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**AGENDA**  
**NSW Minerals Council**

**UHMD Joint Working Group Meeting - Land Management**

**UHMD Resource Centre, Upstairs of the Town Square Shopping Centre  
Suite 1, 159 John Street, Singleton NSW 2330**

**Wednesday 11 May 2016: 1.30pm - 4:30pm**

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1. Welcome and apologies
2. Minutes and actions of the previous meeting
3. Update on current projects (incl. grazing study, rehabilitation reporting)
4. Biodiversity Reference Sites project
5. Rehabilitation awareness and promotion project
6. DRE Exploration and Mining Rehabilitation Factsheet
7. Voids project
8. Pasture Plants of the Upper Hunter book
9. 2015 UHMD Annual Forum report
10. Update on UHMD communications initiatives and media mentions
11. Working group performance, relevance and strategic direction
12. Other business

# **DRAFT MINUTES**

## **NSW Minerals Council UHMD – Land Management Joint Working Group** UMHD Resource Centre, Singleton Town Square Shopping Centre, Singleton

**Wednesday 11 November 2015: 1.30pm- 4.30pm**

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### **Present**

Bill Baxter (Chair)	Rio Tinto
Glenda Briggs	Department of Primary Industries
John Drinan	Singleton Shire Healthy Environment Group
Bruce Devonport	Singleton Council
Nigel Charnock	Glencore
Dee Murdoch	AECOM
Neil Griffiths	NSW Department of Primary Industries
Wendy Bowman	NSW Mine Watch
Julie Thomas	Muswellbrook Coal Company Limited
Shane Davey	Theresource
Bob Mackie	<i>Theresource</i>
Jim Morgan	Wybong Action Group
Ron Fenwick	Community member
Monique Meyer	Resources and Energy NSW Trade and Investment
Tim Roberts	The University of Newcastle
Greg Sullivan	NSW Minerals Council
Andrew Rode	NSW Minerals Council

### **Apology**

Jo Powells	NSW Department of Primary Industries
Rebekah Gomez-Fort	NSW Department of Primary Industries
Digby Short	Ashton Coal
Jason Desmond	The Bloomfield Group
Matthew Newton	NSW Department of Trade and Investment
Brooke York	Anglo American

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## **1. Welcome and Apologies**

The Chair welcomed attendees and noted apologies.

## **2. Confirmation of Minutes of 6 August 2015**

The minutes of the 6 August 2015 meeting were confirmed.

The working group mentioned that there was another voids project, similar to the UHMD project being undertaken as an ACARP project.

### **ONGOING ACTION:**

- NSWMC to organise a presentation from OEH on the Upper Hunter Strategic Assessment, when the materials are publicly released.

### **NEW ACTIONS:**

- NSWMC to distribute DPC presentation provided by Ms Jodie Calvert on initiatives in the Upper Hunter.
- NSWMC to identify details of ACARP voids project.

## **3. Simplification of UHMD minuting procedures**

The working group agreed to simplify minutes.

## **4. Update on current projects**

Neil Griffiths provided an update on the grazing study. Key points included:

- Cattle on rehabilitated sites are gaining more weight - the rehabilitation sites may require more steers as there is a lot of ungrazed grass.
- Botanical diversity analysis showed better than expected results on rehabilitated sites.
- Need to determine when to sell the cattle (pre-winter).

Neil also mentioned the development of a book on pastures in the Hunter and Central West.

Andrew Rode provided an update on other projects.

The working group suggested that the revised scope of the biodiversity reference sites project be progressed.

### **ACTIONS:**

- NSWMC to add discussion on pasture plants book at next JWG agenda.
- NSWMC to commence scoping of biodiversity reference sites project.

## **5. Update on JASC meeting outcomes**

The working group noted the updates from the JASC meeting.

## **6. Rehabilitation reporting 2014**

The working group noted the updated rehabilitation figures for 2014, it suggested that:

- The figures be published with the appropriate contextual information.
- The value of the company rehabilitation principles reports be considered, e.g. by determining the number of web hits to the download page.
- To include Vale in the 2014 figures by proving figures from its AEMR report.
- To calculate the proportion of disturbed land that has been rehabilitated across the Upper Hunter mines.

