

Chapter 31
Conclusions and commitments

ESMERALDA GRAPHITE PROJECT

aarc ENVIRONMENTAL SOLUTIONS
APEM Group

GRAPHINEX

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Glossary, acronyms and abbreviations

Acronym or Abbreviation	Meaning
ACCU	Australian Carbon Credit Units
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AS	Australian Standard
BMP	Bushfire Management Plan
CHMP	Cultural Heritage Management Plan
DAF	Department of Agriculture and Fisheries
DEHP	Department of Environment and Heritage Protection
DES	Department of Environment and Science
DESI	Department of Environment, Science and Innovation
DETSI	Department of the Environment, Tourism, Science and Innovation
DIDO	Drive-In Drive-Out
DPI	Department of Primary Industries
DSITI	Department of Science, Information Technology and Innovation
EA	Environmental Authority
EIS	Environmental Impact Statement
EO Act	*Environmental Offsets Act 2014*
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
EV	Environmental Values
FIFO	fly-in/fly-out
FTE	Full time equivalent
GAB	Great Artesian Basin
GABORA	Great Artesian Basin and Other Regional Aquifers
GDE	Groundwater Dependent Ecosystems
GHG	Greenhouse Gas
GRF	Gilbert River Formation
GRP	Gross regional product
GSP	Gross State Product

Acronym or Abbreviation	Meaning
GVA	Gross value add
HR Act	*Human Rights Act 2019*
IECA	International Erosion Control Association
IMP	Irrigation Management Plan
LGA	Local Government Area
LOP	Life of Production
MAW	Mine affected water
MIA	Mine infrastructure area
ML	Mining Lease
MLA	Mining Lease Application
MSES	Matters of State Ecological Significance
MW	Megawatts
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NMP	Noise Management Plan
NUMA	Non-use management area
NZS	New Zealand Standard
PDD	Pit Dewatering Dam
PMF	Probable Maximum Flood
PMLU	Post mining land use
PRCP	Progressive Rehabilitation and Closure Plan
PWD	Process Water Dam
QFES	Queensland Fire and Emergency Services
QH Act	*Queensland Heritage Act 1992*
QPS	Queensland Police Service
RA	Rehabilitation Areas
RE	Regional Ecosystems
REMP	Receiving Environment Monitoring Program
RFB	Royal Fire Brigade
RFDS	Royal Flying Doctor Service
SES	State Emergency Service
SHMS	Safety and Health Management System
SIMP	Social Impact Management Plans

Acronym or Abbreviation	Meaning
SMU	Soil Management Unit
STP	Sewage Treatment Plant
TOR	Terms of Reference
TSF	Tailings Storage Facilities
WMP	Water Management Plan
WoNS	Weed of National Significance
WQO	Water Quality Objectives
WRD	Waste rock dump

31 Conclusions and commitments

31.1 Project impacts and management measures summary

In accordance with the Terms of Reference, this chapter provides a consolidated description of the Qld Aus Graphite Pty Ltd (the Proponent) management and monitoring commitments that will be implemented for the Esmeralda Graphite Project (the Project).

31.1.1 Land, rehabilitation and closure

Table 31-1: Land and rehabilitation impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Land disturbance to 2413.7 ha	Adverse	All areas will be rehabilitated to achieve the requirements of an assigned post-mining land use (PMLU). All areas will be required to meet agreed rehabilitation milestone criteria in accordance with approvals. PMLUs are developed in collaboration with stakeholders.
Permanent changes to topography including retained water structures, final landform and permanent diversion changing the ecological functionality and visual amenity values of the site	Adverse	PMLUs are developed in collaboration with stakeholders and in consideration of the pre-mining land use of grazing. The Project proposes to return as much of the site as practicable to a post-mining land use of grazing. A permanent diversion will be developed and rehabilitated in a manner that sustains ecological function of the watercourse. The revegetation of the retained TSF and WRD will support a reduced visual amenity impact.
Permanent changes to topography including retained water structures, final landform and permanent diversion changing the ecological functionality and visual amenity values of the site	Beneficial	Permanent infrastructure will be retained via negotiated agreements with appropriate landholders, and support grazing operations through improved access, and additional watering point..
Permanent storage of tailings in-pit and in the rehabilitated TSF	Adverse	Low-permeability, engineered capping of tailings in-pit, ensuring hydraulic isolation of the tailings, before backfilling to surface with waste rock. Tailings facility to have a low permeability capping layer above the tailings, prior to additional capping with waste rock and growth medium. Revegetation of TSF to a grassland PMLU, and exclusion of cattle access with fencing. Groundwater monitoring network up and down gradient of TSF.

31.1.2 Water

Table 31-2: Water impacts and management measures

Potential impact	Adverse or beneficial Impact	Management measure
Surface water		
Erosion and sedimentation from disturbed areas causes contamination in downstream aquatic environments	Adverse	Sediment dams will provide sufficient storage for settlement of suspended solids so that water quality during overtopping events has negligible impact on the water quality in the receiving waterway. Progressive rehabilitation and stabilisation of disturbed areas will also be undertaken to reduce sediment generation over time. Erosion and sediment control plan will be developed that applies the hierarchy of controls to avoid areas where possible, install erosion control protection measures, topsoil management and retention, monitoring and rectification works and ongoing continuous improvement through the assessment of the effectiveness of controls.
Ore processing generating mine affected water	Adverse	Water used in the concentrator processing plant will be recycled through the various stages and discharged with the tailings material to the four TSFs over the project life. Water will be recollected through a sump and used for water supply where suitable. Excess water in the tailings will evaporate.
The reduction in downstream runoff primarily associated with: • capture and retention of runoff from disturbed mine infrastructure areas; • evaporation losses from mine water storages and sediment dams; • retention of runoff within the mining pit; and • reuse of captured water for operational demands within the processing plant and site water management system.	Adverse	Water management plan to ensure water is managed efficiently and responsibly throughout the life of the operation, while protecting the environmental values of surrounding surface water environments Water management system designed to align with the objectives of the Water Plan (Gulf) 2007 by sustainably managing overland flow, minimising impacts to natural ecosystems, and supporting equitable access to water resources Minimising the capture of clean external runoff through reuse of MAW and clean water diversion Infrastructure and operational controls to maintain separation of water types and reduce environmental risk.
impacts associated with waterway barrier works include: • localised changes to flow velocities and drainage patterns;	Adverse	A water management plan will detail site water management infrastructure, maintenance requirements and containment performance standards to apply in design and operation of the Project to address water risks.

Potential impact	Adverse or beneficial Impact	Management measure
• temporary disruption to hydraulic connectivity during construction activities; • local scour or erosion associated with altered flow paths; and • impacts to fish passage and aquatic connectivity.		
Mine water dam overflows causing contamination	Adverse	Mine water storages associated with the Project have been designed to operate as a closed system, with all overflows directed internally to the mining pit. No routine off-site discharge from mine water storages is proposed, impacts to downstream surface water resources associated with mine water dam overflows are expected to be minimal The Project does not propose controlled water releases. Mine affected water including rainfall runoff and groundwater ingress will be dewatered to the PDD, which will then be transferred to PWD for reuse in the processing plant.
Sediment dam overflow causing contamination	Adverse	Sediment dams have been designed to contain runoff from the 10% AEP, 24-hour rainfall event, including allowance for sediment storage Sediment dams 3 and 4 overflow to the stream order 3 tributary, and sediment dams 1 and 2 overflow to the mining pit. These dams only overtop during large events where receiving waterways experience elevated flows. Sediment dams may receive run-off water from waste rock dumps. Overburden materials can produce concentrations of molybdenum (Mo) and selenium (Se) that are above livestock drinking water criteria of 0.15 mg/L and 0.02 mg/L, respectively. These trace metal/metalloids are typically associated with neutral metalliferous drainage (NMD), rather than AMD. However, concentrations peak in the third leach event and then diminish and should not persist in the long term. Considering the dam capacity, relatively low metal concentrations and volume contributions from seepage compared to runoff during larger rainfall events, any contaminants produced from seepage are expected to be diluted by surface runoff and remain below the draft WQOs. Sedimentation pond 3 water quality is expected to be influenced by the WRD seepage however is expected to produce a low risk of exceeding the draft WQOs in overflows. The risk is further mitigated by the expected dilution in the receiving waterway (stream order 3 tributary) with a contributing catchment of 115 km2 (160 times greater than the sedimentation pond 3 catchment).

Potential impact	Adverse or beneficial Impact	Management measure
Groundwater		
Water supply restrictions as a result of Project dewatering	Adverse	The Project will utilise associated water from an aquifer managed under the GABORA Water Plan as part of the Project water supply
Mining activities causing groundwater drawdown	Adverse	The maximum predicted drawdown in the GRF extends beyond the Project area, with drawdown extending approximately 1600 m beyond ML 100430 in the north and 1200 m beyond ML 100431 in the southwest Proponent has obligations under Chapter 3 of the Water Act 2000 to undertake baseline assessments of any third-party groundwater supply bores which may be impacted by the Project, and where necessary, entering into make good agreements with owners of affected groundwater supply bores. The Proponent commits to these undertakings. Groundwater Monitoring Program to: • establishing monitoring sites that are located downgradient of potential sources; • establishing monitoring sites capable of monitoring groundwater flow paths between sources and receptors; • establishing a long-term dataset that represents baseline groundwater information (i.e. baseline groundwater level and quality conditions); • allowing the ability to confirm model predictions of groundwater levels and drawdown resulting from Project mining activities; and • allowing the ability to assess whether there is potential for environmental harm.
Seepage of contaminants from the backfilled void and rehabilitated TSF	Adverse	The tailings in the backfilled void will be hydraulically isolated with low permeability capping to reduce water inflow rates and slow the mobilisation of contaminants. The rehabilitated TSF will be capped with a low permeability layer, preventing water infiltration. The HDPE liner of the TSF will also prevent seepage of contaminants. Monitoring of adjacent groundwater bores will be undertaken, with a period of 5 consecutive years of no exceedances of trigger limits required before satisfying the rehabilitation milestone to relinquish the site.
Water related cultural values Changes to waterways may alter the perception and cultural significance of certain sites for Indigenous communities.	Adverse	A Cultural Heritage Management Plan (CHMP) is being developed and will be finalised prior to any construction activities.

