PEMBROKE

Olive Downs Coking Coal Project

Draft Environmental Impact Statement

Section 6

General Environmental Protection Commitments and Model Conditions

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6 GENERAL ENVIRONMENTAL PROTECTION COMMITMENTS AND MODEL CONDITIONS

6.1 GENERAL ENVIRONMENTAL PROTECTION COMMITMENTS

6.1.1 Overview

This section provides a summary of the proposed environmental protection commitments for the Project, including mitigation, monitoring, auditing and reporting.

A summary of management, monitoring and reporting commitments for the Project is provided in Table 6-1. In addition to this, a summary of commitments made by Pembroke throughout the EIS is provided in Table 6.2. Proposed monitoring locations are shown on Figure 6-1.

Environmental Policy

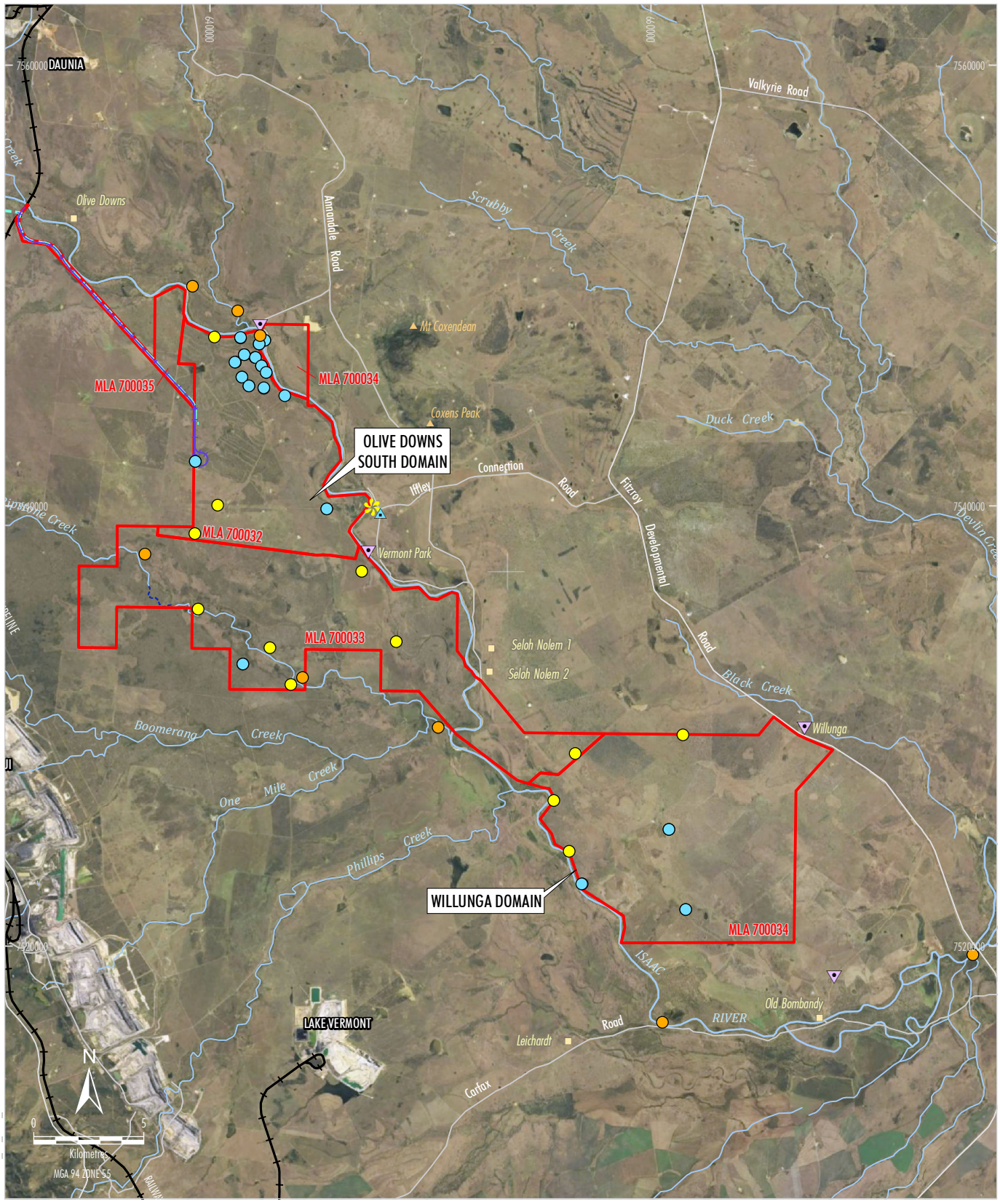
Pembroke has in place an Environmental Policy to guide the planning and management of activities to minimise impacts to the environment.

As part of the Environmental Policy, Pembroke has developed an Environmental Management Plan for the exploration activities conducted at the Project.

Table 6-1
Summary of Management, Monitoring and Reporting Commitments for the Project

Proposed Management, Monitoring and Reporting	EIS Section Reference	Proposed EA Condition
Management and Monitoring		
Species Management Program	Sections 3, 4.1, 4.13, 6.1.3.1 and 6.1.3.11	-[1]
Offset Management Plan and Notices of Election	Sections 3, 4.1 and 6.1.3.1	Conditions H6 to H13
Weed and Pest Management Plan	Sections 4.13, 5.3, 6.1.3.1 and 6.1.3.11	-
Fauna Species Management Plan	Sections 4.1.5	-
Receiving Environment Monitoring Program (REMP)	Sections 4.2 and 6.1.3.2	Conditions F20 to F22
Water Management Plan	Sections 4.2, 4.3, 6.1.3.2 and Appendices D and E	Condition F26
Erosion and Sediment Control Plan	Sections 4.2, 5.3, 6.1.3.2 and Appendix E	Conditions F27 to F28
Groundwater Monitoring and Underground Water Impact Report	Sections 4.2, 4.3, 6.1.3.2 and Appendix D	Conditions E1 to E5
Surface Water Monitoring Program	Sections 4.2 and Appendix E	-
Mineral Waste Management Plan	Sections 4.2 and Appendix L	Condition C3
Register of Regulated Structures	Sections 4.4 and 6.1.3.3 and Appendix F	Conditions J28 to J33
Air Quality Management Plan	Sections 4.5 and 6.1.3.4	-
Noise Management Plan	Sections 4.9 and 6.1.3.7	-
Blast Management Plan	Sections 4.5, 4.9, 6.1.3.4 and 6.1.3.7	-
Cultural Heritage Management Plan (Agreement with the Barada Barna Aboriginal Party)	Sections 4.6 and 6.1.3.9	-[2]
Social Impact Management Plan	Sections 4.6 and 6.1.3.5 and Appendix H	-
Road Use Management Plan	Section 4.8 and Appendix J	-
Rehabilitation and Mine Closure Plan	Section 5.6	-
Rehabilitation Monitoring Program	Sections 5.4 and 6.1.3.1	-
Topsoil Management Plan	Sections 4.10, 5.3 and 6.1.3.8 and Appendix M	-
Risk Management System	Sections 4.12 and 6.1.3.10	Condition A7
Emergency Response Procedure	Section 4.12	-
Waste Management Program	Section 4.14	-
Reporting		
Annual Return	Section 6.1.4	Conditions F18 and J34[3]
Third Party Reporting on Compliance	Section 6.1.4	Condition A12
Annual Reporting on the Findings of the REMP	Section 6.1.3.2	Condition F22
Annual Inspection Report of Regulated Structures	Section 6.1.3.3	Conditions J21 to J24
Greenhouse Gas Reporting	Sections 4.14 and 6.1.4 and Attachment 3	-[4]

1 Required under section 332 the *Nature Conservation (Wildlife Management) Regulation, 2006*.
2 Required under section 88 of the ACH Act.
3 Required under section 308 of the EP Act.
4 Required under the NGER Act.



LEGEND

- Mining Lease Application Boundary
- Railway
- Dwelling
- Proposed Rail Spur and Loop
- Proposed Water Pipeline
- Proposed Creek Diversion
- Proposed Groundwater Monitoring Location
- Groundwater Monitoring Site
- Surface Water Monitoring Site
- Air Quality Monitoring Site
- Noise Monitoring Site
- On-Site Weather Station

Source: Pembroke (2018), Geoscience Australia - Topographical Data 250K (2006), Department of Natural Resources and Mines (2016)
Orthophotography: Google Image (2016)

