



Ash Development
Association of Australia

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COAL ASH matters

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ash - a valuable resource

Sustainability: the way of the future

It's a topic that we're increasingly hearing about. It's governing environmental reports, dominating the media, and has been described by Kevin Rudd as the "challenge of our age". While some may doubt the potential impact of climate change, core science proves that it is real, it is happening and it's having a major impact on our planet.

With the majority of Australians now acknowledging climate change, the matter is moving towards how we can respond to this issue. In December 2007, the Rudd government ratified the Kyoto Protocol, setting the target of reducing Australia's greenhouse pollution by 60 per cent by the year 2050, and becoming a leader in the global market for energy efficient technology.

As the issue of sustainability continues to loom in all aspects of Australian society, it is now everyone's responsibility to be part of the solution in dealing with the consequences of climate change. For those within the industry, the Australian government is offering additional assistance, having recently confirmed a \$500 million National Clean Coal

Initiative, which will support coal producers around Australia in reducing their emissions of greenhouse gases.

This issue of Coal Ash Matters provides some great examples of how many companies in the industry are actively being part of the solution in fighting climate change. Many articles in this issue detail various projects in which members are utilising CCPs to promote the sustainable use of coal. We've also included a short article on a recent book the ADAA has published in conjunction with the Cooperative Research Centre for Coal in Sustainable Development (see below). This issue's Insider provides an in-depth view of a CCP project currently underway at Eraring Energy to ensure the sustainable use of CCPs at their power station for the next 25 years, and Tarong North speaks about their use of Furnace Bottom Ash in the Gateway Upgrade Project.

For more information on the ADAA, its members and the industry, or to download an electronic copy of this newsletter, please visit our website: www.adaa.asn.au.

CCP HANDBOOK

The ADAA, in partnership with the Cooperative Research Centre for Coal in Sustainable Development (CCSD) recently launched the Coal Combustion Products Handbook at the final Annual Conference held in April.

The Handbook is the culmination of many years of excellent Australian-based research by our science and industry sectors, under the umbrella of the CCSD and ADAA, and is further testament to the high standard of our Australian based researchers and industry participants.

The handbook essentially provides knowledge for producers of CCPs, civil engineers, researchers, contractors, operators, planners, designers, architects and others within the industry, on the various ways to productively use fly ash. With environmental concerns constantly being put high on the agenda, this book emphasises the importance of using ash from coal consumption beneficially, as a means of ensuring coal sustainability.

The ADAA trusts that the handbook will be an important resource for producers, processors and users, which leads to greater understanding of CCP and encourages further use in a wider range of applications.

Copies of this publication can be obtained through the ADAA.



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Membership >

Company Members

A primary role of the Association is to bring together producers and marketers of coal combustion products (CCPs). Our activities cover research and development into CCP usage, advocacy and technical assistance to CCP producers and users, and a forum for the exchange and publication of CCP information. If you would like more information on the Association and how you can become involved, please complete the information section at the end of this newsletter. Current membership is listed below.

Adelaide Brighton Cement
Blue Circle Ash
Cement Australia
CS Energy
CSIRO (CMSE)
Delta Electricity
EFA Technologies
Eraring Energy
Flinders Power
Flyash Australia
Golden Bay Cement (New Zealand)
Heeleys Consulting
HRL Technology
Hyrock
Independent Fly Ash Brokers
Intergen (Millmerran)
International Power
Loy Yang Power
Nuash
Pozzolan Enterprises
Cemex
Rio Tinto
Roads Traffic Authority of New South Wales
Tarong North Power Station
Tarong Energy Corporation
TRUenergy
Verve Energy

Personal Members:

Barry Butler
Peter Heeley
Ron McLaren
Peter Nelson

Related Associations

American Coal Ash Association
www.acaa-usa.org

CCSD (CRC for Coal in Sustainable Development)
www.ccsd.biz

Institute for Water and Environmental Resource Management University of Technology, Sydney
www.iwerm.uts.edu.au

UK Quality Ash Association
www.ukqaa.org.uk

Furnace

ASH IN GATEWAY UPGRADE PROJECT



A new Gateway Upgrade Project, which will duplicate the crossing over the Brisbane River from Tarong North (TN) Power Station near Nanango in Queensland. The proximity of a particular area to the “Airtrain” rail link between the city and the airport has meant that normal methods to combat subsidence (such as ‘wick drains’) cannot be used. Being a stable, lightweight fill, FBA is being used as an alternative.

