

**Table A.1**      **Where PER Guidelines have been addressed**

Section	Description	Where addressed
<b>1 General content</b>		
<b>1.1 General content</b>	The PER should be a document that focuses on the matters listed below: <ul style="list-style-type: none"> <li>• listed threatened species and communities (section 18 &amp; section 18A)</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Appendix D</li> </ul>
	<ul style="list-style-type: none"> <li>• unconventional gas or large coal mining development with impact on water resources (sections 24D and 24E).</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 6</li> <li>• Appendix E</li> </ul>
	The proponent should ensure that the PER assesses compliance of the action with principles of Ecological Sustainable Development as set out in the EPBC Act, and the objects of the Act.	<ul style="list-style-type: none"> <li>• Chapter 11</li> </ul>
<b>1.2 Format and Style</b>	The PER should comprise three elements, namely: <ul style="list-style-type: none"> <li>• the executive summary</li> </ul>	<ul style="list-style-type: none"> <li>• Executive Summary</li> </ul>
	<ul style="list-style-type: none"> <li>• main text of the document</li> </ul>	<ul style="list-style-type: none"> <li>• Chapters 1 to 11</li> </ul>
	<ul style="list-style-type: none"> <li>• appendices containing detailed technical information and other information that can be made publicly available.</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix A to Appendix G</li> </ul>
	The main text of the PER should include a list of abbreviations, a glossary of terms and appendices containing: <ul style="list-style-type: none"> <li>• a copy of these guidelines with reference to where the requested information can be found in the report</li> </ul>	<ul style="list-style-type: none"> <li>• Abbreviations</li> <li>• Section 1.11</li> </ul>
	<ul style="list-style-type: none"> <li>• a list of persons and agencies consulted during the PER</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 9</li> <li>• Appendix B</li> </ul>
	<ul style="list-style-type: none"> <li>• contact details for the proponent</li> </ul>	<ul style="list-style-type: none"> <li>• Section 1.3</li> </ul>
	<ul style="list-style-type: none"> <li>• the names of the persons involved in preparing the PER and work done by each of these persons.</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix C</li> </ul>

Section	Description	Where addressed
<b>2 Introduction</b>		
<b>2.1 General information</b>		
<b>2.2 Description of the action</b>	The PER must include a description inclusive of the information identified below:	• Section 1.2
	• the title of the action	
	• the full name and postal address of the designated proponent	• Section 1.3
	• a clear outline of the objective of the action	• Section 1.4
	• the location of the action	• Section 1.5
	• the background to the development of the action	• Section 1.1
	• how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action	• Section 1.6
	• the current status of the action	• Section 1.7
	• the consequences of not proceeding with the action.	• Section 1.8
	The description of the action must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts.	• Chapter 3 • Section 3.3
<b>2.3 Feasible alternatives</b>	Any feasible alternatives to the action to the extent reasonably practicable, including:	• Section 3.5 • Appendix G
	<ul style="list-style-type: none"> <li>a) if relevant, the alternative of taking no action</li> <li>b) comparative description of the impacts of each alternative on the MNES protected by controlling provisions of Part 3 of the EPBC Act for the action</li> <li>c) sufficient detail to make clear why any alternative is preferred to another.</li> </ul> <p>The PER should also discuss short, medium and long-term advantages and disadvantages of the options. If there are no feasible alternatives, provide sufficient information as to why this is the case and why there are not alternatives for constructing elements of the project elsewhere.</p>	

Section	Description	Where addressed
<b>3 Matters of national environmental significance</b>		
<b>3.1 Description of the existing environment</b>	A description of the existing environment, land uses and character of the proposal site and the surrounding areas that may be affected by the action (including downstream of the project site). It is recommended that this includes the following information on matters of national environmental significance.	<ul style="list-style-type: none"> <li>• Chapter 4</li> </ul>
