



***ADDENDUM REPORT:***

***STATE SIGNIFICANT DEVELOPMENT***

***Springvale Mine Extension  
Project (SSD 5594)***



Section 89E of the  
*Environmental Planning and Assessment Act 1979*

August 2015

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## EXECUTIVE SUMMARY

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This Addendum Report (AR) for the Springvale Mine Extension Project (the project) has been produced by the Department of Planning and Environment (the Department) for consideration by the Planning Assessment Commission (Commission).

This AR focuses on the residual matters identified in the Commission's Springvale Mine Extension Project Review Report of June 2015, responses to that report by the applicant Centennial Springvale Pty Limited (Centennial) and by the Department, and ongoing discussions between Centennial and the Department with the Environmental Protection Authority (EPA), Water NSW, the NSW Office of Water (DPI Water) and the Office of Environment and Heritage (OEH).

The Commission's report made 15 recommendations for further consideration of issues and consultation, primarily in relation to:

- resolving some of the uncertainty in relation to non-conventional subsidence effects;
- further consultation with the EPA and Water NSW to finalise the plan of action for water discharges to the Coxs River;
- further consultation with DPI Water about the options available for Centennial to acquire water licences; and
- further consideration of adaptive management options and offset policy provisions in relation to the impact on swamps.

The Department has largely accepted the Commission's recommendations and has amended and strengthened its recommended conditions where relevant, to require:

- monitoring of non-conventional subsidence movements;
- Trigger Action Response Plans (TARPs) in each Extraction Plan, to warn of any increasing risk of subsidence impacts and to guide the implementation of adaptive management;
- mine-water discharge performance measures for salinity and toxicity to meet targets and timeframes agreed with the EPA;
- an Upper Coxs River Action and Monitoring Plan;
- a Swamp Offset Bond for the first two upland shrub swamps above the mining area and a Swamp Offset for all other shrub swamps, to reflect the intent of the draft *Policy Framework for Biodiversity Offsets for Upland Swamps and Associated Threatened Species Impacted by Longwall Mining Subsidence* (OEH, May 2015);
- a fully Independent Monitoring Panel to provide advice regarding preparation of Extraction Plans, achievement of performance measures and calculation of offset liabilities;
- a management and research program for the endangered Blue Mountains Water Skink; and
- findings of Centennial's funded swamp research projects to be used to inform the Swamp Monitoring Program.

DPI Water has provided correspondence confirming that Centennial can obtain surface water licences under the *Water Management Act 2000*. Centennial is in the process of securing these licences.

The Department remains satisfied that the project would provide major economic and social benefits for the Lithgow region and for NSW as a whole. These benefits include the:

- provision of the only local source of coal to the Mt Piper Power Station, which provides 15% of NSW's electricity;
- continued direct employment of 310 full time equivalent staff during operations and around 50 contractors during construction;
- estimated indirect employment of around 1,200 people across NSW; and
- total estimated net economic benefit in excess of \$200 M (Net Present Value), which includes:
  - \$170 M in operational phase incomes;
  - \$160 - \$180 M to the State of NSW in royalty revenue; and
  - \$18 M in Commonwealth, State and local tax revenues.

The Department is satisfied that its recommended conditions, which incorporate a number of changes as recommended by the Commission, are based on contemporary policy and reflect current best-practice, and are equitable and enforceable. The Department remains satisfied that the project is, on balance, in the public interest, and recommends that it be approved, subject to the recommended conditions of consent.

# 1.0 INTRODUCTION

## 1.1 Background

This Addendum Report (AR) has been produced for the consideration of the Planning Assessment Commission (Commission).

It provides an addendum to the Secretary's Preliminary Assessment Report (PAR, April 2015) for the Springvale Mine Extension Project (SSD 5594) (the project). The PAR provides a detailed assessment of the key issues in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and remains part of the Secretary's environmental assessment report for the project.

This AR considers the recommendations made in the Commission's Springvale Mine Extension Project Review Report (June 2015), and additional information received from Centennial Springvale Pty Limited (Centennial) and key Government agencies since the Commission's review.

## 1.2 Project Overview

Centennial is seeking approval to extend underground mining at the Springvale Mine to allow the mine to continue operating for an additional 13 years. The project would involve:

- continued longwall mining operations to extract up to 4.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the Lithgow Seam;
- continued operation of the mine's pit top area, support facilities and utilities;
- extension and continued use of the Springvale Delta Water Transfer Scheme, bore dewatering facilities and ventilation infrastructure;
- continued processing (sizing and screening) of ROM coal at the pit top area;
- continued stockpiling of ROM coal (85,000 tonnes (t) capacity);
- continued transportation of processed coal by overland conveyor to Centennial's Western Coal Services site (WCSS) for further processing or to the Mt Piper Power Station;
- continued transportation of processed coal by road haulage to other local domestic customers (limited to 50,000 tpa); and
- rehabilitation of the pit top area and Newnes Plateau surface infrastructure sites.

The major components of the project are summarised in **Table 1** and depicted in **Figures 1** and **2**.

**Table 1: Key Components of the Springvale Mine Extension Project**

Aspect	Springvale Mine Extension Project
<i>Project Life and Mining Schedule</i>	<ul style="list-style-type: none"><li>• 13 years, first progressing sequentially eastwards from longwall LW416 to LW423 in the northern area. LW424 to LW432 (immediately to the south) and LW501 to LW503 (further to the west) would then be extracted.</li></ul>
<i>Development Application Area</i>	<ul style="list-style-type: none"><li>• Covers an area of 5,810 hectares (ha), including Mining Leases 1303, 1323, 1326, 1537, 1588 and 1670; Mining Purposes Lease 314; and Coal Lease 377.</li></ul>
<i>Mining and Extraction</i>	<ul style="list-style-type: none"><li>• Retreat longwall mining method.</li><li>• Extraction of up to 4.5 Mtpa of ROM coal.</li></ul>
<i>Coal Production</i>	<ul style="list-style-type: none"><li>• Coal would be conveyed from the underground mine, deposited on the ROM stockpile (85,000 t capacity) and sized and screened (no washing or other processing) prior to being transported off-site by conveyor. All crushed coal would be transported off site and no reject material would be generated at the pit top.</li></ul>
<i>Water Demand and Supply</i>	<ul style="list-style-type: none"><li>• The largest source of water would be from dewatering in advance of underground mining operations and inflow into underground workings. Mine-water make from existing workings is around 12 megalitres per day (ML/day) and this is predicted to increase to around 19 ML/day in 2022 with the proposed extension.</li><li>• The key water demands would be dust suppression, workshop and vehicle wash-down, coal crusher and screening plant, and mining equipment requirements, which would continue to average about 1 ML/day.</li><li>• The site would continue to operate with a significant water surplus of up to 18 ML/day, which is proposed to be discharged to the Coxs River via Licensed Discharge Point 9 (LDP 9).</li></ul>
<i>Employment</i>	<ul style="list-style-type: none"><li>• Continued employment of 310 people.</li></ul>

Aspect	Springvale Mine Extension Project
<i>Pit Top Surface Facility</i>	<ul style="list-style-type: none"> <li>Continued use of existing facilities including parking areas; administration buildings with amenities, office and training areas; workshops; hardstand areas; vehicle and equipment wash down areas; diesel, solcenic hydraulic fluid and oil storage; mining supplies and conveyor equipment storage areas; dirty and clean water management systems; potable and waste water services; sewage treatment works; ROM coal stockpile area; coal preparation (crushing and screening plant) and handling (conveyor systems and rill tower) facilities; overland conveyor systems connecting pit top to Wallerawang and Mt Piper power stations, WCSS and Lidsdale Siding; telecommunications facilities; electrical distribution network including substations 1-3.</li> </ul>
<i>Support Facilities and Utilities</i>	<ul style="list-style-type: none"> <li>Continued use of ventilation facilities at the pit top area, Ventilation Shafts No. 1 &amp; 2 and Ventilation Shaft No. 3 located in the Newnes Plateau Infrastructure Area.</li> <li>Construction and operation of Bore 9 &amp; 10 mine dewatering facilities and decommissioning of the Bore 8 dewatering facility on completion of LW419.</li> <li>Construction and operation of a downcast ventilation shaft at the Bore 10 facility site.</li> <li>Continued use of access roads, water and electrical facilities.</li> </ul>
<i>Hours of Operation</i>	<ul style="list-style-type: none"> <li>24 hours, 7 days a week.</li> </ul>
<i>Mine Site Access</i>	<ul style="list-style-type: none"> <li>Continued access to the pit top via Mine Access Road, which joins the Castlereagh Highway near Lidsdale.</li> <li>Continued access via unsealed tracks to surface infrastructure sites on the Newnes Plateau.</li> <li>Continued access to the underground mine via two in-seam portals at the pit top.</li> </ul>
<i>Product Coal Transport</i>	<ul style="list-style-type: none"> <li>Continued transportation of crushed coal by overland conveyor to the Mt Piper Power Station or WCSS.</li> <li>Continued transportation of crushed coal by road haulage to other local domestic customers (limited to 50,000 tpa).</li> </ul>
<i>Rehabilitation</i>	<ul style="list-style-type: none"> <li>Rehabilitation of all surface facilities following the completion of mining.</li> </ul>
<i>Capital Value</i>	<ul style="list-style-type: none"> <li>\$17.65 million.</li> </ul>

### 1.3 Chronology of Events

A brief chronology of the key events relevant to this AR in the time since the Department's referral of its PAR to the Commission to consider as part of its merit review of the project is presented in **Table 2**.

**Table 2:** Chronology of Events

Date	Event
27 April 2015	Secretary's Preliminary Assessment Report referred to Commission
27 May 2015	Commission holds public hearings in Lithgow
23 June 2015	Department receives a submission from the Office of Environment & Heritage (OEH) on the PAR and draft consent conditions ( <b>Appendix A</b> )
29 June 2015	Commission finalises its review and refers its review report to the Department
9 July 2015	Centennial submits its response to the Commission review report to the Department ( <b>Appendix B</b> )
16 July 2014	Centennial submits its response to the OEH Submission ( <b>Appendix C</b> )
22 July 2015	Centennial forwards the DPI Water's letter dated 9 July 2015 regarding surface water licensing to the Department ( <b>Appendix D</b> )
27 July 2015	Department held discussions with representatives of Water NSW with regard to the quality of mine-water discharges
27 July 2015	Centennial submits additional information to the Department on mine-water discharge toxicity and swamp mapping issues ( <b>Appendix E</b> )
3 August 2015	Centennial submits supplementary information to the Department on an additional simulation of the Regional Water Quality Impact Assessment Model ( <b>Appendix F</b> )