Around 12,000 cubic metres of material has been used for the project, making it the largest quantity of FBA used so far from TN. It is hoped that this significant project will assist in developing further confidence in the use of this quite unique material. While previously small quantities (up to 1,000 cubic metres) have been used successfully such as the North/South tunnel in Brisbane, no other project has utilised FBA in quite the same way as the Gateway Upgrade Project.

Handling of FBA is similar to that of natural fine materials. That is, before transporting FBA, it is conditioned to OMC (optimum moisture content) to ensure dusting is minimised and all loads are covered. Whenever possible, materials arriving on site are placed directly into the project site.

The recent expansion in the potential uses of Coal Combustions Products (CCPs) into civil applications such as the Gateway Project have been made possible through an umbrella approval granted via a “Beneficial Reuse Application” (BRA) process.

The ADAA, working closely with Queensland EPA and members, demonstrated through sound scientific and rigorous analysis that CCPs are safe, and provide significant benefits in a natural resource constrained environment. The ADAA is continuing to consult with the EPA on another application to use CCPs as a soil conditioner for horticultural/agricultural applications.

This milestone project is testament to the efforts of Cement Australia and Tarong North and the customer as both companies worked closely together to bring this project to fruition. Up to 100kt of furnace ash is produced each year with 120kt readily available from the Nanango operation. Tarong North’s aim is to maximise the reuse of its CCPs in environmentally and commercially sound ways. The Gateway Upgrade Project is a significant step forward towards achieving this goal.

INSIDER: ERARING POWER STATION COAL COMBUSTION PRODUCT (CCP) PROJECT >>>



Developing Compensatory Habitat at Ash Dam

Eraring Power Station has recently embarked on a project that is said to ensure the viability of Coal Combustion Product (CCP) management at their power station until the year 2032. The project, which is looking to investigate the various options for the future placement and storage of CCPs, will provide many additional benefits including:

- The development of a new method of CCP placement in storage facility (ash dam) using approximately same footprint.
- Continuation of supplying CCP to Flyash Australia (FAA) for use in their cement/concrete markets.
- Improvement in the quality of CCP supplied to FAA (through segregation of the fine material from coarse material), with an aim to increase sales of CCP to the markets in which FAA operate.
- Ensuring that the new system allows for the sale of CCP excess to the needs of FAA and other markets.

The team came up with a number of possibilities for the new storage facility during initial discussions. Options first discussed included:

- A new storage facility (dam) in the next valley.
- Increasing the height of the existing dam wall to allow more storage in the storage facility.
- Dry placement of CCP within the existing storage facility.

While these possibilities would solve the problem of CCP storage, all were deemed as unacceptable on the grounds of safety and/or environmental regulations.

Instead it was decided that a new method of placement, which involved storage of CCP in the area of the existing storage facility, would be looked at. After evaluation of the

area, dense phase placement of CCP was deemed the best option, as this would mean substantially more CCP could be placed per cubic metre, resulting in a smaller footprint for the overall storage facility. In order to operate efficiently, a small area of Crown Land was purchased to the north of the existing storage facility from the Department of Lands in mid 2006.

The project was deemed to be a project of state significance with Department of Planning setting a goal of recycling/reusing 80% of all CCP produced at the site. Approval requirements, which went through the Department of Planning, were quite strict, particularly with concerns on the clearing of bushland and the consequential threat to species of flora and fauna.

Eraring Energy was required to offer what was called 'compensatory habitat' areas for the land to be cleared, which had to be available before clearing could start. Each stage of clearing could only be a maximum of seven hectares and the compensation was required at a rate of two to one. So for each clearing proposed, fourteen hectares of compensatory habitat was required. Concept approval was granted by the Department of Planning in

December 2006.

Similar areas of bushland have been identified by Eraring Energy, to be offered as part of the compensatory habitat required for the project. Additionally, Eraring Energy is developing areas of similar habitat in cooperation with the local Aboriginal land council, Koompahtoo, by seeding areas with native species endemic to the local area.

Infrastructure for the Project

Following on from Concept Approval, a design was developed that allowed the project to be put forward to the Department of Planning for Project Approval in December 2007.

The design included a new fly ash collecting system for each generating unit. This new system removes the air slides used in the old process to reduce the likelihood of dust leaks. The design allows the collection of fly ash required for use by FAA (the finer portion of the fly ash collected during the shake cycle of the fabric filter bags) and separates that from the coarse material.