#### **ACTIONS:**

- NSWMC to update the rehabilitation figures table to include Vale in 2014.
- NSWMC to publish 2014 rehabilitation data with appropriate contextual information.
- NSWMC to determine the popularity of the 'rehabilitation reporting' website and the reports contained within.
- NSWMC to calculate the proportion of disturbed land that has been rehabilitated across the Upper Hunter mines.

### **7. Beneficial reuse of voids project**

Andrew provided an update on the voids project - which included the preparation of a draft water quality report and an outline of a voids workshop.

Tim Roberts advised that the University of Newcastle had undertaken some analysis of voids in the Upper Hunter and counted that there were to be around 22 voids. The working group suggested that this information be included as part of the Voids Workshop.

#### **ACTION:**

- NSWMC to include information relating to the University of Newcastle's analysis of voids in the Voids Workshop.

### **8. Muswellbrook Mining Dialogue Community Day**

Greg and Shane provided an overview of the upcoming Muswellbrook Mining Dialogue Community Day. The working group discussed opportunities to promote the event.

### **9. Annual UHMD Workshop**

The working group discussed the upcoming UHMD Annual Workshop, suggesting:

- That there be table facilitators to guide conversations.
- That the working group goals be revisited.
- That participants have the opportunity to raise any new issues.

#### **ACTIONS:**

- NSWMC to ensure that the UHMD Annual Workshop:
  - Includes table facilitators.
  - Revisits working group goals.
  - Enable new issues to be raised.

### **10. Update on UHMD Communications Plan**

The working group suggested that the UHMD Communications Plan be presented at the Annual Workshop.

The working group also suggested that a clips file be prepared to track all UHMD related articles / mentions in the media on an ongoing basis.

**ACTIONS:**

- NSWMC to include a presentation on the UHMD Communications Plan in the Annual Workshop.
- NSWMC to prepare a media clips file on the UHMD, on an ongoing basis.

**11. Other Business**

Andrew mentioned that there was an upcoming soils seminar.

Meeting closed at 4:25pm.

**Actions arising from meeting on 11 November 2015  
UHMD Land Management Joint Working Group Meeting**

Action	Responsibility	Status
<b>1. Welcome and Apologies</b>		
<b>2. Confirmation of Minutes of 8 August 2015</b>		
<ul style="list-style-type: none"> <li>● NSWMC to organise a presentation from OEH on the Upper Hunter Strategic Assessment, when the materials are publicly released.</li> </ul>	<b>NSWMC</b>	Ongoing
<ul style="list-style-type: none"> <li>● NSWMC to distribute DPC presentation provided by Ms Jodie Calvert on initiatives in the Upper Hunter.</li> </ul>	<b>NSWMC</b>	Completed
<ul style="list-style-type: none"> <li>● NSWMC to identify details of ACARP voids project.</li> </ul>	<b>NSWMC</b>	Completed
<b>3. Simplification of UHMD minuting procedures</b>		
<b>4. Update on current projects</b>		
<ul style="list-style-type: none"> <li>● NSWMC to add discussion on pasture plants book at next JWG agenda.</li> </ul>	<b>NSWMC</b>	Completed - refer to Item 8
<ul style="list-style-type: none"> <li>● NSWMC to commence scoping of biodiversity reference sites project.</li> </ul>	<b>NSWMC</b>	Completed - refer to Item 4
<b>5. Update on JASC meeting outcomes</b>		
<b>6. Rehabilitation reporting 2014</b>		
<ul style="list-style-type: none"> <li>● NSWMC to update the rehabilitation figures table to include Vale in 2014.</li> </ul>	<b>NSWMC</b>	Completed
<ul style="list-style-type: none"> <li>● NSWMC to publish 2014 rehabilitation data with appropriate contextual information.</li> </ul>	<b>NSWMC</b>	Completed
<ul style="list-style-type: none"> <li>● NSWMC to determine the popularity of the 'rehabilitation reporting' website and the reports contained within.</li> </ul>	<b>NSWMC</b>	Completed
<ul style="list-style-type: none"> <li>● NSWMC to calculate the proportion of disturbed land that has been rehabilitated across the Upper Hunter mines.</li> </ul>	<b>NSWMC</b>	Completed
<b>7. Beneficial reuse of voids project</b>		
<ul style="list-style-type: none"> <li>● NSWMC to include information relating to the University of Newcastle's analysis of voids in the Voids Workshop.</li> </ul>	<b>NSWMC</b>	Not completed - information was not available
<b>8. Muswellbrook Mining Dialogue Community Day</b>		
<b>9. Annual UHMD Workshop</b>		
<ul style="list-style-type: none"> <li>● NSWMC to ensure that the UHMD Annual Workshop: <ul style="list-style-type: none"> <li>○ Includes table facilitators.</li> <li>○ Revisits working group goals.</li> <li>○ Enable new issues to be raised.</li> </ul> </li> </ul>	<b>NSWMC</b>	Completed, with the exception of working group goals (to be discussed in Item