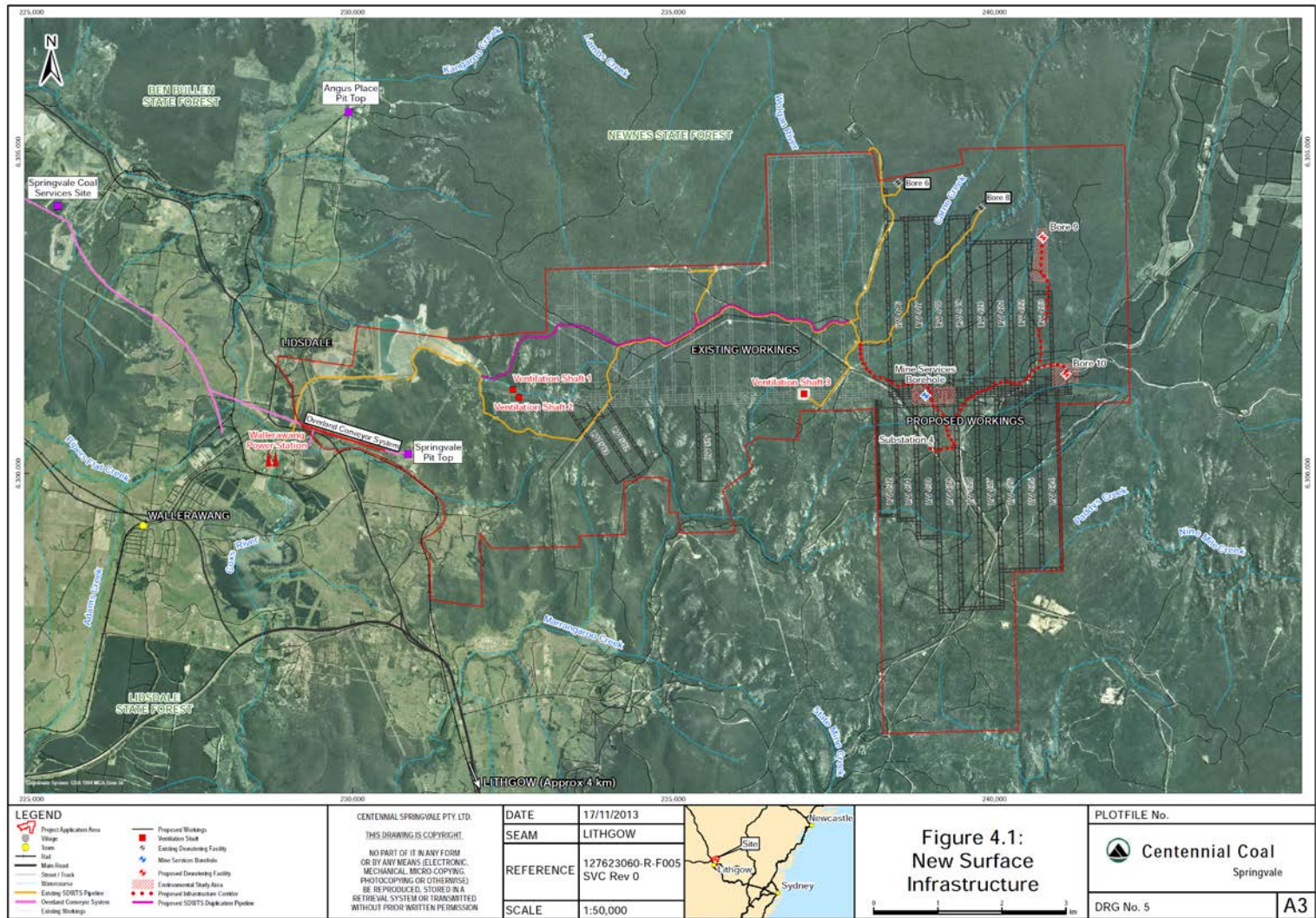


Figure 1: Location of Proposed Longwalls and Surface Facilities

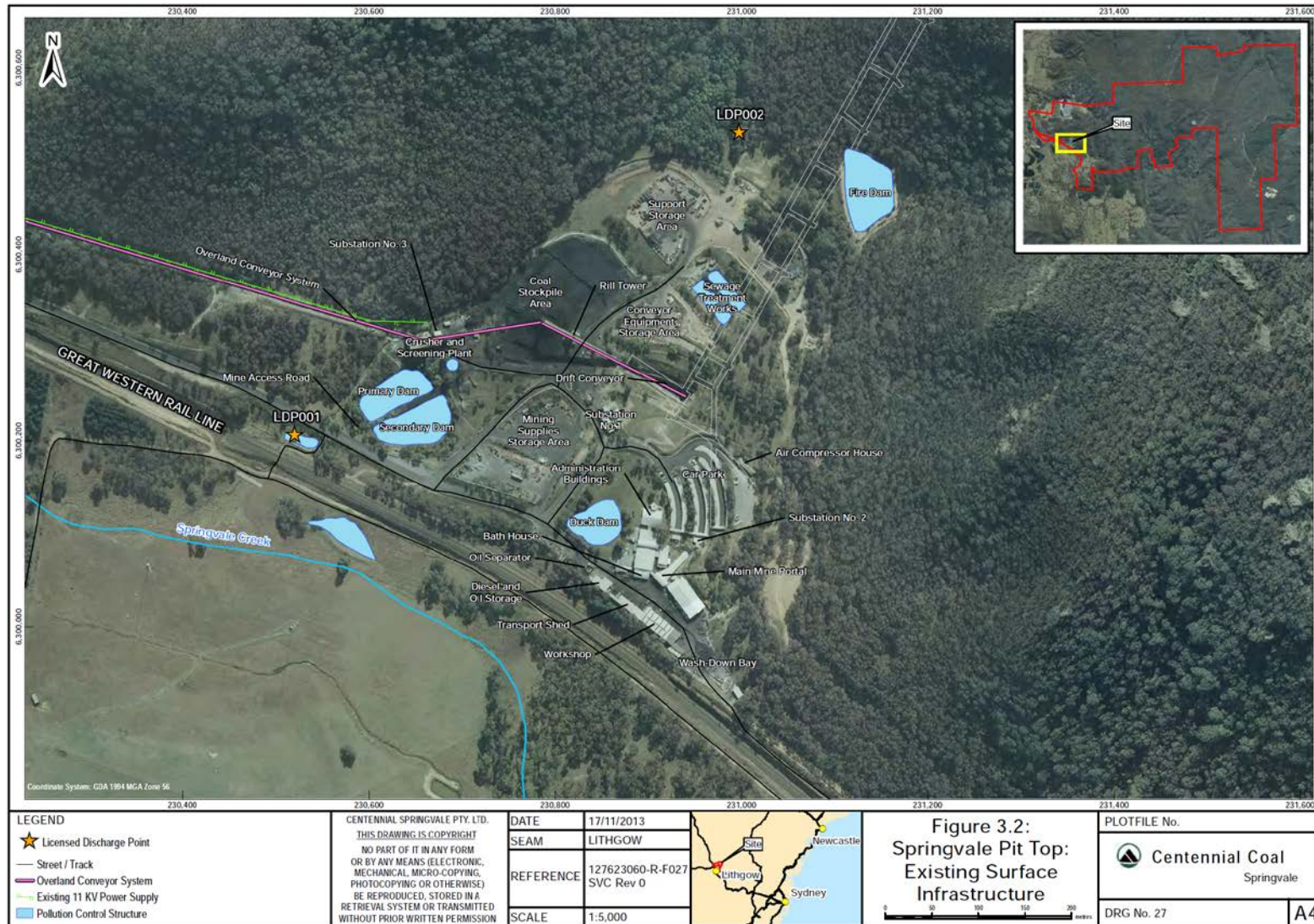


Figure 2: Layout of Pit Top Surface Facilities

## 2.0 CONSIDERATION OF PAC REVIEW

### 2.1 Overview of Commission Review Findings

The Commission Review Report concludes that:

*“the project would have a number of project specific impacts, but that these can be managed to an acceptable level through stringent and robust conditions along with careful management of operations on site. The Commission has made a number of recommendations in this regard, particularly relating to the need for best practice management of subsidence and impacts on water resources and swamps. With these measures, and requirements for best practice management in place, the Commission is satisfied that the project can be approved, subject to conditions”.*

The Commission agrees with most of the PAR's findings and recommendations, but provides 15 recommendations it considers would enhance the determination of the project and ensure that potential impacts are avoided, minimised or mitigated. The Commission's recommendations for further consideration of issues and consultation were primarily in relation to:

- resolving some of the uncertainties in relation to non-conventional subsidence effects;
- further consultation with the EPA and Water NSW to finalise the plan of action for water discharges to the Coxs River;
- further consultation with DPI Water to about the options available for Centennial to acquire water licences under the *Water Management Act 2000*; and
- further consideration of adaptive management options and offset policy provisions in relation to the potential impacts on swamps.

A full list of the Commission's recommendations and a summary of the Department's consideration of these recommendations is provided in **Table 3**. Overall, the Department supports 10 of the Commission's recommendations. The Department has some concerns over aspects of the implementation of five recommendations. The actions proposed by the Department to ensure these recommendations are given effect are provided in the second column of **Table 2**.

Based on this consideration, the Department has also prepared revised recommended conditions of approval for the project, which are provided in **Appendix G**.

**Table 3: Commission Recommendations and Summary of the Department's Responses**

<b>Commission Recommendation</b>	<b>Department's Consideration and Action</b>
<b>Subsidence</b>	
1. That the Department give further consideration to upsidence and valley closure effects.	Refer to Section 2.2.
2. That appropriate monitoring of non-conventional subsidence effects should be included as a requirement in any consent and that the relevant Extraction Plan is required to contain appropriate measures to limit and manage the risks from non-conventional subsidence so as to ensure that the environmental performance criteria are not exceeded.	The prediction of non-conventional subsidence effects is a relatively young and inexact science. The Department has recommended strengthening and making explicit the condition requiring monitoring of conventional and non-conventional subsidence.
3. That a rigorous set of performance measures is included in any consent. Rigorous in this context means able to be measured or assessed in a scientifically and legally sound manner and be capable of enforcement. These performance measures must be supported by: <ul style="list-style-type: none"> <li>(i) a requirement that the Extraction Plan for each longwall contains revised subsidence predictions based on experience from previous mining on the site and that these revised predictions will not allow the performance criteria to be exceeded; and</li> <li>(ii) a requirement that the Extraction Plan for each longwall contains:               <ul style="list-style-type: none"> <li>(a) appropriate triggers to warn of the development of an increasing risk of exceedance of the performance criteria (e.g. the subsidence predictions</li> </ul> </li> </ul>	Refer to Section 2.2. The consent contains performance measures linked to the significance of features and the likelihood of severity of impacts. These are well established performance measures. The performance measures would be closely linked to performance indicators developed as part of each Extraction Plan.

<p>themselves and/or other relevant subsidence-related measurements);</p> <p>(b) specific action plans to respond to increased risk of exceedance that will ensure the criteria are not exceeded (e.g. cessation of mining, narrowing the longwall, altering seam height, etc) &amp;;</p> <p>(c) an assessment of remediation measures that may be required if exceedance does occur and the capacity to implement the measures.</p>	
<b>Water Resources</b>	
<p>4. That, prior to determination, the Department liaises with Water NSW about the salinity level of discharges into Coxs River, and considers Water NSW's request to include a condition of consent requiring a 'negligible change' in the salinity level at Lake Burragorang.</p>	<p>Refer to Section 2.3</p> <p>The EPA and Centennial have reached an agreement regarding salinity limits in mine-water discharges over specified timeframes. Water NSW understands that there is a long history of negotiations between the EPA and Centennial in relation to salinity limits in mine-water discharges and accepts that the recent agreement is likely to be the best outcome.</p> <p>The Department is satisfied that the mine-water discharge volumetric and quality limits agreed by the EPA and Centennial, as reflected in the recommended consent, would result in a 'beneficial effect' on waters within the catchment.</p> <p>It is considered to be more effective to regulate the quality of water discharges at the LDP, rather than at or within Lake Burragorang, and to then carry out regular monitoring downstream of the LDP to determine any impacts on water quality.</p>
<p>5. That, prior to determination, an agreed plan of action relating to the salinity level of discharges into the Coxs River is included in the Statement of Commitments, and adequately addressed in conditions of consent relating to the relevant management plan and monitoring program.</p>	<p>Refer to Section 2.3</p> <p>Agreement has been reached between Centennial and the EPA in relation to the salinity of mine-water discharges and this has been reflected in the conditions of consent.</p>
<p>6. That, prior to determination, the Department liaises further with the EPA in relation to other toxicity factors in the mine-water, including ionic composition and high bicarbonate alkalinity, and ensure that the agreed criteria are included in the Statement of Commitments.</p>	<p>Refer to section 2.3</p> <p>The Department has liaised with the EPA and reached an agreement which requires Centennial to eliminate the 'toxicity characteristics' in its mine-water discharges by 30 June 2017. This has been reflected in the conditions of consent.</p>
<p>7. That, prior to determination, the Department liaises further with NOW about the options available for the Applicant to acquire water licences, and that the Applicant include appropriate resolutions as commitments in its Statement of Commitments</p>	<p>Refer to Section 2.3</p> <p>DPI Water has provided correspondence confirming a viable option to allow Centennial to obtain a surface water licence under the <i>Water Management Act 2000</i>, which Centennial has confirmed it is in the process of implementing.</p>
<p>8. That, prior to determination, the Department liaises with OEH about monitoring options or other measures to ensure that OEH's concerns about potential impacts on streams within the Gardens of Stone and Blue Mountains National Parks can be adequately addressed.</p>	<p>Refer to Section 2.3</p> <p>The Department notes that these national parks are located greater than 5 kilometres (km) from the proposed longwalls and are highly unlikely to be impacted by the underground mining operations. Recommended conditions require Centennial to consult with OEH, as well as the EPA and DPI Water, during preparation of the site's Water Management Plan.</p>
<b>Swamps</b>	
<p>9. That the Department considers the most up-to-date monitoring results and ensures that the monitoring of any swamp impacts is able to identify and quantify the role of subsidence movements, as against other mechanisms including discharge or erosion impacts.</p>	<p>Refer to Section 2.4</p> <p>The existing monitoring plan and network can be readily expanded to cover the 11 swamps in the extended project area, and that the resultant monitoring regime would allow Centennial and regulators to identify and quantify the role of subsidence movements, as against other</p>

