RAVENSWORTH
OPEN CUT

GLENCORE

25 November 2014

Mr Mike Young
Manager Mining Projects
NSW Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Mike

RAVENSWORTH OPERATIONS FINAL LANDFORM MODIFICATION – RESPONSE TO SUBMISSIONS

1 INTRODUCTION

Ravensworth Operations Pty Limited (Ravensworth Operations) operates in accordance with Project Approval (PA) 09_0176 (as modified) to provide high quality thermal and semi-soft coking coal to export and domestic markets at a maximum of 16 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal.

Ravensworth Operations is seeking a Modification to PA 09_0176 under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to facilitate an alteration to the approved final landform design so that it will more closely blend with the surrounding natural topography (the Modification).

Ravensworth Operations submitted the Ravensworth Operations Final Landform Modification Environmental Assessment (Modification EA) (Hansen Bailey, 2014) to Department of Planning and Environment (DP&E) on 9 October 2014. In correspondence from the DP&E dated 13 October 2014, it was confirmed the Modification EA would be made publicly available on the DP&E website. In addition, DP&E provided copies of the Modification EA to key regulatory authorities including Singleton Shire Council (SSC), NSW Office of Water (NOW), Environmental Protection Authority (EPA) and NSW Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DRE).

Following the review period, DP&E has provided Ravensworth Operations with responses to the Modification EA from the SSC, NOW, EPA and DRE.

This document provides a response to the issues raised by each of the submissions.

PO Box 294, Muswellbrook, NSW 2330
Lemington Road, Ravensworth, NSW 2330
T + 61 2 6570 0700 F + 61 2 6570 0747 www.glencore.com

Ravensworth Operations Pty Ltd ABN 12 098 937 761

2 RESPONSE TO SUBMISSIONS

*The following section addresses the issues raised in the submissions and responds to each. A copy of all submissions is provided in **Appendix A**.*

2.1 SINGLETON SHIRE COUNCIL

In its correspondence received via DP&E dated 3 November 2014, SSC representatives indicated that they had no issues or concerns with the Modification. No further response is required.

2.2 NSW OFFICE OF WATER

NOW provided comment in relation to the Modification dated 28 October 2014. NOW noted that the revised final landform would result in changes to the size and shape of the final void. This may have implications for ongoing groundwater inflows to the void which is predicted to act as a groundwater sink.

As stated on Section 8.4 of the Modification EA it is predicted that the final void will continue to remain a groundwater sink. Further discussion in regard to mine plan alterations following DRE's submission is provided in **Section 2.4.2**.

NOW also noted that Ravensworth Operations is required to hold all relevant licensed entitlements to account for water take for all stages of the project (including post-operations). Any required changes to the existing licensing regime will be undertaken, in consultation with NOW to ensure appropriate accounting of all water take.

2.3 ENVIRONMETAL PROTECTION AUTHORITY

EPA provided comment in relation to the Modification dated 28 October 2014. EPA noted that they had no objection or comments in relation to the Modification. No further response is required.

2.4 DIVISION OF RESOURCES AND ENERGY

DRE provided comment in relation to the Modification dated 14 November 2014. The DRE has requested clarification over the following matters:

- Justification that a topographically diverse landform is not practical within current emplacement height restrictions;
- For each pit, justify the final void design and future use. There should be no increase in the number or size of final voids;
- Justify the need for water management (e.g. contour drains and sediment detention basins); and
- Detail the environmental net benefit of the proposed final landform design.

The following section responds to these queries.

2.4.1 Landform Height

As noted in Section 4.3 of the Modification EA, Ravensworth Operations has reviewed the completion criteria and final landform presented in the *Ravensworth Operations Project Environmental Assessment* (Ravensworth EA) (Umwelt, 2010a) and identified areas where improved landscape outcomes can be achieved through the implementation of the final landform strategies described in the Modification EA.