		11).
<b>10. Update on UHMD Communications Plan</b>		
<ul style="list-style-type: none"> <li>• NSWMC to include a presentation on the UHMD Communications Plan in the Annual Workshop.</li> </ul>	<b>NSWMC</b>	Completed
<ul style="list-style-type: none"> <li>• NSWMC to prepare a media clips file on the UHMD, on an ongoing basis.</li> </ul>	<b>NSWMC</b>	This will be completed for the JASC and ISC. Project specific media will be included in JWG papers.
<b>11. Other business</b>		

### Agenda Item 3

#### **UPDATE ON CURRENT PROJECTS**

##### **Rehabilitation Reporting**

The 2014 data for the Rehabilitation Principles and Commitments has been published on the website with the company rehabilitation principles reports. The data was also presented at the UHMD Annual Forum.

NSWMC is now compiling 2015 data from the industry.

For information, the UHMD rehabilitation reporting website has been viewed 427 times in the past 12 months. The company reports sub-page was viewed 98 times in that period.

##### **Grazing Study**

A verbal update will be provided.

A story on the grazing study featured in the Newcastle Herald on 8 April 2016 (attached).

##### **Biodiversity Reference Sites**

Refer to item 4.

##### **Rehabilitation awareness and promotion**

Refer to item 5.

##### **Beneficial reuse of voids**

Refer to item 7.

#### **FOR INFORMATION / DISCUSSION**



# A mine of information

BY ANITA BEAUMONT

CATTLE grazed on rehabilitated mine sites can perform just as well, if not better, than those fed on native pasture according to a study conducted by the NSW Department of Primary Industries.

The four year project is looking into the effects of grazing cattle on rehabilitated mine land compared to non-mined control sites.

Neil Griffiths from the Department of Primary Industries was in charge of the study, which took place at Rio Tinto Coal in Muswellbrook and Allied's Hunter Valley Operations in Singleton.

He said early results were encouraging.

Angus steers grazing on the rehabilitated land weighed in at an average of 764 kilograms, compared to 611 kilograms for those on the control sites.

"150 kilos is worth nearly \$400 a head difference in those steers under basically the same management and seasonal conditions in the two different areas," Mr Griffiths said.

At each site, two herds of steers were separated into adjacent paddocks.

One herd was on the rehabilitated mine land, and the other was on native pasture.

Neither site had had been fertilised for many years.

"They are close together so they should get pretty much the same rainfall, as well as have similar soil fertility," Mr Griffiths said.

The steers had the same average weight at the beginning of the study, and the same breeding background.

"We were deliberately trying to make the management of them as similar as possible," he said.

"It appears that with the right management, those mine sites can be grazed quite effectively.

"The caveat on that of course is that the rehabilitation needs to be done well."

The study will continue with a second group of steers put on the sites throughout the next 12 months.

As well as providing information as to whether mined land could be effectively used for grazing, the study also provided useful information for the broader industry.

"We're getting good information on feed quality and growth patterns on the pastures that are there," Mr Griffiths said.

Mine sites rehabilitated in the future could yield even better results with the benefit of modern pasture production knowledge.

NSW Minerals Council chief executive Stephen Galilee said mine rehabilitation in NSW had the potential to restore land to a state better than what it was before mining took place.

"We can see from this study that cattle being grazed on rehabilitated mine land

gained weight at a more considerable rate compared

to those grazing on the non-mined land," he said.

"It's a great example of how mining and farming can co-exist in the Hunter, and how the same land can be used productively by both of these important industries."

## Agenda Item 4

### **BIODIVERSITY REFERENCE SITES PROJECT**

#### **Issue**

Travis Peak (Umwelt) has prepared a scoping overview for the Biodiversity Reference Sites (BRS) project that focuses on sharing existing reference site information.