	mechanisms, if any swamp impacts are observed.
10. That the Department considers the need for further piezometric monitoring in hanging swamps.	Refer to Section 2.4 The potential risks to the function of hanging swamps from the proposed longwalls are low and most, if not all, hanging swamps would maintain their function. The Department considers that an extension of the existing monitoring program for hanging swamps would allow any impacts to these ecosystems to be identified, and that piezometric monitoring is unsuitable and impractical in these swamps.
11. That, prior to determination, the Department considers the work that has been done as part of the ANU research project.	Refer to Section 2.4 The majority of the research work is yet to be published. However, recommended conditions require that the Swamp Monitoring Program (required as part of the Extraction Plan) consider and incorporate any relevant findings from ongoing swamp research projects.
12. That, prior to determination, the Department liaises further with OEH to: <ul style="list-style-type: none"> <li>clarify the best available information on the distribution and abundance of the EEC; and</li> <li>ensure that the conditions are updated to reflect the current draft framework for swamp offsets, including incorporating the listed primary and secondary methods of monitoring, and appropriate availability of raw monitoring data to provide for independent review.</li> </ul>	Refer to Condition 2.4 Centennial has provided OEH with its GIS files for swamp mapping undertaken by the University of Queensland over almost a decade. This mapping is extensive, comprehensive and based on best practice vegetation mapping techniques. Recommended conditions reflect the current draft Swamp Offset Policy. The Swamp Monitoring Program has included requirements for monitoring of both primary (groundwater) and secondary (terrestrial and aquatic flora and fauna, soil and peat, stability, erosion) monitoring of swamps to inform the adaptive management process. The Swamp Monitoring Program also requires that the raw swamp monitoring data be made available to OEH, on request.
13. That, prior to determination, the Department considers opportunities for adaptive management in relation to certain swamps as the proposed mine progresses, through a comprehensive monitoring program in key areas and via deferred Extraction Plan approvals, dependent on the collection and analysis of monitoring data coupled with iterative risk assessment.	Refer to Section 2.4 An adaptive management approach has been incorporated into the recommended Extraction Plan and Swamp Offset conditions and within the subsidence impact performance measures. An Independent Monitoring Panel to provide advice regarding preparation of Extraction Plans, achievement of performance measures and calculation of offset liabilities is recommended.
<b>Biodiversity</b>	
14. That the Department ensures that no access tracks are created into the national park during the construction of dewatering bores and that the use of existing access tracks is encouraged.	Refer to Section 2.5 The Gardens of Stone and Blue Mountains National Parks are located over 5 km from the proposed Springvale extension. The proposed development does not involve the construction of any access tracks in the vicinity of these national parks. Centennial has provided a commitment to ensure that existing access tracks within the Newnes State Forest would be utilised wherever possible.
15. That the Department considers future exploration activities within the project area and ensures that any potential impacts are dealt with through appropriate conditions of consent, such as management plan requirements and rehabilitation objectives.	Refer to Section 2.5 The Department has included a condition requiring Centennial to prepare and implement an Exploration Activities and Surface Infrastructure Management Plan.

## 2.2 Subsidence

### **PAC Recommendations 1 and 2**

*That the Department give further consideration to upsidence and valley closure effects.*

*That appropriate monitoring of non-conventional subsidence effects should be included as a requirement in any consent and that the relevant Extraction Plan is required to contain appropriate measures to limit and manage the risks from non-conventional subsidence so as to ensure that the environmental performance criteria are not exceeded.*

The project's Environmental Impact Statement (EIS) for the project includes a Subsidence Impact Assessment (SIA) prepared by Mine Subsidence Engineering Consultants (MSEC). The SIA includes an overview and predictions of potential non-conventional or irregular subsidence movements, including valley-related movements such as upsidence and valley closure that could result from the proposed extraction of longwalls at Springvale. MSEC used the empirical method known as the ACARP method to predict valley-related subsidence movements.

Upsidence is the uplift in a valley (commonly expressed as a reduction in conventional subsidence) which results from the dilation or buckling of near-surface strata at or near the base of the valley. Valley closure is a phenomenon whereby one or both walls of a valley move horizontally towards the valley centreline due to subsidence-induced changes in horizontal stress conditions, which vary between the ridges and sides of the valley, as against its floor.

Non-conventional subsidence effects have only come to be recognised in the last 15 to 20 years, largely as a result of observations in the NSW Southern Coalfields. Prediction of non-conventional subsidence effects is therefore a relatively young and somewhat inexact science. MSEC acknowledged that *"the development of the predictive methods for upsidence and closure are the result of recent and ongoing research and the methods do not, at this stage, have the same confidence level as conventional subsidence prediction techniques"* (p. 38). MSEC also noted that the methods *"are based predominantly upon the measures data from Tower Colliery in the Southern Coalfield, where the in-situ stresses are high. The methods should, therefore, tend to over-predict the movements in lower areas"* (p 38).

To illustrate this point, MSEC used observed valley-related movements along stream alignments from previous mining at Angus Place and Springvale to make 'back-predictions' through applying the ACARP method. MSEC found that observed closures were significantly less (typically in the order of between 30-60%) than those which would have been predicted using the ACARP method. Therefore, MSEC's predictions of valley-related compressive strains of between 5 and 16 millimetres/metre (mm/m) along drainage lines located directly above Springvale's proposed longwalls are considered by both MSEC and the Department to be conservative.

Irrespective, as stated in the Department's PAR, it is important to note that MSEC's SIA includes consideration of worst-case (ie peak) non-conventional strains as well as conventional strains. The Department remains satisfied that this is the appropriate approach.

To increase the theoretical knowledge base in NSW regarding non-conventional subsidence effects, the Department has historically included standard conditions of approval under Extraction Plans requiring detailed subsidence monitoring and the analysis of relationships between predicted and resulting subsidence effects and predicted and resulting subsidence impacts. This requirement is reflected in the proposed conditions of consent. The Department has accepted the Commission's recommendation that this requirement should be made more explicit by referencing both conventional and non-conventional subsidence, and has amended the proposed conditions accordingly.

### **PAC Recommendation 3**

*That a rigorous set of performance measures is included in any consent. Rigorous in this context means able to be measured or assessed in a scientifically and legally sound manner and be capable of enforcement. These performance measures must be supported by:*

- (i) *a requirement that the Extraction Plan for each longwall contains revised subsidence predictions based on experience from previous mining on the site and that these revised predictions will not allow the performance criteria to be exceeded; and*
- (ii) *a requirement that the Extraction Plan for each longwall contains:*
  - (a) *appropriate triggers to warn of the development of an increasing risk of exceedance of the performance criteria (e.g. the subsidence predictions themselves and/or other relevant subsidence-related measurements);*

- (b) *specific action plans to respond to increased risk of exceedance that will ensure the criteria are not exceeded (e.g. cessation of mining, narrowing the longwall, altering seam height, etc) &;*
- (c) *an assessment of remediation measures that may be required if exceedance does occur and the capacity to implement the measures.*

The Commission identified that this recommendation was based in the perceived need to provide for a robust 'adaptive management' framework over the 13-year life of the project. In this respect, the Commission quoted the views of the Land and Environment Court regarding adaptive management, relevantly as follows:

*"Adaptive management is not a "suck it and see", trial and error approach to management, but is an iterative approach involving explicit testing of the achievement of defined goals. Through feedback to the management process, the management procedures are changed in steps until monitoring shows that the desired outcome is obtained. The monitoring program has to be designed so that there is statistical confidence in the outcome. In adaptive management the goal to be achieved is set, so there is no uncertainty as to the outcome and the conditions requiring adaptive management do not lack certainty, but rather they establish a regime which would permit changes, within defined parameters, to the way the outcome is achieved."*<sup>1</sup>

The Commission also considered that conditions containing performance measures *"need to have clear outcomes that must be met that are measurable and enforceable, assisted by an adaptive management system that monitors and modifies operations in advance, based on predetermined triggers to achieve the outcomes."*

The Department notes that a recommendation in similar terms appeared in the Commission's previous merit review reports for the Wallarah 2 Coal Project (W2CP) and the Mandalong Southern Extension Project (MSEP). The substantive argument made by the Commission in favour of this recommendation was included in its W2CP review report. The W2CP remains under assessment due to unforeseen problems for the applicant in obtaining consent from the NSW Aboriginal Land Council. In the absence of a clear discussion and conclusion on these matters, the Commission's MSEP review report considered that the MSEP *"presents a sensible and necessary opportunity to adopt the same recommendations to improve the conditions"*. It is presumed that the Commission considers that the Springvale Mine Extension Project also presents a similar opportunity.

However, there are substantial differences between W2CP and the Springvale project (as also exist between W2CP and MSEP). Most particularly, Springvale and MSEP are existing underground coal mines which have been conducting longwall operations and producing coal for many years, whereas W2CP is a 'greenfield' coal mine proposal. Centennial has been mining underground at Springvale for 15 years. W2CP on the other hand has no history of longwall production and also proposes to extract longwalls at a broad range of widths (125 – 255 m).

The result of these differences is that there is a much better body of existing subsidence data at Springvale (and Mandalong) on which to base subsidence predictions. Consequently, the risks associated with mine design not satisfactorily achieving the proposed performance measures are substantially reduced. In this respect, the Department also notes the Commission's satisfaction in its Springvale review report (and that for Mandalong) that the subsidence predictions are likely to be accurate. Clearly, these factors lessen the need for a risk-averse adaptive management framework.

Secondly, in its W2CP review report, the Commission pointed to a single example of the Department's draft subsidence impact performance measures which it considered to be not sufficiently strict and unenforceable. This draft measure was based on limiting the intensity of impacts on particular watercourses to a percentage of the stream length to be undermined. No such similar performance measure exists in the recommended conditions for Springvale.

Subsidence effects, subsidence impacts and environmental consequences have been extensively assessed in the Western Coalfield over the last 30 years, which has provided a substantial body of data and information on geological conditions and the way subsidence develops in response to mining. This database has been used in developing the Springvale mine plan, and the project's subsidence prediction model, which, as the Department noted in its PAR, has been modified by Centennial's experience at Springvale to provide a robust prediction methodology for the project.

The range of subsidence impact performance measures in the recommended conditions of consent are well-established (and accepted widely by the community and Government, including the

<sup>1</sup> See: *Newcastle and Hunter Valley Speleological Society Inc. v Upper Hunter Shire Council and Stoneco Pty Limited* [2010]

Commission in previous assessments) for underground coal mining projects in NSW. The Department considers the recommended performance measures represent current best practice for underground mining projects.

The performance measures are drafted so that individual impact limits apply to groups of similar and related features. The performance measures are targeted toward management regimes based not only the significance and sensitivity of the feature being protected, but also the risk profile, likelihood and severity of potential impacts occurring at the particular feature. The terms used in the proposed performance measures are generally subject to definitions set out in the consent.