PEMBROKE

OLIVE DOWNS COKING COAL PROJECT
Environmental Monitoring Sites

Figure 6-1

Table 6-2
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Rehabilitation	The Project rehabilitation strategy has been prepared in consideration of the *Mineral and Energy Resources (Financial Provisioning) Bill 2018*, however, the final legislation and, importantly, the associated guidance material, was not available during preparation of this EIS to inform the preparation of a PRC Plan. Notwithstanding, Pembroke will comply with the legislation upon enactment, and if required, prepare a PRC Plan for the Project.
	A Rehabilitation and Mine Closure Plan would be prepared for the Project and would develop on the preliminary rehabilitation requirements described in Table 5-2 (i.e. the rehabilitation goals, domains, objectives, performance indicators and completion criteria), in consultation with DES, and based on more detailed mine planning and scheduling information.
	The Project would be progressively rehabilitated to achieve the rehabilitation objectives established for each domain. The progress of the rehabilitation would be monitored against indicators, and ultimately against completion criteria to demonstrate successful rehabilitation of the Project. The rehabilitation goal for the Project requires rehabilitation of areas disturbed by mining to create a post-mining landform that is: • safe; • non-polluting; • stable; and • able to sustain a post-mining land use.
	The rehabilitation monitoring program for the Project would be designed to track the progress of revegetation and to determine the requirement for intervention measures, such as alternate species or species mix, thinning to reduce the density of revegetated areas, or additional plantings in areas where vegetation establishment has been sub-optimal.
	The in-pit waste rock emplacement areas would be rehabilitated progressively as the mine develops. The mine plan includes fully backfilling Pits ODS1 ODS2, ODS4, ODS5, ODS6 and ODS9, as well as partial backfilling areas of Pits ODS3 and ODS7/ODS8. Similarly, the mine plan for the Willunga domain includes fully backfilling Pits WIL1, WIL2, WIL3 and WIL4 and partially backfilling Pit WIL5.
	Disturbance due to exploration activities in areas not scheduled or authorised to be mined within two years would be rehabilitated in accordance with provisions detailed in the *Code of Environmental Compliance for Exploration and Mineral Development Projects* (DEHP, 2013c).
	Permanent highwall emplacements would surround the final voids and isolate them from all flood events, up to and including a PMF event.
	Final voids would act as groundwater sinks into perpetuity, preventing the migration of potentially saline water into adjacent aquifers and watercourses.
	Final void highwalls would be fenced to prevent access and designed to remain stable in the long term, based on site specific geological data and geotechnical modelling.
	Final void water bodies would equilibrate well below the point at which they would spill to the surrounding environment.
	The conceptual post-mining land use for the Project is to reinstate land that would be suitable for the existing land uses, namely low intensity cattle grazing, while establishing woodland vegetation in areas which would benefit from enhanced stability effects (e.g. near watercourses and drainage lines and on the permanent highwall emplacements and adjacent areas).
	Sediment dams would be retained until the revegetated surface of the waste rock emplacements are stable and runoff water quality reflects runoff water quality from similar undisturbed areas, at which time these controls would be removed and the areas would be free-draining.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Rehabilitation (Cont.)	All infrastructure associated with the Project would be assessed on an individual basis for possible removal or to be retained for future land owners. Where infrastructure is removed, the land would be re-contoured, topsoiled, ripped and seeded. All disturbed areas would be rehabilitated with an appropriate seed mix to enable revegetation.
	Remediation works would be undertaken to remove contaminated material, or rip, cap and topsoil inert areas. Areas would then be seeded with native grasses.
	The temporary flood levee in the north-east of the ODS domain would be removed or reshaped once the open cut is backfilled and rehabilitated in the northern areas to provide additional flood storage areas adjacent the Isaac River to reduce flood velocities and stream power. Similarly, the temporary flood levees in the south and south-west of the ODS domain adjacent Ripstone Creek would be removed or reshaped once the waste rock emplacements are rehabilitated.
	The temporary flood levee in the west of the Willunga domain would also be removed or reshaped once the Pit WIL1 is backfilled and the waste rock emplacements rehabilitated.
Surface Water Management	The following key principles would be applied for the Project to meet the water management objectives: • all temporary flood levees would be designed to provide flood ingress protection to a flood level of a 1:1000 AEP plus suitably designed freeboard; • permanent highwall emplacements would be designed to be self-sustaining and long-term stable; • all water storage dams, structures and facilities would be designed, constructed and managed in accordance with *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (DEHP, 2016); • water storage dams that manage mine affected water would be designed and operated to achieve zero uncontrolled release to the receiving environment; • water for mine operating purposes would be preferentially sourced from dedicated on-site water storage dams; • water collected in water storage dams, sediment dams and/or haul road runoff dams would be captured and retained for reuse on-site and/or controlled release off-site to the receiving environment in accordance with *Guideline: Resource Activity - Mining: Model Water Conditions for Coal Mines in the Fitzroy Basin* (DEHP, 2013); and • surface runoff from rehabilitated waste rock emplacements would be directed to dedicated sediment dams for settling and release to the receiving environment.
	Mine affected water would be managed through a mine water management system which is designed to operate in accordance with typical EA conditions and the model water conditions. That is, it would have controlled release conditions and in-stream trigger levels aligned with the WQOs in the EPP (Water).
	A Water Management Plan would be prepared cognisant of the DES guideline for the *Preparation of water management plans for mining activities.*
	If, during operations, there was a risk that the licence allocation could be exceeded, the site water demands could be adjusted accordingly (e.g. reduce dust suppression demand) or alternative water harvesting measures on site could be implemented, to avoid and/or minimise any impacts on regional water availability.
	To achieve the 'no mine affected water storage uncontrolled release' objective, the mine would be operated such that water could be temporarily stored in the active open pit if required (e.g. as a result of exceedance of the design capacity of the water management system). Alternatively, Pembroke would construct additional pit water dams ahead of mining in the ODS domain to temporarily store any excess mine affected water until there is sufficient out-of-pit storage available.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Surface Water Management (Cont.)	Pembroke would prepare a Receiving Environment Monitoring Program (REMP) for the Project in accordance with the *Receiving Environment Monitoring Program Guideline* (DEHP, 2014b).
	Controlled water release conditions have been developed for releases to the Isaac River and Ripstone Creek, based on the DEHP *Guideline Model Mining Conditions*.
	Controlled releases would not occur within Wetland Protection Areas located adjacent the Project area.
	Monitoring of upstream, onsite and downstream water quality would assist in demonstrating that the site water management system is effective in meeting its objective to protect the integrity of local and regional water resources and allow for early detection of any impacts and appropriate corrective action.
	Surface run-off and seepage from the Project area would be monitored for water quality parameters including, but not limited to, pH, EC, major anions (sulfate, chloride and alkalinity), major cations (sodium, calcium, magnesium and potassium), TDS and a broad suite of soluble metals/metalloids.
	Sizing of sediments dams would be designed in accordance with the *Best Practice Erosion and Sediment Control* guideline (IECA, 2008) and an Erosion and Sediment Control Plan would be developed and implemented throughout construction and operations.
	Potable water would be regularly tested to ensure it complies with the *Australian Drinking Water Guidelines* (NHMRC, 2011).
	Initially, the sediment dam monitoring would occur on a regular (e.g. monthly) basis to demonstrate the water quality of stored waters is consistent with relevant operating parameters to allow releases from sediment dams to occur when required. Subject to demonstrating the water quality objectives can be met, the frequency of monitoring and suite of parameters for the sediment monitoring would be reviewed and updated accordingly (e.g. to occur only when releases occur).
	Pembroke would implement a number of mitigation and management measures for the mine-affected water dams including: • operational measures that would allow for the practical limitations of being able to redistribute stored volumes across the containment system (including operability of equipment under extreme weather conditions); • annual inspections to assess the condition and adequacy of all components of the regulated structures; and • establishing and maintaining a register of regulated structures.
Watercourse Diversion	The Ripstone Creek Diversion has been designed in consideration of the *Water Act 2000* and the *Environmental Protection Act 1994*, and to, as far as possible, replicate the natural hydraulic behaviour of the Ripstone Creek waterway.
	A monitoring strategy for the Ripstone Creek Diversion has also been developed and includes monitoring prior to construction, during operation and for relinquishment.
Groundwater Management	Make good measures would be put in place with potentially affected landholders to ensure the bore owner has access to a similar quantity and quality of water for the groundwater bore's authorised purpose. This may include deepening a bore to increase its pumping capacity, constructing new water supply bore, providing water from an alternative source or financial compensation.
	Recording of groundwater levels from existing monitoring bores and VWPs would continue and would enable natural groundwater level fluctuations (such as responses to rainfall) to be distinguished from potential groundwater level impacts due to depressurisation resulting from proposed mining activities.
	Groundwater quality monitoring would continue to be undertaken on a quarterly basis.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Groundwater Management (Cont.)	Subject to accessibility, quarterly groundwater quality monitoring would also be conducted on privately-owned landholder bores predicted to be impacted by drawdown associated with the mining operation.
	Groundwater quality triggers would be established for each groundwater unit potentially impacted by the Project, including alluvium, regolith and the Permian coal measures.
	Groundwater quality triggers would be established to monitor predicted impacts on both environmental values and predicted changes in groundwater quality, and would be developed in line with the DSITI guideline on *Using monitoring data to assess groundwater quality and potential environmental impacts* (DSITI, 2017). Impact assessment criteria for the site would be documented within a Water Management Plan.
	Each year, an annual review of groundwater quality trends would be conducted by a suitably qualified person. The review would assess the change in groundwater quality over the year, compared to historical trends and impact assessment predictions.
	Every five years, the validity of the groundwater model predictions would be assessed and, if the data indicates significant divergence from the model predictions, the groundwater model would be updated for simulation of mining.
	Pembroke would prepare an Underground Water Impact Report prior to the commencement of mining in accordance with Chapter 3 of the Water Act.
	Bores fitted with automatic loggers would record on a daily basis with others manually dipped on a quarterly basis. Subject to accessibility, quarterly groundwater level monitoring would also be conducted on privately-owned landholder bores predicted to be impacted by drawdown associated with the Project.
	Changes in groundwater levels at the site bored would be compared to predicted groundwater trends to evaluate any deviations from the model predictions.
	Groundwater seepage would be collected and contained within mine water dams and utilised for processing and dust suppression on site.
	Installation of sumps and a pump/pipe system on a bench of the open cut would catch direct groundwater inflows from alluvium exposed in the highwall of the open cut for use in the mine water management system.
	The existing groundwater monitoring network would be consolidated to remove bores in close proximity to each other and augmented with additional proposed monitoring locations around the pit footprint and proposed coal reject emplacements/ILF cells.
Flood Management	The construction of permanent highwall emplacements to the east and south-east of the proposed ODS domain open cut pits adjacent to the Isaac River floodplain would provide immunity to flood levels up to a PMF flood event.
	Temporary flood levees would be designed to protect the active open cut mining area from flood events up to a 0.1% AEP flood event.
	The flood management infrastructure would be inspected by a suitably qualified and experienced person once per year between the months of May and October (inclusive) (i.e. in advance of the wet season). In addition, a visual inspection of the flood management infrastructure would be carried out following major flood events (e.g. 10% AEP or greater) to identify any potential issues with erosion, settlement or slumping.
	Geomorphic monitoring would include topographic survey of the Isaac River channel and floodplain, repeated every year for 3 years, and then either every five years, or after every flood event exceeding the 5 yr ARI event (e.g. 20% AEP or greater).
	The rating curve would be adjusted regularly in consultation with DNRME or otherwise relocated further upstream (i.e. 5 km upstream) to the next best confined flow path which is relatively free of influence.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Waste Rock and Rejects	Pembroke would undertake validation testwork of potential waste rock materials from the Willunga domain as the mine develops to enable appropriate waste rock management measures to be planned and implemented as required.
	Where highly sodic and/or dispersive waste rock is identified, this material would not be placed in areas which report to final landform surfaces and would not be used in construction activities.
	It is expected that highly sodic and dispersive waste rock may not, in some cases, be able to be selectively handled and preferentially disposed of – although Pembroke would take reasonable measures to identify and selectively place highly sodic and dispersive waste rock. In such cases, waste rock landforms would need to be constructed with short and low (shallow) slopes (indicatively slopes less than 15% and less than 200 m long) and progressively rehabilitated to minimise erosion.
	Geotechnical testing of the backfilled parts of Pits ODS 7 and ODS 8 would be conducted to confirm (and validate as required) it is suitable as a foundation for the permanent highwall emplacement.
	Where waste rock is used for construction activities, this would be limited (as much as practical) to unweathered Permian sandstone materials, as these materials have been found to be more suitable for construction and for use as embankment covering on final landform surfaces.
	Regardless of the waste rock type, especially where engineering or geotechnical stability is required, testing would be undertaken during construction to determine the propensity of such materials to erode.
	A Mineral Waste Management Plan would be developed prior to the commencement of mining for the handling and disposal of fine reject and coarse reject material for the Project.
	Pembroke would undertake validation testwork of actual coal reject materials from the CHPP during development of the mine – particularly during the first two years of CHPP operation following commissioning and following commencement of mining and coal processing at the Willunga domain.
	Validation testwork of actual coal reject materials from the CHPP as the Project develops would be undertaken, particularly during the first year of CHPP operation following commissioning, and following commencement of mining at the Willunga domain.
Biodiversity Offsets	Pembroke would provide a biodiversity offset for the impacts associated with the Project in accordance with the *Queensland Environmental Offsets Policy (Version 1.6)* (DEHP, 2017) and *EPBC Act Environmental Offsets Policy* (SEWPaC, 2012a) (and supporting *EPBC Act Offsets Assessment Guide* [SEWPaC, 2012b]).
	Pembroke propose a staged environmental offset in consideration of the staged land clearing. The Stage One Offset Area is comprised of three distinct areas located on the eastern side of the Isaac River owned by Pembroke (there are no other relevant parties with registered interests under the Qld *Land Act 1994* or the Qld *Land Title Act 1994*).
	Pembroke would seek to secure the Stage One Offset Area as a Nature Refuge, as requested by DNRME and DES during consultation regarding the Project, within two years of Project commencement.
	Pembroke would develop an Offset Management Plan for the Project.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Flora and Fauna	Where possible, riparian vegetation along the Isaac River has been avoided in the mine design and a minimum buffer zone of 200 m between the mine pits and Isaac River has been implemented.
	The conveyor would be restricted to a construction corridor of 180 m however this would be reduced when crossing the Isaac River; where, within 200 m of the defining bank, the construction corridor width would be limited to 45 m to reduce impact on the riparian habitat.
	The final location of the rail spur would maintain a buffer zone of approximately 85 m to the bank of the Isaac River at its closest point (affecting 1.5 km of the rail alignment).
	Vegetation clearance procedures would be developed as part of the Project and would include: • Boundaries of areas to be cleared, and those not to be cleared, would be defined during construction and operation. • An internal Ground Disturbance Permit would be required prior to any clearing so that clearing activities are authorised prior to disturbance. • Clearing of native vegetation would be undertaken progressively over the life of the mine and only in areas required for mining activities within the following year. This would have the effect of minimising the area of exposed land. • Pre-clearance flora and fauna surveys would be undertaken by suitably experienced and qualified persons. • Collection of native seed from the Project area for use in rehabilitation program. • A suitably trained and qualified person would be present during the clearing of habitat. • Management of fauna identified during clearing may include relocating individuals to adjacent habitat or treating injuries. • Pre-clearance surveys to *Bertya pedicellata* within habitat proposed to be cleared along the ETL alignment. Impacts to *Bertya pedicellata* would be avoided where possible. • Where applicable, and in consultation with DES, limit time of construction to avoid breeding seasons for threatened species. • Salvage and reuse of selected trees (e.g. tree hollows) for use as fauna habitat in rehabilitation areas (e.g. habitat logs).
	All waterway crossings proposed as part of the Project would be constructed with consideration to the *Accepted development requirement for operational works that is constructing or raising waterway barrier works* (DAF, 2017) so as not to create a barrier to fish movement and minimise impacts on aquatic ecology.
	Any waste storage facilities associated with the Project would be designed and located to restrict fauna access.
	Pembroke would comply with the NC Act requirements by preparing a Species Management Program (under section 332 of the *Nature Conservation [Wildlife Management] Regulation, 2006*).
	Appropriately qualified persons would be engaged to undertake bi-annual pest animal monitoring in the Project area. Feral animal control strategies (e.g. baiting and trapping) would be implemented in the Project area in accordance with relevant standards, to maintain low abundance of declared animals.
	Pembroke would implement a Fauna Species Management Plan for the Project.
	Pembroke would implement a Weed and Pest Management Plan for the Project which would detail the weed prevention techniques proposed to be implemented in the Project area.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Social Impacts	The Project's recruitment strategy would provide equitable access to employment opportunities and prioritise recruitment of people from the Isaac Regional Council LGA in the first instance, before seeking candidates from other areas.
	The construction and use of additional accommodation facilities for the Project's construction and operational workforce is not proposed as part of the Project, given the numerous hotels for temporary accommodation and a number of accommodation villages in Moranbah and Coppabella.
	Pembroke does not propose a 100% fly-in fly-out workforce for the Project.
	Pembroke would implement a Social Impact Management Plan (SIMP) for the Project.
	The Project's Internal Coordination Committee would track implementation of the SIMP and review key performance measures quarterly, to facilitate continual improvement of strategies and practices. Data on social indicators would be tracked and reported to the Community Reference Group (CRG) as available, including quarterly tracking of housing indicators.
	Monitoring data on delivery of the SIMP would be reported at each CRG meeting, and a report against performance measures and social indicators would be presented to the Isaac Regional Council and the CRGs annually.
	Pembroke would make continued contributions to the Isaac Regional Council and the local community through rates and infrastructure contributions and ongoing support for community initiatives.
Stakeholder Engagement	In addition to the designated public consultation periods, consultation and input from the public will continue to be encouraged by Pembroke throughout the environmental impact assessment process. This will continue to be achieved though websites, community newsletters and bulletins, community information sessions and a Community Advisory Group.
	Implementation of the stakeholder engagement strategy would include engagement and opportunity for consultation with all affected and interested persons, and other relevant stakeholders identified during its implementation.
Noise	Mining operations in Pits ODS7 and ODS8 would be conducted during the daytime hours only, to minimise air quality and noise impacts at nearby privately-owned dwellings.
	To reduce noise emissions at the nearest sensitive receptors throughout the life of the Project, Pembroke would enclose a portion of the overland conveyor and utilise low noise idlers.
	Pembroke would implement proactive and reactive noise control measures. These measures would include the use of weather forecasting and real-time measurement of meteorological conditions and noise levels to modify mining operations as required in order to achieve compliance with applicable noise limits at the nearest sensitive receptors.
Air Quality	A number of management measures to minimise the generation of coal dust from rail loading and transport would be implemented, consistent with the dust mitigation activities presented in the *Coal Dust Management Plan* (QR Network, 2010).
	Pembroke would implement proactive and reactive dust control measures. These measures would include the use of weather forecasting and real-time measurement of dust levels and meteorological conditions to modify mining operations as required in order to achieve compliance with applicable air quality objectives at the nearest privately-owned receivers.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Air Quality (Cont.)	Meteorological data and TSP, PM_{10} and $PM_{2.5}$ levels would continue to be monitored on an ongoing basis at the existing monitoring site at the Project for the implementation of operational dust controls. A network of dust deposition gauges would also be installed.
	If monitoring indicates any unexpected exceedances of air quality objectives, an investigation would be conducted by Pembroke, including additional dust monitoring if required.
Blast Management	Blast management measures to minimise the off-site generation of dust and fumes would be detailed in a Blast Management Plan to be prepared for the Project. Blast management measures may include product selection, review of prevailing meteorology and review of ground conditions.
Project Rail Spur	The Project rail spur would be designed and constructed in consultation with Aurizon to minimise potential impacts on the existing environment in accordance with relevant guidelines, including the *Guide for Development in a Railway Environment* (Department of Infrastructure and Planning, 2010).
Transport	Parts of Annandale Road, from Daunia Road to the Olive Downs South domain mine access road, would be upgraded by the Isaac Regional Council, in accordance with a road infrastructure arrangement with Pembroke.
	The intersection with the Fitzroy Developmental Road would be constructed in accordance with DTMR (2014) *'Road Planning and Design Manual (Edition 2) – Volume 3: Supplement to Austroads Guide to Road Design Part 4A'*. Furthermore, the lighting at the Willunga Domain Access Road and Fitzroy Development Road intersection would be designed and constructed in accordance with the relevant Australian Standards in consultation with the DTMR.
	Pembroke would install permanent flood lighting at the new intersection, and street lighting along the extent of Annandale Road that is subject to the proposed upgrade. The lighting requirements at these locations would be identified during detailed design of the road upgrades and intersection design, in consultation with the Isaac Regional Council and DTMR.
	Pembroke would upgrade the left turn from the Peak Downs Highway to Daunia Road intersection to a full auxiliary lane in 2027 to cater for project generated traffic.
	Project traffic data would be provided to Aurizon to allow assessment of the potential impacts on the relevant level crossing using the Australian Level Crossing Assessment Model.
	Existing local and regional infrastructure would be used to transport product coal to the port for export, including the Norwich Park Branch Railway and the DBCT.
	Pembroke will review the Pavement Impact Assessment and update it as required prior to the construction of the intersection with the Fitzroy Development Road, as required.
	Pembroke is preparing a Road Use Management Plan in accordance with DTMR's *Guideline for Preparing a Road-use Management Plan* (2018).
	The Project workforce will utilise the existing regional air infrastructure if and as required.
Land	The area of agricultural land disturbed by the Project at any one time would be minimised so that beneficial agricultural uses (i.e. cattle grazing) could continue to be undertaken on available grazing land within the Project footprint.
	Soil stripping and handling measures would be undertaken in accordance with a Topsoil Management Plan to be developed for the Project.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Land (Cont.)	A topsoil inventory would be maintained during the life of the Project and detailed in the Topsoil Management Plan. The topsoil inventory would account for the volumes and locations of topsoil to be progressively stripped, stockpiled and reapplied.
	Pembroke would implement appropriate mitigation measures and management to prevent or reduce the potential for contamination as a result of the Project. If evidence of unexpected contamination is identified, work would cease in that area and action taken to appropriately delineate the contaminated soil or fill material. In accordance with the EP Act, this material would be managed or remediated and validated under supervision of a suitably qualified person. DES would be notified by telephone, as well as by written notification within 24 hours of detection and advised of appropriate remedial action.
	Pembroke will engage with DNRME and the IRC regarding the potential impacts to the stock route network and any mitigation measures considered necessary. The rail spur would be fenced to prevent access by stock.
	Prior to the commencement of any occupation, activity or construction upon any lands, all appropriate land tenure would be secured and all necessary approvals and/or consents from all parties holding a lawful interest in the lands within the Project disturbance footprint would be obtained.
Visual	Whilst ensuring that operational safety is not compromised, Pembroke would seek to minimise light emissions from the Project by select placement, configuration and direction of lighting to reduce potential impacts to the surrounding environment where practicable.
	Visual screening to mitigate visual impacts during operations (e.g. through tree planting) would be considered by Pembroke, if requested by a nearby landholder.
Waste	Pembroke would manage the waste produced at the Project in accordance with the waste and resource management hierarchy as stipulated in the WRR Act. If waste must be disposed of, Pembroke would do so in a way that prevents or minimises adverse effects on environmental values.
	A Waste Management Plan would be developed and implemented at the Project. It would define and describe the objectives and measures for protecting or enhancing environmental values from impacts by waste.
Safety	All equipment and vehicle operators would be trained in the safe operation of the equipment (including operating procedures for the refilling and maintenance of fuel storage tanks and mine vehicles) and the relevant emergency response procedures in the event of an incident.
	Regular inspection programs would be undertaken to monitor the structural integrity of fuel tanks and bunds.
	The explosive magazine would be fenced, signed and maintained in accordance with AS 2187.1:1998 *Explosives – Storage, Transport and Use.*

