23. Environmental Management and Commitments

23.1 Introduction

Environmental Management for the Project will need to address conditions of approval, permit requirements, conditions of the MMP which will include an EMP and legislative and company requirements.

The Environmental Management Framework discussed in this chapter includes reference to the proposed EMP framework for construction and operation of the Project and a summary of commitments proposed by Vista Gold.

23.2 Environmental Management Plan

The purpose of an EMP is to clearly describe key policies, commitments and environmental management strategies to be adopted to manage activities, minimise potential environmental impacts and enhance the benefits of the Project.

The EMP will form part of the MMP as per an advisory note on Mine Management Plans (DoR 2012):

> "*A MMP is the key operational document for all Northern Territory mining operations to support the Application for an Authorisation of mining activities. It aims to satisfy all legislative requirements and provides a valuable reporting and operational planning tool for the mine, outlining the actions, programs and responsibilities necessary to achieve a "life-of-mine" commitment to safety, health and the environment. This is part of what is known as systematic management*".

A MMP will be developed by Vista Gold in the event approval for the Project is granted. An EMP framework for the Project for inclusion in the MMP is provided in Appendix Z. The framework will be comprehensively updated by Vista Gold to enable conditions of approval to be incorporated and addressed and that contractor construction and mining methods are recognised and managed.

The EMP structure includes:

- emergency contact register;
- description of the Project;
- overview of applicable legislative framework and Vista Gold company policies;
- description of potential key risks;
- identification of roles and responsibilities; and
- management subplans for environmental parameters which include:
  - Objectives
  - Target
  - Actions
  - Monitoring
  - Reporting and
  - Contingency Planning.

Additional information is provided in the EMP framework for the Project (Appendix Z).

23.3 Commitments

The following subsections outline the key commitments made through the environmental impact assessment process and subsequent risk assessment of residual impacts (Chapter 5). These commitments have also been included in the management sub plans for all environmental aspects addressed in the EMP framework.

These commitments will form the basis of a commitments register that will be maintained and expanded where necessary, in order to monitor compliance with the Draft EIS and environmental authority conditions.

23.3.1 Community

Community	
Impact area	**Proponent Commitment**
Community health and safety	Occupation health and safety policies will be developed for the construction and operational phases of the Project. First aid will be available at the mine site. A site safety plan will be developed that includes preventative measures for a range of on and off-site incidents that might impact on community health and safety. An emergency response plan will be developed that includes any emergency incidents that might involve members of the public. The proponent will work closely with the Katherine Emergency Services in developing the plan.
Community housing and accommodation	A housing and accommodation strategy will be developed in consultation with the Northern Territory Government and key regional stakeholders that will include: ◗ development of a purpose-built construction camp for the temporary construction workforce, outside of existing settlements; and ◗ finalisation and implementation of a hybrid accommodation strategy for the operational workforce including a mix of FIFO / DIDO and residential options.
Workforce management	A workforce management strategy for the construction and operational phases will be developed and address workforce sources, workforce management, worker health and wellbeing and worker behaviour. The workforce management strategy will include a recruitment policy that allows for appropriate notice periods to be served for new employees.
Community employment and training	An industry participation plan will be developed in accordance with the requirements of the Northern Territory Government, and with a preference to build business, industry and community capability within the Northern Territory. The Proponent will work with local training providers to develop local training programs that will provide opportunities for employment to unskilled people.

Community	
Impact area	**Proponent Commitment**
Community values and change	A community and stakeholder engagement plan will be developed. The plan will establish a community and stakeholder relations role and a community reference group that will advise the Proponent on community matters. The community reference group will include representatives of vulnerable groups. A complaints and feedback register will be established to track complaints and feed the response back to of the Proponent. The Proponent will continue to maintain, develop and operate the project website in order to inform the community. The Proponent will establish a community sponsorship fund to contribute to community development initiatives. Contractors will be selected on their ability and willingness to uphold the community commitments of the Project.
Near neighbour impacts	A 'near neighbour' program will be established to monitor any changes on adjacent and downstream properties and agree to mitigation. The 'near neighbour' program will include monitoring for impacts to the road network affecting such properties.
Indigenous resources, values and aspirations	The Proponent will continue to work under the Partnership Agreement with the Jawoyn Traditional Owners, towards achievement of their economic and employment aspirations. Clear mechanisms will be established for collaboration, communication, reporting and dispute resolution between the Proponent and Indigenous groups that may be affected by the Project. A Cultural Heritage Management Plan will be implemented, monitored and maintained.