The performance measures are not intended to act in isolation; rather, they operate to provide an umbrella framework under which a range of other considerations and assessments would be undertaken to avoid and minimise subsidence impacts either prior to, during or following the extraction of each longwall panel. In particular, these assessments relate to Extraction Plans.

Nonetheless, the Department agrees with the intent of the Commission's recommendation. It agrees that performance measures should be rigorous, scientifically sound, legally sound and therefore be capable of enforcement. It also agrees that all underground mining consents (particularly those that authorise longwall mining) need to support a robust adaptive management framework.

Generally speaking, the Department considers that its subsidence impact performance measures meet the standard sought by the Commission, and that its Extraction Plan process supports a robust adaptive management framework. For example, the Department considers that the intent of paragraph (i) of the Commission's recommendation is achieved by the Department's standard condition that:

*"Each Extraction Plan must .... provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since the commencement date of this consent;"*

The Extraction Plan process provides a detailed assessment process which supports the achievement of the performance measures. This process addresses the issues raised by the Commission's recommendation. For example, each Extraction Plan requires a new and detailed assessment of impacts, ensuring the most up-to-date data is available as to the likelihood of impacts and to inform decisions regarding suitable management strategies.

The preparation of an Extraction Plan for each group of longwall panels allows an iterative assessment of impacts to all built and natural features to be focussed at the local level, ensuring that impacts are regularly re-assessed and impact management regimes further refined during the life of the project in response to the results of subsidence monitoring and recorded impacts.

As a management plan which is entirely subordinate to the requirements and other provisions of a development consent, Extraction Plans are assessed by the Department in close consultation with other affected agencies. The form of the recommended consent is such that subsidence predictions, whether revised or otherwise, cannot be used to allow the performance measures to be exceeded. This is also the case with all other key management plans. The Department would be pleased to provide the Commission with examples of current Extraction Plans (otherwise available on company websites), if it would like to further consider them.

In regard to paragraph (ii) of the recommendation, the Department notes that it has standard conditions regarding subsidence monitoring, contingency planning and adaptive management. These are also considered to be generally sound. However, the Department agrees with the Commission that these can and should be strengthened. The Department recommends the following condition of approval:

*"Each Extraction Plan must ....*

*(g) include a:*

- (i) Subsidence Monitoring Program which has been prepared in consultation with DRE to:*
  - describe the ongoing conventional and non-conventional subsidence monitoring program;*
  - provide data to assist with the management of risks associated with conventional and non-conventional subsidence;*
  - validate the conventional and non-conventional subsidence predictions;*
  - analyse the relationship between the predicted and resulting conventional and non-conventional subsidence effects and predicted and resulting impacts under the plan and any ensuring environmental consequences; and*
  - inform the contingency plan and adaptive management process in paragraphs (ix) and (x) below;*

- (ix) *Trigger Action Response Plans (TARPs) addressing all features in Tables 1 and 2, which contain:*
  - *appropriate triggers to warn of increased risk of exceedance of any performance measure; and*
  - *specific actions to respond to high risk of exceedance of any performance measure to ensure that the measure is not exceeded;*
  - *an assessment of remediation measures that may be required if exceedances occur and the capacity to implement the measures;*
- (x) *Contingency Plan that expressly provides for:*
  - *adaptive management (including modifying mining height, longwall width or any other element of the mine plan) where monitoring indicates that there has been an exceedance of any performance measure in Tables 1 and 2, or where any such exceedance appears likely; and*
  - *an assessment of remediation measures that may be required if exceedances occur and the capacity to implement the measures;”*

In terms of ensuring that the performance measures have full legal enforceability, the Department has included a condition which specifically requires Centennial to undertake the assessment and management of development-related risks to ensure that performance measures are not exceeded. The recommended condition is as follows:

*“The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the performance measures in Table 1. Any exceedance of these performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation, notwithstanding actions taken pursuant to [the offsets condition] below. Where any exceedance of these performance measures has occurred, the Applicant must, at the earliest opportunity:*

- (h) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;*
- (i) consider all reasonable and feasible options for remediation and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and*
- (j) implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary.”*

## 2.3 Water Resources

### **PAC Recommendation 4**

*That, prior to determination, the Department liaises with Water NSW about the salinity level of discharges into Coxs River, and considers Water NSW’s request to include a condition of consent requiring a ‘negligible change’ in the salinity level at Lake Burragorang.*

#### Salinity in Mine-Water Discharges

The Department has undertaken additional consultation with Water NSW in relation to water quality issues at the Springvale mine. Consultation has included:

- discussions with representatives from Water NSW on 27<sup>th</sup> July 2015; and
- discussions during an interagency senior officers resource advisory committee meeting on 31<sup>st</sup> July 2015.

These discussions considered the outcomes of negotiations that have been undertaken between the Department, EPA and Centennial in relation to acceptable levels of salinity in mine-water discharges from Springvale’s LDP 9 into the Coxs River. These negotiations have resulted in an agreement between the EPA and Centennial which requires Centennial to meet a 50<sup>th</sup> percentile of 700, a 90<sup>th</sup> percentile of 900 and a 100<sup>th</sup> percentile of 1,000 micro-Siemens per centimetre Electrical Conductivity ( $\mu\text{S}/\text{cm EC}$ ) limits for salinity by 30 June 2017.

While Centennial has not accepted the EPA’s position that it should also achieve a 90<sup>th</sup> percentile of 500  $\mu\text{S}/\text{cm EC}$  limit for salinity in *Springvale’s* mine-water discharges by 30 June 2019, it has accepted that it must consider “all licensed discharge points within the Upper Coxs River catchment (including at the Springvale Mine, Lidsdale Siding, Western Coal Services and Angus Place Colliery) and include a financial justification and timetable for achieving a further reduction in salinity to 500 (90<sup>th</sup> percentile) EC by June 2019”. Centennial has also indicated that it would accept a 90<sup>th</sup> percentile limit of 500  $\mu\text{S}/\text{cm EC}$  for salinity in *Angus Place’s* mine-water discharges by 30 June 2019.

In addition, Centennial and the EPA have agreed on a monitoring program to assess the impact of Springvale’s discharges on the aquatic environment, including downstream salinity and pollutant levels in Lake Wallace and Lake Lyell. The monitoring program would be based on:

- water quality, macroinvertebrate and ecotoxicology monitoring across the Coxs River catchment to measure the performance against a long term water quality objective of 350  $\mu\text{S}/\text{cm}$  EC and the impacts of change on the aquatic ecology and ecosystem health of the Coxs River;
- water quality parameters to be monitored at all LDPs, with the frequency of monitoring and concentration limits focused on those that have been identified as having potential to cause harm to the environment; and
- a TARP that focuses on the extent to which any exceedances of concentration limits may affect aquatic ecology in the Coxs River catchment.

Centennial and the EPA have agreed that status reports on the impact of Springvale's discharges on the aquatic environment should be submitted to the EPA by 30 June 2017 and 30 September 2020.

The Department has included mine-water discharge performance measures and a proposed condition requiring that Centennial implement the agreed water quality limits and monitoring regime. The EPA has advised that it would also be including a condition in Springvale's environment protection licence (EPL) to implement the monitoring program.

*State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011*

The project is located within Sydney's drinking water catchment and therefore must be considered under the provisions of *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water Catchment SEPP)*. The *Sydney Drinking Water Catchment SEPP* was made in 2011 in response to section 34B of the EP&A Act, under which a SEPP must provide that consent authorities must refuse to grant consent to a development application relating to any part of the Sydney drinking water catchment unless the consent authority is satisfied "that the carrying out of the proposed development would have a neutral or beneficial effect on the quality of water".

In response to this requirement, clause 10(1) of the *Sydney Drinking Water Catchment SEPP* states that a consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a 'neutral or beneficial effect' (NorBE) on water quality.

The *Neutral or Beneficial Effect on Water Quality Assessment Guideline (SCA, 2011)* provides guidance, principally for local government authorities, on how to assess whether development proposals would achieve NorBE. WaterNSW has advised that the guideline and the associated 'NorBE Tool' are not intended to be used to assess State significant developments but rather are designed for local developments. Notwithstanding, guidance is provided on defining what is a 'neutral or beneficial effect' and the guideline states that NorBE can be considered to be satisfied for water quality if the development:

- a) has no identifiable potential impact on water quality; or
- b) will contain any water quality impact on the development site and prevent it from reaching any watercourse, water body or drainage depression on the site; or
- c) will transfer any water quality impact outside the site where it is treated and disposed of to standards approved by the consent authority.

Neither the SEPP nor the guidelines clearly define 'neutrality' or 'beneficial effect' in relation to water quality. That is, they do not indicate whether neutrality is purely to be measured in either purely arithmetic terms, or in terms of one measure or another of ecological health, or by the achievement of particular water quality guidelines. They do not specify locations at which neutrality must be measured, either upstream or downstream of a development. In terms of water quality, they do not specify whether quality parameters should relate to *delivered* drinking water, *stored* drinking water, catchment flows *delivered to storages*, or to catchment flows *close to or at source*.

They also do not specify how an existing development should be treated when it seeks to either modify its consent, or to replace an existing consent with a new development consent, as is the case at Springvale. Further, they provide no guidance as to the particular circumstances at Springvale where discharges that were previously transferred for industrial use at the nearby Wallerawang Power Station can no longer be used in this manner.

Consequently, in order to assess whether the project would achieve NorBE under the requirements of the SEPP, it is necessary for the Department to first establish the point in time, or the 'base case', against which to make the NorBE assessment. Secondly, it is necessary to establish the basis for measurement of current and future discharges against this base case.

Underground mining operations, and associated mine-water discharges, have been taking place at Springvale for over twenty years. A significant change to the way in which mine-water discharges are handled occurred in 2006, when the Springvale Delta Water Transfer Scheme (SDWTS) was commissioned, as part of a Pollution Reduction Program required by the EPA. The SDWTS permits groundwater inflows to Springvale's underground mine workings to be transferred by pipeline to the Wallerawang Power Station for use as cooling water.

The original function of the SDWTS was to reduce the volume of water sourced by the power station from the regional surface rivers and lakes which feed into the drinking water catchment. Cooling tower water was treated via Wallerawang's reverse osmosis (RO) plant prior to being discharged to the Coxs River, with Wallerawang's EPL limiting its water discharges to the Coxs River to a 100<sup>th</sup> percentile of 2,900 µS/cm EC and 30 ML/day volumetric.

As described in the Department's PAR, since the closure of the Wallerawang Power Station in early 2014, Centennial has had no choice but to discharge its surplus mine-water directly into the Coxs River via LDP 9. The current licensed water discharge limits from LDP 9 are a 100<sup>th</sup> percentile limit of 1,200 µS/cm EC and 30 ML/day volumetric.

The Department and Water NSW have considered the question of what is an appropriate 'base case' for Springvale, given the length of time the mine has been operating and other variables, including the closure of the Wallerawang Power Station. In the context of the long-term and existing mining operations at Springvale, the Department considers that the most appropriate position is to consider the base case as being the existing discharge limits on Springvale's EPL that existed at the time the current development application was made (ie 1,200 µS/cm EC).

On this basis, implementation of the EPA's agreement with Centennial to meet a 50<sup>th</sup> percentile of 700, a 90<sup>th</sup> percentile of 900 and a 100<sup>th</sup> percentile of 1,000 µS/cm EC limits for salinity by 30 June 2017 would clearly result in a 'beneficial' effect on water quality in the Coxs River and downstream water storages in the medium to long term, compared with Springvale's existing approved EC limits for mine-water discharges. The increased salt load which would result from the predicted increase in discharges from an average of 12 ML/day to 18-19 ML/day is considered to be 'environmentally neutral', since aquatic organisms react to salt *concentrations*, rather than salt *loads*. Because salt *concentrations* would drop significantly as a result of the agreed changes to EC limits under Springvale's EPL, saline ecotoxicity resulting would also drop. That is, the proposal's beneficial effect on water quality is best demonstrated through the commitment to reduce salt concentrations. This beneficial effect on water quality would also be environmentally beneficial.

