

## Appendix A

### SEARs and agency recommendations

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**Table A.1** SEARs and agency recommendations addressed in the water assessment

Water Assessment ID	Agency	Requirement	Section addressed
SEAR 1	DP&E	As assessment of the likely impacts of the development on the quantity and quality of the region's surface and groundwater resources, having regard to the EPA's, DPI's and Water NSW requirements and recommendations.	10, 11
SEAR 2	DP&E	An assessment of the likely impacts of the development on aquifers, watercourses, riparian land, water-related infrastructure, and other water users.	10, 11
SEAR 3	DP&E	An assessment of the potential flooding impacts of the development.	8.5, 10.3
SEAR 4	DP&E	A water management strategy, having regard to the EPA's, DPI's and WaterNSW requirements.	13.2.1
AR 1	DRE	Surface and groundwater usage and management.	2.3
AR 2	DRE	A groundwater assessment to determine the likelihood and associated impacts of groundwater accumulating and subsequently discharging from the workings post cessation of mining, including consideration of the likely controls require to prevent or mitigate against these risks as part of the closure plan for the site.	Groundwater numerical flow model8.6 11, 13
AR 3	Fisheries NSW	Analysis of impacts of subsidence upon water flow within and downstream of all waterways within the proposal area.	10.1.2
AR 4	Fisheries NSW	Analysis of impacts of groundwater interference and drawdown on water quality, water flow and aquatic and riparian environments within and downstream of all waterways within the proposal area.	10
AR 5	Fisheries NSW	Fisheries NSW recommend the use of best practice sediment and erosion control, and water quality and stormwater management provisions to safeguard and mitigate impacts on water quality at the site and downstream. They also recommend inclusion of appropriate riparian corridors to provide a buffer between the development areas and adjacent waterways or natural drainage lines to provide protection to riparian and aquatic habitats.	13
AR 6	Fisheries NSW	Details of ongoing monitoring programs to assess any impacts upon water quality, water flow and aquatic and riparian environments within and downstream of all waterways within the proposal area.	13
AR 7	Fisheries NSW	Safeguards to mitigate any impacts upon water quality, water flow and aquatic and riparian environments within and downstream of all waterways within the proposal area during construction and ongoing operation of the proposed coal mine. In particular, provide details on proposals for erosion and sediment control (to be incorporated into a Construction Environmental Management Plan - CEMP) and proposed stormwater and ongoing drainage management measures. Water quality management for the project should be designed to achieve no net increase in pollutant run-off to receiving waters within the proposal site.	13
AR 8	DPI Water	Annual volumes of surface water and groundwater proposed to be taken by the activity (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.	12
AR 9	DPI Water	Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project).	12
AR 10	DPI Water	The identification of an adequate and secure water supply for the life of the project.	12
AR 11	DPI Water	Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.	12

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<b>Water Assessment ID</b>	<b>Agency</b>	<b>Requirement</b>	<b>Section addressed</b>
AR 12	DPI Water	A detailed and consolidated site water balance.	8.2
AR 13	DPI Water	A detailed assessment against the NSW Aquifer Interference Policy (2012) using DPI Water's assessment framework.	9.3.2, 11
AR 14	DPI Water	Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, wetlands, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.	10, 11
AR 15	DPI Water	Full technical details and data of all surface and groundwater modelling, and an independent peer review of the groundwater model.	8 and Appendices D, E, F, G, I, and J
AR 16	DPI Water	Proposed surface and groundwater monitoring activities and methodologies.	13
AR 17	DPI Water	Proposed management and disposal of produced or incidental water.	2.3
AR 18	DPI Water	Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.	10.4, 11.3
AR 19	DPI Water	Consideration of relevant policies and guidelines.	3
AR 20	DPI Water	Assessment of whether the activity may have a significant impact on water resources, with reference to the Commonwealth Department of Environment Significant Impact Guidelines.	10, 11
AR 21	DPI Water	If the activity may have a significant impact on water resources, then provision of information in accordance with the Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals, including completion of the information requirements checklist.	10, 11, Appendix B
AR 22	DPI Water	A detailed assessment of riparian and watercourse impacts, particularly with respect to watercourse crossings. The project should be designed to minimise impacts on watercourses and riparian land, and must have regard to the Department of Primary Industries' Guidelines for Controlled Activities on Waterfront Land – in particular the guideline on watercourse crossings.	10
AR 23	DPI Water	The EIS should take into account the objects and regulatory requirements of the Water Act 1912 (WA 1912) and Water Management Act 2000 (WMA 2000), and associated regulations and instruments, as applicable.	3
AR 24	DPI Water	Describe the ground and surface water sharing plans, water sources, and management zones that apply to the project. Multiple water sharing plans may apply and these must all be described.	3.2.1
AR 25	DPI Water	Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection (including groundwater dependent ecosystems), water quality and surface-groundwater connectivity.	3, 12
AR 26	DPI Water	Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.	2.3, 8.2

