SOUTH AUSTRALIA

DEPARTMENT OF MINES AND ENERGY

# OPEN FILE ENVELOPE NO. 8585

## EL 1416, BENDIGO STATION

## Partial Surrender Report

Submitted by

Cracow Resources Ltd

1992

# ENVELOPE 8585

**TENEMENT:** EL 1416, Bendigo Station

**TENEMENT HOLDER:** Cracow Resources Ltd, Fairview Gold Pty Ltd

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# EXPLORATION LICENCE 1416

## Bendigo Station Area- South Australia

## First Relinquishment Report

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# First Relinquishment Report
# Exploration Licence 1416 - Bendigo Station Area

## Introduction

El 1416, located 220 km north of Adelaide in South Australia (Figure 2), was granted to Fairview Gold Pty. Limited (Fairview) on August 6th 1987. The licence covers an area of 2553 sq. km. between Kiaora Station in the south to Old Whydown Station 90 km to the north. The area was reduced to 1331 sq.km on July 26 1991 and the expiry date extended to February 5th, 1992. A second extension for a further six months has been granted for an expiry date of August 5th, 1992.

Fairview was acquired 100% by Cracow Resources Limited (Cracow), a company listed on the Australian Stock Exchange, on 13 November, 1991. Upon completion of the takeover Cracow has assumed full responsibility for administration and exploration of the licence and has been responsible for the preparation of this relinquishment report.

The relinquished portion of EL 1416 is contained within three separate blocks referred to as Blocks A-C. An outline of the areas is described in Table 1 and shown in Figure 2. This report is a compilation of the fieldwork carried out on these areas by Fairview Geologist Mr. F.F. Greene.

## Location and Access

EL 1416 is located 220 km north of Adelaide and 100 km east of Peterborough in the northern Mount Lofty Ranges. The Barrier Highway and the Adelaide-Broken Hill Railwy pass near the north western corner of the area. Access within the permit is over numerous rural roads and station tracks. The area is gently undulating to flat with sparce vegetation and is principally used for grazing sheep.

## Regional Setting and Geology of EL1416

EL 1416 overlies portion of the Nackara Arc, a major tectonic element of the Adelaide Geosyncline and contains sedimentary rocks which form part of the Adelaide System of Upper Proterozoic age. The sediments were deformed into a series of broad elongate synclines and faulted anticlines during the Delamarian Orogeny which commenced towards the end of the Cambrian. Within EL1416 the folds and associated faults strike predominantly in a north easterly direction.

Complex diapiric bodies of carbonate-cemented breccia occur throughout the Adelaide Geosyncline and a number of these occur around and possibly within EL 1416. Thes structures may have formed syndepositionally and/or as part of the Delarmarian Orogeny. A syntectonic granitoid, the Bendigo Granite, of possible Ordovician age intrudes the Adelaidian sequence in the southern part of EL 1416.

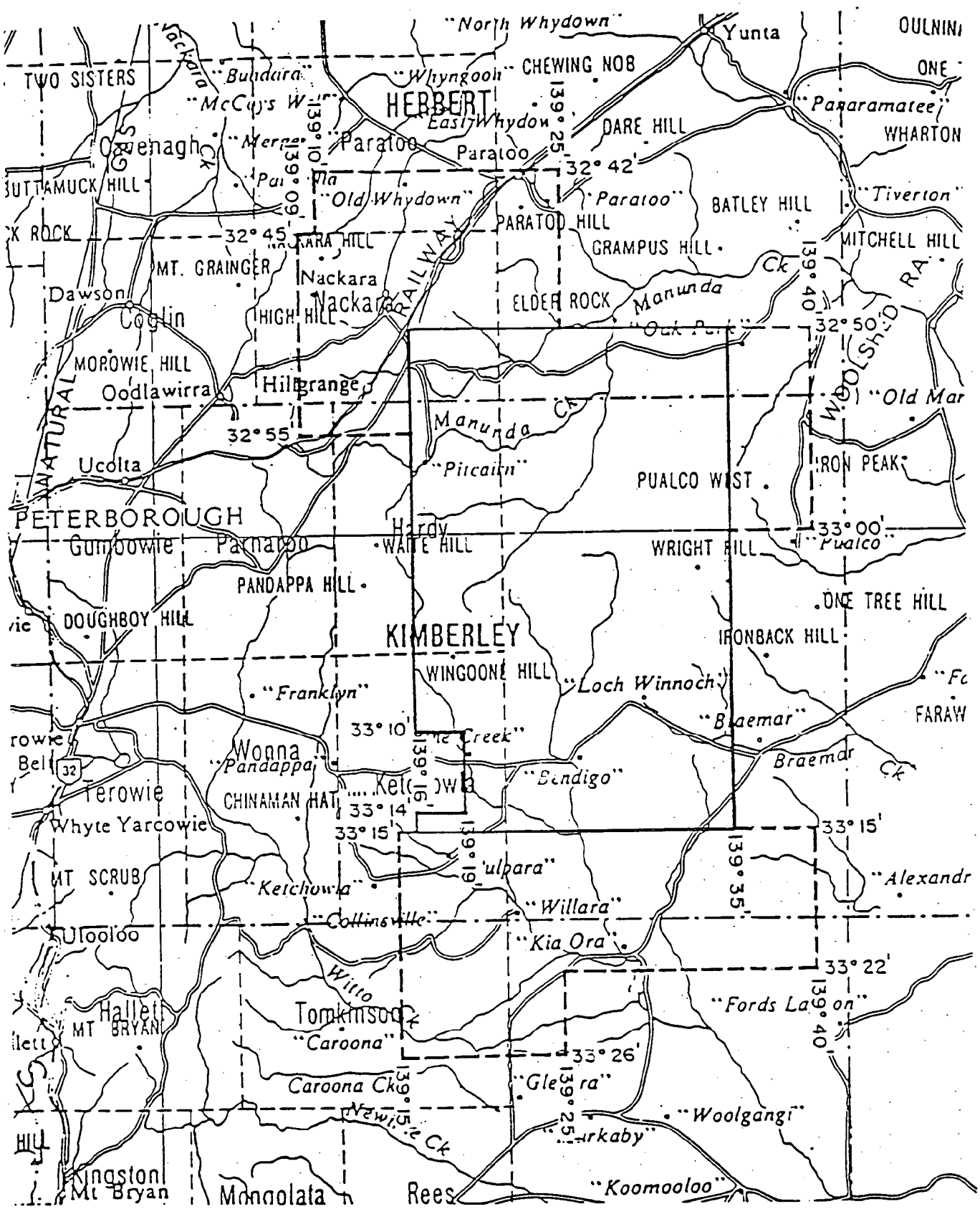


Figure 01. Location plan. Bendigo Area (EL 1416), Mount Lofty Ranges, South Australia. Tenement boundary shown in solid lines, relinquished ground by dashed lines. 1/50,000 scale.

The Adelaidean sediments have been metamorphosed regionally to greenschist facies and there is an extensive zone of contact metamorphism associated with the Bendigo Granite. Extensive zones of hydrothermal alteration have been reported associated with some of the diapiric structures.

Gold and base metal mineralisation are widespread in the Adelaide Geosyncline. Within EL1416 a number of small vein hosted gold and copper deposits are known but no significant production has been reported.

**EL 1416 Selection Criteria**

EL 1416 is esentially a bluesky exploration area for gold and basemetal deposits selected by Fairview on the basis of the following concepts:

1) The area is located in the axial portion of a the Nackara Arc, a potentially favourable area for the hosting of substantial mineral deposits.

2) The Bendigo Granite intrudes part of the area and may provide a heat source for the mobilisation and concentration of metal deposits.

3) Both gold and copper mineralisation are commonly associated with diapiric structures of the type which within and around the licence area.

**Exploration Programme**

Fairview geologist Mr. F.F. Greene employed the technique of extensive ground traverses in the evaluation of EL1416 during which detailed observations are made of the lithology, structure, alteration and extent of all exposures traversed. Rock chip samples are taken for analysis from those areas which may contain significant mineralisation. All observations are referenced by a location number and grid reference established by carefully transferring the location established from an air photograph to a topographic map. This technique has proved successful for Mr. Green in the discovery of ecomomic mineral deposits in other little explored areas.

Extensive traversing was carried out on block A (north west corner) and B (north east corner). Only a limited amount of field work was carried out on Block C (south). No observations were made in these blocks which would suggest the occurrence of significant mineralisation and it is on this basis that the areas have been relinquished.

**Report Data**

All field notes with the appropriate field number and grid reference for each field station within the areas relinquished are provided in the Appendix. Analytical data from rock chip samples and a glossary of abbreviations are also provided. The areas relinquished are shown on the attached map (in pocket). Within the relinquished areas the numbered field station locations are also shown.

