/92	82172	Wacker	22684	321350	5429900	321350	5429900		DGLG			Sss	10	Sand	0.376	1.15	0.435	0.03	531	8	14	72	0.51	-5	-5	-5	21	44	-10	-0.01	-10
5473581	Nelson	18/92	82172	Wacker	22684	321375	5429900	321375	5429900		DGW			Sss	0	Sand ; white quartz frags	0.546	5.47	3.71	0.01	2920	49	38	62	1.45	9	10	15	9	293	-10	-0.01	10
5473582	Nelson	18/92	82172	Wacker	22684	321400	5429900	321400	5429900		DG			Ssi	0		0.459	4.06	2.16	0.025	1840	27	45	177	1.85	-5	11	-5	10	228	-10	-0.01	16
5473583	Nelson	18/92	82172	Wacker	22684	321425	5429900	321425	5429900		GU		Ma	Sss	14	Sand ; white quartz frags	0.012	0.145	0.095	-0.005	2010	5	15	29	0.35	-5	-5	-5	8	98	-10	-0.01	-10
5473584	Nelson	18/92	82172	Wacker	22684	321450	5429900	321450	5429900		W		Ma	Sss	5	White massive quartzite	0.022	0.055	0.03	-0.005	880	-2	-10	39	0.435	-5	-5	-5	6	-5	15	-0.01	-10
5473585	Nelson	18/92	82172	Wacker	22684	321475	5429900	321475	5429900		LGW		Ma	Sss	10	Sand	0.007	0.07	0.05	-0.005	859	-2	-10	40	0.475	-5	-5	-5	8	6	-10	-0.01	-10
5473586	Nelson	18/92	82172	Wacker	22684	321500	5429900	321500	5429900		BG		We	Sss	0	Sand	0.007	0.055	0.025	-0.005	375	-2	11	32	0.34	-5	-5	-5	9	-5	-10	-0.01	-10

Appendix 7

Laboratory Analysis Flow Sheets

245109

Rock Sampling Flowsheet

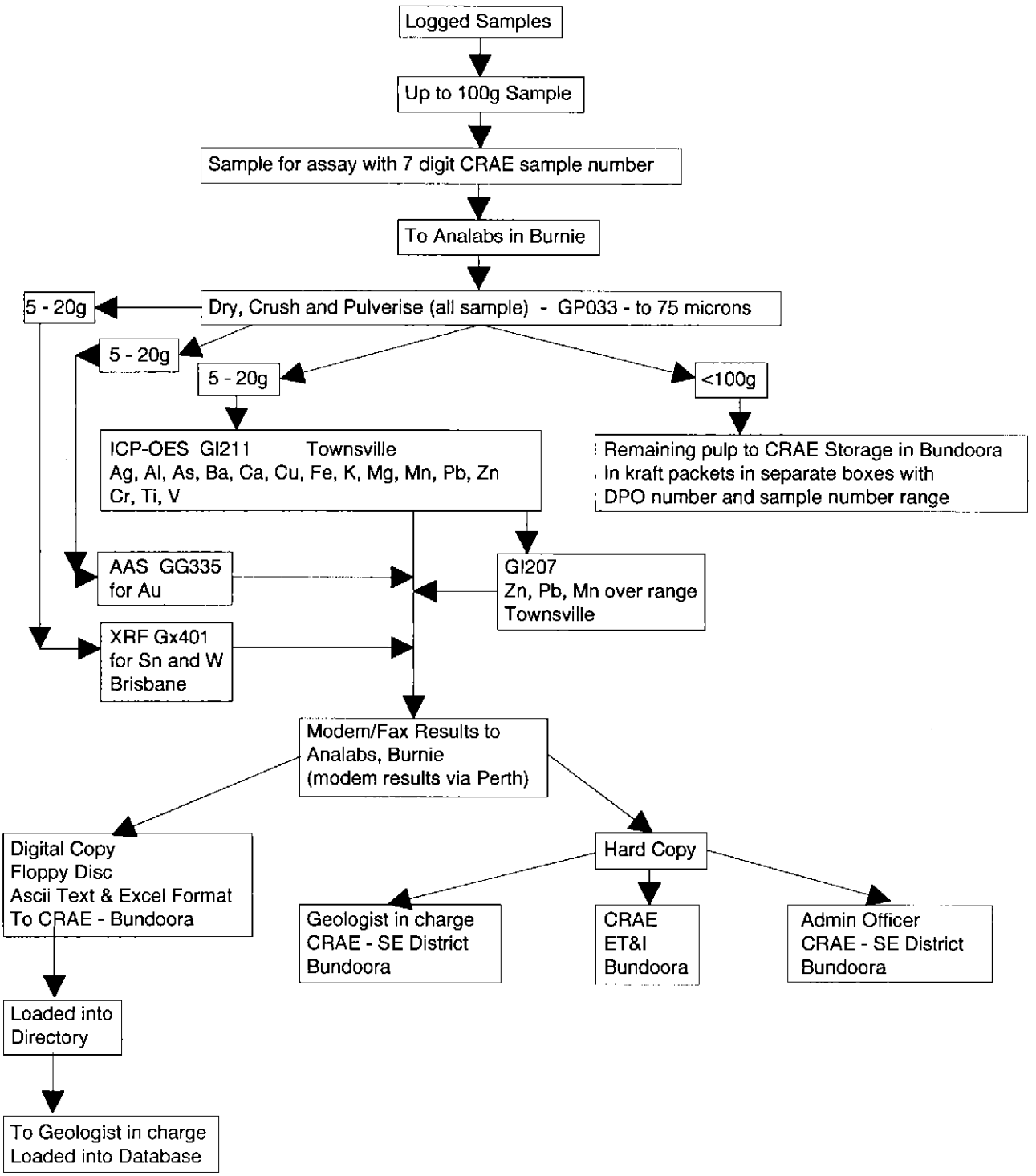


GI211 - Aqua Regia/Perchloric/hydrofluoric acid : acid digest
GI207 - Aqua Regia/Perchloric/hydrofluoric acid : acid digest

S.J.Tear August 1996

245110

Bedrock Wacker Sampling Flowsheet



GI211 - Aqua Regia/Perchloric/hydrofluoric acid : acid digest
GI207 - Aqua Regia/Perchloric/hydrofluoric acid : acid digest

S.J.Tear August 1996

Appendix 8

Previous DPO Results

[redacted]rab S[redacted] Geod[redacted]ry
Nelson Prospect
EL18/92

Sample No	AMGE	AMGN	DPO	Field ID	Texture	Alt/Min	Colour	Comments	Ag	As	Au	Co	Cu	Fe	Mn	Ni	Pb	Zn
									ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
4142201	320625	5431200	81227	Mq	MaVq		W	Grab sample. 3% Vq.	-1	1.2	-0.005	-3	9	0.66	38	5	-3	5
4142202	320655	5431200	81227	OvqMq			W	Grab from 3m t o/c	-1	1	-0.005	-3	9	0.55	37	5	-3	4
4142218	320030	5434055	81229	Mq		He	PBW	Grab sample of hematite altered qtzite.	-1	5.1	0.008	-3	6	0.7	30	3	-3	8
4142219	319870	5434040	81229	Mq	Ma	Py	LG	Grab sample of qtzite with 2% py to 1mm.	-1	20.1	-0.005	-3	18	0.91	118	6	11	521
4142220	319305	5433430	81229	CsgOvq	Gs		WB	Grab of rare s/c of vn qtz with 10% goeth filled vugs	-1	129	-0.005	-3	19	1.95	21	4	-3	19
4142221	319305	5433430	81229	Ovq	Fr			Grab sample from same locn as 220 of barren looking vn qtz.	-1	5.2	-0.005	-3	10	0.33	20	3	-3	10
4142222	319825	5433280	81229	SssSsi	BdSl		LGG	Grab of qtz f/g sdst and slst with Fe ox after py dissem in	-1	8.3	-0.005	-3	6	0.79	28	-3	-3	79
4142223	320615	5432640	81229	Mq			W	Grab of qtzite with v.tr unknown DG mineral?	-1	5.5	-0.005	-3	6	0.47	23	-3	-3	11
4142224	320385	5432535	81229	Ovq	Vu		WLB	Grab of vn qtz with LB ferrug altn & vugs partly filled with goeth.	-1	122	-0.005	-3	9	1.81	20	-3	-3	302
4142225	320385	5432535	81229	Ovq	FrBx		WLB	As above except without Fe	-1	5.4	-0.005	-3	6	0.43	22	5	-3	20
4142226	320180	5432745	81229	Sss	WeVqBd		BLG	F/g sdst with 3% qtz vnlets and Fe weathering.	-1	11.2	-0.005	-3	3	4.43	26	-3	-3	10

CRA EXPLORATION PTY. LIMITED

(INC. IN N.S.W.) A.C.N. 000 057 125

245113 ★ DPO No.: 81227

Head Office: 55 Collins Street, Melbourne, Vic.

DESPATCH ADVICE, PACKING SLIP & ORDER

DISTRICT OFFICE COPY

★ From CRAE office at: 1/23 Bell Street PRESTON 3072 ★ Date: 31/1/95

★ To Laboratory: ANALABS

★ Lab. address: 14 Thirkell Street Cooee Tas 7320

★ No. of samples: ~~190~~ 189

★ 1:250000 sheet(s): Burnie SK55-3

★ Investigation: NW Tasmania Cu

★ Tenement: EL4/94, EL18/92

Complete on District, CIS & File copies only

Samples despatched per: Delivered

Addressed: ANALABS As above

ENTERED

★ Return residues to: Send 100g split to CRAE Queensbeyan. Return 1 to CRAE Preston.

COPIES OF THE RESULTS REPORT TO BE FORWARDED TO CRA EXPLORATION PTY LIMITED AT:

1. PO. Box 8093, NORTHLAND CENTRE, 3072

★ Attn: M Donnelly

2. As above

Attn: C. Hayward **WITH THE INVOICE**

3. PO Box 3709, Manuka ACT 2603 Australia
Attention: CRAE Information Systems

QUOTE DPO NUMBER ON ALL REPORTS AND INVOICE.