#### **Background**

Umwelt has prepared a scope for the BRS project that considers the following requirements:

- Maximum possible utilisation of existing sites, either existing or ones already committed to being established.
- Minimum requirement for new sites to be established – if needed, for these to be considered by mines in future when establishing new sites for project approval or other purposes.
- Consider and allow for possibility of using monitoring data from other sources, especially the Office of Environment and Heritage (OEH), as well.
- A simple process that provides broad guidance (or specific guidance where warranted) on how data should be collected, analysed and reported, which operates generally in accordance with the State government's biometric approach.
- Identify future potential opportunities to improve the rigour of the program, and expand it where practicable.

The steps that would be required to undertake this, are as follows:

#### *Stage 1 - Prepare Concept and Undertake General Desktop Review*

- Prepare the concept design for how the project would be undertaken, including target communities (including the recently listed Central Hunter Valley Eucalypt Forest and Woodland CEEC) anticipated outcomes.
- Liaise with mines with assistance with NSW Minerals Council to obtain feedback on which mines have, or might have, sites established, or planned to be established, that could contribute to this project.
- High level review of existing/proposed reference sites/data to determine potential suitability.
- Make recommendations on sites to be used/agreed upon for program design.
- Provide briefing note to UHMD for consideration and review.

#### *Stage 2 - Targeted Review of Current Sites and Data Collection and Prepare Report on Site Sampling Methodology, Reporting Recommendations and Future Options*

- Assessment of known or anticipated broad UHSA/FBA mine rehabilitation requirements (including the UHSA Mine Rehabilitation Guideline), as they relate to the BRS project.
- Mines to provide spreadsheets/databases/locations of sites and information monitored at each site provided – based on agreed monitoring sites to use as a result of Stage 1.
- Identify/highlight opportunities to make use of data from other sources, e.g. OEH.
- Undertake a targeted 'fit for purpose' audit of data for current sites to be used as reference sites – present in tabular form.
- Undertake a targeted gap analysis of above data yield, as well as gap analysis of site numbers/replicates – present in tabular form.
- Describe the site coverage, recommended (biometric) data collection methodology, data analysis methodology, reporting approach.
- Identify key opportunities/outcomes that could be achieved from future BRS survey/analysis, e.g. in More Appropriate Local Data (MALD) report, establishing local benchmarks, assisting in explaining relatively poor rehabilitation outcomes due to drought etc.
- Briefly identify future options that could be undertaken (deliberate or opportunistic) to improve robustness of the monitoring program, analysis and reporting.
- Provide report to UHMD for consideration and review; finalise report after comments received.

**RECOMMENDATION**

The working group to provide advice and comment on the proposed scope of the project.

**FOR INFORMATION / DISCUSSION**

## Agenda Item 5

### **REHABILITATION AWARENESS AND PROMOTION PROJECT**

#### **Issue**

The rehabilitation awareness and promotion project needs to be scoped and commence this year.

#### **Background**

NSWMC met with DRE on Thursday 28 April 2016 to discuss the scope for this project.

DRE expressed a strong interest in raising awareness about rehabilitation policy and existing rehabilitation examples through a partnership approach with the NSW Minerals Council. They were particularly interested in tours, case studies, and developing and working on a communications strategy through a staged approach.

It was decided that a Joint NSWMC - DRE working team be established to work through the project.

NSWMC will keep the JWG updated on progress.

#### **FOR INFORMATION / DISCUSSION**

## Agenda Item 6

### **DRE EXPLORATION AND MINING REHABILITATION FACT SHEET**

#### **Issue**

In March 2016, DRE released a 'Exploration and Mining Rehabilitation' fact sheet.

#### **Background**

The fact sheet is attached, and also available here:

[http://www.resourcesandenergy.nsw.gov.au/\\_data/assets/pdf\\_file/0008/619838/PUB16-177-Exploration-and-mining-rehabilitation-fact-sheet-FINAL.pdf](http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0008/619838/PUB16-177-Exploration-and-mining-rehabilitation-fact-sheet-FINAL.pdf)

DRE has also advised that it would be preparing a fact sheet on rehabilitation securities. NSWMC requested that DRE present that fact sheet to the JWG once it is completed. This has been pencilled in for the following meeting on 21 July 2016.