Potential impact	Adverse or beneficial Impact	Management measure
Changes could have implications for the cultural practices, traditions, and values associated with these elements. To the extent possible, the Project has been designed to avoid impacts to waterways		Any development activities that affect alter waterways will be carefully evaluated to determine their potential impact on the cultural heritage values of the area. Any uncovered artefacts or sites will undergo detailed assessment by an appropriate Aboriginal Party or a suitably qualified professional. Appropriate processes will be in place to manage and preserve the identified values.

31.1.3 Flora and fauna

Table 31-3: Flora and fauna impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Contribution to research and knowledge base on species of concern	Beneficial	• Various surveys identifying species of concern • Ongoing monitoring • Offset management plans that are required to generate overall conservation gain for species effected by the Project
Weed and feral animal control	Beneficial	• Weed and feral animal control managed through Weed and Feral animal control plans • Offset areas and locations on site which are degraded will be improved through weed and pest control measures and restricted access.
Vegetation clearance and habitat disturbance causes the loss of biodiversity or habitat fragmentation	Adverse	A financial offset will satisfy MSES offset obligations. • Clearing activities will be undertaken progressively in accordance with the mine schedule and Project requirements and not before necessary, to protect the land • Clearing operations will be managed to maximise the reuse of cleared vegetative material. This will include the potential to salvage and reuse select habitat resources from the cleared vegetation (e.g. logs) for habitat enhancement, either in the rehabilitation program or elsewhere on site, or mulching of removed vegetation for respreading to minimise erosion.

Potential impact	Adverse or beneficial impact	Management measure
		• Clearing activities will be undertaken in accordance with mitigations measures for cultural heritage matters, developed in consultation with the Tagalaka People (detailed in the Cultural Heritage EIS chapter for the Project). • All land will be rehabilitated to an agreed PMLU that includes areas of native vegetation.
Modification of water courses impacts wetlands and riparian habitat function	Adverse	• A water management plan will be developed and implemented to ensure effective design and management of surface flows around the mining operation, with consideration of surrounding biota, including wetlands. • An erosion and sediment control plan will be developed and implemented to mitigate erosion processes and protect downstream ecosystems from increased sediments loads. • A water quality monitoring program will be developed and implemented to confirm the effectiveness of management practices and the protection of downstream ecosystems
Changes to flood regimes affect downstream waterway ecosystems	Adverse	The diversion and flood protection measures will be designed to ensure existing channel features are maintained and flood regimes are not significantly altered.

31.1.4 Economics

Table 31-4: Economic impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Influx of workers causes pressure on labour market for workers	Adverse	The source of labour during operations is expected to be similar as during construction, with up to around 10% of the workforce sourced locally (within 125 km of the Project) and the remainder being FIFO workers. The Proponent will engage with stakeholders to minimise demand pressures should this issue emerge.

Potential impact	Adverse or beneficial impact	Management measure
Increased employment opportunities associated with the project. The project is expected to support 465 FTE during operations and 366 FTE during construction	Beneficial	The Project will prioritise employment opportunities for local and Indigenous workers. It is expected that the majority of workers will be from outside the local catchments.
Increased demand for accommodation associated with the Project increases prices/reduces housing affordability	Neutral	Increased house prices is beneficial for some while adverse for others. The Project workforce will be predominantly FIFO and accommodated on site. The use of a FIFO workforce minimises pressure on local accommodation or the local or regional property market.
Project contributes to government revenue. The Project is expected to generate the following in taxation revenue accruing to the Queensland Government and Australian Government; • $60.3 million in total during construction • $77.4 million per annum on average during operations	Beneficial	The Project will seed to maximise this value through collaborative and efficient operations.
Impact on GHG Emissions The present value cost of GHG emissions attributable to the Project is estimated to equate to $455.6 million at a 7% discount rate, using a social cost of carbon approach consistent with guidelines from Infrastructure Australia (2023)	Adverse	GHG abatement measures will be applied to the Project to mitigate emissions.

31.1.5 Air quality

Table 31-5: Air quality impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Dust deposition	Adverse	Results of the air quality assessment demonstrated that predicted ground-level concentrations of all air pollutants and dust deposition rates due to the Project with ambient background levels included are predicted to comply with the relevant air quality objectives at all sensitive receptors. Air quality will be monitored over the life of the Project to ensure any potential adverse impacts are identified if they occur. Specific management controls will then be developed if they occur.

31.1.6 Greenhouse Gas

Table 31-6: Noise and vibration impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Throughout the life of Project (LOP), including construction, operation, and decommissioning, the total unabated GHG emissions are estimated to be 6,798,698 t CO_2-e	Adverse	Replacing the assumed all-road freight route with the road and rail option is estimated to reduce: • Downstream transportation and distribution emissions by approximately 216,484 t CO_2-e over the LOP; and • Upstream transportation and distribution emissions by approximately 86,204 t CO_2-e over the LOP. This estimate does not assume rail freight is used during Project Year 1, as construction phase freight is assumed to be transported by road.

Potential impact	Adverse or beneficial impact	Management measure
	Adverse	Graphinex will also investigate other Scope 3 abatement opportunities including: • Lower emission capital goods (low carbon steel and green concrete); • Logistics optimisation; • Ongoing Scope 3 monitoring and evaluation by working with suppliers and customers to reduce carbon footprint; and • Research initiatives into reducing the lifecycle and embodied carbon intensity of the Project's sold products for opportunities to contribute to lifecycle improvements of product
Impact on GHG Emissions Graphinex increases the supply of graphite, a critical mineral required in the transition to renewables to reduce the global reliance on fossil fuel and subsequent GHG emissions.	Beneficial	The Project will seed to maximise this value through collaborative and efficient operations while reducing the GHG emissions generated by the Project itself.

31.1.7 Noise and vibration

Table 31-7: Noise and vibration impacts and management measures

Potential impact	Adverse or beneficial impacts	Management measure
Noise	Adverse	Predicted noise levels at residential sensitive receptors near the Project where the daytime noise limit is at 40 dBA and the night-time limit is at 35 dBA. The highest A-weighted noise level is expected to occur at Receptor 2 (Prospect) in calm night conditions, at 31 dBA. The predicted noise levels are under the limits, the Project will be compliant with the acoustic quality objectives Ongoing monitoring of noise and vibration will be conducted through the life of the Project to identify if any levels above the limits are recorded and, if so, apply corrective measures.

Potential impact	Adverse or beneficial impacts	Management measure
Airblast vibration from blasting or operation activities impacts nearby sensitive receptors.	Adverse	Air blast and modelling identified that airblast levels are below the airblast limits of 115 and 120 dB at a distance of 3 to 4 km. The nearest receptor (R2) is approximately 10 km from the mine pit, at which point the airblast levels are well below these limits. Ongoing monitoring of noise and vibration will be conducted through the life of the Project to identify if any levels above the limits are recorded and, if so, apply corrective measures.
Ground vibration from blasting or operation activities impacts nearby sensitive receptors.	Adverse	Vibration levels are below the vibration limits of 5 and 10 mm/s at a distance of 1 to 2 km. The nearest receptor (R2) is approximately 10 km from the mine pit, at which point the vibration levels are well below the vibration limits Ongoing monitoring of noise and vibration will be conducted through the life of the Project to identify if any levels above the limits are recorded and, if so, apply corrective measures.

31.1.8 Traffic and transport

Table 31-8: Traffic and transport impacts and management measures

Potential impact	Adverse or beneficial impacts	Management measure
Increased heavy vehicle transport of graphite product on public roads causing accidents	Adverse	Road design and maintenance works to increase capacity where appropriate Further investigation of rail options
Increased heavy vehicle transport causing damage to roads	Adverse	Maintenance agreements to negotiated with road owners
Improvements of transport system	Beneficial	Maintenance agreements to be negotiated with road owners
Increased traffic of DIDO workers causing vehicle accidents	Adverse	95% of workers to be FIFO direct to site

31.1.9 Visual amenity

Table 31-9: Visual amenity impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Project may impact the visual amenity of surrounding sensitive receptors during nighttime operations	Adverse	The western WRD will reach an estimated maximum height of 109 m above the current surface (234 mAHD); and the eastern WRD is estimated to reaching a maximum peak height of 90 m above the current surface (215 mAHD). Visual amenity is considered in the design of the landform and has been designed to replicate natural topography and with minimal height and slope gradients within the constrains of volume and stability.

31.1.10 Social

Table 31-10: Social impacts and management measures

Potential impact	Adverse or beneficial impact	Management measure
Workforce Management		
Increase in employment opportunities	Beneficial	Further develop and implement manage measures in the Workforce Management Plan including: • Recruitment hierarchy prioritising employment in the following order: Croydon LGA residents; Carpentaria and Richmond LGA residents; broader North and Northwest Queensland residents; rest of Queensland. • Staggered recruitment advertising and use of various channels to promote Project opportunities (e.g., Jobs Northwest, Project website, local noticeboards/newsletters, etc). • Collaborate with construction and principal operations contractor to deliver apprenticeships and/or traineeships (contracting expectation). • Collaborate with employment and training providers to facilitate access to Project opportunities (e.g., school and industry-based partnerships, strategies to reduce First Nations employment barriers, etc).Regularly and transparently monitor groundwater impact throughout the life of the Project.

