Anticipated impacts and proposed mitigation measures for activities to be undertaken during the Decommissioning Phase

- Rehabilitation of mine affected areas:
  - Final backfill of open pit and closing of the final void, including backfilling with discard.
  - Rehabilitation of the discard dump.
  - Dismantling and removal of processing plant and associated mining infrastructure.
  - Cleaning, landscaping and re-vegetation of disturbed area.
  - Rehabilitation of the PCDs and slurry ponds.
  - Waste generation and disposal.
  - Monitoring and maintenance.
- Rehabilitation of the Redan siding:
  - Rehabilitation of the coal siding
  - Monitoring and maintenance

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REHABILITATION OF MINE AFFECTED AREAS																								
1	**Geology**	The final opencast void will be sequentially backfilled with coal discard, carbonaceous overburden and then non-carbonaceous overburden. The unconsolidated material will fill up the areas previously occupied by natural geological strata, but cannot replicate pre-mining conditions. The secondary impacts of the backfilled overburden on groundwater flow and surface stability are the main issues of concern, and are discussed in more detail below.	No	-	4	1	5	5	50	3	3	2	Reduction.	Mitigation by backfilling of the final void.	Management of the material balance will ensure that sufficient material remains for the backfilling of the final void during the decommissioning phase.	-	2	1	5	5	40	Decommissioning phase.	Mining manager.	
2		No further impacts are expected to occur on geology as a result of the removal of infrastructure and rehabilitation of disturbed areas.																						
3	**Topography**	Impacts on topography will remain where infrastructure is left intact or rehabilitated *in situ*. Infrastructure such as the Springfield co-disposal facility / discard dump and long-term groundwater water management infrastructure will be left intact, depending on the agreed Closure objectives.	No	-	4	1	5	5	50	2	2	2	Reduction.	To maximise potential for sustainable land use(s) in the future. Minimise long term impact on topography.	Infrastructure that will remain intact will be maintained by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	-	2	1	5	4	32	Operational and decommissioning phases.	Mining manager. Environmental manager.	
															Options for future use of the remaining facilities and buildings (e.g. letting or selling onwards to third parties) will be considered as part of the overall Springfield Colliery Mine Closure Plan. See also impacts on land capability and land use below.	-	2	1	5	4	32	At least 5 years prior to mine Closure.	Mine manager. Environmental manager.	
															Permanent infrastructure such as the Springfield co-disposal facility / discard dump will undergo final *in situ* rehabilitation to ensure that the potential impacts during the decommissioning and Post-Closure phases are minimised, and even prevented, as far as possible. Effective and proven strategies	-	2	1	5	5	40	Operational and decommissioning phases.	Mining manager. Environmental manager. Rehabilitation manager.	

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															and methodologies will be used to ensure that the soil cladding and vegetation used as part of *in situ* rehabilitation will require minimal maintenance, and that the vegetation will become self-sustaining.									
4	**Topography**	The removal of all surface infrastructure that will not form part of the final end land use(s) e.g. the conveyor, and the rehabilitation of the remaining footprint areas will contribute to the restoration of the pre-mining topography.	No	+	2	1	5	5	40	1	1	1	Enhancement.	• To reinstate topography to be free draining. • To ensure rehabilitated areas will become self-sustaining.	Implementation of measures to ensure sustainable restoration and rehabilitation of other environmental components such as soil, vegetation and surface water will simultaneously enhance the positive impacts on topography and the related effects on visual aspects.	+	4	1	5	5	50	Decommissioning phase.	Rehabilitation manager. Environmental manager.	
5		Storm water separation and dirty water management berms and trenches will be removed during rehabilitation, restoring the topography to pre-mining conditions as far as practicable. The river diversion / alteration may have to remain a permanent diversion.	No	+	2	1	5	5	40	1	1	1	Enhancement.										
6		The remaining soil stockpiles will be removed and used in the rehabilitation of disturbed areas previously used for infrastructure such as haul roads, etc.	No	+	2	1	5	5	40	1	1	1	Enhancement.										
7		A positive impact is anticipated due to the backfilling of the final opencast void(s) and the associated rehabilitation, which will be conducted in such a manner as to create a free draining topography and limit erosion.	No	+	4	2	4	5	50	1	1	1	Enhancement	• To reinstate topography to be free draining. • To ensure rehabilitated areas will become self-sustaining.	Rehabilitation of the final void will take place once the last load of coal has been hauled from the last pit. The surface of the rehabilitated final void will be shaped to be free draining and to return runoff to the receiving catchment, as far as practicable.	+	6	1	5	5	60	Decommissioning phase.	Mining manager.	
															Implementation of measures to ensure sustainable restoration and rehabilitation of other environmental components such as soil, vegetation and surface water will simultaneously enhance the positive impacts on topography and the related effects on visual aspects.								Rehabilitation manager. Environmental manager.	
8		All remaining dirty water management infrastructure within the Springfield mining area will be removed. The natural drainage line of the unnamed tributary of the Klip spruit will probably not be reinstated and the stream alteration will remain permanent, depending on the Water Use Licence conditions.	No	-	10	2	5	5	85	3	3	1	Enhancement	• To reinstate the topography. • To ensure the rehabilitated areas will be self-sustaining. • Ensure the stream alteration will be long term sustainable.	The topography of the Unnamed tributary of the Klip spruit will probably not be reinstated due to the risk of erosion of the backfilled opencast. Where possible the area will be made free draining.	+	6	1	5	5	60	Operational and decommissioning phases.	Mining manager. Rehabilitation manager.	
															A detailed method statement and rehabilitation plan for the final rehabilitation of the Unnamed tributary of the Klip spruit will be submitted to the DWS with the applicable Water Use Licence Application during the Construction phase. It is assumed that the main diversion will remain a permanent structure to prevent erosion.							Operational phase.	Environmental manager.	

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9	**Soil**	The movement of vehicles and machinery over the rehabilitated areas such as the final void would compact the soils, changing their structure and function, and compromising the success of rehabilitation. This could lead to secondary surface and groundwater impacts which are discussed below.	Yes	-	6	1	1	5	40	1	1	1	Minimisation.	To minimise negative impacts on soils.	Final void(s) will be backfilled and spoil surfaces will be levelled and shaped to a free draining topography. Topsoil will be replaced in sufficient quantities to render a soil depth after levelling which is similar to the stripping depth. Soil amelioration and re-vegetation will be done as described in detail in the specialist soil report attached. in **Appendix 3c** titled the Soil, Land capability and Agricultural Agro-ecosystem Specialist Assessment (Rehab Green, March 2024). This will include the separate placement of soil types in accordance with the specialist requirements as summarised in this report as well as the attached specialist report.	-	4	1	2	5	35	Decommissioning phase.	Rehabilitation manager.	
10		Soils remaining in the footprint areas of the haul and service roads will be rehabilitated to ensure the maximum post-mining land capability can be achieved.	Yes	-	4	1	1	1	6	1	1	1	Rectification.	To restore soils as far as practicable to achieve maximum land capability.	The remaining footprint areas will be thoroughly cleaned and all road building material will be removed to a suitable disposal facility. The remaining footprint areas will be ripped to alleviate soil compaction. After ripping, the rough surface will be smoothed with a disc or multiple tooth implement and then graded to a smooth surface. Topsoil stored as berms on the road edges (during the construction and operational phases) will be spread over the ripped and smoothed road footprint areas. The topsoil will be ameliorated according to the soil chemical analysis and in line with the soil specialist report attached in **Appendix 3c**. The remaining footprint areas over which the soil would have been ripped and replaced will be re-vegetated so as to become self-sustaining. Additional care is to be taken where haul roads crossed the watercourse to minimise potential impact on the remaining draining areas and to ensure long term sustainable rehabilitation.	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
11		Removal of the conveyor equipment and housing will leave holes where the footing / supports of the conveyor had been during the construction and operational phases.	Yes	-	4	1	2	5	35	1	1	1	Rectification.	To restore soils as far as practicable to achieve maximum land capability.	Footing holes will be backfilled with soils from the surrounding areas and the areas re-vegetated.	-	2	1	1	1	4	Decommissioning Phase.	Rehabilitation manager.	

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12	**Soil**	Decommissioning of the dirty water management dams, paddocks and slurry dams could leave soils contaminated with carbonaceous materials, if not appropriately managed.	Yes	-	10	1	5	5	80	2	3	1	Minimisation. Rectification.	To restore soils as far as practicable to achieve maximum land capability.	The dam floors will be thoroughly cleaned and all polluted material will be removed to either the Springfield co-disposal facility/ discard facility or the final void / pit (before the facility or pit undergoes final rehabilitation). Soil material used for wall embankments and berms will be spread over the cleared and ribbed / and disced surfaces of the removed dams. The topsoil that was stockpiled ahead of dam construction will be replaced on the surface without further compaction.. Soil compaction will be alleviated by ripping. Soil amelioration will be done according to analyses of soil samples taken after replacement of the stored topsoil and according to the specifications, especially for soil types, as per the specialist soil report attached hereto. The rehabilitated dam footprints will be re-vegetated with an appropriate grass seed mixture that will ensure that the agreed end land capability and land use will be achieved. The rehabilitation will be monitored for vegetation establishment and erosion until proven sustainable.	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
13		The recovery and removal of any buried pipelines and other infrastructure will require the overlying soil to be removed before the pipelines and other infrastructure can be removed. The impacts on soil that were identified during the construction phase (further mixing of soil horizons with the resultant reduction in soil quality) will be repeated.	No	-	4	1	1	2	12	3	2	2	Minimisation. Rectification.	To restore soils as far as practicable to achieve maximum land capability.	The topsoil will be excavated and placed away from the resulting trench, prior to removal of the pipeline or other buried infrastructure as part of decommissioning activities. The soils will be backfilled. Care will be taken not to overly compact the backfilled soils. Soil amelioration and rehabilitation will take place as described in attached soil / agricultural report..	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
14		The tip area, ROM stockpile and product stockpile area will be removed and the remaining footprint will be rehabilitated.	No	-	2	1	1	1	4	3	2	2	Rectification.	To restore soils as far as practicable to achieve maximum land capability.	Carbonaceous materials will be removed from the footprint area of the tip area and ROM stockpile area, and disposed on the Springfield co-disposal facility / discard dump (before the facility undergoes final *in situ* rehabilitation) / within the final void. Where compacted areas remain within the remaining tip area footprint, the areas will be ripped and disced, prior to placement of topsoil and further compaction avoided..	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	

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15		Depending on the agreed end land use objectives, the workshop and office complex may either be removed or remain in place.	Yes	-	4	1	1	1	6	3	2	2	Rectification.	To restore soils as far as practicable to achieve maximum land capability.	Carbonaceous materials and any remaining hydrocarbon spillages will be removed from the footprint area of the workshop and office complex, and disposed on the Springfield co-disposal facility / discard dump (before the facility undergoes final *in situ* rehabilitation)/ within a final void (only carbonaceous material). Where compacted areas remain within the remaining workshop and office complex footprint, the areas will be ripped and disced, prior to placement of topsoil and further compaction avoided..	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
16	**Soil**	The final *in situ* rehabilitation of the Springfield co-disposal facility / discard dump will require the replacement of the remaining stockpiled topsoil that was removed ahead of construction onto the shaped and capped coal discard facility surface.	Yes	-	10	2	5	5	85	3	3	3	Reduction. Rectification.	To restore soils as far as practicable to ensure the sustainability of the *in situ* rehabilitated facility.	The final shape of the disposal facility will achieve gradients suitable for re-vegetation. The disposal facility will be covered with a topsoil layer and re-vegetated with a suitable grass mixture with strong stabilizing capabilities.	-	10	2	5	5	85	Operational and decommissioning phases.	Mining manager. Rehabilitation manager.	
17		The rehabilitated soil surfaces will initially be exposed and susceptible to erosional forces, this could lead to a loss of soils.	No	-	4	1	1	5	30	3	3	1	Minimisation.	To minimise the loss of soils through erosion.	Soils will be placed in such a manner to minimise potential erosion by ensuring slopes less than 1:6. Steeper gradients require additional erosion protection permanent measures. Erosion of rehabilitated surfaces will be repaired and controlled until proven self-sustainable through monitoring. Rehabilitated areas will be monitored and remediated when / if necessary until mine Closure is achieved.	-	2	1	1	5	20	Decommissioning phase.	Rehabilitation manager.	
18		Vehicles and machinery may leak or spill hydrocarbons. This will contaminate the rehabilitated soil and alter the structure and functioning of the soil.	No	-	10	1	2	3	39	3	3	1	Avoidance. Minimisation. Rectification.	To conserve soil function.	The related mitigation measures identified the operational phase EIAMAP will also be applied here.	-	10	1	2	1	13	LOM	Environmental manager..	
19	**Land capability**	Depending on the final agreed Closure objectives, the land capability of the final void(s) will be returned to arable and grazing, depending on the pre-mining land capability and soil types, and will be consistent with the mined out voids that will have been progressively rehabilitated during the operational phase. As with the rest of the rehabilitated opencast area, the land capability in the immediate area of where the final opencast void(s) was / were located will gradually and progressively change from mining to arable and grazing once rehabilitation is successful.	Yes-	+	6	1	5	5	60	N/A			Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Backfilling of final void(s), shaping of the surface to be free-draining, and management of aspects such as soil, vegetation and surface water will ensure that the land capability will be restored to be able to support the agreed end land use objectives. If soil is managed throughout the construction- , operational and decommissioning phases as committed to in in the attached specialist report (**Appendix 3c)**, the possible land capabilities will be maximised for future land users.	+	8	1	5	5	70	Decommissioning phase.	Rehabilitation manager.	