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Water Assessment ID	Agency	Requirement	Section addressed
AR 27	DPI Water	Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including: <ul style="list-style-type: none"> <li>- Sufficient market depth to acquire the necessary entitlements for each water source.</li> <li>- Ability to carry out a “dealing” to transfer the water to relevant location under the rules of the WSP.</li> <li>- Daily and long-term access rules.</li> <li>- Account management and carryover provisions.</li> </ul>	3, 12
AR 28	DPI Water	Provide a detailed and consolidated site water balance.	8.2
AR 29	DPI Water	The EIS should take into account the following policies (as applicable): <ul style="list-style-type: none"> <li>· NSW Guidelines for Controlled Activities on Waterfront Land (NOW, 2012)</li> <li>· NSW Aquifer Interference Policy (NOW, 2012)</li> <li>· Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW, 2012)</li> <li>· Australian Groundwater Modelling Guidelines (NWC, 2012)</li> <li>· Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals (IESC, 2014)</li> <li>· Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments - impacts on water resources (Australian Govt. 2014)</li> <li>· NSW State Rivers and Estuary Policy (1993)</li> <li>· NSW Wetlands Policy (2010)</li> <li>· NSW State Groundwater Policy Framework Document (1997)</li> <li>· NSW State Groundwater Quality Protection Policy (1998)</li> <li>· NSW State Groundwater Dependent Ecosystems Policy (2002)</li> <li>· NSW Water Extraction Monitoring Policy (2007)</li> <li>· Groundwater Monitoring and Modelling Plans - Information for prospective mining and petroleum exploration activities (NOW, 2014)</li> <li>· NSW Code of Practice for Coal Seam Gas Well Integrity (DTIRIS 2012)</li> <li>· NSW Code of Practice for Coal Seam Gas Fracture Stimulation (DTIRIS 2012)</li> </ul>	3, 10, 11

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Water Assessment ID	Agency	Requirement	Section addressed
AR 30	DPI Water	Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site – such as evaporative loss from open voids or inflows).	8.2
AR 31	DPI Water	Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.	12
AR 32	DPI Water	Explanation of how the required water entitlements will be obtained (ie through a new or existing licence/s, trading on the water market, controlled allocations etc).	12
AR 33	DPI Water	Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).	2.3.2
AR 34	DPI Water	Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.	2.3.2, 4.2.2iii 12
AR 35	DPI Water	Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages.	2.3.2, 5.5
AR 36	DPI Water	Details on the location, purpose, size and capacity of any new proposed dams/storages.	2.3.2
AR 37	DPI Water	Applicability of any exemptions under the Water Management (General) Regulation 2011 to the project.	3.5.17
AR 38	DPI Water	Consideration of water allocation account management rules, total daily extraction limits and rules governing environmental protection and access license dealings.	12
AR 39	DPI Water	Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.	5.1
AR 40	DPI Water	Identification of all surface water sources as described by the relevant water sharing plan.	3.2.1, 5.1
AR 41	DPI Water	Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.	5.5, 6.10.2
AR 42	DPI Water	Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.	2.3, 8.2