Potential impact	Adverse or beneficial impact	Management measure
Increase in training and skills development opportunities (Operations)	Beneficial	Further develop and implement manage measures in the Workforce Management Plan including: • Recruitment hierarchy prioritising employment in the following order: Croydon LGA residents; Carpentaria and Richmond LGA residents; broader North and Northwest Queensland residents; rest of Queensland. • Staggered recruitment advertising and use of various channels to promote Project opportunities (e.g., Jobs Northwest, Project website, local noticeboards/newsletters, etc). • Collaborate with construction and principal operations contractor to deliver apprenticeships and/or traineeships (contracting expectation). • Collaborate with employment and training providers to facilitate access to Project opportunities (e.g., school and industry-based partnerships, strategies to reduce First Nations employment barriers, etc).Regularly and transparently monitor groundwater impact throughout the life of the Project.
Increase in workforce health, safety and well-being risk factors	Adverse	Establish Health and Safety Management System for the Project with workforce health and safety provisions including: • Relevant Project policies and protocols (i.e., fatigue management, site inductions and training, pre-starts/toolbox meetings, safety and operational protocols, remote work etc). • Workforce Code of Conduct – Project site, on road, in community. • Provision of mental health support service on-site (e.g., digital mental health service, employee assistance program, etc) • On-site first aid facility with dedicated advanced first aid qualified personnel. • Explore carpooling arrangements and journey management protocols for DIDO workforce. • Develop a detailed emergency response plan for the Project in collaboration with local and regional health and emergency service providers (i.e., RFDS, SES, QPS, RFB) including onsite response capacity/resource, training, and protocols). • Provide workforce with a self-sufficient and well-equipped onsite accommodation village including recreational facilities, health and safety provisions, catering and communications. • Ongoing engagement with health and emergency service providers on Project development including advance notice of workforce mobilisation or changes.
Impact on workforce wellbeing from redundancies due to ramp down and closure	Adverse	• Regular engagement with key stakeholders throughout Project lifecycle including advance notice of Project closure schedule and planned transition activities. • Collaboration with state and local governments regarding workforce impacts due to mine closure.
Housing and accommodation		

Potential impact	Adverse or beneficial impact	Management measure
increase in demand on local short-term accommodation affecting accessibility by other users (Pre-construction)	Adverse	Further develop and implement management measures in the Housing and Accommodation Plan including: • Provision of temporary mobile accommodation on-site during site establishment. • Provision of a self-sufficient and well-equipped onsite accommodation village including recreational facilities, health and safety provisions, catering and communications. • Engagement with short-term accommodation providers in Croydon on any potential Project accommodation requirements. • Regular engagement with Croydon Shire Council to monitor Project workforce demand on local housing and proactively address any emerging issues. • Ongoing engagement with community and stakeholders on Project development including advance notice of workforce mobilisation or changes.
Additional economic opportunities for short-term accommodation providers (Pre-construction)	Beneficial	
Decrease in local housing availability and affordability due to demand from relocating Project workforce (operations)	Adverse	
Local business and industry procurement		
Increase in supply and procurement opportunities (Construction)	Beneficial	Further develop and implement management measures in the Local Business and Industry Procurement Plan including: • Establish and maintain a local and regional business register. • Host supplier briefing and tender information sessions in Croydon and nearby regional service centres. • Embed Proponent expectations and strategies around local and First Nations content into the Project's contracting model. • Collaborate with relevant state government agencies and business and industry groups to support delivery of tender readiness and business capacity building programs, including targeted programs to support First Nations business participation. • Advance notice of Project supply requirements and tendering opportunities through various channels (e.g., Project website, local noticeboards/networks). • Assign higher preference weighting to local businesses and First Nations businesses in competitive bidding processes. • Explore opportunities to break down large work packages and provide small-to-medium friendly payment terms (where appropriate) to support local business participation.
Increase in industry diversification (Operations)	Beneficial	
Increase in economic activity for businesses (Operations)	Beneficial	• Provide opportunities for workforce interaction with Croydon town (e.g., monthly bus into town, attendance at local events, etc).

Potential impact	Adverse or beneficial impact	Management measure
		• Regular engagement with community and stakeholders on Project development including advance notice of workforce mobilisation or changes.
Increase in labour draw and competition for other businesses (Construction and Operations)	Adverse	• Further develop and implement training and skills development measures from the Workforce Management Plan. • Monitor and understand changes in local workforce availability and staffing level in collaboration with council, local businesses, and essential service providers. • Regular engagement with community and stakeholders on Project development including advance notice of workforce mobilisation or changes.
Health and community wellbeing		
Increase in demand for health and emergency services contributing to service provision disruptions to for existing residents (Construction and Operations)		• Establish and promote Project complaints and feedback process. • Establish Health and Safety Management System for the Project with workforce health and safety provisions including: • Policies/protocol relevant to Project (i.e., fatigue management, site inductions and training, pre-starts/toolbox meetings, safety and operational protocols, remote work etc). • Workforce Code of Conduct – Project site, on road, in community. • Provision of mental health support service on-site (e.g., tele-mental health, employee assistance program, etc) • On-site first aid/medical facility with dedicated paramedic or nurse. • Develop detailed incident/emergency response plan for the Project in collaboration with local and regional emergency service providers (including onsite response capacity/resource, training, protocols) • Provide workforce with a self-sufficient and well-equipped onsite accommodation village including recreational facilities, health and safety provisions, catering and communications. • Ongoing engagement with emergency service providers on Project development including advance notice of workforce mobilisation or changes.
Increase in road safety risks (e.g., accidents, road condition deterioration, etc) (Construction and Operations)	Adverse	• Implement management measures identified in the Traffic Impact Assessment and subsequent management plans to be developed (e.g., Traffic Management Plan, Road Use Management Plan • Enter into infrastructure agreements with both local governments prior to commencement of construction. • Explore carpooling options for DIDO workforce. • Advance notice of key Project transport movements and anticipated disruptions (e.g., text message alert, notice on council and Project website).
Improved access and connectivity (Construction and Operations)	Beneficial	

Potential impact	Adverse or beneficial impact	Management measure
		• Establish and promote Project complaints and feedback process.
Changes to cultural heritage value (Construction and Operations)	Adverse	• Implement CHMP agreed for the Project. • Ongoing engagement with Tagalaka Aboriginal Corporation throughout Project lifecycle including advance notice of key Project activities. • explore opportunities for Tagalaka Ranger involvement in cultural heritage / environmental management activities for the Project where feasible.
Changes to ecological / environmental values (Construction, Operations and Decommissioning)	Adverse	• Implement management measures identified in relevant environmental assessments and subsequent management plans to be developed for construction, operations and decommissioning (including the Progressive Rehabilitation and Closure Plan). • Continue engaging with relevant stakeholders (e.g., local government, Tagalaka Aboriginal Corporation, landholders, etc) throughout the progressive rehabilitation and closure planning process.
Disruptions to surrounding amenity (Operations)	Adverse	• Establish and promote Project complaints and feedback process. • Implement management measures identified in relevant environmental assessment and subsequent management plans to be developed for construction and operations. • Regular engagement with stakeholders on Project development and advance notice of key Project activities including workforce mobilisation and key transport movement and anticipated disruptions
Support overall socio-economic wellbeing of Croydon (Operations)	Beneficial	• Establish a Community Support Program (annual budget of up to $25,000) to support community initiatives and/or programs and local community groups. • Provide opportunities for workforce interaction with Croydon community (e.g., monthly bus into town, attendance at local event, etc). • Explore partnerships with community groups and service providers to support community initiatives and/or programs, including in-kind support opportunities. • Establish and promote Project complaints and feedback process.
Support increase in resident population (Operations)	Beneficial	• Develop and implement a live local policy for the Project with incentives (e.g., relocation allowance, wage incentives, flexible rostering, etc)
Community scepticism and apathy towards Project (Pre-construction)	Adverse	• Further develop and implement engagement activities in line with the Community and Stakeholder Engagement Plan for Project construction and operations. • Regular engagement with community and stakeholders on Project development including upcoming activities and key milestones. • Establish and promote Project complaints and feedback process.

Potential impact	Adverse or beneficial impact	Management measure
		• Establish a Community Benefit Fund/Program of up to $tbc per annum to support local community groups and initiatives.

31.2 Commitments

Table 31-11: Summary of Project commitments

Project Matter	Commitment
Surface water	The water management system for the Project will reduce the use of water and/or production of wastewater or contaminants by: • minimise capture of clean surface water from external catchments via drainage diversion; • no uncontrolled release of mine affected water; • maintain supply to project water demands with preferential supply from site water storages over external raw water supply; • maximise recycle and reuse of first mine affected water, then sediment runoff, for site demands including processing and dust suppression; and • maintain pit dewatering and operability.
	The standard of containment of the mine affected water storages will meet the environmental objectives for regulated structures containing contaminants outlined in the 'Guideline for Structures which are Dams or Levees Constructed as part of Environmentally Relevant Activities' (EHP 2017a).
	Erosion and sediment dam controls will be designed and constructed in accordance with the 'Best Practice Erosion and Sediment Control Guidelines' (IECA 2018). Sediment dams will be sized to contain runoff generated by a 24-hour storm event with an Annual Exceedance Probability (AEP) of 10% plus 10% of settling volume for sediment storage.
Surface water (cont.)	An annual review of the performance of the Water Management System will be undertaken over the mine life to continually inform updates to the Water Management System. The performance of the Water Management System will be assessed against: • compliance with the Project's EA conditions; • results of water monitoring and the Receiving Environment Monitoring Program (REMP);

Project Matter	Commitment
	• water demand and supply requirements; and • the implementation of mitigation measures.
	To ensure adequacy of the Water Management System, the review of the Water Management System will include an update of the Project's water balance. The following data and information will be collected for the duration of the Project to inform regular updates and validation of the operational water balance model: • water inventory of the mine water dams and sediment dams (dam water level); • metered water movements to and from the processing plant; • decant water volumes from the tailings cells; • water quality sampling of the mine water storages and sediment dams; • pumped flow meter data for major transfer and truck fill points; • aerial survey of the mine topography to review catchment area and land use development; and • daily rainfall.
Surface water (cont.)	A Water Management Plan will be prepared for the Project in consideration of the Department of Environment, Science and Innovation (DESI) guideline for the 'Preparation of Water Management Plans for mining activities' (DEHP 2012). It will include: • A description of the baseline environment, including environmental values and water quality objectives of the receiving waterways, a description of receiving waterways, local and regional groundwater aquifers, current and historical mining and associated activities, site climate conditions and water quality monitoring of the receiving waterways and groundwater aquifers used to establish baseline conditions. • A description of contaminant sources for the different water sources and uses associated with the project. • A description of Water Management System including objectives, site storage details and locations, transfer infrastructure, identification of bulk water storages, maintenance methodology for water infrastructure and freeboard in containment structures. • A description of the water balance model including major water inflow and outflow mechanisms details, water balance model development (details of calibration of runoff parameters, key input assumptions) and water balance forecast results. • A program for the monitoring and review of the Water Management Plan's effectiveness. • Corrective actions and contingency procedures for emergencies. • Assignment of responsibility for water management plan actions. The Water Management Plan will be reviewed annually prior to the wet season The Water Management Plan will be updated when material changes occur to mine layout, water balance or receiving environment options.