<b>3.2 Listed threatened species and ecological communities</b>	<p>The PER must provide information for listed threatened species and ecological communities identified as being significantly impacted by the proposed action, including but not limited to:</p> <ul style="list-style-type: none"> <li>• Central Hunter Valley Eucalypt Forest and Woodland – critically endangered</li> <li>• Hunter Valley delma (<i>Delma vescolineata</i>) – endangered.</li> </ul> <p>The department considers that there is potential for the action to have an impact on additional species and communities, including but not limited to:</p> <ul style="list-style-type: none"> <li>• Spotted-tailed Quoll (<i>Dasyurus maculatus maculatus</i>) south-eastern mainland population – endangered</li> <li>• Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>) – endangered</li> <li>• Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) – vulnerable</li> <li>• Swift Parrot (<i>Lathamus discolor</i>) – critically endangered</li> <li>• Regent Honeyeater (<i>Anthochaera phrygia</i>) – critically endangered</li> <li>• White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – critically endangered</li> <li>• Warkworth Sands Woodland of the Hunter Valley ecological community – critically endangered.</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Section 5.4</li> </ul> <ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Section 5.4</li> </ul>
<b>3.3 A water resource, in relation to coal seam gas development and large coal mining development</b>	Provide a description of the water resources which may be impacted by the proposed action including impacts from upgrades to infrastructure, expansion of mining areas and the extension of mine life.	<ul style="list-style-type: none"> <li>• Chapter 6</li> <li>• Section 6.3</li> <li>• Section 6.4</li> <li>• Section 6.5</li> </ul>
<b>3.3.1 Submission to the Independent Expert Scientific Committee (IESC)</b>	You must complete the checklist in the IESC guidelines to ensure that the information requirements for the IESC review have been clearly and adequately addressed in the PER.	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
<b>4 Relevant impacts</b>		
<b>4.1 Describe and assess relevant impacts</b>	<p>The PER must include a description of all the relevant impacts to the action, including direct, indirect and prescribed impacts, as well as cumulative impacts in relation to water resources. The description of impacts must include the magnitude, duration and frequency of the impacts. Relevant impacts are impacts that the action will have or is likely to have on MNES. Impacts during both the construction/infrastructure upgrades and ongoing operational phases of the project should be addressed, and the following information provided:</p> <ul style="list-style-type: none"> <li>• a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts</li> <li>• a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible</li> <li>• analysis of the significance of the relevant impacts</li> <li>• any technical data and other information used or needed to make a detailed assessment of the relevant impacts, including details of the scope, timing (survey season/s) and methodology for studies or surveys used to acquire information.</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Appendix D</li> </ul>
	<p>The PER must also provide a detailed assessment of any likely impact that this proposed action may facilitate on the following (at the local, regional, state, national and international scale):</p> <ul style="list-style-type: none"> <li>• listed threatened species and ecological communities</li> <li>• water resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Chapter 6</li> <li>• Appendix D</li> <li>• Appendix E</li> </ul>
	<p>The PER must also include a detailed assessment of the presence listed threatened ecological communities which will or is likely to be impacted by the proposed action.</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> </ul>
<b>4.2 Listed threatened species and ecological communities</b>	<p>a) An assessment of the likely impacts associated with the proposed action, including construction, operation and decommissioning/rehabilitation phases.</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>b) Identification of Plant Community Types (PCT) within the HVO North proposed action area and wider HVO Complex. The identification of PCTs should be in accordance with the NSW PCT classification and based on contemporary (within the last 5 years) vegetation surveys.</p> <ol style="list-style-type: none"> <li>Identification of PCTs which conform to listed threatened ecological communities based on relevant condition thresholds and conservation advice.</li> <li>Maps identifying PCTs overlaid with the proposed development footprint for HVO North proposed action area and for the HVO Complex.</li> <li>Maps identifying ECs overlaid with the proposed development footprint for HVO North proposed action area and for the HVO Complex.</li> </ol>	<ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Appendix D</li> </ul>

Section	Description	Where addressed