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Water Assessment ID	Agency	Requirement	Section addressed
AR 43	DPI Water	Assessment of predicted impacts on the following: - flow of surface water (including floodwater), sediment movement, channel stability, and hydraulic regime, - water quality, - flood regime, - dependent ecosystems, - existing surface water users, and - planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.	10, 11
AR 44	DPI Water	The known or predicted highest groundwater table at the site.	6.3
AR 45	DPI Water	Works likely to intercept, connect with or infiltrate the groundwater sources.	2.3
AR 46	DPI Water	Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.	2.3, 12
AR 47	DPI Water	Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.	4.2.2
AR 48	DPI Water	A description of the water table and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).	6
AR 49	DPI Water	Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.	4
AR 50	DPI Water	The predicted impacts of any final landform on the groundwater regime.	11
AR 51	DPI Water	The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	6.10, 11.4, 13, Appendices M, N, O
AR 52	DPI Water	An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.	6.10, 11.2
AR 53	DPI Water	An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).	11.2
AR 54	DPI Water	Measures proposed to protect groundwater quality, both in the short and long term.	13
AR 55	DPI Water	Measures for preventing groundwater pollution so that remediation is not required.	13
AR 56	DPI Water	Protective measures for any groundwater dependent ecosystems (GDEs).	13

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Water Assessment ID	Agency	Requirement	Section addressed
AR 57	DPI Water	Proposed methods of the disposal of waste water and approval from the relevant authority.	2.3, 8.2, 13
AR 58	DPI Water	The results of any models or predictive tools used.	8, 10, 11, Appendices D, E, F, G, I, and J
AR 59	DPI Water	Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on: <ul style="list-style-type: none"> <li>- Any proposed monitoring programs, including water levels and quality data.</li> <li>- Reporting procedures for any monitoring program including mechanism for transfer of information.</li> <li>- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.</li> <li>- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).</li> <li>- Description of the remedial measures or contingency plans proposed.</li> <li>- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.</li> </ul>	10, 11, 13
AR 60	DPI Water	Scaled plans showing the location of: <ul style="list-style-type: none"> <li>- wetlands/swamps, watercourses and top of bank;</li> <li>- riparian corridor widths to be established along the creeks;</li> <li>- existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);</li> <li>- the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and</li> <li>- proposed location of any asset protection zones.</li> </ul>	5 and <i>Hume Coal Project Biodiversity Assessment Report</i> (EMM 2017c)
AR 61	DPI Water	Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.	5 and Appendix F



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Water Assessment ID	Agency	Requirement	Section addressed
AR 62	DPI Water	A detailed description of all potential impacts on the watercourses/riparian land.	10 and <i>Hume Coal Project Biodiversity Assessment Report</i> (EMM 2017c)
AR 63	DPI Water	A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.	10 and <i>Hume Coal Project Biodiversity Assessment Report</i> (EMM 2017c)
AR 64	DPI Water	A description of the design features and measures to be incorporated to mitigate potential impacts	13
AR 65	DPI Water	Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.	5.2, Appendix F
AR 66	DPI Water	Detailed modelling of potential groundwater volume, flow and quality impacts of the presence of an inundated final void (where relevant) on identified receptors specifically considering those environmental systems that are likely to be groundwater dependent.	8.6, 11, Appendix I
AR 67	DPI Water	The measures that would be established for the long-term protection of local and regional aquifer systems and for the ongoing management of the site following the cessation of the project.	13
AR 68	OEH	The EIS must describe background conditions for any water resource likely to be affected by the development, including: a. Existing surface and groundwater. b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations. c. Water Quality Objectives (as endorsed by the NSW Government <a href="http://www.environment.nsw.gov.au/ieo/index.htm">http://www.environment.nsw.gov.au/ieo/index.htm</a> ) including groundwater as appropriate that represent the community's uses and values for the receiving waters. d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.	5 and 6 5 5 5, 10 and Appendix E
AR 69	OEH	The EIS must assess the impacts of the development on water quality, including: a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction. b. Identification of proposed monitoring of water quality.	4, 10, 11, 13