The Modification has been instigated by Ravensworth Operations (beyond existing obligations and statutory requirements) to demonstrate Glencore's and Ravensworth Operations' ongoing commitment towards improved environmental outcomes and continual improvement associated with the development of the final landform.

In order to achieve this ongoing effort towards improved environmental outcomes the Modification is required to provide Ravensworth Operations the ability to emplace overburden to a greater height (and also lesser in places) than approved levels.

As overburden emplacement is already underway as part of the existing approved operations there is limited flexibility to enhance the topography without increasing the height of the emplacement areas in places. Detailed overburden balance analysis completed by Ravensworth Operations indicates that there is no other feasible option available to improve the final landform without increasing the total approved disturbance footprint. Increasing the overall disturbance footprint would have other deleterious environmental impacts and as such was not pursued as part of the Modification.

The Modification will not require the handling of any additional quantity of overburden material to that assessed in the Ravensworth EA. All mining and associated activities to be conducted as part of the Modification will be consistent with the approved operations described in Section 3 of the Modification EA. No increase above the approved production levels, life of mining, areas of disturbance or workforce limit is proposed as part of the Modification.

2.4.2 Final Void Design & Use

Narama and Narama West Mining Area

PA 09_0176 currently permits that once mining ceases at the Narama and Narama West mining area that the Narama Void will be utilised for tailings emplacement prior to rehabilitation. The Modification will not result in any change to this outcome or any associated existing commitments.

Prior to the commencement of tailings emplacement within the Narama Void a Tailings Management Strategy will be developed to ensure the areas will safely support construction equipment required for rehabilitation. Once the Narama Void can safely support such equipment, it will be rehabilitated and covered with a minimum of 2 m of overburden in accordance with the Rehabilitation Strategy (to be developed in consultation with DRE).

The Modification EA (Figure 3) presents a Revised Conceptual Final Landform and as noted above the final land use and design option for the Narama Void will be determined through the development of an appropriate revision to the existing *Ravensworth Open Cut & Ravensworth Coal Handling Preparation Plant Mining Operations Plan 2013* (Ravensworth MOP) and future Ravensworth Mine Closure Plan in consultation with DRE.

Ravensworth North Void

As depicted conceptually the Modification EA (Figure 3) has identified a small increase to the surface area of the final void. Following a meeting between representatives from DRE, Ravensworth Operations and Hansen Bailey on 6 November 2014 and to address the issues DRE identified in their correspondence dated 14 November, Ravensworth Operations has since completed additional mine planning in order to develop a landform with a void consistent to that approved.

As a result of this additional mine planning, an alternative Revised Conceptual Final Landform has been developed for the Modification (see **Figure 1**). In addition, a section line has been developed to provide a comparison between the alternative Revised Conceptual Final Landform with regard to the existing approved final landform (see **Figure 2**). This alternative Revised Conceptual Final Landform effectively ensures that the Western OEA north of the future Emu Creek Diversion remains as currently presented in the Modification EA however the landform south of the future Emu Creek Diversion will be constructed consistent with the landform currently approved (see **Figure 1**).

The alternative Revised Conceptual Final Landform ensures that the visual benefits of the Modification are maintained without altering the size, catchment area, maximum predicted water level or position of the approved final void. Given this outcome the final void is anticipated to remain as a groundwater sink as described in the Ravensworth EA.