Growing seedlings at EPS

CONTINUED >>>

The fine portion is collected in intermediate silos and transferred to the processing facility of FAA at site. The coarse material and any excess to the needs of FAA is passed either through intermediate silos (for Units 1 and 2) or directly from the collection vessels (for Units 3 and 4) to the main storage silos located at the northern end of the power station site.

From here, the CCP can be either:

- loaded dry to road tankers
- conditioned (slightly wet) to open top trucks for local use, or
- placed in the storage facility using the dense phase placement technique.

Large piston diaphragm pumps are used to pump the CCP in its paste form to the storage facility three kilometres away for placement.

The CCP placement utilises gravity which allows dense phase material to flow using the slope of the land. This material sets firm and can be walked upon some 24 hours after placement. Dusting is minimised due to the fact that cenospheres are not released during the dense phase process.

The dense phase plant will be operational in mid 2009 when the first unit is expected to be connected. The remaining units will be connected

sequentially by the end of 2009.

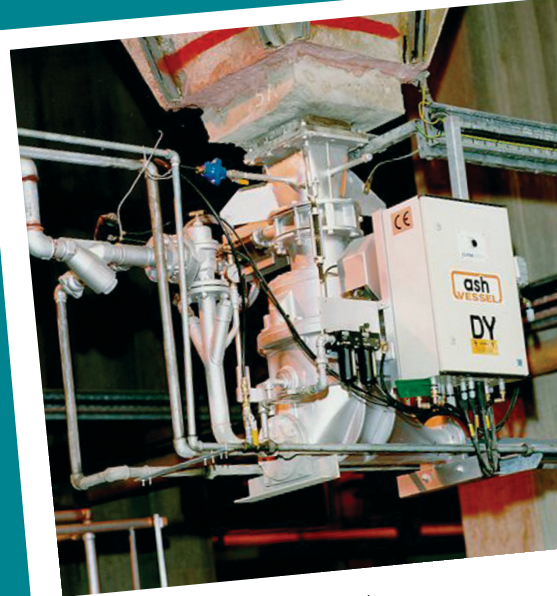
The successful company for this project was Clyde Bergemann Senior Thermal (CBST) based in Smithfield, Sydney. CBST are well known to the power industry and have been involved in similar projects in Europe and China though Clyde Bergemann Power Group of the UK.

The project includes a period of Operation and Maintenance (O&M) until practical completion of the whole project is reached. This then continues for a further 12 months and an optional additional 12 months following the first O&M period.

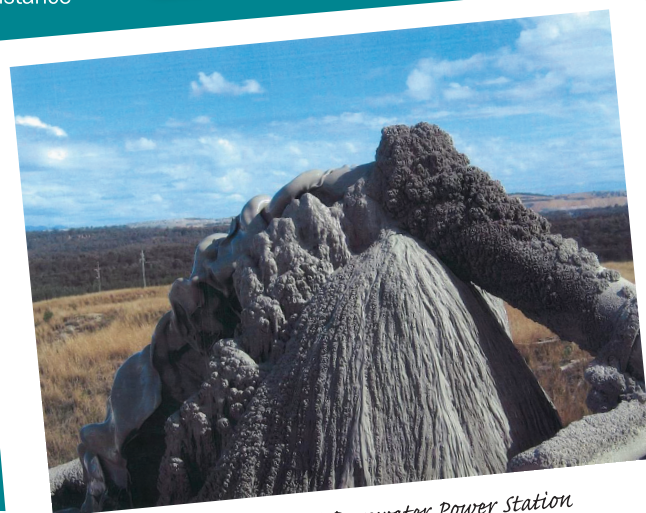
Eraring Energy looks forward to a successful partnership with CBST and wishes to thank CBST for the assistance in producing this article.

Garry Craig

Project Manager



Typical CCP collection vessel



Dense Phase placement at Bayswater Power Station

QUEENSLAND ENVIRONMENTAL PROTECTION AGENCY: Beneficial Reuse of CCPs

The ADAA has had yet another success after gaining approval for the beneficial reuse of Coal Combustion Products (CCPs) in Queensland. After submitting numerous Beneficial Reuse Applications (BRAs) to the Queensland government, the ADAA is now well on its way to achieving its goal of gaining regulatory reclassification and approval for the beneficial reuse of CCPs in every state in Australia.

After meeting with the Environmental Protection Authority (EPA), the ADAA successfully negotiated with the EPA, who agreed to amend the "industrial"

descriptor, on the provision that there would be a tightening of the criteria in Table 1- e.g. from an Exposure Setting F to A1.