Copy of **(for CRAE laboratory only):**

- ☐ Sample location plan attached
- ☐ Sample ledger attached

Samples			Work Required
Start No.	End No.	Qty	
4141302	4141307	6	SAMPLE TYPE: SOILS
	4141309	1	Please dry and pulverise.
4141314	4141478	165	Assay for
			Ag, Co, Cu, Ni, Pb, Zn, Fe, Mn by Aqua Regia/ Perchloric Acid digest: AAS finish (GA14C)
			As by hydride generation/AAS (GA114)
			Au by Fire assay/Carbon rod (GG326)
			PLEASE NOTE: SAMPLES ARE IN PLASTIC BAGS
4142201	4142207	7	SAMPLE TYPE: ROCK
			Please dry crush & pulverise.
			Assay for
			Ag, Co, Cu, Ni, Pb, Zn, Fe, Mn by AAS(GA140)
			As by hydride/AAS (GA140)
			Au by fire assay/AAS (GG313)

IMPORTANT — Each sample type must be entered separately with the following clearly shown:

1. Appropriate sample type,
2. Assay methods,
3. Laboratory method codes,
4. Preassay treatment,
5. Any special assay requirements,
6. Elements/minerals to be determined.

Cost code(s): G02141-CN 68% 3920
G02136-CN 32%

Authorised by: M Donnelly

HT/CRA-9/84

Analabs

245114

Analabs Pty. Ltd.
A.C.N. 004 591 664

Phone (004) 316857 | 14 Thirkell St. COOEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 104165.60.10693

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
CRA Exploration Pty Limited
P.O. Box 8093
NORTHLAND CENTRE VIC 3072

ORDER No.	PROJECT
81227	

DATE RECEIVED	RESULTS REQUIRED
03/02/95	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1.6	- 22/02/95	1	189

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
4141302-307,4141309, 4141314-478,4142201-217	SR Prep : GP031,GP033	Cu,Pb,Zn,Ag,Fe,Mn,Co,Ni/GA140 Fe(1)/GA140 As/HA140,As/GA140 Au/GG313 Au,Au(R)/GG326

RESULTS TO
M Donnelly
CRA Exploration Pty Ltd
P O Box 8093
NORTHLAND CENTRE VIC 3072

RESULTS TO
Mr C Hayward
CRA Exploration Pty Limited
P.O. Box 8093
NORTHLAND CENTRE VIC 3072
(c2736-CN-(68) 14553

T: 14553 78

RESULTS TO
CRAE Information Systems
P.O. Box 3709
MANUKA ACT 2603

REMARKS

Fe(1)/GA140 results are over the recommended analytical range.

AUTHORISED OFFICER

nalabs
A.C.N. 004 591 664

245115

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.10693	21/02/95	81227	7 OF 16

	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Fe(1)	Mn	Co	Ni
THOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA140
1	4141457	2	<3	7	<1	0.19	-	31	<3	10
2	4141458	<2	<3	5	<1	0.19	-	20	<3	16
3	4141459	2	<3	7	<1	0.34	-	23	4	13
4	4141460	2	<3	7	<1	0.53	-	28	<3	12
5	4141461	5	6	31	<1	2.19	-	78	<3	19
6	4141462	3	<3	20	<1	2.80	-	162	3	17
7	4141463	2	<3	10	<1	-	6.1	42	<3	5
8	4141464	2	<3	5	<1	1.95	-	107	<3	11
9	4141465	2	4	21	<1	0.78	-	94	<3	19
10	4141466	5	<3	22	<1	3.09	-	31	<3	11
11	4141467	3	4	11	<1	3.13	-	64	<3	14
12	4141468	6	<3	12	<1	-	5.3	55	<3	7
13	4141469	14	<3	9	<1	2.71	-	34	<3	7
14	4141470	9	<3	14	<1	4.63	-	53	<3	<3
15	4141471	5	<3	15	<1	3.67	-	17	<3	6
16	4141472	7	3	12	<1	1.75	-	9	<3	13
17	4141473	2	5	13	<1	1.07	-	23	<3	9
18	4141474	6	3	19	<1	2.55	-	48	<3	10
19	4141475	3	4	24	<1	0.66	-	43	<3	13
20	4141476	2	4	25	<1	1.19	-	73	<3	11
21	4141477	24	32	24	<1	0.61	-	41	<3	22
22	4141478	7	5	19	<1	1.12	-	36	<3	8
23	4142201	9	<3	5	<1	0.66	-	38	<3	5
24	4142202	9	<3	4	<1	0.55	-	37	<3	5
25	4142203	30	17	41	<1	2.31	-	146	3	<3

sult in ppm unless otherwise specified
ele ent not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

Cost code(s) ...

HT/CRA-9/84

Analabs Pty. Ltd.
A.C.N. 004 591 664

Analabs

245116

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.10693	22/02/95	81227	8 OF 16

	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Fe(1)	Mn	Co	Ni
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA140
1	4142204	16	4	16	<1	0.68	-	68	<3	4
2	4142205	3	5	9	<1	0.62	-	77	<3	<3
3	4142206	12	18	13	<1	2.46	-	80	<3	<3
4	4142207	19	8	15	<1	1.98	-	75	<3	4
5	4142208	5	<3	8	<1	1.08	-	69	<3	6
6	4142209	11	4	4	<1	0.30	-	21	<3	5
7	4142210	12	6	83	<1	4.19	-	514	11	18
8	4142211	14	4	19	<1	0.99	-	332	4	11
9	4142212	31	3	24	<1	1.12	-	84	<3	6
10	4142213	10	6	10	<1	0.76	-	79	<3	<3
11	4142214	9	<3	5	<1	0.33	-	28	<3	5
12	4142215	13	<3	25	<1	-	5.7	438	4	11
13	4142216	2	<3	37	<1	-	22.7	652	<3	<3
14	4142217	6	12	14	<1	-	15.3	2674	10	<3
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION	2	3	2	1	0.01	0.1	3	3	3
25	UNITS	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm

Results in ppm unless otherwise specified
- element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

Cost code(s)

HT/CRA-9/84

[redacted]halabs

245117

A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.10693	22/02/95	81227	15 OF 16

	SAMPLE No.	Au	Au(R)	Au	As	As				
ETHOD		GG326	GG326	GG313	HA140	GA140				
1	4141457	0.002	-	-	0.7	-				
2	4141458	0.002	-	-	<0.5	-				
3	4141459	0.001	-	-	3.5	-				
4	4141460	0.002	-	-	1.2	-				
5	4141461	0.002	-	-	44.9	-				
6	4141462	0.002	-	-	12.6	-				
7	4141463	0.002	-	-	21.1	-				
8	4141464	0.002	-	-	1.3	-				
9	4141465	0.001	-	-	1.2	-				
10	4141466	0.002	-	-	8.5	-				
1	4141467	0.002	-	-	2.7	-				
12	4141468	0.004	-	-	12.3	-				
13	4141469	0.002	-	-	14.8	-				
1	4141470	0.002	-	-	6.0	-				
15	4141471	0.004	-	-	4.9	-				
16	4141472	0.004	-	-	43.5	-				
17	4141473	0.002	-	-	3.9	-				
18	4141474	0.002	-	-	15.5	-				
1	4141475	0.001	-	-	1.7	-				
20	4141476	0.001	-	-	7.6	-				
2	4141477	0.002	-	-	2.4	-				
22	4141478	0.001	-	-	6.3	-				
23	4142201	-	-	<0.005	1.2	-				
2	4142202	-	-	<0.005	1.0	-				
25	4142203	-	-	<0.005	26.4	-				

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

Cost code(s) C02136-CN 32% 5120 Authorised by [redacted]

HT/CRA-9/84

ANALYTICAL DATA

245118

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.10693	22/02/95	81227	16 OF 16

	SAMPLE No.	Au	Au(R)	Au	As	As				
THO		GG326	GG326	GG313	HA140	GA140				
1	4142204	-	-	<0.005	2.3	-				
2	4142205	-	-	<0.005	0.9	-				
3	4142206	-	-	<0.005	5.6	-				
4	4142207	-	-	<0.005	19.7	-				
5	4142208	-	-	<0.005	1.4	-				
6	4142209	-	-	<0.005	0.7	-				
7	4142210	-	-	<0.005	1.9	-				
8	4142211	-	-	<0.005	0.9	-				
9	4142212	-	-	<0.005	8.0	-				
10	4142213	-	-	<0.005	0.7	-				
11	4142214	-	-	<0.005	<0.5	-				
12	4142215	-	-	<0.005	12.3	-				
13	4142216	-	-	<0.005	2.5	-				
14	4142217	-	-	<0.005	4.2	-				
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION	0.001	0.001	0.005	0.5	50				
25	UNITS	ppm	ppm	ppm	ppm	ppm				

