

	Aspect	Option 1: Complete backfill of the pits	Option 2: Partial backfill	Option 3: Concurrent backfill (In-pit dumping only i.e. no backfilling at closure)	Option 4: Concurrent backfill with passive remediation
Environmental	Water availability and quality	<p>Advantages: Requires less treatment for long term use.</p> <p>Disadvantages: Flow through pit means contamination plumes may be released to wider groundwater system. Water will not be available for water supply.</p>	<p>Advantages: Requires less treatment for long term use</p> <p>Disadvantages: Flow through pit means contamination plumes may be released to wider groundwater system. Water will not be available for water supply.</p>	<p>Advantages: Hydraulic sink benefit as cone of depression captures wider pollution plumes from other mine areas and sources (WRDs etc.). Water can be made available for water supply.</p> <p>Disadvantage: Requires treatment for long term use; Periodic water sampling required.</p>	<p>Advantages: Hydraulic sink benefit as cone of depression captures wider pollution plumes from other mine areas and sources (WRDs etc.). Water can be used for water supply</p> <p>Disadvantages: Requires treatment for long term use, but this can include passive wetland treatment.</p>
Environmental	Groundwater	<p>Advantages: Requires less treatment for long term use</p> <p>Disadvantages: Flow through pit means contamination plumes released to wider groundwater system; water will not be available for water supply</p>	<p>Advantages: Requires less treatment for long term use</p> <p>Disadvantages: Flow through pit means contamination plumes released to wider groundwater system; water will not be available for water supply</p>	<p>Advantages: Hydraulic sink benefit as cone of depression captures wider pollution plumes from other mine areas and sources (WRDs etc).</p> <p>Disadvantages: Requires some treatment - at long time after closure; requires sampling and tracking the pit lake water analysis</p>	<p>Advantages: Hydraulic sink benefit as cone of depression captures wider pollution plumes from other mine areas and sources (WRDs etc).</p> <p>Disadvantages: Minimal passive treatment required which will assist in regulating the water quality of the pit lake; requires sampling and tracking the pit lake water analysis.</p>

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Environmental	Terrestrial and Aquatic biodiversity	<p>Advantages: with comprehensive rehabilitation, diversity and ecosystem function will be restored without any evidence of the mining disturbance</p> <p>Disadvantages: The secondary vegetation that results after rehabilitation may not restore to an acceptable level of ecosystem function. The secondary vegetation may not allow for the natural carrying capacity to be truly reinstated to pre-mining levels. The area may be prone to invasion by alien and invasive floral and faunal species.</p>	<p>Disadvantages: Depression created by only backfilling to the regional ground water level may result in the formation of a microclimate which could promoted further habitat fragmentation, a loss of surface hydrology which would impact the water courses, it may result in the formation of alternate plant communities, and the invasion of alien and invasive floral and faunal species. The secondary vegetation may not allow for the natural carrying capacity to be truly reinstated to pre-mining levels</p>	<p>Advantages: The creation of an artificial surface water feature may attract additional species to the area and increase habitat diversity, thereby stimulating an increase in faunal and floral species diversity.</p> <p>Disadvantages: Requires extensive aftercare as it may take many years for the water levels to stabilize and the ecosystems to reach a functional state.</p>	<p>Advantages: The creation of an artificial surface water feature may attract additional species to the area and increase habitat diversity, thereby stimulating an increase in faunal and floral species diversity. Passive remediation which will assist in regulating the water quality of the pit lake. The improved water quality influences the scope of end usage and lessens the risk to the surrounding surface water ecosystems.</p> <p>Disadvantages: Requires extensive aftercare as it may take many years for the water levels to stabilize and the ecosystems to reach a functional state.</p>