23.3.2 Climate Change and Sustainability

Climate Change and Sustainability	
Impact Area	**Proponent Commitment**
Climatic conditions	Undertake adaptive management to manage extremes of air temperature, precipitation, flash floods, tropical cyclones, wet and dry periods and evaporation. Consider appropriate temperature ranges during the design phase of the Project; including storage of chemicals and explosives; and the procurement of plant, equipment and construction materials. Preventative maintenance of plant and equipment will be incorporated into standard working procedures. Monitoring will be undertaken during extremes of temperature. Potential increased risk of flooding will be considered in the design of the Project, including site drainage, bunding of watercourses, pond sizing and open pit slopes. Dry and wet periods will be considered in the design of recycled plant process water. Risk management systems will be enacted to provide early identified and corrective action to avoid potential project failures.
Sustainability (community, economy, environment)	An environmental management system will be developed based on established guidelines and include a requirement to report on key result areas, key performance indicators and sustainability goals. An environmental management, monitoring and reporting schedule will be established to support the environmental management system. Project personnel and contractors will be educated on the environmental management system and their roles within it. Project personnel and contractors will be educated on the risk management system to create a culture of risk awareness and risk management. Consider type, volume, sourcing and application of materials, services and resources to achieve sustainable outcomes. Sustainability criteria will be incorporated into tender documents, where practicable. Whole of life considerations will be incorporated into project design. Resilience of equipment will be considered to minimise long-term costs.

23.3.3 Greenhouse Gas

Greenhouse Gas	
Impact Area	**Proponent Commitment**
Emissions to atmosphere	A commitment to energy efficiency will be carried into the environmental management plan. An energy efficiency assessment will be undertaken to identify initiatives and technologies leading to implementation of processes to allow energy efficiency opportunities to be integrated into operations. The detailed design and planning stage of the Project will include a focus on the optimisation of diesel use. Opportunities for the use of biodiesel on the Project will be examined. Through assessment and review, the Project will seek continuous improvement in compliance and emissions reduction. Scope 1 and Scope 2 emissions will be reported under the National Greenhouse and Energy Reporting Scheme (NGERS). The legislated reporting requirements of NGERS will be used to monitor performance and identify opportunities across the life of the Project.

23.3.4 Land

Land	
Impact Area	**Proponent Commitment**
Landscape	Where possible rehabilitated structures will be integrated with existing topography and landscape features.
Soil	Develop and implement Erosion and Sediment Control Plan including installation of temporary erosion control measures such as sediment fences, diversion drains, hay bales, sediment traps and hardstand covers. Regular inspection and maintenance of sediment control structures. Minimise the disturbance footprint and undertake progressive rehabilitation where practicable. Construction and management of soil stockpiles to ensure they do not contribute to sediment load on drainage lines and watercourses. Stormwater drainage controls and erosion and sediment controls for haul roads will be designed and constructed to minimise erosion and channel scour. Verges will be vegetated where practicable.
Hazardous materials management	Appropriate design and storage of hazardous materials to Australian standards. All hydrocarbons will be stored and handled in accordance with the bunding requirements of AS 1940:2004: The Storage and handling of combustible and flammable liquids. Regular inspections of storages, tanks and bulk containers and the integrity of bunded areas and containment systems. Chemical and hydrocarbon storage facilities will be managed in accordance with a MMP, and include an inventory of chemicals stored on site, the relevant material safety data sheets, spill kits and spill response procedures. The Project will comply with the International Cyanide Management Code. Spill clean-up procedures will be developed and project personnel and contractors will be trained accordingly.
AMD or cyanide contamination	Monitoring of groundwater quality. Characterisation of waste material. Encapsulation of AMD material in the WRD. Treatment of water prior to discharge. Comply with International Cyanide Management Code.