Results in ppm unless otherwise specified
- element not determined

IS = insufficient sample
SNR = *sample not received*

AUTHORISED OFFICER

6. Elements/minerals to be determined.

Cost code(s) G02141-CN 68% 3920
G02136-CN 32%

Authorised by M Ormerod

HT/CRA-9/84

Soil and Wacker Bedrock Samples
Nelson Prospect
EL 18/92

Sample No.	AMGE	AMGN	DPO #1	DPO #2	Sample Type	Depth m	Horizon	Texture	Colour	Comments	Field ID	Mineralogy
4141329	320975	5431600	81227	77190	SOIL	0.9	C	Bd	G-LB		Ssi	
4141330	320950	5431600	81227	77190	SOIL	0.6	C	Vq	G	Carbonaceous micaceous slst	Sbs	
4141331	320925	5431600	81227	77190	SOIL	0.7	C	FeBd	DB		Ssi	
4141332	320900	5431600	81227	77190	SOIL	0.8	C	Lm	B		Ssi	
4141333	320875	5431600	81227	77190	SOIL	1.2	C	Lm	B		Ssi	
4141334	320850	5431600	81227	77190	SOIL	0.9	C	Lm	B		Ssi	
4141335	320825	5431600	81227	77190	SOIL	0.6	C	Lm	B-LG		Ssi	
4141336	320800	5431600	81227	77190	SOIL	0.3	C	Lm	B		Ssi	
4141337	320775	5431600	81227	77190	SOIL	0.35	C	Lm	G	Carbonaceous with W lamellae	Sbs	
4141338	320750	5431600	81227	77190	SOIL	0.75	C		B		Ssi	
4141339	320700	5431600	81227	77190	SOIL	0.5	C	Lm	G		Ssi	
4141340	320675	5431600	81227	77190	SOIL	1	C	Lm	G	carbonaceous slst	Sbs	
4141341	320650	5431600	81227	77190	SOIL	0.3	C		LG	F/g qtz sdst & minor slst frags	Sss	
4141342	320625	5431600	81227	77190	SOIL	0.7	C	Lm	GB	F/g qtz sdst & G slst lamellae	Sss	
4141343	320600	5431600	81227	77190	SOIL	0.8	C		DG	Siliceous carbonaceous slst	Sbs	
4141344	320575	5431600	81227	77190	SOIL	0.6	C	Sc	DG	V.carbonaceous slst frags	Sbs	
4141345	320550	5431600	81227	77190	SOIL	0.45	C	Bx	W-G	Vn qtz bx with Gy sedi clasts	Obx	
4141346	320525	5431600	81227	77190	SOIL	0	Bedrock	Vq	LG	O/c grab sample	Mq	
4141347	320475	5432000	81227	77190	SOIL	0.6	Bedrock		LB	m/g qtz arenite	Sss	
4141348	320500	5432000	81227	77190	SOIL	0.95	C	Sl	G	silcified f/g sdst frags	Sss	
4141349	320525	5432000	81227	77190	SOIL	0.55	C		W-B	F/g qtz-musc sdst	Sss	
4141350	320550	5432000	81227	77190	SOIL	0.3	C	Vu	WB	finely pitted vn qtz frags	Ovq	
4141351	320575	5432000	81227	77190	SOIL	0.5	C		DG	Carbonaceous micaceous slst	Sbs	
4141352	320600	5432000	81227	77190	SOIL	0.75	C	Lm	GB		Ssi	
4141353	320625	5432000	81227	77190	SOIL	0.6	C	Lm	GB		Ssi	
4141354	320650	5432000	81227	77190	SOIL	0.6	C	Lm	B		Ssi	
4141355	320675	5432000	81227	77190	SOIL	0	C	Lm	LG	G-WB slst	Ssi	
4141356	320700	5432000	81227	77190	SOIL	0.6	C	Lm	B		Ssi	
4141357	320725	5432000	81227	77190	SOIL	1.1	C	Lm	LG		Ssi	
4141358	320750	5432000	81227	77190	SOIL	1.2	C	Lm	LG		Ssi	
4141359	320775	5432000	81227	77190	SOIL	0.5	C	Lm	B		Ssi	
4141360	320800	5432000	81227	77190	SOIL	0.8	C	Lm	B		Ssi	
4141361	320825	5432000	81227	77190	SOIL	0.7	C	LmFe	B		Ssi	
4141362	320850	5432000	81227	77190	SOIL	0.7	C	Lm	LGB		Ssi	

Soil and Wacker Bedrock Samples
Nelson Prospect
EL 18/92

Sample No.	AMGE	AMGN	DPO #1	DPO #2	Sample Type	Depth m	Horizon	Texture	Colour	Comments	Field ID	Mineralogy
4141363	320875	5432000	81227	77190	SOIL	1.2	C	Lm	LG		Ssi	
4141364	320900	5432000	81227	77190	SOIL	1.1	C	Bd	LGB	Bedded f/g sdst	Sss	
4141365	320925	5432000	81227	77190	SOIL	0.8	C		LGB	Qtz-musc sdst frags	Ssi	
4141366	320950	5432000	81227	77190	SOIL	1.4	C	Lm	LG	LG-WB lam slst	Ssi	
4141367	320975	5432000	81227	77190	SOIL	1.3	C		LG		Ssi	
4141382	320525	5432800	81227	77190	SOIL	1	C		LG	Qtz sdst	Sss	
4141383	320550	5432800	81227	77190	SOIL	0.9	C		LG-LB		Sss	
4141384	320575	5432800	81227	77190	SOIL	0.4	B		WB	Qtzite & sand. 5m wide qtzite.	Mq	
4141385	320600	5432800	81227	77190	SOIL	0.9	B/C		B		Ssi	
4141386	320625	5432800	81227	77190	SOIL	0.6	C	Fe	DB		Ssi	
4141387	320650	5432800	81227	77190	SOIL	0.4	C	Fe	DB		Ssi	
4141388	320675	5432800	81227	77190	SOIL	1.2	C		B	Qtz sdst	Sss	
4141389	320700	5432800	81227	77190	SOIL	1	C	Sl	DB	F/g qtz musc sdst	Sss	
4141390	320725	5432800	81227	77190	SOIL	0.9	C		DGB		SssSsi	
4141391	320750	5432800	81227	77190	SOIL	0.65	C		DG		Sbs	
4141392	320800	5432800	81227	77190	SOIL	0.7	B/C?		G	Qtzite frags; ridge crest	Mq	
4141393	320825	5432800	81227	77190	SOIL	0.55	B/C?		WG	Qtzite frags; ridge crest	Mq	
4141397	320675	5431200	81227	77190	SOIL	0.65	C		DG	Carbonaceous slst	Sbs	
4141398	320725	5431200	81227	77190	SOIL	0.7	C	Bd	LGLB	Slst	Ssi	
4141399	320750	5431200	81227	77190	SOIL	0.65	C	Lm	G	LG-WB slst	Ssi	
4141400	320775	5431200	81227	77190	SOIL	0.8	C	Lm	G	LG-WB slst	Ssi	
4141401	320800	5431200	81227	77190	SOIL	0.75	C	Lm	GB		Ssi	
4141402	320825	5431200	81227	77190	SOIL	0.85	C		G		Ssi	
4141479	321550	5430400	81230	77190	WACKER	2.4	bedrock		LB	Upper change of slope @ 321535E.	Mq	
4141480	321525	5430400	81230	77190	WACKER	2.4	bedrock	Ma	W-LG		Mq	
4141481	321500	5430400	81230	77190	WACKER	1.3	bedrock	Ma	W		Mq	
4141482	321475	5430400	81230	77190	WACKER	2.3	bedrock	Ma	W		MqSss	
4141483	321450	5430400	81230	77190	WACKER	1.6	bedrock	Lm	LG	Lower break in slope @ 321460E.	Ssi	
4141484	321425	5430400	81230	77190	WACKER	2.2	bedrock	Lm	LG-WB		Ssi	
4141485	321400	5430400	81230	77190	WACKER	2.1	bedrock	Lm	LG-LB	euhedral py	Ssi	Py
4141486	321375	5430400	81230	77190	WACKER	2.2	bedrock		G		Ssi	
4141487	321350	5430400	81230	77190	WACKER	2	bedrock		LG	minor py	Ssi	Py
4141488	321325	5430400	81230	77190	WACKER	2.2	bedrock					
4141489	321300	5430400	81230	77190	WACKER	1.5	bedrock		G	micaceous sandy slst	Ss ss	

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4141490	321275	5430400	81230	77190	WACKER	1.9	C	Lm	GB	Qtz-musc sandy slst	Ss ss	
4141491	321250	5430400	81230	77190	WACKER	4.9	C	Lm	LG-LB		Ssi	
4141492	321225	5430400	81230	77190	WACKER	5	C	LmWe	LG-LB	V.small sample	Ssi	
4141493	321200	5430400	81230	77190	WACKER	2.6	C	Lm	G-LB		Ssi	
4141494	321175	5430400			WACKER	2.2	Trans		B	Qtz sand & gravel. Unable to penetrate.	Cg	
4141495	321150	5430400	81230	77190	WACKER	6.5	bedrock	Lm	G-WB		Ssi	
4141496	321125	5430400	81230	77190	WACKER	2.6	bedrock	Lm	G	carbonaceous slst with tr py	Sbs	Py
4141497	321100	5430400	81230	77190	WACKER	4.2	bedrock	Lm	LG	micaceous slst	Ssi	
4141498	321075	5430400	81230	77190	WACKER	2	bedrock	Lm	LG	sandy slst	Ssi	
4141499	321050	5430400	81230	77190	WACKER	1.4	C	WeVq	W		Mq	
4141500	321025	5430400	81230	77190	WACKER	1.6	bedrock	Vq	W		Mq	
4141501	321000	5430400	81230	77190	WACKER	1.7	C?	Vq	G-W	Bedrock or gravel? On steep slope	SssiMq	
4141502	320800	5430800	81230	77190	WACKER	0.9	bedrock		W		Mq	
4141503	320825	5430800	81230	77190	WACKER	1	bedrock	Vq	WG	Qtz sandy slst. Interp as Pyq	Ssi	
4141504	320850	5430800	81230	77190	WACKER	1.3	bedrock		W		Mq	
4141505	320875	5430800	81230	77190	WACKER	2.5	C?	We	DB	Unable to penetrate further, 2 attempts	Ssi	
4141506	320900	5430800	81230	77190	WACKER	1.8	C	Lm	LBG		Ssi	
4141507	320925	5430800	81230	77190	WACKER	4.4	bedrock	Lm	G-W		Ssi	
4141508	320950	5430800	81230	77190	WACKER	1.5	C	Bd	GB	micaceous	Ssi	
4141509	320975	5430800	81230	77190	WACKER	1.4						
4141510	321000	5430800	81230	77190	WACKER	1.2	C	Lm	G-LB	V.small sample; diff to penetrate	Ssi	
4141511	321025	5430800	81230	77190	WACKER	1.7	C	Lm	G-WB		Ssi	
4141512	321050	5430800	81230	77190	WACKER	5.5	bedrock	Lm	G-W		Ssi	
4141513	321075	5430800	81230	77190	WACKER	2.8	bedrock	Lm	G-W		Ssi	
4141514	321100	5430800	81230	77190	WACKER	6	bedrock	Lm	G-W		Ssi	
4141515	321125	5430800	81230	77190	WACKER	4	bedrock	Lm	G-W		Ssi	
4141516	321150	5430800	81230	77190	WACKER	3	bedrock	Lm	G-W	Small sample.	Ssi	
4141517	321175	5430800	81230	77190	WACKER	5	bedrock	Lm	G-W		Ssi	
4141518	321200	5430800	81230	77190	WACKER	2.7	C	Lm	B-G	micaceous	Ssi	
4141519	321225	5430800	81230	77190	WACKER	2.5	bedrock	Lm	G		Ssi	
4141520	321250	5430800	81230	77190	WACKER	4.3	bedrock	Lm	G-W		Ssi	
4141521	321275	5430800	81230	77190	WACKER	3.4	C	Lm	B-G	v.small sample	Ssi	
4141522	321300	5430800	81230	77190	WACKER	2.9	bedrock	Bd	LG	f/g qtz-musc sdst & G slst	SssSsi	
4141523	321325	5430800	81230	77190	WACKER	3.5	bedrock	Bd	LG	W bank of ck	Ssi	