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Water Assessment ID	Agency	Requirement	Section addressed
AR 70	OEH	<p>The EIS must assess the impact of the development on hydrology, including:</p> <ul style="list-style-type: none"> <li>a. Water balance including quantity, quality and source.</li> <li>b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.</li> <li>c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.</li> <li>d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (eg river benches).</li> <li>e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.</li> <li>f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.</li> <li>g. Identification of proposed monitoring of hydrological attributes.</li> </ul>	4, 10, 13
AR 71	OEH	<p>The EIS must map the following features relevant to water and soils including:</p> <ul style="list-style-type: none"> <li>a. Acid Sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).</li> <li>b. Rivers, streams, wetlands, estuaries (as described in Appendix 2 of the Framework for Biodiversity Assessment).</li> <li>c. Groundwater.</li> <li>d. Groundwater dependent ecosystems.</li> <li>e. Proposed intake and discharge locations.</li> </ul>	5, 6, and <i>Hume Coal Project Land and Soil Assessment (EMM 2017f), Hume Coal Project Biodiversity Assessment (EMM 2017c)</i>
AR 72	EPA	Identify relevant water quality objectives for surface and groundwater, including indicators and associated trigger values or criteria, in accordance with National Water Quality Management Strategy Guidelines. Reference the water quality objectives for the Wingecarribee River catchment in the "NSW Healthy Rivers Commission of Inquiry into the Hawkesbury Nepean Catchment". Identify any downstream users and uses of the discharged water classified in accordance with relevant ANZECC 2000.	5, 6
AR 73	EPA	Estimate the chemical composition and load of chemical and physical stressors and toxicants in any discharge with ANZECC 2000 trigger values for the various environmental values of the waterway.	10.2, 11.2

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Water Assessment ID	Agency	Requirement	Section addressed
AR 74	EPA	Investigate options to reduce the levels of pollutants in the discharge of water to protect the environment from harm as a result of that pollution. Identify all practical measures to control or reduce pollutants in the surface or groundwater discharges. Identify preferred measures and their justification.	13
AR 75	EPA	If WQO's cannot be met for the project, demonstrate that all practical options to avoid water discharge have been implemented and outline any measures taken to reduce the pollutant loads where a discharge is necessary. Where a discharge is proposed, analyse the expected discharges in terms of impact on the receiving environment, including consideration of all pollutants that pose a risk of non-trivial harm.	10, 11, 13
AR 76	RMS	The impacts of groundwater flows, including changes in the water table configuration through such things as new dam construction, re-routing of waterways, groundwater behavioural changes, and changes to the catchment areas that feed to or away from the Hume Highway. Any change in the water table has the potential to affect the structural integrity of the Hume Highway.	11.4
AR 77	WaterNSW	Demonstrate that the proposed measures to capture and treat water impacted by the proposal will have no impact on water quality within the Wingecarribee River.	10.2
AR 78	WaterNSW	Specifically address clauses 9(1) and (2) and 10(1) of State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011. In particular, the EIS must describe and justify how the development would have a neutral or beneficial effect on water quality.	3.5.12, 10.2
AR 79	WaterNSW	<p>A full description of the development including those aspects which have the potential to impact on the quality and quantity of surface and groundwaters at and adjacent to the site, including:</p> <ul style="list-style-type: none"> <li>- the mining proposal and mine layout</li> <li>- the location, mapping and geomorphology of all creeks and water resources overlying and adjacent to the proposed mining area</li> <li>- the hydrogeological fluxes between surface and groundwaters, including the filling of pine feather voids</li> <li>- the location, management and storage of all hazardous materials</li> </ul> <ul style="list-style-type: none"> <li>- the disposal of wastes from the treatment of mine waters in the mine water treatment plant</li> <li>- the management of dirty water from the washing and preparation of coal for transport</li> <li>- the location, sizing and description of all water quality management measures</li> <li>- the location and description of all water monitoring points (surface and ground waters)</li> <li>- on-site domestic (sewage) wastewater management</li> </ul>	<p>2</p> <p>5, Appendix F</p> <p>7.3, 10, 11,</p> <p><i>Hume Coal Project Hazard and Risk Assessment Report (EMM 2017e)</i></p> <p>2.3, 8.2</p> <p>2.3, 8.2</p> <p>2.3, 8.2</p> <p>4</p> <p>2.3</p>

