Appendix 3

Environmental Risk Analysis

Appendix 3 - Environmental Risk Analysis

Northparkes Mines Step Change Project

Activity	Aspect	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Environmental Risk?
				C	L	R		
CONSTRUCTION PHASE								
Construction of mine infrastructure (including Tailing Storage Facility (TSF) and mine access road).	European Heritage	Disturbance of sites of European heritage significance.	The Project Area has been previously surveyed and assessed for historic heritage impacts. This assessment indicated that there is a number of local historical heritage significance located in approved disturbance areas. No state listed heritage items were identified within the Project Area.	2	D	L	A description of heritage management practices will be discussed in the Environmental Assessment (EA).	No
	Ecology	Loss of native flora and fauna.	A number of surface facilities will be constructed outside existing and approved disturbance areas. A full assessment of the potential impacts of the project on ecological values has been completed.	2	C	M	An assessment of the potential impacts of the project on ecological values has been undertaken.	Yes
	Cultural Heritage	Disturbance of Aboriginal places or objects.	A number of surface facilities will be constructed outside existing and approved disturbance areas. A survey of these areas has been completed. The management of cultural heritage impacts within the approved Cultural Heritage Management Plan.	2	D	L	A survey of the additional disturbance area has been completed in consultation with the local Aboriginal community. management processes are outlined in the EA.	No
	Erosion and Sediment Runoff	Sedimentation of local waterways.	Existing water management controls will be extended/implemented, including appropriate erosion and sediment controls designed and constructed for all construction areas in accordance with Soils and Construction (Landcom 2004).	2	D	L	Due to effective mitigation of this potential impact further assessment is not required. Management controls are outlined in the EA.	No

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Construction of mine infrastructure (including TSF and mine access road).	Clean Water Management	Contamination of clean water.	Any additional diversion drains will be constructed to divert clean waters away from major construction areas. Dirty water will be segregated from clean water. The drains will be designed and constructed in accordance with Soils & Construction (Landcom 2004).	2	D	L	Due to effective mitigation of this potential impact further assessment is not required. Management controls are outlined in the EA.	No
	Surface Water	Reduction in surface water catchments.	Construction of mine infrastructure will reduce natural surface water catchment area.	1	A	M	Surface water impact assessment completed for Project as a part of EA.	Yes
	Groundwater	Degradation of natural groundwater flow and quality.	Ground disturbance associated with construction activities has minimal (if any) potential to impact groundwater aquifers.	1	D	L	No further assessment required.	No
	Dust Generation	Degradation of air quality.	The construction program including the development of new tailings facilities which has the potential to generate construction phase air quality impacts. A full Air Quality Assessment is being completed for the Project, which will take into consideration Air Quality impacts from the construction phase.	2	C	M	An assessment of the potential impacts of the project on air quality is currently being carried out.	Yes
	Visual Amenity	Aesthetics of exposed earthworks and construction works.	The development of a tailings storage facility will be considered as a part of the operational phase of the project. Construction works, including the development of surface infrastructure will be relatively short in duration and will be included as a part of a visual impact assessment to consider the visual impacts associated with project construction.	2	D	L	No further assessment is required.	No

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Construction of mine infrastructure (including TSF and mine access road).	Land Capability and Agricultural Suitability Soils	Loss/deterioration of land capability and agricultural suitability. Loss of productive topsoil.	The proposed project will impact upon areas of land outside of existing and approved disturbance areas. An agricultural impact assessment has been prepared for the project to assess the impact of infrastructure development on agricultural land located outside the existing and approved disturbance areas.	2	C	M	An agricultural impact assessment is being prepared for the project to assess the impact of infrastructure development on land located outside the existing mine disturbance areas.	Yes
	Traffic	Supply of materials for construction project resulting in increased traffic.	Construction activities will result in increased traffic movements during the construction phase of the Project. The level of traffic will be consistent with existing approved levels. Construction activities will include upgrades to roads and intersections with potential for some level of traffic disruption. A traffic impact assessment is being prepared for the project which will include consideration of traffic impacts during construction.	1	D	L	Construction traffic impacts will be readily mitigated through standard construction traffic management controls which are described in the EA.	No
	Noise Generation	Degradation of noise amenity.	The construction of proposed infrastructure (TSF and road access) has the potential to generate noise impacts. A noise impact assessment is being prepared for the project to assess the operational noise impact of construction activities.	2	C	M	A noise impact assessment is being prepared for the project to assess the construction noise impacts.	Yes
	Surface Water Flows	Alteration of flow/flood in surrounding drainage lines.	The Project involves a number of changes to the existing and approved footprint. There is a potential to have an impact on the water flow and flooding of existing water catchments including Goonumbla Creek, Tenandra Creek, Cookapie Creek and the Bogan River.	2	C	M	An assessment of the potential impact of the project on surface water flows will be undertaken.	Yes