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Environmental	Soils and land capability	<p>Advantages: provides the largest area for post-closure land use.</p> <p>Disadvantages: it does not allow for the intensification of agricultural productivity in the area because there will be no additional water available once the pit has been backfilled completely or partially.</p> <p>Depending on the success of the land rehabilitation efforts, the grazing capacity of the rehabilitated areas are anticipated to be worse than the current long-term grazing capacity of the undisturbed areas that are estimated at 11 ha/LSU.</p>	<p>Advantages: provides some area for the re-establishment of grazing land capability.</p> <p>Disadvantages: it does not allow for the intensification of agricultural productivity in the area because there will be no additional water available once the pit has been backfilled partially. Depending on the success of the land rehabilitation efforts, the grazing capacity of the rehabilitated areas are anticipated to be worse than the current long-term grazing capacity of the undisturbed areas that are estimated at 11 ha/LSU.</p>	<p>Advantages: allow for the use of water that will accumulate in the pit lake and allow for the intensification of agriculture in the area.</p> <p>Disadvantages: reduced area available for extensive grazing.</p>	<p>Advantages: allow for the use of water that will accumulate in the pit lake and allow for the intensification of agriculture in the area.</p> <p>Disadvantages: reduced area available for extensive grazing.</p>
	Backfilling activities	<p>Advantage: Complete backfilling the UMK open pits will stimulate the national, local and regional economy.</p>	<p>Advantage: Partial backfilling the UMK open pits will stimulate the national, local and regional.</p>	<p>Disadvantage: Not backfilling in line with the current approved closure plan, will result in a loss of operational expenditure for the backfilling. However, access to underground resources will be provided for.</p>	<p>Disadvantage: Not backfilling in line with the current approved closure plan, will result in a loss of operational expenditure for the backfilling. However, access to underground resources will be provided for.</p>
Socio-economic	Agricultural	<p>Advantage: Grazing may be able to resume on the fully rehabilitated area.</p>	<p>Advantage: Once the pit has been partially rehabilitated, grazing activities may be able to resume on available land.</p>	<p>Advantage: Not rehabilitating the open pit area, will result in a loss of grazing land due to the pit and waste rock dumps on surface. Only a small portion of land will be available for grazing.</p>	<p>Advantage: Not rehabilitating the open pit area, will result in a loss of grazing land due to the pit and waste rock dumps on surface. Only a small portion of land will be available for grazing.</p>

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	Aggregate crushing	Advantage: Aggregate crushing activities may be able to continue for a limited number of years depending on market demand for all four options.	Advantage: Aggregate crushing activities may be able to continue for a limited number of years depending on market demand for all four options.	Advantage: Aggregate crushing activities may be able to continue for a limited number of years depending on market demand for all four options.	Advantage: Aggregate crushing activities may be able to continue for a limited number of years depending on market demand for all four options.
	Accessing underground resources	Disadvantage: Access to the underground resources will not be feasible utilising a vertical shaft system from surface. Backfilling the pit completely will result in a lost capital investment injection.	Disadvantage: Access to the underground resources will not be feasible utilising a vertical shaft system from surface. Backfilling the pit completely will result in a lost capital investment injection.	Advantage: Only undertaking in-pit dumping provides access to the underground resources via the un-rehabilitated open pit area. Accessing underground resources via the open pit area will result in a revenue boost. The mine will also be able to provide numerous job opportunities.	Advantage: Only undertaking in-pit dumping provides access to the underground resources via the un-rehabilitated open pit area. Accessing underground resources via the open pit area will result in a revenue boost. The mine will also be able to provide numerous job opportunities.
Socio-economic	Economic contribution	Disadvantage: The new Financial Provision regulations (to be promulgated 2021) to replace Regulation 1147 of 2015 require that the full cost for closure is made available immediately by the mine. Due to the cost of the backfilling, this will make the long-term mining of the site non-financially feasible and will necessitate the reduction of the Life of Mine from 32 years to about 15 years. This will have an impact on job security and financial benefits to the greater community.	Disadvantage: Similar to the Option 1 but with shorter duration of the final backfilling operations and smaller reduction of reserves and of the LO Open Pit Mine.	Advantage: long-term mining of the site financially feasible and will result in an underground life of mine of 64 years. This will have an impact on job security and financial benefits to the greater community.	Advantage: long-term mining of the site financially feasible and will result in an underground life of mine of 64 years. This will have an impact on job security and financial benefits to the greater community