# Appendix 1

## Field Notes - Relinquished Areas
## EL 1416

# GLOSSARY OF ABBREVIATIONS

| | |
|---|---|
| add'v | additive |
| Al | aluminium |
| alluv | alluvium |
| alter'n | alteration |
| amt | amount |
| ang | angular |
| approx | approximately |
| arg | argillic |
| bed | bedding attitude |
| blk | black |
| blu | blue |
| brecc'n | brecciation |
| brg | bearing, compass |
| brk | brick (colour) |
| brn | brown |
| calc's | calcareous |
| cavs | cavities |
| cell'r | cellular |
| cgl | conglomerate |
| chalc | chalcopyrite |
| chl | chlorite |
| cleav | cleavage |
| cly | clay |
| comp'n | composition |
| dev'd | developed |
| diam | diameter |
| diss | disseminated |
| dk | dark |
| dol | dolomite |
| efferv's | effervescence |
| fn | fine |
| fn'ly | finely |
| fract | fracture |
| gen | general |
| grn | green |
| grnd | grained |
| gry | grey |
| hem | hematite |
| hrd | hard |
| intercal'ns | intercalations |
| irreg | irregular |
| jt | joint |
| kimb | kimberlite |
| lam | lamination |
| lam'd | laminated |
| lim | limonite |
| limestn | limestone |
| loc | location |
| lt | light |
| med | medium |
| min | mineral |
| m/m | metamorphic |
| monz | monzonite |
| mudstn | mudstone |
| non-min | non-mineralized |

| | |
|---|---|
| excav'n | excavation |
| exp'd | exposed |
| felds | feldspar |
| ferrg | ferruginous |
| flt | float |
| Fm | Formation |
| princ | principal |
| prob'ly | probably |
| prod'v | productive |
| prosp | prospect |
| pyt | pyrite |
| qtz | quartz |
| qtzite | quartzite |
| qtzose | quartzose |
| rd | red |
| rk | rock |
| rn'd | rounded |
| $S^{=}$ | sulfide |
| sandstn | sandstone |
| sed | sediment |
| ser | sericite |
| SG | specific gravity |
| sid | siderite |
| silic | silicic |
| o/c | outcrop |
| o/lain | overlain |
| ox'n | oxidation |
| phenos | phenocrysts |
| pnk | pink |
| prev's | previous |
| sltstn | siltstone |
| slt | slight |
| slt'ly | slightly |
| sol'n | solution |
| spec | specular |
| sta | station,geologic |
| stn'd | stained |
| str | strong |
| str' | structure |
| tex | texture |
| topo | topographic |
| vn | vein |
| w/o | without |
| wh | which |
| wht | white |
| Xta | crystal |
| yel | yellow |

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# EL 1416 - Relinquished Area A

## Field Notes

Note: All field notes referenced by field location number and map grid reference.

06 314300/6331050. Terowie-Bendigo HS road. Caroona 1/100 0 sheet. Road a/c's expose Tapley Hill fm (Umbertana Group), finely W5+, slaty cleavage also more massive interbeds (50 cm) carbonate (dolomite) sandstn, yel brn, bleached. Bed: 180/60W (I).

07 315930/63330500. Road cut exposing purplish to gry grn slate with excellent slaty cleavage with fine dolomitic lamina and bed to 20 cm thickness.. Excellent bed: 170/55SW (2) qtz veinlets milky wht, conchoidal fract'r, with weak FeO, mostly paralleling beds.

136 334885/6324235. Shallow prospect pit. Princ rk type is monzonite rare qtz. Mullock includes large chunks (15 cm) qtz vn material. Qtz vn not visible in prospect. Mullock qtz carries minor diss pyt. Also note a yellowish-bloom on fresh surfaces (As?). Sample **B23R** taken of qtz.

290 350280/6367085. West Riley's Dam Quartzite (Grampus Qtzite) near contact (to west) with Ulupa Siltstn. Forms a prominent 60° trending ridge standing 40 to 50 m in relief. Fairly massive. Fract cleav: 55/65NW. Regional bed: 55/50NW. Hand lens inspection shows mostly qtz with less amts feldspathic material and clays.

305 340650/6368600. Grampus Quartzite. Laced with qtz vns, milky wht, often coated on fracts with spec hematite. Joints: 10/50SW. Fract cleav: 30/75SE. Qtz vns tend to parallel joints. 350 m around end of ridge to east side find aboriginal markings. Consist of chipped-out circular designs and crude arrows pointing from one circle to another. Two photos taken (the first including a blue-tongue lizard). Most interesting is that showing arrows pointing 205° m from one small circle to a larger one. Three arrows. An indication of one water hole to another?

306 341490/63920. Ulupa Siltstn. Gry-grn. Bed: 355/30SW. Fract cleav: 40/80NW.

331 345670/6366810. Hill top. Ulupa Siltstn, numerous qtz vns large (50-70 cm) milky white, strike length 50 m at best Sample **B51R**. Occupy mostly top of hill. Fract cleav: 35/85NW. Bed: 310/30NE(II), 2nd bed: 310/20NE(I). Trend of qtz vng 270/75N.

332 345480/6367375. Hill top (418). Ulupa Silstn, lt gry-grn. Well-dev'd fract cleav: 40/85NW. Bed: 340/zone(II).

333 344700/6368620. Hill top (460). Ulupa Siltstn. Gry-grn, well-dev'd fract cleav: 40/80NW. Bed: 300/15NE(II). 2nd bed: 285/25NE(I), 3rd bed (at very top of hill): 315/zone(I). Fract cleav: 335/85NW.

334 344285/6369060. Hill top (442). Ulupa Siltstn. Gry grn, well-dev'd fract cleav: 35/85NW. Bed: 330/30NE(I).

335 344000/6369385. Hill top (468) Ulupa Siltstn. Gry grn. Poorly dev'd fract cleav: 30/90. Bed: 15/55NE(I). Gen fn'ly lam'd. Rare qtz vns, one to 10 cm thick, milky wht, 55/80NW, non-productive appearing.

336 343775/6370590. Hill top (448) Ulupa Siltstn. Well-dev'd fract cleav: 30/85SE. Bed: 25/45SE (Regional). Bed: 25/40SE(I).

337 344520/6371100. Creek bed, 2 m o/burden on Ulupa Siltstn. Str'ly decomposed W7. Bed: 10/45SE. 120 m downstream (easterly) Ulupa Siltstn: N/50SE, 2nd bed: N/40SE(I).

338 345700/6371790. Creek bed, Ulupa Siltstn. Bed: 355/20NE(I). Fract cleav: 30/90 poorly dev'd.

339 346430/6372075. Ulupa Siltstn. Gry grn. Quite massive appearing. Fract cleav: 35/90. Bed: 350/30NE(II).

340 346465/6372890. Hill top. Fract cleav: 35/80SE. Found old survey stake (10-12 yrs old), former explor'n? Bed: N/20E(II).

341 345085/6372250. Hill top (472). Ulupa Siltstn. Well-dev'd, fract cleav: 20/90. Bed: 350/50NE(II).

342 344425/6373020. Ulupa Siltstn. Well-dev'd fract cleav: 30/75SE. Bed: 20/35SE(I). Non-reactive to HCl.

343 343720/6373585. Ulupa Siltstn. Fract cleav: 25/80SE. Bed: 10/40SE(I). Fn'ly lam'd, dk gry. Non-reactive to HCl. Some beds quite massive appearing to 60 cm thickness, gen form resistant o/c's.

344 342815/6373815. Boulder tillite in qtzo-felds matrix. Thin alternating blk and wht bands 1-3 mm thick, on east side of ridge. Spine of ridge consists of dk gry brn qtzose sandstn 2 m thick, bed: 10/80SE. On west side of ridge rks become quite qtzo-felds'c, slt'ly rd brn and excessively pitted. 2nd bed: 10/60SE in coarse but distinctive bedding lam's in latter sandstn. Photo taken view looking 200°. Grampus Qtzite. Boulder tillite found only on east side.

345 344075/6374520. Site of windmill and tank. Ulupa Siltstn, well-dev'd fract cleav: 35/60SE (Bed also).

346 343160/6369415. Ulupa Siltstn. Gry grn, fn'ly bedded: 10/40SE. Fract cleav: 35/85NW.

347 343920/6367725. Creek bed. Ulupa Siltstn. Creek bed exposes rolling anticlines and synclines, amplitude 4 m plunge: 15° in direction 30°. Fn'ly lam'd gry grn siltstn. Most persistent bedding: 30/50SE. Fract cleav: 35/90. Jointing: 310/85SW.