It is noted that Centennial is also seeking approval to upgrade the SDWTS from its current capacity of 30 ML/day to 50 ML/day to accommodate increased inflows from the concurrent operations of both Springvale and Angus Place mines. Centennial has confirmed that, with Angus Place now operating in 'care and maintenance' and not expected to be re-opened until Springvale is in its final years of project life, the SDWTS would not need to be upgraded until 2028.

On this basis, the EPA has requested that development consent for the project specifically excludes expansion of the capacity of the SDWTS. The EPA has also said that its agreement with Centennial regarding future salinity limits was based on volumetric discharge limits of 30 ML/day, not 50 ML/day. The Department agrees that expansion of the SDWTS's capacity is not required for successful operation of the Springvale extension (including the management of water from Angus Place whilst it is on 'care and maintenance'). The Department therefore agrees with the EPA and recommends a condition expressly excluding upgrade of the SDWTS's capacity from the consent.

The Department notes that, if Centennial plans to re-commence operations at Angus Place prior to 2028, or if there is a need to upgrade the SDWTS prior to this time, then Centennial would be required to submit a modification to the proposed consent, which would in turn require additional public and agency consultation.

The Department and EPA have accepted that alternative treatment arrangements would need to be put in place by Centennial in order to achieve the proposed discharge limits, and that this may take some time to implement. However, the Department is satisfied that the water quality and volumetric limits for mine-water discharges agreed between the EPA and Centennial and reflected in the proposed consent would result in 'beneficial effect' on waters within the catchment. Water NSW has

advised it accepts the outcomes agreed between the EPA and Centennial in relation to future salinity levels in Springvale's mine-water discharges.

#### Negligible Change at Lake Burragorang

In its submission to the Commission, Water NSW requested that a condition of consent is imposed requiring a 'negligible change' in salinity levels in Lake Burragorang. The Department has considered this request and further discussed the issue with Water NSW.

The Department notes that the EPA considers that the water quality impacts of the project are best managed by controlling water quality at source (ie the LDP) rather than at any particular downstream location. Further, it is considered impractical to regulate water quality associated with Springvale discharges at Lake Burragorang due to the:

- significant distance between the Springvale and Lake Burragorang (>20km); and
- cumulative water discharges into the Coxs River catchment from other industrial and agricultural sources, over which Centennial has no control.

Furthermore, the Department questions what would constitute a 'negligible change' in salinity levels at Lake Burragorang, and if a greater than a negligible change is identified, what could be done under the existing consent to manage the impact.

The Department notes that the modelled variations in salinity under median rainfall conditions in Lake Burragorang are minimal, regardless of whether both Springvale and Angus Place are closed (98 mg/L) or whether the mines are operated sequentially (103 mg/L) or concurrently (104 mg/L). The Department notes all these levels are fundamentally very similar and are substantially less than the 600 mg/L recommended by the *Australian Drinking Water Guidelines 2015* (ADWG). The PAR noted that this predicted increase of 5 – 6% is not arithmetically 'neutral'. However, the Department is of the view that that 'arithmetic neutrality' should not be the basis of its assessment. The critical question is whether the increase is 'environmentally neutral', to both ecosystems and the ultimate users of the water (ie the population of Sydney). In this regard, it is important to note that the predicted increase in salinity in Lake Burragorang results not from higher EC in inflows from the Coxs River, but from an increased total salt load as a result of the expanded mining area. The increase must be considered in the light of the ADWG and the potential for any such increase to lead to any 'environmental harm'.

In the Department's opinion, there is no basis on which to conclude that there would be any negative effects from the predicted increase in salinity, which is well within the range of normal upland streams and catchments in eastern Australia and well within the expected standards of the ADWG. On this basis, the Department considers the changes to be environmentally 'neutral'.

The Department is of the view that the appropriate places to measure and manage the impacts of mine-water discharges are at the mine's LDPs. The Department is satisfied that the water quality limits agreed between the EPA and Centennial and included in the draft conditions, as well as the implementation of the proposed Upper Coxs River Action & Monitoring Plan (see below) would result in a 'beneficial effect' on water quality in the Coxs River and its downstream waterways, when compared to the existing approved discharges.

#### **PAC Recommendation 5**

*That, prior to determination, an agreed plan of action relating to the salinity level of discharges into the Coxs River is included in the Statement of Commitments, and adequately addressed in conditions of consent relating to the relevant management plan and monitoring program.*

The agreement reached between the EPA and Centennial in relation to salinity levels in Springvale's mine-water discharges to the Coxs River and the associated monitoring regime has been reflected in the revised consent, as well as in Centennial's revised Statement of Commitments.

#### **PAC Recommendation 6**

*That, prior to determination, the Department liaises further with the EPA in relation to other toxicity factors in the mine-water, including ionic composition and high bicarbonate alkalinity, and ensure that the agreed criteria are included in the Statement of Commitments.*

In its submission on the EIS, the EPA raised concerns about the toxicity of the mine-water being discharged from LDP 9 into the Coxs River. Water sampling undertaken by the EPA in May 2014 had indicated that the discharge water was toxic to water fleas ('Cladoceran species').

The EPA subsequently placed a Pollution Reduction Program (PRP) on Springvale's EPL which required Centennial to undertake an ecotoxicology assessment of the Upper Coxs River. The results of this investigation were included in the Response to Submissions (Appendices 9 and 10). These investigations identified that the source of toxicity was the flocculants used in the mine-water treatment process. Centennial subsequently replaced the flocculants in April 2015.

In May 2015, the EPA engaged OEH to test the LDP 9 discharge to determine if the changes to the flocculation process eliminated the toxicity. Recent correspondence from the EPA indicates that the discharges remain toxic, particularly to Cladoceran species.

Centennial has since accepted that the toxicity of the mine-water discharges is likely to be attributable to bicarbonate alkalinity, rather than flocculants. Centennial indicates that the RO treatment of mine-water required to meet the EC limits agreed with EPA would also significantly reduce alkalinity and the ionic imbalance, through removing total dissolved solids.

The Department and the EPA accept that there are limited measures available to treat bicarbonate alkalinity other than via RO. It is also accepted that, although the toxicity levels identified in the mine-water may be toxic to small crustaceans such as water fleas, these species are highly sensitive. Overall, the toxicity levels are not considered to be high and are unlikely to impact on larger aquatic species, including fish.

However, the Department and the EPA agree that the toxicity characteristics of the mine-water need to be eliminated to protect all aquatic species and to ensure the development results in a 'beneficial effect' on water quality. Accordingly, the Department has recommended that a water management performance measure be included which requires Centennial to eliminate the 'toxicity characteristics' of the mine-water discharges by 30 June 2017. This would allow time for Centennial to have the RO treatment methods in place. Centennial has also committed to undertake the required investigations into the toxicity of LDP009 water discharge in its revised Statement of Commitments.

#### **PAC Recommendation 7**

*That, prior to determination, the Department liaises further with NOW about the options available for the Applicant to acquire water licences, and that the Applicant include appropriate resolutions as commitments in its Statement of Commitments*

As discussed in the Department's PAR, under the *Water Management Act 2000*, Centennial is required to hold a surface water licence for predicted baseflow reductions within the Wywandry River Management Zone of the *Upper Nepean and Upstream Warragamba Water Source* and the Colo River Management Zone of the *Hawkesbury and Lower Nepean Water Source*.

Recent correspondence from DPI Water (see **Appendix D**) indicates that:

*"DPI Water has reviewed the operation of the NSW Aquifer Interference Policy in relation to the issue of passive take of surface water resulting from underground activities, and has determined that in limited circumstances, a water access licence in a groundwater source could be used to authorise the taking of water from an intersecting surface water source. However, this can only be relied upon if an access licence has been granted that explicitly authorises this take of water.*

*Centennial Coal's Springvale Colliery is likely to meet the relevant requirements to account for its surface water take."*

Accordingly, Centennial has confirmed that it has applied for a new water access licence in the relevant groundwater source with a zero share component. Once this licence is granted, DPI Water has confirmed that dealing can be undertaken to trade entitlement from Springvale's existing licences to the new licence. Centennial has updated its Statement of Commitments to reflect these arrangements.

#### **PAC Recommendation 8**

*That, prior to determination, the Department liaises with OEH about monitoring options or other measures to ensure that OEH's concerns about potential impacts on streams within the Gardens of Stone and Blue Mountains National Parks can be adequately addressed.*

On 12 June 2015, OEH provided a submission to the Department on its review of the PAR and draft consent conditions (see **Appendix A**). In this submission, OEH raised concerns about potential impacts to the Gardens of Stone and Blue Mountains National Parks through loss of stream flows.

In its submission, OEH indicated that the project area is located adjacent to these national parks, and that many streams overlying the project area flow directly into the national parks. It should be noted that, while this is the case for the Angus Place mine, it is not true for the Springvale proposal. The longwalls associated with the Springvale proposal are located between 6 and 8 km south of the Gardens of Stone National Park and between 5 and 6 km west of the Blue Mountains National Park. Angus Place Mine and Clarence Colliery are situated between Springvale and the Gardens of Stone National Park and Blue Mountains National Park, respectively.

The EIS's SIA states that, at these distances, the national parks would not experience any measureable subsidence movements resulting from extraction of the proposed longwalls. Similarly, the EIS's Groundwater Assessment states that no significant drawdown in either the perched or shallow aquifer systems is anticipated in the vicinity of the national parks, and accordingly no detrimental groundwater related impacts are anticipated. The Groundwater Assessment's baseflow modeling, undertaken by the CSIRO, also predicts that the project is unlikely to have a material impact on baseflows, as most streams in the project application area are ephemeral and only flow after prolonged or significant rainfall events.

The Department also notes the Commission's comments that, as a whole, the development is predicted to have only minor net loss of baseflow levels and that these are unlikely to have significant implications downstream. The Department also notes that the Commission endorses the recommended conditions requiring "no greater than negligible subsidence impacts or environmental consequences" to the Wolgan River, and other watercourses located outside the site. Further, consistent with the response to Recommendation 7 above, Centennial is required to hold a surface water licence for the minor predicted baseflow reductions associated with the development.

As discussed in Section 6.4 of the PAR, the Department and DPI Water also agree that a rigorous monitoring regime and associated TARP is necessary to provide a clear basis to decide whether or not the surface water performance measures are being met and certainty in determining appropriate management responses to exceedances. Daily flow monitoring is currently being undertaken by Centennial at Wolgan River and Marrangaroo Creek. The Department believes this current monitoring should be maintained and that any additional monitoring requirements should be negotiated with DPI Water and the EPA during the preparation of the site Water Management Plan. In order to ensure OEH's concerns in relation to stream monitoring are adequately addressed, the Department has recommended that Centennial also consult with OEH during preparation of this plan.

## 2.4 Swamps

### **PAC Recommendation 9**

*That the Department considers the most up-to-date monitoring results and ensures that the monitoring of any swamp impacts is able to identify and quantify the role of subsidence movements, as against other mechanisms including discharge or erosion impacts.*

The Department is aware that the exact cause of impacts to five swamps (Narrow North, Narrow South, Kangaroo Creek Swamp, East Wolgan and Junction Swamps) by Centennial's previous mining operations at Springvale and Angus Place remains somewhat uncertain. These impacts are likely to have been caused by a combination of factors, but primarily through the discharge of mine-water in the swamps or subsidence-induced changes to swamp hydrology caused by surface cracking of the swamps' rocky substrate (see Section 6.2 of the PAR and Goldney *et al*, 2010).

In order to avoid this situation in the future, and to more accurately quantify subsidence-related impacts against other potential causes such as water discharge or erosion impacts, the Commonwealth Department of the Environment (DoE) required that Centennial prepare a document titled *Springvale Mine Temperate Highland Peat Swamps on Sandstone Monitoring and Monitoring Plan* (April 2013). This plan was prepared to satisfy the Commonwealth's approval of extraction of LW415 to LW417 and provides a comprehensive swamp monitoring program for subsidence, flora, fauna, surface water and groundwater above these longwalls. The plan was peer-reviewed by independent experts and approved by DoE.