	<p>iv. An assessment of areas of Central Hunter Valley Eucalypt Forests and Woodlands and Warkworth Sands Woodlands against condition thresholds identified in conservation advice. This should include areas of rehabilitation and identify potential direct and indirect impacts resulting from:</p> <ul style="list-style-type: none"> <li>• fragmentation</li> <li>• edge effects</li> <li>• weed and feral animal encroachment</li> <li>• changes to hydrology and/or groundwater.</li> </ul> <p>v. The total area (ha) of Central Hunter Valley Eucalypt Forests and Woodlands, Warkworth Sands Woodlands and White Box – Yellow Box – Blakely’s Red Gun Grassy Woodland and Derived Native Grassland ecological communities (ECs) within the HVO North proposed action area and the total area of these ECs within the HVO Complex.</p>	
	<p>c) Include the total direct impacts (loss of habitat or individuals), indirect impacts (reduction in habitat quality of retained vegetation through disturbance), prescribed impacts (direct or indirect impacts to human-made structures or non-native vegetation which may provide habitat for MNES) as a result of the proposed action. This must include the type (foraging and breeding), and quality of the habitat impacted and quantification of the number of individuals (where relevant) and habitat area (in hectares) to be impacted. Note, habitat for some species, for example the Hunter Valley delma, may include non-native vegetation and/or non-vegetated areas (including Category 1 Exempt land).</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>d) Impacts to species should include an assessment of direct impacts resulting from:</p> <ul style="list-style-type: none"> <li>• removal of habitat</li> <li>• reduction in habitat connectivity</li> <li>• increased light, vibration, noise and dust</li> <li>• weed and feral animal encroachment</li> <li>• vehicle strike.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>e) An assessment of the impacts of habitat fragmentation in the proposed action area and adjacent areas, including consideration of species’ movement patterns and habitat use. This assessment should identify any existing and proposed barriers to the movement to fauna such as fencing, roads, tracks, and voids.</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>f) An assessment of the likely duration of impacts to MNES as a result of the proposed action.</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>g) A discussion of whether the impacts are likely to be repeated, for example as part of ongoing maintenance (e.g. ongoing maintenance of grassland in transmission line easement).</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	<p>h) A discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.</p>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>

Section	Description	Where addressed
	i) Provide assessment of the impacts identified against the significant impact criteria and justification for the likelihood of occurrence.	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
	j) Justification, with supporting evidence, how the proposed action will not be inconsistent with: <ul style="list-style-type: none"> <li>• Australia’s obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)</li> <li>• a recovery plan or threat abatement plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 5.5</li> <li>• Appendix D</li> </ul>
<b>4.3 Water Resources</b>	a) A regional overview of the project area, including a description of the geological basin, coal resource, surface water catchments, groundwater systems and water-dependent assets.	Chapter 4
	b) A description of any potential third-party users of water in areas potentially affected by the proposed project, including municipal, agricultural, industrial, recreational and environmental uses of water including: <ul style="list-style-type: none"> <li>• Downstream water users accessing surface water via water access licences and basic landholder rights.</li> <li>• Third-party landholder bores located upstream and downstream of the HVO Complex, typically installed in the alluvium.</li> <li>• Ecosystems that potentially rely on surface water and/or groundwater:               <ul style="list-style-type: none"> <li>– river red gum communities</li> <li>– stygofauna occurring principally in alluvial sediments along the Hunter River and its tributaries</li> <li>– aquatic ecosystems</li> <li>– Warkworth Sand Woodland communities.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 6</li> <li>• Section 6.3</li> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
	c) Include a description and assessment of the impacts to water resources giving consideration to relevant departmental policies and guidelines, including the <i>Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources</i> (2013). In addition, specific impact assessment requirements are outlined in the groundwater, GDE and surface water sections below.	<ul style="list-style-type: none"> <li>• Chapter 6</li> <li>• Appendix E</li> </ul>