348 351105/6378625. Ulupa Silststn, dk gry, well-dev'd fract cleav: 70/70SE. Relatively massive producing unusually prominent o/c's to 3 m relief, particularly in valley walls.

349 351110/6378450. Ulupa Siltstn. Dk to metallic gry, fract cleav: 40/85SE. Bed (Regional hills to immediate SE): 65/20SE(I).

350 351990/6378950. Ulupa Siltstn. Fract cleav: 60/65SE.

351 351505/6379930. Ulupa Siltstn. Hill top. Fract cleav: 55/85SE. Bed: 55/20SE(I).

352 350980/6379665. Ulupa Siltstn. well-dev'd fract cleav: 40/90. Bed: 45/45SE(I).

353 350085/6379210. Station Hill north of Paratoo HS. Ulupa Siltstn. Fract cleav: 35/40SE (also bed).

354 349480/6378500. Ulupa Siltstn. Paratoo Creek, N bank. Fract cleav: 70/75NW. Bed: 35/35SE.

355 350225/6376830. Mudstn, blk, calcareous. Bed: 65/40SE(II).

356 350030/6376810. Mudstn (shale) blk, calcareous. Fract cleav: 50/50SE (also bed). Bunyeroo Formation.

357 349025/6376935. Ulupa Siltstn. Fract cleav: 55/85NW. Bed: 30/25SE(II), 2nd bed: 30/25SE regional measurement on hill to immediate north. Appear to be darker gry grn than ordinary, str reactive to HCl.

358 347380/6373530. Ulupa Siltstn. Fract cleav: 45/85SE. Dk gry grn. Non-reactive to HCl.

359 348385/6372670. Sandy Creek Well. Ulupa Siltstn exposed in sharp bend in Sandy Creek. Bed: 340/20NE. Fault gouge well-exposed on north side of creek: 290/85NE. Beautifully constructed old stone, stock watering tank here.

382 337875/6363075. Felds-lithic sandstn, lt grn gry. Str'ly reactive to HCl. Fract cleav: 30/90. Bed: 30/75SE(II). Tillite, containing numerous small, well-rnd' pebbles and few cobbles, gen 3 cm diam. Locally host weathers to lt gry grn clayey product.

385 339930/6366325. Old mine workings. Adit driven 270° for 60 m. Rk o/c at portal are med gry grn siltstn, massive. Bed: 30/70SE. 17 m in from portal contact with qtzite, slt'ly pinkish due to FeO-staining of matrix. Contact is slightly sheared, exhibiting 1 m str leaching of siltstn, drag material and minor brecciation. Siltstn attitude: 05/75SE. Qtzite attitude: 05/70SE. No veining or other min brg str observed in workings or mullock. Width of adit: 1.6 x 1.8 m height. According to local knowledge, workings were for gold.

386 340640/6367185. Ulupa Siltstn. Well-dev'd fract cleav: 30/85SE. Bed (regional measurement on hills to immediate south): 25/45SE(I); to immediate north: 05/45SE(I).

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387 340705/6364100. Creek bed. Ulupa Siltstn. Fract cleav: 35/85NW. Bed: 30/80SE, 2nd bed: 20/60SE(I). Olive grn gry. Non-reactive to HCl.

388 335880/6361485. Ridge N38E, mod relief with relatively dense scrub timber. Qtzo-felds sandstn. Platy, x-bedded. Diss lim specks after pyt. Weathers to lt brn on exposed surfaces, quite wht on fresh. Well-dev'd fract cleav: 20/85NW. Some beds with ferruginous cementing medium lending pinkish color to matrix. Several shallow (1-2 m deep) prospects along crest of ridge which open ferruginous qtz vns, 8-9 cm thickness.

389 334950/6360680. Creek bed, exposes gry grn siltstn down 1.5 m thru soil, str'ly reactive to HCl. Platy str. Bed: 25/80NW(I). Some bed quite calcareous exhibiting typical rounded erosion pattern. Suspect Tarcowie Siltstn.

390 334655/6361380. Qtzose sandstn. Diss lim specks, lends slightly ferruginous appearance to matrix. Even tex, fn grnd. Massive. Interbedded with dk, slt'ly metallic gry mudstn, non-reactive to HCl. Platy fract: 35/85NW. Width of sandstn member 12 m, forms crest of ridge. Qtz vng, slt greasy lustre, supports clots good rd brn lim-hem.

Fract cleav on west side of ridge: 40 m W of Sta: 20/80SE (bed also?), rk is dull metallic gry mudstn with phyllosilicates. Limonite pseudomorphs after pyt, diss, trace amts to1%. Thin 1 mm hair-like streaks, discontinuous, bld-rd-brn limonite. Frequent qtz vng along ridge crest. Sample **B66R** from ferruginous vn: 20/85SE, 32 cm wide, slt greasy lustre, with vugs filled with productive-appearing lim-goethite, bld-rd. Vn itself laced with thin, hair-like seams FeO. Ferruginous material resembles jasperoid, as if baked against qtz. Sample site loc'd 165 m brg 25° from Sta. Sta 390 loc'd on what appears to be highest point along ridge this area.

391 334035/6360820. Qtzose sandstn. Exhibits streaking, or fine banding (1-3 mm) parallel to bed'g, slt'ly rd brn. Bed: 20/85NW. Qtzose beds hosted by gry siltstn. Abundant qtz vng to 50 cm thickness. One vn (?) resembles diatreme dike, comprises mix of rnd' and ang'r clasts to 3 cm. Sample **B67R**. Str pinches and swells from 30 to 80 cm, strike length 50 m. Constituents resemble jasperoid (brn, glassy), qtzite and a phyllosilicate-rich rk, also qtz.

v

Vugs gen filled with rd-brn lim-hem. Attitude of str: 25/80NW. Qtz vng (1-5 cm) laced throughout str and x-cutting same.

392 333655/6360660. Qtzose sandstn. Slt'ly punky (ie, friable) exhibiting yel argillic color. Gen 2.5 m thick: 25/85SE. Hosted by silty-sandy qtzose sandstn with diss FeO specks and filling thin fracts, gives rk slt reddish color. Platy fract: 30/85SE. Qtzose sandstn quite massive forming ridge crest. Well jointed: 305/85SW.

393 333720/6361640. Railroad cut. Mudstn, dk gry platy str. Locally bleached nearly wht. Bed: 20/75SE(I).

394 334725/6364215. Wheal Bassett. Rock quarry used to provide rail bedding. 25 m deep opencut. Rks are excessively bleached and leached, orig choc brn, slt reactive to HCl. Fn'ly bed: 80/50NW(III). Minor qtz. Walls exhibit extensive deform'n of beds. Fault: (loc'd centrally): 195/25SE, gouge 25 cm wide, non-min. According to GSSA rks here are Tindelpina Shale (choc brn, well-lam'd) and Apilla Tillite. No indication of Cu mineralisation, 2nd bed north side: 345/60NE(I).

395 335825/6364930. Dry gully adjacent to railroad. Clayey siltstn, lt gry, bleached, occasionally with purplish color. Supports minor S= casts prob after pyt. Non-reactive to HCl. Bed: 10/65SE(I). Joints: 285/30N, gen coated with purplish-brn FeO product. Minor leisgang banding.

Adjacent railroad cut 70 m northerly of Sta exposes clayey siltstns, vari colored, abundant FeO staining, some bleaching. Bed: 10/65SE(II).

396 335570/6365385. Ridge, low relief, trend N53E. Crest comprised of qtzite, 3 m thick, with wk FeO pervasive in matrix. To east rks are limestone (str react'n to HCl). Old excav'n, several metres in diam, exposes lt blu-gry siltstone, no min'zn of significance, suspect $CaCO_3$ source.

397 335325/6365870. Extensive prospect and small mine excavations. Vertical shaft 3 m deep cut in SE side of hill, 2nd shaft to immediate east has been back-filled, mullock heap hints at 10-12 m depth. Qtz vn exposed in wall (first shaft), 10 cm pinches and swells to 20 cm, attitude: 60/75NW contains irreg clots well-

indurated limonite, qtz exhibits slt greasy lustre. Host rk is qtzose sandstn, sugary and blu-gry shale with diss casts after pyt 1%. Fn'ly lam'd. Bed: 60/50NW dip increases locally to 75NW.

Abundant and widespread qtz vng, some enechelon but most paralleling bed'g, pinching and swelling resembling stockwork. Most qtz in mullock supports the fine cellular box-work of former massive S=. Sample **B68R**, excellent lim and cell'r str. At least two more shallow (1-2 m original) prosp pits found SW'ly along ridge crest (just east of crest line). Host rk is pebbly tillite. Fract cleav: 355/90, trend of prolific qtz vng.