The monitoring program is designed to collect pre-mining data to further develop an understanding of the pre-mining environment. It also collects post mining data, to determine whether any mining related impacts have occurred. Monitoring is carried out at sites potentially impacted by longwall mining activities (impact sites) as well as at sites that are located away from the effects of mining activities (reference sites). Reference sites are used as a comparative reference when determining whether any changes at impact sites are non-mining related (eg climatic, forestry or other land use) or whether

changes are the result of mining activities.

Swamp-related monitoring has been undertaken at Springvale since 2002. The current swamp monitoring network comprises:

- 24 standpipe piezometers that monitor water level in 10 shrub swamps (four piezometers have been undermined, 20 have not been undermined);
- 14 standpipe piezometers installed into the elevated ridges between the swamps, which monitor shallow groundwater levels in the Banks Wall Sandstone aquifer;
- water quality sampling from swamp standpipe piezometers;
- 18 individual monitoring locations with fully grouted Vibrating Wire Piezometers (8 in undermined areas, 10 in areas not undermined);
- 4 surface water flow monitoring stations at swamp discharge sites for Sunnyside, Junction and Narrow Swamps and on Kangaroo Creek;
- 2 additional surface water gauging stations on Paddys Creek (downstream of Pine and Nile Mile Swamps) and Gang Gang Swamp; and
- flora monitoring at 46 sites (including undermined swamps and swamps that have not been undermined).

The monitoring results of this monitoring program are provided in Centennials' Annual Environmental Management Reports (AEMRs), which can be downloaded from: <http://data.centennialcoal.com.au/domino/centennialcoal/cc205.nsf/Published.xsp?site=Springvale&type=Environmental%20Management%20Report&date=All>.

As indicated in the PAR, the Department is satisfied that the existing monitoring plan and network can be readily expanded to cover the 11 shrub swamps in the project area. Centennial has committed that one of the two major suspected causes of damage, namely the discharge of mine water into the swamps, will no longer occur. Other potential factors, such as erosion caused by access tracks, are relatively easy to observe. On this basis, the Department is satisfied that, under the proposed monitoring regime, Centennial and regulators would be able to identify and quantify the role of subsidence movements, as against other mechanisms, if any significant swamp impacts are observed.

### **PAC Recommendation 10**

*That the Department considers the need for further piezometric monitoring in hanging swamps.*

Hanging swamps occur on the flanks of valleys in areas which are subject to infrequent waterlogging caused by a supply of water from perched groundwater systems, surface runoff and rainfall. The base of hanging swamps is generally at a much higher slope angle than shrub swamps, which means that hanging swamps are less able to retain water as it drains downslope. Hanging swamps generally do not have a thick peat base or a consistent free groundwater surface that can be measured. Furthermore, the steep topography in which hanging swamps are generally situated makes accessibility for piezometer installation impractical. As a result, the conditions are not suited to the installation of swamp piezometers.

The Department considers that, due to the hillside locations and hydraulic characteristics of hanging swamps, it is both unsuitable and impractical to conduct piezometric monitoring in these swamps. Consequently, Centennial has proposed a different approach for the monitoring of hanging swamps. The hanging swamp monitoring program, which has been endorsed by DoE and is currently being undertaken for swamps overlying LWs 415 to 417, includes:

- conducting site inspections and photographic monitoring at all hanging swamps located within a 26.5 degree angle of draw before and after the passage of each longwall panel to check for any visible surface subsidence damage such as cracking, slumping or erosion;
- aerial photographic monitoring of all hanging swamps on a regular basis to allow the condition of the total area of hanging swamps to be assessed;
- Rapid Assessment Method flora monitoring at all hanging swamps pre- and post-mining;
- using aerial LiDAR data to measure ground level at the commencement and completion of mining of each longwall panel. Each LiDAR survey is compared against previous survey data to derive the incremental subsidence since the previous survey. This allows cumulative subsidence effects to be measured to within  $\pm 150$  mm. This method would provide 100% coverage of the hanging swamps with minimal disturbance.

Potential impacts of the proposed Springvale extension on hanging swamps are surface cracking and excessive tilts that interfere with swamp hydrology. While cracking is theoretically possible, Centennial reports that no cracking has ever been observed in soft soil or peat-covered areas due to the relatively

low strains that are normally experienced in this area. In addition, predicted (and previously measured) tilts are well below those required to reverse the hydraulic gradient in hanging swamps, which follow the dip of the local strata. Centennial report that numerous hanging swamps have been previously undermined by more than 40 longwall panels at both Springvale and Angus Place Mines, and there has not been any observed cracking within a hanging swamp or damage to the vegetation as a result.

As discussed in the PAR, the Department agrees that the potential risks to the function of hanging swamps from the proposed longwalls are low and most, if not all, hanging swamps would maintain their function. The Department is satisfied that an extension of the existing monitoring program for hanging swamps would allow any impacts to these ecosystems to be identified, and that piezometric monitoring is both unsuitable and impractical.

#### **PAC Recommendation 11**

*That, prior to determination, the Department considers the work that has been done as part of the ANU research project.*

As a result of the mining-related impacts to the Narrow North, Narrow South, East Wolgan and Junction Swamps, Centennial agreed to enter into an 'enforceable undertaking' with DoE under section 486DA of the *Environment Protection and Biodiversity Conservation Act 1999*. Under this instrument, Centennial has entered into a research agreement with the Australian National University (ANU) to undertake a comprehensive research program into shrub swamps on the Newnes Plateau.

Centennial has provided \$1.45 million to fund the ANU research project. The project commenced in November 2011 and is scheduled to run over a 4-year period. It is overseen by a Steering Committee, which includes academics, DoE, the OEH and Centennial. The research is focused into six key projects, which cover a range of topics including:

- spatial distribution of swamps;
- framework and toolbox for assessing and monitoring swamp condition and ecosystem health;
- effects of fire and hydric flow regimes;
- maintaining long-term resilience for isolated peat swamp flora;
- significance of population variation and connectivity using genetic and ecological evidence; and
- peat swamp hydrology and water balance.

Although a number of the projects are reaching finalisation, only one paper has been published to date. This paper, titled "*Developing a model of upland swamp structure, function and evolution for biodiversity conservation and rehabilitation: The case of threatened Temperate Highland Peat Swamps on Sandstone (THPSS)*", examines the sedimentology, age structure, hydrological function and stygofauna diversity of nineteen swamps in the Blue Mountains and Southern Highlands of NSW to produce a regional model of THPSS geo-ecological function. It is expected that other papers will be published within the next twelve to eighteen months.

Centennial is also funding research by the University of Queensland, which involves research on more than 1000 swamp communities in a 268 km<sup>2</sup> area including the Newnes Plateau.

The Department has considered the initial work by the ANU and notes that, although it provides useful information on the formation and function of swamps, it does not provide information that could be readily incorporated or inform the existing swamp monitoring regime. However, the Department considers that future outcomes of the ANU research project, along with the research being undertaken by the University of Queensland, may inform the understanding of the ecology of swamps and could result in improved swamp monitoring, management and rehabilitation techniques on the Newnes Plateau.

Centennial has advised the Department that it has, and will continue to, include the findings of the research projects in its adaptive management framework, and in particular in its monitoring and management program. To ensure this occurs, the Department has recommended that the Swamp Monitoring Program (required as part of each Extraction Plan) consider and incorporate any relevant findings from ongoing swamp research projects.

#### **PAC Recommendation 12**

*That, prior to determination, the Department liaises further with OEH to:*

- *clarify the best available information on the distribution and abundance of the EEC; and*
- *ensure that the conditions are updated to reflect the current draft framework for swamp offsets, including incorporating the listed primary and secondary methods of monitoring, and appropriate availability of raw monitoring data to provide for independent review.*

### Swamp Mapping

As requested by OEH, on 11 June 2015 Centennial provided OEH with GIS files of the swamp mapping which was undertaken by the University of Queensland for Centennial over the period of almost a decade. The swamps on the Newnes Plateau were mapped using a combination of on-the-ground detailed survey combined with aerial photography and remote sensing techniques. Centennial maintains that this mapping is extensive, comprehensive and based on best practice vegetation mapping techniques (see **Appendix E**).

The Department accepts that the mapping undertaken by the University of Queensland is likely to be the most detailed mapping currently available. It also notes that the Blue Mountains Vegetation Map, which was used by OEH to delineate the area of swamps potentially impacted by the development, is based on air photo interpretation at a relatively large scale (ie 1:100,000) and on information gathered from a limited number of quadrants. It is also much older. The Department therefore accepts that Centennial's mapping of the individual and total areas of shrub swamps potentially affected by the project is detailed, contemporary and the most accurate available.

The Department is satisfied that OEH now has the best available information available to complete an independent analysis of the swamp areas potentially affected by the development.

### Swamp Offset & Monitoring Conditions

The Department confirms that the draft consent conditions have been revised to reflect the intent of the draft *Policy Framework for Biodiversity Offsets for Upland Swamps and Associated Threatened Species Impacted by Longwall Mining Subsidence* (draft Swamp Offset Policy, OEH, May 2015), even though the details of the policy remain under consideration.

The draft conditions set performance measures of negligible environmental consequences for two of the 11 shrub swamps (Sunnyside and Nine Mile) and the hanging swamps. If these performance measures are exceeded, and if it is not reasonable or feasible to remediate the impact, then Centennial is required to provide a suitable offset in compensation. The offset could be like-for-like or alternatively could be a payment into the NSW Offset Fund or another supplementary measure.

The Department has recommended a condition which requires a Swamp Offset Bond of \$2,000,000 for the first two swamps to be undermined (ie Sunnyside East and Carne West Swamps). This is in recognition of the fact that Centennial is unlikely to be able to purchase relevant offset sites or biodiversity credits, or arrange for supplementary measures to be carried out, before it commences mining the longwalls which may impact these swamps. The bond therefore provides a safeguard in the event that these swamps are impacted by mining operations, and gives Centennial time to demonstrate that it can satisfy the maximum predicted offset liability for all other shrub swamps.

There are seven other shrub swamps which may be impacted by mining operations (Gang Gang South West, Gang Gang East, Pine, Pine Upper, Paddys Creek, Marangaroo Creek and Marrangaroo Creek Upper Swamps). Recommended conditions require Centennial to have suitable offsets in place prior to carrying out any longwall extraction under these swamps and to offset any impacts on these swamps that cause greater than 'negligible environmental consequences'.

The Department confirms that the consent has been revised to require the preparation of a Swamp Monitoring Program as part of the Extraction Plan, which requires both primary (groundwater) and secondary (terrestrial and aquatic flora and fauna, soil and peat, stability, erosion) monitoring of swamps to inform the adaptive management process (as recommended by the Commission). The Swamp Monitoring Program requires consideration of a minimum of 2 years of baseline data for swamp hydrology and swamp vegetation. Swamp monitoring must fully satisfy Before After Control Impact (BACI) design principles.

The Department is also proposing a fully Independent Monitoring Panel to provide advice to both it and Centennial regarding:

- achievement of performance measures relating to swamps, cliffs, pagoda formations and biodiversity;
- preparation and implementation of Extraction Plans (particularly the Swamp Monitoring Program, Biodiversity Management Plan and Land Management Plan components); and
- calculation of swamp offset liability and verification of calculated swamp offset liability.

The Swamp Monitoring Program also requires that the raw swamp monitoring data be made available to the Department, OEH and the Independent Monitoring Panel, upon request.

OEH has proposed that Centennial undertake a management and research program for the endangered Blue Mountains Water Skink (*Eulamprus leuraensis*), and the Department has also supported this proposal.