Final Void Design and Use

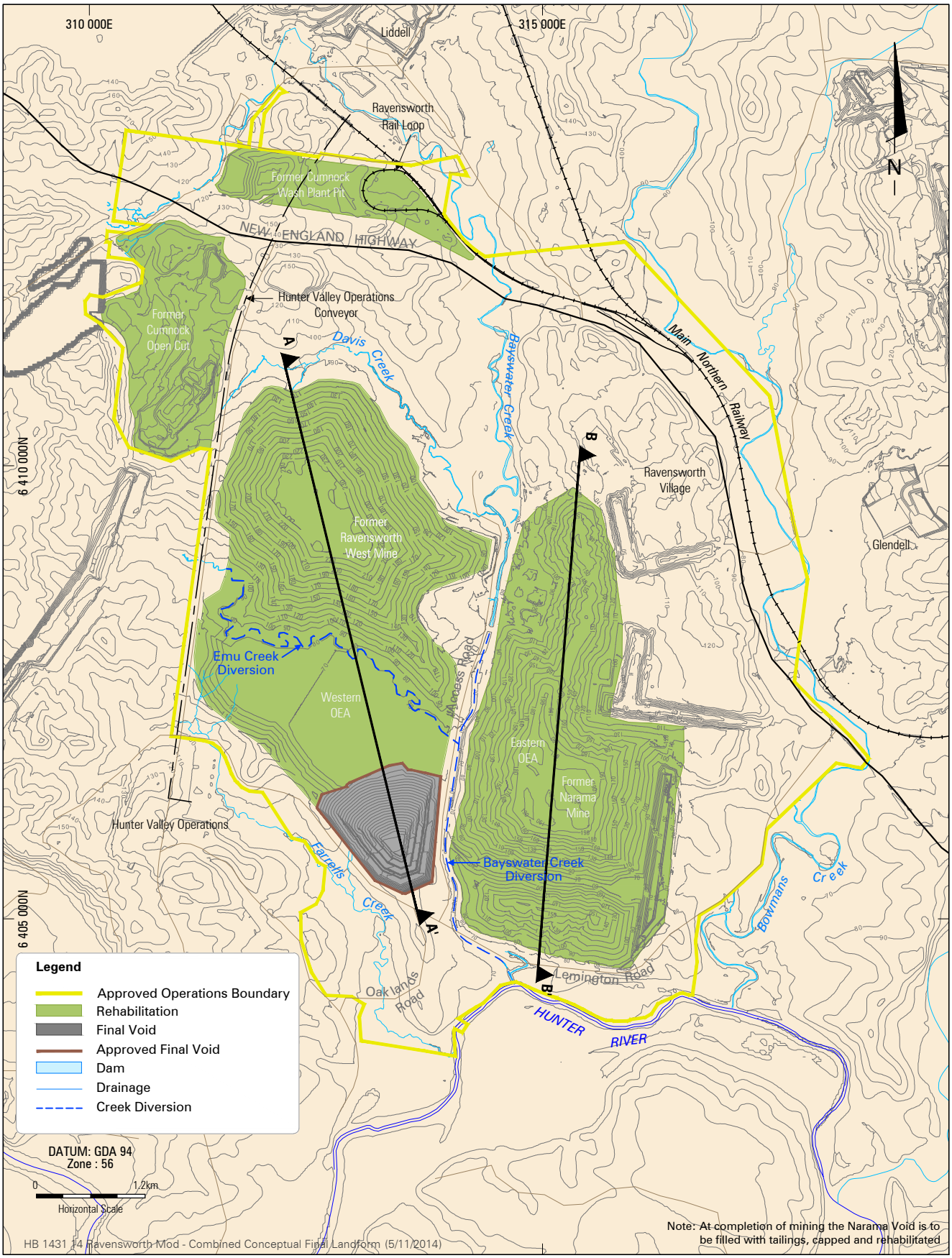
As committed to in the Modification EA the existing Ravensworth MOP will be updated to the satisfaction of DRE to incorporate changes arising from the Modification.

All existing commitments outlined in PA 09_0176 will continue to be maintained as a result of the Modification. PA 09_0176 Schedule 3, Condition 40 (a) notes that rehabilitation should be conducted progressively as soon as practicable following disturbance and Schedule 3, Condition 40 (b) notes that Ravensworth Operations will achieve rehabilitation objectives consistent with commitments in the Ravensworth EA (and *Response to Submissions* (Umwelt 2010)).

