

7th Australian Workshop on Acid and Metalliferous Drainage (AMD)

Emerging Trends in Acid and Metalliferous Drainage Management



21-24 June 2011 | Crowne Plaza, Darwin

Acid and Metalliferous Drainage (AMD) or 'Acid Rock Drainage' (ARD) continues to be the single most important long-term environmental issue for the world-wide mining industry. In spite of considerable amounts of expenditure to remediate sites affected by AMD, progress in waste characterisation, acid drainage treatment and effective long-term management, it is apparent that AMD still presents many challenges for mining companies and opportunities for new research.

For over 20 years in Australia a vast array of information has been made available to site managers to manage with the purpose to minimise or eliminate AMD, and thereby reduce the costs to their operations and business. A good deal of this knowledge has been shared at previous workshops, the first of which was held in 1992.

SMI Knowledge Transfer acknowledges and recognises the valuable contributions made in this field, initially by the Australian Centre for Minesite Rehabilitation Research (ACMRR) and the Australian Centre for Minerals Extension and Research (ACMER).

This workshop presented by SMI Knowledge Transfer, a unit within JKTech Pty Ltd, provides an opportunity to share with the mining industry, regulators, researchers, consultants and the community, unbiased expertise and advocacy with respect to the causes, management and amelioration of the impacts of AMD.

The workshop theme, "**Emerging Trends in AMD Management**", emphasises the need for companies to learn from observations and advances in practical long-term AMD management. This includes assessment of AMD risk at pre-feasibility stages of projects, implications of climatic extremes, integration of appropriate emerging technologies and research into AMD planning and management into life-of-mine planning through to closure and relinquishment.

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Emerging Trends in Acid and Metalliferous Drainage Management

Benefits of Attending

Personnel working on AMD/ARD issues produced as a result of mining, and also from use and development of acid sulphate soils, will have the opportunity to:

- Consider the business case for improved AMD/ARD practices,
- Compare and share innovative approaches relating to material characterisation, planning and design to prevent or minimise the impacts of acid drainage,
- Better manage and treat acid drainage,
- Examine options for closure and relinquishment of sites impacted by acid drainage, and
- Identify knowledge gaps and the need for alternative approaches for acid drainage management and control.

Inclusions

Delegates will receive:

- Delegates' book including abstracts (workshop delegates only), presenters' slides, and space for notes,
- A complete set of refereed papers on CD (workshop delegates only),
- Complimentary Leading Practice Sustainable Development handbooks on CD,
- Arrival tea/coffee, morning/afternoon tea, and lunch,
- Welcome Event on Monday 20 June 2011,
- Workshop Dinner on Tuesday 21 June 2011 (workshop delegates only),
- Field trips to Woodcutters (Lead-Zinc) Mine and Rum Jungle (Uranium) Mine (workshop delegates only).

Audience

This workshop will benefit personnel in the resources industry, government, consulting groups, research institutions with an involvement or interest in acid and metalliferous drainage:

- | | | |
|-----------------------------------|----------------------------------|--------------------|
| • Environmental Managers | • Government Regulatory Agencies | • HSE Managers |
| • Environmental Consultants | • Rehabilitation Practitioners | • Mine Planners |
| • Environmental Advisors/Officers | • Geochemists | • Project Managers |
| • Sustainability Managers | • Researchers | • Recent Graduates |

Sponsors

Workshop Sponsor:



Workshop Sponsor:



Workshop Sponsor:



Welcome Event Sponsor:



Lanyard and Name Badge Sponsor:



Cafe Bar Sponsor:



Emerging Trends in Acid and Metalliferous Drainage Management

Short Course Program

DRAFT

Monday 20 June 2011

The Fundamentals of Acid and Metalliferous Drainage

- Welcome and Introduction
- Understanding the Nature of AMD Generation – Causes and Impacts
- Prediction and Identification
- Managing AMD from Mine Waste Materials
- Treatment Options

Case studies:

- The Importance of Mine Planning
- Managing Mine Waste Materials
- Legacy Issues



INAP's Global Acid Rock Drainage (GARD) Guide

- Welcome to the Short Course
- Introduction to the GARD Guide
- Structure and Content of the GARD Guide
- The Business Case for ARD Development
- Characterisation and Sampling: Case Study
- Mine Water Treatment and Case Study
- Conclusions and Closure: Future of the GARD Guide

Presented by:



Darwin's Ultimate Urban Wildlife Experience

Welcome Event

20 June | 6pm

**58 Mitchell Street
Darwin City, NT 0800**

**Cocktail Food and Beverages provided
Roaming Reptiles + 'Fishing for Crocs' Platform Feed
Optional 'Cage of Death' - to pre-book contact SMI KT**



Welcome Event Proudly Sponsored by:



Emerging Trends in Acid and Metalliferous Drainage Management

Workshop Program

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Tuesday 21 June 2011

- Implementing AMD Risk Reviews Across Global Operations
- Economic Pre-Feasibility Work – Linking AMD Hazards and Risks to Operations and Closure
- INAP's GARD Guide – An Update on Implementation and Rollout
- The 8th ICARD Update on Global Progress
- CNAMD – Progress in Asia
- Appropriate Geo-Cover Systems for Different Climates
- Acidification of a Sandy Aquifer with Declining Rainfall and Increasing Abstraction: Implications for Groundwater Management with Climate Change
- Applicability of Cover Designs in Different Climates of Australia
- Design Considerations for Active Treatment of Acid Rock Drainage in a High Rainfall Equatorial Region
- Understanding the Long-term Seepage Chemistry of Base Metal Mine Tailings in a Semi-Arid Tropical Climate, Mount Isa, Australia
- The Benefits of Kinetic Testwork Using Oxygen Consumption Techniques and Implications for the Management of Sulfidic Materials
- Improved Results Using New AMD Material Classification Criteria
- Geochemical Risk Assessment Process for Rio Tinto's Pilbara Iron Ore Mines

Wednesday 22 June 2011

- Emerging Trends in the Development of Stable Mine Waste Landforms and Cover Systems for Reactive Materials
- Monitoring of Cadia's "Store and Release" Covers Over a Potentially Acid Forming Trial Waste Rock Dump: Four Years On
- State-of-the Art Performance Monitoring of Cover Systems – Moving from Point Scale to Macro Scale Approaches
- Waste Rock Dump Rainfall Infiltration and Base Seepage
- Development and Implementation of a Remediation Plan for Small Scale Uranium Mining Activities
- Integrated Acid Rock Drainage Management at the Phu Kham Copper Gold Operation in Lao PDR
- Assessment of Alkaline Cover Performance for Abatement of ARD from Waste Rock Dumps at Savage River Mine
- Demonstrating Leading Practice in AMD Planning for Mine Closure: Why Does Understanding Tailings Geochemistry Matter?
- AMD & Ephemeral Creeks in NW Queensland – Case Study: Page Creek MMG Century Mine
- Mitigation and Control of the World's Most Acidic Mine Drainage: A Case Study of Iron Mountain Mine, California, USA
- The Formation, Fate, and Effects of "Floc" from Acid Mine Drainage in Stream Waters
- Acidity Load Contributions from Highwall Sources at the Brukunga Mine



Workshop Dinner

21 June | 7pm | Pee Wees at the Point

Return transportation from Crowne Plaza provided

Canapés and 2 Course Dinner with Beverages provided



Workshop Program cont.

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Thursday 23 June 2011

Travelling in the comfort of an air-conditioned coach, delegates will be taken on a field trip to visit Woodcutters Mine and Rum Jungle Uranium Mine.

Woodcutters Mine

SMI Knowledge Transfer would like to acknowledge the support and co-operation of Newmont Asia Pacific in granting access to Woodcutters Mine.



Rum Jungle Uranium Mine

SMI Knowledge Transfer would like to acknowledge the support and co-operation of Department of Resources in granting access to Rum Jungle Uranium Mine.



Friday 24 June 2011

- Waste Rock Hydrology and Oxygen Transport - An Overview of Full Scale Excavations and Scale-up Experiments Conducted over the Last Two Decades
- A New Approach to Integration of Mineralogy, Geochemistry and Texture for Improving Prediction of Acid Metalliferous Drainage from Abandoned Mines
- The Maghemite Sludge Process: a Potential New Method for Active Neutralisation of AMD
- Rapid On Site Screening (ROSS) Technology and its Practical Applications for Acid and Metalliferous Drainage Studies
- A Novel Approach to Management of Waste Rock and Tailings Sulfidic Waste
- State-of-the-Practice of Mine-Impacted Water Restoration in the U.S.
- Passive Treatment of Mine Drainage Arsenic and Antimony through Adsorption by AMD Precipitates, West Coast, New Zealand
- A Sulphate Reducing Bioreactor – Part of Strategic Stormwater Drainage at Nyrstar's Hobart Smelter
- Passive Treatment of Acid Mine Drainage using Waste Mussel Shell, Stockton Coal Mine New Zealand
- Factors Influencing Inland Acid Sulfate Soil Formation in South-Eastern Australia
- Invited Panel Discussion Workshop Review