### **PAC Recommendation 13**

*That, prior to determination, the Department considers opportunities for adaptive management in relation to certain swamps as the proposed mine progresses, through a comprehensive monitoring program in key areas and via deferred Extraction Plan approvals, dependent on the collection and analysis of monitoring data coupled with iterative risk assessment.*

The Department fully supports adaptive management in relation to swamps as the proposed mine progresses. It has specifically strengthened conditions to facilitate this approach (see Section 6.2 above).

In line with the draft Swamp Offset Policy, in cases where potential impacts to swamps are uncertain and therefore not governed by performance measures, Centennial is required to provide up-front offsets for the predicted impacts. This has been determined to be the case for nine of the 11 shrub swamps in the development area, including the two swamps subject to the proposed Swamp Offset Bond. The only two shrub swamps not subject to offset requirements for any predicted or actual impacts are Sunnyside and Nine Mile Swamps, where performance measures require negligible environmental consequences. A breach of this standard would be an offence under the EP&A Act.

The swamp offset conditions require that the potential swamp offset liability under any Extraction Plan is assessed as a potential maximum (ie worst case scenario). On this basis, Centennial would be required to demonstrate that it can satisfy the maximum predicted offset liability for the total area of swamp(s) predicted to be impacted under any particular Extraction Plan. If monitoring of previous longwalls demonstrates that greater than 'negligible environmental consequences' have resulted from mining, then Centennial would be required to meet the full calculated value of the offset. Centennial would then need to make a decision about potential impacts and liability associated with future longwalls. It would be at the discretion of the company to either accept the swamp offset liability or modify (ie adaptively manage) the mine plan to reduce swamp impacts and the associated liabilities.

As noted by the Commission, the existing mine plan and location of swamps does provide opportunities for Centennial to adapt the mine plan to reduce offset liabilities, if it decides to do so. For example, the northern extents of LWs 420-422 could be shortened to avoid impacts to Gang Gang South West Swamp and the southern extents of LWs 424-431 could be shortened to avoid impacts to Pine, Pine Upper and Marrangaroo Swamps.

The decision on the number of longwalls covered by a particular Extraction Plan is up to Centennial. However, the Department considers it very unlikely that Centennial would be able to support a single Extraction Plan application for more than five longwalls at any one time. Instead, a sequential series of Extraction Plans for between 2 and 5 longwalls is anticipated. There are many reasons for this, including the costs, difficulties and uncertainties of making subsidence effect, subsidence impact and environmental consequences predictions that far in advance of known mining conditions. However, the requirement for an upfront offset for worst-case scenario impacts on shrub swamps also acts to limit the scope of any particular Extraction Plan, since the upfront cost of offsets may prove prohibitive (or at least, an avoidable operational cost). Thus, the Department's Extraction Plan process provides inherent opportunities for regular and ongoing adaptive management.

The development consent also requires an adaptive management approach for swamps which are governed by performance measures, ie Sunnyside and Nine Mile Swamps and all hanging swamps. In these cases, the development consent requires a Contingency Plan to be prepared as part of the Extraction Plan (see Section 6.2). The Contingency Plan is required to expressly provide for adaptive management of the mine plan where monitoring indicates that there has been an exceedance of any subsidence-related performance measure (ie greater than negligible environmental consequences).

## **2.5 Biodiversity**

### **PAC Recommendation 14**

*That the Department ensures that no access tracks are created into the national park during the construction of dewatering bores and that the use of existing access tracks is encouraged.*

As noted in the Department's response to Recommendation 8 above, the Gardens of Stone and Blue Mountains National Parks are located over 5 km from the proposed Springvale extension. The

proposal does not involve construction of any access tracks in the vicinity of these national parks. Centennial has provided a commitment to ensure that existing access tracks within the State Forest area would be utilised wherever possible.

### **PAC Recommendation 15**

*That the Department considers future exploration activities within the project area and ensures that any potential impacts are dealt with through appropriate conditions of consent, such as management plan requirements and rehabilitation objectives.*

As part of its development application, Centennial is seeking approval to continue exploration activities within the boundaries of its exploration licences. The exploration activities predominantly involve the drilling of exploration boreholes to collect information on geotechnical conditions and the characteristics of the coal seam. Related activities include the installation of piezometers for ongoing groundwater monitoring.

OEH raised concerns about allowing undefined and unquantified exploration activities as part of the project. OEH considers that undefined exploration should not have been included as part of the EIS, and should be approved by the Division of Resources and Energy (DRE) of NSW Trade & Investment, using separate processes for environmental impact assessment under Part 5 of the EP&A Act.

In response, Centennial advises that, as the location of future boreholes are currently not known, it cannot undertake an accurate assessment of their potential environmental impacts. Once exploration borehole locations are determined, Centennial proposes to undertake a series of due diligence assessments to consider ecological, archaeological and noise issues. In its Statement of Commitments, Centennial has committed to notifying DRE (and where applicable the Forestry Corporation of NSW) of all proposed exploration activities and to obtaining all required approvals prior to the commencement of any exploration activity.

The Department has considered whether exploration should be included within the scope of the development application and consent. It notes, firstly, that the *Mining Act 1992* grants the right for the holder of a mining lease to conduct 'prospecting operations' (ie exploration activities) within the area of the lease, and also (with the consent of the landowner) on land above the area of a sub-surface lease. As a consequence, exploration within or above a mining lease can reasonably be construed as 'development for the purposes of mining', rather than a land use or activity in its own right. It is within Centennial's rights to construe exploration in this way and to seek development consent for this activity as part of its development application to obtain consent for coal mining.

DRE manages exploration within or above a mining lease under the Mining Operations Plan that it requires for each mine. Notwithstanding, seeing as Centennial's proposed exploration would also be subject to consent, it is appropriate that it is specifically managed under consent conditions. The Department therefore agrees with the Commission that exploration within or above the Springvale mining lease should be subject to a management plan and rehabilitation objectives.

The Department has therefore recommended a condition requiring Centennial to prepare and implement an Exploration Activities & Surface Infrastructure Management Plan in consultation with DRE and the Forestry Commission of NSW. The plan would be required to detail the measures that would be implemented to avoid threatened species and endangered ecological communities; minimise disturbance and rehabilitate disturbed areas. The Department considers that exploration activities at Springvale would be appropriately managed under the processes proposed by Centennial and the recommended conditions of consent.

In addition, the Department has proposed conditions that require Centennial to prepare and implement a Surface Infrastructure Management Plan to regulate construction, operation and rehabilitation of surface infrastructure such as minewater drainage bores, service boreholes, infrastructure corridors and associated access tracks.

## **3.0 RESIDUAL MATTERS**

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### **3.1 Statutory Considerations**

In line with the Commission's requests on other recently reviewed projects, the Department has given further consideration to a number of statutory requirements, including the:

- objects found in section 5 of the EP&A Act;

- matters relating to threatened species found in sections 5A-5D of the EP&A Act;
- the matters listed under section 79C of the EP&A Act;
- clause 12AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP).

The Department confirms that it has considered all of these matters in its assessment of the project. A summary of this assessment is provided below.

#### Objects of the EP&A Act

Section 5 of the EP&A Act outlines a range of objects that must be considered when making decisions under the Act. The Department confirms that it has considered the objects of the Act in its assessment of the Springvale Mine Extension Project. A summary of the Department's consideration is provided in Section 4.6 of the PAR.

One of the key objects of the Act is "to encourage ... ecologically sustainable development" (ESD). The EP&A Act specifies that ESD has the same meaning as under the *Protection of the Environment Administration Act 1991*. That Act sets out a number of principles and programs through which ESD can be achieved. The Department has considered Centennial's consideration of these principles in the EIS. The PAR and AR in their totality address the principles and programs of ESD. However, the Department has also given further consideration to the ESD principles and programs below.

- Precautionary Principle

The Department has considered the threats of serious or irreversible environmental damage to the environment in its assessment of the project. Whilst the project would result in a number of impacts of varying significance, the key threat for serious or irreversible environmental damage is the potential impact on the Newnes Plateau Shrub Swamp endangered ecological community (EEC). The Department has carefully considered these impacts in its assessment of the project, and is satisfied that there is sufficient scientific certainty to enable the consent authority to weigh up the impacts of the project on shrub swamps and determine the project.

The Department's assessment has been guided by a careful evaluation of measures to avoid, where practicable, serious or irreversible environmental damage, and enable assessment of risk-weighted consequences of various options. The Department has taken a risk-based approach to the setting of recommended conditions to mitigate and offset impacts on the shrub swamps and other environmental impacts, and is satisfied that any residual threats do not outweigh the benefits of the project. In particular, conditions requiring offsets for subsidence impacts on swamps that exceed the standard of negligible environmental consequences reduce the risk of serious or irreversible environmental damage to a low and acceptable standard.

- Intergenerational Equity

The Department acknowledges that coal and other fossil fuel combustion is a known contributor to climate change, which has the potential to impact future generations. However, it also recognises that there remains for the foreseeable future a clear need to continue to mine coal deposits to meet society's basic energy needs. The Department also notes that climate change is a global phenomenon, the project's contribution to climate change would be very small and that Centennial has considered greenhouse gas mitigation measures. The Department also acknowledges that the downstream energy and other socio-economic benefits generated by the project would benefit future generations, particularly through the shoring up of national and international energy needs.

- Conservation of Biological Diversity and Ecological Integrity

The conservation of biological diversity and ecological integrity has been a fundamental consideration of the Department's assessment of the project, in both the PAR and AR. As outlined above and in the PAR, the Department recognises that the project has the potential to impact biodiversity, and in particular shrub swamp EECs. The Department is satisfied that these impacts can be mitigated and/or offset to an acceptable standard.

- Improved Valuation, Pricing and Incentive Mechanisms

The Department has considered this principle in its assessment of the project, which has included independent review of Centennial's revised Economic Impact Assessment and associated cost benefit analysis (CBA) for the project against applicable NSW Government guidelines. The CBA seeks to identify, quantify and weigh up all of the project's benefits and costs based on its full range of environmental, social and economic impacts. As outlined in the PAR, the independent review by the Centre for International Economics (CIE) raised some concerns about the presentation of the CBA,

but concluded that these issues would not affect the overall findings of the analysis. Accordingly, the Department accepts the Applicant's CBA, and its conclusion that the project would result in a net benefit to the Lithgow region and the State of NSW.

#### Sections 5A-5D of the EP&A Act

Sections 5A to 5D of the EP&A Act relate to threatened species assessment and management. The Department confirms that its assessment of the project has taken into account the matters listed in these sections in assessing whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats.

These matters include the:

- factors in section 5A(2), known as the '7 part test of significance';
- threatened species assessment guidelines<sup>2</sup> identified in section 5A(1); and
- register of critical habitat as identified in section 5B.

The Department's consideration has had regard to Centennial's ecological assessment and the 7 part tests of significance included in the project EIS, along with the threatened species assessment guidelines which assist in the interpretation and application of the 7 factors (or tests) of significance. This assessment has considered the direct and indirect impacts of the project on threatened species, populations or ecological communities, or their habitats – both on the site and the broader study area, as defined under the threatened species assessment guidelines.

As outlined in the PAR, in the absence of any avoidance, mitigation or offsetting measures, the project is likely to have a significant impact on the Newnes Plateau Shrub Swamp EEC. The project is not likely to affect any listed critical habitat. The Department's assessment concludes that these impacts are able to be mitigated or compensated to an acceptable standard through a mix of avoidance, mitigation and offsetting measures that form part of the project.

These measures include a range of avoidance measures, a Swamp Offset Bond, land-based swamp offsets, requirements for retiring residual biodiversity credits, and supplementary measures in accordance with the draft Swamp Offset Policy.

#### Section 79C of the EP&A Act

Section 79C(1) of the EP&A Act outlines the matters that a consent authority must take into consideration when determining development applications. These matters can be summarised as:

- the provisions of environmental planning instruments (including draft instruments), development control plans, planning agreements, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) and any coastal zone management plan;
- the impacts of the development;
- the suitability of the site;
- any submissions; and
- the public interest.