The Modification will not require any changes to the total areas proposed to be rehabilitated as currently described in the Ravensworth MOP although the specific locations of each type of rehabilitation area may vary slightly. Ravensworth Operations will revise the Ravensworth MOP to the satisfaction of DRE to ensure that the proposed changes described in this document will be implemented into the final design.

Section 8.11 of the EA notes that the final land use for the Ravensworth North void has not yet been determined, with a decision on the final land use of the final void to be made closer to mine closure. Detailed measures to manage the final void will be outlined in the Ravensworth Mine Closure Plan, which is to be prepared in consultation with DRE at least five years prior to mine closure.

Future final use options may include tailings facility, fly ash facility or open void to be utilised for overburden emplacement by another Glencore operation or by a neighbouring mining company such as Coal & Allied or Ashton (following consultation and receipt of an appropriate approval).



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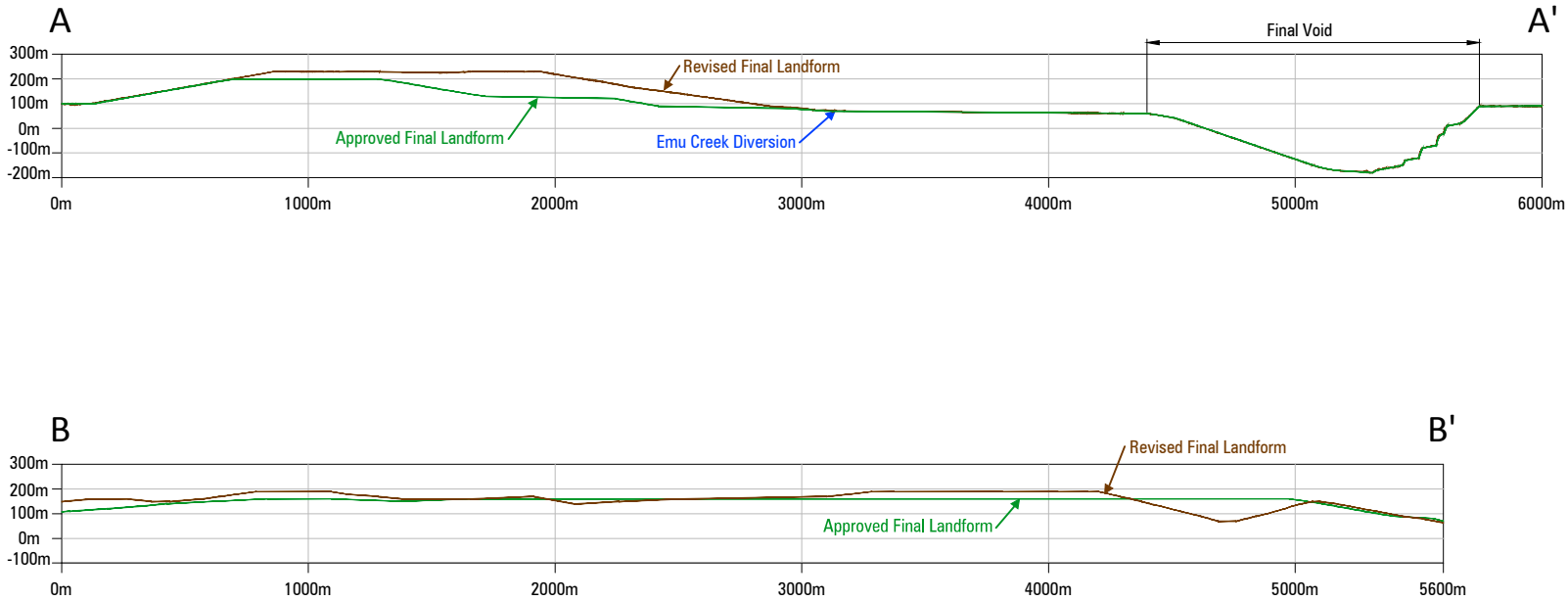
Hansen Bailey
ENVIRONMENTAL CONSULTANTS

Revised Conceptual Final Landform

FIGURE 1



0 600m
Horizontal Scale

0 600m
Vertical Scale

HB 1431 15 Ravensworth Mod - Landform Section Revised (5/11/2014)

(The indicative landform indicated is to be further developed at detailed design to ensure appropriate natural looking micro relief.)