	d) Provide robust scientific information and supporting evidence for every assertion, assumption and/or conclusion made in the assessment of potential impacts, or lack of impacts, on water resources.	• Appendix E
	<b>Information required – Groundwater</b>	
	e) Demonstrate whether the proposed action is likely to have a significant impact on groundwater resources through drawdown, depressurisation and water quality.	<ul style="list-style-type: none"> <li>• Chapter 6</li> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
	f) Suitable information to allow an independent reviewer to consider the appropriateness of the underlying assumptions and conceptual models on which numerical models are based. Conceptual and numerical models should be constructed at a suitable spatial and temporal scale to be able to assess both site-specific and regional cumulative impacts. Any assumptions should be clearly described and justified. Any model must be constructed in accordance with the conceptual model and calibrated and verified with appropriate baseline data which captures the natural variation within the system. Modelling should clearly distinguish between impacts from the proposed action and existing operations. For example, the PER must clearly identify the absolute amount of drawdown due to the proposed mining and the total predicted cumulative drawdown values. This must include details on how the estimated contributions to cumulative drawdown have been derived.	• Appendix E
	g) A sensitivity analysis must be undertaken. Tested parameters should be varied by the plausible range of values or justification provided if less variation is examined.	• Appendix E
	h) An uncertainty analysis of the groundwater modelling as per the IESC explanatory notes must be provided.	• Appendix E
	i) An assessment of the main groundwater resources impacted including: <ul style="list-style-type: none"> <li>i. alluvial aquifers, occurring mainly along the Hunter River and Wollombi Brook</li> <li>ii. Permian groundwater systems.</li> </ul>	• Section 6.4 • Appendix E
	j) Investigations of surface water-groundwater interactions and any changes to infiltration patterns should be considered in groundwater modelling over the extended mine life, inclusive of altered groundwater flow pathways which may intersect nearby pits.	• Section 6.4 • Appendix E
	k) An assessment of the following impacts relating to dewatering over the extended mine life (20 years): <ul style="list-style-type: none"> <li>i. the cone of depression beneath pits affecting groundwater availability and flow pathways</li> <li>ii. increased salinity impacting groundwater quality of alluvial aquifers, particularly when groundwater levels recover post-mining <ul style="list-style-type: none"> <li>a. increasing salinity in final voids rehabilitated as pit lakes are expected to be contained as groundwater sinks however, should throughflow occur, for instance following heavy rainfall, saline water could migrate to surrounding aquifers</li> </ul> </li> <li>iii. surface watercourses which may be affected due to reduced baseflow identifying potential impacts to ecological values, including opportunistic or facultative groundwater-dependent ecosystems (GDEs).</li> </ul>	• Section 6.4 • Appendix E

Section	Description	Where addressed
	<p>l) An assessment of the potential impacts from increasing the mining depth to the base of the Barrett Seam within the Carrington Pit, and an additional increase of the mining extent between the existing West and Mitchell pits including:</p> <ul style="list-style-type: none"> <li>i. increased dewatering over an extended time period, with additional volumes extracted where groundwater drawdown and declining piezometric head may currently be observed</li> <li>ii. impacted groundwater flow direction in the alluvial aquifer by removal of overburden</li> <li>iii. increased salinity from post-mining groundwater level recovery</li> <li>iv. impacts to groundwater hydraulic gradients due to disruption of groundwater flow paths.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
	<p>m) An assessment of the impacts of additional mine/dirty water containment dams on groundwater. This assessment should consider:</p> <ul style="list-style-type: none"> <li>i. impacts to groundwater quality due to groundwater seepage of contaminants from mine affected water to leach into alluvial aquifers, given that dewatering volumes from mine activities will be discharged into Parnell's Dam</li> <li>ii. overflow from excess rainfall events and saturation of adjacent alluvium from contaminated groundwater may impact groundwater supply, GDEs, or surplus runoff affecting surface water quality and groundwater-surface water interactions</li> <li>iii. a trigger action response plan (TARP) outlining monitoring schedule timeframes would be beneficial to supplement the groundwater monitoring program outlined in the Groundwater Impact Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