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4141524	321354	5430800	81230	77190	WACKER	5.7	bedrock	Bd	W-G	f/g qtz-musc sdst & G slst	SssSsi	
4141525	321375	5430800	81230	77190	WACKER	2.1	C	Lm	G-W	v.small sample.	Ssi	
4141526	321400	5430800	81230	77190	WACKER	6	bedrock	Bd	LG	f/g qtz-musc sdst & slst	SssSsi	
4141527	321425	5430800	81230	77190	WACKER	3.8	bedrock	Lm	G-W		Ssi	
4141528	321450	5430800	81230	77190	WACKER	3	bedrock	Lm	G		Ssi	
4141529	321475	5430800	81230	77190	WACKER	1.4	bedrock	Lm	G		Ssi	
4141530	321500	5430800	81230	77190	WACKER	1.2	bedrock		DG	carbonaceous slst	Sbs	
4141531	321520	5430800	81230	77190	WACKER	1.9	bedrock		W-G	Qtz sdst. On low ridge with qtzite flt.	Sss	
4141532	321550	5430800	81230	77190	WACKER	1.2	C	We	B	f/g silty sdst	Sss	
4141533	321575	5430800	81230	77190	WACKER	3.4	bedrock	Bd	DG-W	micaceous, DG bands carbonaceous	Ssi	
4141534	321600	5430800	81230	77190	WACKER	1	C	Lm	G-B		Ssi	
4141562	320975	5431200	81230	77190	WACKER	1	bedrock	Bd	G	micaceous slst & f/g sdst	Ss ss	
4141563	320950	5431200	81230	77190	WACKER	1	C	LmWe	LB-G	micaceous slst	Ssi	
4141564	320925	5431200	81230	77190	WACKER	1.1	C	LmWe	BG		Ssi	
4141565	320900	5431200	81230	77190	WACKER	1.2	C	BdWe	BG		Ssi	
4141566	320875	5431200	81230	77190	WACKER	1.1	C	LmWe	GB		Ssi	
4141567	320850	5431200	81230	77190	WACKER	1.6	bedrock	Lm	G-W		Ssi	
4141605	320850	5432800	77184	77190	WACKER		bedrock	Ma	W	Quartzite	Sss	
4141606	320875	5432800	77184	77190	WACKER	2.4	C	WeMa	DB	Fn-med gr sst, arg mtx. Cover contam?	Sss	
4141607	320900	5432800	77184	77190	WACKER	2.5	C	WeMa	DB	Very weathered arg sltst	Ssi	
4141608	320925	5432800	77184	77190	WACKER	2	C-bdrck	Lm	DYO	Fining up sltst laminae. Pyjama sltst	Ssi	
4141609	320950	5432800	77184	77190	WACKER	8.2	bedrock	Lm	W-G	Pyjama sltst	Ssi	
4141610	320975	5432800	77184	77190	WACKER	6.4	bedrock	Lm-Bd	W-G	Pyjama sltst	Ssi	
4141689	320975	5433600	77184	77190	WACKER	6.7	bedrock	Lm	LG-G	?Trace v fn d sem Py, trace mica	Ssi	?Py
4141690	320950	5433600	77184	77190	WACKER	5.2	bedrock	Bd	W	Ssi grading to v fn Sss	Ssi-Sss	
4141691	320925	5433600	77184	77190	WACKER	3.6	bedrock	Lm	W-LG	Pyjama Siltstone	Ssi	
4141692	320900	5433600	77184	77190	WACKER	3.2	bedrock	Lm	W-G	Pyjama Siltstone	Ssi	
4141693	320875	5433600	77184	77190	WACKER	4	bedrock	Lm-Bd	W-N		Ssi	
4141694	320850	5433600	77184	77190	WACKER	4	bedrock	Lm	W-G	Pyjama Siltstone	Ssi	
4141695	320825	5433600	77184	77190	WACKER	5.2	bedrock	Lm	W-DG	Pyjama Siltstone	Ssi	
4141696	320800	5433600	77184	77190	WACKER	3.5	C	Bd	LB-N		Ssi	
4141697	320775	5433600	77184	77190	WACKER	2.7	bedrock	Ma	LG-G		Ssi	
4141698	320750	5433600	77184	77190	WACKER		bedrock	Bd-Lm	W-N	Cross-cutting 5mm qtz-py vein	Ssi	Py
4141699	320725	5433600	77184	77190	WACKER	1	C	Ma We	LB-DB		Ssi	

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4141700	320700	5433600	77184	77190	WACKER	1.2	bedrock	Ma	W	V fn to fn gr, silica cemented, qtz sandstone	Sss	
4141701	320675	5433600	77184	77190	WACKER		C	Ma We	B-DB	Some Cg contam	Ssi	
4141702	320650	5433600	77184	77190	WACKER	0.8	C	Ma We	LB		Ssi	
4141703	320625	5433600	77184	77190	WACKER		C	Bd-Lm	W-N	Some Cg contam	Ssi	
4141704	320600	5433600	77184	77190	WACKER	0.7	C	Ma	BG	Some Cg contam. Trace mica	Ssi	
4141705	320575	5433600	77184	77190	WACKER		C	Bd	LB-DG		Ssi	
4141706	320550	5433600	77184	77190	WACKER	0.8	C	Ma We	B-DG		Ssi	
4141707	320525	5433600	77184	77190	WACKER	1	C	Ma We	LB		Ssi	
4141708	320500	5433600	77184	77190	WACKER	1.2	C	Lm-Ma	LB-G	Minor Cg contam	Ssi	
4141709	320475	5433600	77184	77190	WACKER		C	Ma We	LB-GB	Slightly micaceous	Ssi	
4141710	320450	5433600	77184	77190	WACKER		bedrock	Ma	G-LG		Ssi	
4141711	320425	5433600	77184	77190	WACKER	0.7	C	Ma	LB	Sltst, trace sst. Micaceous, siliceous	Ssl-Sss	
4141712	320400	5433600	77184	77190	WACKER		C	Lm-Ma	LB-G	Slightly siliceous	Ssi	
4141713	320375	5433600	77184	77190	WACKER		C	We	W-B	Micaceous sltst. Trace Py	Ssi	Py
4141714	320350	5433600	77184	77190	WACKER	4.8	bedrock	Lm-Bd	LG-G	Micaceous. Trace Py	Ssi	Py
4141715	320325	5433600	77184	77190	WACKER	3.2	bedrock	Ma-Lm	LG-G	Micaceous. V fn d sem Py?	Ssi	Py
4141716	320300	5433600	77184	77190	WACKER	5.7	bedrock	Ma-Lm	G		Ssi	
4141717	320275	5433600	77184	77190	WACKER	2.5	bedrock	Lm	G-DG	Minor fn Py along some laminae	Ssi	Py
4141718	320250	5433600	77184	77190	WACKER	6.6	bedrock	Bd-Lm	LG		Ssi	
4141719	320225	5433600	77184	77190	WACKER	0.8	C	Ma-Lm	G	Some Cg contam	Ssi	
4141720	320200	5433600	77184	77190	WACKER	1	C	Lm	G	Coarse sands and clays in bedrock (thru roots)	Ssi	
4141721	320175	5433600	77184	77190	WACKER		C	Lm We	LB-G	Common Cg contam	Ssi	
4141722	320150	5433600	77184	77190	WACKER	1	Trans	Ma We	GB	Predom Cg, some Ssi	Cg-Ssi	
4141723	320125	5433600	77184	77190	WACKER	1	C	Lm We	B-G	Ferruginous. Some Cg contam	Ssi	
4141724	320100	5433600	77184	77190	WACKER	0.8	bedrock	Ma	LG-G	Sltst. Minor thin qtz veins	Ssi	
4141725	320075	5433600	77184	77190	WACKER		C	Ma We	BG	Some Cg contam	Ssi	
4141726	320050	5433600	77184	77190	WACKER	1.5	Trans-C	Ma We	B-DB	Some Cg contam	Ssi	
4141727	320025	5433600	77184	77190	WACKER	1.2	C	Ma We	DB-N	Very ferruginous siltstone, also quartzite	Ssi-Sss	
4141728	320000	5433600	77184	77190	WACKER		bedrock	Ma	W	V fn gr qtz sst grading to sltst in places	Sss	
4141729	319975	5433600	77184	77190	WACKER	0.8	bedrock	Ma	W	Fn gr qtz sst. Semi lithified	Sss	
4141730	319950	5433600	77184	77190	WACKER	1	C	Bd We	DB-B	Ferrug, v fn gr qtz sst grading to sltst	Sss-Ssi	
4141731	319925	5433600	77184	77190	WACKER		C	Bd We	B-G	Ferrug, v fn gr sst, minor interbedded sltst	Sss-Ssi	
4141732	319900	5433600	77184	77190	WACKER	1.2	C	Ma-Bd	B-DB	Ferrug, v fn gr qtz sst. Qtz veined. Minor sltst	Sss-Ssi	
4141733	319875	5433600	77184	77190	WACKER		bedrock	Ma	W	V fn gr, silica cemented, qtz sst	Sss	