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Safety (Cont.)	The following processes and measures would be implemented at the Project to reduce the risk of impacts on health, safety and the environment associated with the Project: • Development and implementation of a Risk Management System. • Hazardous substances (including, hydrocarbons, chemicals and explosives) would be transported, stored and handled in accordance with relevant legislation, standards and guidelines. • The management of all chemicals would be conducted in accordance with the relevant safety data sheet. • Training of vehicle and equipment operators would be undertaken to allow for safe and stable operation of the equipment and emergency response procedures would be implemented in the event of an incident. • Hazardous wastes would be collected, stored and removed from site by licensed contractors. • Regular inspections would be conducted to maintain the structural integrity of hazardous substance storage tanks and bunds. • Spill control kits would be located at all chemical storage areas and within storage vehicles. • Pembroke would liaise with relevant community emergency services and implement community engagement processes. • The explosives magazines would be fenced, signed and maintained in accordance with AS 2187.1:1998.
	Pembroke would prepare an Emergency Response Procedure in consultation with emergency services (e.g. Queensland Police Service, Queensland Fire and Emergency Service).
	Pembroke would perform a risk study specific to hazardous chemicals stored on-site during the detailed design phase of the Project, in accordance with relevant standards and codes.
Biosecurity	Pembroke would manage the Project so that it does not result in the spread of pests, diseases or contaminants.
	Monitoring of feral animals (including pigs, dogs, rabbits and cats) will be undertaken every two years by an appropriately qualified contractor. If the results of these surveys indicate that a control program is necessary, such a control program will be implemented and monitored.
	Weed management (prevention, monitoring and control) would be undertaken to lessen the abundance and species of weeds in the Project area and minimise the potential for weeds to spread into adjacent habitat areas. Weeds that are present on-site would be identified by regular surveys (of tracks, revegetation [rehabilitation] areas and topsoil stockpiles, etc.).
Bushfire Risk	All reasonable and practicable fire prevention measures would be implemented by Pembroke during construction and operation, including the construction and maintenance of fire breaks (if required), the provision of fire-fighting equipment around site, and the training of staff in the use of the fire-fighting equipment.

Table 6-2 (Continued)
Summary of Project Commitments made by Pembroke Throughout the EIS

Project Matter	Commitment
Bushfire Risk (Cont.)	Bushfire prevention and management measures would include: • Implementation of a Safety Management System and associated frameworks to record and monitor fire including: - incident management framework; - hazard / near miss reporting process; - incident notification; and - crisis management and evacuation framework. • Allowance for appropriate buffer distances between the Project and surrounding bushland. • Minimise any chemicals used in the Project area and ensure they are handled and disposed of in accordance with the relevant Safety Data Sheet. • Ensure access tracks are able to be used for fire-fighting and other emergency purposes by Queensland Fire and Rescue Service.

The Environmental Policy and Environmental Management Plan would be developed as the Project moves from the exploration phase into the construction and operations phases.

Pembroke also has an Occupational Health and Safety Policy to provide a safe and healthy workplace for all people undertaking work for the Project. This objective is achieved through education, inspections and investigations, hazard identification, monitoring, auditing and reporting.

6.1.2 Consultation and Community

Pembroke has a Community Interface Policy to provide consideration of community interests in the planning and management of its activities. Pembroke would transition from the Community Interface Policy to the Social Impact Management Plan presented in the SIA (Appendix H) as the Project moves from the exploration phase into the construction and operations phases.

6.1.3 Environmental Management, Mitigation Measures, Monitoring and Auditing

6.1.3.1 Flora and Fauna

Environmental Objectives

The Project would achieve the following performance outcomes as identified in Part 3, Schedule 5, Tables 1 and 2 of the EP Regulation:

2 All of the following—

(a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the environmental values of land;

(b) areas disturbed will be rehabilitated or restored to achieve sites that are—

(i) safe to humans and wildlife; and

(ii) non-polluting; and

(iii) stable; and

(iv) able to sustain an appropriate land use after rehabilitation or restoration;

(c) the activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants;

(d) the application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.

2 Both of the following apply—

(a) areas of high conservation value and special significance likely to be affected by the proposal are identified and evaluated and any adverse effects on the areas are minimised, including any edge effects on the areas;

(b) critical design requirements will prevent emissions having an irreversible or widespread impact on adjacent areas.

The environmental objective relevant to wetlands, as described in the Terms of Reference for the Project, is:

(b) protects the environmental values of wetlands

The Project would achieve the following performance outcome relevant to wetlands as identified in Part 3, Schedule 5, Table 1 of the EP Regulation:

2 The activity will be managed in a way that prevents or minimises adverse effects on wetlands.

The environmental objectives relevant to aquatic communities, as described in the Terms of Reference for the Project, are:

(b) environmental flows, water quality, in-stream habitat diversity, and naturally occurring inputs from riparian zones to support the long term maintenance of the ecology of aquatic biotic communities

The Project would achieve the following performance outcome relevant to aquatic communities as identified in Part 3, Schedule 5, Table 1 of the EP Regulation:

(f) any discharge to water or a watercourse or wetland will be managed so that there will be no adverse effects due to the altering of existing flow regimes for water or a watercourse or wetland;

The environmental objectives relevant to GDEs, as described in the Terms of Reference for the Project, are:

(d) volumes and quality of groundwater are maintained or alternate water supply is provided and current lawful users of water (such as entitlement holders and stock and domestic users) and other beneficial uses of water (such as surface water users, spring flows and groundwater –dependent ecosystems) are not adversely impacted by the development.

The Project would achieve the following performance outcome relevant to GDEs as identified in Part 3, Schedule 5, Table 1 of the EP Regulation:

> *2 The activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.*

Proposed EA Conditions

Section 6.2.8 includes proposed EA conditions for flora and fauna at the Project. These conditions include:

- Progressive rehabilitation of the Project to achieve a rehabilitation goal of safe, non-polluting, stable and self-sustaining landforms (Conditions H1 and H2).
- Implementation of the proposed staged offset strategy as described in Section 4.1 (Conditions H6 to H13).

Refinement of the Mine Design to Avoid Land Clearance

The following refinements to the mine design would minimise land disturbance:

- optimising the backfilling of the open cut to minimise the overall mine footprint;
- forgoing some coal resource to the north of Pit 1 to minimise impacts through the riparian corridor associated with the Isaac River;
- use of a conveyor to transport ROM coal from the Willunga Domain to the Olive Downs South Domain, as opposed to a haul road (which would have a wider disturbance footprint);
- co-locating infrastructure corridors to minimise disturbance through the riparian corridor associated with the Isaac River; and
- locating infrastructure corridors through predominantly cleared land and along existing road reserves where practicable.

Vegetation Clearance Procedures

Vegetation clearance procedures would be adopted for the Project and include:

- Boundaries of areas to be cleared, and those not to be cleared, would be defined during construction and operation.
- An internal Ground Disturbance Permit would be required prior to any clearing so that clearing activities are authorised prior to disturbance.
- Clearing of native vegetation would be undertaken progressively over the life of the mine and only in areas required for mining activities within the following year. This would have the effect of minimising the area of cleared/exposed land within an annual period.
- Pre-clearance flora and fauna surveys would be undertaken by suitably experienced and qualified persons.
- A suitably experienced and qualified person would be present during the clearing of habitat.
- Management of fauna identified during clearing may include relocating individuals to adjacent habitat or treating injuries.
- Pre-clearance surveys to identify *Bertya pedicellata* within habitat proposed to be cleared along the ETL alignment. Impacts to *Bertya pedicellata* would be avoided where practicable.
- Salvage and reuse of selected trees (e.g. tree hollows) for use as fauna habitat in rehabilitation areas (e.g. habitat logs).