398 334890/6365395. Hill top (516). Rock type is silty slate, grn gry. Well dev'd fract cleav: 35/80NW. Supports narrow dol ls, well-dev'd qtz vn on top west side of hill, 40 cm thick, 25/80NW, milky wht. Bed: 55/80SE(II), shows in fn lam'r str of limestn.

399 334720/6365725. Area of intensive prospecting and small-scale mining. Mostly vertical shafts, one to at least 15 m depth (based on mullock heap). Host rock to ferruginous qtz vng is clayey siltstn with diss lim pseudomorphs after pyt. Thin dol limestn beds. Productive material in mullock is ferruginous qtz vn to 20 cm thickness, contains lim clots, some with vry good cellular str after massive S=.

Works are quite extensive compared to other workings observed. Qtz is gen fract'd and rehealed with S= veinlets (hair-size). Sample **B69R** from vn boulder 60 cm thick, has been shattered and rehealed with siliceous FeO mix, numerous vugs with lim. Suspect area may have been productive on small scale, Cu, Au.

400 334435/6365390. Hill crest. Qtzose sandstn, fairly resistant, rd=brn due diss specks that have diluted into the matrix. Fract cleav: 45/85NW. The qtzose bed is hosted by blu-gry slaty shale which supports diss FeO specks after pyt. Pebbly qtzite beds, tillite (?) well-indurated, 2-3 m thick. Bed: 45/85SE.

401 332855/6365715. Area of previous extensive opencut and less underground (shafts) mining. Most workings bulldozed in concealing mineralisation. Rock type silty sandstn, blu-gry, fn'ly lam'd. Exhibits the zebra striping dev'd by alternating lt and dk (FeO-rich) bands (1-5 mm thick). Non-reactive to HCl. Bed: 45/85NW(I). Some shafts timbered with local trees. Trace amts

CuO staining. Vry little qtz vn material! Sample **B70R**, ferruginous qtz vn with abundant CuO.

402 332365/6365180. Formerly a large opencut (see map for dimensions) now in part back-filled. Conceivably these could have been used as road metal borrow source. Princ rk is blu- to purplish-gry silty sandstn. Bed: 35/85NW. Minor qtz vng parallels beds, 5-10 cm thick. Sample **B71R**.

403 332025/6365035. Another back-filled opencut. Clayey siltstn, blu-gry, easily erodible. Bed: 30/80SE(I). Fn'ly lam'd exhibiting zebra pattern. Minimal qtz. Widespread FeO-staining. Sample **B72R**, ferruginous qtz vn material, more ferruginous than qtz. Abundant FeO coating bedding planes, transported.

414 334380/6364690. Siltstn, lt gry to grn-gry siltstn. Well-dev'd platy fract cleav: 45/90. Supports interbeds dolomitic sandstn. Minor qtz vng parallel to bedding, milky wht, non-productive.

415 333585/6364830. Approx centre point of line of Cu mineralisation. Strike length 280 m. Workings comprise several vertical shafts to 10 m depth (min) with drifts developed at 4 m and 8 m depth. Width of workings confined to hard slickensided walls 1.3 m wide. CuO and $CuCaCO_3$ along with chalcocite ($Cu_2S$) impregnate rehealed fault gouge, presumably that material lying between the drift walls. Host rock is an orange-brn to yel-brn calcareous siltstn, exhibiting fn lam's.

This correlates with GSSA's (Orroroo 1/250 000 Geo Sheet) lower member of the Willochra fm "a flaggy red-brown siltstn" which shows Cu mineralisation in the Weal Bassett Copper Mine (Wheal Bassett (Cu) on the Orroroo 1/250 000 Geo Sheet correlates precisely with the workings at Sta 415. The large railway metal borrow pit on the Nackara 1/50 000 Sheet (topographic) is incorrectly named "Wheal Bassett".

Attitude of the mineralised fault zone: 40/85-90NW. Sample **B73R** from chalcocite-bearing fault gouge. Bed: 40/90. The camp has been subject to a proper engineering survey, say within last 10 years. Minor prospecting along a parallel line to the main mineralisation about 5 m to west exposes CuO stained qtz vns. The

occurrence, however, is secondary with no hint of primary CuS- assoc'd with the quartz.

416 333350/6364400. Qtzose sandstn, rd-brn, fn to med grnd non-reactive to HCl suporting interbeds of granule sandstn giving str response to HCl. Fract cleav: 40/85NW. Good qtz vn, 30 cm thick, parallels fract cleav, supports clots lim-geothite, cellular str. Sample **B74R**.

417 333730/6363980. Ridge crest (N50E) comprising qtzose sandstn, non-reactive to HCl, laced by numerous thin qtz vns. Gen attitude: 45/85NW. Qtz vn system comprising numerous parallel vns 3-5 cm thick over 1 m width. Attitude: 40/85NW. Supports clots lim-geothite with remnant cellular str after massive S-. Visible pyt, euhedral in qtz. Strike length 60 m.

418 333250/6363585. Ridge crest (as at Sta 417). Rk at crest is qtzose sandstn, laced with milky wht qtz vns. On west side (10-20 m) greenish siltstn with more fn to med grnd qtzose sandstn. Well-dev'd fract cleav: 45/85SE (resembles bedding as well). Greenish siltstn supports narrow dol ls beds (to 30 cm thickness): 45/85NW(I). Joints: 325/80SE, appears to have involved minor (3-5 m) displacements of the "crest" qtzose bed (3-4 m thick).

419 332190/6363480. Ridge high point (548) on N50E trending ridge. Qtzite bed 4-5 m thick responsible for ridge relief and itself forms prominent outcrops to 4-5 m height with vertical walls. Bed: 45/85-90NW(II). Paralleled by thin (1-2 m) qtzite beds. Intervening rk is greenish qtzose sandstn wkly reactive to HCl.

420 331620/6363000. Quartzose sandstn, pinkish, mod reactive to HCl. Bed: 45/85NW. 110 m on brg 335° from Sta a prospect area comprising two pits and a small (3 m length) costean. Mullock and o/c comprises a orange-brn calcareous siltstn as at Sta 415. Fract cleav: 45/85SE (bedding also?). Weakly reactive to HCl. Minor gossanous material in mullock, transported? along with minor CuO staining. Qtz vng in adjacent host rks but not in prospects. Bed: 40/85SE(II). The western flank of this ridge supports a dense "willowy" eucalyptus stand with str odor. Considerable harvesting evident.

421 331005/6362475. Qtzose sandstn, coarse gran, lt rd-brn matrix str reactive to HCl. Bed: 35/85SE(II).

422 329560/6362010. Qtzose sandstn, beige, absorbs HCl non-reactive. Fract cleav: 40/85SE. Often laced with hair-like veinlets bearing productive-appearing lim and S- cellular str's. Dk gry silty qtzose sandstn which show str reaction to HCl.

423 329430/6360680. Silty qtzose sandstn, fn'ly lam'd. Wk'ly reactive to HCl. Diss pyt casts filled with lim. Bed: 35/90

525 33795/6362800. Silstn and mudstn, lt blu-gry varying to lt grn-gry. Many pebbles and cobbles. Fract cleav : 20/90

526 337660/6362800. Pepuarta Tillite in gully. Abour 3.5 m alluvial overburden. Siltstn and claystn exposed in bed, typically fn'ly lam'd with intricate fold features (penecontemporaneous?). Two large qtz vns, milky-wht that pinch and swell from 2-70 cm, about 15 m in length, attitude: 30/35NW. Bed:20/90. Joint: 120/80SW.

527 3377210/6362890. Pepurata Tillite, lt olive-brn. Fract cleav:30/85NW. Joint: 115/75SW. Very fn'ly lam'd bedding: 20/80SE(I)

529 337765/6362085. Pepuarta Tillite. Massive outcrops. Many pebbles, cobbles and boulders, all well-rounded. Largest boulder 40 cm diam, comp'n types include biotite granite, gry qtzite, qtzose gneiss, and a finely lam'd meta-sed.

Approximately 120m, brg 125m from sta, slt topo rise. Rocks comprise tillite with numerous, well-rounded cobbles. Fract cleav:25/85SE. Joint:135/85SW. Produce ragged outcrops. Wk'ly reactive to HCl.