23.3.5 Surface Water

Surface Water	
Impact Area	**Proponent Commitments**
Flooding, AMD run-off	Water retention ponds will be sized to capture an ARI event appropriate to their hazard category, plus an appropriate freeboard allowance for sedimentation. The ponds will be designed to discharge to the natural environment in periods of extreme rainfall to protect the integrity of the structure. A site Water Management Plan will be developed, implemented and regularly reviewed. Water retention ponds will be managed to maximise their available storage in the Wet Season, including discharge in accordance with the WDL. Additional pumping capacity will be installed to accommodate severe rainfall. If all water storages are at capacity, excess water will be transferred to the TSFs for temporary storage. The heap leach pad and heap leach pad moats will be reshaped and lined to accommodate extreme rainfall events. Surface water monitoring will be undertaken to validate the Water Balance Model. Design and construction of infrastructure in accordance with Australian National Committee on Large Dams (ANCOLD) requirements. The capacity of the WTP and equalisation pond will be sufficient to prevent overflows in normal operating conditions. Active water treatment will be undertaken including for general on-site use and to meet discharge criteria for release to the Edith River during the Wet Season. During the pre-production phase, a lined equalisation pond will be constructed for mixing of AMD from various on-site sources prior to treatment and to temporarily store AMD in case of system upset. A lined sludge disposal cell will also be constructed for the permanent disposal of water treatment sludge. Treatment of water prior to release. Any emergency Wet Season release to the Edith River will only be considered in consultation with the Northern Territory Government. Discharge events will be monitored and reported to the Northern Territory Government and stakeholders in accordance with the WDL. A Surface Water Monitoring Program will be developed and implemented in accordance with the WDL. Development and implementation of a Tailings Management Plan. Overflow from the seepage collection sump under upset conditions such as a mechanical failure of the pumps, will discharge into the adjoining lined seepage overflow collection pond.

Surface Water	
Impact Area	**Proponent Commitments**
Offsite release of sediment and of poor quality water	Development, implementation and regular review of the Erosion and Sediment Control Plan. Stormwater drainage will be designed for a 100 year ARI design event and all drainage will be regularly checked and maintained. Stormwater runoff into the pit will be minimised by construction of runoff barriers (e.g. engineered mounds / levees) around the pit. "Clean" runoff from undisturbed land within and upstream of the mine site will be kept separate from "dirty" runoff from disturbed areas within the mine site. Clean runoff will be diverted downstream of the mine site with no further treatment. Dirty runoff will be stored and treated on site. Regular checks and maintenance of structures and scouring protection.
Hazardous materials management	All chemicals, fuels and oils will be stored and contained according to Australian Standards and Regulations for the protection of surface water from impacts of spills. Lubricating oil will be stored in bulk containers inside a bunded area with spill protection and recovery. Waste oil / lube oil will be stored in tanks within a bunded area and held for collection by a contractor for reprocessing and recycling. The Proponent will use low toxicity, non-ionic or anionic flocculants to prevent adverse environmental impacts. The Proponent will provide an alternative and temporary supply for potable water in the event of failure of the water treatment plant. Spill response and clean up procedures will be implemented. Sewage treatment will be licenced by the Department of Health and a WDL will be applied if treated effluent is to be discharged from site. Stormwater runoff from material storage dumps will be managed by: ◗ constructing dumps in a manner that dissipates runoff through seepage and evaporation; ◗ constructing the outer batter slopes of dumps with inert overburden material; ◗ construction of perimeter drains that collect runoff from the outer batter slopes and perimeter areas; and ◗ construction of drainage lines that convey runoff from dump perimeter drains to water retention ponds. Testing for chemicals will be included in the Surface Water Monitoring Program.