Management of Conservation Significant Species

The Project would disturb animal breeding places and therefore Pembroke would comply with the NC Act requirements by preparing a Species Management Program (under section 332 of the Nature Conservation [Wildlife Management] Regulation, 2006).

Rehabilitation

The Project area (e.g. waste rock emplacements and infrastructure areas) would be progressively rehabilitated and revegetated, to create stable post-mining landforms. Rehabilitation would commence within two years of areas becoming available for rehabilitation.

Pembroke would develop a Rehabilitation and Mine Closure Plan, which would include a rehabilitation monitoring program for the Project.

Rehabilitation procedures to be adopted for the Project are discussed in detail in Section 5.

Feral Animal Control Strategies

Feral animals would be discouraged at the Project by maintaining a clean, rubbish-free environment. Appropriately qualified persons would be engaged to undertake annual pest animal monitoring in the Project area. Feral animal control strategies (e.g. baiting and trapping) would be implemented in the Project area in accordance with relevant standards to maintain low abundance of declared animals.

Pembroke would also develop and implement a Weed and Pest Management Plan for the Project.

Biodiversity Offset Strategy

Pembroke proposes a staged environmental offset in consideration of the staged land clearing described in Section 4.1. The offset for each stage of clearance would be provided before clearing the relevant stage. The residual significant adverse impacts can be offset given:

- The native vegetation communities/regional ecosystems to be cleared during the life of the Project (including those listed as 'Endangered' and 'Of Concern') all occur extensively in the surrounding landscape and subregions (Appendix A).
- The surrounding landscape contains large areas of non-remnant vegetation (required to offset the significant residual impact on 'Connectivity').
- The Ornamental Snake, Squatter Pigeon [southern], Greater Glider and Koala (and their habitats) are widely distributed in the surrounding landscape and region (Appendix B).
- HES wetlands are mapped as occurring widely in the surrounding locality (Appendix C).

The offset management strategy would be documented in a Offset Management Plan as discussed in Section 4.1.5.

Weed Management

Consistent with the general biosecurity obligations outlined by the Isaac Regional Council Local Government Biosecurity Plan, Pembroke would manage the Project so that it does not result in the spread of pests, diseases or contaminants. Weed prevention techniques implemented in the Project area would include:

- clearing of vegetation to be restricted to the minimum required to enable the safe construction, operation and maintenance of the Project, including infrastructure corridors;
- implementation of a Weed and Pest Management Plan for the Project; and
- conduct progressive rehabilitation activities over the life of the Project.

6.1.3.2 Water Quality and Water Resources

Environmental Objectives

The relevant environmental objectives for water quality are that the Project be operated in a way that:

(a) protects the environmental values of waters

(b) protects the environmental values of wetlands

(c) protects the environmental values of groundwater and any associated surface ecological systems

During construction, operation and decommissioning, the Project would aim to meet the following objectives for water resources:

(a) equitable, sustainable and efficient use of water resources

(b) environmental flows, water quality, in-stream habitat diversity, and naturally occurring inputs from riparian zones to support the long term maintenance of the ecology of aquatic biotic communities

(c) the condition and natural functions of water bodies, lakes, springs and watercourses are maintained - including the stability of beds and banks of watercourses

(d) volumes and quality of groundwater are maintained or alternate water supply is provided and current lawful users of water (such as entitlement holders and stock and domestic users) and other beneficial uses of water (such as surface water users, spring flows and groundwater-dependent ecosystems) are not adversely impacted by the development.

Proposed EA Conditions

Sections 6.2.5, 6.2.6 and 6.2.9 include proposed EA conditions for water quality and water resources at the Project. These conditions include:

- Controlled releases in accordance with the *Model Mining Conditions* (Version 6) (Conditions F1 to F18).
- Requirements for determinations of water quality and biological monitoring (Condition F19).
- Implementation of the REMP (Conditions F20 to F22).
- Conditions regarding the transfer and use of water for stock water, irrigation, construction and/or road maintenance (Conditions F23).

- Reporting on results of water monitoring in the Annual Water Monitoring Report (Condition F24).
- Requirements for temporary interference with watercourses (Condition F25).
- Implementation of a Water Management Plan (Conditions F26).
- Development and implementation of an Erosion and Sediment Control Plan (Conditions F27 to F28).
- Implementation of a Groundwater Monitoring Program, including background groundwater monitoring program in accordance with the methods, locations and frequencies outlined in the conditions (Conditions E1 to E5).
- Requirement for groundwater investigations where trigger levels are exceeded and maintenance of groundwater bores to minimise potential impacts to environment and monitoring (Conditions E5 to E7).
- Management of sewage effluent in accordance *Model Mining Conditions* (Version 6) (Conditions G1 to G9).
- Requirement for the design and construction of permanent watercourse diversions (Condition I1).
- Requirement for the preparation of a permanent watercourse diversion design plan and 'as constructed' drawings (Conditions I2, I3 and I4).
- Maintenance of a Register of Watercourse Diversions (Condition I5).

Water Management System

The objectives of the water management system for the Project aim to protect the environmental values relevant to water quality and water resources. The objectives include:

- separation of mine affected and up-catchment water to reduce potential contamination;
- containment of mine affected runoff and priority reuse in mine water supply;
- minimising external catchment runoff (off-site water) draining into open cut pits;
- using erosion and sediment control measures to manage sediment from disturbed catchment areas (e.g. out-of-pit waste rock emplacements) prior to release off-site;
- reduced release of mine affected water through the prioritising reuse of on-site water to support operational water demands; and
- management of mine affected water releases to the receiving environment to discharge in accordance with environmental release conditions.

Groundwater Monitoring and Underground Water Impact Report

The groundwater monitoring program established as part of EIS groundwater investigations would be continued throughout the life of the Project with modification and addition of monitoring sites, parameters and frequency as required. Recording of groundwater would continue and would enable natural groundwater level fluctuations (such as responses to rainfall) to be distinguished from potential groundwater level impacts due to depressurisation resulting from proposed mining activities.

Groundwater quality sampling would continue in order to provide longer term baseline groundwater quality around the Project site, and to detect any changes in groundwater quality during and post-mining.

Groundwater monitoring criteria would be established to monitor predicted impacts on both environmental values and predicted changes in groundwater quality. Impact assessment criteria for the site would be documented within a UWIR for the Project.

Pembroke would prepare an Underground Water Impact Report (UWIR) prior to the commencement of mining in accordance with Chapter 3 of the Water Act. The UWIR would be based on the information contained in the Groundwater Assessment (Appendix D), and would describe, make predictions about and manage the impacts of underground water extraction by the Project.

6.1.3.3 Flooding and Regulated Structures

Environmental Objectives

The environmental objective relevant to flooding and regulated structures for the Project, is:

> *The construction and operation of the project should aim to ensure the risk of, and the adverse impacts from flooding hazards or dam failure are avoided, minimised or mitigated to protect people, property and the environment.*

The environmental objective would be achieved by implementing the requirements of the Model Conditions in *Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934)* and the requirements for flood levees in the *Model Mining Conditions* (Version 6).

Proposed EA Conditions

Section 6.2.6 includes proposed EA conditions for flood protection at the Project. These conditions include:

- Assessment and certification of consequence category for regulated structures in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* (Conditions J1 to J3).
- Requirements for design and construction of new regulated structures in accordance with the requirements of the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* and *Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934)* (Conditions J4 to J8).
- Requirements for identification and notification of affected persons in the event of regulated structure failure (Condition J9).
- Requirements for the operation of new regulated structures (Condition J10).
- Maintenance of each regulated structure during its operational life in a manner that is consistent with the operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings (Condition J11).
- For regulated structures which have not been certified as low consequence category for 'failure to contain – overtopping', marking and monitoring of the Mandatory Reporting Level (MRL), and on becoming aware that the MRL has been reached, acting to prevent the occurrence of any unauthorised discharge from the regulated dam (Conditions J12 to J15).
- Recording any changes to the MRL in the Register of Regulated Structures (Condition J16).
- Assessment of the available storage to meet the Design Storage Allowance (DSA) volume, and where, the network of linked containment systems does not have the available storage to meet the DSA volume on 1 November of any year, notifying the administering authority and act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems (Conditions J17 to J20).
- Requirements for annual inspection reports of regulated structures (Conditions J21 to J24).
- Arrangements for transfer of information if the EA is transferred to a new holder (Conditions J25).
- Decommissioning and rehabilitation requirements (Conditions J26 and J27).
- Maintenance of a Register of Regulated Structures (Conditions J28 to J33).

Annual Inspection

Each regulated structure would be inspected annually by a suitably experienced and qualified person. The annual inspection would provide recommendations to ensure the integrity of the regulated structure is maintained, if required.

Register of Regulated Structures

Pembroke would establish and maintain a register of regulated structures for the Project.

6.1.3.4 Air Quality

Environmental Objectives

The Project would achieve the following performance outcome as identified in Part 3, Schedule 5, Table 1 of the EP Regulation:

> *2 All of the following—*
>
> *(a) fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised;*
>
> *(b) contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air;*
>
> *(c) releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.*

Proposed EA Conditions

Section 6.2.2 includes proposed EA conditions for air quality at the Project. These conditions include:

- Implementing reasonable and feasible avoidance and mitigation measures so that dust and particulate matter emissions generated by the mining activities do not cause exceedances of the levels outlined in the *Model Mining Conditions* (Version 6) (Condition B1).

Air quality management measures and monitoring for the Project would be documented in an Air Quality Management Plan to be prepared for the Project.

Dust Management Measures

General dust mitigation measures that would be implemented for the Project to minimise dust generation are summarised in Table 6-3.

Table 6-3
General Project Dust Control Measures

Activity	Key Dust Control Measures
Wheel-generated dust and grading	• Watering of haul road surfaces. • Chemical suppressant.
Drilling	• Dust suppression systems.
Wind erosion of exposed areas	• Progressive rehabilitation.
Wind erosion of ROM coal stockpiles	• Water sprays.
CHPP conveyors	• Water sprays on transfer points.
Train loading	• Water sprays.
Crushing	• Enclosure of infrastructure.

In addition to water sprays during train load-out (i.e. coal moisture regulation), Pembroke would design the train load-out facility consistent with the dust management strategies identified for new facilities in QR Network's (2010) *Coal Dust Management Plan* (refer Section 2.5.9), including:

- automated loading of train wagons to prevent overloading;
- sill beam brushes to remove coal on the outside faces of the train wagons;
- veneering system to prevent coal dust generation during transit to port; and
- use of spill pit to recover spilt coal under the train load out.

Coal would also be tested for dustiness and dust management would be adjusted accordingly based on the results of testing.

Pembroke would also implement proactive and reactive dust control measures. These measures would include monitoring of weather forecasting and real-time measurement of dust levels and meteorological conditions to modify mining operations as required in order to achieve compliance with applicable air quality objectives at nearby privately-owned receptors.

Modifying mining operations could include the application of additional dust controls, an increase in the intensity of applied dust controls, reducing the intensity of particular operations or halting particular operations.

Blast management measures to minimise off-site generation of dust and fumes would be detailed in a Blast Management Plan to be prepared for the Project.

Monitoring

Meteorological data, as well as TSP, PM_{10} and $PM_{2.5}$ levels would continue to be monitored at the existing Project monitoring site for the implementation of operational dust controls.

If monitoring indicates any unexpected exceedances of air quality objectives, an investigation would be conducted by Pembroke, including additional dust monitoring if required (Appendix G).

6.1.3.5 Social and Economic

Environmental Objectives

The environmental objectives relevant to social and economic values for the Project, are:

(a) *avoid or mitigate/manage adverse social impacts arising from the project*

(b) *capitalize on opportunities potentially available for local industries and communities*

(c) *create a net economic benefit to the location, region and state.*

Proposed EA Conditions

Section 6.2.1 includes proposed EA conditions for managing social and economic values at the Project. These conditions include:

- Requirement for Pembroke to give the administering authority financial assurance as a security for compliance (Conditions A5 and A6).
- Requirement for the management of complaints received by Pembroke regarding the Project (Conditions A10 and A11).

Social Impact Management Plan

Pembroke would implement a Social Impact Management Plan for the Project, as described in detail in Appendix H.

In accordance with the Queensland Government *Social Impact Assessment Guideline* (SDMIP, 2018), the Social Impact Management Plan includes proposed mitigation and management measures for the following key components:

- Community and stakeholder engagement: Strategies to build on Pembroke's current community and stakeholder engagement processes to facilitate the establishment of a working partnership with the communities in which it operates.
- Workforce management: Strategies for local and equal opportunity employment recruitment and identifies important partnerships, such as with Skills Queensland, to address skills gaps and training requirements.
- Housing and accommodation: Strategies to meet the accommodation requirements of the Project.
- Local business and industry: Strategies to inform local business of the goods and service provision opportunities and raise awareness of Pembroke's compliance requirements of business to secure contracts.
- Health and community wellbeing: Strategies to minimise existing and potential impacts upon residents of the Isaac Regional Council LGA.