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20		Land capability in the areas where infrastructure will remain in place (e.g. workshops and access road - see also the discussion of proposed Closure objective- at the end of LOM will remain permanently altered from the pre-mining land capability. However, while the land may no longer be capable of supporting an agricultural land use in these areas, the potential benefits of the remaining infrastructure to future land users / owners is some of these areas would contribute to a sustainable future land use and would enable future land users / owners to generate an income through the use of the remaining infrastructure.	Yes	+	4	1	5	4	40	2	3	2	Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Infrastructure that will remain intact will be maintained in good repair by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	+	6	1	5	4	48	Operational and decommissioning phases.	Mining manager. Environmental manager.	
21	**Land capability**	The land capability of the *in situ* rehabilitated Springfield co-disposal facility / discard dump will remain permanently altered from the pre-mining land capability to a post-mining land capability of fallow land. The land in this areas will not be capable of supporting alternative land uses in future, with the possible exception of strictly controlled grazing. However, grazing may lead to footpaths that will form erosion gullies, and are therefore not a preferred end land use for the rehabilitated discard dump.	Yes	-	10	1	5	5	80	3	3	3	Reduction.	To ensure self-sustaining *in situ* rehabilitation of the Springfield co-disposal facility /discard dump.	Implementation of the soil, vegetation and surface water management measures identified for the construction, operational and decommissioning phases of the Springfield co-disposal facility / discard dump will contribute significantly to the successful *in situ* rehabilitation of the said infrastructure.	-	8	1	5	5	70	LOM	Mining manager. Rehabilitation manager.	
22		In areas that will be rehabilitated to arable or grazing, final land capabilities will be directly dependant on the soil and the success of rehabilitation. Little reduction of land capability will take place if the soil measures identified throughout the LOM are followed.	Yes	-	4	1	1	1	6	2	2	2	Rectification.	To restore soils as far as practicable to achieve maximum agricultural land capability.	Implementation of the soil management measures throughout the Construction and Operational Phases, as well as the Decommissioning Phase will ensure that the maximum agricultural land capability can will be achieved, in line with the planned Closure objectives, best environmental practice and sustainability principles.	-	2	1	1	1	4	LOM	Mining manager. Rehabilitation manager.	
23	**Land use**	The land use of the final rehabilitated voids will be returned to grazing and arable land, is soil rehabilitation occurs as described in detail in the attached agricultural specialist report, attached as **Appendix 3c**. The land use will change from the relatively short-term land use of 'mining' to a land use which is sustainable over the long-term. The end land use, and the rehabilitation to achieve the end land use, should be in compliance with the pre- agreed Closure objectives.	Yes	+	6	1	5	5	60	N/A			Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Backfilling of final void(s), shaping of the surface to be free-draining, and management of aspects such as soil, land capability, vegetation and surface water will ensure that the land capability will be restored to be able to support the agreed end land use objectives. As mentioned previously, if soil is managed throughout the LOM as committed to in this document, the possibilities for post-mining land use will be maximised.	+	8	1	5	5	70	Decommissioning phase.	Rehabilitation manager.	

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24	**Land use**	The potential retention and maintenance of the infrastructure that will remain for possible utilisation post-closure, such as the workshop area and access road will restrict the future land use to urban / peri-urban uses such as light industry. However, the close location to the existing urban areas as well as the nearby heavy industries, makes the possible use of the workshops for post-closure light industrial use desirable.	Yes	+	6	1	5	4	48	N/A			Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Infrastructure that will remain intact will be maintained in good repair by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	+	8	1	5	4	56	Operational and decommissioning phases.	Mining manager. Environmental manager.	
25		The land use of the *in situ* rehabilitated Springfield co-disposal facility / discard dump will remain permanently altered from the pre-mining land use. No alternative land uses will be possible in these areas in future, with the possible exception of strictly controlled grazing at the Springfield rehabilitated disposal facility. However, grazing may lead to footpaths that will form erosion gullies, and are therefore not a preferred end land use for the rehabilitated discard dump.	Yes	-	10	1	5	5	80	3	3	3	Reduction.	To ensure self-sustaining *in situ* rehabilitation of the Springfield co-disposal facility / discard dump	Implementation of the soil, land capability, vegetation and surface water management measures identified for the construction, operational and decommissioning phases of the Springfield co-disposal facility / discard dump will contribute significantly to the successful *in situ* rehabilitation of the said infrastructure. While no alternative land uses will be possible in these areas, the self-sustaining rehabilitated surfaces will ensure that the likelihood that the permanent infrastructure will impact negatively on the receiving environment during the Post-Closure Phase is minimised.	-	8	1	5	5	70	LOM	Mining manager. Rehabilitation manager.	
26	**Vegetation**	Indirect habitat and untransformed vegetation loss and degradation as a result of possible exposure to mine affected water during rehabilitation. Contaminated mine water can lead to permanent degradation of terrestrial and wetland plant communities by altering species composition of the vegetation and reducing plant species richness. Such changes in vegetation lead to habitat degradation or even loss for certain animal species and lower faunal species richness.	No	-	8	3	5	3	48	3	3	1	Avoidance.	To minimise impacts of contaminated mine water on ecology in the receiving environment.	All contaminated water will be removed from site before all dirty water management infrastructure is removed and the remaining footprints are rehabilitated. The rehabilitation strategy will aim to minimise the potential for spillage of contaminated water to the receiving environment. No uncontrolled discharge or flow of contaminated water to the receiving catchment will be allowed during the decommissioning phase.	-	8	3	5	1	16	Decommissioning phase.	Rehabilitation manager.	
27		Increased invasion of untransformed vegetation into rehabilitated areas by alien plants.	No	-	8	2	4	4	56	2	2	2	Reduction	To prevent declared alien and invasive plants from establishing.	As per the Conservation of Agricultural Resources Act (Act No. 43 of 1983), weeds and alien invader plants will continue to be monitored and controlled within the rehabilitated areas and their immediate surrounds. As mentioned previously, rehabilitated areas will be vulnerable to invasion by such species, and will accordingly be more intensively and closely managed. Soils used for the purpose of rehabilitation will not be obtained from areas invaded by alien plants, as this will serve to disperse seeds and other propagules of aliens, some of which have very long-lived seeds (e.g. *Acacia mearnsii* and *Acacia dealbata*).	-	4	1	2	3	21	Decommissioning phase.	Rehabilitation manager.	

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28		Indirect degradation of untransformed vegetation as a result of temporary increased sedimentation during removal of infrastructure, filling in of voids and landscaping.	No	-	6	2	1	4	36	1	1	1	Reduction	To minimise sedimentation of untransformed vegetation.	The storm water separation and dirty water area isolation berms will remain in place until the last of the rehabilitated areas have been successfully re-vegetated.	-	4	1	1	3	18	Decommissioning phase.	Rehabilitation manager.	
															Dust suppression will be undertaken in open areas where rehabilitation is underway. Dust suppression will cease once all areas of bare soil have been successfully re-vegetated.								
														To minimise the footprint over which the surface will be disturbed.	All rehabilitation activities will be restricted to designated rehabilitation areas.								
														To facilitate successful rehabilitation.	Planting of a seed mix for re-vegetation will take place in early Spring, before the first rains. This will shorten the period during which the replaced soils are exposed, and will enhance the success of rehabilitation.								
29	**Vegetation**	Re-vegetation of un-vegetated and severely degraded areas will have a beneficial impact on the environment. Established grassland, even though secondary, will reduce 'edge effects' to surrounding untransformed vegetation. These edge effects include soil erosion, sedimentation as a result of runoff and dust, and alien plant infestation. It will also provide migratory corridors and extended foraging areas for fauna (including recorded and potentially occurring Threatened and Near Threatened species such as the African Grass Owl and Serval).	No	+	4	2	5	3	33	1	1	1	Rectification	To ensure the land is restored to enable the future land capability and land uses in rehabilitated areas to be optimised.	Wherever possible re-vegetation will be allowed to occur through the encouragement of natural establishment of secondary grassland through the process of secondary succession.	+	6	2	5	4	52	Decommissioning phase.	Rehabilitation manager.	
															Where seeding is required, alien species such as *Chloris gayana* and *Pennisetum clandestinum* will not be used.								
															The establishment of secondary vegetation dominated by indigenous species will be further enhanced by broadcasting seeds of indigenous grasses and forbs, and 'enrichment planting' of indigenous species such as rescued medicinal plants and protected species.								
															Light grazing of these areas will be encouraged once vegetation is established.								
															'Whale-backing will be reduced to a minimum and the natural topography will be reinstated wherever possible.								

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30	**Fauna and flora**	The decommissioning and rehabilitation phase until Closure involves the removal of all infrastructure and rehabilitation of the disturbed areas. The impact of this development phase in relation to the operational phase is mostly positive, as concurrent and final rehabilitation will contribute towards regeneration of natural habitat once mining has been concluded. Alien and invasive floral species may remain present should revegetation not be successful, and should an alien species management programme not be implemented for the duration of the project, which could impact on the suitability of the rehabilitated areas and backfilled opencast pits for the planned final land use.	No	+	6	1	1	4	32	1	1	1	Rectification	To prevent degradation to the floral and faunal ecology within the study area as a result of the development and operations of the proposed activity or the decommissioning thereof, with specific reference to areas of increased floral and faunal ecological sensitivity.	• As per the Conservation of Agricultural Resources Act (Act No. 43 of 1983), weeds and alien invader plants will continue to be monitored and controlled within the rehabilitated areas and their immediate surrounds. As mentioned previously, rehabilitated areas will be vulnerable to invasion by such species, and will accordingly be more intensively and closely managed. • Where seeding is required, alien species such as *Chloris gayana* and *Pennisetum clandestinum* will not be used. • The establishment of secondary vegetation dominated by indigenous species will be further enhanced by broadcasting seeds of indigenous grasses and forbs, and 'enrichment planting' of indigenous species such as rescued medicinal plants and protected species. • The alien species management programme developed prior to the onset of the operational phase will be continued to be implemented during the operational phase until the vegetation has been proven self-sustainable.	+	4	1	5	2	20	LOM	Mine manager. Rehabilitation manager.	
31		The following decommissioning phase activities may have direct effects on the fauna and flora of the site: • Rehabilitation and re-vegetation of disturbed areas • Decommissioning and removal of infrastructure. • Backfilling of opencast pits and final voids. • Ripping and revegetation of stockpile areas, haul roads and other compacted areas. • Clearing, landscaping and replacement of soils over disturbed areas. • Rehabilitation of the discard dump and water management infrastructure.	No	+	6	1	1	4	32	1	1	1	Rectification	To prevent degradation to the floral and faunal ecology within the study area as a result of the development and operations of the proposed activity or the decommissioning thereof, with specific reference to areas of increased floral and faunal ecological sensitivity.	• No waste material or pollution-causing agents may remain on site after closure. • It must be ensured that proper surface restoration is undertaken to prevent erosion and that the final landforms are stable, with acceptable slopes. • It must be ensured that the rehabilitated areas are free draining, and that no compaction remains. • All impacted areas should be ripped, covered with topsoil and revegetated with an indigenous grass species mixture comprising species representative of the Soweto Highveld Grassland vegetation type (refer to the specialist report attached).	+	4	1	5	2	20	LOM	Mine manager. Rehabilitation manager.	