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	An Erosion and Sediment Control Plan (ESCP) will be prepared for the Project in accordance with EA requirements and consistent with the IECA recommendations outlined in the 'Best Practice Erosion and Sediment Control Guideline' (IECA, 2018) to minimise erosion and sediment generation from disturbed areas and maintain water quality in downstream water systems. The ESCP will define the following aspects of the erosion sediment control requirements for the Project: • Limiting disturbance to prevent sediment runoff generation. • Erosion control measures such as revegetation and rehabilitation, aimed to prevent soil erosion from disturbed areas. • Documenting soil types and disturbed catchment areas on the site and their potential for sediment generation. • Design and management of drainage control measures to prevent erosion from concentrated flows and manage the flow of both clean water and sediment runoff. • Erosion and sediment control requirements associated with temporary disturbance and construction activities. • Design and management of sediment dams including dewatering and desilting requirements and the use of suitable construction materials. • Water quality testing of sediment dams to assess their performance and inform continual improvements of the erosion and sediment control system.
Surface water (cont.)	A surface water quality monitoring program will be implemented for the Project (Water Monitoring Plan). Monitoring will include, but not necessarily limited to: • monitoring of surface water quality in Warrigal Creek and the unnamed Tributary (stream order 3); • monitoring of mine water dam water quality; • monitoring of sediment dam water quality; and • monitoring the quality of surface runoff and seepage from waste rock emplacements (including any rehabilitated areas). The monitoring locations, parameters and frequency will be detailed in the Water Management Plan. Water quality monitoring will be undertaken using a combination of laboratory and in situ sampling and in accordance with the Queensland 'Monitoring and Sampling Manual' (DES 2018c).
	Streamflow gauging will be undertaken during the operational phase of the Project to assess impacts and to allow for ongoing refinement of surface water models. In addition to the flow gauging, streamflow monitoring will be undertaken in the local stream order 3 tributary and Warrigal Creek/Borer River.
	A Receiving Environment Monitoring Program (REMP) will be prepared and implemented for the Project in accordance with the 'Receiving Environment Monitoring Program Guideline' (DES 2014a). The REMP design document will include: • measurable indicators associated with the environmental values (e.g. physical, chemical, or biological indicators) and the WQOs for these indicators; • suitable test sites within the receiving waters that are potentially impacted by uncontrolled releases;

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	• suitable control sites where a background or reference condition can be established; • a description of the frequency and timing of sampling; and • how the condition of, and impacts to, environmental values will be assessed. REMP monitoring will be undertaken annually at a minimum and will be undertaken to account for seasonal variability.
	An annual review of surface water quality trends will be conducted by a suitably qualified person or persons. The review will assess the change in surface water quality over time compared to historical trends, impact assessment predictions.
Surface water (cont.)	The risk associated with the accidental mobilisation of contaminants on site will be proactively and reactively managed through the following measures: • hazardous chemicals and dangerous goods will be stored in bunded storage areas within the mine infrastructure area (MIA) with spill clean-up kits located in close proximity, in accordance with relevant Australian Standards; • transfers of fuels and chemicals within the mining lease applications (MLA) will be controlled and managed in accordance with Standard Operating Procedures developed for the Project to minimise the risk of spillage outside bunded areas; • wastewater from wash down areas will be directed through oil and grease separators before being transferred to mine water storages; • any contaminated material/major spillage of stored material in bunded areas will be collected and transported offsite by a licensed waste collection agency; and • any significant leakage/spillage events will be reported immediately, and clean-up operations will be implemented. Procedures, containment and spill control measures will be implemented at suitable locations where the transportation and loading, as well as storage of hazardous and/or dangerous materials occurs onsite. The design and management of all required fuels and hydrocarbons will ensure there are effective means of secondary containment to prevent or minimise releases to the environment from any fuel and oil storage onsite.
	Water quality monitoring of mine water storages (sediment dams, clean water dams and mine water dams) will be undertaken monthly to track water quality trends. Water levels in the storages will be monitored monthly.
Groundwater	The existing groundwater monitoring program will be sustained throughout the life of the Project. Additional groundwater bores in the Proterozoic basement, Gilbert River Formation, and Tertiary sediment will be installed, including groundwater monitoring bores to monitor the area associated with the TSFs to ensure that the TSF design is effectively preventing seepage. Groundwater level and quality monitoring locations, parameters and frequency will be detailed in a prepared Water Management Plan, as described in the commitments for surface water management above.

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	Groundwater level and quality monitoring will be undertaken frequently (monthly to two-monthly) at all monitoring bore locations in accordance with the Queensland Government Monitoring and Sampling Manual and the Groundwater Sampling and Analysis - A Field Guide 2nd Edition. Regular comparisons between trigger limits and site data will be carried out as per EA conditions.
	Site-specific groundwater quality triggers (water quality objectives) will be developed for the Project prior to mining commencement, consistent with the guideline 'Using monitoring data to assess groundwater quality and potential environmental impacts' (DSITI 2017). These triggers will be approved within the EA conditions for the Project through an EA amendment process. Consistent with the Department of Science, Information Technology and Innovation (DSITI) (2017) guidelines, triggers will be established for each groundwater unit potentially impacted by the Project. The groundwater quality monitoring triggers will be detailed in the REMP. The REMP is described in the commitments for surface water management above.
Groundwater (cont.)	Changes in groundwater levels at the site bores will be compared to predicted groundwater trends to evaluate any deviations from the predicted trends. A review of groundwater levels will be assessed each year by a suitably qualified person to verify any changes from historical trends.
	Changes in groundwater levels at the site bores will be compared to predicted groundwater trends to evaluate any deviations from the predicted trends. Groundwater level data will be assessed for comparison between actual and modelled drawdowns in accordance with the DSITI (2017) guidelines for *using monitoring data to assess groundwater quality and potential environmental impacts*.
	The numerical groundwater model will be reviewed and updated in accordance with the guideline, 'Underground Water Impact Reports and Final Reports' (DES, 2017).
	Groundwater pit inflow will be monitored during the open cut mining operational phase.
	An annual review of the Water Management Plan will be undertaken. The annual review will consider the results of groundwater monitoring and management measures and the development of mining activities. The review will assess the change in groundwater quality over time compared to historical trends and impact assessment predictions. The Water Management Plan will be updated pending the outcomes of the review or updates/changes in legislative requirements.
Flooding and regulated dams	Hazardous materials will be stored at the mine infrastructure area, which maintains Probable Maximum Flood (PMF) immunity. Any storage containers that hold hazardous materials will be secured in line with relevant Australian Standards to prevent the removal of the containers from the site by a flood event.

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	The Project disturbance and infrastructure will be located within the 0.1% AEP flood extent from Warrigal Creek/Borer River. A flood protection levee will be constructed around the northern and eastern extents of the Project to provide 0.1% AEP flood immunity. Water storages will be designed with spillway capacity to pass 1% AEP flood event. Clean water drains will be utilised for the management of natural rainfall and runoff from undisturbed or established rehabilitation area and has not come into contact with disturbed land or active mining areas. Clean water drains will be designed to divert the 0.1% ARP flood event.
Flooding and regulated dams (cont.)	Mine water dams will be used to collect / store water which has interacted with mining activities consistent with the Mine Affected Water (MAW) definition from the 'Model Mining Conditions' (DES 2017a).
	Sediment dams will be used to collect rainfall and runoff generated by disturbed landforms including access roads, unrehabilitated spoil and cleared land. Sediment dams will capture sediment laden runoff from disturbed areas, topsoil stockpiles, and surrounding natural catchments. Sediment dams are designed in accordance with the requirements of the 'Best Practice Erosion and Sediment Control Guidelines' (IECA, 2018) and, therefore, sediment dam overflow should be of a quality to mitigate any environmental harm arising.
	The preliminary consequence category assessment of water management infrastructure conducted in accordance with the 'Manual for Assessing Consequence Categories and Hydraulic Performance of Structures' (DES 2016a) will be reviewed and revised once the engineering and design of the water infrastructure is finalised. All water storage dams and structures will be designed, constructed and managed in accordance with 'Manual for Assessing Consequence Categories and Hydraulic Performance of Structures' (DEHP 2016a) and the guideline 'Structures which are dams or levees constructed as part of environmentally relevant activities' (DES 2019a).
	Any structures determined to be regulated for 'failure to contain overtopping' following detailed design will be designed and constructed with wet season containment in accordance with the design criteria requirements outlined in the 'Manual for Assessing Consequence Categories and Hydraulic Performance of Structures' (DES 2016a).
	Structures to be regulated for 'dam break' will be designed and constructed with spillway capacity in accordance with the design criteria requirements outlined in the 'Manual for Assessing Consequence Categories and Hydraulic Performance of Structures' (DES 2016a).
	Water storages will be operated as an integrated water management system. That is, water will be transferred between each water storage (including the open-cut pit) to reduce the risk of failure.