23.3.6 Groundwater

Groundwater	
Impact Area	**Proponent Commitment**
Contamination from TSF	Tailings will be managed in accordance with the Tailings Management Plan. Reinstate existing TSF1 underdrainage system and associated infrastructure to reduce seepage to groundwater. TSF2 will be designed, constructed and rehabilitated in a manner that will minimise oxidisation of sulfides and leakage of contaminated liquor or leachate TSF2 will be underlain by a system of under-drains, geo-membrane liner, toe drains and over-drains. There will be no connection between TSF2 and underlying groundwater. Monitoring of water levels and quality adjacent to tailings storage facilities to establish if there is a linkage with the TSFs and the surrounding environment - data to be assessed monthly and summarised yearly within the Water Management Plan. Rehabilitation of monitoring bores proposed to be retained, to meet most current Minimum Construction Requirements for Water Bores in Australia. Decommissioning redundant bores and / or grouting of exposed exploration drill holes.
Contamination from the WRD	Existing WRD will be encapsulated within the expanded WRD. Investigate alternative methods of neutralising PAG rock (e.g. anoxic limestone drains). AMD materials in the WRD selectively handled to exclude oxygen and water. The WRD will be managed in accordance with the Waste Rock Management Plan. Groundwater Monitoring Program associated with the WRD. Construction of 8m wide benches at 30m vertical intervals in WRD to collect stormwater drainage and convey to surface water collection ditch. A surface water collection ditch will be constructed down gradient of the WRD to collect flows for treatment prior to discharge. Potentially acid forming rock in the WRD will be contained in a Non-acid forming shell reducing exposure to air and water during operations and post mining. Monitoring of water levels and quality adjacent to WRD to establish if there is a linkage with the WRD and the surrounding environment - data to be assessed monthly and summarised yearly within the Water Management Plan. Continued collection of seepage from the WRD by RP1 Installation of GCL progressively throughout closure of areas of the WRD. The installation of the GCL will reduce / eliminate infiltration and generation of AMD in the structure.

Groundwater	
Impact Area	**Proponent Commitment**
Contamination from HLP	Processing or rehabilitation of heap leach materials. Ongoing maintenance of the HLP post-Wet Season. Cleaning of HLP moat and repairs of liners as required. Pumping of stormwater from the HLP to the WTP. Monitoring of water levels and quality adjacent to the HLP to establish if there is a linkage with the surrounding environment -data to be assessed monthly and summarised yearly within the Water Management Plan
HazMat	Manage disposal of wastes in accordance with the Waste Management and Pollution Control Act and waste management hierarchy through the MMP. Chemical and hydrocarbon storage facilities bunded and managed in accordance with the MMP including inventory of chemicals onsite, material safety data sheets, spill kits and spill response procedures.
Groundwater drawdown	Ongoing monitoring to ensure that groundwater impacts are not greater than those predicted.

23.3.7 Flora and Vegetation

Flora and Vegetation	
Impact Area	**Proponent Commitments**
Vegetation clearing	Adhere to buffer widths recommended by the Northern Territory Land Clearing Guidelines, where possible, with regard to riparian vegetation in drainage lines. If not possible install structures that would capture sediment downstream of development. Stage clearing of vegetation to minimise areas of bare ground and clear land only as required and in accordance with the Erosion Sediment Control Plan. Avoid land clearing for construction during the Wet Season (Dec-May). Develop and implement Vegetation Clearing Plans which include areas not to be cleared (no-go areas) and make all workers aware of them through EMP and site work briefings. Clearly mark limits of clearing. Project personnel and contractors will be educated to understand the vegetation clearing plans as part of general environmental inductions for the workforce. Clearing will be monitored to comply with areas marked for clearing. No intrusion of any kind will be made on areas outside the clearing zone. Areas of potential habitat for the threatened species will be fenced off and clearly marked as 'no-go' areas. Where clearing is proposed for habitat of the threatened *Ultricularia singeriana* or *Fimbrostylus fimrostyoloides*, a targeted survey of the area will be conducted prior to any clearing.
Dust	Chemically treat haul roads to minimise dust emissions, use water sprays on haul roads, and loads, wet ore before crushing, use hooded crushers and enclosed HPGR's. Dust suppression sprays on conveyor.
Fire	Controlled burning will be carried out with a focus on burning patches of vegetation in a mosaic during early Dry Season.
Weeds	Weed Management Plan implemented. Environmental inductions for workforce. Vehicle and equipment wash-down procedures on site.