Emerging Trends in Acid and Metalliferous Drainage Management

Presenters

Keynote Speakers Include:

Dr Terrence Chatwin	INAP
Dr David Jones	Environmental Research Institute of the Supervising Scientist
Dr Bruce Kelley	Rio Tinto
Prof Ward Wilson	The University of Alberta
Prof David Williams	The University of Queensland

Leading Experts Include:

Dr Steve Appleyard	Department of Environment and Conservation of Western Australia
Dr Thomas Baumgartl	Centre for Mined Land Rehabilitation, The University of Queensland
Mr Nic Bourgeot	Earth Systems
Mr David Brett	GHD Pty Ltd
Miss Fiona Crombie	Solid Energy New Zealand Limited
Ms Suzanne Davis-Hall	Newcrest Mining Ltd
Ms Tina Dhewiyani	ITM Mining Limited
Dr Mansour Edraki	Centre for Mined Land Rehabilitation, The University of Queensland
Ms Bronwen Forsyth	Centre for Mined Land Rehabilitation, The University of Queensland
Miss Fiona Glover	Department of Agricultural Science, La Trobe University
Dr Rosalind Green	Rio Tinto Iron Ore
Dr Gary Hickman	CH2M HILL
Dr Iskandar	Bogor Agricultural University
Dr Jun Li	Mawson Institute, University of South Australia
Mr Timothy Loch	Landloch Pty Ltd
Mr Greg Maddocks	Golder Associates
Mr Stuart Miller	Environmental Geochemistry International Pty Ltd
Dr Philip Mulvey	Environmental Earth Sciences
Mr Mike O'Kane	O'Kane Consultants Pty Ltd
Mr Steven Pearce	GHD Pty Ltd
Dr Alan Robertson	RGS Environmental Pty Ltd
Dr Timothy Rohde	Sinclair Knight Merz
Mr Dave Salmon	Golder Associates
Mr Peter Scott	Environmental Earth Sciences
Prof Wen-Sheng Shu	Sun Yat-sen University
Mr Jim Stefanoff	CH2M HILL
Dr Jeff Taylor	Earth Systems
Mr Dave Trumm	CRL Energy Limited
Mr James Versluis	Minerals and Metals Group
Assoc Prof John Webb	Environmental Geoscience, La Trobe University



Emerging Trends in Acid and Metalliferous Drainage Management

Venue

Cost

Grand Ballroom Crowne Plaza 32 Mitchell Street DARWIN Northern Territory 0801 +61 8 8982 4953 www.ichotelsgroup.com	Registrations <i>Due on or before:</i>	Early Bird <i>Thurs 31 March</i>	Normal Registration <i>Fri 3 June</i>
	Short Course 20 June Workshop 21-24 June Both 20-24 June Full Time Student	\$ 900 incl GST \$2450 incl GST \$2750 incl GST \$ 495 incl GST	\$ 995 incl GST \$2750 incl GST \$2950 incl GST \$ 495 incl GST

Registration

SMI Knowledge Transfer is pleased to offer you the convenience of online registration and payment for 2011.

'**Register and Pay**' will enable you to give contact details and make payment via credit card online. '**Register Only**' will enable you to give contact details online with a follow up call from a SMI KT staff member regarding alternative payment details.

Timings

Professional development events will generally commence at 8.30am and conclude at 5.00pm. Please take note of the specific start times in the Program (downloadable on the website). Times may be subject to slight variations on the day; however SMI Knowledge Transfer will endeavour to keep to time.

Accommodation

SMI Knowledge Transfer has arranged preferred rates with the following hotels inclusive of breakfast for one - simply quote "**JKTech**" to receive these rates (please note conditions may apply):

Crowne Plaza
32 Mitchell Street
Darwin NT 0801
+61 8 8901 0704
(Block code: AMC)
www.ichotelsgroup.com
From \$249 per night

Mantra on the Esplanade
88 The Esplanade
Darwin NT 0800
+61 8 8943 4333
www.mantra.com.au
From \$255 per night

Novotel Darwin
100 The Esplanade
Darwin NT 0800
+61 8 8941 0755
www.novotel.com
From \$260 per night

For further accommodation options visit Travel NT at <http://en.travelnt.com/>

Cancellation

SMI Knowledge Transfer reserves the right to cancel any course at its discretion. Whilst we endeavour to make every effort not to do this, there could be circumstances beyond our control (e.g. insufficient numbers) that may prevent us from going ahead. In light of this, if you need to fly, we suggest that you purchase a fully flexible airline ticket. Delegates cancellations 14-8 days before course commencement incur an administration fee of \$110. The full registration fee is payable for cancellations 7 days or less before course commencement or non-attendance at the course. Substitutions accepted when advised.