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4141734	319850	5433600	77184	77190	WACKER	3	bedrock	Lm	W-G	Common poddy and fn d sem Py. Tr ?chlorite	Ssi	Py
4141735	319825	5433600	77184	77190	WACKER	1.2	bedrock	Ma	G	Tr v fn d sem sulphide	Ssi	Su
4141736	319800	5433600	77184	77190	WACKER		C	Ma We	B	Coarse sand introduced by roots	Ssi	
4141737	319775	5433600	77184	77190	WACKER		bedrock	Ma	W	Very fn to fn gr, well sorted qtz sst, silica cem	Sss	
4141738	319750	5433600	77184	77190	WACKER		bedrock	Ma	W	Very fn to fn gr qtz sst, silica cement	Sss	
4141739	319725	5433600	77184	77190	WACKER	3.2	C	Ma We	B		Ssi	
4141740	319700	5433600	77184	77190	WACKER	1.6	C	Lm	LB-G	Pyjama Siltstone. Coarse sltst to fine gr qtz sst	Ssi	
4141741	319675	5433600	77184	77190	WACKER	1.8	C	Ma We	B-DB		Ssi	
4141742	319650	5433600	77184	77190	WACKER		bedrock	Ma-Lm	G-LG	Micaceous	Ssi	
4141743	319625	5433600	77184	77190	WACKER	4.7	bedrock	Lm-Ba	LG-DG	Tr Py along some laminae	Ssi	Py
4141744	319600	5433600	77184	77190	WACKER	2.4	bedrock	Lm-Ba	LG-DG	Pyjama Siltstone	Ssi	
4141745	319575	5433600	77184	77190	WACKER	3	bedrock	Ma-Bd	LG-G	Common v fn vein sulphides	Ssi	Su
4141746	319550	5433600	77184	77190	WACKER	2.5	bedrock	Ma-Lm	G-LG		Ssi	
4141747	319525	5433600	77184	77190	WACKER	2	bedrock	Ma-Lm	G-LG		Ssi	
4141748	319500	5433600	77184	77190	WACKER		Trans-C	Lm	G-LG	Large silic frags. Cg contam?	Ssi-Cg	
4141749	319475	5433600	77184	77190	WACKER		C	Lm-Ba	LB-G		Ssi	
4141750	319450	5433600	77184	77190	WACKER		bedrock	Lm	LG-G	Pyjama Siltstone. Minor v fn vein Py	Ssi	Py
4141751	319425	5433600	77184	77190	WACKER		bedrock	Ma	W	V fn gr, silica cemented, qtz sst	Sss	
4141752	319400	5433600	77184	77190	WACKER	1	C	Lm Ma	W-N	Interbedded sst (or cover sands?) and sltst	Sss-Ssi	
4141753	319375	5433600	77184	77190	WACKER	1	C	Lm	B-G	Coarse sltst grading to v fn qtz sst	Ssi-Sss	
4141754	319350	5433600	77184	77190	WACKER	1	C	Lm-Ba	OB-G	Tr v fn Py along veins	Ssi	Py
4141755	319325	5433600	77184	77190	WACKER	1	C	Lm	OB-G	V fn gr qtz sst with minor sltst laminae	Sss	Py
4141756	319300	5433600	77184	77190	WACKER	4.7	bedrock	Lm-Ba	W-G	Sltst grades to v fn qtz sst. Minor v fn vein Py	Ssi-Sss	Py
4141757	319275	5433600	77184	77190	WACKER	2	bedrock	Ba-Lm	LB-G	V fn gr qtz sst grading to sltst	Sss-Ssi	
4141758	319250	5433600	77184	77190	WACKER	3	bedrock	Lm	VG-G	V fn gr qtz sst grading to sltst. Tr vein Py	Sss-Ssi	Py
4141759	319225	5433600	77184	77190	WACKER	1.5	C	Ba We	DB-G	V fn gr qtz sst grading to arg sltst	Sss-Ssi	
4141760	319200	5433600	77184	77190	WACKER	1.5	C	Ma-Lm	OB-G	Common veins and pods Py	Ssi	Py
4141761	319175	5433600	77184	77190	WACKER	1.2	C	Lm We	LB-LG		Ssi	
4141762	319150	5433600	77184	77190	WACKER		C-bdrck	Ma	LB-DB	Micaceous sltst	Ssi	
4141763	319125	5433600	77184	77190	WACKER	3.1	bedrock	Ma	W-N	Micaceous	Ssi	
4141764	319100	5433600	77184	77190	WACKER	3	bedrock	Ma	W-LG	Sltst gr to sst	Ssi-Sss	
4141765	319075	5433600	77184	77190	WACKER	2	bedrock	Lm-Ma	LG-G	Tr vein Py	Ssi	Py
4141766	319050	5433600	77184	77190	WACKER	2.8	bedrock	Ma	W-G	V fn gr qtz sst gr to sltst. Tr coarse Py	Sss-Ssi	Py
4141767	319025	5433600	77184	77190	WACKER	1	Trans-C	Ma	G	Cover gravels and clay?	Cg-Ccy	

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4141768	319000	5433600	77184	77190	WACKER	0.8	C	Ma	LG-DG	Some root intro coarse sand. Tr Py	Ssi	Py
4141769	318975	5433600	77184	77190	WACKER	1	bedrock	Lm	LB-DG	Micaceous, slightly silicified	Ssi	
4141770	318950	5433600	77184	77190	WACKER	2.2	bedrock	Ma	G-DG	Micaceous (along cleavage?). Sheared?	Ssi	
4141771	318925	5433600	77184	77190	WACKER	1.2	C-bdrck	Ma	DB-DG		Ssi	
4141772	318900	5433600	77184	77190	WACKER	3	bedrock	Lm-Ma	LG-G	Sltst, minor v fn gr, well sorted qtz sst. Tr Py	Ssi-Sss	Py
4141773	318875	5433600	77184	77190	WACKER	3.8	bedrock	Ma-Bd	VG-DG	V fn gr qtz sst with tr py and micac sltst	Sss Ssi	Py
4141774	318850	5433600	77184	77190	WACKER	0.8	bedrock	Ma	BG-DG	Silicified in places?	Ssi	
4141775	318825	5433600	77184	77190	WACKER	1	bedrock	Ma	DG-DB	Common v fn d sem sulphides (5%). Silic?	Ssi	Su
4141776	318800	5433600	77184	77190	WACKER	0.7	C	Lm We	OB-DB	Silicified in places	Ssi	
4141777	318775	5433600	77184	77190	WACKER	0.8	Trans-C	Ma We	DB	Very silicified. Limonite along fractures	Ssi	
4141778	318750	5433600	77184	77190	WACKER	0.7	C	Lm	G-B	Very silicified. Possibly transported?	Ssi	
4141779	318725	5433600	77184	77190	WACKER	1.1	C-bdrck	Lm	LG-G	?Pyjama Siltstone	Ssi	
4141780	318700	5433600	77184	77190	WACKER	0.8	bedrock	Ma	LG-LB	Sltst and v fn gr sst with cubic voids after Py	Ssi Sss	Py
4141781	318675	5433600	77184	77190	WACKER	1.5	bedrock	Ma-Lm	G	Tr coarse gr Py in veins and pods	Ssi	Py
4141782	318650	5433600	77184	77190	WACKER	3.2	bedrock	Lm	LG-G		Ssi	
4141783	318625	5433600	77184	77190	WACKER	2.2	bedrock	Ma	G	Common fn Py along veins	Ssi	Py
4141784	318600	5433600	77184	77190	WACKER	2	bedrock	Lm-Ma	G	Micaceous	Ssi	
4141785	318575	5433600	77184	77190	WACKER	2.5	bedrock	Lm-Ba	W-G	Sltst and minor v fn gr qtz sst. Trace Py	Ssi	Py
4141786	318550	5433600	77184	77190	WACKER	3	bedrock	Lm	LG-DG		Ssi	
4141787	318525	5433600	77184	77190	WACKER	1.5	bedrock	Ba-Lm	W-DG	Micaceous. Some rotted root matter. Tr vein Py	Ssi	Py
4141788	318500	5433600	77184	77190	WACKER		bedrock	Lm	LB-DG		Ssi	
4141789	318475	5433600	77184	77190	WACKER	1.2	bedrock	Lm	W-G	Micaceous	Ssi	
4141790	318450	5433600	77184	77190	WACKER		bedrock	Lm	W-DG		Ssi	
4141791	318425	5433600	77184	77190	WACKER		C-bdrck	Lm	LG-DG	Lam sltst and minor v fn gr qtz sst	Ssi-Sss	
4141792	318400	5433600	77184	77190	WACKER		bedrock	Lm	LG-DG	Trace mica and coarse, spotty Py	Ssi	Py
4141793	318375	5433600	77184	77190	WACKER		C	Ma We	B-DB	Micaceous	Ssi	
4141794	318350	5433600	77184	77190	WACKER		C	Ma We	B-N	Micaceous	Ssi	
4141795	318325	5433600	77184	77190	WACKER		bedrock	Lm	OB-DG		Ssi	
4141796	318300	5433600	77184	77190	WACKER		bedrock	Lm	OB-DG		Ssi	
4141797	318150	5434000	77184	77190	WACKER		C-bdrck	Lm	G-DG	Micaceous	Ssi	
4141798	318175	5434000	77184	77190	WACKER		C-bdrck	Ma We	OB-DB	7mm layer/vein coarse sulphide	Ssi	Su
4141799	318200	5434000	77184	77190	WACKER		Trans-C	Lm	LG-G	Sltst with Ccy contamination	Ssi-Ccy	
4141800	318225	5434000	77184	77190	WACKER		C	Lm-Ma	LG-G		Ssi	
4141801	318250	5434000	77184	77190	WACKER		bedrock	Ma-Lm	G	Common vein Py	Ssi	Py