23.3.8 Terrestrial Fauna

Terrestrial Fauna	
Impact Area	**Proponent Commitments**
Clearing	Areas of land to be cleared will be clearly marked to ensure no intrusion into lands intended to remain intact. Activities will be monitored to comply with areas marked for clearing and no intrusion of any kind will be made on areas outside the clearing zone. The Gouldian finch habitat, *Eucalyptus tintinnans* woodlands adjacent to the pit will only be cleared during the non-breeding season i.e. the Wet Season. Standard noise mitigation will be applied to minimise noise levels during clearing
Fire	The existing system of early Dry Season controlled burns will be maintained. Fire management will include the Yinberrie Hills site of conservation significance. A fire management approach resulting in a patchy mosaic of burned and unburned areas will be investigated. Monitoring of the breeding population of the Gouldian finch will continue and focus on uncertainties surrounding the highest recorded risk to that species, impacts to the crested shrike-tit and partridge pigeon populations, and impacts to the fauna on the Yinberrie Hills generally.
Feral Species	Standard mitigation regarding waste management will limit the potential for colonisation by black rats.
Artificial light	The potential impacts of artificial light will be mitigated in accordance with an EMP.
Dust	Standard dust mitigation will include chemical treatment of roads to reduce dust generation, use of water sprays, wetting of ore prior to crushing, hooded crushers and enclosed HPGR. Additional mitigation measures are planned should dust levels prove excessive. Monitoring of the Gouldian finch breeding population will continue and will also assist with inferring impacts on the crested shrike-tit and partridge pigeon populations. Dust levels will be monitored to assist in determining: ◗ levels of dust concentration and dust deposition in breeding habitat adjacent to the Mt Todd mine before and during mine operation; and ◗ effects of dust levels on intensity and success of Gouldian finch nesting. Artificial nest boxes will be established throughout the area of Gouldian finch habitat potentially subject to >50 µg/m^3 levels of dust as part of the monitoring program. These boxes will be established prior to the breeding season.

Terrestrial Fauna	
Impact Area	**Proponent Commitments**
Monitoring	A Gouldian finch population monitoring program will be developed alongside the dust monitoring and allow analysis of the effects of habitat, dust levels and distance from the mine on nesting frequency and success. Monitoring of the breeding population will focus on dealing with uncertainties surrounding the highest recorded risk to the Yinberrie Hills fauna. The monitoring program will document the status of other potential breeding areas of Gouldian finch in the Yinberrie Hills and the Mt Todd to Pine Creek region. The Project will assist long term population monitoring conducted by DLRM.

23.3.9 Biting Insects

Biting Insects	
Impact Area	**Proponent Commitment**
Public health	Storm water drainage will be designed and managed to avoid ponding and maximise sheeting. Containers (drums, tyres etc) will be appropriately disposed of or stored under cover. Rainwater tanks will be appropriately screened at the inlet and outlet. Construction will be managed to avoid establishment of areas of temporary water. Monitoring for mosquito presence. Larvacides used if breeding detected. Personnel to wear long sleeved shirts, long trousers and mosquito repellent. The Project will comply with “Guidelines for preventing mosquito breeding sites associated with mining sites” (Medical Entomology Centre for Disease Control 2005). Drainage of grassy waterways will be maintained or improved.

23.3.10 Aquatic Fauna

Aquatic Fauna	
Impact Area	**Proponent Commitment**
AMD contamination	Proactive management of water levels to ensure adequate storage capacity. Increase the rate of treatment and discharge if uncontrolled release likely. Ongoing monitoring and evaluation of water quality and macroinvertebrate and fish community structure. Targeting sampling of refugia pools during the Dry Season to investigate to potential of groundwater seepage impacting aquatic fauna. Effective implementation of site Water Management Plan. Compliance with the Waste Discharge Licence. Tailings dam design to ANCOLD guidelines. Surface Water Monitoring Program. Compliance with MMP conditions.
Diversion channel design and planning	Prior to construction existing and proposed site drainage patterns will be identified. A revegetation plan will be developed prior to creek diversion to stabilise and to suit the physical characteristics and requisite environmental values of the waterway. Incorporate appropriate materials into the design to achieve the requirements for habitat creation. Post-construction monitoring to assess creek bank remediation measures. A macroinvertebrate monitoring program will be developed that takes into account the location of potential sources of impact, the large inputs of rain during the Wet Season and the necessary level of statistical power to detect change in macroinvertebrate communities. Modelling at normal flow conditions will be undertaken to assess the hydraulic impacts of diversion channels on fish passage. Fish passage will be considered in the design of diversion channels to provide sufficient depth, velocity and resting habitat during regular flow events.