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	A design plan will be prepared for regulated structures to outline how all identified consequence scenarios are addressed in the design and operation of the regulated structures. The design plan will include: • a description of the physical dimensions of the regulated structure; • the materials and standards to be used for construction of the regulated structure; • the criteria to be used for operating the regulated structure; • investigation and design reports, plans and specifications; and • planned decommissioning and rehabilitation outcomes.
Flooding and regulated dams (cont.)	Regulated structures will be certified by suitably qualified and experienced persons, in accordance the requirements prescribed in the 'Manual for Assessing Consequence Categories and Hydraulic Performance of Structures' (DES 2016a).
	Inspections will be carried out for each regulated dam, by a suitably qualified and experienced person, to assess the condition and adequacy of the dams. An inspection report will be prepared that contains details of the assessment and any recommended actions.
Rehabilitation	The Proponent has separately prepared a Progressive Rehabilitation and Closure Plan (PRCP) for the Project in accordance with section 126(1)(n) of the Environmental Protection Act 1994 and the PRC Plans Statutory Guideline requirements which provides that the PRCP schedule must be approved at the same time as the EA with only one decision issued for both, despite separate decision considerations. The Project will be progressively rehabilitated to achieve the rehabilitation objectives established for each rehabilitation area. The progress of the rehabilitation will be monitored for a range of performance indicators, against relevant completion criteria, to demonstrate successful rehabilitation of the Project.
	Topsoil management will be carried out in accordance with a topsoil management plan addressing the following aspects: • the delineation of topsoil resources based on the soil assessments already undertaken and providing information on stripping depths and topsoil qualities and quantities; • the delineation of stockpiled topsoil resources to ensure protection from unplanned use or disruption and to assist in prioritising re-use; • a topsoil stockpiling plan that optimises the placement of topsoil stockpiles to avoid rehandling, is located outside the active mine path, and that nominates stockpile design parameters including height (typically up to 3 m, with preferred height of 2 m) and batter angles (no greater than 1 in 3), as well as information on applicable construction practices; • topsoil stockpile revegetation to assist in stabilisation and erosion control; and • erosion and sediment control methods to be used for areas stripped of topsoil, topsoil stockpiles (including revegetation where warranted) and areas where topsoil is being and has been reapplied, in order to minimise topsoil loss.

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	A topsoil inventory will be maintained for the life of the Project to account for the volumes and locations of topsoil to be progressively stripped, stockpiled and reapplied. The topsoil inventory will assist early identification of potential issues, such as soil balance deficits or poorer quality soils, enabling remedial actions to be planned in advance of mining operations. Topsoil will be respread on reshaped landforms either by scraper or by transporting it to the work area by dump truck and subsequently spreading. The topsoiled area will be deep ripped on the contour to bind the subsoil and topsoil interface and create sufficient surface roughness to assist with plant germination as well as provide early erosion control.
Rehabilitation (cont.)	A Rehabilitation Monitoring Program will be prepared and implemented for the Project which will detail the objectives, methodology, timing and frequency of monitoring for the Project. The results of rehabilitation monitoring will be captured through various monitoring reports and assessed against the milestone criteria outlined in the PRC Plan Schedule (Appendix T, Draft Progressive Rehabilitation and Closure Plan).
	A Draft PRCP has been prepared for the Project and will be implemented once approved. The PRCP identifies; • community consultation information; • post-mining land uses (PMLUs); • rehabilitation and management methodology; • risk assessment; and • a monitoring and maintenance program. The Rehabilitation schedule part includes; • nomination of a PMLU for all land within the relevant resource tenures, including land uses for undisturbed land; • identification of when land becomes available for rehabilitation or improvement; • rehabilitation or management milestones to achieve the PMLU or NUMA outcomes; • milestone criteria that demonstrate when each milestone has been completed; • completion dates for each milestone to be achieved; • any conditions considered necessary or desirable; and • a final site design.
Biosecurity	A Weed and Pest Management Plan will be prepared and implemented as part of the Project and will include reasonable and practicable measures to mitigate each identified biosecurity risk. Control programs included in the Pest Management Plan will be prepared in accordance with methods recommended by DPI. The Weed and Pest Management Plan will address faunal pest risks by: • establishing vegetation clearance requirements and procedures; • ensuring that potential food and water sources are managed to reduce pest abundance; and

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	• ensuring that any control measures and management strategies adhere to accepted animal welfare requirements. The Weed and Pest Management Plan will include weed management controls that address: • Reporting: any declared weeds will be identified, and dealt with pursuant to the Biosecurity Act and the Banana Shire Council Biosecurity Plan; • Vehicle wash-down requirements: vehicles may require wash-down prior to entering the Project area if arriving from a known high-risk area to avoid the introduction of new weed species; • Staff training: staff will be notified of the major weed species in the locality to report any identified weed infestations to their supervisors; • Weed control program: weeds will be controlled in accordance with DPI recommended methods specific to that species. Herbicides will be used in accordance with their label requirements and only on those species that are capable of being managed effectively by that particular herbicide. This capability evaluation will take into consideration factors specific to the Project, such as weather, surrounding vegetation and watercourses, and the potential for off-target loss; • Prioritisation of treatment of weed species: for those weed species that are identified as WoNS, and/or are restricted under the Biosecurity Act, will be treated as a matter of priority; and • Periodic surveys: information on weed composition and distributions on-site will be gathered periodically throughout the life of the Project.
	The Weed and Pest Management Plan monitoring program activities will include: • Regular weed monitoring: general site monitoring will occur every 12 months to identify any weeds not previously identified in the region. • Routine monitoring: areas identified as higher risk (e.g. areas that are known to regularly exhibit weeds or are at high risk of weed infestations) will be monitored at the start of each season, especially after significant rainfall; and • Opportunistic monitoring: any weeds observed during normal activities are to be recorded and managed accordingly.
	The Project will implement the following practices to reduce the risk of mosquito outbreaks: • General protection measures will be implemented to reduce the likelihood of mosquito bites (e.g. long sleeves on shirts, insect repellent). • Potential breeding sites for mosquitoes will be eliminated by identifying and minimising the potential for water ponding to occur. • Should employees begin to show symptoms associated with vector-borne diseases, they will be monitored and taken for treatment, and details of the incident will be reported to appropriate authorities.
Air Quality	Mitigation measures to reduce the impacts on sensitive receptors will include: • watering and regular maintenance of haul roads; • watering of other trafficked areas;

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	• use of gravel, sheeting or surfactants on haul roads; • use of water sprays on equipment; • drilling and blasting operations to include properly fitting and working shrouds, dust extraction for drill rigs and blasting during daytime hours only; • personnel training; • monitoring and modifying mining operations to achieve compliance with applicable air quality objectives at the nearest privately-owned sensitive receiver(s); • material drop heights during loading and unloading are to be reduced; • blasting controls put in place to minimise dust blowing towards sensitive receptors; and • minimising exposed areas by rehabilitation and revegetating as soon as possible after activity has ceased.
	A general dust management plan to be implemented including; • overview of the routine operational procedures and mitigation measures enacted to prevent or minimise dust emissions; • procedures for visual inspection of dust emissions from the Project; • utilisation of publicly available meteorological forecasting tools to inform potential adverse meteorological conditions; • a framework for identifying actual and potential dust impacts based on visual inspection and forecast analysis, and for applying pro-active and reactive mitigation and management measures to address those potential impacts; • adequate record keeping for any actions taken; • assessment of PPE requirement for workforce; • procedures for investigating and addressing dust complaints; and • procedures for review and revision of the management plan.
Greenhouse gas	The following facility will be constructed and implemented to minimise Project's greenhouse gas (GHG) emissions: • a solar array, up to 10 MW plus a battery energy storage system with a capacity up to 1.6 MWh, will be constructed and operated over the life of mine.
	Renewable energy will be generated on-site to meet the Safeguard mechanism obligations and achieve the reduction goals in alignment with, or exceeding, the Safeguard mechanism requirements.
	Residual GHG emissions that cannot be avoided, minimised or substituted may be managed through offset mechanisms, which may include the use of Australian Carbon Credit Units (ACCUs).
	The proponent will report yearly on the Project's GHG emissions and energy use/production in accordance with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act).

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Noise and Vibration	Noise and vibration management and mitigation measures are proposed for the Project and will include the following: • avoid the noise generation (e.g. locate an industrial activity in an area that is not near a sensitive receptor); • minimise the noise in the following order: o orientate an activity to minimise the noise (e.g. face the part of an activity that makes noise away from a sensitive receptor); then o use the best available technology to minimise the noise; and • manage the noise (e.g. use heavy machinery only during business hours).
Noise and Vibration (cont.)	A Noise Management Plan (NMP) has been developed to manage potential impacts and will be finalised prior to Project construction and be implemented for all phases of the Project. The NMP will address: • A process to enable the proponent to receive and promptly respond to any community noise or vibration complaints; • If monitoring detects noise exceedance, there will be a process to promptly respond to noise exceedance. • Noise monitoring will be undertaken in the event of receipt of a noise complaint and will be undertaken in accordance with the latest version of the 'Noise Measurement Manual' (DES 2020c) and relevant Australian Standards. Noise monitoring will record one-third octave band noise levels and audio samples to remove extraneous noise (e.g. farm activities, dogs, insects, high wind speeds) from the data. Additionally, weather data (i.e. wind direction and speed, rainfall, temperature and humidity) will be measured and reported with the noise data. Outcomes of noise monitoring will determine the required corrective actions. The NMP will include potential noise management and mitigation measures including: • management of mining equipment locations, such as operating at lower elevation or shielded areas; • reducing the number of equipment in operation; • attenuation of equipment; • construction of bund walls; and/or • noise and/or vibration monitoring, including the monitoring of background creep, to ascertain the effectiveness of any noise and/or vibration control measures.
	A Blasting Management Plan will be implemented, either as a stand-alone or in combination with the Noise Management Plan. Vibration and airblast monitoring devices will be implemented as a part of the Blasting Management Plan, which will also include: • Vibration and airblast monitoring during initial or all blasts, with monitoring sites at or near the worst affected receptor/s. The sites could be at receptors (e.g. nearest Receptor 2 to the south), or at a reference location/s between the blasting and the receptors. • Processes to enable the mine to promptly react to high community vibration/airblast levels and/or related complaints. Such processes should advise on how the mine will respond. • Vibration and airblast mitigation options including revised blast design.