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Pre and Post Optional Tours

Visitors to the Northern Territory's capital are always beguiled by the city's natural surroundings, laid back multiculturalism, quirky sense of humour and cosmopolitan yet quintessentially Australian way of life. With the highest daily average sunshine hours of any Australian capital, you'll love Darwin's relaxed tropical, outdoor lifestyle.

Darwin's greatest surprise is how much there is to see and do here. From some of the world's best sport fishing to exploring the nearby natural wonders, there's plenty to look forward to when the business day is done.

For more information and further touring options at delegates own expense visit www.darwindaytours.com.au
Please note that the below prices and itineraries are subject to change with seasonal updates.

1 Day KAKADU TOUR | \$224pp

Includes: Tour vehicle and guide | Yellow Water Cruise | Lunch | Ice-water throughout the tour
You'll See/Do: Kakadu National Park | Ubirr Aboriginal Art site | Yellow Water Wetlands | Wildlife | + More

1 Day KATHERINE GORGE and EDITH FALLS | \$199pp

Includes: Tour vehicle and guide | 2 Hour Cruise | Lunch | Ice-water throughout the tour
You'll See/Do: Edith Falls | Swim | Katherine Gorge | Nitmiluk National Park | Adelaide River | + More

Half Day JUMPING CROCODILE CRUISE TOUR | \$105pp

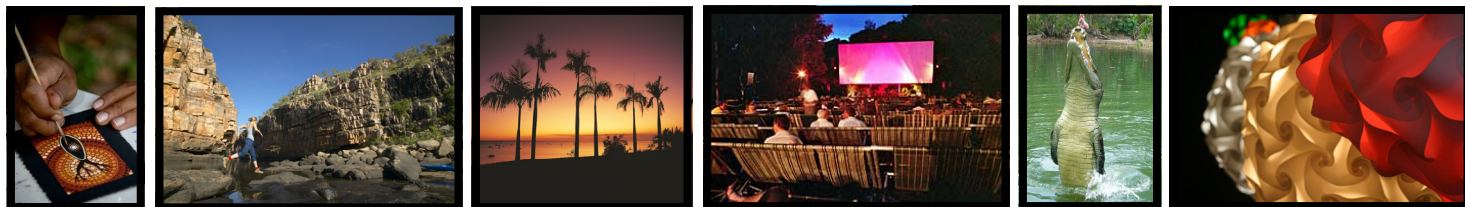
Includes: Tour vehicle and guide | Entry Fees | Cruise
You'll See/Do: Fogg Dam Nature Reserve | Window on the Wetlands | Jumping Crocodiles

Half Day TERRITORY WILDLIFE PARK | \$70pp / \$145pp with Harbour Cruise

Includes: Tour vehicle and guide | Entry Fees | Museum and Art Gallery | Harbour Cruise (optional)
You'll See/Do: Territory Wildlife Park | Nocturnal House | 'Birds of Prey' and Feeding Interactions | + More

Top End Touring Pass - HALF DAY BUNDLE | \$219pp

Travel on the day of your choice and experience three of the most popular attractions around Darwin:
Afternoon Darwin City Sights Tour | Morning Territory Wildlife Park Tour | Afternoon Jumping Crocodile Tour



Places and Events of Interest

Deckchair Cinema | www.deckchaircinema.com | catch a movie under the starry sky right by the harbour. The Deckchair Cinema runs seven nights a week during the dry season and is a unique attraction for Darwin.

Mindil Beach Sunset Markets | www.mindil.com.au | open on Thursday and Sunday nights. Watch the magnificent sunset over Mindil Beach and enjoy food stalls, handmade crafts, indigenous art, and live entertainment.

Berry Springs Nature Park | just 45 minutes from the CBD near the Territory Wildlife Park. Berry Springs is a popular swimming and picnic/BBQ area in surrounded by natural bush and small waterfall.

V8 Supercars | www.v8supercars.com.au | the SKYCITY Triple Crown will be held just 15 mins from the CBD in Hidden Valley on 17-19 June 2011, the weekend prior to the workshop.