

working TOGETHER

Brukunga and the Dawesley Creek Catchment Area

2013

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REMINDER

It is recommended that water in Dawesley Creek downstream of the Brukunga Mine not be used for any purpose.

Although the installation of the Dawesley Creek mine diversion in 2003 substantially improved water quality, it is still contaminated.

Dawesley Creek diversion extension starts in early 2014

The Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) is responsible for the management and remediation of the former Brukunga pyrite mine, working in conjunction with the Brukunga Mine Site Remediation Board.

In an effort to improve water quality downstream of the mine, DMITRE will be extending the Dawesley Creek diversion for an additional 300 metres in early 2014. This will reduce the volume of clean water in Dawesley Creek coming into contact with acid and metalliferous drainage producing wastes on the mine site.

The works involve laying pipe both above and below ground at the southern most section of Dawesley Creek within the mine. On-site work will occur over a 12–16 week period (weather permitting) in early 2014. DMITRE and the contractor will endeavor to minimise the impact on the Brukunga township and meet all Environmental Protection Authority policies on noise and dust.

The original Dawesley Creek diversion was completed in 2003 and had an immediate and sustained improvement in water quality downstream of the mine. The diversion extension is expected to further improve water quality by reducing acid and metalliferous drainage entering Dawesley Creek and increasing the holding capacity of the treatment system.

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New board appointments

The Brukunga Mine Site Remediation Board provides direction in the engagement and consultation component of the Brukunga Mine remediation strategy. The board is pleased to announce that two new members have been appointed: Suzanne Skibinski and Harry Seager.

Suzanne is a long-term resident of Dawesley whose property is adjacent to Dawesley Creek. She is currently working at Equestrian South Australia as a coach and officials coordinator.

Harry has extensive experience in community liaison and has worked as a project officer at the Eastern Hills and Murray Plains Catchment Group for the last nine years. Harry is also the retiring chair of the Goolwa to Wellington Local Action Planning Association, and lives at Callington.



*Suzanne Skibinski,
Downstream Dawesley
Creek Community
Representative.
(Photo 413492)*



*Harry Seager,
Community
Representative.
(Photo 413491)*

Days Creek remediation design

The current remediation design for the Brukunga Mine involves the compaction and saturation of mine waste on-site (tailings and waste rock), placed behind a seepage cutoff wall and under an engineered cover system of soil and rock.

Acid and metalliferous drainage is generated by chemical reactions when acid forming materials (like pyrite) mix with oxygen and water. Saturating the co-disposed waste prevents oxygen entering the waste and the subsequent generation of acid.

Days Creek Domain, the northern portion of the former mine, is an ideal location to run a large-scale trial (proof of concept) for the preferred remediation option. Within the domain lie two deep voids, about 10 metres deep, which provide good containment for the saturated waste rock, tailings and limestone (to control acidity).

Detailed planning and design for the Days Creek Domain proof of concept has been underway since late 2011 and is due to be completed in 2014.

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Water monitoring report 2012

The *Brukunga Mine site water monitoring report 2012* was submitted to the Environment Protection Authority South Australia (EPA) in September 2013 and is available on the DMITRE website.

In 2012:

- A total of 582 millimetres of rain was recorded at Brukunga compared with the long-term average of 560 millimetres.
- There were seven small and one large overflows of acid mine water from the on-site catchment system to Dawesley Creek. This was a result of heavy rains and flow that exceeded the holding and treatment capacity of the Brukunga Mine site acid water treatment plant.
- The largest overflow of mine water was experienced between 20 to 25 August and caused from significant localised flooding.

During all overflow events DMITRE takes measurements of the water quality downstream of the mine site and notifies the EPA. All overflow events are managed in accordance with the EPA approved contingency plan in order to minimise the impacts on Dawesley Creek.



Water sampling, Brukunga. (Photo 413483)



Full diversion drain, Brukunga. (Photo 413482)

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DET CRC update

The Deep Exploration Technologies Cooperative Research Centre (DET CRC) established a research facility at the Brukunga Mine site and the adjacently located Brukunga Country Fire Service (CFS) in November 2011 using a state-of-the-art drill rig. DET CRC aims to deliver research programs for more successful, cheaper and safer ways to drill, analyse and target deep mineral deposits.

In 2012 the facility completed their first drillhole down to a depth of 300 metres, and in 2013 the second diamond drilled hole was completed to 354 metres.

Nine driller training courses were held in 2013 for 122 students.

Planned future activities for 2013–14 include testing the world's first drilling with carbon-fibre drill rods.



Australian Training Alliance students at Brukunga. (Courtesy of Australian Training Alliance; 413485)

Training at Brukunga

The Australian Training Alliance is a registered training organisation and has been using the Brukunga Mine site and CFS facilities since 2012 to conduct training in mining and drilling. To date approximately 340 students have been trained in various mine and quarrying related skills, utilising the CFS facility, the acid water treatment plant and the quarry.

DET CRC has also been using the drilling facility for vocational training. In the last quarter over 50 trainees took part in pre-employment programs, acquiring a broad overview of drilling methods and technologies.

The South Australia Police and CFS have also used the mine site for training over the last 12 months.