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32	**Fauna and flora**	• The risk exists of ongoing degradation of habitat within the study area and surrounds due to unsuccessful rehabilitation efforts. • Rehabilitation and revegetation of exposed and impacted areas may occur. • Failure to monitor rehabilitation works post-closure may contribute the post-closure instability of the rehabilitation. • Failure to implement an invasive species management programme until Closure is obtained to ensure the site is sustainable..	No	-	8	2	5	4	60	1	2	1	Rectification	To prevent degradation to the floral and faunal ecology within the study area as a result of the decommissioning phase activities.	• Rehabilitation of natural vegetation should proceed in accordance with the predetermined rehabilitation plan. This rehabilitation plan should consider all development phases of the project indicating rehabilitation actions to be undertaken concurrently and during / after mining before Closure. • Concurrent rehabilitation efforts should be documented in terms of species used, soil amelioration and other variables, in order to act as rehabilitation trials in order to determine the efficiency of rehabilitation methods and the suitability of plant species used for final revegetation purposes that is site specific. • All infrastructure footprint areas should be rehabilitated to a point where natural processes will allow an appropriate level of ecological functioning and biodiversity of the area to be re-instated. • Implementation of an alien and invasive species management programme must continue to be implemented during decommissioning until Closure. • Any natural areas, including wetland and open grassland areas beyond the development footprint, must not be disturbed by the rehabilitation activities. • All soils compacted as a result of mining or rehabilitation activities falling outside of the project footprint areas should also ripped, profiled and revegetated as required. Special attention should be paid to alien and invasive control within these areas. • Should a nursery have been established for medicinal and endangered species, as part of the construction and operational phase activities the indigenous plant species can be propagated for the purpose of rehabilitation. • Any priority floral species rescued and relocated during the mining process, should be monitored to determine their re-establishment success. • Rehabilitation success and plant species establishment on mining areas must be monitored during the decommissioning phase of the project for a period of at least three years on until Closure was obtained..	-	4	1	2	2	14	LOM	Mine manager. Rehabilitation manager.	

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33	Fauna and flora	Disturbance or persecution of faunal species of conservation concern: Clearing, reshaping and revegetation of disturbed areas as part of the rehabilitation activities may again impact on the fauna and flora of the site.	No	-	6	2	5	4	52	1	2	1	Rectification	To prevent degradation to the floral and faunal within the study area as a result of the decommissioning phase activities.	• Faunal species threatened by decommissioning activities should be removed to safety under the control of the Environmental manager or an appropriately qualified environmental practitioner. • All hazardous material should be stored in the appropriate manner to prevent land contamination.	-	4	1	2	2	14	Decommissioning phase	Environmental manager.	
34		Positive impact as avifaunal species return to rehabilitated areas, although they may be disturbed by decommissioning and rehabilitation activities.	No	+	6	2	5	4	52	1	2	1	Rectification Enhancement	Cleaning, landscaping and revegetation of the disturbed area.	• Avoid repeated burning. If the burnt area is too large and burnt repeatedly localised extinction may occur. • Prevent prolonged over-grazing, which may lead to a loss of vigour in the sward, altered species composition and veld degradation, and a resultant change or decrease in bird diversity. • Avoid grazing new growth immediately after a burn every year. This can cause soil erosion, loss of nutrients, and the loss of the leaf litter in which many insects live, thereby decreasing prey availability to grassland birds	+	6	2	5	4	52	Decommissioning phase	Environmental manager.	
35	Animal life	Noise from vehicles and machinery used for rehabilitation may frighten any remaining animals and in turn cause them harm.	No	-	6	1	2	1	9	2	2	2	Minimisation.	To minimise damage to, and loss of, animal life, particularly animals of conservation importance.	Vehicles and machinery used for the rehabilitation of the final void will be limited to the remaining access and haul roads as well as rehabilitation areas.	-	2	1	1	1	4	Decommissioning phase.	Mining manager. Rehabilitation manager.	
36		Human presence on site will be significantly reduced during the rehabilitation of the final void and remaining footprint areas of the removed infrastructure, and would therefore improve conditions for animals occurring in the vicinity and utilising the rehabilitated mining areas for habitat and hunting purposes.	No	+	2	1	4	5	35	1	1	1	Enhancement.	To encourage the return of animal life to the rehabilitated areas.	Human presence and movement of vehicles will be reduced on rehabilitated areas.	+	4	1	4	5	45	Decommissioning phase.	Rehabilitation manager.	
37		With the re-establishment of vegetation and topsoil, animal habitats will be restored or replaced with new habitat.	No	+	6	1	5	4	48	1	1	1	Enhancement.	To restore animal habitats	Management of soils, vegetation and surface water during rehabilitation, as well as a reduction in the noise generated in rehabilitated areas, will ensure that rehabilitated areas provide habitat for animal species and would likely encourage animal species to return to the site.	+	4	1	5	4	40	Decommissioning phase.	Rehabilitation manager.	

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38		The pits should be backfilled and the associated infrastructure should be removed and the footprint areas rehabilitated. Impacts during rehabilitation until Closure. • The impacts are likely to be similar to the water quality and erosion impacts discussed in the construction phase. • No additional impacts are envisaged as this activity should be restricted to the already disturbed areas. • There will be concurrent rehabilitation of disturbed and / or contaminated areas • The pits and associated infrastructure should be removed, and the footprint areas rehabilitated. • Impact of surface water quality due to excess discharge water from pits	No	-	8	2	3	4	52	1	2	1	Avoidance Minimisation Rectification Reduction	To minimise impacts on the surrounding water environment.	• Remaining open pits must be backfilled and vegetated.. • All the soil stockpiles and overburden stockpiles to be used for backfilling and rehabilitation. • The remaining co-disposal facility / discard dump must be revegetated to manage on-going dust generation and erosion and all rehabilitation activities should be monitored until vegetation is well established. • Excess water will be treated and released to the environment and potentially surrounding farms, depending on the Water Use Licence requirements.	-	4	1	2	2	14	Decommissioning phase	Mine manager. Environmental manager.	
39	**Surface water (general)**	• Utilisation and maintenance of surface infrastructure until completion of the decommissioning phase, will have negative impacts on surface water flow and catchment yield, on the quality of surface water runoff from the affected areas, and in some cases on the receiving watercourses and wetlands themselves. These are discussed individually in more detail below. • Water Uses, as defined in Section 21 of the NWA, 1998, will change during the decommissioning phase as mining will have ceased and the associated removal and re-use of water will no longer be required. • Some water storage may have to continue as part of the long-term water management strategy, depending on the decant volumes anticipated (refer to the Groundwater aspect).	Yes	N/A (individually assessed below).								Avoidance Minimisation Rectification Reduction	• To implement principles of the DWS's four step hierarchy of decision taking. • To comply with requirements of the NWA and associated legislation and policy.	An application will be made under Chapter 4 of the NWA, 1998, to amend the Water Use Licence to reflect the changes in Water Uses during the Decommissioning Phase.	N/A						At least two years prior to the commencement of the decommissioning phase.	Environmental manager.	
															If the above-mentioned Water Use Licence Amendment is granted to Springfield Colliery under Chapter 4 of the NWA, 1998, the conditions of the Licence Amendment will be implemented.							Decommissioning phase.		
															Auditing of compliance with the IWWMP commitments (and if a WUL Amendment is granted, to the conditions of the Licence Amendment) will be conducted regularly in accordance with the timeframes set by the DWS or committed to in the IWWMP.									
															Any new infrastructure will be designed to comply with GN704, 1999, under the NWA.									
															Compliance with Regulations GN 704, titled "Regulations on use of water for mining and related activities aimed at the protection of water resources", dated June 1999, under the NWA, 1998 (Act 36 of 1998), or any Regulations to replace these, will be audited annually, and reported to the DWS.									

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														To minimise impacts on the surrounding water environment.	Employees and contractors will be trained to identify activities that would impact on the surface water aspect of the mine, such as spillage of contaminated water from pollution control dams during emptying ahead of rehabilitation, or spillages of contaminating substances such as diesel, carbonaceous material, etc. Furthermore, they will be informed on the environmental emergency procedure, and will be trained to contact the appropriate person to report such incidents.							Decommissioning phase.	Environmental manager.	
														To verify and quantify the potential impacts of the mine on the receiving water environment.	The surface water monitoring programme and biomonitoring programme will continue to be implemented to enable the actual impacts of the mining and related activities at the proposed Springfield Colliery to be verified and quantified.							Decommissioning phase.	Environmental manager.	
40	**Surface water (quantity and flow)**	The topography will be affected because the remaining voids and the surface infrastructure areas will be rehabilitated and shaped be free draining. This will ensure that storm water runoff, which will be clean once rehabilitation is completed, is no longer retained on site and is discharged to the receiving catchment.	No	+	2	1	5	4	32	1	1	1	Minimisation.	Restore free draining surfaces and catchment yields.	Rehabilitated areas will be monitored to ensure that the area is free draining.	+	2	1	5	5	40	Decommissioning phases.	Rehabilitation manager.	
41		Although Springfield co-disposal facility / discard dump will be rehabilitated *in situ* resulting in the permanently alternation of the topography and localised surface water flow patterns, runoff from the rehabilitated surfaces of the extension will be clean after in situ rehabilitation and will also be allowed to discharge to the receiving catchments. This will contribute to the restoration of pre-mining catchment yield.	Yes	-	2	1	5	4	32	1	2	1	Enhancement.	To restore pre-mining catchment yield through rehabilitation as far as practicable.	The rehabilitated surface of the Springfield co-disposal facility / discard dump will be inspected regularly and repaired or maintained where necessary.	-	2	1	5	4	32	Operational and decommissioning phases	Environmental manager	
42		Entrapment of rainfall on dirty water impoundments that will continue to be utilised during the decommissioning phase as part of the long-term groundwater management strategy will result in the continued retention of that direct rainfall, with the result of a marginal decrease in final, post-mining catchment yield.	No	-	4	1	4	4	36	3	3	1	Avoidance. Minimisation.	To minimise loss in catchment yield.	This impact will be limited to the surface area occupied by the final water storage facility / facilities, thereby minimising the loss of runoff to the receiving catchments.	-	2	1	4	4	28	Decommissioning phase	Mining manager. Environmental manager.	