	<p>n) An assessment of construction activities, such as the new bridge over the Hunter River for the Lemington Road realignment, levee construction, and infrastructure for mining activities including:</p> <ul style="list-style-type: none"> <li>i. impacts from dewatering associated with groundwater drawdown and potential groundwater quality impacts should spills of hazardous materials (if applicable) occur</li> <li>ii. the duration of the potential impacts on groundwater drawdown considering any potential dewatering actions.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
	<p><b>Information Required – Groundwater dependent ecosystems (GDEs)</b></p>	
	<p>o) An assessment of direct, indirect and consequential impacts to GDEs, including a discussion of any potential GDEs in the vicinity. You must consider both surface water and groundwater impacts to GDEs within the proposed action area and within the zone of potential drawdown (e.g. impacts due to groundwater drawdown, reduction in surface water flow).</p>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
p)	<p>A desktop assessment (e.g. searches of NSW BioNet, the Bureau of Meteorology's GDEs Atlas and Geoscience Australia's Water observations from space, etc.) used to identify potential GDEs for field assessment including:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.bionet.nsw.gov.au/">http://www.bionet.nsw.gov.au/</a></li> <li>• <a href="http://www.bom.gov.au/water/groundwater/gde/">http://www.bom.gov.au/water/groundwater/gde/</a></li> <li>• <a href="https://www.ga.gov.au/scientific-topics/community-safety/flood/wofs">https://www.ga.gov.au/scientific-topics/community-safety/flood/wofs</a>.</li> </ul> <p>The desktop and field assessments must consider the Australian GDE toolbox (2011) and the IESC GDE explanatory note. If GDE field verification surveys are not undertaken, the department is likely to apply a precautionary approach to the presence of GDEs and the assessment of potential impacts.</p>	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
q)	Field assessment data to confirm the outcomes of desktop assessments.	<ul style="list-style-type: none"> <li>• Appendix D</li> <li>• Appendix E</li> </ul>
r)	<p>The GDE assessment must provide the details and results of the above database searches and field studies, including observations of the vegetation present in the area and descriptions of the soil/geology encountered. A time series of satellite imagery of the potential GDEs in the vicinity may be able to be provided. Observing the state of the vegetation over time, given the existing mining operations and corresponding groundwater drawdown, may help to demonstrate whether or not the vegetation is groundwater dependent and whether impacts to the vegetation have occurred as a result of previous mining operations.</p>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
s)	<p>A comprehensive, site-specific risk analysis and investigation into the extent of groundwater dependence of the Warkworth Sands Woodland and Central Hunter Valley Eucalypt Forest and Woodland communities and the likelihood of water related impacts to these communities. This analysis and investigation should follow methods outlined in Doody et al (2019) <i>Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems</i>.</p>	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
t)	<p>Connectivity between Warkworth Sands and Permian groundwater should be assessed to determine the effects of groundwater availability to Warkworth Sands Woodlands from potential drawdown in the Permian strata.</p>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
u)	<p>An assessment of the potential impacts to stygofauna and other GDEs resulting from any potential decrease in electrical conductivity within the alluvium.</p>	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>
v)	Sufficient evidence to support any conclusion that particular ecosystems are not groundwater dependent.	<ul style="list-style-type: none"> <li>• Section 6.4</li> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
<b>Information Required – Surface water</b>		
w)	<p>An up to date, quantitative site-specific water balance for the proposed action area, that accounts for the various sources of uncertainty (e.g. using the Water Accounting Framework for the Australian Minerals Industry, Minerals Council of Australia 2014) and includes:</p> <ul style="list-style-type: none"> <li>i. the total water supply and demand under a range of rainfall, climatic and water demand scenarios to support the uncertainty analysis</li> <li>ii. the required water infrastructure, including infrastructure capacity and transfers</li> <li>iii. the volumes of water requiring discharge under a range of rainfall scenarios</li> <li>iv. the potential water quality impacts caused by one or more of the above water management actions</li> <li>v. details on any assumptions relating to the water balance estimates.</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