The Department has considered all of these matters in its assessment of the project. In summary, the Department believes that:

- the development can be undertaken in a manner that is consistent with the aims, objectives and provisions of the applicable environmental planning instruments, other applicable planning documents and the EP&A Regulations (see Section 4.3 and Appendix B of the PAR);
- the impacts of the development can be adequately minimised, managed, or offset or compensated for, to an acceptable standard;
- the site is suitable for the development, as it contains high quality thermal coal resources, is adjacent to existing mining operations, can be carried out using existing infrastructure, and is a permissible development on the land. The Department has carefully considered the potential impacts of the project on the site and surrounds in its assessment of the development, and is satisfied that the impacts of the development on the environment and the local community can be adequately minimised, managed, or compensated for, to an acceptable standard; and
- whilst there is opposition to the development from the general public and special interest groups, on balance, the development is in the public interest, particularly as it would:
  - provide the only local source of coal to the Mt Piper Power Station, which provides 15% of NSW's electricity;

<sup>2</sup> *Threatened Species Assessment Guidelines – The Assessment of Significance*, prepared by the then Department of Environment and Climate Change, dated August 2007.

- o generate significant economic benefits; and
- o facilitate continued direct employment for approximately 360 people at the mine and indirect employment of 1,200 across NSW.

### Mining SEPP

The Department has considered the Mining SEPP in the PAR (see Section 4.3).

Part 3 of the SEPP outlines a number of matters that a consent authority must consider before determining an application for consent for mining-related development. These matters, and a summary of the Department's consideration of each in relation to the Springvale Mine Extension Project, are outlined below.

- Significance of the Resource (Clause 12AA)

DRE provided an assessment of the significance of the resource, which has concluded that the:

- Centennial resource is significant based on:
  - o the fact it is high-quality thermal coal, which is used to supply the Mt Piper Power Station, which provides 15% of NSW's electricity;
  - o its strategic location in the Western Coalfield and its close proximity to the Mt Piper Power Station; and
  - o the relationship of the resource to the existing Springvale operations, and the synergies this presents for utilising existing infrastructure and reducing capital costs associated with extracting the resource; and
- project would generate substantial socio-economic benefits including:
  - o the continued direct employment of 310 FTE staff during operation and around 50 contractors during construction;
  - o the indirect employment of around 1,200 people across the State of NSW;
  - o provision of the only local source of coal to the Mt Piper Power Station in the short to medium term; and
  - o total estimated net economic benefit in excess of \$200 M (NPV), which includes:
    - \$170 M in operation phase incomes;
    - \$160 - \$180 M to the State of NSW in royalty revenue; and
    - \$18 M in Commonwealth, State and local tax revenue.

The existing wording of clause 12AA requires the significance of the resource to be the consent authority's 'principal consideration' under Part 3 of the SEPP (although not under section 79C of the Act). However, this provision is currently under review. The Government has proposed that clause 12AA of the Mining SEPP is repealed.

The Department has considered the proposed changes to clause 12AA to be a 'draft environmental planning instrument' for the purposes of section 79C. The Department is satisfied that the proposed repeal of clause 12AA would have no bearing on the outcomes of the Department's assessment of the project or the conclusions reached regarding its net overall benefits. The Department still considers the Springvale coal resource to be 'very significant' for the reasons identified by DRE above.

These matters remain material to the assessment of the economic significance of the project, despite the proposed repeal of clause 12AA. The Department remains satisfied that the project is able to be managed in a manner that is generally consistent with the aims, objectives, and provisions of the Mining SEPP, whether or not clause 12AA is repealed.

- Compatibility with other Land Uses (Clause 12)

The Department's assessment has considered the potential impacts of the project on other land uses in the locality, including the Newnes State Forest and conservation areas such as the Gardens of Stone, Wollemi and Blue Mountains National Parks. This assessment has been undertaken in consideration of the public benefits of the project and the surrounding land uses, and measures to avoid or minimise any land use incompatibility.

The Department's assessment indicates there would be minimal disruption to forestry activities, no impact on national parks and minimal residual impacts on a small number of privately-owned residences, but that it is not likely to result in unacceptable impacts to surrounding land uses in general, and the Department is satisfied that the residual impacts are able to be minimised, mitigated or compensated for to achieve acceptable environmental and amenity outcomes.

- Voluntary Land Acquisition and Mitigation Policy (Clause 12A)

The Department's assessment has considered the NSW Government's *Voluntary Land Acquisition and Mitigation Policy* (December 2014), and concludes that no acquisition and/or mitigation rights to surrounding receivers are required.

- Compatibility with Mining, Petroleum and Extractive Industries (Clause 13)

The Department is satisfied that the project has been designed in a manner that is compatible with, and would not adversely affect, adjacent current or future mining-related activities.

- Natural Resource Management and Environmental Management (Clause 14)

The Department has recommended a number of conditions aimed at ensuring that the project is undertaken in an environmentally responsible manner, including but not limited to conditions in relation to water resources, threatened species and biodiversity, and greenhouse gas emissions. All offsets in relation to swamps have been designed to reflect the draft Swamp Offset Policy.

- Resource Recovery (Clause 15)

The Department has considered resource recovery in its assessment of the project, and is satisfied that the project can be carried out in an efficient manner. The Department has recommended conditions requiring Centennial to implement reasonable and feasible measures to minimise waste and maximise the salvage and re-use of resources within the disturbance area (including vegetative and soil resources).

- Transport (Clause 16)

The Department notes that the project involves minimal transportation of coal by road, and is unlikely to result in significant additional truck movements in residential areas or near schools. The Department has consulted with the applicable roads authorities in relation to the project, and taken these submissions into consideration in its assessment of the project.

- Rehabilitation (Clause 17)

The Department has recommended a number of conditions aimed at ensuring the rehabilitation of land that would be affected by the project. These include requirements on Centennial to prepare and implement a Rehabilitation Management Plan, to effectively manage waste, and to meet a number of rehabilitation objectives including ensuring that the mine site as a whole is safe, stable and non-polluting, and to ensure public safety.

### 3.2 *Persoonia hindii* Research Program

Springvale's existing development consent includes a condition that requires Centennial to implement a research program for the endangered plant species *Persoonia hindii*. This condition was included in the consent in 2013 as part of a modification allowing the construction of a new dewatering bore (Bore 8) and an associated access track. The original assessment for Bore 8 indicated that it would result in the clearing of 93 stems of *Persoonia hindii*. To compensate for this, the Department required Centennial to conduct a research program and translocation trials of the plant species (see condition 19(c) of Schedule 2 of DA 11/92).

Subsequently, Centennial re-routed the access track to Bore 8 to avoid all *Persoonia hindii* plants. The Department accepts that, since no *Persoonia hindii* plants were cleared, Centennial should not be required to undertake the research program and trials and has removed the condition from the updated consent. It is also noted that Centennial did conduct translocation trials for this species at its Angus Place site in November 2013.

## 4.0 MINISTERIAL REQUEST FOR A FURTHER REVIEW

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On 13 August 2015, the Minister requested that the Commission carry out a further review of the Springvale Mine Extension Project (SSD 5594) by considering:

- a) the draft *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Significance of Resource) 2015* (draft SEPP) and explanation of intended effect, notified to the Commission and published on the Department's website on 7 July 2015;
- b) the terms and effect of the draft SEPP if it is made;
- c) this Addendum Report and recommended conditions;

- d) any submissions made to the Commission as part of any public hearings held in relation to this review; and
- e) any submissions made by the applicant to the Commission on the matters the subject of this review.

The Minister also requested that the Commission hold a public hearing on matters arising from or relevant to the review.

## 5.0 RECOMMENDED CONDITIONS

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Appropriate revisions have been made to the draft conditions of consent to reflect the Commission's recommendations (see **Appendix G**).

The Department has also consulted with Lithgow City Council, OEH, EPA, RMS, DRE, WaterNSW and DoE in regard to the recommended conditions.

Centennial has advised the Department that it has no objections to the revised conditions as recommended.

## 6.0 CONCLUSION

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In June 2015, the Commission completed its merit review of the Springvale Mine Extension Project and concluded that the project is able to be approved, subject to clarifying some issues and strengthening a number of the Department's then-recommended conditions.

The Department has carefully considered the Commission's proposals. The Department has largely accepted the Commission's recommendations and has accordingly amended and strengthened its recommended conditions where relevant. This includes amended and/or additional conditions to require:

- monitoring of non-conventional subsidence movements;
- Trigger Action Response Plans (TARPs) in each Extraction Plan, to warn of any increasing risk of subsidence impacts and to guide the implementation of adaptive management;
- mine-water discharge performance measures for salinity and toxicity to meet targets and timeframes agreed with the EPA;
- an Upper Cocks River Action and Monitoring Plan;
- a Swamp Offset Bond for the first two upland shrub swamps above the mining area and a Swamp Offset for all other shrub swamps, to reflect the intent of the draft *Policy Framework for Biodiversity Offsets for Upland Swamps and Associated Threatened Species Impacted by Longwall Mining Subsidence* (OEH, May 2015);
- a fully Independent Monitoring Panel to provide advice regarding preparation of Extraction Plans, achievement of performance measures and calculation of offset liabilities;
- a new management and research program for the endangered Blue Mountains Water Skink;
- findings of Centennial's funded swamp research projects to be used to inform the Swamp Monitoring Program;
- raw swamp monitoring data to be provided to the Department, OEH and the Independent Monitoring Committee; and
- preparation and implementation of an Exploration Activities and Minor Surface Infrastructure Management Plan.

With these amendments, the Department considers that its recommended conditions provide a comprehensive, strict, and precautionary approach to ensuring that the project can comply with relevant criteria and standards, and ensure that the predicted residual impacts can be effectively minimised, mitigated and/or compensated for. The Department believes that these conditions reflect current best practice for the regulation of underground mining projects in NSW, and would therefore protect the local environment and the amenity of the local community and promote the orderly development of the region's important natural resources.

The Department also recognises that the project would provide major economic and social benefits for the region and NSW as a whole. These benefits include:

- provision of the only local source of coal to the Mt Piper Power Station, which provides 15% of NSW's electricity;
- continued direct employment of 310 full time equivalent staff during operations and around 50 contractors during construction;
- estimated indirect employment of around 1,200 people across NSW; and
- total estimated net economic benefit in excess of \$200 M (Net Present Value), which includes:
  - \$170 M in operational phase incomes;
  - \$160 - \$180 M to the State of NSW in royalty revenue; and
  - \$18 M in Commonwealth, State and local tax revenues.


The Department has carefully weighed the impacts of the project against the significance of the resource and the social and economic benefits. On balance, the Department remains satisfied that the project's benefits substantially outweigh its residual costs, that it is in the public interest and should be approved, subject to strict conditions of consent.


## 7.0 RECOMMENDATION

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It is RECOMMENDED that the Commission, as requested by the Minister for Planning:

- **consider** the findings of this report;
- **consider** the draft *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Significance of Resource) 2015* (draft SEPP); its explanation of intended effect; and the terms and effect of the draft SEPP if it is made;
- **hold a public hearing** on matters relating to the draft SEPP;
- **consider any submissions** made on matters relating to the draft SEPP; and
- **provide a review report** on matters relating to the draft SEPP and any residual matters by 17 September 2015.

  
 Howard Reed  
 Director  
 Resource Assessments  
 14.8.15

  
 David Kitto  
 Executive Director  
 Resource Assessments & Business Systems  
 14/8/15

# APPENDIX A: OEH SUBMISSION ON PAR

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## **APPENDIX B: CENTENNIAL'S RESPONSE TO THE PAC MERIT REVIEW**

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# APPENDIX C: CENTENNIAL'S RESPONSE TO OEH'S SUBMISSION

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## **APPENDIX D: DPI WATER'S LETTER REGARDING WATER LICENSING**

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# APPENDIX E: ADDITIONAL INFORMATION FROM CENTENNIAL

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# APPENDIX F: SUPPLEMENTARY INFORMATION FROM CENTENNIAL

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# **APPENDIX G: RECOMMENDED CONDITIONS OF APPROVAL**

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