6.1.3.6 Transport

Environmental Objectives

The environmental objectives relevant to transport for the Project, are:

> *(a) maintain the safety and efficiency of all affected transport modes for the project workforce and other transport system users*
>
> *(b) avoid or mitigate impacts on the condition of transport infrastructure*
>
> *(c) ensure any required works are compatible with existing infrastructure and future transport corridors.*

The environmental objective relating to transportation would be achieved by implementing the following:

- Parts of Annandale Road, from Daunia Road to the Olive Downs South Domain mine access road, would be upgraded by the Isaac Regional Council, in accordance with a road infrastructure arrangement with Pembroke.
- Pembroke would prepare a Road Use Management Plan in consultation with DTMR and the Isaac Regional Council (Appendix J).
- The rail spur would be designed and constructed in consultation with Aurizon to minimise potential impacts on the existing environment in accordance with relevant guidelines.
- Transportation of dangerous goods by road would be in accordance with relevant legislation.

No specific air transport mitigation measures are proposed to be implemented for the Project.

Proposed EA Conditions

As transport activities occur off-site, there are no proposed EA conditions to address transport associated with the Project.

6.1.3.7 Noise and Vibration

Environmental Objectives

The Project would achieve the following performance outcome as identified in Part 3, Schedule 5, Table 1 of the EP Regulation:

> *2 The release of sound to the environment from the activity is managed so that adverse effects on environmental values including health and wellbeing and sensitive ecosystems are prevented or minimised.*

Proposed EA Conditions

Section 6.2.4 includes proposed EA conditions for noise and vibration at the Project. These conditions include:

- Requirement to avoid causing any exceedances of the noise criteria at a sensitive or commercial place (Condition D1).
- Requirement to avoid causing any exceedances of the peak particle velocity and air blast overpressure at a sensitive or commercial place (Condition D2).
- Requirement for monitoring and recording noise levels and investigation of complaints of noise, air blast overpressure or vibration (Condition D3).
- Development and implementation of a blast monitoring program and to monitor compliance with blasting criteria (Condition D4).

Noise Mitigation Measures

Noise and vibration management measures and monitoring would be documented in a Noise Management Plan and Blast Management Plan to be prepared for the Project.

The Noise and Vibration Assessment (Appendix K) identified noise mitigation measures required to meet the noise limits at nearby sensitive receptors.

To reduce noise emissions at nearby sensitive receptors, Pembroke would implement noise controls on fixed plant and mobile equipment, including the overland conveyor, as described in Appendix K.

Pembroke would also implement proactive and reactive noise control measures. These measures would include the use of weather forecasting and real-time measurement of meteorological conditions and noise levels to modify mining operations as required in order to achieve compliance with applicable noise limits at nearby sensitive receptors.

Modifying mining operations could include reducing the intensity of particular operations, relocating particular operations or halting particular operations.

Noise Monitoring

As described above, real-time meteorological and noise monitoring would be undertaken at locations representative of nearby sensitive receptors to assist in implementing operational controls.

6.1.3.8 Land

Environmental Objectives

The Project would achieve the following performance outcome as identified in Schedule 5, Part 3, Table 1 of the EP Regulation:

2 All of the following—

(a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the environmental values of land;

(b) areas disturbed will be rehabilitated or restored to achieve sites that are—

(v) safe to humans and wildlife; and

(vi) non-polluting; and

(vii) stable; and

(viii) able to sustain an appropriate land use after rehabilitation or restoration;

(c) the activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants;

(d) the application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.

Proposed EA Conditions

Sections 6.2.6 and 6.2.8 include the proposed EA conditions for land management at the Project, including:

- Progressive rehabilitation of the Project to achieve a rehabilitation goal of safe, non-polluting, stable and self-sustaining landforms (Conditions H1 and H2).
- Preparation of a site investigation report before applying for surrender of a mining lease or a progressive rehabilitation certification for an area (Conditions H3 and H4).
- Requirement to minimise the potential for contamination of land by hazardous contaminants (Condition H5).
- Development and implementation of an Erosion and Sediment Control Plan (Conditions F27 and F28).

Topsoil Management Plan

Soil stripping and handling measures would be undertaken in accordance with a Topsoil Management Plan to be developed for the Project.

Mitigation of Visual Impacts

Pembroke would take all reasonable and feasible measures, in consideration of *AS 4282–1997 Control of the obtrusive effects of outdoor lighting*, to mitigate visual and off-site lighting impacts of the Project.

The area of agricultural land disturbed by the Project at any one time would be minimised so that beneficial agricultural uses (i.e. cattle grazing) could continue to be undertaken on available grazing land within the Project footprint.

6.1.3.9 Cultural Heritage

Environmental Objectives

The environmental objective relevant to cultural heritage for the Project, is:

> *The construction and operation of the project should aim to ensure that all reasonable and practicable measures to ensure the project does not harm Aboriginal cultural heritage are carried out, and the nature and scale of the project does not compromise the cultural heritage significance of a heritage place or heritage area.*

Indigenous heritage would be managed in accordance with the ACH Act to achieve the relevant environmental objective.

The Non-Indigenous Cultural Heritage Assessment (Appendix L) concluded that all of the non-indigenous heritage sites, except the grave site, would not require further management measures. Specific management measures recommended by Converge (2018) if disturbance of the grave site is unavoidable, include:

- A heritage recording (compliant with the Draft EPA Guidelines for Archival Recording) would be made.
- Management of the grave site would be undertaken in consultation with family members, and the grave would be relocated to a nearby cemetery or location of their choosing.

Proposed EA Conditions

It is noted the *Model Mining Conditions* (Version 6) do not include EA conditions relating to cultural heritage.

Cultural Heritage Management Plan

Pembroke has agreed-in-principle to the terms of a CHMP with the Barada Barna Aboriginal Corporation. The CHMP is proposed for execution into in mid-June 2018 and would then be submitted for approval pursuant to section 107 of the ACH Act by the Department of Aboriginal and Torres Strait Islander Partnerships. Pembroke would implement the approved CHMP for the Project.

Non-Indigenous Cultural Heritage

All staff or contractors of Pembroke would be informed of their obligations to look for and avoid impacting on any non-Indigenous cultural heritage material until it has been properly assessed. A process for managing historic cultural heritage material which may be located during further development within the Project area is provided in (Appendix L).

6.1.3.10 Hazards and Community Safety

Environmental Objectives

The environmental objectives relevant to hazards and community safety for the Project, are that:

(a) *the risk of, and the adverse impacts from, natural and man-made hazards are avoided, minimized or managed and mitigated to protect people and property*

(b) *the community's resilience to natural hazards is enhanced*

(c) *development involving the storage and handling of hazardous materials are appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment.*

Proposed EA Conditions

Sections 6.2.1 and 5.2.8 include proposed EA conditions for managing hazards and safety at the Project. These conditions include:

- Development and implementation of a Risk Management System within 3 months of the date of issue of the EA (Condition A7).
- Requirements for notifications of emergencies and incidents (Conditions A8 and A9).
- Requirement to minimise the potential for contamination of land by hazardous contaminants (Condition H5).

Compliance with Relevant Legislation, Standards and Guidelines

Pembroke would comply with relevant legislation, standards and guidelines at the Project, in particular:

- Hazardous substances (including, hydrocarbons, chemicals and explosives) would be transported, stored and handled in accordance with relevant legislation, standards and guidelines.

- All chemicals would be managed in accordance with the relevant SDS.
- The explosives magazines would be fenced, signed and maintained in accordance with AS 2187.1:1998.
- The final void highwalls would be fenced in accordance with relevant legislation, standards and guidelines.

6.1.3.11 Biosecurity

Environmental Objectives

The environmental objectives relevant to biosecurity for the Project, are that:

(a) the spread of weeds and pest animals and vector agents impacts are/is minimised

(b) existing weeds and pests are controlled.

The objectives would be achieved by implementing flora and fauna management strategies described in Section 6.1.3.1, including:

- vegetation clearance protocol;
- species management program;
- progressive rehabilitation;
- feral animal control strategies; and
- weed management.

6.1.3.12 Waste Management

Environmental Objectives

The Project would achieve the following performance outcomes, as stated in Schedule 5, Part 3, Table 1 of the EP Regulation:

1 Both of the following apply—

(a) waste generated, transported or received is managed in accordance with the waste and resource management hierarchy in the Waste Reduction and Recycling Act 2011;

(b) if waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values.

The performance outcomes would be achieved by implementing the requirements of the *Model Mining Conditions* (Version 6).

Proposed EA Conditions

Section 6.2.3 includes proposed EA conditions for waste management at the Project, including:

- Requirements for managing coal rejects (Condition C3).
- Requirements to treat and manage acid sulphate soils that may occur at the Project (Condition C4).

Coal Rejects Management

Validation testwork of actual coal reject materials from the CHPP would be undertaken, particularly during the first year of CHPP operation following commissioning, and following commencement of mining at the Willunga domain.

The proposed strategy for the disposal of coarse reject material is via truck from the CHPP to dispose within in-pit disposal areas (below existing ground level) and later bury with spoil (generally within three months of placement).

Coarse rejects disposed into the pit would be placed below the expected final (post-closure) groundwater level and buried by at least 5 m (cover thickness) of spoil.

The proposed strategy for disposal of fine rejects is for the thickened material to be pumped to solar drying ponds reused in the infrastructure area, where flocculants would be added (i.e. ILF cells) and water would be recovered and recycled in the CHPP.

Dewatered and dried fine rejects would be excavated and trucked for disposal within the in-pit disposal area (below existing ground level) and later buried by spoil (generally within three months of placement).

The dried fine rejects disposed into the pit would be placed below the expected final (post-closure) groundwater level and buried by at least 5 m (cover thickness) of spoil.

6.1.4 Environmental Reporting

Annual Return

If required by the administering authority, Pembroke would prepare and submit an annual return (Conditions F18 and J34).

Third Party Reporting

Pembroke would engage a suitability experienced and qualified person to prepare a report on compliance with the conditions of the EA in accordance with the proposed EA Condition A12 (Section 6.2). The report on compliance would be prepared within one year of after commencement of the EA and further reports would be prepared at regular intervals, not exceeding three years.

Other Reporting Mechanisms

Pembroke would conduct annual reporting of greenhouse house gas emissions, energy production, energy consumption and any other information required under the NGER Act.

6.2 PROPOSED ENVIRONMENTAL AUTHORITY CONDITIONS

This section presents the proposed EA conditions for the Project.

The conditions are generally consistent with the *Model Mining Conditions* (Version 6) or the guideline *Structures which are dams and levees constructed as part of environmentally relevant activities* (ESR/2016/1933).

6.2.1 Schedule A – General

A1: This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.

A2: In carrying out the mining activity authorised by this environmental authority, disturbance of land:

a) may occur in the areas marked 'A'; and

b) must not occur in the areas marked 'B' in the map that is Annexure 1 to this environmental authority.

A3: The holder of this environmental authority must:

a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;

b) maintain such measures, plant and equipment in a proper and efficient condition;

c) operate such measures, plant and equipment in a proper and efficient manner;

d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

Monitoring

A4: Except where specified otherwise in another condition of this environmental authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than five years.

Financial Assurance

A5: The activity must not be carried out until the environmental authority holder has given financial assurance to the administering authority as security for compliance with this environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the Act.

A6: The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the authority is amended.

Risk Management

A7: The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, by **<<insert date 3 months from date of issue>>**.

Notification of Emergencies, Incidents and Exceptions

A8: The holder of this environmental authority must notify the administering authority by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this environmental authority.

A9: Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:

a) results and interpretation of any samples taken and analysed

b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm

c) proposed actions to prevent a recurrence of the emergency or incident.

Complaints

A10: The holder of this environmental authority must record all environmental complaints received about the mining activities including:

a) name, address and contact number for of the complainant;

b) time and date of complaint;

c) reasons for the complaint;

d) investigations undertaken;

e) conclusions formed;

f) actions taken to resolve the complaint;

g) any abatement measures implemented; and

h) person responsible for resolving the complaint.

A11: The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

Third-party Reporting

A12: The holder of this environmental authority must:

a) within one year of the commencement of this environmental authority, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority;

b) obtain further such reports at regular intervals, not exceeding three-yearly intervals, from the completion of the report referred to above;

c) provide each report to the administering authority within 90 days of its completion.

A13: Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority, the holder of this environmental authority must:

a) comply with the amended or changed standard, policy or guideline within two years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in Model Condition X36 of *Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934)*, the time specified in that condition;

b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

6.2.2 Schedule B – Air

Dust and Particulate Matter Monitoring

B1: The environmental authority holder shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the dust and particulate matter emissions generated by the mining activities do not cause exceedances of the following levels when measured at any sensitive or commercial place:

a) Dust deposition of 120 milligrams per square metre per day, averaged over one month, when monitored in accordance with the most recent version of *Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method.*

b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10}) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, for no more than five exceedances recorded each year, when monitored in accordance with the most recent version of either:

1. *Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air— Determination of suspended particulate matter—PM_{10} high volume sampler with sizeselective inlet – Gravimetric method*, or
2. *Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air— Determination of suspended particulate matter—PM_{10} low volume sampler—Gravimetric method.*

c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres ($PM_{2.5}$) suspended in the atmosphere of 25 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of *AS/NZS3580.9.10 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM (sub)2.5(/sub) low volume sampler—Gravimetric method*.

d) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of *AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method*.