x)	<p>Discussion on any predicted reduction and change in water quality in catchment areas, particularly the Hunter River.</p>	<ul style="list-style-type: none"> <li>• Section 6.3</li> <li>• Appendix E</li> </ul>
y)	<p>An assessment of potential impacts from stream diversions taking into account the length, location and design of likely diversions. This assessment should include:</p> <ul style="list-style-type: none"> <li>i. impacts to streams from increased erosion due to unstable stream banks and changes to in-stream characteristics</li> <li>ii. impacts to groundwater flow patterns and recharge.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.3</li> <li>• Appendix E</li> </ul>
z)	<p>An assessment of potential impacts of construction activities for the Lemington Road realignment and bridge over the Hunter River. The assessment should consider:</p> <ul style="list-style-type: none"> <li>i. the potential for increased erosion and sedimentation to the Hunter River</li> <li>ii. potential impacts of increased erosion and sedimentation to downstream aquatic and riparian environments</li> <li>iii. changes to the chemical and physical characteristics of flows.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.3</li> <li>• Appendix E</li> </ul>
aa)	<p>An assessment of the impacts of a potential decrease in baseflow due to groundwater drawdown from dewatering open cut pits including:</p> <ul style="list-style-type: none"> <li>i. An assessment of the potential impacts of reduced baseflow contributions to the Hunter River, including: <ul style="list-style-type: none"> <li>a. quantification of the leakage volume from the river to the alluvium</li> <li>b. quantification of no flow days in the Hunter River.</li> </ul> </li> <li>ii. Identification of the reaches of watercourses fed by baseflow and quantification of baseflow reduction during the life of the project and post-mining.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 6.3</li> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
	<b>Information Required – Final void</b>	
	bb) Further information and discussion on the potential for saline water to migrate into surrounding aquifers and how this risk will be mitigated and managed.	<ul style="list-style-type: none"> <li>• Section 6.5</li> <li>• Appendix E</li> </ul>
	<b>Information Required – Cumulative impacts</b>	
	cc) Identify and address potential and likely cumulative impacts on groundwater and surface water from the expansion of mining and extension of mine life for the existing HVO North and South mine and other nearby resource projects.	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
	dd) Investigate and provide information about potential cumulative impacts related to mine water discharges from multiple mines within the catchment.	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
	ee) Investigate and describe potential cumulative impacts associated with the abstraction of surface water for operational use, in particular to reduced flow within the catchment.	<ul style="list-style-type: none"> <li>• Appendix E</li> </ul>
<b>5 Avoidance and mitigation measures</b>		
5.1 General requirements	a) A detailed summary of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of the proposed action on relevant MNES, for all stages of the proposed action.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 6.6</li> <li>• Appendix D</li> <li>• Appendix E</li> </ul>
	b) The proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar actions and supported by published scientific evidence.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 6.6</li> <li>• Appendix D</li> <li>• Appendix E</li> </ul>
	c) Consideration of measures to minimise and mitigate the effects of fragmentation caused by actions. This may include measures to narrow road widths and salvaging hollow-bearing trees in clearance areas.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
	d) All proposed measures for MNES must be drafted to meet the ‘S.M.A.R.T’ principle: <ul style="list-style-type: none"> <li>• S – Specific (what and how)</li> <li>• M – Measurable (baseline information, number/value, auditable)</li> <li>• A – Achievable (timeframe, money, personnel)</li> <li>• R – Relevant (conservation advices, recovery plans, threat abatement plans)</li> <li>• T – Time-bound (specific timeframe to complete).</li> </ul>	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 6.6</li> <li>• Appendix D</li> <li>• Appendix E</li> </ul>

Section	Description	Where addressed
	e) Identify and consider avoidance of high-quality habitat for MNES such as hollow bearing trees.	<ul style="list-style-type: none"> <li>• Section 5.6</li> </ul>