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Hansen Bailey
ENVIRONMENTAL CONSULTANTS

Revised Conceptual Final Landform Sections

FIGURE 2

2.4.3 Requirement for Water Management Infrastructure

The Modification will result in significant commitment to utilise the latest micro relief software which will ultimately determine the most appropriate contours and associated drainages required to ensure a stable landform. Neither contour drains nor drop structures exist in the natural environment on weathered materials. To ensure ongoing development of the most sustainable landform, Ravensworth Operations proposes to use an alternative mine planning strategy for the development of the final landform.

The Modification EA describes the implementation of 'micro relief' in the development of the final landform. Micro relief can be developed through various mine planning software programs, however it is anticipated for the Modification Ravensworth Operations will adopt the '*Geofluv*' software package (or equivalent software) which has been successfully utilised at other Glencore mining operations in the Upper Hunter Valley. The Geofluv approach results in slopes and drainage densities that replicate the natural landforms found in the same climatic region.

In particular, Ravensworth Operations will adopt a similar methodology proven to be successful at Mangoola Mine (Mangoola). At Mangoola, the Geofluv software has assisted in the creation of a stable and aesthetically pleasing final landform in the absence of the construction of artificial cross drainage and the need for establishing engineered drop structures. Like Mangoola, where possible, Ravensworth Operations will avoid older techniques that do not attempt to mimic the surrounding landscape.

The key elements of Geofluv design are:

1 Slopes are not linear, but are generally initially convex (close to the ridge line) becoming concave and flattening as the catchment area increases. The use of concave slopes which allows longer slopes than a linear design for the same erosion risk, being initially steeper than the comparable linear design, but becoming flatter than the linear design in the lower reaches;
2 Slopes are designed with a drainage density empirically derived in the local environment, effectively limiting the length of steep slopes, with water being shed sideways on to flatter concave drainage lines rather than all flow occurring parallel to the overall slope. The result is an integrated drainage network rather than a series of linear planes;
3 The main drainage lines are compound in nature and flatter than 4% having both a channel for events up to the 2 year Average Recurrence Interval (ARI) flood event, and a floodplain for larger flood events (typically sized for the 50 year ARI flood event or larger); and
4 The overall slope of the main drainage lines from the ridge line down to the lower end of the catchment are based on those found on stable alluvial landforms, that is, the overall gradients cannot exceed those shown to be stable in nature without armouring.

In terms of the overall slope, it is important to note that, in order to compile a Geofluv design for the overburden areas, it is necessary to identify a drainage pathway that will allow an overall gradient from the ridge line to the downstream catchment comparable with those found in the natural environment. These gradients can generally be achieved on most but not all sites. Therefore the need for contour drains and drop structures may be required however would be substantially reduced and not used at all where possible in the final design.

The software associated with Geofluv can also be used to design non-linear slopes with an overall gradient from the ridge line to the downstream catchment that is steeper than those found on stable natural landforms, and for these slopes the potential need for rock armouring or other engineering interventions exists.

Ravensworth Operations' approach has been to ensure that any overburden area with a significant catchment is drained using parameters derived from an alluvial analogue, and only for small catchments such as on the outer slopes of an overburden area has it been considered steeper overall gradients with rock armouring. These steeper outer slopes are subject to an erosion assessment process similar to that undertaken during SIBERIA erosion modelling to identify those areas requiring rock armouring or other interventions, and the gradients used are similar to many of the natural grassed landforms with elements of rock control that exist in the general area adjacent to the site.