6.2.3 Schedule C – Waste Management

C1: Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

C2: The holder of this environmental authority may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.

Tailings Disposal

C3: Tailings must be managed in accordance with procedures contained within the current plan of operations. These procedures must include provisions for:

a) containment of tailings;

b) the management of seepage and leachates both during operation and the foreseeable future;

c) the control of fugitive emissions to air;

d) a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings;

e) maintaining records of the relative locations of any other waste stored within the tailings;

f) rehabilitation strategy; and

g) monitoring of rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

Acid Sulfate Soils

C4: Treat and manage acid sulphate soils in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

6.2.4 Schedule D – Noise

Noise Limits

D1: The holder of this environmental authority must ensure that noise generated by the mining activities does not cause the criteria in **Table D1 – Noise Limits** to be exceeded at a sensitive place or commercial place.

Airblast Overpressure Nuisance

D2: The holder of this environmental authority must ensure that blasting does not cause the limits for peak particle velocity and air blast overpressure in **Table D2 – Blasting Noise Limits** to be exceeded at a sensitive place or commercial place.
D3: Noise monitoring and recording must include the following descriptor characteristics and matters:

a) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins);

b) background noise LA90;

c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels;

d) atmospheric conditions including temperature, relative humidity and wind speed and directions;

e) effects due to any extraneous factors such as traffic noise;

f) location, date and time of monitoring; and

g) if the complaint concerns low frequency noise, Max $L_{pLIN,T}$ and one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range.

Table D1
Noise Limits

Sensitive Place						
Noise Level db(A) measured as:	**Monday to Saturday**			**Sundays and Public Holidays**		
	7.00am to 6.00pm	**6.00pm to 10.00pm**	**10.00pm to 7.00am**	**9.00am to 6.00pm**	**6.00pm to 10.00pm**	**10.00pm to 9.00am**
$L_{Aeq, adj, 15 mins}$	CV = 50 AV = 5	CV = 45 AV = 5	CV = 40 AV = 0	CV = 45 AV = 5	CV = 40 AV = 5	CV = 35 AV = 0
$L_{A1, adj, 15 mins}$	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5
Commercial Place						
Noise Level db(A) measured as:	**Monday to Saturday**			**Sundays and Public Holidays**		
	7.00am to 6.00pm	**6.00pm to 10.00pm**	**10.00pm to 7.00am**	**9.00am to 6.00pm**	**6.00pm to 10.00pm**	**10.00pm to 9.00am**
$L_{Aeq, adj, 15 mins}$	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5

CV = Critical Value, AV = Adjustment Value, bg = background noise level (LA90, adj, 15 mins) measured over 3-5 days at the nearest sensitive receptor.

To calculate noise limits in Table D1:

If bg ≤ (CV – AV):

Noise limit = bg + AV

If (CV – AV) < bg ≤ CV:

Noise limit = CV

If bg > CV: Noise limit = bg+0

In the event that measured bg (LA90, adj, 15 mins) is less than 30 dB(A), then 30 dB(A) can be substituted for the measured background level

If the project is unable to meet the noise limits as calculated above alternative limits may be calculated using the processes outlined in the "Planning for Noise Control" guideline.

Table D2
Blasting Noise Limits

Blasting Noise Limits	**Sensitive or Commercial Place Limits**	
	7.00am to 6.00pm	**6.00pm to 7.00am**
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time.	No blasting.
Ground vibration peak place velocity	5mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time.	No blasting.

D4: The holder of this environmental authority must develop and implement a blast monitoring program to monitor compliance with **Table D2 – Blasting Noise Limits** for:

a) at least 90% of all blasts undertaken on this site in each year at the nearest sensitive place; and

b) all blasts conducted during any time period specified by the administering authority at the nearest sensitive place or commercial place.

6.2.5 Schedule E – Groundwater

E1: The holder of this environmental authority must not release contaminants to groundwater.

Monitoring and Reporting

E2: All determinations of groundwater quality and biological monitoring must be performed by an appropriately qualified person

E3: Groundwater quality and levels must be monitored at the locations and frequencies defined in **Table E1 – Groundwater Monitoring Locations and Frequency** and Annexure 1 for quality characteristics identified in **Table E2 - Groundwater Quality Triggers and Limits**.

E4: Groundwater levels when measured at the monitoring locations specified in **Table E1 - Groundwater Monitoring Locations and Frequency** must not exceed the groundwater level trigger change thresholds specified in **Table E2 - Groundwater Level Monitoring** below.

Exceedance Investigation

E5: If quality characteristics of groundwater from compliance bores identified in **Table E1 - Groundwater Monitoring Locations and Frequency** exceed any of the trigger levels stated in **Table E2 - Groundwater Quality Triggers and Limits** or exceed any of the groundwater level trigger threshold stated in **Table E3 - Groundwater Level Monitoring**, the holder of this environmental authority must compare the compliance monitoring bore results to the reference bore results and complete an investigation in accordance with ANZECC and ARMCANZ 2000.

E6: Results of monitoring of groundwater from compliance bores identified in **Table E1 - Groundwater Monitoring Locations and Frequency**, must not exceed any of the limits defined in **Table E2 - Groundwater Quality Triggers and Limits**.

Bore Construction and Maintenance and Decommissioning

E7: The construction, maintenance and management of groundwater bores (including groundwater monitoring bores) must be undertaken in a manner that prevents or minimises impacts to the environment and ensures the integrity of the bores to obtain accurate monitoring.

6.2.6 Schedule F – Water

F1: Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this environmental authority.

F2: Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in **Table F1 - Mine Affected Water Release Points, Sources and Receiving Waters** and depicted in Figure 1 attached to this environmental authority.

F3: The release of mine affected water to internal water management infrastructure installed and operated in accordance with a water management plan that complies with Condition F28 is permitted.

F4: The release of mine affected water to waters in accordance with Condition F2 must not exceed the release limits stated in **Table F2 - Mine Affected Water Release Limits** when measured at the monitoring points specified in **Table F1 - Mine Affected Water Release Points, Sources and Receiving Waters** for each quality characteristic.

Table E1
Groundwater Level Monitoring and Frequency

Monitoring Point	Location		Surface RL (m)[1]	Monitoring Frequency
	Easting	Northing		
Reference Bores[2]				
TBA	TBA	TBA	TBA	TBA
Compliance Bores				
TBA	TBA	TBA	TBA	TBA

1. Monitoring is not required where a bore has been removed as a direct result of the mining activity.
2. RL must be measured to the nearest 5cm from the top of the bore casing.
3. Reference sites must: (a) have a similar flow regime (b) be from the same bio-geographic and climatic region (c) have similar geology, soil types and topography (d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site.

Table E2
Groundwater Quality Triggers and Limits

Parameter	Contaminant Triggers	Contaminant Limit
TBA	TBA	TBA

Table E3
Groundwater Level Monitoring

Monitoring Points	Location		Level Trigger Threshold
	Easting	Northing	
TBA	TBA	TBA	TBA

F5: The release of mine affected water to waters from the release points must be monitored at the locations specified in **Table F1 - Mine Affected Water Release Points, Sources and Receiving Waters** for each quality characteristic and at the frequency specified in **Table F2 - Mine Affected Water Release Limits** and **Table F3 - Release Contaminant Trigger Investigation Levels, Potential Contaminants**.

Note: The administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition F5 is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

F6: If quality characteristics of the release exceed any of the trigger levels specified in **Table F3 - Release Contaminant Trigger Investigation Levels, Potential Contaminants** during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in **Table F3 - Release Contaminant Trigger Investigation Levels, Potential Contaminants** and:

a) where the trigger values are not exceeded then no action is to be taken, or

b) where the downstream results exceed the trigger values specified **Table F3 - Release Contaminant Trigger Investigation Levels, Potential Contaminants** for any quality characteristic, compare the results of the downstream site to the data from background monitoring sites and:

   1. if the result is less than the background monitoring site data, then no action is to be taken, or
   2. if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority within 90 days of receiving the result, outlining:
      (i) details of the investigations carried out; and
      (ii) actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F6 b (2) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

F7: If an exceedance in accordance with Condition F6 b (2) is identified, the holder of the environmental authority must notify the administering authority in writing within 24 hours of receiving the result.

Mine Affected Water Release Events

F8: The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in **Table F4 - Mine Affected Water Release during Flow Events**.

F9: Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with Condition F2 must only take place during periods of natural flow in accordance with the receiving water flow criteria for discharge specified in **Table F4 - Mine Affected Water Release during Flow Events** for the release point(s) specified in **Table F1 - Mine Affected Water Release Points, Sources and Receiving Waters**.

Table F1
Mine Affected Water Release Points, Sources and Receiving Waters

Release Point	Easting (GDA94 – Zone 55)	Northing (GDA94 – Zone 55)	Mine Affected Water Source and Location	Monitoring Point	Receiving Waters Description
P9	642233	7546564	Pit water dam	Downstream of the Project (ISDS/SW12)	Isaac River
P20	643461	7543378	Pit water dam	Downstream of the Project (ISDS/SW12)	Isaac River
P33	644486	7538924	Pit water dam	Downstream of the Project (ISDS/SW12)	Isaac River
P46	645461	7537592	Pit water dam	Downstream of the Project (ISDS/SW12)	Isaac River
WROM	654725	7528679	Pit water dam	Downstream of the Project (ISDS/SW12)	Isaac River

Table F2
Mine Affected Water Release Limits

Quality Characteristic	Release Limits	Monitoring Frequency	Comment
Electrical conductivity (µS/cm)	Release limits specified in **Table F4: Mine Affected Water Release during Flow Events** below for variable criteria.	Daily during release (the first sample must be taken within two hours of commencement of release)	
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	Daily during release (the first sample must be taken within two hours of commencement of release)	
Turbidity (NTU)	TBA	Daily during release (first sample within two hours of commencement of release)	

Table F3
Release Contaminant Trigger Investigation Levels, Potential Contaminants

Quality Characteristic	Trigger Levels (µg/L)	Comment on Trigger Level	Monitoring Frequency
Aluminium	55	For aquatic ecosystem protection, based on SMD guideline	Commencement of release and thereafter weekly during release
Arsenic	13	For aquatic ecosystem protection, based on SMD guideline	
Cadmium	0.2	For aquatic ecosystem protection, based on SMD guideline	
Chromium	1	For aquatic ecosystem protection, based on SMD guideline	
Copper	2	For aquatic ecosystem protection, based on LOR for ICPMS	
Iron	300	For aquatic ecosystem protection, based on low reliability guideline	
Lead	4	For aquatic ecosystem protection, based on SMD guideline	
Mercury	0.2	For aquatic ecosystem protection, based on LOR for ICPMS	
Nickel	11	For aquatic ecosystem protection, based on SMD guideline	
Zinc	8	For aquatic ecosystem protection, based on SMD guideline	
Boron	370	For aquatic ecosystem protection, based on SMD guideline	
Cobalt	90	For aquatic ecosystem protection, based on low reliability guideline	
Manganese	1900	For aquatic ecosystem protection, based on SMD guideline	
Molybdenum	34	For aquatic ecosystem protection, based on low reliability guideline	
Selenium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Silver	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Uranium	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Vanadium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Ammonia	900	For aquatic ecosystem protection, based on SMD guideline	
Nitrate	1100	For aquatic ecosystem protection, based on ambient Qld WQ Guidelines (2006) for TN	

Table F3 (Continued)
Release Contaminant Trigger Investigation Levels, Potential Contaminants

Quality Characteristic	Trigger Levels (µg/L)	Comment on Trigger Level	Monitoring Frequency
Petroleum Hydrocarbon (C_6 – C_9)	20		Commencement of release and thereafter weekly during release
Petroleum Hydrocarbon (C_{10} – C_{36})	100		
Fluoride (total)	2000	Protection of livestock and short term irrigation guideline	
Sodium	TBA		
Suspended Solids	Limit to be determined based on receiving water reference data and achievable best practice sedimentation control and treatment		
Sulphate (SO_4^{2-}) (mg/L)	Limit to be determined based on receiving water reference data and achievable best practice sedimentation control and treatment	Drinking water environmental values from NHMRC 2006 guidelines OR ANZECC	

1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
2. The quality characteristics required to be monitored as per **Table F3 - Release Contaminant Trigger Investigation Levels, Potential Contaminants** can be reviewed once the results of two years monitoring data is available, or if sufficient data is available to adequately demonstrate negligible environmental risk, and it may be determined that a reduced monitoring frequency is appropriate or that certain quality characteristics can be removed from **Table F3 - Release contaminant trigger investigation levels, potential contaminants** by amendment.
3. SMD – slightly moderately disturbed level of protection, guideline refers ANZECC & ARMCANZ (2000).
4. LOR (limit of reporting) – typical reporting for method stated. ICPMS/CV FIMS – analytical method required to achieve LOR.

F10: The release of mine affected water to waters in accordance with Condition F2 must not exceed the Maximum Release Rate (for all combined release point flows) for each receiving water flow criterion for discharge specified in **Table F4 - Mine Affected Water Release during Flow Events** when measured at the monitoring points specified in **Table F1 - Mine Affected Water Release Points, Sources and Receiving Waters**.