Aquatic Fauna	
Impact Area	**Proponent Commitment**
Diversion channel construction - erosion and sediment control	A clearly definable site boundary will be delineated (where practicable), with construction and vegetation clearance not occurring outside of this area. Site entry and exit points will be clearly defined. Works will be scheduled so that construction coincides with periods of low flow and low rainfall. Implement spill and sediment control measures (such as silt curtains within the river channel) to minimise the potential for sediments to deposit on downstream foraging areas. Stabilise banks, including appropriate native plantings, to consolidate banks post-construction and restore habitat to current, or improved, condition. Avoid stockpiling of soil along existing drainage lines, keep vehicles to tracks and divert storm water away from disturbed areas to minimise soil loss. Minimise the area of exposed ground to reduce the amount of ground subject to erosion. Conduct excavation in stages to minimise ground exposed to erosion. Existing crossings should be used to move equipment across the waterway. If there is no crossing, machinery should be carefully 'walked' across the waterway. If frequent crossings are required, a pad of clean rock will be laid at a shallow point of the waterway to make a temporary crossing. Temporary crossings will be entirely removed when works have finished. Any diversion will be constructed using clean non-erodible material. Develop contingency measures to prevent flooding of the worksite by a rapid rise in the creek. A revegetation plan will be developed during the detailed design phase of the diversion to suit the physical characteristics and requisite environmental values of the waterway. Long-term measures will be used to control erosion at the works site including slope stabilisation, revegetation, soil coverings, rip-rap and armouring, check dams, sediment traps, brush barriers and vegetation filters.

Aquatic Fauna	
Impact Area	**Proponent Commitment**
Diversion channel construction - pollution control	Implement spill control measures. Petroleum products and other hazardous substances will be kept out of the waterway and in a bunded storage facility. Refuelling, top-ups and oil checks will be done well away from the waterway. Non-toxic hydraulic fluids, such as vegetable-based fluids will be used if possible. All equipment will be inspected and repaired regularly to prevent oil and other fluids leaking. If equipment is to be immersed in the waterway, it will be cleaned beforehand to remove any external grease, oil and other fluids. Dirt and mud will be removed from all equipment before entering the works site and waterway to avoid transferring weeds and disease. Wash-down water will not be allowed to enter waterways. Any cast-in-place concrete will be isolated from the waterway for at least 48 hours to allow pH to neutralise. Paints will not be allowed to enter the waterway when constructing, repairing and maintaining in-stream structures. If using wood treated with preservatives, the chemicals will be given enough time to fix before immersing the wood in the water.

23.3.11 Heritage

Heritage	
Impact Area	**Proponent Commitment**
Sacred sites	Actively maintain AAPA Certificate(s) for the project area and the proposed works. Undertake inductions and ensure all personnel understand of the need to comply with the conditions of the AAPA Certificate(s). Restricted work areas will be clearly demarcated at a given buffer / standoff distance and 'no go' areas will be applied where necessary.
Open pit slope failure	Identify sacred sites within close proximity of the open pit. Ensure adjacent slope design configuration and Factor of Safety and / or Probability of Failure are commensurate with nature of sensitive site (i.e., acceptable design tolerance given level of confidence in geotechnical model and analysis – within detailed design phase). Develop and implement a suitably robust and appropriate Ground Control Management Plan (including comprehensive slope design verification, protection measures and monitoring routines). Any sacred sites in proximity to the open pit will be the subject of a Ground Control Management Plan. The plan will be accompanied by verification of slope design, protection measures and monitoring routines that are commensurate with the sensitivity of the site.
Archaeological sites	Areas of European or Indigenous heritage, and or archaeological significance will be clearly demarcated at a given buffer / standoff distance and 'no go' areas will be applied where necessary. Permit to Disturb applications and consultation for isolated artefacts and small sites if necessary to disturb and or relocate. Consultation with traditional owners as part of the management, permitting and possible salvage of sites using acceptable archaeological methodology. Implement a Cultural Heritage Management Plan for the sites remaining and sites to be removed with approval. Consultation with Heritage Branch and other relevant stakeholders in relation to heritage management decisions and location of heritage objects removed with approval under the Heritage Act. Locations of unrecorded archaeological sites that may be discovered during the course of works to be reported to the Heritage Brach of DLPE and the Jawoyn Association.