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OPERATION OF SURFACE FACILITIES AND SERVICES (processing plant, tailings storage facility, office, workshop, roads etc.)								
Operation of surface facilities and infrastructure	Erosion and Sediment Runoff	Sedimentation of local waterways.	Existing water management controls will be extended / implemented, including appropriate erosion and sediment controls designed in accordance with Soils & Construction (Landcom 2004).	2	D	L	Due to effective mitigation of this potential impact further assessment is not required. Management controls are outlined in the EA.	No
	Clean Water Management	Contamination of clean water.	Any additional diversion drains will be constructed to divert clean waters away from additional operational areas as part of the augmentation of the existing water management system. Dirty water will be segregated from clean water. The drains will be designed and constructed in accordance with Soils & Construction (Landcom 2004).	2	D	L	Due to effective mitigation of this potential impact further assessment is not required. Management controls are outlined in the EA.	No
	Dust Generation	Degradation of air quality.	The operation of infrastructure including the ore processing and tailings storage facilities has the potential to impact air quality. An air quality impact assessment is being prepared for the project, which will assess potential dust impacts.	2	C	M	An air quality impact assessment is being prepared for the project, which will assess potential dust impacts.	Yes
	Noise Generation	Degradation of noise amenity.	The operation of proposed infrastructure (ore processing and surface operations) has the potential to generate significant noise impacts.	2	C	M	A noise impact assessment is being prepared for the project to assess the operational noise impact of onsite infrastructure.	Yes

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Operation of surface facilities and infrastructure (cont.)	Visual Amenity	Aesthetics of mine surface facilities.	The Project will include the development of additional TSF over an increased footprint and increased height above ground relative to approved operations. There is a potential for additional visual impact upon residential receivers and public places. A Visual Impact Assessment will be prepared for project to assess the ongoing operational impact of built infrastructure on visual amenities.	2	C	M	A Visual Impact Assessment will be prepared for project to assess the ongoing operational impact of built infrastructure on visual amenities.	Yes
	Energy Use	Emission of greenhouse gas emissions.	The operation of surface facilities will require use of electricity, diesel and petrol. The greenhouse gas emissions resulting from this energy consumption will be assessed.	2	C	M	An assessment of energy use and greenhouse gas emissions will be undertaken.	Yes
	Traffic	Changed traffic conditions.	Traffic associated with ongoing operations will not increase above existing levels. The Project requires changed mine site access which will result in changed traffic conditions on surrounding roads. This has the potential to impact the surrounding road network. A traffic impact assessment is being prepared for the project which will consider all operational traffic impacts.	2	C	M	An assessment of traffic generation due to the proposal and the likely impacts of this traffic on the existing traffic network will be undertaken.	Yes
	Mine Closure	Inadequate mine closure leaving post mining liability.	A conceptual mine rehabilitation plan will be completed along with development of conceptual closure criteria to demonstrate that the proposed operations can be effectively closed at the end of mine life.	2	C	M	A conceptual closure and rehabilitation plan will be discussed in the EA.	Yes

