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# Drilling at the silica mine and elsewhere around Corinna

*by N. J. Turner*

CONTENTS



## INTRODUCTION

This report provides a brief introduction to the diamond drilling that has been done by various organisations in the western part of the Corinna geological map quadrangle (Turner *et al.*, 1991). It also provides a record of drilling that was carried out by the Geological Survey at Hugh Nolan's Cominex silica mine at Corinna.

Aberfoyle Resources Ltd obtained permission to carry out analytical and petrological investigations on some of the silica mine core, and the results of their work are given in Appendix 2. Stratigraphic names and symbols which appear in the following text are from Turner *et al.* (1991).

## DRILLING AROUND CORINNA

In the Bowry Formation holes have been diamond drilled in the pyrite-magnetite lenses (Ptam, Ptamd) near Savage River (Urquhart, 1966), at Long Plains South (Ridgeway, 1970), and at Rocky River (Shannon, 1988). Holes have also been drilled in the magnesite lenses (Ptac) at Bowry Creek and Main Creek (Frost, 1982), and in the pyrite-chalcopyrite lenses at the Alpine prospect (Caithness, 1985) which is southwest of Reece Dam. Much of the drilling in the magnesite and ochre deposits at Main Creek and Bowry Creek is still confidential to Savage Resources Pty Ltd.

Around Reece Dam the Hydro-Electric Commission diamond drilled numerous holes for engineering purposes associated with dam construction. As well as the Bowry Formation (Pta), the adjacent phyllitic unit (Ptsqg) and metamorphosed Oonah Formation (Posm) were drilled. Logs and representative core have been retained by the HEC. The HEC also drilled a number of holes around Hells Gates on the Pieman River near Mt Donaldson but details of the holes were not located. A series of holes were diamond drilled along the proposed crossing of the Pieman River near Corinna by the Department of Main Roads. Core, logs, sections and other details are held by the current equivalent of the old DMR. Partially silicified dolomite (Psds) was encountered below 25–30 m of Cainozoic deposits.

In the Ahrberg Group there has been a prospecting hole diamond drilled in the pyrrhotitic sediments and volcanic rocks (Pbgw) southeast of The Longback (Pemberton, 1984). Several prospecting holes have been drilled near the old Brookside gold mine (Henham, 1990) where sediments and volcanics (Pbt) are in contact with dolomite (Psd).

Tertiary cover and Proterozoic bedrock were drilled by the Hydro-Electric Commission on Delville Saddle in the southwest of the Corinna Quadrangle (Mather, 1963). The purpose was to test for possible reservoir leakage paths. Beneath the Tertiary cover rocks the holes penetrated probable weathered silicified dolomite (?Psds) and dolomite (Psd). Cavities were encountered in these deposits. One of the HEC holes intersected Bernafai Volcanics (Pbu) and another intersected probable upper Donaldson Formation (Pdo). Some of the HEC's Delville

saddle core has been retained by Mineral Resources Tasmania.

## DRILLING AT THE SILICA MINE

During the Corinna mapping programme three holes were drilled at the Cominex silica mine near Corinna (Appendix 1). Two holes were drilled at the southern pit (BH1A, BH2, CP427903), and one at the northern pit (BH1, CP433914). The holes at the southern pit showed that the silica flour passes down into silicified dolomite, thus substantiating the view that the silica flour was derived by leaching and disaggregation of silicified dolomite (see Khin Zaw *et al.*, 1992). No dolomite was encountered at depth at the northern pit, although there are breccia textures in the silica flour which are similar to textures in partially silicified dolomite at the southern pit.

The entire interval of dolomite at the northern pit has been replaced by siliceous materials. At depth these materials are underlain by chloritic mudstone similar to material (Pbg) that occurs in association with the Bernafai Volcanics (Pbu). Thus the original dolomite may have been stratigraphically above the Bernafai Volcanics, that is, it may have been a formation distinct from the Savage Dolomite. However, sedimentary facings are required to prove that the altered dolomite at the northern pit is not a structural repetition of the Savage Dolomite. So far, these have not been recognised in either outcrops or core.

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# APPENDIX 1
# Core logs of drilling at the silica mine, Corinna