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Sample No.	AMGE	AMGN	DPO #1	DPO #2	Sample Type	Depth m	Horizon	Texture	Colour	Comments	Field ID	Mineralogy
4141802	318275	5434000	77184	77190	WACKER	1.5	bedrock	Lm	LG-G		Ssi	
4141803	318300	5434000	77184	77190	WACKER	1.5	bedrock	Ma	W-LG	V fn to fn gr qtz sst with silica cement ip	Sss	
4141804	318325	5434000	77184	77190	WACKER	2.5	bedrock	Lm-Bd	LG-DG	Tr Py	Ssi	Py
4141805	318350	5434000	77184	77190	WACKER	4	bedrock	Lm	LG-G	Py in bedding parallel veins(2-5%)	Ssi	Py
4141806	318375	5434000	77184	77190	WACKER	2	bedrock	Lm-Bd	LB-G	Sltst grading to v fn gr qtz sst	Ssi-Sss	
4141807	318400	5434000	77184	77190	WACKER		C-bdrck	Lm	LB-G		Ssi	
4141808	318425	5434000	77184	77190	WACKER	1.5	bedrock	Ma Ba	B-DG	Sltst grading to v fn gr qtz sst	Ssi-Sss	
4141809	318450	5434000	77184	77190	WACKER	1	C-bdrck	Ma We	OB-G	V fn gr qtz sst with arg matrix	Sss	
4141810	318475	5434000	77184	77190	WACKER	1	bedrock	Ma	OB-G		Ssi	
4141811	318500	5434000	77184	77190	WACKER	1	bedrock	Lm-Ma	DBG	Micaceous	Ssi	
4141812	318525	5434000	77184	77190	WACKER	1	C-bdrck	Lm-Ma	G-DBG		Ssi	
4141813	318550	5434000	77184	77190	WACKER	1	C-bdrck	Lm	LG-DG	Pyjama Siltstone	Ssi	
4141814	318575	5434000	77184	77190	WACKER	1	C-bdrck	Ma-Lm	G-DG		Ssi	
4141815	318600	5434000	77184	77190	WACKER	1	C	Ma-Lm	DB-G		Ssi	
4141816	318625	5434000	77184	77190	WACKER		C-bdrck	Ma	DB		Ssi	
4141817	318650	5434000	77184	77190	WACKER		C-bdrck	Lm	LB-G	Pyjama Siltstone	Ssi	
4141818	318675	5434000	77184	77190	WACKER		C	Ma	DB	Micaceous	Ssi	
4141819	318700	5434000	77184	77190	WACKER		Trans-B	Ma	DB	Micaceous clay with siltstone fragments	Ssi	
4141820	318725	5434000	77184	77190	WACKER		bedrock	Ma We	B-DB		Ssi	
4141821	318750	5434000	77184	77190	WACKER		Trans-B	Ma	OB-G	Clay with sltst and sst fragments	Cg-Ssi	
4141822	318775	5434000	77184	77190	WACKER		bedrock	Lm-Bd	LG-DG		Ssi	
4141823	318800	5434000	77184	77190	WACKER		bedrock	Lm-Ma	G-DG	Micaceous	Ssi	
4141824	318825	5434000	77184	77190	WACKER		Trans	Ma	GB	Sandy, gravelly clay	Ccy-Cg	
4141825	318850	5434000	77184	77190	WACKER		C	Ma We	B-DG	Common coarse vein Py (2%)	Ssi	Py
4141826	318875	5434000	77184	77190	WACKER		C-bdrck	Lm	W-DG	Sltst fragments in grey clay. Tr Py	Ssi	Py
4141827	318900	5434000	77184	77190	WACKER		bedrock	Ma	W-LG	V fn gr qtz sst grading to sltst	Sss	
4141828	318925	5434000	77184	77190	WACKER		bedrock	Lm	LG-DG	Micaceous ip. Tr Py	Ssi	Py
4141829	318950	5434000	77184	77190	WACKER		C	Ma We	W-DB	Arg sltst	Ssi	
4141830	318975	5434000	77184	77190	WACKER		bedrock	Ma	W-LGB	V fn to fn gr qtz sst and kaolinitic sltst	Sss Ssi	
4141831	319000	5434000	77184	77190	WACKER		bedrock	Ma	W	V fn gr, silica cemented, qtz sst	Sss	
4141832	319025	5434000	77184	77190	WACKER		bedrock	Ma	W	V fn gr, silica cemented, qtz sst	Sss	
4141833	319050	5434000	77184	77190	WACKER		bedrock	Ma	W-LG	V fn gr, silica cemented, qtz sst	Sss	
4141834	319075	5434000	77184	77190	WACKER		C	Ma We	LB-B	Some Cg contam	Ssi	
4141835	319100	5434000	77184	77190	WACKER		C	Ma-Lm	W-DB	Kaolinitic?	Ssi	

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Sample No.	Si	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141329	0.07	2	-3	20	-1	1.21	102	-3	10	-0.001	0.8	8	-10
4141330	0.16	2	-3	8	-1	0.32	14	-3	-3	-0.001	0.5	14	-10
4141331	0.15	12	4	13	-1	0.54	69	-3	7	0.001	1.7	8	-10
4141332	0.05	65	24	12	-1	0.53	48	-3	8	-0.001	6.4	13	-10
4141333	0.04	9	5	12	-1	0.36	18	-3	6	-0.001	1	7	-10
4141334	0.06	8	23	747	-1	0.28	27	-3	4	0.001	0.7	9	-10
4141335	0.03	3	-3	19	-1	0.38	30	-3	-3	0.001	0.9	9	-10
4141336	0.11	4	3	17	-1	0.79	75	-3	3	-0.001	2	6	-10
4141337	0.09	3	-3	10	-1	0.53	57	-3	-3	-0.001	1.7	12	-10
4141338	0.05	6	-3	12	-1	0.79	110	-3	6	-0.001	1.1	-3	-10
4141339	0.14	5	-3	14	-1	0.82	151	-3	3	-0.001	0.6	7	-10
4141340	0.1	32	14	11	-1	0.72	72	36	13	0.001	83	4	-10
4141341	0.08	3	-3	8	-1	0.25	51	-3	-3	-0.001	1.1	5	-10
4141342	0.14	3	-3	8	-1	0.3	37	-3	-3	0.002	0.5	4	-10
4141343	0.15	3	-3	7	-1	0.29	33	-3	-3	0.001	1	7	-10
4141344		2	-3	6	-1	0.42	52	-3	-3	0.004	0.6	8	-10
4141345		4	-3	7	-1	0.24	12	-3	3	-0.001	0.6	5	-10
4141346		2	-3	8	-1	0.08	3	-3	-3	0.001	2.3	5	-10
4141347		4	-3	8	-1	0.38	18	-3	9	0.001	0.7	6	-10
4141348		3	-3	7	-1	0.22	13	-3	5	-0.001	-0.5	9	-10
4141349		3	-3	6	-1	0.22	9	-3	3	0.001	-0.5	5	-10
4141350		5	-3	6	-1	0.18	9	-3	-3	-0.001	0.6	-3	-10
4141351		3	-3	7	-1	0.23	28	-3	-3	0.001	-0.5	8	-10
4141352		12	-3	10	-1	0.33	21	3	4	0.001	3	8	-10
4141353		3	-3	8	-1	0.29	14	-3	3	0.004	1	6	-10
4141354		5	7	19	-1	0.57	39	-3	4	0.002	1.1	7	-10
4141355		13	-3	10	-1	0.58	107	-3	-3	0.002	1.3	10	-10
4141356		5	-3	12	-1	0.48	52	-3	4	0.004	1	12	-10
4141357		13	-3	18	-1	1.03	187	-3	5	0.002	2	10	-10
4141358		10	5	13	-1	0.43	58	-3	5	0.004	1.1	11	-10
4141359		6	3	19	-1	0.54	47	7	5	0.002	1.3	5	-10
4141360		5	-3	11	-1	0.38	39	-3	6	0.002	0.9	7	10
4141361		18	4	12	-1	0.56	47	-3	10	0.004	2.3	8	-10
4141362		5	3	13	-1	0.38	25	-3	-3	0.002	2.4	10	-10

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Sample No.	Si *10-3	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Co ppm	Ni ppm	Au ppm	As ppm	Sn ppm	W ppm
4141363		4	-3	13	-1	0.62	132	-3	-3	0.002	0.7	14	15
4141364		6	6	15	-1	0.41	55	-3	-3	0.001	1.3	5	-10
4141365		4	-3	11	-1	0.32	24	-3	-3	0.001	0.6	6	-10
4141366		5	-3	39	-1	2.25	180	-3	11	0.002	3.3	10	-10
4141367		28	5	16	-1	0.9	59	-3	6	0.004	1.3	11	-10
4141382		5	21	18	-1	0.6	46	3	-3	0.001	2.6	-3	-10
4141383		3	4	11	-1	0.21	34	-3	-3	0.001	1	9	-10
4141384		2	-3	7	-1	0.2	9	-3	-3	-0.001	0.9	-3	-10
4141385		13	13	10	-1	0.44	17	-3	-3	0.002	5.2	5	-10
4141386		56	16	12	-1	0.59	93	-3	3	0.001	1.1	10	-10
4141387		5	4	15	-1	0.8	91	-3	3	0.002	0.8	6	-10
4141388		8	5	8	-1	0.36	48	-3	4	0.002	1	6	-10
4141389		3	4	9	-1	0.25	42	-3	-3	0.004	0.5	4	-10
4141390		2	-3	9	-1	0.37	38	-3	-3	0.004	0.7	8	-10
4141391		3	-3	9	-1	0.3	18	-3	-3	0.004	0.7	9	-10
4141392		3	-3	7	-1	0.32	21	5	4	0.002	3.3	8	-10
4141393		2	-3	6	-1	0.16	8	-3	3	0.002	1.1	6	-10
4141397		3	-3	8	-1	0.36	86	-3	-3	0.004	0.8	7	-10
4141398		3	5	7	-1	0.67	116	-3	3	0.001	1.5	9	-10
4141399		7	-3	7	-1	0.7	232	-3	5	0.001	0.5	5	-10
4141400		46	9	9	-1	0.88	271	3	7	0.002	5.7	10	-10
4141401		8	5	8	-1	0.73	174	-3	9	0.002	1.4	6	15
4141402		4	-3	9	-1	0.58	97	-3	6	0.002	-0.5	6	10
4141479		5	5	16	-1	0.27	24	-3	9	0.002	2.6	4	-10
4141480		3	7	17	-1	0.19	14	-3	11	0.001	1.7	4	-10
4141481		3	6	8	-1	0.2	11	-3	-3	0.004	1.8	5	-10
4141482		21	3	9	-1	0.14	6	-3	-3	-0.001	2.1	6	-10
4141483		31	26	46	-1	3.22	105	13	17	0.006	11.3	8	-10
4141484		18	36	24	-1	1.17	93	3	10	-0.001	27.4	8	-10
4141485		60	29	57	-1	3.26	203	4	19	-0.001	6.4	6	-10
4141486		5	6	16	-1	0.88	126	-3	7	0.004	2.8	5	-10
4141487		10	10	17	-1	0.93	183	-3	3	0.002	5.1	9	-10
4141488		19	6	11	-1	1.29	58	10	21	0.006	3.7	10	-10
4141489		19	11	24	-1	1.08	189	4	20	0.004	7.5	11	-10