23.3.12 Air Quality

Air Quality	
Impact Area	**Proponent Commitment**
Sensitive receptors	Interactive Dust management plan produce with standard dust mitigation procedures detailed including chemical treatment of roads to reduce dust generation; use of water sprays; wetting of ore prior to crushing; hooded crushers; and enclosed HPGR. Sprays on primary crusher dump pocket. Dust suppression sprays on conveyors. Continuous dust and metrological monitoring during preproduction construction and operations at site boundary and sensitive receptors including Werenbun. Implement additional management controls if exceedance is likely. Retention of vegetation as a buffer, and to limit potential dust sources. Covering areas of disturbed soil, stockpiles and temporary spoil containment with mulch or other material as best practicable. Whenever possible, avoid conducting dust generating activities during high wind speeds. Burning of waste and materials will not be allowed on site at any time. Spraying of paint will not be undertaken during periods of high wind. Implement additional management controls if exceedances occur. A risk assessment will be undertaken against validated model results.

23.3.13 Noise and Vibration

Noise and Vibration	
Impact Area	**Proponent Commitment**
Mine construction and operation	A Noise Management Plan including mitigation measures will be included in site wide EMP. Although not expected to cause adverse noise impacts, a complaint management system will be implemented. Including the implementation of management measures adopted should noise complaints be received. Operation of more recent and silenced equipment where possible and maintenance for good working condition. Blasting will only occur between 9am to 5pm (Monday to Friday) and 9am to 1pm (Saturday) to reduce social impacts. Maximum instantaneous charges of less than 100kg and limit (interim or final walls) blasting.

23.3.14 Traffic and Transport

Traffic and Transport	
Impact Area	**Proponent Commitment**
Increased vehicle and freight traffic	Prepare Transport Management Plan, including community consultation strategy. Use of pooled vehicles such as buses and work vehicles (to minimise exposure). Fitness for work assessments for site personnel. Workforce management strategy and Traffic Management Plan to address driver fatigue. Prepare Contractor Management Plan. Regular pavement condition review of Edith Falls Road. Liaise with Northern Territory Government to ensure funding and maintenance routines are appropriate. Consolidation of freight and reagent transportation to rationalise transport movements.
Dangerous goods transport	Transport of dangerous goods in accordance with relevant legislation with measures incorporated into the Traffic Management Plan. Prepare Incident Management Plan. Comply with International Cyanide Management Code. Prepare Contractor Management Plan. Consolidation of freight and reagent transportation to rationalise transport movements.

23.3.15 Economics

Economics	
Impact Area	**Proponent Commitment**
Gold price downturn / AUD fluctuations	Independent specialist PFS and FS inputs. Comprehensive financial modelling and scenario planning. Building in contingencies and adopting conservative assumptions (e.g., Au price, capital and operating costs, mine design parameters, etc.) for basis of Final Investment Decision and approvals.
Skill shortages	Identify labour requirements early and provide opportunities to develop skills where gaps in the local labour force are found to be present. Draw on contracting firms and personnel (local and / or interstate).

23.3.16 Acid and Metalliferous Drainage

Acid and Metalliferous Drainage	
Impact Area	**Proponent Commitment**
Batman Pit	Continue current treatment Batman Pit (RP3) waters to level deemed appropriate for discharge in accordance with Waste Discharge Licence. Ongoing monitoring of water quality prior to discharge. Collection and treatment of AMD pit waters resulting from incident rainfall. Develop and implement a Water Management Plan and Closure Plan with detailed monitoring and contingency plans. Post-mining, the pit is likely to behave as a sink under average conditions, effectively confining AMD to the pit and preventing release to the environment outside of the pit.
WRD	A Waste Rock Management Plan will be developed that specifies how waste rock is to be handled to minimise the potential for AMD and maximise the beneficial use of NAF waste rock for closure. RP1 waters will be the required standard under the waste discharge license prior to a controlled discharge. Alternative methods of neutralising PAF rock, such as anoxic limestone drains, will be investigated. All AMD material stored in the WRD will be encapsulated. The Proponent will undertake ongoing stabilisation and rehabilitation of embankments of the WRD. The WRD will be designed according to Western Australia and Northern Territory guidelines, including benches, stormwater drainage, and erosion and sediment controls. Any failure of the WRD slope will be immediately reconstructed.
TSF	During mining comply with approved tailings management plan that will specify how tailings will be handled to minimise AMD, closure, rapid dewatering and consolidation of tailings.
Other infrastructure	Maintain existing diversion drains. Restrict excavation depths to oxidised material where possible. Inspect material types and classify as necessary. Surface flowing AMD from low grade ore stockpile, ROM pad and process plant area, as well as controlled seepage from TSF1, will be treated at the WTP during operation. The HLP and moat will be rehabilitated or processed. An assessment of AMD in historical mine workings, creek diversions and drainage diversion channels constructed through bedrock will be undertaken and management measures will be developed.