688 330270/6367785. Pepuarta Tillite, lt gry-brn on exposed surfaces. Str'ly reactive to HCl. Contains thin (50cm) limestn beds. Fract cleav: 30/85NW. Joint: 305/85NE

689 329700/636775. Pepuarta Tillite, calcareous, rare scattered pebbles. Fract cleav: 40/85NW, well-devl'd. Joint:150/85NE

690 330610/6368370. Creek bed. Tillite. Fract cleav:45/85NW, well-devel'd. Joint:115/80NE. Stream sed Sample **B20S**, consisting of rnd' qtz, ang'r FeO-stained qtz, lithics, magnitite, tr amts hematite and blu-gry schist.

Sample site located down-stream (east) about 350m from a thoroughly-worked alluvial goldfield. Two very old earthern dams lie 150m upstream. They would probably have been used to wash the auriferous gravels. Total area of goldfield est'd 12 hectares.

Approx 40m down stream (east), stream sed Sample **B21S**. Alluvial float includes calcareous siltstn, FeO-stained sandstn and quartz. Bedrock is siltstone and coarse, lithic sandstn. Fract cleav:40/85NW. Joint:135/85NE

691 330100/6368150 Narrow stream channel constitutes northern border of the alluvial gold diggings. Stream sed Sample **B22S**.

Alluvial workings here consist of a dense packing of shallow (0.5-1.5m) excavations that penetrate to bedrock and slightly beyond. Best auriferous gravels lie on bedrock, range in thickness from 10 to 30cm,. show fair sorting and stratification, non-indurated, minimal clay fraction. Alluvial float comprises siltstn and less qtzite. Siltstn bedrock. Fract cleav: 35/80NW. Joint 140/80NE. Source of gold may be local rather than derived from Mount Grainger Goldfield (loc'd 10km to northwest). Airphoto interp'n reveals well-defined fault (N3SE). at least 7km long, forming northwest border of diggings. A second linear feature (NSSE, fault?) cuts through middle of alluvial ground.

692 329450/6368100. Stream channel. Sample **B23S** comprises mostly qtz (vn type) and qtz with attached hematite. Channel 2m deep. Gravels in bank lack sorting and stratification.

693 328880/6367870 Qtzite, coarse, porous. Minor qtz vn'g. Fract cleav:45/85SE. Tillite with qtzite interbeds to 5m thickness. Slight tendency to arkosic comp'n.

694 329060/6368310. Ridge crest. Sandstn, qutzose, forms ridge, wkl'y indurated, locally very porous, produces distinctive rd-brn o/c's (colour anomaly) of moderate relief. Fract cleav:20/80SE. Joints:130/85NE: 40/85NW. Qtz vn'g milly-wht, non-productive.

695 330180/6369250. Tillite, lt brn on exposed surfaces, lt gry on fresh calcareous. Bed:50/80NW(III). Fract cleav:35/85SE, well-devel'd. Joint:140/75NE.

696 329165/6369175. Tillite, few pebbles. Fract cleav:45/85SE, well-devel'd.

697 328435/6370260. Siltstn, lt gry-brn. Bed55/40NW(II), very fn bedding. Non-reactive to HCl.

698 327315/6370560. Creek bed., Siltstn, blu-gry, calcareous. Bed:65/40NW(I). Fract cleav:45/80SE. Joint: 125/80NE.

699 325565/6371420. Creek bed. Siltstn, lt blu-gry, str'ly reactive to HCl. Limestn interbeds. Fract cleav:30/75NW. Bed:125/85NE(I). Joint:130/85NE. Siltstn flt in creek, often veined with hematite.

700 338950/6370465. Railway cut (3m deep). Sandstn, qutzose, bleached yel through brick-rd, massive, abundant FeO in matrix. Laced with numerous qtz vns, MnO/FeO-bearing: 60/75NW. Bed:355/40NE(I). Fract cleav: 65/85NW. Qtz vn'g:80/80NW, numerous. Qtz vn'g 65/85SE, exhibits slt'ly greasy lustre, wk MnO staining, to 5cm thickness. Most persistent qtz vn'g: 170/40SW, to 3cm thicknwss. Bed: 15/40SE(I). Joint: 115/85SW, 15-20/m with str FeO staining walls.

701 340160/6370465. Water bore site., Recently completed to 318 ft with no water. Rk cuttings comprise calcareous siltstn, blu-gry, very hd, tr amts diss pyt. No surface o/c. Flt comprises qtzose sandstn. Depth ox'n 18-20 ft. Site loc'd on gently (5-6%) NW'ly sloping plain. Rk type probably Enorama Shale.

702 340215/6372215. Water bore site, recently completed to 150ft depth. Reported good water rising to within 10 ft of collar. Drill cuttings include mudstn, dk blu, very hrd, wkly reactive to HCl. Area generally flat with slight (5%) SE'ly slope. Bedrock probably Tarcowie Siltstn.

703 345545/63378920. Railway cut. Shale or mudstn, very fn grained. Produces smooth weathering surfaces. Fn'ly lam'd. Bed:40/65SE(I). lt to med gry. Joint: 125/85NE. Str'ly reactive to HCl. Enorama Shale.

704 344830/6378925. Ridge crest, 10-15m relief, trends N60E. Siltstn (Enorama Shale) with limestn interbeds to 10cm thickness. Fract cleav:50/85SE.

Several dozer cuts on both sides of ridge. Appear to be road metal test sites. Qtz vn'g to 20cm, milky-wht, non-productive. Bed:45/80SE(II).

## Geochemical Sampling

| Sample | Station | Au | Ag | Cu | Lithology |
|---|---|---|---|---|---|
| B23R | 136 | .005 | <1 | 46 | Qtz vn, tr diss pyt yel as bloom |
| B51R | 331 | .020 | <1 | 480 | Qtz vn, milky wh, abundent |
| B65R | 388 | .18 | <1 | 840 | Sid/qtz vns vuggy, cell'r, lim/hem |
| B66R | 390 | .04 | <1 | 135 | Ferrg vns vuggy lim/goethite, FeO |
| B67R | 391 | .02 | <1 | 160 | Jasperoid, mica, wk qtz, lim/hem |
| B68R | 397 | .06 | 1 | 2700 | Qtz vn, mass S= cell'r |
| B69R | 399 | .02 | <1 | 40 | Ferrg qtz vns, cell'r after mass S= |
| B70R | 401 | .02 | 3 | 1.48% | Ferrg qtz vn wk CuO |
| B71R | 402 | .02 | <1 | 110 | Qtz vn |
| B72R | 403 | .02 | 1 | 145 | Ferrg qtz vn FeO |
| B73R | 415 | .08 | 16 | 11.6% | Fault gouge, calc/s CuO chalcocite |
| B74R | 416 | .02 | 1 | 430 | Qtz vn lim/goethite clots cell'r |

# EL 1416 - Relinquished Area B

## Field Notes

Note: All field notes referenced by location number and grid reference.

140 367265/6333900. Gry siltstn hosting well-dev'd qtz vn, 15 cm wide, 100 m length, 80/85SE. Rockchip Sample **B26R** from vn material, Irregular masses of cellular limonite constitutes 15-20% of vn, occurring in the centre and less on both sides of qtz body, discontinuous clots to 7-8 cm. S= present in qtz, pyrite euhedral and chalcopyrite anhedral, plus trace amts CuO. Host rks exhibit brk rd bands (1-3 cm) which by hand lens shown to be FeO + hematite replacements. Bed: 70/80SE(I). Fract'r cleav: 15/85SE. Some of the better preserved o/c's of siltstn show on freshly broken surfaces an abundance of limonite speckles (1-2 mm diam) representing former diss pyt 7-8% originally. Continuing easterly along ridge crest 300 m bed: 85/75SE(I), fract'r cleav: 195/85SE.

141 367610/6333960. Prominent hill top to NE trending ridge. Preserved as such due to thorough qtz vn saturation, most 15-20 cm in thickness. Some veins to 1 m width. All contain the irreg'n limonite masses. Predominant attitude: 355/80SW. Host rk is olive gry siltstn. Fract cleav: 205/85SE. Narrow (60 cm) dolomitic lens: 70/60SE with vry fn lam's, yel to buff color. Wk response to HCl. Qtz vns exhibit sltly oily lustre, glassy, contain minor diss euhedral pyt. Sample **B27R** from vns.

142 367030/6334925. Gry siltstn. Fract cleav: 20/90. Joint: 110/80SW usually with FeO coatings, prob'ly derived from alter'n of pyt contained in siltstn. Bed: 115/55SW(I).

158 368450/6318800. Quartzose sandstn, highly schistose. Fract cleav: 05/85SE. Inclusions of qtzite lens' which form crests of local ridges. Pualco Tillite.

168 370830/6322275. Rocks resemble Burra Group, mostly coarse qtzose sandstn with interbedded qtzite lenses forming resistant relief features. Abundant erratic granitic rks, usually well-rnd' str biotite. Fract cleav: 355/85NE. Qtzso-felds sandstn, quite schistose,

grn gry. Fract cleav: 10/85-90NW. Finding unusually large amts biotite granite flt, also minor garnet schist, all erratics.