## Silica mine, Corinna BH1A — Southern Pit

| | | |
|---|---|---|
| Date commenced: | | July 1987 |
| Date finished: | | July 1987 |
| Easting co-ordinates: | | ( 342 695 m (approximate) |
| Northing co-ordinates: | Estimated from BH2 survey | (5 390 362 m (approximate) |
| Height: | | ( 130.5 m (approx) |
| Type of drilling: | | Auger 0-18 m |
| | | DDH-NQ 18 – 44.5 m |
| | | DDH-BQ 44.5 – 47.9 m |

| *Depth (m)* | *Recovery (m)* | *Remarks* |
|---|---|---|
| 0 –2 | bagged samples | Silica flour, i.e. angular quartz silt and fine-grained quartz sand. Slightly discoloured to brownish-grey. Angular fragments up to 4 mm across are very minor, some are very fine-grained quartz whilst others are completely crystalline quartz. Fine-grained types (coherent silica flour) can be disaggregated by abrasion. Sparse rounded vein quartz pebbles are present due to contamination from overlying Tertiary gravels. |
| 2 –12 | bagged samples | Ditto with slightly less discolouration. |
| 12 –13 | bagged samples | Ditto but greater discolouration though still pale. |
| 13 –14 | bagged samples | Ditto but colour mottled due to numerous clots up to 4 cm across comprising white silica flour inside thin (1–2 mm) pale brown limonitic shells. |
| 14 –18 | bagged samples | Ditto though colour now pale grey. Limonitic spots 1–2 mm across make up about 1% by volume. Pale grey colour changes progressively to white from 14 m to 17 m. |
| Diamond drilling commenced at 18–18.5 m. | | |
| 18 –19 | 1 | White silica flour, some coherent and hard, some disaggregated. |
| 19 –20.5 | 1 | White, weakly coherent silica flour. |
| 20.5 –22 | 1.5 | Ditto with 7 cm hard interval. |
| 22 –23.5 | 1 | White, weakly coherent silica flour. |
| 23.5 –25 | 1 ) | Mostly moderately hard to hard, coherent white silica flour with pale grey patches. |
| 25 –26.5 | 0.4 ) | |
| 26.5 –28 | 0.5 ) | |
| 28 –29.5 | 0.5 ) | |
| 29.5 –31 | 0.3 ) | Greyish incoherent to weakly coherent silica flour. |
| 31 –32.5 | 0.03) | |
| 32.5 –34 | 0.05 | Coherent, moderately hard silica flour |
| 34 –35.5 | 1 | White, incoherent silica flour |
| 35.5 –37 | 1 ) | Weakly coherent, dark brown (organics) silica flour to 37.5 m. The colour intensity |
| 37 –38.5 | 0.8 ) | diminishes gradationally to pale grey at 38.5 m. |
| 38.5 –40 | 1 ) | Incoherent pale grey silica flour with patches of very hard silica. |
| 40 –41.5 | 1.2 ) | |
| 41.5 –43 | 1.2 ) | |
| 43 –44.5 | 1 ) | |
| 44.5 –46 | 0.2 | Very hard core of pale grey, coherent silica flour. |
| 46 –47.9 | 0.5 | White, very weakly coherent silica flour. |
| 47.9 | | End of hole — abandoned due to saturated silica flour flowing into drill rods when core barrel raised. |

## Silica mine, Corinna BH2 — Southern Pit

| | |
|---|---|
| Date commenced: | 11.4.1990 |
| Date finished: | 11.5.1990 |
| Easting co-ordinates: | 342 602.5 m |
| Northing co-ordinates: | 5 390 369.5 m |
| Height: | 122.5 m |

Note: This hole was collared some 10 m northwest of BH1A and at about 8 m lower elevation. Coring was commenced at 30 m depth, which is equivalent to about 38 m depth in BH1A.

| *Depth (m)* | *Recovery (m)* | *Remarks* |
|---|---|---|
| 30 –35.47 | 2 | Weakly coherent, pale brown silica flour. |
| 35.47–35.67 | 0.2 | Hard fine-grained pale grey quartz. |
| 35.67–42.86 | 1.2 | Weakly coherent, moderate brown silica flour. |
| 42.86–43.86 | 0.3 | Silica flour with strong brown discolouration (organic). |
| 43.86–45.68 | 0.03 | Hard, fine-grained, pale grey quartz. |
| 45.68–54.68 | 1 | Dark grey clay. |
| 54.68–60.68 | 1 | White to pale grey, very fine-grained, extensively silicified dolomite. |
| 60.68–63.68<br>63.68–66.68 | 0.4 )<br>0.25) | Dark grey clay and hard, fine-grained, dark grey quartz. |
| 66.68–79.68 | 7 | Creamy white dolomite that is partially silicified. There are common, pale grey, irregular patches and zones of fine-grained quartz that appear to represent total silicification. Breccia texture is common with completely angular, creamy 'fragments' occurring in grey matrix. Thin quartz veins are present which are fairly planar and of variable orientation. |
| 79.68 | | End of hole — abandoned due to loss of circulation. |