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43	**Surface water (quantity and flow)**	Pre-mining groundwater contributions to base flow in the Unnamed tributary of the Klip spruit will cease for as long as the groundwater is removed for treatment and maintained below decant level and since the unnamed tributary diversion will be permanent. However, it should be borne in mind that the groundwater that could decant from backed filled mine workings or any remaining underground workings not mined at Springfield Colliery (during the Post-Closure Phase) will very likely be poor quality AMD, and will have to be retained for treatment at the Springfield Colliery Mine Water Treatment plant or passive treatment artificial wetland system proposed, and thus removed from the receiving sub-catchment area until final treatment.	Yes	-	6	1	5	5	60	1	1	3	None.	None.	Little to no mitigation of the remaining impact on surface water quantity after surface rehabilitation will be possible during the decommissioning phase, since the treatment of AMD will have greater benefit to the environment and public than the restoration of catchment yield would be by allowing the AMD to discharge to the receiving wetlands and catchment areas without treatment. Refer also to the Post Closure water management strategy.	-	6	1	5	5	60	Decommissioning phase	N/A	
44		Backfilled opencast mining areas will continue to be subject to localised settling and cracking during the decommissioning phase. Ponding of surface water, the possible development of preferential flow paths, and the infiltration of surface water to the groundwater through surface cracks would impact negatively on the catchment yields. Infiltration to the groundwater would also increase the volume of AMD that would need to be retained and treated.	No	-	6	1	5	4	48	1	2	1	Minimisation. Reduction.	To maximise catchment yield and minimise infiltration to groundwater.	All rehabilitated areas will be inspected for settling and cracking and repaired where necessary to ensure ongoing free drainage until mine Closure is obtained.	-	4	1	5	5	50	Operational and decommissioning phases.	Rehabilitation manager.	
													Minimisation. Rectification		Suitable rehabilitation techniques will be employed for the backfilling of the opencast voids, so as to promote free-drainage, and the re-establishment of pre-mining drainage patterns, as far as possible.								Mine surveyor. Mining manager. Rehabilitation manager.	
													Enhancement.		The rehabilitation of mined areas will be done so as to achieve the pre-planned final landscape configuration taking into account the depth of coal removed and the bulking ratio of the overburden replaced in the pit(s).									
													Minimisation. Rectification.		The post-mining surface topography will be modelled using suitable software, to ensure that appropriate measures can be implemented concurrently with the mining activities to ensure that a free-draining surface can be achieved. Gentle slopes will be implemented to reduce erosion risk.									
													Rectification.		Backfilled cuts will be surveyed to ensure that these are filled and rehabilitated to surface and conform to natural runoff patterns.								Mine surveyor.	
													Rectification		Pre-planning will allow for clean runoff from the rehabilitated area to reach the natural drainage channels in a controlled manner and uncontaminated.								Mine planner. Mine surveyor. Rehabilitation manager.	
													Rectification		Should subsidence / slumping / settlement of the rehabilitated areas occur, maintenance will be undertaken to ensure that the identified subsidence areas are rectified and rehabilitated.								Rehabilitation manager.	

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45	**Surface water (quantity and flow**	Groundwater recharge will increase because of the easier percolation of infiltrating surface water through the unconsolidated material in the backfilled voids. Post-mining recharge levels will increase from pre-mining levels. This increase in groundwater infiltration will result in the equal reduction of MAP available for the receiving surface water catchment.	No	-	6	2	5	5	65	3	3	2	Reduction	To minimise groundwater recharge that will eventually lead to decant of poor quality mine water.	The final void(s) will be backfilled with overburden that will be distributed and shaped to be free draining. The implementation of the soil, surface water and ecology mitigation measures will ensure that the infiltration to the groundwater will be minimised as far as practicable. Compaction of the layers of backfill, and ensuring a high clay content in the backfill subsoils may further reduce excessive infiltration.	-	4	2	5	5	55	Decommissioning phase.	Rehabilitation manager.	
46		Recovery of groundwater levels and possible decant will affect surface water if not prevented or mitigated. At the opencast areas, water quality will be affected through oxidation of pyrites and contact with infiltration. Pits will be rehabilitated by backfilling, shaping and ensuring they are free draining. Once the pits have been backfilled and re-shaped dewatering will cease and water levels will begin to recover in the workings. It is not anticipated that decanting will commence during the decommissioning phase, but only after Closure. However, the construction of decant control measures must take place during the decommissioning phase to be able to obtain Closure.	Yes	-	8	3	5	3	48	1	1	1	Prevention..	To prevent acid mine water / mine affected water from decanting to the receiving surface environment.	All carbonaceous material should be removed and isolated by either disposing of this material on the Springfield co-disposal facility. discard dump or in the final void prior to its rehabilitation. Monitoring of water levels and quality in the backfilled rehabilitated mine workings during the operational and decommissioning phases must be undertaken. This will allow both calibration of the post mining water quality and water volumes. The water level in the workings will be actively managed, if necessary, to ensure it remains below the decant elevation until the long term groundwater management infrastructure was completed. The post closure mine water decant will be collected for treatment it either an active or passive treatment, in line with the long-term mine water management strategy of Springfield Colliery. Clean runoff from the rehabilitated areas will be discharged to the river system.	-	4	2	3	5	45	Decommissioning phase.	Mine manager.	
47	**Surface water (quality)**	Replaced soil in rehabilitated areas will be vulnerable to erosion, leading to increased suspended solids in runoff and resultant sedimentation of receiving catchments, if not appropriately mitigated.	No	-	6	1	1	4	32	1	2	1	Minimisation.	To minimise erosion.	Erosion on the exposed disturbed land use areas as well as rehabilitated land will be minimised by the establishment of a vegetation cover as soon as possible after replacement of soil. The rehabilitated workings will be seeded in accordance with identified suitable indigenous seed mixture. If necessary during windy conditions, dust suppression will be undertaken with raw water in rehabilitated areas. Volumes of water used will be sufficient to reduce dust generation, while avoiding infiltration and ponding of excess water. Clean and dirty water separation berms will only be removed from rehabilitated areas once the vegetation has become self-sustaining and erosion of rehabilitated soils is unlikely to occur.	- - -	4 2 2	1 1 1	1 1 1	4 1 1	24 4 4	Operational and decommissioning phase.	Mining manager. Rehabilitation manager.	

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48	Surface water (quality)	Until rehabilitation of the surface has been completed, possible failure of the storm water management system due to floods exceeding the design capacity may have surface water quality related influences on the receiving water resources.	Yes	-	6	2	1	4	36	3	3	1	Avoidance	To maintain storm water management until rehabilitation has been completed.	Until the surface water management system is removed, the surface diversion berms and drains will be kept free from any obstructions (debris) to ensure that the efficiency is not affected. Changes to the layout of the storm water control measures will be implemented, if required, to accommodate actual conditions and to enhance the efficiency of the management system.	-	6	2	1	1	9	Once a week in dry season, and on a daily basis during the rainy season, especially after storm events during the operational and decommissioning Phases.	Mining manager	
													Reduction		Repair of damages to the clean and dirty water separation infrastructure due to erosion and scouring of areas will be performed following storm events. Normal continuous maintenance throughout Life of Mine will also be performed for all slopes, berms and points of discharge (i.e. clearing of silts and sediments washed into drains, erosion marks will be filled up again, berms will be kept intact, etc.)							Following storm events. Normal maintenance should be undertaken on a weekly basis during operational and decommissioning phases, until infrastructure is removed.	Mining manager	
49		If contaminated surface water (including acid mine water) is discharged, or allowed to flow, to the receiving environment, the water quality in the receiving environment would further deteriorate. Downstream users and aquatic habitats would be negatively affected by such discharge, and the wetlands associated with the streams would also be negatively impacted.	Yes	-	10	3	5	5	90	2	2	1	Avoidance	To prevent contaminated water from entering the receiving environment.	Continuous managing, improvement and monitoring of the water balances will be undertaken to identify risk areas and excess water volumes, and for reporting on conditions on a monthly basis.	-	2	1	4	1	7	Operational and decommissioning phases	Mining manager. Environmental manager.	
															Contaminated surface water will not be allowed to flow or be intentionally discharged to the receiving environment without being treated first, and without the applicable authorisations. However, should such a spill / release occur, the emergency procedure will be implemented to minimise the environmental damage and instigate prompt and effective clean-up.									
50		During decommissioning, surface water would still be vulnerable to contamination due to contact with carbonaceous materials or hydrocarbons, until rehabilitation has been completed.	No	-	10	2	2	4	56	2	3	1	Avoidance. Minimisation. Rectification.	To prevent further contamination of surface water.	Continuing with the implementation of the measures described the construction phase and operational phase EIAMAP, will ensure that contamination of surface water due to contact with contaminating and / or hazardous materials will be minimised.	-	2	1	1	1	4	Operational and decommissioning phases.	Environmental manager. Rehabilitation manager.	
51		Impacts resulting from general rehabilitation and decommissioning works will be similar to those occurring during the construction phase, with rehabilitation earthworks and movement of construction equipment on the site. Unless appropriately managed, impacts may arise from: • Erosion of soils during rainfall events, with elevated suspended solids in the runoff water.	Yes	-	6	2	2	4	40	1	1	1	Minimisation.	Minimise the extent of disturbance and effective dirty water management	Decommissioning and rehabilitation activities will be timed to take place in the dry season, as far as is practical.	-	2	2	2	3	18	Decommissioning phase.	Mining manager.	
															With the exception of permanent infrastructure such as the Springfield co-disposal facility / discard dump, and potential the mine water treatment plant depending on the final Closure objectives, the footprints of disturbed areas will be progressively reduced until rehabilitation is completed.									
															"No-go" zones will be delineated for rehabilitation contractors and mine personnel – particularly in									

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		• Resultant elevated suspended solids in the watercourses, as well as sedimentation in the watercourses and the associated dams. • Hydrocarbon spillages from fuel storage, servicing areas or construction equipment itself, with resultant elevated hydrocarbon concentrations in runoff water, watercourses and the associated wetlands. • Contaminated soils below the plant and stockpiles area may have a long term impact in terms of leaching contaminants to the ground and surface water systems. These impacts are expected to be relatively small, with the resultant impact post decommissioning being positive in comparison with the operational phase.												close proximity and within the catchment areas of the wetlands.									
	Surface water (quality)														The storm water management measures, including PCDs will be decommissioned last, to ensure adequate storm water management during the rehabilitation phase. Before demolition, the dams will be emptied by pumping the contaminated water to the Springfield Colliery Mine Water Treatment Plant for treatment prior to discharge.									
															Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays. Such areas will only be removed once all remaining mining and rehabilitation vehicles are no longer required at the Springfield Colliery mining area.									
															The bunded containment and settlement facilities provided for hazardous materials, such as fuel and oil, will be demolished and removed from the Springfield Colliery mining area once all fuel, oil and other hazardous materials have been removed from the site.									
															Spill absorption product(s) will be kept on site until rehabilitation is completed. The material will be used to clean up hydrocarbon spills in the event that they should occur. This will be carried out in accordance with the mine's waste management procedure.									
															Erosion protection measures will be implemented at steep areas, where required.									
															A waste management plan will be developed for the decommissioning phase, which will include the handling of contaminated materials / soils found on site. This will be carried out in accordance with the mine's existing waste management procedure, which will be updated to include decommissioning activities, prior to the start of decommissioning.									
															All traces of hydrocarbons and residual waste should be removed before infrastructure is demolished.									
															All coal and carbonaceous material will be removed from the stockpiles areas prior to rehabilitation.									
															Contaminated soils will be excavated and placed on the discard facilities, or in the final void prior to their rehabilitation, or removed from site by an appropriately licensed waste contractor.									
															An appropriate sewage management strategy will be implemented during the decommissioning phase,									

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															including decommissioning of the sewage treatment package plant as late as possible in the process.									
															Water quality monitoring will be undertaken downstream of the areas being decommissioned, before and during decommissioning where practical, in order to detect any increase in suspended solids or turbidity and to verify the success of the rehabilitation activities.									
															Erosion protection measures will be implemented at steep areas where required.									
															If erosion is evident or the water quality monitoring indicates an increase in suspended solids, water management around the decommissioning areas will be reviewed and additional measures provided if proven necessary..									
															Contaminated soils will be excavated and placed on the discard facilities or within the final void prior to their rehabilitation, or removed from site by an appropriately licensed waste contractor.									
															The discard dump will be shaped, capped and rehabilitated with slopes gentle enough to be stable in the long term.									
															The opencast pits will be shaped, rehabilitated and made free draining.									
52	**Surface water (quality)**	Decommissioning and rehabilitation of water management infrastructure and PCDs may contribute to surface water quality impacts if not mitigated. The water management berms and canals isolate active areas from the catchment by diverting upslope clean runoff around the active areas and containing runoff generated on the active areas. These can only be removed once the area has been rehabilitated, but may result in increased erosion if not properly planned. The PCDs will be used to contain affected runoff and seepage (from the discard facility) until such time as the area becomes clean. Impacts may arise from: • Erosion of soils during rainfall events, with elevated suspended solids in the runoff water. • Resultant elevated suspended solids in the watercourses, as well as sedimentation in the watercourses and the associated dams.	Yes	-	6	2	2	4	40	1	1	1	Minimisation.	Minimise the extent of disturbance and effective dirty water management	The water management infrastructure will be decommissioned and rehabilitated last. Where necessary, erosion protection in the form of rip-rap, gabions or other appropriate materials will be provided to prevent erosion in the rehabilitated areas.	-	2	2	2	3	18	Decommissioning phase.	Mining manager.	