As stated in Section 8.4 of the Modification EA, the Ravensworth MOP will be updated for the Modification to the satisfaction of DRE to included detailed water management design associated with the Revised Conceptual Final Landform presented in this correspondence (see **Figure 1**).

2.4.4 Environmental Net Benefit

As a result of the abovementioned change to the final landform design, the Western OEA north of the future Emu Creek Diversion will remain as currently presented in the Modification EA however the landform south of the future creek alignment will be constructed consistent with the landform currently approved. This outcome ensures that the visual benefits of the Modification are maintained without altering the size, catchment area, maximum water level or position of the approved final void.

No increase above the approved production levels, life of mining, areas of disturbance or workforce limit is proposed as part of the Modification. Further to this, all assessments undertaken for the Modification have confirmed that the impacts of the mining operation will generally be consistent with those currently approved.

Given the reduced final void outcome presented on **Figure 1** (when compared to the Modification EA), combined with the improved topographical relief, the Modification will result in a net benefit in terms of an improved post mining landform with no additional environmental costs being incurred.

3 CONCLUSION

We trust that the above response is satisfactory to DP&E. Should you require any additional information please do not hesitate to contact me on (02) 6570 0684.

We look forward to receiving approval of the Modification to PA 09_0176 at your earliest possible convenience.

Yours sincerely

Andrew Kelly
Environment and Community, Complex Manager
Ravensworth Complex

Appendix A

Regulatory Correspondence

NSW GOVERNMENT | Resources & Energy

OUT14/37792

Caitlin Elliott
Senior Planner
Mining Projects
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: caitlin.elliott@planning.nsw.gov.au

Dear Ms Elliott

Ravensworth Operation Modification 2 (09_0176 MOD2)
Review of Environmental Assessment

I refer to your email of 14 October 2014 regarding the Ravensworth Operation Pty Limited to modify the development consent for the application for the Ravensworth Operations Project alter the approved final landform design so that it will more closely blend with the surrounding natural topography.

NSW Trade & Investment, Regional Infrastructure & Services, Division of Resources & Energy (DRE) has reviewed the *Ravensworth Operations Final Landform Modification Environmental Assessment* (EA) dated October 2104 and provides the following comments which are directed at specific areas of DRE responsibility for this proposal.

MINING TITLE

As coal is a prescribed mineral under the *Mining Act 1992*, the proponent is required to hold appropriate mining titles from DRE. DRE understands the Northern Coal Logistics Project activities are within Coal Leases 380 and 580; and Mining Leases1393, 1502, 1576, 1683 and 1669 held by the Proponent.

Under the *Mining Act 1992*, mining and rehabilitation are regulated by conditions included in the mining lease, including requirements for the submission of a Mining Operations Plan (MOP) prior to the commencement of operations, and subsequent Annual Environmental Management Reports (AEMR). DRE requires that proponent submit a revised MOP to include this modification if approved.

DRE requires the submission of a new MOP within three months of any project approval. The MOP should reflect the change to the final landform, incorporating changes to rehabilitation completion criteria.

The proponent should be aware that ESG3: Mining Operations Plan (MOP) Guidelines dated September 2013 are available on the DRE website at: http://www.resources.nsw.gov.au/environment/pgf.

REHABILATION

The EA has identified general rehabilitation strategies and objectives. DRE notes the EA commitments to the rehabilitation strategies and objectives detailed in the currently approved MOP for the mine site. However, the EA does not describe the functional rehabilitation domains of this project nor does it adequately provide specific performance objectives and standards of each domain. These will need to be include in the new MOP should the modification be approved.

DRE require the proponent to address the following issues prior to any project approval:

1. Justification that a topographically diverse landform is not practicable within current emplacement height restriction.
2. For each pit justify the final void design and future use. It is DRE's considers there should be no increase in the number or size of final voids.
3. Justify the need for contour drains and sediment detention basins.
4. Detail the environmental net benefit of the proposed final landform design.