F11: The daily quantity of mine affected water released from each release point must be measured and recorded.

F12: Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build-up of sediment in such waters.

Notification of Release Event

F13: The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment. Notification must include the submission of written advice to the administering authority of the following information:

a) release commencement date / time;
b) details regarding the compliance of the release with the conditions of Department Interest: Water of this environmental authority (i.e. contaminant limits, natural flow, discharge volume);
c) release point/s;
d) release rate;
e) release salinity; and
f) receiving water/s including the natural flow rate.

Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local Administering Authority via email or facsimile.

F14: The environmental authority holder must notify the administering authority as soon as practicable and nominally no later than 24 hours after cessation of a release event of the cessation of a release notified under Condition F13 and within 28 days provide the following information in writing:

a) release cessation date/time;
b) natural flow rate in receiving water;
c) volume of water released;

Table F4
Mine Affected Water Release during Flow Events

Receiving Water/Stream	Release Pont (RP)	Gauging Station	Gauging Station Easting (GDA94 – Zone 55)	Gauging Station Northing (GDA94 – Zone 55)	Receiving water flow recording frequency	Receiving water flow criteria for discharge (m^3/s)	Maximum release rate (for all combined RP flows)	Electrical conductivity release limits
Isaac River	P9 P20 P33 P46 WROM	ISDS/SW12	674624	7519604	Continuous (minimum daily)	Medium Flow after natural flow events that exceed 4 m^3/s	0.5 m^3/s	1,000 µS/cm
						Medium Flow after natural flow events that exceed 10 m^3/s	1.0 m^3/s	1,200 µS/cm
						High Flow after natural flow events that exceed 50 m^3/s	2.0 m^3/s	4,000 µS/cm
						High Flow after natural flow events that exceed 100 m^3/s	3.0 m^3/s	6,000 µS/cm
						Very High Flow after natural flow events that exceed 300 m^3/s	1.0 m^3/s	10,000 µS/cm

d) details regarding the compliance of the release with the conditions of Department Interest; Water of this environmental authority (i.e. contaminant limits, natural flow, discharge volume);

e) all in-situ water quality monitoring results; and

f) any other matters pertinent to the water release event.

Note: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with Conditions F13 and F14, provided the relevant details of the release are included within the notification provided in accordance with Conditions F13 and F14.

Notification of Release Event Exceedance

F15: If the release limits defined in **Table F2 - Mine Affected Water Release Limits** are exceeded, the holder of the environmental authority must notify the administering authority within 24 hours of receiving the results.

F16: The environmental authority holder must, within 28 days of a release that is not compliant with the conditions of this environmental authority, provide a report to the administering authority detailing:

a) the reason for the release;

b) the location of the release;

c) the total volume of the release and which (if any) part of this volume was non-compliant;

d) the total duration of the release and which (if any) part of this period was non-compliant;

e) all water quality monitoring results (including all laboratory analyses);

f) identification of any environmental harm as a result of the non-compliance;

g) all calculations; and

h) any other matters pertinent to the water release event.

Receiving Environment Monitoring and Contaminant Trigger Levels

F17: The quality of the receiving waters must be monitored at the locations specified in **Table F6 - Receiving Water Upstream Background Sites and Downstream Monitoring Points** for each quality characteristic and at the monitoring frequency stated in **Table F5 - Receiving Waters Contaminant Trigger Levels**.

F18: If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in **Table F5 - Receiving Waters Contaminant Trigger Levels** during a release event the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and:

a) where the downstream result is the same or a lower value than the upstream value for the quality characteristic, then no action is to be taken; or

Table F5
Receiving Waters Contaminant Trigger Levels

Quality Characteristic	Trigger Level	Monitoring Frequency
pH (pH units)	6.5 – 9.0	Daily during the release
Electrical Conductivity (μS/cm)	TBA	
Total Suspended solids (mg/L)	TBA	
Sulphate (SO_4^{2-}) (mg/L)	250 (Protection of drinking water Environmental Value)	

Table F6
Receiving Water Upstream Background Sites and Downstream Monitoring Points

Monitoring points	Receiving waters location description	Easting (GDA94 – Zone 55)	Northing (GDA94 – Zone 55)
Upstream background monitoring points			
Monitoring point 130410A Isaac River @ Deverill	Isaac River - upstream of P9, P20, P33, P46, WROM.	642393	7547244
Downstream monitoring points			
Monitoring point ISDS/SW12	Isaac River - downstream of P9, P20, P33, P46, WROM.	674624	7519604

b) where the downstream results exceed the upstream results, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:

   1. details of the investigations carried out; and
   2. actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F19 b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

F19: All determinations of water quality and biological monitoring must be performed by suitably experienced and qualified person.

Receiving Environment Monitoring Program

F20: The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site. For the purposes of the REMP, the receiving environment is the waters of the Isaac River and connected or surrounding waterways within 1 km downstream of the release.

The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.

F21: A REMP Design Document that addresses the requirements of the REMP must be prepared and made available to the administering authority upon request.

F22: A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

Water Reuse

F23: Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party (with the consent of the third party).

Annual Water Monitoring Reporting

F24: The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format:

a) the date on which the sample was taken;
b) the time at which the sample was taken;
c) the monitoring point at which the sample was taken;
d) the measured or estimated daily quantity of mine affected water released from all release points;
e) the release flow rate at the time of sampling for each release point;
f) the results of all monitoring and details of any exceedances of the conditions of this environmental authority; and
g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Temporary Interference with Waterways

F25: Destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with Department of Natural Resources and Mines (or its successor) *Guideline – Activities in a Watercourse, Lake or Spring associated with Mining Activities.*

Water Management Plan

F26: A Water Management Plan must be developed by an appropriately qualified person and implemented.

Stormwater and Water Sediment Controls

F27: An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

F28: Stormwater, other than mine affected water, is permitted to be released to waters from:

a) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by Condition F27; and

b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with Condition F26, for the purpose of ensuring water does not become mine affected water.

6.2.7 Schedule G – Sewage Treatment

G1: The only contaminant permitted to be released to land is treated sewage effluent in compliance with the release limits stated in **Table G1 - Contaminant Release Limits to Land**.

G2: Treated sewage effluent may only be released to land in accordance with the conditions of this approval at the following locations:

a) within the nominated area(s) identified in Annexure 1 (sewage treatment plant and effluent disposal); and

b) other land for the purpose of dust suppression and/or firefighting.

G3: The application of treated effluent to land must be carried out in a manner such that:

a) vegetation is not damaged;

b) there is no surface ponding of effluent; and

c) there is no run-off of effluent.

G4: If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.

G5: All sewage effluent released to land must be monitored at the frequency and for the parameters specified in **Table G1 - Contaminant Release Limits to Land**.

G6: The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.

G7: When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.

G8: A minimum area of 2.5 ha of land, excluding any necessary buffer zones, must be utilised for the irrigation and/or beneficial reuse of treated sewage effluent.

G9: Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the Act whilst using the treated sewage effluent.

6.2.8 Schedule H – Land and Rehabilitation

H1: Land disturbed by mining must be rehabilitated in accordance with **Table H1 - Rehabilitation Requirements**.

H2: Rehabilitation must commence progressively in accordance with the plan of operations.

Contaminated Land

H3: Before applying for surrender of a mining lease, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the mining lease which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use.

Table G1
Contaminant Release Limits to Land

Contaminant	Unit	Release Limit	Limit Type	Frequency
5 day Biochemical oxygen demand (BOD)	mg/L	20	Maximum	Monthly
Total suspended solids	mg/L	30	Maximum	Monthly
Nitrogen	mg/L	30	Maximum	Monthly
Phosphorus	mg/L	15	Maximum	Monthly
E-coli	Organisms/100ml	1000	Maximum	Monthly
pH	pH units	6.0 – 9.0	Range	Monthly

Table H1
Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Performance Indicators	Completion Criteria
Waste Rock Emplacements	(a) Long-term safety	1. Backfill to original ground level (or higher) to allow for settlement. 2. Structurally sound; safe to people and animals.	a) Engineering design of waste emplacements. b) Exposure to spontaneous combustion material near surface. c) Landform hazards to people and animals.	I. Evidence that rehabilitated landforms have a rate of erosion similar or below that in the relevant reference sites. II. Evidence that spoil sodicity has been managed. III. Record of compliance with procedures and management plans. IV. Evidence that safety issues and physical risks (e.g. falls from height) have been addressed.
	(b) Non-polluting	1. Waste emplacements are adequately managed to avoid exposure to hazardous materials and yield runoff and seepage that is unlikely to detrimentally affect known environmental values.	a) Exposure to acid forming/generating materials. b) Water quality parameters.	I. Evidence that risk assessment has been carried out on potential long-term pollution aspects and that appropriate control measures are in place. II. Water quality monitoring post closure indicates water quality to be similar to relevant reference sites. III. No exposure of hazardous materials due to erosion of covering material.
	(c) Stable	1. Slopes and surfaces are geotechnically stable. 2. Landform with very low probability of slope slippage or failure with serious environmental consequences. 3. Waste rock emplacements have self sustaining vegetative cover. 4. Landform designs achieve soil loss rates similar to or lower than those on relevant reference sites.	a) Engineering design of waste rock emplacements. b) Erosion. c) Slope failure. d) Vegetation cover (foliage projective cover, type and density).	I. Waste rock emplacements are set back the appropriate distance from final void pit crests. II. Evidence that stability has improved over time as rehabilitation has become established. III. Soil loss rates similar to corresponding relevant reference sites. IV. Evidence that the landform is stable under regular and irregular climatic events. V. Evidence that vegetation cover, types and densities are comparable to relevant reference sites.

Table H1 (Continued)
Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Performance Indicators	Completion Criteria
Waste Rock Emplacements (cont.)	(d) Sustainable Land Use	1. Soil, biological, chemical and physical properties provide support to preferred land use. 2. Vegetation diversity and sustainability are commensurate with the preferred final land use.	a) Adequate topsoil is present to allow vegetation cover establishment. b) Soil organic matter, soil nutrients, invertebrate activity, soil texture are comparable with relevant reference sites. c) Vegetation contains a diversity (trees, shrubs, herbs, grass) comparable to relevant reference sites. d) Native vegetation recruitment. e) Exotic species diversity and abundance.	I. Evidence that physical, chemical and biological properties of the growth media are similar to relevant reference sites. II. Evidence of nutrient cycling/accumulation occurs at a rate comparable with relevant reference sites. III. Evidence that diversity of plant species are similar to that of relevant reference sites. IV. Evidence of generational succession of trees and shrubs apparent in rehabilitation areas.
Final Voids	(a) Long-term safety	1. Structurally sound. 2. Safe to people and animals.	a) Fall hazards. b) Drowning hazards.	I. Perimeter bunding formed and security fencing and signage installed.
	(b) Non-polluting	1. Final voids are isolated from the Isaac River. 2. Final void area and volumes are minimised. 3. Final void hydrology is understood. 4. Interconnectivity between final voids and groundwater is understood. 5. Final voids predicted act as groundwater sinks into perpetuity.	a) Isaac River flood waters isolated from the final voids. b) Surface water and groundwater quality parameters. c) Groundwater monitoring and modelling.	I. Evidence that the final void water is contained with no overflows as predicted by modelling. II. Final void is protected from possible inflows associated with floods from the Isaac River. III. Evidence through monitoring that the groundwater quality is as predicted and stable.

Table H1 (Continued)
Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Performance Indicators	Completion Criteria
Final Voids (cont.)	(c) Stable	1. Slopes and surfaces are geotechnically stable. 2. Landform with very low probability of slope slippage or failure with serious environmental consequences. 3. Landform designs achieve soil loss rates similar to or lower than those on relevant reference sites.	a) Engineering design. b) Erosion. c) Record of slope failure.	I. Final voids profiled for long-term stability as evidenced by geotechnical surveys of highwalls and endwalls. I. Evidence that stability of the final void low walls has improved over time as rehabilitation is established. II. Soil loss rates similar to corresponding relevant reference sites.
	(d) Sustainable Land Use	1. Unused void acting as a groundwater sink.	a) Groundwater modelling. b) Groundwater monitoring.	I. Updated groundwater modelling based on ongoing groundwater data collection indicates the final voids will act as groundwater sinks into perpetuity.
Infrastructure Areas	(a) Long-term safety	1. Structurally sound; safe to people and animals.	a) Structural integrity of retained infrastructure.	I. Evidence that risk from retained infrastructure has been minimised.
	(a) Non-polluting	1. Infrastructure areas are free of waste and hazardous material both domestic and industrial.	a) Presence of waste and hazardous material.	I. Evidence that all waste and hazardous material has been removed.
	(b) Stable	1. Infrastructure areas are located on a stable uniform ground surface suitable for preferred final land use.	a) Structural integrity of retained infrastructure. b) Safe access routes.	I. Evidence that risk from remnant infrastructure have been minimised and, if necessary, control measures are in place to meet agreed requirements.
	(c) Sustainable Land Use	1. Infrastructure areas are commensurate with the preferred final land use.	a) Useability of retained infrastructure.	I. Evidence of use of the retained infrastructure.
Water Management Infrastructure	(a) Long-term safety	1. Structurally sound; safe to people and animals.	a) Presence of waste material. b) Structural integrity of retained infrastructure. c) Appropriate decommissioning of regulated structures and other dams.	I. Perimeter bunding formed and security fencing installed. II. Record of compliance with procedures and management plans. III. Evidence that safety issues and physical risks have been addressed.