619 368500/6358320. Wheal Motley copper mine. Main workings comprise a vertical shaft 7-8 m depth adjacent to an open cut 12 m in length by 2 m depth. Latter exposes a qtz vn 15 cm thick, 80/50NW, brx'd and rehealed with dense mixture FeO/MnO/CuO, Sample **B106R**. Footwall is qtzite bed 1 m thickness, carries diss pyt, limonite specks and chalcocite. Open spaces gen filled or lined with azurite and malachite, Sample **B108R**.

An adjacent qtz vn, parallelling main mineralized structure, also brx'd with qtz clasts suspended in dense limonnite/hematite matrix. Wall of this vn comprise a late addition of qtz totally intact, Sample **B107R**.

Vertical shaft exposes 10-12 cm qtz vn with mylonitic hanging wall, latter is strongly leached and bleached with CuO staining, azurite and malachite. Attitude: 40/75NW.

Approx 100m brg N30E from shaft: several shallow explor'n pits cut into massive qtzite host rk. Latter exhibits diss copper mineralization represented by CuO and FeO spots and rare chalocite, Sample **B109R**. Extent this mineralziation limited to about 2 m width confined to qtzite host.

Country rock this gen area comprises interbedded sequence qtzo-felds sandstns and claystns with fewer qtzite beds (1-3 m) belonging to the Pualco Tillite.

620 369185/6364545. Loc'd SE of Oak Park HS. Rotary drill hole site. Cuttings are dk gry mudstn, hard, str'ly reactive to HCl. Ox'n products pervasively FeO-stained. Reported drilled to 70 cm depth with no water. Farina Subgroup rocks, probably Tarcowie Siltstn.

621 372820/6361790 Prominent break in slope from broad plateau-like area, about 10-15 m relief. Mudstn, blk, calcareous, well-indurated. Bed: 150/40NE(I). Fract cleav: 65/85NW. Joint 135/85SW, 2/m.

622 368850/6359520. Sandstn, silty, lt to med gry, calcareous, massive. Joint: 45/80SE, 3/m.

623 368540/6359545. Creek bed, 6m wide by 4m deep. Exposes tillite, lt to med gry, sandy, plebbles of qtzite, massive. Fract cleav: 100/80SW.

624 367880/6359320. Creek bed, 6m wide by 3m deep. Tillite, lt to med gry on exposed surfaces. Massive, gritty. Qtz grains to 1.5mm. Dropstn comprise dense, dk gry qtzite, lt suggary tex'd qtzite, in grnd leucocratic vol'c matrix sand and silt, stg'ly calcareous. Abundant and widespread qtz vn'g, gen 1-3mm thickness, multi-directional, leached sulfide cavs. tillite wallrock gen FeO-stained (3-5cm width). Joint 175/70NW, occupied by qtz vns. 2nd joint set:120/85Sw aksi wutg qtz vbs. Stream sed Sample **B19S**, comprises qtz and bleached lithic sands and silts, minor FeO shot, qtz vn clasts, silty fraction stg'ly calcareous. Predominant rk cobbles etc are qtzite and siltstn.

627 374630/6353130. Crest of Pualco Range. Qtzite, prominent ridge-former, lt pnk to rd-brn. Diss FeO specks, some to 1mm diam. Bed 95/ 55NE.

628 373750/6350420. Sandstn, purplish-gry. Fract cleav: 65/85SE, well-developed, parallel by qtz vns to 10 cm width, milky-wht, joint: 150/90, 10/m, often filled with calcrete. Tillite constituents comprise ang'r qtz (0.5 -1.5mm), brk-rd ox'd lithics (3mm).

629 374420/6348170. Creek bed. Mudstn, lt to med gry, abundant fine mica. Rk moderately reactive to HCl. Fract cleav: 70/85NW may also represent bed. Joint:345/85NE.

630 372650/63345505. Shale, dk gry to blk on fresh surfaces, dense, very finely lam'd. Fract cleav: 275/85NE. Bed: 275/65NE(I).

631 372110/6345510. Large stream channel, 14m wide by 3m depth. Siltstn/claystn, fn'ly lam'd. Lt gry on exposed surfaces, dk gry to blk on fresh. Non-reactive to HCl. Bed:260/45NW.

632 371880/6348280. Limestn, fn xtl'n, forms lom (1m) but prominent o/c's, 2-3m width. Dk gry-brn on exposed surfaces, lt gry to off-wht on fresh. Attitude:90/80S. O/c resembles diabase dyke.

633 370715/6350245. Creek bed. Tillite, very massive. Joint: 60/85SE, slt tendency for elongate pebbles to parallel this attitude. Pebble comp's include aplite, hornfels, gneiss.

634 370845/6350850. South slope Pualco Range. Qtzite beds (4-6 m) interbedded in poorly sorted rd-brn tillitic sandstn/ siltstn. Shows diss limonite spots and euhedral casts after pyrite to 1mm diam. Bed: 225/70NW(1). Joint: 315/75SW, 20/m

Approx 350m easterly, enter box canyon. Very picturesque setting eroded in alternating tillitic sediments and massive qtzite beds. Here find natural spring modified by unrefined rock work. Remnants of crude timber covering used to inhibit floral and wildlife contamination. Obviously very old and most likely the work of Aboriginal people. Doubtful sufficient discharge to satisfy livestock requirements. Clogged with skeletal remains and floral debris, water now seeps through joints about three metres south of the original spring. Near this point, an Aboriginal symbol has been chipped into a flat tillite surface

Previous observations of similar markings suggest that the circle represents watering ;places (Greene, 1988). Here the circular symbol is crossed by seven parallel lines. These lines are thought to represent the springs protective timber covering.

635 370135/6348325. Creek bed. Sandstn, silty, yel-grn, also mudstn, micaceous, non-reactive to HCl. Joint:125/85Sw, surfaces stained with FeO.

636 368500/6347400. Creek bed.. Tillite, massive, lt gry. Fract cleav: 70/85NW.

637 367410/6358100. Tillite, lt gry rd-brn on exposed surfaces, gry-brn on fresh, massive. Joint: 185/80SE.

642 368150/6361585. Ferruginous o/c, bears slt resemblance to Braemar Ironstone. Well-indurated with FeO, limonite, hematite and MnO, quite dense, slag-like. Breccia, brn-blk on exposed surfaces, yel to orange-brn on fresh. Exhibits faint laminar flow str:N/50W, Sample **B112R**.

643 367900/6361110. Hill. Qtzite, med grnd, equal - gran, sugary tex, unusally wht on fresh surfaces, matrix argillic( former felds.). Prominent silcrete o/c, yel/gry, extremely hard, thoroughly siliceous, produces a bouldry o/c. Fract cleav: 110/90.

644 368040/6360525. Ferruginous breccia (similar to that at sta 642), linear o/c 40m length: 335/80SW, 2-3 m wide, 2 m relief. Fract cleav:N/90. Sample **B113R**, dense, lt brn to blk, breaks with conchoidal fract. Flanking o/c is silcrete, considerable amts, forms abrupt ledges, exhibits rounded bouldery weathering profile. No obvious internal str.

645 368400/6361055. Creek bed (drains 340) Rock exposed is FeO-saturated qtzite grit, med dk brn, contains fragment (1-3m) of former qtz vns. Bed:45/75NW(I). Joint: 135/65NE.

646 368275/6360570. Creek bed. Ferruginous breccia. Attitude: 70/50NW(I). Flanked on north by dense gossanous material containing fragments of the adjacent ferruginous breccia. Brx trends 85, 3-4m wide, discontinuous strike across 200m relatively, flat terrain. Brx flanked to south by silcrete.

647 366870/6360250. Sandstn, str'ly calcareous, coarse grained, approaching a grit. Bed: 315/50SW(I) Sltl'y pyritic, diss lim pseudomorphs after pyrite, 1-2%.

648 366325/6360090. Silt tr, calcareous, lt rd-brn. Also sandstn, calcareous. Bed:245/80SE(I)

649 365730/63600720. Sandstn, dolomite, lt brn, fn'ly lam'd. Bed: 55/85SE(I). Estimate width these beds to 80m. Joint: 330/85SW.

Approx 300m brg 55 along ridge crest, finely lam'd calcareous sandstn. Bed: 55/85NW(I)

650 366150/6364125. Relatively flat terrain. Ferruginous brx, diapiric emplacement, med to grnd siliceous matrix, resembles an altered qtzite. Mafic constituents altered to lim. Rock bears slt textural character to quartz diorite or an altered hornfels. Sample **B114R** contains abundant lim in matrix, str'ly siliceous, minor magnetite. O/c radius about 3m.