	f) Details of specific and measurable environmental outcomes to be achieved for relevant MNES, including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes. All commitments must be drafted using committal language (e.g. 'will' and 'must') when describing the proposed measures.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
	g) Details of the proposed measures to be undertaken to avoid, mitigate and manage relevant impacts to MNES due to the proposed action, including those required through other Commonwealth, State and local government approvals.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 6.6</li> <li>• Appendix D</li> <li>• Appendix E</li> </ul>
	<p>h) Details of the proposed measures to be undertaken to avoid, mitigate and manage relevant impacts to MNES from vegetation clearance, that:</p> <ul style="list-style-type: none"> <li>i. identifies vegetation that is potential nesting or breeding habitat for relevant listed threatened species within the proposed action area</li> <li>ii. identifies the likely breeding season for relevant listed threatened species within the proposed action area</li> <li>iii. pre-clearance survey methods, which include, but are not limited to the following requirements: <ul style="list-style-type: none"> <li>– if clearing of habitat of a species occurs during the breeding season of that species, a qualified ecologist must undertake a pre-clearance survey within 72 hours prior to the removal of the habitat, or removal of vegetation within 50 m of nesting or breeding habitat</li> <li>– if a breeding activity of a listed threatened species is identified during pre-clearance surveys, vegetation clearing within 100 m of the breeding activity must be delayed up until the breeding activity has ceased.</li> </ul> </li> </ul> <p>Note, that if an existing condition(s) from a state development consent for this project requires you to prepare and implement vegetation clearing protocols, please provide an outline of the relevant condition and justification for how the state condition addresses each of the vegetation clearing requirements listed above.</p>	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
	i) Information on the timing, frequency and duration of the proposed avoidance, mitigation, management and monitoring measures, and corrective actions to be implemented.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
	j) An assessment of the expected or predicted effectiveness of the proposed measures.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 8.2</li> <li>• Appendix D</li> </ul>
	k) Any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 8.2</li> <li>• Appendix D</li> </ul>

Section	Description	Where addressed
	l) Details of ongoing management, including monitoring programs to support an adaptive management approach, that validate the effectiveness of the proposed measures and overall demonstrate that environmental outcomes will be achieved.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 8.2</li> </ul>
	m) Details of tangible, on-ground corrective actions that will be implemented in the event the monitoring programs indicate that the environmental outcomes have not or will not be achieved.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Section 8.2</li> <li>• Appendix D</li> </ul>
	n) For each EPBC matter likely impacted, please provide the proposed avoidance and mitigation measures in a table, which outlines: <ul style="list-style-type: none"> <li>i. stage of development (e.g. construction/upgrades phase, operational phase or rehabilitation phase)</li> <li>ii. objectives (e.g. to reduce impact on native vegetation)</li> <li>iii. avoidance (e.g. avoidance of clearance of habitat)</li> <li>iv. mitigation measures (e.g. implementation of construction management plan)</li> <li>v. performance criteria (e.g. erosion and sediment control measures are consistent with the guidelines stated in the Blue Book)</li> <li>vi. monitoring and reporting (e.g. monitoring is to be undertaken weekly during operation)</li> <li>vii. corrective action (e.g. immediately reinstate appropriate erosion and sediment control devices after the identification of a failure)</li> <li>viii. responsible party (e.g. project environmental officer, who will ensure the measures are undertaken)</li> <li>ix. timing, frequency and duration of the measures to be implemented</li> <li>x. the cost of the mitigation measures, including how measures will be funded to ensure enduring protection (and by whom).</li> </ul>	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
5.2 Environmental Management Plan	The PER must also include as an attachment any Environmental Management Plans (EMP) or draft plan (e.g. Construction Environmental Management Plan, Water Management Plan, Biodiversity Management Plan) which have been or will be developed for the project. Plans should set out the framework for management, mitigation and monitoring of relevant impacts of the action.	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