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Flora and fauna	Vegetation clearance protocols will be implemented to minimise and mitigate impacts on flora and fauna habitats and vegetation communities. Clearing activities will be undertaken sequentially and in accordance with a 'Permit to Disturb' process whereby any disturbance that involves individual trees (dead or alive), vegetation and soil disturbance will require an approval from the Environmental Officer. This protocol will ensure the area of vegetation and habitat to be cleared is that which is required for the safe construction and operation of the Project.
Flora and fauna (cont.)	Inspection of areas to be cleared will be undertaken prior to clearing to confirm whether any animal breeding places for threatened or near threatened species are present or likely to be present. If active breeding places for threatened or near threatened species are present, the Project will engage a spotter/catcher to manage the potential impacts to fauna during the clearing activities.
	All road crossings, and any watercourse crossings for linear infrastructure, will be designed to comply with the relevant work type of the 'Accepted development requirements for operational work that is constructing or raising waterway barrier works' (DAF 2018) to ensure that suitable fish passage is maintained in all flow conditions.
	Significant impacts to Matters of State Environmental Significance (MSES) will be offset in accordance with EO Act and Queensland Environmental Offsets Policy. The Proponent will provide offsets for significant residual impacts on regulated vegetation (REs within mapped vegetation management wetlands; and REs within the defined distance of a vegetation management watercourse).
Land and visual amenity	Any disturbance of land will be undertaken in accordance with the following management protocols and measures: • a land disturbance permit system to control and limit land clearing to the minimum amount required for the safe operation of the Project; • progressive rehabilitation of landforms to limit the total area of disturbance at any point in time; • implementation of a Water Management Plan (WMP) that will achieve successful water management and diversion of overland flow/run-off around disturbed areas; and • development and implementation of a topsoil management plan to direct removal, replacement and stockpiling and promote direct placement of topsoil to preserve the seed bank and reduce erosion.
	General topsoil resource management practices will be implemented, including stripping and either immediate reuse for rehabilitation purposes, or stockpiling for subsequent use. A Topsoil Management Plan will be implemented to: • ensure the full recovery of usable soil reserves prior to mining operations; • manage soil reserves to maintain their viability; and • advise on effective soil amelioration procedures to maximise the revegetation benefits associated with topsoil resources.

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	The rehabilitated landform with a PMLU of 'grazing native vegetation' (low intensity), 'grassland', and 'riparian ecosystem' will target the achievement at least Class 4 agricultural land suitability (i.e. marginal land with severe limitations), similar to the pre-mining classification.
Land and visual amenity (cont.)	Management measures will be used to prevent or reduce the risk of land degradation or contamination of land and include the following: • all unexpected contamination will be remediated and validated under supervision of a suitably qualified person in accordance with an Emergency Response Plan predefined for all hazardous materials stored on-site; • a contaminated land register will be maintained on-site; detailing any contamination events, subsequent location and remediation protocols issued; • chemical and hydrocarbon storage areas will be designed and bunded in accordance with 'AS 1940:2017, The storage and handling of flammable and combustible liquids' (Standards Australia 2017); • provision of training to staff on the prevention of spills and the use of spill kits; • a register of spill kits will be maintained, and all kits will be inspected for completeness at least quarterly; • sediment dams will be installed and adhere to the design parameters of the 'Manual for assessing consequence categories and hydraulic performance of structures' (DES 2016a); • Sewerage Treatment Plant (STP) will be designed to cater for the maximum number of personnel that can be accommodated on-site at any one time, and in accordance with the recommendations contained in Appendix M, Land-based Effluent Disposal Report; • waste products including oil and other chemicals will be stored and disposed of according to the relevant material data safety sheets to minimise contamination risk; and • waste management strategies to reduce the risk of land contamination from waste generated during the life of the Project, including waste associated with the STP, will be developed.
	The following actions and measures will be implemented to further minimise the potential visual impacts of the Project: • the revegetation of the retained out-of-pit dump after landform reshaping, in order to reduce contrast between altered landforms and the unaffected surrounding landscape; • design of the dump to have a final landform that does not contrast significantly with the existing topography; • placement, configuration and direction of lighting to reduce light emissions during the operational phase of the Project, in accordance with AS 4282:1997 'Control of the obtrusive effects of outdoor lighting' (Standards Australia, 1997a); and • unless otherwise agreed with landowners to retain infrastructure, all on-lease infrastructure disturbance will be rehabilitated to a safe and stable landform.
	Hazardous material storage and handling measures and standards will be implemented.

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Land and visual amenity (cont.)	Erosion and sediment controls will include the following: • topsoiled areas will be deep ripped to reduce compaction from heavy machinery, encourage infiltration of water and prevent erosion. Areas will be ripped along the contour to reduce the velocity of run-off water down the slope. Ripping depths will vary depending on the type of spoil material, depth of topsoil and equipment used for rehabilitation operations; • topsoil within each SMU will be stripped to the depths determined in the Soils and Land Assessment (Appendix H); • topsoil stockpiles will be constructed to less than 3 m high and contoured to encourage water drainage; • seeding of topsoil will take place as soon as possible after placement onto rehabilitated areas to assist in preventing erosion; • topsoil stockpiles will be placed away from drainage areas, roads, machinery, transport corridors and stock grazing areas; • a topsoil inventory will be maintained for the life of the Project which will account for the volumes and locations of topsoil to be progressively stripped, stockpiled and reapplied; • preservation of vegetation around drainage lines and riparian zones to reduce the exposure of the B horizon if excavation is necessary; • the strategic application of vegetation debris to rehabilitation areas; • use of upslope diversion drains to reduce run-off from undisturbed areas onto disturbed areas; • the use of downslope collection drains to divert surface water to sediment dams (e.g. mulch berms, sediment ponds and drop inlet protection) to contain sediment-laden run-off from disturbed areas; and • the use of sediment fences and filters to retain and filter suspended solids. Installed erosion and sediment control structures will not be removed until disturbed areas have been stabilised.
	Post-mining, rehabilitated waste rock dumps and rehabilitated tailings storage facility which have a PMLU objective of ‘grassland’. Cattle exclusion fencing will be installed around the landforms to prevent grazing. Revegetation activities will utilise flora species consistent with the surrounding pre disturbed land. To mitigate impacts to surrounding land uses, management measures will include: • Management of fugitive dust emissions through: regular watering of haul roads, early rehabilitation of waste rock dump and/or temporary revegetation to minimise the extent of bare ground, and continuous monitoring of weather conditions to ensure that operations are adjusted during periods of adverse weather. • Regular visual checking of light spill to ensure that fixed and mobile lights are located and shielded sufficiently to mitigate excessive light spill. • Monitoring of blast vibration and airblast overpressure to ensure that predicted levels of both parameters are achieved. • Monitoring of all blasts to identify any occurrences of blast fume and where warranted to undertake investigations and mitigating actions to limit adverse impact from blast fume.

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Transport	The Project will work with the required authorities to ensure safe public traffic movement for road vehicles to ensure minimum disruption to existing patterns of movements while the road network is being utilised by the Project.
	Roadside safety including the potential location of any barriers, road furniture and signage, utilities and lighting will be designed and constructed with guidance of Austroads 'Guide to Road Design Part 4A: Unsignalised and Signalised Intersections' (Austroads, 2010a). The location of line marking (including stop lines, give way lines, lane lines, turning lines, pavement arrows and symbols) will be designed and constructed to 'AS1742.2-2009 Manual of uniform traffic control devices – Part 2 Traffic control devices for general use' (Standards Australia 2009) with guidance of 'Guide to traffic management part 10: traffic control and communication devices' (Austroads 2019).
	The Project will comply with all requirements for the transport of dangerous goods and hazardous materials by both road and rail, including requirements under the Transport Operations (Road Use Management – Dangerous Goods) Regulation 2008.
Waste management	Waste will be managed in consideration to a waste management hierarchy.
	A Non-Mineral Waste Management Plan will be developed and implemented for the Project. This plan will incorporate the following elements: • waste will be segregated into general waste, various recyclable waste and regulated waste; • general waste will be collected in clearly designated bins; • waste oils, chemicals, batteries and other hazardous and/or regulated substances will be stored in bunded areas or on bunded pallets within the waste collection area; • all used tyres will be managed in accordance with the operational policy 'Disposal and storage of scrap tyres at mine sites' (DES 2014). • different forms of waste (e.g. metals, paper, oils, batteries, general waste, etc.) will be stored on-site according to waste stream. The design of the waste collection facility will consider public health, hygiene and safety standards. For example, flammable material or combustible liquid wastes will be stored in facilities designed to meet 'AS 1940:2017, The Storage and Handling of Flammable and Combustible Liquids'; • bins located within offices and workshops will be labelled to avoid cross-contamination and ensure separation of different waste streams. Bins will be emptied regularly to keep vermin and pest numbers to a minimum; and • regulated and/or hazardous waste will be stored in a separate storage area to ensure that the potential for environmental harm is minimised. A Mineral Waste Management Plan will be developed and implemented for the Project.
	A spray irrigation system will be adopted for the site. A fixed daily design irrigation rate of approximately 3.5 mm/day, consistent with AS/NZS 1547:2012.