DET CRC drill rig at Brukunga. (Courtesy of DET CRC; photo 413484)

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Filming at 'Brukungungwood'

The Brukungung Mine site continues to be used for various films, TV shows and commercials utilising the rocky and desert like visuals of the quarry.

Filming over the last 18 months has included Farmers Union Iced Coffee and Mitsubishi Triton commercials and a yet to be released children's TV show – *Sam Fox: extreme adventures*.

Previous films which have used Brukungung as the backdrop include *Road train* (2010) and the *Disappearance* (2002).



Screen shot of Farmers Union Iced Coffee commercial filmed at Brukungung in 2013. (Courtesy of Farmers Union; photo 413486)



Screen shot of Mitsubishi Triton commercial filmed at Brukungung in 2013. (Courtesy of Mitsubishi; photo 413487)

Brick making trials

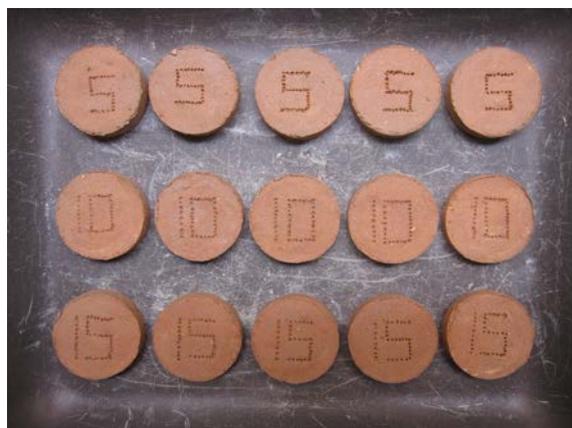
DMITRE employs one or two students to work on various research projects at Brukungung over the summer university vacation.

In 2012–13 one of DMITRE's students, Yuan Tian, investigated the use of gypsum sludge from the Brukungung acid water treatment plant for brick and paver production.

In conjunction with Austral Bricks at Golden Grove, Yuan blended the sludge (and Brukungung tailings) with clay and sand at various ratios to make trial brick pellets.

The brick firing process (vitrification) was successful in locking in the soluble heavy metals contained in the sludge and tailings.

Investigations are continuing into conducting a larger scale brick making trial.



Brick pellets made from Brukungung gypsum sludge and tailings. (Photo 413488)

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New DMITRE appointment

In mid 2012 DMITRE appointed Raul Mollehuara as project director for the Brukunga Mine and Remediation Program. Raul is a chemical engineer with over 20 years experience in the mining industry, both in his native Peru and in Australia. He has considerable experience in managing water treatment plants and dealing with mine wastes and is a welcome addition to the Brukunga team.

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Board meeting

The Brukunga Mine Site Remediation Board held an open public information session on the evening of 22 February 2013.

The board and DMITRE spoke to the community about progress on the Brukunga Mine Remediation Program and the Dawesley Creek diversion extension. The meeting was well attended with about 20 people.



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Geochemical test and trials

Throughout 2013 DMITRE's research officer has been continuing geochemical tests and trials designed to demonstrate and refine the saturated co-disposed mine waste model proposed for the Brukunga remediation design.

Continuing on from work started in 2010, DMITRE has progressed Stage 3 of the Column Leach Trails which investigates the mixing of gypsum sludge and organic content in with saturated mine wastes to determine their properties.

DMITRE also commenced a larger 100 tonne trial to demonstrate how blending with limestone and saturation of the mine wastes stops the generation of acid and metalliferous drainage. Results were encouraging; however, it was found that a small amount of organic content can increase the iron solubility of the wastes considerably.

Geochemical trials are continuing.



Construction of the geotechnical remediation trial for the proposed Brukunga saturated co-disposed mine waste model. (Photo 413490)

Geotechnical remediation trial

DMITRE conducted a geotechnical remediation trial of the Brukunga saturated co-disposed mine waste model.

The trial determined the constructability of the remediation design – in particular, how the waste rock and tailings can be mixed with the limestone effectively.

The trial placed approximately 6000 tonnes of waste rock, tailings and limestone in one of the bench pits within the mine. The material was mixed, saturated and compacted.

Monitoring probes were installed through the trial pad to monitor saturation and oxygen rates within the co-disposed area.

This trial assisted the Days Creek remediation design and took 3 weeks.



Construction of the 100 tonne trial for the proposed Brukunga saturated co-disposed mine waste model. (Photo 413489)

Brukunga and the Dawesley Creek Catchment Area

Brukunga Mine Site Remediation Board

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Board members

Hume Macdonald, Chairman

Dr Ted Tyne, DMITRE

Rolly MacDonald, Dawesley Creek Catchment Landcare Group

Andrew Stuart, District Council of Mount Barker

Harry Seager, Community Representative

Suzanne Skibinski, Downstream Dawesley Creek Community Representative

Deb Johnson, DMITRE administrative support

FURTHER INFORMATION

Further information on Brukunga, including photos, monitoring reports and past issues of *Working Together*, can be found on the [DMITRE Minerals website](http://www.minerals.dmitre.sa.gov.au) <www.minerals.dmitre.sa.gov.au>. Go to Mines & Developing Projects, Former Mines, Brukunga Mine Site.