5.3 Rehabilitation requirements	a) The details of any rehabilitation activities proposed to be undertaken as required by Commonwealth, State or Territory, and local government legislation. Attach relevant Commonwealth, State or Territory, and local government approvals and permits as supporting documents to the PER	<ul style="list-style-type: none"> <li>• Chapter 7</li> </ul>
	b) Maps showing the areas that will be rehabilitated within the project area and the size in hectares of these areas	<ul style="list-style-type: none"> <li>• Chapter 7</li> </ul>
	c) A summary of the vegetation community that is being rehabilitated and the dominant species that will be included in the rehabilitation site	<ul style="list-style-type: none"> <li>• Section 7.3</li> </ul>
	d) Information on management of the rehabilitation site including, but not limited to, erosion and sediment control and weed and pest management	<ul style="list-style-type: none"> <li>• Section 7.4</li> </ul>

Section	Description	Where addressed
<b>6 Offsets</b>		
6.1 Offsets background	The PER must describe the proposed offset strategy, outlining how the offsets will be achieved for each protected matter, demonstrating that the offset liability can be satisfied by the mechanisms, and specifying the expected timeframe for legal security of the offsets.	<ul style="list-style-type: none"> <li>• Section 5.6</li> <li>• Appendix D</li> </ul>
6.2 Endorsed offset frameworks	If using an endorsed framework, the report detailing the outcomes (including credit report) prepared in accordance with the state requirements must be submitted with the PER.	<ul style="list-style-type: none"> <li>• Appendix D</li> </ul>
<b>7 Other requirements</b>		
7.1 Other approvals and conditions	<p>The PER must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:</p> <p>a) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that deals with the proposed action, including:</p> <ol style="list-style-type: none"> <li>i. what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy</li> <li>ii. how the scheme provides for the prevention, minimisation and management of any relevant impacts.</li> </ol> <p>b) A description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply to the action</p> <p>c) A statement identifying any additional approval that is required</p> <p>d) A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action</p>	<ul style="list-style-type: none"> <li>• Section 2.1</li> <li>• Section 8.1</li> <li>• Section 2.1</li> <li>• Section 8.1</li> <li>• Section 8.2</li> </ul>
<b>7.2 Consultation</b>	<p>Any consultation about the action, including:</p> <p>a) any consultation that has already taken place</p> <p>b) proposed consultation about relevant impacts of the action</p> <p>c) if there has been consultation about the proposed action, any documented response to, or result of, the consultation</p> <p>d) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.</p>	<ul style="list-style-type: none"> <li>• Chapter 9</li> <li>• Appendix B</li> </ul>
<b>7.3 Environmental record of person(s) proposing to take the action</b>	<p>The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:</p> <p>a) the person proposing to take the action</p> <p>b) for an action for which a person has applied for a permit, the person making the application.</p> <p>Details of the corporation's environmental policy and planning framework must also be included.</p>	<ul style="list-style-type: none"> <li>• Section 8.3</li> <li>• Section 8.2</li> </ul>

Section	Description	Where addressed
<b>7.4 Economic and social matters</b>	<p>The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:</p> <ul style="list-style-type: none"> <li>• details of any public consultation activities undertaken, and their outcomes</li> <li>• projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies</li> <li>• employment opportunities expected to be generated by the project (including construction and operational phases).</li> </ul>	<ul style="list-style-type: none"> <li>• Section 8.4</li> <li>• Appendix F</li> </ul>
<b>7.5 Information sources provided in the PER</b>	<p>For information given in a PER, the PER must state:</p> <ul style="list-style-type: none"> <li>• the source of the information</li> <li>• how recent the information is</li> <li>• how the reliability of the information was tested</li> <li>• what uncertainties (if any) are in the information.</li> </ul>	<ul style="list-style-type: none"> <li>• Section 8.5</li> <li>• References</li> </ul>
<b>8 Conclusion</b>		
	<p>An overall conclusion as to the environmental acceptability of the proposal should be provided, including discussion on compliance with principles of Ecological Sustainable Development (ESD) and the objects and requirements of the EPBC Act. Reasons justifying undertaking the proposal in the manner proposed should also be outlined.</p>	Chapter 11