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		• These impacts are expected to be relatively small, with the resultant impact post decommissioning being positive in comparison with the operational phase. • Potential spillage of contaminated water during rehabilitation of dams if not managed appropriately.																						
53	**Surface water (watercourse alterations)**	The removal of the haul road bridge and conveyor crossing, and the reinstatement of the Unnamed tributary of the Klip spruit / not, (depending on the Closure objectives) would temporarily disturb the bed and banks of the Unnamed tributary of the Klip spruit once more, until rehabilitation is completed.	Yes	-	4	2	2	4	32	2	1	1	Minimisation. Reduction.	To re-establish natural conditions as far as practicable.	Once the haul road bridge and conveyor crossing have been removed, the remaining footprints will be rehabilitated to re-establish natural conditions as far as practicable.	0	4	2	2	4	32	Decommissioning phase.	Rehabilitation manager.	
															A method statement of the planned removal and rehabilitation of the haul road crossing, conveyor crossing and for the Unnamed tributary of the Klip spruit reinstatement (or not) will be submitted to the DWS as part of the Water Use Licence Amendment Application.							At least two years prior to the commencement of the decommissioning phase.	Environmental manager.	
54		Removal of the haul road bridge and conveyor crossing infrastructure , and the reinstatement of the Unnamed tributary of the Klip spruit (depending on the final Closure objectives) will likely result in increased suspended solids due to soil disturbance on the bed and banks of the Unnamed tributary of the Klip spruit.	Yes	-	8	3	2	5	65	2	2	1	Minimisation.	To minimise negative impacts of the rehabilitation process on receiving water quality.	Removal of the haul road crossing and the conveyor crossing from the Unnamed tributary of the Klip spruit will be conducted during the dry season.	-	4	2	1	2	14	Decommissioning phase.	Rehabilitation manager.	
															Measures will be taken to capture any sedimentation that will likely be released upon uplifting the culverts beneath the haul road crossing. The exact rehabilitation strategy to be followed and measures to be implemented is being designed by ENVASS (2024) refer to **Appendix 7**, and included in the method statement to be submitted to the DWS.	-	2	1	1	1	4			
55	**Surface water (flooding)**	All rehabilitated areas and remaining surface infrastructure, such as water management infrastructure and the *in situ* rehabilitated Springfield co-disposal facility / discard dump could be damaged during an extreme storm event. Erosion of rehabilitated surfaces would result in elevated suspended solids in surface runoff, while overflow of dirty water containment facilities would result in contaminants entering the receiving environment.	Yes	-	8	2	1	2	22	3	3	1	Avoidance Reduction	To minimise potential negative impacts on receiving water environment during flood conditions.	Rehabilitated areas and remaining surface infrastructure will be inspected quarterly and will be maintained and repaired where necessary.	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager. Environmental manager.	
															The implementation of related measures previously described will address possible secondary impacts of flooding on suspended solids and overflow of contaminated mine water on the receiving environment.								

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56	**Groundwater (general)**	Water Uses, as defined in Section 21 of the NWA, 1998, will change during the decommissioning phase as mining will have ceased and the associated removal of groundwater and re-use of dirty water will no longer take place. Some surface water storage will continue as part of the long-term water management strategy. No dewatering to be able to mine will be implemented anymore	Yes	-	6	2	5	4	52	2	2	2	Avoidance Minimisation Rectification Reduction	• To implement principles of the DWS's four step hierarchy of decision taking. • To comply with requirements of the NWA and associated legislation and policy.	An application will be made under Chapter 4 of the NWA, 1998, to amend the Water Use Licence to reflect the changes in Water Uses during the decommissioning phase.	-	6	2	5	4	52	At least two years prior to the Decommissioning phase.	Environmental manager.	
															If the above-mentioned Water Use Licence Amendment is granted to Springfield Colliery under Chapter 4 of the NWA, 1998, the conditions of the Licence Amendment will be implemented.							Decommissioning Phase.		
															Auditing of compliance with the IWWMP commitments (and if a WUL Amendment is granted, to the conditions of the Licence Amendment) will be conducted regularly in accordance with the timeframes set by the DWS or committed to in the IWWMP.									
															Any new infrastructure will be designed to comply with GN704, 1999, under the NWA, or the revision of these Regulations anticipated.									
															Compliance with Regulations GN 704, titled "Regulations on use of water for mining and related activities aimed at the protection of water resources", dated June 1999, under the NWA, 1998 (Act 36 of 1998), will be audited biennially, and reported to the DWS.									
														To minimise impacts on the surrounding water environment.	Employees and contractors working at Springfield Colliery during the decommissioning phase will be trained to identify activities that would impact on the groundwater aspect of the mine, such as spillages of contaminating substances e.g. diesel, carbonaceous material, etc. Furthermore, they will be informed on the environmental emergency procedure, and will be trained to contact the appropriate person to report such incidents.							Decommissioning phase.	Environmental manager.	
															Implement as many closure measures as possible already during the operational phase, while conducting monitoring programmes to demonstrate actual performance of the various management actions during the LOM.									
															Mining should remove all coal (or as much as practical possible) from the old underground workings and the opencast pits. The acid forming waste material must then be placed at the base of the pits as part of backfill.									

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	Groundwater (general)													To verify and quantify the potential impacts of the mine on the receiving water environment.	The groundwater monitoring programme will continue to be implemented to enable the actual impacts of the mining and related activities at the proposed Springfield Colliery during the decommissioning phase to be verified and quantified. Monitoring will also enable the early detection of negative impacts. Audit the monitoring network biennially and update through the LOM, to ensure the monitoring results will also inform the Closure planning.							Decommissioning phase.	Environmental manager.	
57		Once mining has been completed, water will no longer be removed from underground. The cessation of pumping out of groundwater will enable the groundwater levels to gradually recover to pre-mining levels. The recovery of groundwater levels will limit the availability of oxygen in the mine voids, which will contribute to the minimisation of the occurrence of acid mine drainage.	Yes	+	4	1	4	3	27	3	1	2	Minimisation.	• To limit exposure of groundwater to oxygen. • To establish a sustainable and agreed end land use through rehabilitation.	The maximum volume of sulphate containing waste material should be stored at the bottom of the pit and flooded as soon as possible to exclude oxygen. The final void(s) will be backfilled with overburden and shaped to be free draining. Backfilled and shaped surfaces will be topsoiled and re-vegetated.	+	3	1	4	3	24	Decommissioning phase.	Rehabilitation manager.	
58	**Groundwater Quantity**	Groundwater will move at a greater rate through the rehabilitated mine workings than pre-mining conditions, because the replaced overburden is broken and fractured, providing less resistance for the movement of water. For similar reasons, infiltration rates of surface water moving to the groundwater will be higher than pre-mining conditions, and will speed up the refilling of mined out workings. However, even with increased infiltration and groundwater level recovery rates, groundwater level recovery is only anticipated to commence during the Post-Closure phase.	Yes	-	4	1	5	5	50	3	3	2	Reduction.	To manage future groundwater decant.	Major underground fractures encountered while mining must be sealed by grouting, both on inflow and outflow areas. As previously described, infrastructure to capture and temporarily store the contaminated groundwater that will decant from the rehabilitated mining areas during the Post-Closure phase will be constructed during the decommissioning phase. The mine water decant (which is expected to commence during the Post-Closure phase) will then be transferred to the Springfield Colliery Mine Water Treatment for treatment to drinking water standards and either sold onwards or returned to the applicable catchment(s). Alternatively the decant water could be redirected via trenching to a constructed wetland system designed for passive mine water treatment, depending on the volumes and quality of decant.	0	4	1	5	4	40	Decommissioning phase and post-Closure	Mining manager. Rehabilitation manager.	
59	**Groundwater Quantity**	The final *in situ* rehabilitation of the Springfield co-disposal facility / discard dump will reduce infiltration of water from the facility to the groundwater, discharging clean storm water runoff to the receiving catchment instead. It is anticipated that the contribution of the Springfield co-disposal facility to the existing pollution plume will gradually decrease with time during the Post-Closure phase. The groundwater pollution plume will continue to move away	Yes	-	8	1	5	5	70	2	3	2	Rectification	To minimise the potential long-term effects of the pollution plume moving towards surrounding groundwater users.	Contaminated groundwater resulting from the Springfield co-disposal facility / discard dump will be abstracted and treated together with contaminated water from the backfilled pit areas. It is anticipated that this will reduce the risk of contamination of the surrounding groundwater environment.	-	2	1	4	1	7	Decommissioning phase.	Mining manager. Environmental manager.	

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		from the rehabilitated facility, since the groundwater gradient will be away from the facility due to artificial mounding of groundwater infiltration.																						
60		Contact of groundwater with carbonaceous material in the presence of air and water will lead to the oxidation of pyrites and consequently to acid mine drainage.	Yes	-	10	1	5	5	80	3	3	2	Minimisation	To limit exposure of groundwater to oxygen.	Coarse discard and carbonaceous material will be backfilled into the pits and the remaining final voids to below the pre-mining coal horizon. This will ensure that once groundwater levels in the backfilled areas inundate the carbonaceous layers, the availability of oxygen for the generation of acid mine drainage will be limited, and will significantly minimise long-term groundwater impacts.	-	8	1	5	4	56	Decommissioning phase.	Mining manager. Environmental manager.	
															A geochemical study is currently underway and the outcome thereof my further inform this impact assessment in so far e.g. the duration anticipated of contamination release from the mine.									
61	**Groundwater Quality**	Vehicles and machinery used during rehabilitation may leak or spill hydrocarbons in areas of use. These pollutants could then in turn infiltrate and pollute the groundwater.	No	-	10	1	5	3	48	3	3	1	Avoidance. Minimisation. Rectification.	• Minimise impacts on quality of surrounding water environment. • Implement principles of the DWS's four step hierarchy of decision taking. • Comply with requirements of the NWA, 1998 and associated legislation and policy.	As mentioned previously, the groundwater monitoring programme that will have commenced during the construction phase will continue to be implemented to verify impacts on surrounding groundwater environment.	N/A						LOM	Environmental manager.	
															Mitigation of the potential impacts of hydrocarbon spillages on surface water and soil will mitigate the resultant impacts thereof on the groundwater.	-	10	1	5	1	16	LOM	Mining manager. Environmental manager.	
62	**Air Quality**	Topsoil recovered from stockpiles for rehabilitation and re-vegetation of surroundings, which will, if left unmitigated, result in the generation of dust that will lower the air quality within the study area.	Yes	-	8	1	1	3	30	1	1	1	Minimisation	To minimise the generation of dust.	• Where necessary, dust suppression will be undertaken with raw water in rehabilitated areas until vegetation cover was established. • Volumes of water used will be managed to avoid ponding of excess dust suppression water on the surfaces.	-	2	1	1	3	12	Decommissioning phase.	Mining manager. Rehabilitation manager.	
63		Until vegetation in rehabilitated areas has become well established and provides sufficient cover for soil, rehabilitated areas will have the potential to generate dust, particularly during windy conditions.	Yes	-	6	2	4	5	60	2	2	2	Minimisation. Reduction.		• Rehabilitated areas will be seeded as soon as possible after replacement of soil, to minimise potential dust generation. • To maximise the success of rehabilitation, all remaining footprint areas will be topsoiled and seeded with an indigenous seed mix aimed at rehabilitation in the project area specifically at the beginning of the growing season.	-	4	2	4	4	40			