Table H1 (Continued)
Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Performance Indicators	Completion Criteria
Water Management Infrastructure (cont.)	(b) Non-polluting	1. Retained water management infrastructure is free from hazardous materials. 2. Final landform water storages are non-polluting and meet water quality parameters suitable for preferred closure options (e.g. agricultural use).	a) Presence of waste and/or hazardous material. b) Exposure to saline or sodic materials. c) Surface water monitoring upstream and downstream.	I. Evidence that contaminated land has been remediated in accordance with environmental regulation. II. Evidence through monitoring that surface water quality is not negatively impacted by final rehabilitation.
	(c) Stable	1. Diversion with very low probability of erosion or failure with serious environmental consequences. 2. Vegetation cover is established to minimise rate of soil loss. 3. All water infrastructure is structurally and operationally compliant at point of closure.	a) Engineering design. b) Erosion. c) Vegetation type and density. d) Downstream water impacts.	I. Evidence that stability of the diversion has improved over time as rehabilitation is established. II. Soil loss rates similar to corresponding relevant reference sites. III. Vegetation types and density are comparable with relevant reference sites.
	(d) Sustainable Land Use	1. Soil, biological, chemical and physical properties provide support to preferred land use. 2. Native ecosystem diversity and sustainability are commensurate with the preferred final land use.	a) Water quality established by monitoring or modelling validated by monitoring. b) Structural report on integrity of structure. c) Vegetation contains a diversity (trees, shrubs, herbs, grass) comparable to relevant reference sites. d) Native vegetation recruitment. e) Exotic species identification and management.	I. Evidence that physical, chemical and biological properties of the growth media are similar to relevant reference sites. II. Evidence of nutrient cycling/accumulation occurs at a rate comparable with relevant reference sites. III. Meets specified water quality guidelines.

Table H1 (Continued)
Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Performance Indicators	Completion Criteria
ILF Cells	(a) Long-term safety	1. Structurally sound; safe to people and animals.	a) Landform hazards to people and animals.	I. Record of compliance with procedures and management plans.
	(b) Non-polluting	1. Runoff and seepage not affect known environmental values.	a) Water quality parameters.	I. Water quality monitoring post closure indicates water quality to be similar to relevant reference sites. II. No exposure of hazardous materials due to erosion of covering soil.
	(c) Stable	1. Surfaces are geotechnically stable. 2. Landform with very low probability of slope slippage or failure with serious environmental consequences.	a) Erosion. b) Vegetation cover (type and density).	I. Evidence that stability has improved over time as rehabilitation has become established. II. Soil loss rates similar to corresponding relevant reference sites. III. Evidence that the landform design is stable under regular and irregular climatic events. IV. Evidence that vegetation cover, types and densities are comparable to relevant reference sites.
	(d) Sustainable Land Use	1. Soil, biological, chemical and physical properties provide support to preferred land use. 2. Native ecosystem diversity and sustainability are commensurate with the preferred final land use.	a) Adequate topsoil is present to allow vegetation cover establishment. b) Soil organic matter, soil nutrients, invertebrate activity, soil texture are comparable with relevant reference sites. c) Exotic species diversity and abundance.	I. Evidence that physical, chemical and biological properties of the growth media are similar to relevant reference sites. II. Evidence of nutrient cycling/accumulation occurs at a rate comparable with relevant reference sites.

H4: Before applying for progressive rehabilitation certification for an area, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the area the subject of the application which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use under Condition H1.

H5: Minimise the potential for contamination of land by hazardous contaminants.

Impacts to Prescribed Environmental Matters

H6: Significant residual impacts to prescribed environmental matters, are not authorised under this environmental authority or the *Environmental Offsets Act 2014*, unless the impact(s) is specified in **Table H2 - Significant Residual Impacts to Prescribed Environmental Matters**.

H7: Records demonstrating that each impact to a prescribed environmental matter, not listed in **Table H2 – Significant Residual Impacts to Prescribed Environmental Matters**, did not, or is not likely to, result in a significant residual impact to that matter must be:

a) completed by an appropriately qualified person; and

b) kept for the life of the environmental authority.

H8: An environmental offset made in accordance with the *Environmental Offsets Act 2014* and *Queensland Environmental Offsets Policy*, as amended from time to time, must be undertaken for the maximum extent of impact to each prescribed environmental matter authorised in **Table H2 - Significant Residual Impacts to Prescribed Environmental Matters**, unless a lesser extent of the impact has been approved in accordance with Condition H11.

Table H2
Significant Residual Impacts to Prescribed Environmental Matters

Matters of State Environmental Significance			Stage 1 Impact (ha)	Significant Residual Impacts Likely?
Regulated Vegetation	'Endangered' or 'of concern' regional ecosystems*; or	RE 11.3.1	1.5	Yes
		RE 11.4.8	1.5	Yes
		RE 11.4.9[A]	3.5	Yes
		RE 11.5.17	5	Yes
		RE 11.3.2	21.5	Yes
		RE 11.3.3	0.5	Yes
		RE 11.3.4	1	No
	Regional ecosystems within mapped vegetation management wetlands		19	Yes
	Regional ecosystems within the defined distance of a vegetation management watercourse		4.5	Yes
Connectivity Areas			835	Yes
Wetlands and Watercourses				Yes
Designated Precinct in a Strategic Environmental Area			0	No
Protected Wildlife Habitat*	Ornamental Snake[#]		461	Yes
	Koala[#]		828	Yes
	Greater Glider[#]		806.5	Yes
Protected Areas			0	No
Highly Protected Zones of State Marine Parks			0	No
Fish Habitat Areas			0	No
Waterways Providing for Fish Passage			0	No
Marine Plants			0	No
Legally Secured Offset Areas			0	No

[A] 13 ha of this community is mapped as the Brigalow TEC under the EPBC Act

[#] This species is also listed under the EPBC Act.

* The REs and species habitats overlap (i.e. the REs and habitats are not mutually exclusive).

Staged Impacts

H9: The significant residual impacts to a prescribed environmental matter authorised in Condition H6 for which an environmental offset is required by Condition H8 may be carried out in stages. An environmental offset can be delivered for each stage of the impacts to prescribed environmental matters.

H10: Prior to the commencement of each stage, a report completed by an appropriately qualified person, that includes an analysis of the following must be provided to the administering authority:

a) for the forthcoming stage—the estimated significant residual impacts to each prescribed environmental matter; and

b) for the previous stage, if applicable—the actual significant residual impacts to each prescribed environmental matter, to date.

H11: The report required by Condition H10 must be approved by the administering authority before a notice of election for the forthcoming stage, if applicable, is given to the administering authority.

H12: A notice of election for the staged environmental offset referred to in Condition H11, if applicable, must be provided to the administering authority no less than three months before the proposed commencement of that stage, unless a lesser timeframe has been agreed to by the administering authority.

H13: Within six months from the completion of the final stage of the project, a report completed by an appropriately qualified person, that includes the following matters must be provided to the administering authority:

a) an analysis of the actual impacts on prescribed environmental matters resulting from the final stage; and

b) if applicable, a notice of election to address any outstanding offset debits for the authorised impacts.

6.2.9 Schedule I – Watercourse Diversions

Permanent Watercourse Diversions

I1: Permanent watercourse diversions must be designed and constructed to:

a) incorporate natural features (including geomorphic and vegetation) present at the location of the diversion;

b) maintain the pre-existing hydrologic characteristics of surface water and groundwater systems for the area in which the watercourse diversion is located;

c) maintain the hydraulic characteristics of the permanent watercourse diversion that are equivalent to other local watercourses and are suitable for the area in which the diversion is located without using artificial structures that require on-going maintenance;

d) maintain sediment transport and water quality regimes that allow the diversion to be self-sustaining, while minimising any impacts to upstream and downstream water quality, geomorphology or vegetation;

e) maintain equilibrium and functionality in all substrate conditions at the location of the diversion;

f) allow the free passage of fish both upstream and downstream in a safe manner.

Design Plan – All Diversions

I2: A certified Design Plan that achieves Condition I1 for permanent watercourse diversions must be submitted to the administering authority at least 10 business days before commencing construction of the diversion.

I3: The certified design plan for any temporary or permanent watercourse diversion must be consistent with the functional design/s that formed a part of the application documents for this authority.

Construction and Operation – All Diversions

I4: A certified set of ‘as constructed’ drawings and specifications must be submitted to the administering authority within 60 business days from the completion of construction of the temporary or permanent watercourse diversion, or re-establishment of the pre-existing watercourse. These drawings and specifications must state:

a) that the 'as constructed' drawings and specifications meet the original intent of the design plan for the watercourse diversion; and

b) construction of the watercourse diversion is in accordance with the design plan.

Register – All diversions

I6: The details of watercourse diversions planned and constructed under an environmental authority must be accurately recorded on the Register of Watercourse Diversions kept by the holder of the authority. An electronic copy must be provided to the administering authority on request.

6.2.10 Schedule J – Regulated Structures

Assessment of Consequence Category

J1: The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*,at the following times:

a) prior to the design and construction of the structure, if it is not an existing structure; or

b) prior to any change in its purpose or the nature of its stored contents.

J2: A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.

J3: Certification must be provided by the suitably experienced and qualified person who undertook the assessment, in the form set out in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.

Design and construction of a regulated structure

J4: All regulated structures must be designed by, and constructed under the supervision of, a suitably experienced and qualified person in accordance with the requirements of the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.

J5: Construction of a regulated structure is prohibited unless:

a) the holder has submitted a consequence category assessment report and certification to the administering authority; and

b) certification for the design, design plan and the associated operating procedures has been certified by a suitably experienced and qualified person in compliance with the relevant condition of this authority.

J6: Certification must be provided by the suitably experienced and qualified person who oversees the preparation of the design plan in the form set out in the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*, and must be recorded in the Register of Regulated Structures.

J7: Regulated structures must:

a) be designed and constructed in compliance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*;

b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:

   (i) floodwaters from entering the regulated dam from any watercourse or drainage line; and

   (ii) wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

c) have the floor and sides of the dam designed and constructed to prevent or minimise the passage of the wetting front and any entrained contaminants through either the floor or sides of the dam during the operational life of the dam and for any period of decommissioning and rehabilitation of the dam.

J8: Certification by the suitably qualified experienced and qualified person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:

a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and

b) construction of the regulated structure is in accordance with the design plan.

J9: All affected persons must be provided with a copy of the emergency action plan in place for each regulated structure:

a) for existing structures that are regulated structures, within 10 business days of this condition taking effect;

b) prior to the operation of the new regulated structure; and

c) if the emergency action plan is amended, within 5 business days of it being amended.

Operation of a Regulated Structure

J10: Operation of a regulated structure, except for an existing structure, is prohibited unless the holder has submitted to the administering authority in respect of regulated structure, all of the following:

a) one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with Condition J4;

b) a set of 'as constructed' drawings and specifications;

c) certification of the 'as constructed drawings and specifications' in accordance with Condition J7;

d) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan;

e) the requirements of this authority relating to the construction of the regulated structure have been met;

f) the holder has entered the details required under this authority, into a Register of Regulated Structures; and

g) there is a current operational plan for the regulated structure.

J11: Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in compliance with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.

Mandatory reporting level

J12: Conditions J15 to J16 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.

J13: The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

J14: The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.

J15: The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

J16: The holder must record any changes to the MRL in the Register of Regulated Structures.

Design storage allowance

J17: The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system,taken prior to 1 July of each year.

J18: By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).

J19: The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

J20: The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Annual inspection report

J21: Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

J22: At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably experienced and qualified person must prepare an annual inspection report containing details of the assessment and include a recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.

J23: The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.

J24: The holder must within 20 business days of receipt of the annual inspection report, provide to the administering authority:

a) the recommendations section of the annual inspection report;

b) if applicable, any actions being taken in response to those recommendations; and

c) if, following receipt of the recommendations and (if applicable) recommended actions, the administering authority requests a copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days of receipt of the request.

J25: The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

Decommissioning and rehabilitation

J26: Regulated structures must not be abandoned but be either:

a) decommissioned and rehabilitated to achieve compliance with Condition J27; or

b) be left in-situ for a use by the landholder provided that:
   (i) it no longer contains contaminants that will migrate into the environment; and
   (ii) it contains water of a quality that is demonstrated to be suitable for its intended use(s).

c) the holder of the environmental authority and the landholder agree in writing that the;
   (i) dam will be used by the landholder following the cessation of the environmentally relevant activity(ies); and
   (ii) landholder is responsible for the dam, on and from an agreed date.

J27: Before surrendering this environmental authority the site must be rehabilitated to achieve the rehabilitation requirements in **Table H1 - Rehabilitation Requirements**.

Register of Regulated Structures

J28: A Register of Regulated Structures must be established and maintained by the holder for each regulated structure:

J29: The holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated dam is submitted to the administering authority.

J30: The holder must make a final entry of the required information in the Register of Regulated Structures once compliance with Conditions J11 and J12 has been achieved.

J31: The holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.

J32: All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.

J33: The holder must supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format required by the administering authority.