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Water Assessment ID	Agency	Requirement	Section addressed
AR 80	WaterNSW	<p>A detailed assessment of the development on water resources which considers the design, construction, operational and decommissioning phases and have regard for operation during periods of wet weather and include:</p> <ul style="list-style-type: none"> <li>-details of measured and predicted coal mine, preparation area and stockpile area performance with respect to water quality management</li> <li>-details of measures proposed to be adopted to offset impacts associated with construction activities eg earthworks, vegetation clearing and track construction</li> </ul> <p>-impacts on overlying and adjacent creeks and water resources within risk management zone associated with subsidence</p> <p>-impact of the proposed on-site domestic (sewage) waste water management and associated effluent disposal area</p> <p>-pre-development and post development run off volumes and pollutant loads from the site</p> <p>-details of the measures to manage site water associated with processing coal and coal reject, general stormwater runoff and any human activities likely to affect water quality at the site, and how neutral or beneficial effect on water quality (NorBE) principles will be assessed and applied</p> <p>-assessment of the impacts of the development on receiving water quality and volume, both surface and groundwater including from the filling of pine feather voids and associated impact on interaction and baseflows of surface waters</p> <p>-details of the structural stability, integrity, ongoing maintenance and monitoring of all site water management measures including dams over the life of the project</p> <p>-details of proposed monitoring of groundwater levels, surface water flows, groundwater and surface water quality, along with information as to how the proposed monitoring will be used to monitor, and, if necessary, mitigate impacts on surface water and groundwater resources</p> <p>-the principles outlined in the 'Managing Urban Stormwater - Soils and Construction - Mines and Quarries' Manual prepared by the Department of Environment and Climate Change (2008).</p>	<p>10, 11, <i>Hume Coal Project Biodiversity Assessment</i> (EMM 2017c),</p> <p>10</p> <p>2.3</p> <p>5, 10, Appendices E, F, 10, 13</p> <p>10, 11</p> <p>2.3, 13</p> <p>4, 13</p> <p>2.3, 10, 13</p> <p>2.3</p>
AR 81	WaterNSW	<p>The EIS should provide plans/protocols/procedures for:</p> <ul style="list-style-type: none"> <li>- environmental management plan;</li> <li>- soils and water management plan;</li> <li>- spill management.</li> </ul>	13.2.2, Chapter 23 of the <i>Hume Coal Project EIS</i> (EMM 2017a)

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Water Assessment ID	Agency	Requirement	Section addressed
AR 82	DoEE	An assessment of the relevant impacts of the action on water resources including: - a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts; - a statement whether any relevant impacts are likely to be known, unpredictable or irreversible, and analysis of the significance of the impacts; and - any technical data and other information used or needed to make a detailed assessment of the impacts.	10, 11, Appendices D, E, F, G, I, and J
AR 83	DoEE	Information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including: - a description of the proposed avoidance and mitigation measures to address the impacts of the action; - assessment of the expected or predicted effectiveness of the mitigation measures; - the cost of mitigation measures; - a description of the outcomes that the avoidance and mitigation measures will achieve: and - a description of the offsets proposed to address the residual adverse significant impacts and how these offsets will be established.	13, Appendix O
AR 84	DoEE	The EIS should provide a description of the location, extent and ecological characteristics and values of the identified water resources potentially affected by the project.	5, 6
AR 85	DoEE	The assessment of impacts should include information on: - any substantial and measureable changes to the hydrological regime of the water resource, for example a substantial change to the volume, timing, duration or frequency of ground and surface water flows; - the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the water resource being seriously affected; and - substantial and measureable change in the water quality and quantity of the water resource – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland; or water temperature that may adversely impact on biodiversity, ecological integrity, social amenity or human health.	10, 11
AR 86	DoEE	The EIS must provide adequate information to allow the project to be reviewed by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, as outlined in the <i>Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals</i> (2015).	Appendix B

Notes: DRE – Department of Industry, Resources and Energy.  
DPI W – Department of Primary Industries, Water.  
OEH – Office of Environment and Heritage.  
EPA – Environment Protection Agency.  
RMS – Roads and Maritime Services.  
IESC- Independent Expert Scientific Committee.  
DoEE – Commonwealth Department of Environment and Energy.  
SEAR – Secretary’s environment assessment requirement.  
AR – Agency recommendation.  
The SEARs and agency recommendations have been allocated a unique ID (water assessment ID) for the purpose of reference within the water assessment.