Tested by rotary-percussion drill hole. Count 23 cutting heaps (=46m depth?). Depth of ox'n 6m. Bottom of hole cut hornfels, slt'ly gneissic, fresh, shiny amphibole. Some portions of o/c coarse grained, 3-4mm diam. feldspars, pegmatite-like. Hard, silicified, mod reactive to HCl.

Rks to south are dol limestn, yel-brn, overlying bed comprises dk brn sandstn quite similar to a grit, 1m thick with sub-rnd' clasts dol, qtzite, grn felsite. Matrix non-reactive to HCl.

661 368320/6369490. Hill top, 15-20m relief. Shale, dk gry to blk, slaty. South slope of hill (near top) supports heavily FeO-stained silty sandstn, well indurated, locally brx'd. Qtz vns appear productive with good, ochre-rd limonite. Sample **B118R**. Mineralization tends to parallel bed. 70/80SE. 2nd bed: 75/85NW.

662 368580/6370100. Diapiric brtx. Isolated o/c, 3m relief. Brx clast rn'd to sub-ang'r , some clasts exhibit greenish colour, most pale rd to gry. Matrix consists qtz, silicified lithics and ext'ly hard ferruginous materia. Non-calcareous. Sample **B119R**.

663 369220/6370390. Diapiric breccia. Intruded rocks are limestn in to med grnd. slt'n lt to med gry, very distorted (twisted and stretched) Massive str'ly responsive to HCl. 10m from main diapiric body, limestn exhibits irreg, iron-rich replacements in part controlled by fractures also a wavy lam'r flow str suggesting sypathetic movement with br emplacement. Sample **B120R** from brx, matrix highly xtln with yel and rd-brn FeO-staining.

664 371910/8364345. Ridge crest trends S80E. Qtzite two varieties: one a lt beige, med grained with diss euhedral pyt (1%) and limonite pseudomorphs after pyt to 1mm diam., Minor FeO in matrix, heavily laced with qtz vns, milky-wht, discontinuous. 2nd qtzite type med to dk brn ext'ly hard, conchoidal fract, 30-40% of grains resemble obsidian, lt rd-brn, semi-translucent, 0.5-1mm diam, sub-angl'r Cementing medium is lt gry FeO-stained silica with scattered, dense clots limonite enveloping annedral pyt. Bed:50/55NW(III). Joint:125/70SW

Darker variety of qtzite appears to be a lens (50-60m) length by 5-10m width) cutting diagonally across lighter qtzite. Darker variety also exhibits a laminar fol'n: 240/80NW, but often twisting 180. Fract cleav: 30/85NW. Rock type south of quartzites comprise blk shale, slaty vry hrd. Bed:80/75NW(II)

Old (75-100 yrs) rock cairn located along highest point of ridge. Some of the rocks are vn quartz carrying massive concentration of pyrite.

665 372410/6365500. Hill top. Claystyn, very fn'ly lam'd. Laminations amplified by thin (1-2mm) qtz and dk min bands. Rks are rd-brn on exposed surfaces, med to gry on fresh. Bed: 105/60NE. Sample **B121R**, shale, blk., FeO-spotted, well-devel'd slaty cleav: 165/85Sw, slt'ly micaceous. Thin(0.5-1mm) discontinuous qtz lamina. Occasional qtz vn (1-2mm) often with leached sulfide cavities.

South side of hill, shales are bleached cream-coloured to yel-rd. A distinctive colour feature noticeable from distant (1-2km) observation. Sample **B122R** comprises bleached shale as well as lt gry shale carrying 3-5% fn'ly diss pyt, thin qtz vns with sulfide cavs.

Approx 200 m brg N10W, heavily FeO/MnO-laden bed, attitude: 65/90, 1.5m wide. Supports euhedral limonite pseudomorphs after pyt to 2mm diam. Sample **B123R** taken.

Approx 80m brg N10W from Sta 665, old vert shaft, now caved to within 1m of surface. Mullock heap suggests original depth to about 5m. Mullock contains qtz vn material to 60 cm thickness, carries yel-grn bloom and abundant (15-29%) irreg'r clots pyt. Qtz shows a greasy lustre., ochres rd-brn limonite-goethite fill cav's. Also euhedral pyt xtls to 2mm diam. Sample **B124R**.

666 371950/6365900. Ridge trends N75E. Qtzite, minor felds fraction, lt brn-gry, tr amts diss pyt now mostly altered to lim. Few qtz vns milky-wht, non-productive appearing. Host rocks are quite massive, appear to fragment easily producing rubble-strewn surface. Fract cleav:135/85SW. Joint:10/80SE.

667 372820/8366050. Ridge crest. Qtzite, same beds as at Sta 666 but off-set approx 80m by right lateral fault: N65SW. Bed: 100/50NE(III) Rks to south are rd-brn sandstn, wk'ly calcareous, fn'ly lam'd Bed: 80/80NW(I).

668 372305/6367285. Shale, lt gry-grn. Fract cleav: 90/65N also bed (II) Qtz vn'g with leached sulphide cavities, 2nd bed: 55/80NW(I). Also siltstn, lt gry-grn with thin (5-10cm) dol sandstn.

669 373390/6366580. Ferruginous bed, 1m thick pinches and swells, discontinuous Over 70m, abundant MnO. Sample **B125R**, dense,

conchoidal fract, leached sulfide cavs, med to dk brn-blk. Bed:45/80NW(I). Also lt gry pyritic beds . 2nd bed 40/70NW(I).

Rks to souith dol limestn, dolyel brn. Overlying bed comprises dk ben sandstn quite similar to a grit, 1 m thick with sub rnded clasts dol, qtzite, grn felsite. Matrix non-reactive to HCl.

670 372780/6362575. Siltstn, lt rd-brn on exposed surfaces, lt gry on fresh. Mod reactive to HCl. Fract cleav:60/85NW. Joint: 165/90. Bed: 115/25NE(I).

671 373785/6362980. Hill top. Limestn, dol. Top of hill caped by large qtz blow, milky-wht, trending gen'ly: N35E. Bed: 75/55NW(II). 2nd bed: 80/40NW(I). Fract cleav: 45/85SE. Rks are str'ly reactive to HCl. Some beds are calcareous sandstn.

672 372900/6363950. Sandstn, silty, non-reactive to HCl. lt gry on exposed surfaces, dk gry to blk on fresh. Fract cleav: 45/85NW. Bed:70/70SE(I). Find well-rnd' cobble qtzite, ext'ly hard (dropstn?)

Approx 150 m brg N85W,creek bed, exposes good o/c calcareous sandstn, interbedded with greenish siltstn, latter fn'ly lam'd. Bed:85/90(I). 2nd Bed: 90/80S(I).

673 373030/6364435. Limstn, dolomitic, alternating with dk gry shale (latter non-reactive to HCl). Bed:65/40SE(I)

674 673875/6364300. Creek bed. Siltstn., lt gry-grn, calcareous, fn'ly lam'd. Bed:65/80NW(I)

675 375565/6364750. Creek bed. Siltstn, lt blu-gry, calcareous, also interbedded limestn. Fract cleav 25/69NW, well-devel'd. Bed:55/50NW

676 370880/6457415. Creek bed, 5m wide. Limestn, silty limestn and calcareous sandstn. All exhibiting fn laminations, FeO-stained on exposed surfaces, med to dk gry-brn on fresh. Bed:80/45NW(I). Fract. cleav:60/90.

677 369300/63356870. Crek bed, 3m wide. Mudstn, silty, olive-gry on exposed surfaces, med to dk gry on fresh. Wk'ly calcareous. Bed:33S/35NE(I), accentuated by thin (1-2mm), alternating light and dark banding.

678 367870/6356245. Sandstn, qtzose, mod'ly felsic, latter mineral gen altered to clays, lends, lt cream-colour to freshly broken surfaces. Fract cleav: 85/65NW, also bed. Joint: 05/85SE.

679 368330/6355025. Tillite, lt rd-brn, gritty/sandy matrix, supports about 10% pebbles. Latter comprise qtzite, vn qtz, felsite. Fract cleav:45/85NW. Rare qtz vn to 3 cm thickness, milky-wht non-productive appearing

680 368225/6354115. Tillite, with wide (15-20m) qtzite interbeds. Bed:165/75NE(II). Joint: 85/70SE. Tillite characterized by rusty-rd colouration that contrasts sharply with lighter, off-wht, qtzite. Fract cleav 60/85NW. Tillite matrix, non-reactive to HCl.