#### **FOR INFORMATION / DISCUSSION**

## FACT SHEET

# Exploration and mining rehabilitation

March 2016

The NSW Government has strict conditions that ensure exploration and mining affected land is left in a safe and stable condition and that local communities are not unduly affected. Post-mining rehabilitation can take many forms such as the removal of infrastructure, securing of mine entrances and shafts, remediation of contaminated land, landscaping and revegetation.

## What is rehabilitation?

The NSW Government encourages the safe and sustainable development of the state's natural resources and imposes strict conditions on authority holders (mostly exploration and mining companies) to ensure the environment and people of NSW are not unduly affected as a result of their actions. Rehabilitation of impacted land is essential and therefore an integral consideration throughout the entire exploration and mining cycle.

The *Mining Act 1992* defines rehabilitation as 'the treatment or management of disturbed water or land for the purpose of establishing a safe and stable environment'.

During exploration, the Department of Industry, Skills and Regional Development - Division of Resources and Energy ensures, through its approval and compliance processes, that rehabilitation activities return disturbed land to a condition that is safe and stable. The final condition should be as good or better than it was before exploration activities, or that it allows the proposed final land use(s) (developed in consultation with landholders) to be sustained.

Rehabilitation commitments post-mining are established as part of the development approval issued under the *Environment Planning and Assessment Act 1979* (EP&A Act) and associated conditions of title issued under the *Mining Act 1992*.

The focus is generally towards supporting future land uses. Post-mining land use(s) are approved by a consent authority such as the Minister for Planning and Environment, the Planning Assessment Commission or a local council.

Post-mining rehabilitation can take many forms such as the removal of infrastructure, securing of mine entrances and shafts, remediation of contaminated land, landscaping and revegetation works.

### Key points

- Rehabilitation is the treatment or management of disturbed water or land for the purpose of establishing a safe and sustainable environment
- All exploration and mining approvals contain conditions regarding rehabilitation
- Authority holders lodge security bonds with the NSW Government to cover the full cost of rehabilitation. The total bond held across the state as at February 2016 is \$2 billion
- Historic mining issues are dealt with under the NSW Government's Derelict mines program
- Rehabilitation obligations transfer to the new owner if a mine is sold or ownership transferred.

Remediation plans are negotiated with landholders and the community to ensure the final landform and post-exploration or mining land use is safe and usable for future generations.

## Conditions and controls

All exploration and mining approvals contain specific conditions regarding rehabilitation. Authority holders are required to:

- comply with all requirements under relevant legislation
- comply with the *Exploration code of practice: Rehabilitation*, which have been granted, issued, renewed or transferred after 1 July 2015 (prospecting titles only)
- develop rehabilitation and completion criteria in consultation with relevant landholders
- lodge a security bond that covers the full cost of rehabilitation in the event the authority holder becomes insolvent. The total bond held by the government is in the region of \$2 billion
- develop a mining operations plan (MOP, also known as a Rehabilitation Management Plan, or

RMP) that outlines and commits to rehabilitation activities

- regularly report on the performance of rehabilitation activities against the MOP and any other rehabilitation commitments
- permit access by government compliance officers to inspect rehabilitation efforts
- fulfil all rehabilitation obligations and take on security bonds if mine ownership is transferred from one operator to another.

## Best practice regulation

Under the *Mining Act 1992*, the department regulates rehabilitation conditions of mining and mining-related activities. The department seeks to ensure that land disturbed by mining operations is returned to a condition capable of supporting the nominated post-mining land use(s).

The department's approach to rehabilitation regulation is outcome focussed. Authority holders are required to identify the impacts of their activities as well as the ways in which rehabilitation will address these. All rehabilitation commitments become part of the titleholder's condition of title, to which they are legally held accountable.

As a condition of title, a titleholder is required to submit and comply with a MOP. A MOP outlines the rehabilitation objectives and completion criteria of the proposed post-mining land use(s). A MOP also describes how rehabilitation activities will be implemented to ensure these outcomes are achieved.

The department regulates rehabilitation throughout the entire life of a project by assessing whether a title holder is meeting the commitments in the MOP, and whether rehabilitation is on course to meet final land use criteria (post-mining). As part of this process, title holders are required to undertake progressive rehabilitation once project stages are complete.

Progressive rehabilitation is supported by the partial release of the security deposit if successful rehabilitation is demonstrated. If the rehabilitation obligations have not been met to the satisfaction of the Minister, then part or all of the security deposit will be retained until obligations are met.