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64		Infrastructure removal at plant site, which will, if left unmitigated, result in the generation of dust that will lower the air quality within the study area.	Yes	-	6	1	1	3	24	2	1	1	Minimisation		Where necessary, dust suppression will be undertaken with raw water in rehabilitated areas until vegetation cover was established.	-	2	1	1	3	12			
65		Vehicle entrainment on unpaved road surfaces, which will, if left unmitigated, result in the generation of dust that will lower the air quality within the study area.	Yes	-	8	1	1	4	40	2	1	1	Minimisation		Dust will continue to be controlled through wet suppression and / or chemical stabilisation. Strict speed control will continue to be implemented on the remaining gravel roads within the study area until mine Closure is achieved.	-	2	1	1	1	4			
66		Tailpipe emissions from vehicles utilised during the decommissioning phase, which will if left unmitigated result in the generation of air pollutants that will lower the air quality within the study area.	No	-	6	1	1	3	24	1	1	1	Minimisation	To improve performance in terms of minimising greenhouse gas emissions.	• The mine will register with and report to on greenhouse gas emissions such as CO2, CH4 and N2O to the Department of Environment Forestry and Fisheries (DEFF) (Competent Authority) under the National Greenhouse Gas Emission Reporting Regulations of 3rd April 2017, during the LOM, including the Decommission phase until Closure was obtained. • In addition, vehicle operators will be trained to reduce standing / idling time.	-	2	3	4	2	18			
67	**Air Quality**	All anticipated impacts on air quality during the decommissioning phase were described briefly above. More detailed impact descriptions and impact modelling is presented in the Air Quality Specialist Study attached. **Appendix 3i**: Air Quality Impact Assessment Report. Rayten Engineering Solutions (Pty) Ltd. November 2023	Yes	N/A									None.	To verify and quantify the impacts of the proposed Springfield Colliery Springfield Colliery on the air quality in the receiving environment.	The air quality monitoring programme will continue to be implemented during this phase until Closure is achieved. Measurements will continue to be taken during the decommissioning phase to verify and quantify the impacts on air quality, both as a result of the Springfield Colliery as well as the cumulative effect of the Springfield Colliery and other nearby operations. The monitoring results will also be used to verify the success of the rehabilitation measures implemented.	N/A						LOM	Environmental manager.	
68		Until all stored hydrocarbons and other flammable substances are removed from the Springfield Colliery mine boundary area, the possibility of hydrocarbon spills (e.g. from fuel storage tanks at the office and workshop complex) remains a risk, and noxious and flammable gases may be emitted which are hazardous, both to the receiving environment and to people's health and wellbeing.	No	-	10	1	2	3	39	3	3	3	Prevention. Rectification.	• To minimise people's exposure to the flammable gases. • To clean up any spillages the affected environment.	In the case of a large hydrocarbon spill, all employees should vacate the area where the spill has occurred. This would be considered an emergency and procedures regarding hazardous spills will be followed.	-	10	1	2	1	13	LOM	Mining manager. Environmental manager.	
69	**Noise**	Concurrent and final rehabilitation of mined out workings will require the use of heavy vehicles and possibly noisy machinery and equipment. Noise impacts would therefore be similar to those identified during the construction and operational phases, with the exception of noise impacts related to blasting which will no longer take place.	Yes	-	8	1	4	5	65	1	1	2	Avoidance. Minimisation.	To minimise noise levels near sensitive receptors.	The related mitigation measures identified in the construction and operational phases will continue to be implemented during the decommissioning phase until mine Closure is achieved.	-	6	1	4	5	55	Operational and decommissioning phases	Mining manager. Environmental manager. Rehabilitation manager.	

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70	**Noise**	Dismantling of redundant infrastructure near residential areas will generate nuisance noise that would impact on I&APs within the study area.	Yes	-	8	1	1	4	40	1	1	2	Avoidance. Minimisation.		Dismantling of redundant surface infrastructure will be done during the daytime, and will be limited on weekends to reduce the impact on I&APs.	-	6	1	1	4	32	Operational and decommissioning phases	Mining manager. Rehabilitation manager.	
71		Once all active rehabilitation has taken place, noise impacts will cease.	Yes	+	2	1	5	5	40	N/A			Enhancement.	Maximise the reduction in noise.	Ensure active rehabilitation is completed within a relative short period of time to reduce the impact on receptors.	N/A						Decommissioning phase.	N/A	
72		The pre-mining hydrology of the wetlands will have been permanently altered as a consequence of mining.	Yes	-	6	2	5	5	65	2	2	2	Reduction. Rectification.	• To ensure that rehabilitated areas become self-sustaining. • To ensure that the contribution of the study area to the catchment yield is maximised. • To minimise potential negative impacts on surface water quality in the receiving environment.	Replaced spoils will be landscaped to be free draining, but will avoid steep slopes and concentrated run-off. The commitments in this document with regard to soil, ecology and surface water will ensure that the success of rehabilitation is maximised. The rehabilitated areas will be re-vegetated as soon as possible following completion of the earthworks to minimise erosion. Regular long-term follow up of rehabilitated areas will be undertaken to ensure the successful establishment of vegetation and to survey for any erosion damage on site. Erosion damage will be repaired as soon as possible.	-	6	1	5	5	60	Decommissioning phase.	Rehabilitation manager.	
73	**Sensitive landscapes**			-	6	1	5	4	48	2	2	2	Compensation.	To offset the loss of wetlands during the construction and operational phases.	The possibility of implementing wetland offsets as a means of mitigating against the loss of wetland habitat within the Springfield Colliery mine boundary area is being investigated. A wetland offset strategy is being developed by a suitably qualified person using the SANBI offset guideline methodology. If authorisation is granted by the DWS, management of the offsite wetland area(s) will continue throughout the life of mine.	-	6	1	5	4	48	LOM	Project Manager. Environmental manager. Suitably qualified and independent wetland specialist appointed by the mine.	
74		As mentioned previously, soils in the rehabilitated areas will be vulnerable to erosion. This could lead to increased sediment transport to the receiving wetlands within the study area.	No	-	8	2	3	5	65	2	2	2	Minimisation.	To limit sediment transport off rehabilitated areas.	Implementation of all related measures to mitigate impacts on soils, vegetation and surface water will ensure that the significance of this impact will be minimised.	-	6	2	2	4	40	Decommissioning phase.	Rehabilitation manager.	
75		Unless appropriately managed, sediment movement could occur from the *in situ* rehabilitated Springfield co-disposal facility / discard dump into the down slope wetlands.	No	-	6	1	4	4	44	2	2	2	Minimisation.	To minimise sediment transport off the facility.	Implementation of the soil, vegetation and surface water management measures pertaining to the *in situ* rehabilitation of the co-disposal facility/ discard dump during the operational and decommissioning phases will ensure that this impact will be minimised.	-	4	1	4	3	27	Operational and decommissioning phases.	Mining manager. Rehabilitation manager.	
76		Rehabilitated areas and the wetlands remaining during this phase of the LOM will continue to be vulnerable to an increase in alien invasive plant species.	No	-	6	2	5	3	39	2	2	2	Minimisation.	To prevent declared alien and invasive plants from establishing.	Implementation of the weed eradication and management plan will ensure that this impact on wetlands will be addressed simultaneously.	-	4	1	3	3	24	Decommissioning phase.	Environmental manager.	

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77		Potential impacts on soils and surface water quality could, if not appropriately mitigated, negatively affect the functioning and ecological status of the wetlands within the study area.	No	-	6	2	5	4	52	2	3	2	Minimisation.	To minimise mobilisation of contaminants.	Implementation of mitigation measures for soil and surface water aspects will ensure that this impact on wetlands will be addressed simultaneously.	-	4	1	1	3	18	Decommissioning phase.	Environmental manager. Rehabilitation manager.	
78		Unless appropriately mitigated, any remaining wetland habitat may be further disturbed during this phase of the LOM through impacts.	No	-	6	1	2	4	36	2	2	2	Minimisation.	To minimise activity footprint.	Decommissioning activities will be limited to the existing disturbed footprints. Only existing roads and tracks will continue to be used to access infrastructure areas. Any laydown areas and temporary stockpiles will be located outside wetland areas. Disturbed areas will be rehabilitated as soon as possible following removal of infrastructure. Decommissioning activities will be undertaken in the dry season, as far as practical.	-	4	1	2	3	21	Decommissioning phase.	Rehabilitation manager.	
74	**Sensitive landscapes**	Unless appropriately mitigated, the discharge of clean runoff from the *in situ* rehabilitated Springfield co-disposal facility / discard dump may result in erosion at storm water discharge points if they are placed within or near a wetland.	No	-	6	1	5	4	48	2	2	2	Avoidance.	To prevent erosion at storm water discharge points.	Final rehabilitation of the Springfield co-disposal facility / discard dump will include the design and construction of a surface water management plan to protect the rehabilitated facility and the adjacent areas from erosion by high velocity, concentrated flows. Discharge points will be protected against erosion.	-	4	1	1	3	18	Decommissioning phase.	Rehabilitation manager.	
75		The potential seepage of contaminated water from the rehabilitated co-disposal facility to the receiving surface water environment would lead to the deterioration of water quality in the downslope receiving wetlands.	No	-	8	4	4	4	64	2	3	2	Reduction. Rectification.	To intercept seepage of contaminated water from the co-disposal facility.	Management of the potential impacts of the Springfield co-disposal facility / discard dump on the receiving groundwater and surface water environment (including wetlands) as described in the construction and operational phases will continue until mine Closure is obtained. In line with the long-term groundwater management plan at Springfield Colliery, permanent facilities for the ongoing collection and management (treatment or evaporation) of contaminated seepage from the facility will be constructed during this phase, if proved required through monitoring.	-	6	1	5	3	36	Decommissioning phase.	Rehabilitation manager.	
															Continued groundwater and surface water monitoring as well as biomonitoring will enable this potential impact to be verified and quantified.	N/A						Decommissioning phase.	Environmental manager.	

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76	**Sensitive landscapes**	The specialist study (Limnology, November 2023) attached as **Appendix 3g**, identified impacts on the following aspects related to the wetlands associated with the decommissioning mining and related activities:: • Flood attenuation. • Streamflow regulation. • Sediment trapping. • Sediment regime. • Phosphate assimilation. • Nitrate assimilation. • Toxicant assimilation. • Erosion control. • Road crossing of aquatic ecosystems. • Carbon storage. • Habitat. • Hydrology. • Water quality. • Geomorphology.	No	-	10	2	4	5	80	2	2	2	Reduction. Rectification. Compensation.	• To ensure that rehabilitated areas become self-sustaining. • To ensure that the positive contribution of the rehabilitated mining areas to the wetlands e.g. catchment yield is maximised. • To minimise potential negative impacts on surface water quality in the receiving environment. • To offset the loss of wetlands during the construction and operational phases.	• Attenuation of contaminated storm water into the PCD until all storm water run off can be unaffected by mining and rehabilitation.. • Impact of the removal of the channelled valley bottom wetland must be mitigation for by the storm water management plan. • All wetland related impact mitigation measures previously included in the construction and operational phases still apply. • No release of affected mine water from the mining operations or rehabilitation areas into any wetlands or streams. • Inclusion of sediment trapping in stormwater planning and road infrastructure. • Ensure geomorphology of the wetlands is reinstated after the mining with emphasis on landscape form. • Inclusion of phytoremediation aspects in the PCD and storm water management. • Decrease release sources of contaminated water during decommissioning. • Hydrological connectivity must be retained at both subsurface and surface level. • Ensure post mining landscape form is reinstated. Prevent sheet flows from the activities into aquatic ecosystems. • Preventative measures must be incorporated in the run of mine plan for possible salt and acid mine drainage. • Ensure slopes of structures is 1:3. • Avoid concentrated flow releases. • Loss of depression and seepage wetlands of concern and must be avoided where possible.	-	6	2	4	4	48	Decommissioning phase.	Environmental manager.	
77	**Visual aspects**	Available side slopes of the Springfield co-disposal facility / discard dump will be rehabilitated *in situ* during the operational and decommissioning phases. This will be undertaken by soil cladding and vegetation of the sidewalls of the facility. This will improve the aesthetic appearance of the facility and increase the visual absorption capacity over distances of ~1 km.	No	+	6	3	5	4	56	1	2	2	Enhancement.	To minimise the visibility of the remaining infrastructure as far as practicable.	Implementation of mitigation measures for the anticipated impacts on soils, vegetation, surface water, groundwater, air quality and wetlands will ensure that the anticipated positive impacts on the visual aspects of the study area associated with the rehabilitation of the facility will be maximised.	N/A							Operational and decommissioning phases.	Rehabilitation manager.	