681 368275/6353210 Tillite, exposed on steep hill slope. Fract cleav: 60/35SE. Pebbles and cobbles in tillite comprise qtzite, biotite granite boulder to 50cm diam.

Approx 120m brg 850E, sandstn, silty, med to dk grn, non-reactive to HCl. Supports abundant pebbles and gritty/ sandy interbeds 60-80cm thickness. Bed:10/50SE(I). Fract cleav: 70/85NW.

682 366400/6352485. Shale, blk, fnl'y lam'd. Bed:175/50NE(I). Fract cleav. 50/85NW. well-devel'd. Shales are non reactive to HCl. Rock chip Sample **B126R** consists of blk shale, vry har and fnl'y lam'd, fresh surfaces exhibit a faint greenish tinge.

683 368265/6351920. Shale, blk slaty, hrd. Bed:115/60NE(I). Fract cleav:50/90.

684 368905/6351875. Tillite section, occurs as wedge-shaped body approx 8m thick pinching within 50m to east, 200m to west. Cobble constituents include dk gry qtzite, wht, fn xtl'n limestn and leucocratic igneous type resembling aplite. Fract cleav: 30/75SE. Tillite ' south contact is transitional to a dk metallic gry, ext'ly hrd and fine gained material with pebble inclusions. About 1m wide, FeO/MnO-rich, altered fault zone ? Shale contact: 85/70NW(I). Joint:360/85S.

Approx 70m southerly encountering several thin (30-50cm) gry-brn limestn beds. Host rocks are blk shale, slt'ly greenish, exhibit fn lamina with graded cycle. Bed:95/65NE(1).

Approx. 250m southerly,. prominent linear o/c im width, considerable strike length, schistose. Attitude 70/50NW(I), bedding plane fault.

685 369900/6351810. Shale, blk, extr'ly hard. Bed: 45/85NW(I). Approx 120m brg S40W, creek channel occupying contact between blk, slaty shale and brn, qtz-lithic sandstn, non-calcareous Thin (1-7cm) sandstone interlaminations become frequent at contact often exhibiting soft sediment deformational features

686 370635/6352130. Pualco Tillite, lt brn on exposed surfaces, med gry-brn on fresh. Joint: 150/85NE. Fract cleav:50/75NW, may also represent bedding but seds very massive. Several large (1m diam) pot-holes weathered in tillite, some holding water.

687 371530/6352125. Qtzite, interbedded in Pualco Tillite. Matrix contains numerous rd specks (limonite) altered from former diss pyt. Fract cleav:305/75SW.

## Geochemical Sampling

Analyses in parts per million unless otherwise stated

| Sample | Station | Au | Ag | Cu | As | Lithology |
|---|---|---|---|---|---|---|
| B106R | 619 | 0.04 | 1 | 5.00% | 560 | Brx'd qtz vn,FeO/MnO/CuO,hem/lim |
| 107 | 619 | 0.04 | 2 | 5.10% | 260 | Brx'd qtz vn, hem/lim,CuO |
| 108 | 619 | <.02 | 1 | 4750 | 46 | Qtzite, diss lim specks, azurite |
| 109 | 619 | 0.02 | 1 | 9500 | 19 | Qtzite,diss FeO specks azurite, CuO |
| 112 | 642 | 0.04 | 2 | 310 | 26 | Diapiric brx, silicic, hem/lim |
| 113 | 644 | 0.02 | 3 | 32 | 34 | Diapiric brx, ferru, rd-brn |
| 114 | 650 | 0.02 | <1 | 38 | 12 | Ferrug, str silic, mag, lim |
| 117 | 655 | 0.02 | 1 | 12 | 18 | Diapiric brx, qtz, FeO/MnO, silicic |
| 118 | 661 | 0.04 | 1 | 460 | 82 | Qtz vn,ochre-rd, lm brx'd |
| 119 | 662 | 0.04 | 2 | 270 | 86 | Diapiric brx, silicic, FeO, chl |
| 120 | 663 | 0.04 | 1 | 88 | 26 | Diapiric brx,ztl'n matrix, FeO |
| 121 | 665 | <.02 | <1 | 54 | 19 | Blk shale,spotted FeO, thin qtz |
| 122 | 665 | 0.02 | 1 | 9 | 12 | Blk shale,bleached, 3%diss pyt. |
| 123 | 665 | <.02 | 2 | 135 | 20 | Sandstn, FeO/MnO impreg'd,pyt'c |
| 124 | 665 | 0.08 | 1 | 22 | 380 | Qtz vn,massive pyt,greasy lustre |
| 125 | 669 | 0.06 | 3 | 210 | 30 | Sandstn, FeO/MnO impreg'd, pyt'c |
| 126 | 682 | 0.06 | 2 | 14 | 10 | Blk shale, hrd, greenish tinge |

# Relinquished Area C

## Field Notes

Note: All field notes referenced by field location number and map grid reference.

114 339525/6320450. Siltstn, dk gry blk, well-dev'd fract cleav: 10/80NW. Bed: 35/25SE(I).

156 363085/6315480. Two road metal excavations expose pastel grn cherty rk, W5, resembles similar rks at Sta's 25 and 56, encrusted with a wht calcrete coating.

157 366285/6315330. Resembles Braemar Iron Fm. Highly ferruginous. Fract cleav: 10/85NW. Bed: N/60W(II). Surface soils cluttered with milky wht qtz chips. Quartzite cobbles (exotic).

158 368450/6318800. Quartzose sandstn, highly schistose. Fract cleav: 05/85SE. Inclusions of qtzite lens' which form crests of local ridges. Pualco Tillite.

171 342660/6318035 Willara 1/50 000 sheet. Small ridge-like hill 20 m relief trending 15°. Rock type is siltstn. Well-dev'd slaty cleav: 10/85NW. Bed: 05/40NW(II). Bed: N/25W(I). Bed: N/30W(I). Fn'ly laminated silstns, include thin (.5-1 m) dolomite beds, str'ly reactive to HCl, Freshly broken surface dk gry to blk and responsive to HCl. 2nd fract set: 315/55NE cut across and displace 10/85NW fract cleav. Qtz vns appear to correlate with bedding, exhibit greasy lustre, streaked with fine gry planations. Suspect S- originally present. Sample **B29R**.

172 344650/6317815. Flt only. Rk is predominantly silcreted gravels, vry hrd, silicic. 250 m east of Sta a natural occurring basin 20 m in radius, open and draining to south, 3-4 m deep. On west shoulder an excav'n originally 8-10 m deep (an old hand dug well?). Rk here is siltstn. An abundance of ferruginous chips on surface.

8585-1

139° 10'
139° 25'
139° 09'
139° 40'
139° 16'
139° 15'
32° 42'
32° 45'
32° 55'
32° 50'
33° 00'
33° 10'
33° 14'
33° 15'
33° 22'
33° 26'
A
B
C
HIGHWAY 32
BARRIER RANGE
PITCAIRN HILL
BATLEY HILL
HOOK HILL
GRAMPUS HILL
GRAMPUS CREEK
'SPRING DAM'
MANUNDA
'OAK PARK'
WHEAL MOTLEY
'TIVERTON O.S.'
"I'll know who did it"
PUALCO WEST
PUALCO RANGE
PUALCO
'PUALCO' Abandoned
IRONBARK HILL
'TILKILKI'
'PINE CREEK'
BRAEMAR PEAK
'BRAEMAR'
'PULPARA'
'WILLARA'
'KIA-ORA'
HOG BACK

DATUM : This plan utilizes A.M.G cadastral, cultural and related map data taken from published topographic sheets prepared by the Government of South Australia

LEGEND :
- Homestead 'THE OAKS'
- Watercourses
- Station locations 487
- Triangulation point MONKS
- Road, unsealed surface
- Road, sealed surface (32)
- Railway
- Relinquished area boundary
- Retained area

G.N.
T.N. M.N.
Grid convergence 1°01'
Grid magnetic angle 6°15'

The relationship between True North, Grid North and Magnetic North is shown diagramatically. Magnetic value is correct for 1980. Annual change is 01' Easterly.

SCALE 1:100,000

Metres 1000 0 2 4 6 8 10 Kilometres

GEOLOGY: F.F.GREENE

ORIGINAL DRAWING: G.M. Findlay "Pitcairn Stn" 8th June 1988

AMENDED: 8th November 1988

COMPUTER DRAFTED: ANTHONY BRYSON March 1992

# GEOLOGICAL CONTROL FOR RELINQUISHED AREAS

## EL 1416 BENDIGO STATION AREA ADELAIDE GEOSYNCLINE, S.A.

PLAN : 01

CRACOW RESOURCES LIMITED.

A.C.N. 008 587 086

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