Rehabilitation obligations, including the security debt, transfer to the new owner in the event a mine is sold or ownership transferred.

## Final voids

To address the issue of final voids, mining title applicants are required to present final landform options in their Environmental Impact Assessments. Applicants need to justify that the proposed design is safe, feasible and environmentally stable.

Options for backfilling, partial backfilling, reshaping and void configuration (shape) are included. The main aim here is to minimise potential sterilisation of post-

mining land. This information is used by consent authorities as part of a triple bottom line assessment, when determining mine applications.

Mining operators often develop innovative solutions to rehabilitate final voids, and ex-mines have been adapted for tourism, agricultural and ecological uses.

The security bond is set to cover these actions and commitments rather than refill a void.

## Derelict mines program

Unfortunately, mine rehabilitation was not always a consideration during historic mining operations. In 1974, the NSW Government established the Derelict mines program to address legacy mine issues.

\$3.3 million was allocated to the Derelict mines program in the 2015-16 financial year, for the purpose of remediating derelict mine sites.

Derelict mines are former mine sites requiring remediation where no individual or company can be held responsible for its management or remediation. Generally speaking, the responsibility for derelict mines lies with the landowner although support is provided through the Derelict mines program.

Modern regulation, including the requirement to lodge a security bond, means that mining operators are responsible for their own rehabilitation works.

The primary aims of the Derelict mines program are to:

- reduce or eliminate risks to public health, safety and the environment
- stabilise and prevent further degradation of derelict mine sites
- remove or contain contamination or sources of nuisance at their source and prevent them from spreading.

The secondary aims are to:

- optimise beneficial reuse of derelict mine sites
- encourage native plant and animal life
- conserve items of significant heritage value
- improve visual amenity.

## More information

Environment Planning & Assessment Act 1979  
Exploration Code of Practice: Rehabilitation  
Mining Act 1992

[www.resourcesandenergy.nsw.gov.au/miners-and-explorers/codes-and-guidelines/codes-of-practice/rehabilitation](http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/codes-and-guidelines/codes-of-practice/rehabilitation)  
[www.resourcesandenergy.nsw.gov.au/miners-and-explorers/programs-and-initiatives/derelict](http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/programs-and-initiatives/derelict)  
[www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-and-forms/pgf](http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-and-forms/pgf)

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March 2016). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Industry, Skills and Regional Development or the user's independent advisor.  
INT16/5322

## Agenda Item 7

### **VOIDS PROJECT**

#### **Issue**

The voids project deliverables have been finalised with the development of a workshop report, a water quality review and a void water quality monitoring guidance note.

#### **Background**

##### *Voids workshop report*

Golder Associates hosted a successful voids workshop on 25 November 2015, in Muswellbrook. Dr Clint McCullough (Golder) also spoke on the radio about the project. Golder has prepared a workshop report (attached) that captures feedback received and makes several recommendations.

The key recommendation relates to the establishment of a Upper Hunter regional committee on mine voids. NSWMC has discussed this with the Division of Resources and Energy. DRE believes that this should be broadened to rehabilitation generally and ties in with the Upper Hunter Synoptic Plan. DRE therefore suggested that NSWMC meet with the Department of Planning and Environment and DRE to progress the recommendation.

##### *Voids water quality review*

Golder Associates has updated and finalised its water quality review document (refer attached).

##### *Void water quality monitoring guidance note*

Dr McCullough has also prepared a void water quality monitoring guidance note.

##### *UNSW ACARP Research Project on Voids*

The UNSW (led by Dr Wendy Timms) completed a high-level research project on voids in the Upper Hunter, which generated some interesting results (see attached summary). NSWMC met with UNSW to discuss their results on 1 April 2016. UNSW is subsequently preparing an application for funding for research on voids from ACARP (Australian Coal Industry's Research Program).

#### **Recommendation**

NSWMC recommends that the working group provide any suggestions on appropriate next steps in progressing voids related issues and promoting the completed voids research project.

### **FOR INFORMATION / DISCUSSION**



Australian Centre for Sustainable Mining Practices

## Future scenarios for mine voids from open cut mining in the Hunter Valley

**19 January 2016**

Research by a team from the Australian Centre for Sustainable Mining Practices (ACSMP) at UNSW Australia is looking at future scenarios for mine voids that are left by open cut mines in the Hunter Valley

Alexandra Fegan, Dr Wendy Timms and Dr Simit Raval have summarised their research progress so far.