## Silica mine, Corinna BH1 — Northern Pit

| | |
|---|---|
| Date commenced: | 19.3.1990 |
| Date finished: | 10.4.1990 |
| Easting co-ordinates: | 343 261 m |
| Northing co-ordinates: | 5 391 372 m |
| Height: | 177.4 m |

| *Depth (m)* | *Recovery (m)* | *Remarks* |
|---|---|---|
| 0 –13.21 | 4 | White, weakly coherent silica flour. |
| 13.21–25.21 | 9.5 | Weakly coherent, dark brown (organics) silica flour. |
| 25.21–28.21 | 0 | |
| 28.21–44.56 | 13.3 | Very weakly coherent, medium to dark brown silica flour. |
| 44.56–51 | indeterminate | Core mostly brown disaggregated silica flour. Short intervals of coherent brown breccia also coherent silica. |
| 51 –57.5 | | Brown, siliceous breccia comprising completely angular fragments of fine-grained quartz in a matrix of fine-grained quartz. |
| 57.5 –60.12 | | Clay derived from pale green chloritic slaty mudstone. |
| 60.12–69.12 | | Unweathered lustrous slaty grey mudstone with common green chloritic material which may form patches up to a few centimetres across. |
| 75.12–78.12 | 0.05 | Fine-grained, grey, vuggy quartz — vein or silicified patch. |
| 78.12 | | End of hole. |

# APPENDIX 2
# Aberfoyle Resources Ltd results

## Cominex silica mine

*Core grind sampling intervals (431575–431580)*

| | *Sample No.* | *Depth/Interval* |
|---|---|---|
| Hole #1 (BH 1) | #431576 | 46.21–57.12 m |
| | #431577 | 57.12–75.12 m |
| Hole #2 (BH 2) | #431578 | 54.68–73.0 m |
| | #431579 | 73.0–77.5 m |
| | #431580 | 77.5–79.68 m |
| | #431581 | 47.18 m |
| | #431583 | ? |
| DMR Hole at Corinna | #431582 | ? |

*Analytical Data (analyses by ANALABS)*

| *Sample No.* | *Cu* | *Au* | *AuChk* | *As* | *Sb* | *Hg* | *CaO* | *$SiO_2$* |
|---|---|---|---|---|---|---|---|---|
| 431576 | 117 | <0.008 | <0.008 | <2 | <3 | 0.020 | 0.05 | 79.5 |
| 431577 | 122 | <0.008 | - | <2 | 3 | 0.030 | 0.19 | 50.0 |
| 431578 | 44 | <0.008 | - | <2 | <3 | 0.050 | 17.20 | 25.2 |
| 431579 | 7 | <0.008 | - | <2 | <3 | 0.005 | 24.90 | 15.6 |
| 431580 | 17 | <0.008 | - | <2 | <3 | <0.005 | 21.40 | 34.5 |
| 431581 | 1313 | <0.008 | - | 15 | <3 | 0.050 | 15.80 | 63.5 |
| 431582 | 7 | <0.008 | - | <2 | <3 | 0.035 | 3.90 | 77.5 |
| 431583 | 6 | <0.008 | - | <2 | 4 | 0.020 | 0.06 | 40.0 |
| Detection | 5 | 0.008 | 0.008 | 2 | 3 | 0.005 | 0.01 | 0.1 |
| Units | ppm | ppm | ppm | ppm | ppm | ppm | % | % |
| Method | 101 | 309 | 309 | 401 | 401 | 122 | 104 | 109 |

## Petrological report — Sample Number: 431583

*(A. J. Crawford)*

### *Summary:*

This is a brecciated dolomite with saccharoidal chalcedonic silica filling fractures; it is believed to be a low-T diagenetic process that produced this sample, not epithermal alteration.

### *Hand specimen:*

This is a fractured and silicified dolomite with clear chalcedonic silica sealing fractures.

### *Thin section*

This rock is composed of two minerals, dolomite and quartz. The dolomitic section is composed of strongly fractured polycrystalline fine-grained dolomite with grainsize from 0.05–0.1mm, that contains irregular areas in which it has recrystallised to exceptionally fine-grained dolomite. The dolomite is criss-crossed by fractures in which saccharoidal silica has crystallised. These quartz (chalcedony) areas reach more than 1 cm thick in places, and are quite clean and clear. The sugary texture of the quartz in fracture fillings coarsens up to ragged and strained larger grains (to around 1 mm across) in the central portions of some veins. I don't believe that the quartz is replacing dolomite in this slide: rather, it has been introduced into strongly fractured and brecciated dolomite.

I have discussed these dolomite-silica rocks with Simon Stephens, our lapidarist, who is quite knowledgeable about these rocks and this area. I suggest you speak to him for detailed comments, but he has come up with the following thoughts. He believes that the silica (chalcedony) is introduced into fractured dolomites during diagenesis, and dehydrates to the sugary banded, almost agate-like material often seen in these rocks. Silica is mobilised downward in the section during Tertiary weathering and peneplanation, and is later disaggregated by some unknown process (that doesn't even disrupt banding, but loosens grains one from the other) and this quartz is weathered and concentrated into the Corinna-type silica flour deposits. The process is low-temperature in the case of this sample, and most unlikely to be epithermal system-related. It is essentially a diagenetic, soil-forming process.