The EPA agreed to amend the <1 year provision, if there has been no 'co-disposal' in the ash source in question, and also took on advice from the ADAA to improve the definition of the amount of sampling required- the suggestion recommending a more defined definition of frequency as it relates to volume. The ADAA also recommended a clarification of definitions in relation to CCPs, fly ash (AS 3582.1), and furnace bottom ash

(in relation to fluidized bed combustors and wood waste combustors).

The outcome of the BRA is a positive step forward for those in the industry in Queensland. This outcome has also meant there is now more consistency between states in Australia.

Around the power stations

TARONG ENERGY & TARONG NORTH

Tarong Power Station, owned by Tarong Energy Corporation (TEC), is situated near Nanango, Queensland, some 180 km northwest of Brisbane. It is one of Queensland's largest power stations, with a total generating capacity of 1400 megawatts,

The first of Tarong's four generating units became operational in May 1984 with the station being completed in 1986.

Initial testing of the Meandu coal, which supplies Tarong and Tarong North showed unfavourable resistivity properties for collection of fly ash using electrostatic precipitators. To achieve reasonable stack emissions six zone electrostatic precipitators were selected for fly ash collection.

In 1999, the Queensland Government approved the construction of Tarong North, a single 445-megawatt advanced cycle coal-fired unit at the existing Tarong Power Station site. Commissioning of the plant commenced in August 2002 and was completed in July 2003.

The Tarong North Power Station is owned by a 50/50 joint venture of Tarong Energy and TM Energy (Australia) Pty Ltd, which is owned by Tokyo Electric Power Company (TEPCO) and Mitsui & Co. Ltd. (Mitsui).

Tarong North utilises supercritical boiler technology to increase efficiency and reduce emissions. In addition to this, particulate emissions (ash and dust emitted from the chimney stack) are managed

via the use of bag filter technology which enables Tarong North to have lower emissions and assist with meeting best practice environmental standards.

Tarong and Tarong North Power Stations produce about 1.9 million tonnes of ash each year as a by-product of combusting coal. In 2006/07, more than 20% of this ash was sold through Cement Australia and Sunstate for use as an additive material in cement. The station is well located to service the rapidly growing concrete markets in Brisbane, the Gold Coast and Sunshine Coast.

Tarong Energy continues to seek potential new markets for any unsold volumes. Any unsold ash is currently stored in the Tarong Energy ash dam. The existing ash dam is expected to reach its maximum capacity in 2009. A new ash storage area must be developed and be operating prior to this date.

In 2007 the Queensland Government announced that it had accepted Tarong Energy's recommendation to purchase Meandu Mine from Rio Tinto Coal Australia and construct a new fuel source at Kunioon. The purchase of the Meandu mine has allowed Tarong Energy to explore the option of disposal of ash in mine voids.

The new mine will be constructed in time to succeed Meandu Mine when it is no longer commercially viable. Meandu Mine will be completely rehabilitated and a new mine infrastructure will be constructed at Kunioon. The new mine will be linked to the power station by a 16 kilometre coal transport conveyor system. The intention is for Kunioon to supply both power stations for at least 20 years.

Tarong Energy is a member of the Ash Development Association of Australia (ADAA).



Tarong Power Station

AUSTRALIAN NEWS

FLYASH AUSTRALIA is pleased to announce the appointment of Bob Marks to the new position of Business Development and Technical Manager, Flyash Australia. Bob has been working with Flyash Australia on a full-time consultancy basis since the EFA Technologies acquisition in September 2006.

As Business Development and Technical Manager, Bob will continue to be responsible for sales and marketing of the Solidflow product. In addition, Bob will take on the responsibility of market development and contract administration in Western Australia and South Australia, as well as providing technical oversight throughout FAA. This will include representing FAA in technical/regulatory forums, such as the ADAA, the Concrete Institute and others. Bob will be based at Crows Nest.

INTERNATIONAL NEWS

FOOTBRIDGE hosted its third international conference from July 2-4 2008 in Porto Portugal. Following the success of its first two conferences in Paris 2002 and Venice 2005, this year's theme 'Footbridges for Urban Renewal', covered all the various issues affecting the conception, analysis, construction, observation and repair of footbridges, whether they relate to social, artistic or technical issues.

The conference brought together urban and landscape planners, designers, civil engineers, architects, researchers, contractors and operators from all around the world to review and discuss the various topics associated with the development, design, analysis, construction and maintenance of footbridges. See website for more details on Footbridge 2008 and past conferences.

www.footbridge2008.com

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