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	An Irrigation Management Plan (IMP) will be developed, consistent with the DETSI *Technical Guideline for Disposal of Effluent Using Irrigation*. A monitoring program will be included where practicable: • periodic soil and groundwater monitoring for nutrients, salinity and sodicity; • reviews of irrigation performance, monitoring results, and operational practices; and • updates where necessary to relevant management measures to ensure ongoing compliance with licensing requirements and environmental objectives.
Cultural Heritage	The Project will be constructed and operated in accordance with a Cultural Heritage Management Plan (CHMP) entered into with a Traditional owner endorsed party (Tagalaka People). The CHMP is intended to provide an efficient and workable means by which parties to the CHMP can protect and manage the impacts of the Project on Aboriginal cultural heritage in a culturally appropriate manner while complying with all necessary legislative requirements.
	The Project will liaise with the Tagalaka People to arrange for the nomination of a technical adviser who will assist in the conduct of cultural heritage assessments.
	An understanding of Indigenous cultural heritage values and legal obligations will be promoted within the Project workplace through the inclusion of Indigenous cultural heritage awareness information in employee/contractor induction programs.
	Site induction material prepared for Project personnel will include information on the potential occurrence of non-Indigenous cultural heritage sites and the actions that are to be taken if a potential site is found.
	Personnel or contractors of the Project will be informed of their obligations under section 89 of the Queensland Heritage Act 1992 to report to the DETSI any archaeological items (as defined under the Act) that may constitute an important source of information about an aspect of the history of Queensland. Additionally, reporting the discovery of any Aboriginal cultural heritage in the Project area as soon as reasonably practical to the Coordinating Committee.
	An Incidental Finds Procedure will be implemented in the event that a potential site of non-Indigenous cultural heritage significance is identified within the Project area that has not previously been recorded.
	In accordance with the QH Act Section 89, if encountered, in such cases, a “Stop Work” procedure will be implemented by the Project personnel for matters of non-Indigenous cultural heritage, including in dealing with the discovery of currently unknown and unidentified sites, places, or items.
Social and Economic	The Project will prioritise employment opportunities for local and Indigenous workers where practicable. It is expected that the majority of workers will be from outside the local catchments.

Project Matter	Commitment
	Employees will be supported to live within local towns should they choose to do so, but require accommodation on-site during shifts. The fly-in/fly-out (FIFO) workforce will be minimised where practicable. The Project will have a target for employment and training opportunities, with 10% of construction workforce comprising residents of Croydon and Normanton and 10% of peak operations workforce comprising residents of Croydon, Carpentaria, and Richmond LGAs (including relocating workers). The Proponent will engage with stakeholders to minimise the demand pressure on labour market for workers should this issue emerge.
	The following management plans will be finalised and implemented for the Project: • **Workforce Management Plan** to prioritise recruitment of workers from local and regional communities and workers who will live in regional communities, reduce the proportion of workers engaged in FIFO arrangements and support the health and wellbeing of the Project workforce. • **Housing and Accommodation Plan** to provide strategies to meet the accommodation requirements of the Project and to monitor the impact that workforce influx has on the real estate market. • **Local Business and Industry Procurement Plan** to maximise opportunities for local businesses to provide goods and services to the Project. • **Community Health and Wellbeing Plan** to provide processes and strategies to avoid or mitigate adverse social impacts and capitalise on opportunities to improve the health and wellbeing of local and regional communities. • **Community and Stakeholder Engagement Plan** to facilitate engagement, consultation and collaboration with stakeholders.
	An adaptive approach to monitor and update the implementation of Social Impact Plans (SIMPs) will be used throughout the life of the Project. Monitoring will be conducted to: • track the progress and assess the appropriateness and effectiveness of the management measures; • assess actual Project impacts against potential impacts and required amendments to the management measures; and • facilitate engagement, consultation and collaboration with stakeholders and incorporate feedback into revised SIMPs. SIMPs will be reviewed and updated annually during construction and the first three years of operation and will be produced annually to incorporate the monitoring results and relevant updates.
	An Emergency Response Plan (ERP) will be developed with authorities, covering key risks, procedures, and onsite response capabilities. A first-aid facility will be established onsite and include dedicated first aid qualified personnel to support the workforce throughout the life of Project.

Project Matter	Commitment
	A Workforce Code of Conduct will set expected behaviour standards and apply to all workers, with consequences for non-compliance.
Hazards, Risks and Safety	The following processes and measures will be implemented in addition to expected and standard controls to reduce the risk of impacts on health, safety and the environment associated with the Project: • Fatigue management/fitness for work, alcohol and drug testing and road safety awareness training to manage the increased risk of motor vehicle incidents. • Occupational Health and Safety performance to be closely monitored and assessed and, where required, individual issue specific risk assessments to be undertaken to identify fit-for-purpose safety initiatives. • Routine watering of haul roads, scheduling of blasting operations and reactive dust control measures to be utilised to manage dust impacts to sensitive receivers.
	Development and implementation of a Safety and Health Management System (SHMS) will be undertaken in accordance with the Australian Standard 'AS/NZS 4801 Occupational Health and Safety Management Systems' (Standards Australia/Standards New Zealand Committee 2001). The (SHMS) will document the standards, methods and procedures necessary to ensure mitigation of risks relevant to the stages of the Project and ensure legislative compliance. The SHMS will be applicable to all personnel who enter the site (i.e. Project workforce, contractors and visitors). A detailed hazard and opportunities assessment will be undertaken as part of the final planning process. The assessment will build upon the preliminary hazard and risk assessment and identify the principal hazards for management focus during each phase of the Project.
Hazards, Risks and Safety (cont.)	Development and implementation of an Emergency Response Plan (ERP) for the Project, which will include the following: • provide contact details relevant to emergency management; • detail the roles and responsibilities of site personnel; • Include participation of Qld Ambulance staff; • include the potential emergency situations that could occur as identified by the risk assessment; • detail the equipment available to emergency responders; • provide for emergency response training; • provide for regular testing of the site's emergency response capability; • outline the emergency response procedure to be followed, including raising the alarm and summoning of emergency assistance, and the termination of emergency response; • identify emergency communications protocols, including requests for assistance from external emergency services (e.g. Queensland Mines Rescue Service, Queensland Fire and Emergency Service, Queensland Police);

Project Matter	Commitment
	• outline fire response procedures; • detail evacuation procedures and muster points; • include maps and relevant Global Positioning System information; and • include duty cards detailing the roles and responsibilities of the Incident Commander, Incident Controller, Emergency Response Team, supervisors and mine workers. Development of the ERP will include consultation with key external bodies potentially involved in emergency response relating to site activities. Evacuation muster points will be established specific to each work area on-site and site evacuation levels established. Flooding impacts will be considered during ERP development, as will potential accommodation village evacuation requirements.
	Monitoring of the effectiveness of the SHMS and environmental management system will be undertaken to ensure the effectiveness of the system. Audits of system implementation will also form a component of the monitoring program. Monitoring information will be provided for management team review, and corrective actions will be implemented. Corrective actions will include reviews of relevant policies, plans and procedures.
Hazards, Risks and Safety (cont.)	All hazardous substances and dangerous goods will be stored, transported, and handled in accordance with the relevant standards, label instructions and material safety data sheets. Security measures will prevent unauthorised use or theft. Aprons and hardstands for substance transfer will be provided and will include spill clean-up equipment and fire extinguishers. Storage of these materials will utilise secondary collection and storage such as bunded pallets or self-bunded shipping containers constructed and operated in accordance with relevant standards. The MIA and workshop will include a stormwater management system which incorporates oil/water separation systems to ensure potentially contaminated water is appropriately collected and disposed of off-site.
	A Bushfire Management Plan (BMP) will be included in the ERP and will outline the response to fires, including bushfires. The BMP component of the ERP will be developed in consultation with the QFES and reviewed by the responsible site representative (Mine Manager) prior to each bushfire season. The BMP will be developed upon approval of the Project.

31.3 Overall Project impact and opportunities assessment

The Esmeralda Graphinex Project represents a significant new critical minerals Project within the Croydon LGA of North Queensland. Being a large resource project, its development will generate a mix of potentially beneficial and adverse impacts across environment, social, cultural and economic domains. These have been described in detail throughout the EIS.

The following sections draw together the assessment findings from technical reports, field surveys, consultation and engagement on the Project to provide an overall assessment of the Project impacts. The assessment considers the magnitude, duration, extent and significance of both beneficial and adverse impacts, including residual impact following the application of management controls.

31.3.1 Beneficial Impacts

31.3.1.1 Economic benefits

The Project is expected to generate significant economic benefits to the local, regional and state economies. Key beneficial impacts include;

- Direct employment during pre- construction, construction and operational phases. Employment numbers will correspond with production rates with highest numbers expected during peak production volumes;
- Indirect employment through flow on activities driven by supply chain inputs, procurement and household spending, supporting 465 FTE jobs per year for the life of the Project;
- Increased gross value add (GVA) and gross regional product (GRP) from the increased value of goods and services inputs in the production process in the production process. An additional $295.1 million in direct and flow-on output for businesses in Queensland outside of the regional catchment is expected to be generated as a result of construction activity associated with the Project. This is expected to generate an additional $112.8 million in GRP for the rest of Queensland, for a total of $203.7 million in Gross State Product (GSP) in Queensland;
- Taxation revenue to the Queensland and Australian Government of approximately $60 million during construction and $77 million during operations; and
- Diversification opportunities through the relatively new graphite mining market that will strengthen Queensland's critical-mineral industry and help buffer regional agriculturally based economies from the impacts of more extreme weather, such as droughts and floods.

31.3.1.2 Social and community benefits

The Project is anticipated to deliver several positive social outcomes;

- Employment and training opportunities will prioritise local and Indigenous people for long term work arrangements. These opportunities provide apprenticeships and training opportunities that benefit long term careers;
- Improved regional services capacity is supported by the increased economic activity and potential for co-investment in the region;
- Population stabilisation potential reversing the decline in local population in the Croydon LGA and supporting community viability through this stabilisation; and
- Strengthened community partnerships through structured engagement associated with Project and community investment programs.

Potential beneficial impacts associated with Indigenous Cultural Heritage include:

- documentation, survey and research of cultural heritage;
- cultural heritage related employment and training; and
- investment in programs that support cultural heritage.