Acid and Metalliferous Drainage	
Impact Area	**Proponent Commitment**
Additional work	A predictive geochemical pit lake model will be developed to assess the long-term acidity after cessation of mining operations. Additional Acid Based Accounting will be undertaken to confirm that waste rock is adequately represented by the characterisation program. A subset of waste rock samples will be subjected to NAF pH testing to assess the adequacy of the proposed technique as a method for waste rock segregation. The NAF test extract will be analysed to estimate the potential release of metals in proportion to sulfate as a result of sulfide oxidation. Additional tailings samples will be subjected to static testing to confirm the preliminary findings to-date. Humidity cell testing will also be initiated to investigate long-term metal leaching and the potential to generate acid.
Closure	After mining and processing of all residual ore, material in the LGO2 area will be regraded and covered. LGO1 will be consumed by the expansion of the Batman Pit. The process plant and pad area will be regraded, covered and revegetated. The following specific closure investigations will be undertaken to address information gaps: ◗ analysis of waste and cover material hydraulic properties; ◗ tailings trafficability study; ◗ precipitation-watershed yield study; ◗ site wide soils, closure cover, and rehabilitation material inventory and characterisation; and ◗ waste and closure cover erosion and sediment control study. A design for the constructed wetlands will be finalised to confirm that water quality exiting the wetlands will meet the site specific trigger levels prescribed in the WDL.

23.3.17 Waste

Waste	
Impact Area	**Proponent Commitment**
Waste rock characterisation and storage	Additional drilling. Further and ongoing waste characterisation. Leach Testing. Cover trials. Implement Waste Rock Management Plan. Provide ongoing refinement of materials balance. Increase contingency for cover requirements. Construction of surface and sub-surface drainage and implementation of a Water Management Plan for contaminated water. Diversion of run-on water and catchment reduction measures.
General waste	Waste management addressed in EMP. Separation of waste for recycling and recovery. Removal of residual waste to landfill. Disposal of hydrocarbon and other chemical spills to approved facilities. Record waste types and volumes generated on-site and being transported off-site. Monitor for potential environmental impacts by conducting surface water quality monitoring. Treatment of sewage.

23.3.18 Closure and Rehabilitation

Closure and Rehabilitation	
Impact Area	**Proponent Commitment**
Soils erosion and sedimentation	Closure and Rehabilitation Plan updated and refined throughout mining operations including life of mine closure planning, contingency planning, tailings management plan, waste rock management plan and a care and maintenance plan. Revegetation and weed management trials to determine best practice for revegetation of the site. Progressively rehabilitating the mine reducing the environmental and financial risk of closure.
Closure planning failures	Annual review of security bond calculations. Closure and Rehabilitation Plan updated and refined throughout mining operations including life of mine closure planning, contingency planning, tailings management planning, waste rock management planning and care and maintenance planning. Revegetation and weed management trials to determine best practice for revegetation of the site. Progressively rehabilitating the mine reducing the environmental and financial risk of closure.
AMD issues	Closure and Rehabilitation Plan updated and refined throughout mining operations including life of mine closure planning, contingency planning, tailings management plan, waste rock management plan and a care and maintenance plan. Engagement with Northern Territory Government regulatory authorities on plans to leverage off other projects. Thickness of rock armouring to be substantially enough to ensure integrity of the cover. Revegetation and weed management trials to determine best practice for revegetation of the site. Progressively rehabilitating the mine reducing the environmental and financial risk of closure. Under the Water Management Plan and Closure and Rehabilitation Plan implement and maintain a passive water treatment system. Further study will be undertaken prior to mine operation on: ◗ waste and cover material hydraulic properties, characterisation and analysis; ◗ tailings trafficability testing; and ◗ improvement of the watershed hydrologic data collection system to enable an update of precipitation-yield characteristics of the site.