DRE has recently met with representatives from Ravensworth Operation to discuss the above requirements and the proponent has agreed to provide this detail in its response to submissions.

RECOMMENDED CONDITIONS OF APPROVAL

DRE recommends that the following conditions be incorporated into the Development Consent, if granted:

Rehabilitation Objectives and Commitments

The Proponent must rehabilitate the site to the satisfaction of the Secretary of Department of Trade & Investment, Regional Infrastructure & Services.

Rehabilitation must be substantially consistent with the Rehabilitation Objectives described in the EA, the Statement of Commitments and the following objectives in Table 1.

Table 1

Rehabilitation Feature	Objective
Mine site (as a whole of the disturbed land and water)	Safe, stable and non-polluting, fit for the purpose of the intended post-mining land use(s).
Rehabilitation materials	Materials (including topsoils, substrates and seeds of the disturbed areas) are recovered, appropriately managed and used effectively as resources in the rehabilitation.

Landforms	Final landforms sustain the intended land use for the post–mining domain(s). Final landforms are consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post mining landscape. Final landforms incorporate design relief patterns and principles for consistent with natural drainage.
Water Quality	Water retained on site is fit for the intended land use(s) for the post-mining domain(s). Water discharged from site is consistent with the baseline ecological, hydrological and geomorphic conditions of the creeks prior to mining disturbance. Water management is consistent with the regional catchment management strategy.
Native flora and fauna habitat	The rehabilitated areas are to contribute to achieving self-sustaining biodiversity habitats. Species are selected that re-establishes and complements regional and local biodiversity. The Native Vegetation Belt / Fauna Corridor links with the existing vegetation along existing waterways.
Post-mining agricultural pursuits	The land capability classification for the relevant nominated agricultural pursuit for each domain is established and self-sustaining within 5 years of land use establishment (first planting of vegetation.)

Progressive Rehabilitation

The proponent shall carry out all surface disturbing activities (eg pre-stripping in advance of mining operations including for example monitoring lines and access for rehabilitation purposes) in a manner that, as far is reasonably practicable, minimises potential for dust emissions and shall carry out rehabilitation of disturbed areas progressively, as soon as reasonably practicable, to the satisfaction of the Secretary of Department of Trade & Investment, Regional Infrastructure & Services.

Rehabilitation Plan

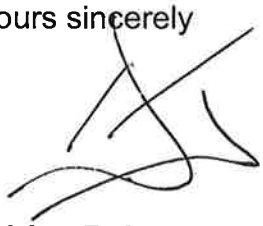
1. The Proponent must prepare and implement a Rehabilitation Plan to the satisfaction of the Secretary of Department of Trade & Investment, Regional Infrastructure & Services.
2. Rehabilitation Plan must:
   a. be submitted and approved by the Secretary of Department of Trade & Investment, Regional Infrastructure & Services prior to carrying out any surface disturbing activities of the development (including surface expression of subsidence related impacts), unless otherwise agreed by the Secretary;

b. be prepared in accordance with DRE guidelines and in consultation with the Department, Office of Environment and Heritage, Environmental Protection Authority, Office of Water, Council and the mine Community Consultative Committee;;
c. incorporate and not be inconsistent with the rehabilitation objectives in the EIS and Table 1;
d. integrate and build on, to the maximum extent practicable, the other management plans required under this approval and,
e. address all aspects of mine closure and rehabilitation, including post mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management.

Note: The approved Mining Operation Plan (which will become the Rehabilitation Management Plan once the Mining Act Amendments have commenced), required as a condition of the Mining Lease(s) issued in relation to this project, will satisfy the requirements of this condition for a Rehabilitation Management Plan.

Should you have any enquires regarding this matter please contact Julie Moloney, Principal Adviser, Industry Coordination on (02) 4931 6549.