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UNDERGROUND MINING OPERATIONS								
Underground Mining Operations	Ecology, Cultural Heritage, Historic Heritage	Disturbance of environmental and cultural/ archaeological features.	All underground mining will be undertaken within previously disturbed areas – either in areas subject existing/approved subsidence areas or open cut mining areas.	1	E	L	No impacts in addition to already approved will occur as a result of the Project.	No
	Groundwater	Degradation of natural groundwater flow and quality (including depressurisation).	Underground mining operations may impact groundwater resources through a potential intersection of aquifer systems, with the potential to impact local and regional groundwater aquifers.	2	C	M	A groundwater impact assessment will be undertaken.	Yes
	Land use and Agricultural Productivity	Impact on land use, land capability and agricultural suitability.	All underground mining will be undertaken within previously disturbed areas – either in areas subject to existing/approved subsidence areas or open cut mining areas.	1	E	L	No impacts in addition to already approved will occur as a result of the Project.	No
	Energy Use	Emission of greenhouse gas emissions.	Underground block cave mining requires the use of electricity, diesel, explosives and petrol. The greenhouse gas emissions resulting from this energy consumption need to be assessed. Fugitive emissions of greenhouse gases will additionally be assessed.	2	C	M	An assessment of energy use and greenhouse gas emissions will be undertaken.	Yes
	Mine Closure	Inadequate mine closure leaving post mining liability.	A conceptual closure plan will be developed to demonstrate that the proposed operations can be effectively closed at the end of mine life.	2	C	M	A conceptual closure and rehabilitation plan will be discussed in the EA.	Yes

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OPEN CUT MINING OPERATIONS								
Open Cut Mining Operations (including waste dumps)	European Heritage	Disturbance of sites of European heritage significance.	The Project Area has been previously surveyed and assessed for historic heritage impacts. This assessment indicated that there is a number of local historical heritage significance located in approved disturbance areas. No state listed heritage items were identified within the Project Area.	2	D	L	A description of heritage management practices will be discussed in the EA.	No
	Ecology	Loss of native flora and fauna.	Open cut mining operations may have impacts on native flora and fauna as a result of areas of additional disturbance relative to existing and approved areas. A full assessment of the potential impacts of the project on ecological values will be completed.	2	C	M	An assessment of the potential impacts of the project on ecological values will be undertaken.	Yes
	Cultural Heritage	Disturbance of Aboriginal places or objects as a result of disturbance.	A number of surface facilities will be constructed outside existing and approved disturbance areas. A survey of these areas has been completed. The management of cultural heritage impacts within the approved Cultural Heritage Management Plan.	2	D	L	A survey of the additional disturbance area has been completed in consultation with the local Aboriginal community. Management processes are outlined in the EA	No
	Groundwater	Degradation of natural groundwater flow and quality (including depressurisation).	Open cut mining operations may impact groundwater resources through a potential intersection of aquifer systems, with the potential to impact local and regional groundwater aquifers.	2	C	M	A groundwater impact assessment has been undertaken.	Yes
	Land Use and Agricultural Productivity	Impact on land use, land capability and agricultural suitability.	The areas of additional disturbance associated with open mining areas and waste dumps located outside existing and approved disturbance area will impact lands currently utilised for agriculture.	1	B	M	Assessment of land use and agricultural impacts associated with the project will be undertaken.	No