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Sample No.	Si	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141490		48	97	81	-1	2.17	64	20	40	0.006	6.3	8	-10
4141491		23	1788	1845	2	2.04	38	29	50	0.004	9.2	9	-10
4141492		24	105	1100	-1	1.44	47	13	28		3.5	9	-10
4141493		25	89	242	-1	1.22	69	10	23	0.002	1.3	10	-10
4141494													
4141495		10	62	1058	-1	1.94	186	9	25	0.002	31.7	8	-10
4141496		13	197	305	-1	2.08	99	10	32	0.002	2	11	-10
4141497		17	36	120	-1	2.54	340	9	24	0.001	63	6	-10
4141498		3	15	59	-1	1.04	136	-3	20	0.002	3.2	6	-10
4141499		3	6	12	-1	0.15	8	-3	17	0.002	6.1	-3	-10
4141500		3	4	10	-1	0.2	8	-3	9	0.004	1.6	-3	-10
4141501		5	7	113	-1	0.24	11	-3	13	0.002	0.9	6	-10
4141502		2	5	11	-1	0.17	5	-3	10	0.001	0.6	-3	-10
4141503		5	6	16	-1	0.15	5	-3	16	0.002	0.8	-3	-10
4141504		2	5	5	-1	0.16	5	-3	6	0.001	0.7	-3	-10
4141505		5	5	10	-1	0.52	33	-3	30		2.1	-3	-10
4141506		6	6	217	-1	0.87	83	-3	15		1.1	9	-10
4141507		10	25	36	-1	1.48	117	4	16	0.004	1.7	5	-10
4141508		2	7	16	-1	0.59	96	-3	9	0.011	0.8	12	-10
4141509		-2	4	10	-1	0.61	72	-3	7	0.004	5.2	7	-10
4141510		3	4	13	-1	0.78	47	-3	18		1.4	11	-10
4141511		27	11	414	-1	1.07	70	5	26		3	8	-10
4141512		2	44	95	-1	1.56	125	-3	11	0.001	8	5	-10
4141513		7	12	127	-1	0.97	83	3	13	0.006	8	4	-10
4141514		13	10	44	-1	1.29	107	11	23	0.002	23	5	-10
4141515		30	70	431	-1	1.87	104	32	29	0.004	47.9	10	-10
4141516		18	12	861	-1	0.74	37	-3	29	0.001	2.2		-
4141517		22	25	161	-1	1.76	149	9	22	0.001	9.3	5	-10
4141518		26	18	185	-1	2.04	219	7	22		10.8	7	-10
4141519		13	14	62	-1	1.5	124	8	16	0.001	36	6	-10
4141520		32	50	253	-1	1.93	154	13	28		15	8	-10
4141521		44	12	1450	-1	1.15	87	5	24		7.4	10	-10
4141522		12	7	22	-1	1.27	205	3	13	0.002	5.4	8	-10
4141523		16	10	24	-1	1.71	210	-3	15	0.002	5.7	7	-10

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Sample No.	SI	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141524		15	14	49	-1	2.09	255	4	23	0.001	8.6	5	-10
4141525		12	7	17	-1	1.3	76	3	27		44.9	-3	-10
4141526		20	27	183	-1	1.17	175	8	20	0.002	6.2	-3	-10
4141527		23	64	35	-1	0.51	68	-3	11	0.001	5.5	7	-10
4141528		42	26	41	-1	1.56	114	7	19	0.001	28.7	11	-10
4141529		6	12	15	-1	0.75	59	-3	10	0.001	1.6	8	-10
4141530		2	-3	9	-1	0.51	30	-3	12	0.001	-0.5	7	-10
4141531		6	4	7	-1	0.28	33	-3	17	0.001	0.9	8	-10
4141532		9	51	68	1	0.53	71	-3	13	-0.001	5.8	4	-10
4141533		63	30	79	1	5.4	467	34	49	0.001	92	7	-10
4141534		3	4	14	1	0.43	77	4	10	0.002	6.7	7	-10
4141562		5	-3	11	-1	0.97	91	-3	9	-0.001	6.7	10	-10
4141563		-2	3	10	-1	0.55	72	-3	6	-0.001	3.7	14	-10
4141564		7	5	6	-1	0.47	67	-3	4	-0.001	1	12	-10
4141565		3	-3	13	-1	0.71	71	-3	7	-0.001	1.3	9	-10
4141566		2	3	8	-1	0.64	101	-3	9	-0.001	0.9	13	-10
4141567		24	3	23	-1	1.78	173	8	48	0.002	7.3	13	-10
4141605		7	12	8	-1	0.14	14	-3	14	-0.001	1.5	10	-10
4141606		8	16	19	-1	0.48	31	4	16	-0.001	1.6	7	-10
4141607		7	13	15	-1	0.61	37	-3	7	-0.001	0.9	12	-10
4141608		13	43	46	-1	1.3	146	5	11	0.001	8.6	6	-10
4141609		19	31	54	-1	1.95	179	5	23	-0.001	4.3	14	15
4141610		22	49	99	-1	2.29	257	5	19	-0.001	5	12	-10
4141689	0.22	18	35	65	-1	3.66	221	15	74	-0.001	33	-3	-10
4141690	0.11	14	23	20	-1	1.52	172	7	13	-0.001	9.1	6	-10
4141691	0.11	11	18	13	-1	0.71	42	4	9	-0.001	5	5	-10
4141692	0.15	20	25	27	-1	2.17	218	12	16	-0.001	18	-3	-10
4141693	0.16	31	24	37	-1	2.22	233	7	14	-0.001	11	10	-10
4141694	0.11	13	17	28	-1	1.68	212	10	16	-0.001	13	6	-10
4141695	0.14	28	23	58	-1	2.72	240	10	28	-0.001	12	-3	-10
4141696	0.14	74	22	12	-1	1.27	82	6	12	-0.001	8.9	-3	-10
4141697	0.42	22	27	23	-1	3.57	237	11	28	-0.001	5.9	5	-10
4141698	0.13	32	28	25	-1	3.11	202	10	25	0.002	11	6	-10
4141699	0.15	20	17	13	-1	1.56	155	-3	6	0.004	13	5	-10

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Sample No.	Sl	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141700	0.09	5	13	4	-1	0.13	13	-3	5	-0.001	2.2	4	-10
4141701	0.63	6	17	6	-1	0.33	26	4	9	0.002	1.2	-3	-10
4141702	0.26	15	21	16	-1	3.72	689	3	20	0.001	3.9	-3	-10
4141703	0.11	5	15	7	-1	0.63	133	-3	12	0.002	2.6	-3	-10
4141704	0.13	14	19	28	-1	2.52	494	-3	34	-0.001	2.2	6	-10
4141705	0.12	26	25	19	-1	2.03	149	8	26	0.002	14	5	-10
4141706	0.12	6	21	12	-1	1.57	108	-3	20	0.002	1.6	-3	-10
4141707	0.12	15	22	8	-1	0.51	47	4	21	0.002	7.9	6	-10
4141708	0.13	13	23	16	-1	1.94	330	8	20	0.002	23	7	-10
4141709	0.17	8	26	15	-1	4.05	814	7	23	0.001	16	-3	-10
4141710	0.09	4	13	6	-1	0.63	54	-3	6	0.002	1.6	5	-10
4141711	0.13	16	20	11	-1	1.25	93	4	7	0.002	2.7	5	-10
4141712	0.15	48	31	21	-1	2.27	201	7	18	0.002	12	5	-10
4141713	0.2	20	35	72	1	5.3	741	7	21	0.004	2.1	-3	-10
4141714	0.23	32	80	21	-1	4.35	228	6	20	0.002	20	-3	-10
4141715	0.24	59	25	22	-1	3.83	259	18	41	-0.001	19	5	-10
4141716	0.2	30	30	30	-1	3.69	317	9	24	0.001	11	-3	-10
4141717	0.19	13	22	24	-1	3.54	309	6	17	-0.001	4.2	8	-10
4141718	0.17	15	71	58	-1	3.07	352	6	14	-0.001	7	-3	-10
4141719	0.09	3	19	14	-1	1.52	189	-3	12	0.001	10	6	-10
4141720	0.09	3	18	14	-1	1.79	196	4	13	0.002	3.3	-3	-10
4141721	0.06	70	33	4	-1	0.38	46	4	5	-0.001	16	5	-10
4141722	0.13	2	15	8	-1	1.18	153	-3	5	0.002	3.8	7	-10
4141723	0.11	5	16	26	-1	0.32	24	-3	7	0.001	2.5	4	-10
4141724	0.08	2	12	4	-1	0.17	12	-3	3	0.001	1.9	6	-10
4141725	0.1	2	12	3	-1	0.19	18	-3	5	-0.001	2	4	-10
4141726	0.29	3	13	3	-1	0.24	7	-3	17	-0.001	2.1	-3	-10
4141727	0.12	2	14	2	-1	0.21	5	-3	12	-0.001	1.7	9	-10
4141728	0.13	3	12	37	-1	0.08	5	-3	10	-0.001	1.9	-3	-10
4141729	0.07	3	8	4	-1	0.13	3	4	7	-0.001	2.1	-3	-10
4141730	0.05	7	16	4	-1	0.91	62	4	10	-0.001	5	9	-10
4141731	0.04	3	14	3	-1	0.18	9	-3	-3	-0.001	10	5	-10
4141732	0.07	15	22	11	-1	0.63	42	8	20	-0.001	12	-3	-10
4141733	0.32	3	12	8	-1	0.16	8	-3	18	-0.001	1.3	4	-10