Yours sincerely



Adrian Delany
A/Director Industry Coordination
14.11.14

Caitlin Elliott

From: Wayne Jones <wayne.jones@dpi.nsw.gov.au>
Sent: Tuesday, 28 October 2014 3:01 PM
To: Caitlin Elliott
Subject: Ravensworth Operations Project (DA09_0176 MOD 2)

Hi Caitlin

Please see following draft DPI comment on the above modification project. Formal response should follow shortly.

Regards
Wayne

OUT14/35460

Ms Caitlin Elliott
Mining Projects
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Caitlin.Elliott@planning.nsw.gov.au

Dear Ms Elliott,

Ravensworth Operations Project (DA09_0176 MOD 2)
Proposed Modification

I refer to your email to the NSW Office of Water dated 14 October 2014 requesting advice in respect to the above matter.

Comment by NSW Office of Water
The NSW Office of Water has reviewed the Environmental Assessment (EA) for the proposed modification to the Ravensworth Operations Project. The following comments are provided for the Department of Planning & Environment's consideration in the assessment of the proposal and the proponent's consideration in ongoing operations.

The Office of Water notes from Figures 3 and 4 of the EA that the revised final landform would result in changes to the size and shape of the final void. This may have implications for ongoing groundwater inflows to the void which is predicted to act as a groundwater sink. The commitment to continue to manage operations in accordance with the Ravensworth Operations Water Management Plan is noted. The Office of Water requests that the plan be amended to incorporate the modification, including an evaluation of the impacts of the modification on long-term groundwater inflows.

The proponent is required to hold sufficient licensed entitlement to account for water take for all stages of the project (including post-operations). As such it is also requested that the proponent undertake to liaise with the Office of Water regarding licensing requirements to ensure appropriate accounting of all water take.

For further information please contact Rohan Macdonald, Water Regulation Officer, Major Projects (Newcastle Office) on 4904 2642 or at rohan.macdonald@water.nsw.gov.au.

Future referrals
It would be appreciated if all future referrals be forwarded or copied to the landuse.enquiries@dpi.nsw.gov.au address to ensure proper records are maintained and to ensure all agencies within the Department of Primary Industries are aware of proposed developments.

Regards
Wayne

NSW EPA

Our reference: DOC14/252003 EF13/3485
Contact: Kurt Sorensen (02) 4908 6827
Electronic correspondence to: hunter.region@epa.nsw.gov.au

NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Caitlin Elliot

Dear Ms Elliot

RAVENSWORTH OPERATIONS – MODIFICATION 2

Reference is made to your email to the Environment Protection Authority (EPA), dated 14 October 2014, seeking comments on the Ravensworth Operations Project – Modification 2 (09_0176 MOD 2), which is applied for by Ravensworth Operations Pty Limited under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The modification involves changes to the final landform to incorporate micro-relief to achieve a more natural landform.

The EPA has reviewed the modification as detailed in the report titled '*FINAL LANDFORM MODIFICATION Environmental Assessment*' October 2014, (the EA) and provides the following comments.

As described in the EA, due to the minor nature of the modification no environmental aspects provided a critical or high risk. Air quality and acoustic impacts were determined to be of moderate risk with all remaining environmental and socio-economic issues deemed to be low risk. The EA also notes that no increase above the approved production levels, life of mining or areas of disturbance is sought as part of the modification.

The EPA has no objection to the project proceeding as described in the EA. The EPA is satisfied that the current conditions on Environment Protection Licence 2652 can accommodate the modification.

Please contact Kurt Sorensen on (02) 4908 6827 if you require any further information regarding this matter.

28.10.14

KAREN MARLER
Head Regional Operations Unit – Hunter
Environment Protection Authority

PO Box 488G Newcastle NSW 2300
Email: hunter.region@epa.nsw.gov.au
117 Bull Street, Newcastle West NSW 2302
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 43 692 285 758
www.epa.nsw.gov.au