Final voids of open cut coal mines are a potential issue for water resources and communities, particularly as the number, depth and size of voids increases. A review of available information on mine voids within the Hunter Valley indicated there are currently plans for 30 final voids, with a combined footprint of 3,840 hectares (~38 km<sup>2</sup> or 0.18% of the total region). Reported plans for final void use was varied: backfilled and rehabilitation to a stable landform (n=6), coal and tailings placement (n=7), water storages (n=6), while others were yet to be decided. Mine void areas are small compared with 19,570 hectares of mining disturbed land and 8,188 hectares of rehabilitated mining land in this region (Summerhayes, 2011).

Based on this review, mine void models (A to F) were designed to typify a range of realistic site conditions (eg. A was 300 ha, 200 m depth; B was 40 ha and 250 m depth). An indication of the feasibility of backfilling each void type was evaluated with a semi-quantitative approach. It was found that backfill might be economically feasible only for void types B and E, with various assumptions including a strip ratio of 4:1 (waste:ore) and the number and type of earth moving equipment deployed. However, backfill of other void types was unlikely to be feasible, given a back fill time >5 years during mine rehabilitation. Thus, alternative beneficial uses of many open final voids are required.

Numerical models (n=18) for water level and salinity of open voids over 500 years were then developed in Goldsim software, taking into account evaporation losses

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*A void left by coal mining that is now used for crayfish farming, Western Australia (Photo: W. Timms)*

and mass balance of water and salt on a monthly time step. For each void type (A to F), equilibrium water levels and salinity were modelled for 3 scenarios - 0 and 4 ML/day groundwater inflow, and a groundwater in flow rate to achieve an equilibrium water level near the top of the void. Preliminary results will be presented for water salinity and level trends for the 18 models. Results indicated water salinity at 500 years was fresh (n=6), brackish water (n=9), moderately saline (n=2), and seawater salinity (n=1), and thus with a range of beneficial uses for the water. These results extend and confirm model results by Hancock et al. (2005), though both approaches have several limitations. Final voids that could be brackish or saline should be designed as groundwater sinks (no flow away from the void) with negligible risk of overflow from the top of the void. Further work is recommended to evaluate future scenarios for voids on a case by case basis, including for water storage, aquaculture, pumped hydro storage, and the possibility of wetlands managed for carbon sequestration.

For further information contact [w.timms@unsw.edu.au](mailto:w.timms@unsw.edu.au)

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## Agenda Item 8

### **PASTURE PLANTS OF THE UPPER HUNTER BOOK**

#### **Issue**

At the last JWG meeting, Neil Griffiths (DPI) mentioned that a Pasture Plants book could be developed. Neil has since provided further details on how the UHMD could be involved in its development.

#### **Background**

Neil Griffiths (DPI) has been liaising with people involved in Tocal Agricultural Centre about potentially developing a book focused on pasture plants in the Upper Hunter. The book purpose would be to act as a resource for landcare groups, local land services and other agriculture interested individuals (such as mining companies).

Key facets include:

- DPI to write and produce the book of around 180 - 200 pages.
- Desktop publish ready for printing.
- Produce e-book versions.
- Tocal to handle sales and maintain availability in future.
- Produce pdf version to go on UHMD website if required.
- Print 2000 - 3000 copies of durable book.
- Distribution to be some combination of free give away (by funding organisations) and/or sales through Tocal. Expected that this would be a one-off print run. Future availability maintained through e-versions.
- NSW DPI to hold copyright. Funding organisations to be acknowledged in all forms of book
- Storage and distribution to be decided. It may be that Tocal stores and sells books as part of a catalogue. Possibly 50% or more of printed copies could be made available free as required by UHMD / funders.

An example of a similar book is provided here:

<http://www.dpi.nsw.gov.au/aboutus/resources/bookshop/grasses-of-coastal-nsw>

Tocal is interested in the job, but would not normally (without mining industry funding) produce a book for the Upper Hunter only as its series covers larger regions eg coast, tablelands, slopes.

The scope of book could potentially be more focused on mining and/or rehabilitation.

#### **RECOMMENDATION**

The working group to consider and provide feedback on the potential value of this project and its possible scope.