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Open Cut Mining Operations (including waste dumps) (cont.)	Blasting	Impact on surrounding private residences and sensitive infrastructure.	Blasting practices in proposed open cut mining areas may result in additional ground vibration and noise (airblast) levels which may impact on surrounding receivers.	2	C	M	Assessment of blasting impacts has been undertaken as part of EA.	Yes
	Noise	Impacts on noise amenity.	Open cut mining operations may result in additional noise levels which may impact on surrounding receivers.	2	C	M	Assessment of noise impacts has been undertaken as part of EA.	Yes
	Air Quality	Impacts on air quality associated with particulates.	Open cut mining operations may result in additional dust levels which may impact on surrounding receivers.	2	C	M	Assessment of air quality impacts has been undertaken as part of EA.	Yes
	Surface Water Flows	Alteration of flow/flood in surrounding drainage lines.	The Project involves a number of changes to the approved footprint. There is a potential to have an impact on the water flow and flooding of existing water catchments including Goonumbla Creek, Tenandra Creek, Cookapie Creek and the Bogan River.	2	C	M	An assessment of the potential impact of the project on surface water flows has been undertaken.	Yes
	Visual Amenity	Aesthetics of mine surface facilities.	The Project will include the development of additional waste dumps in the southern extent of the Project Area. There is a potential for additional visual impact upon residential receivers and public places. A Visual Impact Assessment will be prepared for project to assess the ongoing operational impact of built infrastructure on visual amenities.	2	C	M	A Visual Impact Assessment will be prepared for project to assess the ongoing operational impact of built infrastructure on visual amenities.	Yes
	Energy Use	Emission of greenhouse gas emissions.	Open cut mining requires the use of diesel, explosives and petrol. The greenhouse gas emissions resulting from this energy consumption need to be assessed. Fugitive emissions of greenhouse gases will additionally be assessed.	2	C	M	An assessment of energy use and greenhouse gas emissions will be undertaken.	Yes

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Open Cut Mining Operations (including waste dumps) (cont.)	Mine Closure	Inadequate mine closure leaving post mining liability.	A conceptual closure plan will be developed to demonstrate that the proposed operations can be effectively closed at the end of mine life.	2	C	M	A conceptual closure and rehabilitation plan will be discussed in the EA.	No
ANCILLARY ACTIVITIES AND ISSUES								
Non – Mineral Waste Management	Waste Disposal (including sewage)	Pollution and/or contamination due to incorrect disposal. Inefficient use of resources.	All wastes generated as part of this project will be managed by a non mineral site wide waste management plan and in accordance with the Northparkes Mines EMS.	2	D	L	Due to effective mitigation of this potential impact, no further assessment is required. Management measures are outlined in the EA.	No
	Waste Oil and Grease Storage	Soil and/or water contamination from spills or leaks.	All fuels, oils, grease etc will be collected and handled using systems designed and operated in accordance with relevant legislation and Australian Standards.	2	D	L	Due to effective mitigation of this potential impact, no further assessment is required. Management measures are outlined in the EA.	No
Water Extraction Management	Extraction of Additional Water from Surrounding Aquifers	Potential drawdown of aquifers.	Water sources for the Project will continue in accordance with current approvals and licensed allocations.	2	E	L	No potential impacts in addition to existing and approved operations.	No
Materials supply and storage	Oil, Fuel and Grease Supply and Storage	Soil and/or water contamination from spills or leaks.	All fuels, oils, grease etc will be handled using systems designed and operated in accordance with relevant legislation and Australian Standards.	1	D	L	Due to effective mitigation of this potential impact, no further assessment is required.	No
	Dangerous Goods Supply and Storage	Soil and/or water contamination from spills or leaks. Explosion hazard	All dangerous will be handled using systems designed and operated in accordance with relevant legislation and Australian standards.	1	D	L	Due to effective mitigation of this potential impact, no further assessment is required. Hazards goods management controls are outlined in the EA.	No

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Workforce and Amenities	Population Changes	Potential impact on services/local infrastructure.	The project will maintain current employment. Any potential impacts associated with demand on local infrastructure will be in accordance with existing approved operations.	1	E	L	Social impacts in the community will be discussed in the EA.	No
Socio economic	Economic Benefits	Economic impacts on local area, region and state.	The Project will provide for ongoing employment over an extended mine life.	2	C	M	An economic impact assessment for the Project will be completed.	Yes

Likelihood	Consequence				
	1 - Minor	2 - Medium	3 - Serious	4 - Major	5 - Catastrophic
A - Almost Certain	Moderate	High	Critical	Critical	Critical
B - Likely	Moderate	High	High	Critical	Critical
C - Possible	Low	Moderate	High	Critical	Critical
D - Unlikely	Low	Low	Moderate	High*	Critical
E - Rare	Low	Low	Moderate	High*	High*