31.3.1.3 Strategic and national benefits

Graphite is a designated critical mineral under Australian and Queensland policy frameworks. Both the Australian and Queensland Governments have established policy frameworks that explicitly support the development of a domestic graphite industry. The Project contributes to:

- national critical minerals supply chain security;
- the broader decarbonisation transition objectives by supporting battery and renewables technology development; and
- Queensland Energy and Jobs Plan that enables the transition to lower emission industries by providing employment, training and skills development opportunities.

31.3.2 Adverse Impacts

31.3.2.1 Flora and fauna

The project will result in disturbance to flora, some of which are considered matters of state environmental significance. Management controls have been applied in accordance with the hierarchy of controls so that where possible disturbance is avoided, or minimised. Where this has not been possible, biodiversity offsets are to be secured. A summary of unavoidable impacts on MSES is presented in Table 31-12.

Table 31-12: Summary of MSES to have a significant residual impact from the Project

Matter of State Environmental Significance	Regional Ecosystem impacted	Area (hectares)
Regulated vegetation - Prescribed REs that intersect a VM Act wetland	RE 2.3.55d	10.45
Regulated vegetation - Prescribed REs located within the defined distance of a VM Act watercourse	RE 2.3.22	8.99
	RE 2.3.26a	19.07
	RE 2.3.29b	42.02
	RE 2.5.14a	7.38
	RE 2.5.17b	16.13
	RE 2.5.18a	0.42
	RE 2.5.28a	1.90

31.3.2.2 Water resources

There are several chapters in the EIS that describe the impacts on surface water and groundwater as well as the impacts on the availability of water resources for human and environmental purposes. Potential impacts on water include;

- alteration of surface water flows and flooding behaviours;

- groundwater drawdown that potentially effect GDEs;
- seepage of contaminants;
- sediment or contaminant mobilisation, particularly during the construction phase or associated with mine water collecting in sediment dams; and
- reduction in the availability of water for other water users.

Hydrological modelling and water balance assessments of these impact indicate that surface water is disconnected from the underlying groundwater table, the potential impacts associated with MAW seepage or accidental spills within the processing plant area on surrounding EVs are expected to be of low risk and low magnitude, and that the potential for impacts to regional groundwater quality during the operational and closure phase is considered to be very low.

31.3.2.3 Air quality

Dust will be generated during construction through topsoil stripping and development of mine infrastructure areas. During operations, stockpiles and mining operations themselves may generate dust through earth moving activities.

Results of the air quality assessment demonstrated that predicted ground-level concentrations of all air pollutants and dust deposition rates due to the Project with ambient background levels included are predicted to comply with the relevant air quality objectives at all sensitive receptors.

Air quality impacts are therefore likely to be low.

31.3.2.4 Greenhouse Gas

The Project will generate point source and diffuse greenhouse gas (GHG) emissions (Scope 1 and Scope 2), upstream and downstream emissions (Scope 3), naturally occurring sources, that potentially impact on environmental values. The total estimated GHG emissions for the life of the project are;

- Scope 1 is 4,663,805 t CO_2-e;
- Scope 2 is 0 t CO_2-e; and
- Scope 3 is 2,134,892 t CO_2-e.

The Human Rights Act 2019 (Qld) protect 23 fundamental rights including the right to life. The HR Act does not explicitly recognise the right to a healthy environment; several right s are engaged by the emissions of GHG including the;

- right to life;
- protection of families and children; and
- right to health.

These human rights are considered in the context of future generations having limits placed upon them as a result of the contribution of GHG on climate change. Management measures are proposed for the Project that ensure that GHG emission impacts to not pose an unreasonable risk to human health or safety.

Abatement of these emissions are to be achieved through the decarbonisation management controls presented in Chapter 27, Greenhouse Gas. Scope 1 abatement measures are expected to reduce associated emissions from the extraction, production and transport of fuels consumed by the Project. Scope 3 abatement measures are focused on upstream and downstream transportation and distribution, which are presently assumed to rely on road freight between Townsville and the Project site.

31.3.2.5 Noise and vibration

Acoustic modelling of predicted noise levels at residential sensitive receptors near the Project where the daytime noise limit is at 40 dBA and the night-time limit is at 35 dBA. The highest A-weighted noise level is expected to occur at Receptor 2 (Prospect) in calm night conditions, at 31 dBA. The predicted noise levels are under the limits, the Project will be compliant with the acoustic quality objectives.

Air blast and modelling identified that airblast levels are below the airblast limits of 115 and 120 dB at a distance of 3 to 4 km. The nearest receptor (R2) is approximately 10 km from the mine pit, at which point the airblast levels are well below these limits.

Vibration levels are below the vibration limits of 5 and 10 mm/s at a distance of 1 to 2 km. The nearest receptor (R2) is approximately 10 km from the mine pit, at which point the vibration levels are well below the vibration limits.

The impact of noise and vibration is considered low.

31.3.2.6 Mineral waste and tailings

An estimated 188.05 Mt of overburden will be excavated over the life of the mine. Excavated overburden and non-ore-bearing material will be removed and placed in the two out-of-pit waste dumps located adjacent to the mining void. waste rock from one of the WRDs will be used as backfill and capping material for the backfilled void. The other WRD will remain as a landform at closure.

Tailings will be generated as a biproduct of the mineral processing circuit, with approximately 159.85 Mt of tailings generated from across the life of the Project. Tailings generated from the mineral processing will be stored in four engineered tailings storage facilities (TSFs).

Mineral waste areas will be rehabilitated at the end of mine life. These areas will have a PMLUs of grazing native vegetation, grassland, retained infrastructure, retained water storages or riparian ecosystem. PMLUs acceptance will be contingent upon achieving specific rehabilitation milestone criteria that demonstrate that the land is safe, stable and non-polluting. There will be no non-use management areas remaining post closure.

A risk assessment is included in the PRC Plan which concluded;

- 28 Class I risks; defined as Risks that are below the risk acceptance threshold and do not require active management;
- 44 Class II risk; defined as risks that lie on the risk acceptance threshold and require active monitoring; and
- seven (7) Class III risk; defined as risks that exceed the risk acceptance threshold and require proactive management.

There were no Class IV risks identified; defined as risks that significantly exceed the risk acceptance threshold and need urgent and immediate attention.

Of the seven (7) Class II risks identified:

- Five (5) were considered to be compliance risks related to the risk of achieving a sustainable PMLU with respect to five of the RAs. The Class III compliance rankings were not reflected by their respective environmental risks for the equivalent risk scenario which ranged from Class I to Class II. This classification better reflects the deemed seriousness of not complying with PRCP schedules and criteria rather than any specific environmental risk.
- One risk related to the high consequence associated with the risk of personal safety during flood events within the retained diversion. It should be noted that this risk ranking is no different from that applied in the current pre-mining state.
- The remaining Class III risk was identified as having an environmental consequence relating the challenges that may be associated with achieving an acceptable riparian vegetation outcome within the rehabilitated diversion channel.

31.3.2.7 Non-mineral waste

Non-mineral waste in the form of general (putrescible) waste, regulated wase and sewage will be generated by the Project. Thes have potential impacts on land and water. Inappropriate storage and handling of these wastes can generate offensive odours, harbour pathogens or attract pests that then generate further impacts.

These impacts are managed through dedicated waste areas, recycling and the removal of hazardous waste to off-site licenced of site facilities. Sewage effluent generated on-site from the STP is via land application through irrigation.

31.3.2.8 Social and community impacts

Social and community impacts may be associated with a short term workforce influx during specific activities that may increase the demand for;

- housing;
- health services;
- emergency services; and/or
- increase traffic in or traversing through communities.

Community cohesion influences from changed population dynamics and industrial activity that may influence community character which may have both adverse and beneficial outcomes.

These impacts are mitigated by engaging a workforce that is 95% FIFO who will stay on site at mine workers accommodation. The mine workers accommodation will be run as self sufficiently as possible with ongoing engagement with local and regional service providers to avoid excessive demands or constraints on local communities for services or products.

31.3.2.9 Cultural heritage impacts

The Project area contains cultural values of significance to Indigenous people, including the Tagalaka people, the traditional owners and native title holders of the area. Potential adverse impacts include;

- Disturbance to cultural heritage sites; and
- Reduced access to culturally significant landscapes.

These impacts are managed through proactive survey of lands that may be disturbed that was directed by and involving representatives of the Tagalaka people. The survey identified no items of cultural heritage significance. However, if items of cultural heritage value are encountered during Project activities, procedures are in place to immediately engage with Tagalaka representatives to ensure the items are protected and managed respectfully in accordance with agreements in the CHIMA.

Ongoing participation in decision making and engagement with Indigenous people for the life of the Project benefits all parties and will reduce the likelihood and severity of impacts on cultural heritage values.

31.3.3 Overall impact profile

Overall, the assessment demonstrates that the Graphinex Esmeralda Graphite Project is expected to deliver substantial long-term economic and strategic benefits, including local and regional employment, increased economic activity and strengthened participation in and development of critical mineral supply chains and industry. These benefits, however, are balanced against a range of environmental, social and human rights considerations, that have been identified through the EIS process.

Adverse impacts relate to land disturbance, water resource limits, tailings and mineral waste management, services demand and biodiversity. While many of these impacts can be avoided or mitigated through the proposed management, ongoing consultation with affected parties, particularly Traditional Owners, will be essential to ensuring impacts are minimised or values enhanced.

The findings of this assessment are that, with appropriate mitigation, monitoring and continued engagement with affected communities and Traditional Owners, the Project can be managed in a way that supports overall benefit to the environment and people.

31.4 TOR Reconciliation table

Terms of reference - Content requirements of the EIS		EIS Section
Section 31 - Conclusions and commitments		
31.1	The EIS must include an overall conclusion that sets out: (a) a summary of predicted project impacts (b) a description of the impact avoidance and mitigation strategies the proponent will implement to avoid, then minimise and mitigate the predicted project impacts (c) an overall evaluation of the project that considers the balance of predicted environmental, economic and social impacts and benefits.	Section 31.3.3
31.2	The EIS must include a consolidated list of commitments and conditions that are proposed to apply to the project to protect environmental values and achieve predicted outcomes.	Section 31.2