#### **FOR DISCUSSION**

## Agenda Item 9

### **UHMD ANNUAL FORUM REPORT**

#### **Issue**

The UHMD held a successful Annual Forum on 9 December 2015 in Singleton.

#### **Background**

The UHMD Annual Forum report was reviewed by the JASC and finalised and published in March 2016.

The overwhelming feedback this year related to a focus on communications and community engagement. This included suggestions to resurvey the community to gauge their perception of the Dialogue, engage and educate the broader community about the work of the Dialogue, and reinvigorate UHMD membership and promote the projects. Specifically there were several suggestions around creating roadside viewing and information displays about both mining and the UHMD. There were also suggestions relating to increasing collaboration between the mining companies and educating mining employees to be able to promote the UHMD. Other common suggestions related to promoting tourism and economic opportunities post mine closure.

#### **RECOMMENDATION**

NSWMC recommends that the working group provide any comment, feedback or recommendations regarding the report and any suggested action(s).

#### **FOR INFORMATION/ DISCUSSION**

## Agenda Item 10

### **UPDATE ON UHMD COMMUNICATIONS INITIATIVES**

#### **Issue**

The UHMD held a successful Muswellbrook Community Day event on 25 November 2015. There are a number of other communications initiatives currently being planned.

#### **Background**

##### *Muswellbrook Mining Dialogue Community Day*

The Mining Dialogue Community Day in Muswellbrook on 25 November 2015 featured:

- A sit-down breakfast with Muswellbrook Chamber of Commerce members.
- A showcase of UHMD projects in a gallery.
- Tours of Mangoola's rehabilitation.
- A live 2NM radio broadcast and interviews with Upper Hunter and mining-related representatives.
- A presentation to school students from the Tom Farrell Institute.
- A workshop on mine voids.

Overall the Community Day was successful - however NSWMC considers that the breakfast, radio broadcast and void workshop were particularly successful and beneficial.

Some lessons learnt following this initial event include:

- The unsuitability of weekday (during working hours) for significant promotional events. This is due to a reasonably low turnout for showcasing of UHMD projects.
- The need to be flexible and realistic regarding timings for mine tours, as there were some significant delays and a cancellation.
- That hotter days should be avoided and/or shade / air conditioning should be provided.

The JASC's feedback on the day was that any future promotional events should be focussed on providing mine tours of UHMD related projects. The tours should be held in conjunction with existing initiatives/events on weekends (for the general public), and held on weekdays (for school children).

##### *Other recent initiatives*

The UHMD recently progressed its focus on communications through:

- A trade booth at the Singleton Community Day (part of the Hunter Coal Festival) on 2 April 2016.
- A presentation, trade booth and Gold Sponsorship at the Tom Farrell Institute 2016 Rehabilitation Conference on 7 April 2016.
- A trade booth at the Tocal Field Day over 29 April - 1 May 2016.
- The preparation of various UHMD promotional collateral.
- The preparation of a basic community survey for use at the above field days.

##### *Future initiatives*

Future communications initiatives that are planned include:

- Undertaking UHMD website updates.
- A detailed UHMD resurvey of the community.
- Investigating options for providing mine tours to Upper Hunter schools.

### **FOR INFORMATION/ DISCUSSION**

## Agenda Item 11

### **WORKING GROUP PERFORMANCE, RELEVANCE AND STRATEGIC DIRECTION**

#### **Issue**

NSWMC is interested to discuss the working group members' perspectives on how the working group is performing and whether the activities and issues are still relevant and important for members. Any suggestions on the strategic direction of the UHMD and this working group are welcome.

#### **Background**

To prompt thinking and discussion, NSWMC poses the following questions for consideration:

- How well do you believe the working group is performing?
- Are the working groups projects, activities and issues still relevant and important and of interest?
- Are the working group goals still relevant?
- What could be improved to make the working group more effective?
- Are there any strategic changes that could be made to the UHMD or the working group?

The working group goals are provided, for reference:

1. Decrease the time that disturbed areas are left without temporary or final cover, recognising that different mining operations are at different points in rehabilitation.
2. Achieve a consistent level of best practice, quality, integrated rehabilitation across the Upper Hunter - both within the industry and with future land uses - and to be a responsible steward of the land.

#### **RECOMMENDATION**

That the working group provide feedback on the working group's performance, relevance and any areas that could be improved.

#### **FOR INFORMATION / DISCUSSION**