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78		Backfilling and rehabilitation of mined out areas, and the removal of redundant infrastructure and rehabilitation of remaining footprints will restore the topography to pre-mining conditions, thus contributing to the pre-mining visual aesthetics of the study area.	No	+	2	2	4	5	40	N/A			Minimisation. Rectification	To restore the pre-mining visual aesthetics as far as practicable.	Implementation of mitigation measures for the anticipated impacts on topography, soils, vegetation, surface water, groundwater, air quality and wetlands will ensure that the anticipated positive impacts on the visual aspects of the study area associated with the rehabilitation of the mined out areas and remaining footprints of removed infrastructure will be maximised.	N/A						Operational and decommissioning phases.	Rehabilitation manager.	
79		Rehabilitation of mined out workings and footprint areas remaining once infrastructure has been removed to agricultural land capability and grazing land use will contribute to the restoration of the pre-mining 'sense of place' associated with the area.	No	+	2	2	5	5	45	N/A			Rectification	To restore the pre-mining visual aesthetics as far as practicable.	Implementation mitigation measures for the anticipated impacts on topography, soils, vegetation, surface water, groundwater, air quality and wetlands will simultaneously maximise the positive effects of this visual impact.	N/A						Operational and decommissioning phases.	Rehabilitation manager.	
80	**Visual aspects**	Other impacts on visual aspects include secondary impacts of dust generation during rehabilitation, if not appropriately mitigated.	Yes	-	6	2	4	4	48	1	1	1	Minimisation	To minimise impacts of dust on visual aesthetics of study area.	Implementation of air quality mitigation measures described above will simultaneously address this impact on visual aspects.	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
81		The general decommissioning activities leading to visual intrusion on sensitive receptors may include: • Final backfill of open pit and closing of the final void resulting in a mount in the landscape. • Dismantling and removal of the processing plant and associated mining infrastructure. • Rehabilitation of compacted areas. • Cleaning, landscaping, and replacement of soils over the disturbed areas. • Waste generation and disposal. • Ineffective rehabilitation leading to landscape scarring, permanent visual contrast and a permanent alteration of the landscape character and sense of place.	Yes	-	8	3	5	3	48	3	1	1	Minimisation. Rectification	To restore the pre-mining visual aesthetics as far as practicable.	Implementation of mitigation measures for the anticipated impacts on topography, soils, vegetation, surface water, groundwater, air quality and wetlands will ensure that the anticipated positive impacts on the visual aspects of the study area associated with the rehabilitation of the mined out areas and remaining footprints of removed infrastructure will be maximised.	-	6	3	3	2	24	Decommissioning phase.	Rehabilitation manager.	

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82		Residual impact on remaining cemeteries and burial grounds	Yes	-	1	3	4	2	16	1	1	1	Minimisation	Minimise residual impacts	• All burial grounds and graves should be retained and avoided with a buffer zone of 100m (Regulations 17.6(a) and 17.7(a) of the Mine Health and Safety Act Regulations (2014)). Any blasting or activity within the 100m buffer will require a consultation process to identify the next of kin and informing them of this activity. • A 50 meter buffer is required of no activity as contained in the SAHRA Burial Grounds and Graves Policy. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of S36 of the NHRA and its regulations as well as the National Health Act and its Regulations. • Mitigation by selecting alternative routes that will evade the identified sites will enable the reduction in cumulative effects.	+	1	2	5	3	24	Decommissioning phase	Mine manager Rehabilitation manager	
83	**Sites of Archaeological and cultural importance**	Residual impact on Structures older than 60 years Sites: SVR007, SVR011, KF012.	Yes	-	1	1	5	1	7	1	1	1	Minimisation	Minimise residual impacts	• The buildings will be impacted by the proposed opencast as well as the proposed placement of the processing plant. • The design of the processing plant has taken the existing buildings into account and will not impact directly on those remaining historic powerplant buildings (KF012). • Mitigation by selecting alternative routes that will evade the identified sites will enable the reduction in residual effects.	+	1	2	5	3	24	Decommissioning phase	Mine manager Rehabilitation manager	
84		Impact on Structures older than 60 years Sites: SVR012, KF013 – Residual	Yes	-	4	1	5	1	10	1	1	1	Minimisation	Minimise residual impacts	• SVR012 and KF0013 and all its structures will require a destruction permit from the Gauteng provincial Heritage Authority (PHRA-G) in accordance with S34 of the NHRA. • This application will require an application for a mitigation permit from SAHRA; • Documentation of the site through excavations to expose the extent of the structures. • A destruction permit from PHRA-G and SAHRA will be then applied for by the Applicant with the backing of the mitigation report. • Mitigation by acquiring a destruction permit will enable the reduction in residual effects.	-	4	1	5	2	20	Decommissioning phase	Mine manager Rehabilitation manager	

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85		Impact on provincial heritage site Redan rock art site - Residual	Yes	-	2	3	5	4	40	3	3	1	Minimisation	Minimise residual impacts	• A buffer of 200 meters from the closest open cast mining must be put in place. (If less e.g. 50m proposed, the necessary authorization must be applied for). • A Heritage Management Plan (HMP) must be developed in consultation with SAHRA and PHRA-G after approval of the EA. • This HMP must include as a minimum: a. Agreed upon buffer distances. b. Fencing strategies. c. Monitoring strategies. d. Roles and responsibilities. • Mitigation by implementing a Heritage Management Plan will enable the reduction in residual effects.	-	2	3	5	4	40	Decommissioning phase	Mine manager Rehabilitation manager	
86	**Sites of Archaeological and cultural importance**	Impact on Palaeontology Residual	Yes	-	2	1	5	4	32	3	3	1	Minimisation	Minimise residual impacts	• The ECO for this project must be informed that the Vryheid Formation, has a very High Palaeontological Sensitivity. • The ECO for this project must be informed that the Vryheid Formation (Ecca Group, Undifferentiated Karoo) and Precambrian dolomites and associated marine sedimentary rocks allocated to the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup), has a very High Palaeontological Sensitivity. • If fossil remains are discovered during any phase of construction, operation or decommissioning, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO in charge of these developments. These discoveries ought to be secured (if possible, in situ) and the ECO ought to alert SAHRA so that appropriate mitigation (documented and collection) can be undertaken by a paleontologist. • These recommendations must form part of the Heritage Management Plan for Springfield Colliery. • Mitigation recommendations implemented on identified site will enable the reduction in residual effects.	-	2	1	5	4	32	Decommissioning phase	Mine manager Rehabilitation manager	
87	**Sites of Archaeological and cultural importance**	The impacts and mitigation measures identified in the construction and operational phases will continue to apply during the decommissioning phase, until mine Closure has been achieved.																						

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88	Socio-economic impacts	All positive impacts of the mine on the socio-economy that will have taken place during the operational phase will wane during the decommissioning phase until they cease, mainly due to the reduction or cessation of jobs and the related cessation of demand for goods and services. Closure will involve large scale downscaling and retrenchment of the workforce over several years. Although there will be downscaling during this phase, some community members would have worked on the proposed mine, and will constitute a reserve of trained workforce. The effects of economic opportunities lost will be felt for a long time, especially if those affected cannot secure economic opportunities elsewhere. This impact will further be exacerbated by the overall shortage of economic opportunities in the primary zone of influence area and the country at large. The impact will mostly affect individuals who benefitted from the	Yes	-	10	3	5	5	90	3	3	2	Reduction. Minimisation. Reduction.	To ensure that employees are re-skilled to ensure they are employable.	The impact of mine closure on businesses providing goods and services is unavoidable, as is the cessation of contribution to community projects. However, the impacts on employees would be mitigated by the continued implementation of the Social and Labour Plan. Employees will be skilled and career progressed through the human resources development programme, which will enable them to acquire skills that will help them re-enter the work place after closure of the mine. Springfield will, through the Social and Labour Plan (processes pertaining to management of downscaling and retrenchments) and the relevant legislation, re-skill all employees to be retrenched. This will ensure that the employees affected by the closure of this mining operation can re-enter the workplace. Note, however, that the mine and the mining contractor may still use the employees in other mining projects, limiting the number of retrenchments after mine closure.	+	4	1	4	4	36	LOM	Environmental manager.	
89		Depletion of mineable coal at Springfield Colliery will mean that the contribution of the mine to national, provincial and local GDPs will cease. Similarly, the provision of coal for domestic electricity generation will cease, possibly contributing to the constraints and pressures of power generation in South Africa, which would impact further downstream on businesses and homes dependant on electricity.	Yes	-	6	4	5	5	75	3	3	3	None.	None.	As coal is a fossil fuel, it is a non-renewable resource. The impacts of the depletion of coal on national, regional and local socio-economic aspects are unavoidable, and no mitigation is possible.	N/A								
90		Rehabilitation of the surface to support pre-mining land capability means that future land use of the site will be sustainable over the long-term. Use of the land for agricultural purposes such as crop cultivation or grazing will enable the contribution of future land users to the local and regional socio-economy through food production and agricultural job creation, albeit potential at a lesser level / intensity.	Yes	+	8	2	5	4	60	3	3	2	Rectification. Enhancement	To ensure that the land capability and end land use objectives can be achieved. To ensure that the land is rehabilitated so that it can provide economic value to the surrounding communities.	Measures will be implemented to ensure that the land capability and end land use objectives can be achieved, and will ensure that the anticipated positive future long-term socio-economic impacts will be possible. Springfield Colliery will again conduct public participation during the decommissioning phase to understand how the surrounding communities would like to use the land during the Post-Closure.	N/A N/A		Operational and decommissioning phases. Decommissioning phase.	Rehabilitation manager. Environmental manager. Rehabilitation manager. Community Officer.	

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91	Socio-economic impacts	• Residual impacts on the developed local economy. The residual impacts associated with the creation of employment and business opportunities and training during the construction of additional infrastructure is that the workers can improve their skills by gaining more experience. • Residual impacts on improved economic development: Increased capacity to develop and maintain livelihood strategies. • Residual impacts associated with the creation of employment and business opportunities and training during the operational phase is that it benefits the local economy. Acquired transferable skills that could potentially be used with other businesses. • Local suppliers will have gained experience and exposure to meeting standards of quality and scale that could be transferrable to business opportunities	Yes	-	10	3	5	5	90	3	3	2	Minimisation. Reduction	Minimise residual impacts	• The impact of mine closure on businesses providing goods and services is unavoidable, as is the cessation of contribution to community projects. However, the impacts on employees would be mitigated by the continued implementation of the Social and Labor Plan. • Employees will be skilled and career progressed through the human resources development programme, which will enable them to acquire skills that will help them re-enter the workplace after closure of the mine. • Springfield will, through the Social and Labour Plan (processes pertaining to management of downscaling and retrenchments) and the relevant legislation, re-skill all employees to be retrenched. This will ensure that the employees affected by the closure of this mining operation can re-enter the workplace. Note, however, that the mine and the mining contractor may still use the employees in other mining projects, limiting the number of retrenchments after mine closure.	+	1	4	1	3	18	LOM	Environmental manager. Mine manager. Community Officer.	
92		• Community Development and Social Upliftment through LED Projects Economic process. • The Closure of the project is expected to significantly reduce economic development and diversification. • Nature of the impact: dependency on mine for sustaining local economy during closure phase. • Increased social pathologies linked to influx of workers and job seekers-Demographic change/Socio-cultural wellbeing process. • During the decommissioning and closure phases, it is likely that workers will remain in the area as they may seek employment locally and are likely to have established networks and become connected after a long period of time. • While the proposed Project can contribute significantly to economic development through its lifetime, this positive impact also has an adverse aspect, in that the	Yes	-	8	4	4	4	64	1	3	2	Minimisation. Reduction	Minimise residual impacts	• Effect retrenchments according to procedures stipulated in approved SLP. • The proposed Glubay Coal's SLP should provide strategies and measures that prevent job loss. • Support economic diversification through development of alternative markets. • Develop a Social Mine Closure Plan. • Proactively and effectively implement mine closure plan. • Collaborate with nearby mining companies and industries to develop and implement sustainable community building. • Develop alternative and sustainable livelihoods. • Alternatives to save jobs/avoid downscaling should be investigated beforehand. • Proactively assess and manage the social and economic impacts on individuals, regions and economies where retrenchment and/or closure of the mine are certain. • Partner with the relevant government departments, to jointly manage Closure process.	-	6	4	4	3	42	LOM	Environmental manager. Mine manager. Community Officer.	