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Sample No.	Si	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141734	0.11	12	12	39	-1	2.28	228	7	19	-0.001	24	7	-10
4141735	0.1	19	6	11	-1	0.57	37	7	11	-0.001	12	8	-10
4141736	0.11	3	9	9	-1	0.31	20	-3	13	-0.001	0.9	-3	-10
4141737	0.13	2	11	5	-1	0.13	14	3	12	-0.001	0.9	-3	-10
4141738	0.18	3	8	6	-1	0.09	15	-3	9	-0.001	9.2	-3	-10
4141739	0.11	2	14	27	-1	0.56	86	3	7	-0.001	2	7	-10
4141740	0.21	4	15	14	-1	1.2	189	5	14	-0.001	2.5	6	-10
4141741	0.09	47	30	16	-1	1.99	214	15	29	-0.001	18	7	-10
4141742	0.17	12	21	35	-1	2.9	362	6	23	-0.001	16	5	-10
4141743	0.13	16	20	36	-1	3.49	344	6	25	-0.001	9.7	-3	-10
4141744	0.12	23	16	40	-1	2.45	360	-3	17	-0.001	6.9	5	-10
4141745	0.16	24	14	30	-1	2.84	268	4	18	-0.001	17	4	-10
4141746	0.16	27	11	28	-1	2.92	284	9	35	-0.001	16	5	-10
4141747	0.16	12	15	22	-1	2.82	369	5	25	-0.001	40	8	-10
4141748	0.19	8	15	17	-1	1.73	224	-3	15	-0.001	9.6	8	-10
4141749	0.14	4	15	22	-1	2.11	336	-3	15	-0.001	0.5	6	-10
4141750	0.13	9	16	14	-1	2.26	304	6	24	-0.001	4.5	-3	-10
4141751	0.08	4	16	7	-1	0.17	40	-3	9	0.002	-0.5	-3	-10
4141752	0.15	24	30	11	-1	1.35	122	15	33	0.004	20	-3	-10
4141753	0.24	15	15	14	-1	1.02	126	-3	17	-0.001	1.1	6	-10
4141754	0.07	8	31	20	-1	1.28	157	-3	18	0.001	4.3	6	-10
4141755	0.14	20	21	18	-1	1.93	246	13	27	0.004	20	7	-10
4141756	0.13	9	17	21	-1	2.03	265	-3	25	0.002	4.8	7	-10
4141757	0.13	5	33	28	-1	2.06	306	-3	15	-0.001	3.8	4	-10
4141758	0.16	22	19	19	-1	3.37	188	15	25	0.004	24	6	-10
4141759	0.09	25	20	17	-1	1.35	117	-3	8	-0.001	8.6	6	-10
4141760	0.07	82	18	10	-1	0.61	47	-3	10	0.002	8.3	4	-10
4141761	0.11	4	11	7	-1	0.7	55	-3	6	0.004	1.3	9	-10
4141762	0.04	13	19	8	-1	0.4	23	4	11	0.001	14	5	-10
4141763	0.11	9	16	13	-1	1.15	121	-3	15	0.004	4.5	6	-10
4141764	0.13	5	14	24	-1	1.92	205	-3	12	-0.001	16	6	-10
4141765	0.07	21	42	61	-1	1.66	42	5	23	0.001	21	-3	-10
4141766	0.13	13	25	35	-1	1.76	124	12	20	-0.001	-0.5	-3	-10
4141767	0.07	9	13	6	-1	0.38	47	-3	11	-0.001	3.5	-3	-10

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Sample No.	St	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141768	0.07	5	10	10	-1	0.42	96	-3	9	-0.001	8.7	7	-10
4141769	0.06	4	14	13	-1	1.02	96	-3	5	-0.001	1.1	5	-10
4141770	0.12	8	9	26	-1	2.06	125	4	13	-0.001	4.6	7	-10
4141771	0.15	15	16	19	-1	0.97	135	-3	12	-0.001	6.3	6	-10
4141772	0.11	12	55	124	-1	2.08	171	11	23	-0.001	18	7	-10
4141773	0.14	19	18	81	-1	1.24	94	8	18	-0.001	19	-3	-10
4141774	0.14	5	11	29	-1	1.55	105	-3	16	-0.001	0.9	5	-10
4141775	0.11	3	10	41	-1	2.3	162	-3	15	-0.001	-0.5	4	-10
4141776	0.09	7	6	29	-1	1.37	103	3	14	-0.001	-0.5	6	-10
4141777	0.08	7	12	31	-1	1.46	113	-3	12	0.001	-0.5	8	-10
4141778	0.08	15	14	29	-1	1.38	118	-3	12	0.001	6	7	-10
4141779	0.11	31	12	22	-1	1.25	101	-3	9	-0.001	6.3	6	-10
4141780	0.15	7	10	57	-1	2.72	345	-3	7	-0.001	5.4	4	-10
4141781	0.09	14	11	25	-1	1.06	86	-3	11	-0.001	10	5	-10
4141782	0.17	17	28	45	-1	1.7	138	7	14	-0.001	15	7	-10
4141783	0.21	44	98	472	-1	3.52	159	25	33	0.002	42	5	-10
4141784	0.12	7	12	80	-1	2.25	203	-3	14	-0.001	4.5	4	-10
4141785	0.12	19	16	49	-1	3.1	241	22	38	-0.001	45	4	-10
4141786	0.18	30	32	66	-1	2.55	197	7	19	-0.001	2.4	5	-10
4141787	0.08	20	17	80	-1	2.49	119	20	35	-0.001	65	6	-10
4141788	0.08	52	18	47	-1	1.76	167	6	15	0.001	33	5	-10
4141789	0.08	2	14	12	-1	0.67	149	-3	6	-0.001	4.5	7	-10
4141790	0.15	19	18	35	-1	2.48	191	7	12	-0.001	8.7	7	-10
4141791	0.05	13	14	11	-1	0.59	38	-3	7	-0.001	5.1	6	-10
4141792	0.09	13	15	46	-1	2.92	129	10	39	-0.001	14	9	-10
4141793	0.12	23	17	28	-1	1.31	107	8	25	-0.001	37	5	-10
4141794	0.12	40	30	13	-1	0.82	119	-3	12	-0.001	13	8	-10
4141795	0.11	4	13	18	-1	0.67	175	3	9	-0.001	2.8	5	-10
4141796	0.11	3	15	12	-1	0.78	233	9	16	0.002	26	6	-10
4141797	0.17	-2	10	17	-1	1.33	166	-3	13	0.004	4.6	7	-10
4141798	0.3	63	26	92	-1	11.7	612	31	245	0.004	50	8	-10
4141799	0.1	-2	12	14	-1	0.86	44	-3	-3	0.001	5.8		
4141800	0.1	-2	7	12	-1	1.25	131	-3	6	-0.001	1.9	6	-10
4141801	0.11	15	13	11	-1	1.19	96	4	9	0.002	10	10	-10

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Sample No.	Sl	Cu	Pb	Zn	Ag	Fe	Mn	Co	Ni	Au	As	Sn	W
	*10-3	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4141802	0.12	12	11	16	-1	1.42	272	-3	11	-0.001	4.4	7	-10
4141803	0.1	8	28	46	-1	1.53	200	-3	6	-0.001	2.9	-3	-10
4141804	0.19	25	18	63	-1	2.44	169	14	27	0.011	10	7	-10
4141805	0.09	49	30	68	-1	2.42	19	28	31	0.004	34	6	-10
4141806	0.15	26	21	134	-1	4.52	123	66	88	-0.001	39	5	-10
4141807	0.12	53	47	50	-1	1.07	106	-3	16	-0.001	8	8	-10
4141808	0.3	19	26	110	-1	1.4	145	10	29	-0.001	18	5	-10
4141809	0.1	8	21	18	-1	0.57	82	4	8	-0.001	4.7	4	-10
4141810	0.09	10	13	28	-1	0.94	97	5	17	0.001	3.8	6	-10
4141811	0.11	22	51	115	-1	1.53	163	7	10	-0.001	5.9	7	-10
4141812	0.1	6	13	11	-1	0.64	107	3	8	0.01	2	9	-10
4141813	0.13	44	30	20	-1	1.34	92	6	11	0.001	6.5	7	-10
4141814	0.1	4	10	14	-1	1.64	96	5	10	-0.001	4.3	10	-10
4141815	0.06	4	28	21	-1	0.59	100	-3	12	-0.001	2.8	7	-10
4141816	0.12	25	47	29	-1	1.68	110	6	21	-0.001	6.7	11	-10
4141817	0.06	-2	10	12	-1	0.54	19	-3	7	0.004	2.4	7	-10
4141818	0.05	109	864	17	-1	0.62	10	4	11	-0.001	20	-3	-10
4141819	0.07	43	70	21	-1	1.01	35	7	16	-0.001	17	-3	-10
4141820	0.1	2	10	32	-1	1.02	70	6	8	-0.001	2.1	8	-10
4141821	0.07	3	14	12	-1	0.39	63	7	5	0.001	1.9	7	-10
4141822	0.12	-2	13	11	-1	0.7	117	3	11	-0.001	2.1	10	-10
4141823	0.09	-2	10	10	-1	0.46	54	5	5	0.001	1.4	8	-10
4141824	0.08	5	9	6	-1	0.18	7	3	9	-0.001	-0.5	10	-10
4141825	0.09	16	12	11	-1	0.74	10	8	10	0.001	15	11	-10
4141826	0.13	5	10	7	-1	0.53	39	-3	7	-0.001	-0.5	12	-10
4141827	0.18	4	8	7	-1	0.37	23	-3	14	0.001	-0.5	6	20
4141828	0.27	43	18	12	-1	3.25	370	6	19	-0.001	8.7	6	10
4141829	0.09	3	16	6	-1	0.44	111	-3	7	-0.001	5.7	9	-10
4141830	0.11	2	13	6	-1	0.35	76	-3	7	-0.001	3	7	-10
4141831	0.16	5	9	5	-1	2.24	56	-3	13	-0.001	5.1	8	-10
4141832	0.06	10	12	6	-1	0.3	15	-3	8	-0.001	3.9	5	-10
4141833	0.22	3	7	2	-1	0.16	27	-3	6	-0.001	3.9	10	-10
4141834	0.07	-2	11	5	-1	0.42	79	-3	8	0.001	1.7	10	-10
4141835	0.1	-2	15	7	-1	0.49	68	-3	6	-0.001	1.7	10	-10