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		proposed mine will inevitably close, and this may have devastating consequences for an area that has not invested in economic diversification. The decommissioning phase of the Project will result in several potential negative socio-economic impacts. A considerable number of people and their families will become increasingly dependent on the mine for their livelihood. • Corresponding project benefits such as community development, LED and CSI programmes will cease. • More widely, project benefits arising from the procurement of goods and services as well as demand for goods and services by wage-earning employees will cease. • The mine's direct involvement in community development initiatives will also cease. Economic downturn and the resultant loss of employment could result in increases in social pathologies, such as crime, gender violence, prostitution and substance abuse.																					
93	I&APs	Restoration of surface topography and rehabilitation of disturbed areas to agricultural (arable and grazing) land capability and use for grazing will improve the visual aspects of the study area, restoring the 'sense of place' associated with the natural topography and agricultural activities of the region.	Yes	+	2	2	4	5	40	N/A		Rectification.	To minimise negative visual impacts.	The measures implemented to mitigate impacts on topography, soils, vegetation, surface water and air quality will indirectly mitigate negative visual impacts.	N/A						Operational and decommissioning phases.	Rehabilitation manager.	
94		Nuisance dust and noise impacts will cease once rehabilitation has been completed.	Yes	+	2	1	5	5	40	N/A		None.	Keep communication channels between Springfield Colliery and I&APs open.	Communication with I&APs will continue through the Decommissioning Phase.	N/A						LOM	Community Officer.	
95		Erosion of soil from rehabilitated areas will increase suspended solids and turbidity of runoff draining into receiving watercourses, causing sedimentation and increased TDS, which could impact on downstream water users.	Yes	-	6	2	4	4	48	2	3	1	Avoidance. Minimisation. Reduction.	To prevent further impacts on downstream water users.	Implementation of soil and surface water management measures will prevent or minimise the potential impacts on downstream water users.	N/A						Operational and decommissioning phases.	Rehabilitation manager.	

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96	**I&APs**	Rehabilitation of the surface to agricultural potential means that land will become available behind mining during the operational phase, as well as once rehabilitation during the decommissioning phase has been completed. Such land will become available for use for grazing, and will be made available for tenancy by local farmers, but only after re-vegetation has suitably been re-established, until mine closure is obtained.	Yes	+	8	1	3	4	48	N/A		Enhancement.	To ensure land is restored to be able to support optimal sustainable land uses over the long term.	Implementation of measures to ensure that the pre-mining land capability is restored as far as practicable, and that the land is used for long-term sustainable activities.	N/A						Operational and decommissioning phases.	Mine manager. Environmental manager.	
97		Treatment of mine water at the Springfield Colliery Mine Water Treatment and onward potential sale of potable water to the farmers or discharge to the receiving water resource will contribute positively to the availability of potable water, influencing downstream businesses and development, which will influence socio-economic impacts positively.	Yes	+	10	3	4	5	85	N/A		Enhancement.	To provide an ongoing, long-term solution to acid mine drainage decanting, both now and in the future.	Continued supply of mine water to the Springfield Colliery Mine Water Treatment for treatment will ensure that the availability of treated mine water for agricultural use and for discharge to the receiving resource to meet the Reserve objectives as required by the DWS..	N/A						Operational and decommissioning phases.	Mining manager. Environmental manager.	
DECOMMISSIONING OF THE REDAN SIDING																							
98	**Geology**	No impacts are expected to occur on geology as a result of the removal of redundant infrastructure and rehabilitation of disturbed areas.																					
99	**Topography**	Impacts on topography will remain where infrastructure, such as the railway siding itself is left intact. Infrastructure such as the Rapid Loading Terminal and stockpile area will be rehabilitated. The water management infrastructure will be left intact, depending on the agreed Closure objectives.	No	-	4	1	5	5	50	2	2	2	Reduction.	To maximise potential for sustainable land use(s) in the future. Minimise long term impact on topography.	Infrastructure that will remain intact will be maintained by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	-	2	1	5	4	32	Operational and decommissioning phases.	Mining manager. Environmental manager.	
100	**Soil**	The Rapid Loading Terminal area and product stockpile area will be removed and the remaining footprint will be rehabilitated. The siding, buildings and access roads will remain, depending on the end land use. The soils in the area where infrastructure remain will be permanently impacted.	No	-	2	1	1	1	4	3	2	2	Rectification.	To restore soils as far as practicable to achieve maximum land capability.	Carbonaceous materials will be removed from the Redan siding footprint area and disposed on the Springfield co-disposal facility / discard dump (before the facility undergoes final *in situ* rehabilitation) / within the final void. The related mitigation measures identified above will also be applied here.	-	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	

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101	**Land capability**	Land capability in the areas where infrastructure will remain in place such as the Redan siding and access road, will remain permanently altered from the pre-mining land capability. However, while the land may no longer be capable of supporting an agricultural land use in this area, the potential benefits of the remaining infrastructure to future land users / owners would contribute to a sustainable future land use and would enable future land users / owners to generate an income through the use of the remaining infrastructure.	Yes	+	4	1	5	4	40	2	3	2	Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Infrastructure that will remain intact will be maintained in good repair by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	+	6	1	5	4	48	Operational and decommissioning phases.	Mining manager. Environmental manager.	
102	**Land use**	The potential retention and maintenance of the infrastructure at the Redan siding that will remain for utilisation post-closure, such as the siding, buildings and access road will restrict the future land use to peri-urban uses such as light industry. However, the close location to the existing urban areas as well as the nearby heavy industries, makes the possible use of the siding post-closure desirable.	Yes	+	6	1	5	4	48	N/A			Enhancement.	To ensure land is restored to be able to support a long-term sustainable land use.	Infrastructure that will remain intact will be maintained in good repair by Springfield Colliery until mine Closure is obtained, or until ownership of the said infrastructure and land is acquired by a third party in future.	+	8	1	5	4	56	Operational and decommissioning phases.	Mining manager. Environmental manager.	
103	**Vegetation**	Increased invasion of untransformed vegetation into rehabilitated areas by alien plants is possible at the Redan siding.	No	-	8	2	4	4	56	2	2	2	Reduction	To prevent declared alien and invasive plants from establishing.	As per the Conservation of Agricultural Resources Act (Act No. 43 of 1983), weeds and alien invader plants will continue to be monitored and controlled within the rehabilitated areas and their immediate surrounds. As mentioned previously, rehabilitated areas will be vulnerable to invasion by such species, and will accordingly be more intensively and closely managed.	-	4	1	2	3	21	Decommissioning phase.	Rehabilitation manager.	
104	**Animal life**	Noise from vehicles and machinery used for the demolishing of infrastructure such as the Rapid Loading Terminal , conveyor and stockpiles as well as rehabilitation within the Redan siding area, such as the removal of coal dust / fines may frighten any remaining animals and in turn cause them harm and prevent the return of such animals from the surrounding areas due to permanent habitat destruction.	No	-	6	1	2	1	9	2	2	2	Minimisation.	To minimise damage to, and loss of, animal life, particularly animals of conservation importance.	Vehicles and machinery used for the rehabilitation at the Redan siding will be limited to the remaining access roads as well as rehabilitation areas itself.	-	2	1	1	1	4	Decommissioning phase.	Mining manager. Rehabilitation manager.	

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105	**Surface water**	Affected water storage within the purpose build PCD and silt trap, may have to continue as part of the long-term water management strategy, Entrapment of rainfall on dirty water impoundments that will continue to be utilised as part of the long-term management strategy will result in the continued retention of that direct rainfall, with the result of a marginal decrease in final, post-mining catchment yield.	No	-	4	1	4	4	36	3	3	1	Avoidance. Minimisation.	To minimise loss in catchment yield.	• This impact will be limited to the surface area occupied by the final water storage facility / facilities, thereby minimising the loss of runoff to the receiving catchments. • The surface water monitoring programme and biomonitoring programme will continue to be implemented to enable the actual impacts of the mining and related activities at the Redan siding to be verified and quantified.	-	2	1	4	4	28	Decommissioning phase	Mining manager. Environmental manager.	
106	**Groundwater**	Vehicles and machinery used during rehabilitation may leak or spill hydrocarbons in areas of use. These pollutants could then in turn infiltrate and pollute the groundwater.	No	-	10	1	5	3	48	3	3	1	Avoidance. Minimisation. Rectification.	• Minimise impacts on quality of surrounding water environment. • Implement principles of the DWS's four step hierarchy of decision taking. • Comply with requirements of the NWA, 1998 and associated legislation and policy.	• Mitigation of the potential impacts of hydrocarbon spillages on surface water and soil will mitigate the resultant impacts thereof on the groundwater. • As mentioned previously, the groundwater monitoring programme that will have commenced during the construction phase will continue to be implemented to verify impacts on surrounding groundwater environment.	-	10	1	5	1	16	LOM	Mining manager. Environmental manager.	
107	**Air Quality**	Infrastructure removal at Redan siding, will, if left unmitigated, result in the generation of dust that will lower the air quality within the study area.	Yes	-	6	1	1	3	24	2	1	1	Minimisation	To minimise the generation of dust.	Where necessary, dust suppression will be undertaken with raw water in rehabilitated areas until vegetation cover was established.	-	2	1	1	3	12	Decommissioning phase.	Mining manager. Rehabilitation manager.	
108	**Noise**	Dismantling of redundant infrastructure near residential areas will generate nuisance noise that would impact on I&APs within the study area.	Yes	-	8	1	1	4	40	1	1	2	Avoidance. Minimisation.	To minimise noise levels near sensitive receptors.	Dismantling of redundant surface infrastructure will be done during the daytime, and will be limited on weekends to reduce the impact on I&APs.	-	6	1	1	4	32	Operational and decommissioning phases	Mining manager. Rehabilitation manager.	
109	**Sensitive landscapes**	Unless appropriately mitigated, any remaining wetland habitat may be further disturbed during this phase through rehabilitation impacts.	No	-	6	1	2	4	36	2	2	2	Minimisation.	To minimise activity footprint.	• Decommissioning activities will be limited to the existing disturbed footprints. • Only existing roads will be used to access infrastructure rehabilitation / demolishing / maintenance areas. • Decommissioning activities will be undertaken in the dry season, as far as practical.	-	4	1	2	3	21	Decommissioning phase.	Rehabilitation manager.	

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110	**Visual aspects**	General decommissioning activities leading to visual intrusion on sensitive receptors may include: • Rehabilitation of compacted areas. • Cleaning, landscaping, and replacement of soils over the disturbed areas. • Waste generation and disposal. • Ineffective rehabilitation can lead to landscape scarring, permanent visual contrast and a permanent alteration of the landscape character and sense of place.	Yes	-	8	3	3	3	42	3	1	1	Minimisation. Rectification	To restore the pre-mining visual aesthetics as far as practicable.	Implementation of mitigation measures for the anticipated impacts on topography, soils, vegetation, surface water, groundwater, air quality and wetlands will ensure that the anticipated positive impacts on the visual aspects of the study area associated with the rehabilitation of the mined out areas and remaining footprints of removed infrastructure will be maximised.	-	8	3	3	2	28	Decommissioning phase.	Rehabilitation manager.	
111		Other impacts on visual aspects include secondary impacts of dust generation during rehabilitation, if not appropriately mitigated.	Yes	-	6	2	4	4	48	1	1	1	Minimisation	To minimise impacts of dust on visual aesthetics of study area.	Implementation of air quality mitigation measures described previously will simultaneously address this impact on visual aspects.	0	2	1	1	1	4	Decommissioning phase.	Rehabilitation manager.	
112	**Sites of Archaeological and cultural importance**	The impacts and mitigation measures identified in the construction and operational phases will continue to apply during the decommissioning phase, until mine Closure has been achieved.																						
113	**Socio-Economic aspects**	The same impacts and mitigation measures described above for Springfield Colliery mining rehabilitation of mine affected areas applies.																						
114	**I&APs**	The same impacts and mitigation measures described above for Springfield Colliery mining rehabilitation of mine affected areas applies.																						